

D1750V2, Serial No. 1090 Extended Dipole Calibrations

Referring to KDB 865664 D01 v01r02, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

	1750V2 – serial no. 1090											
	1750 Head					1750 Body						
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2019.3.27	-29.2		47.5		-2.3		-23.2		43.9		-2.2	
2020.3.26	-29.8	-0.02	51.2	-3.66	-3.0	0.70	-25.0	-0.08	45.1	-1.22	-2.17	-0.02

<Justification of the extended calibration>

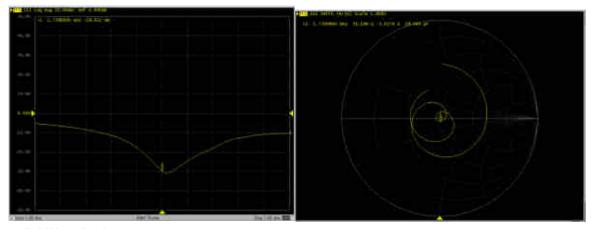
The return loss is < -20dB, within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

TEL: 86-0512-5790-0158 FAX: 86-0512-5790-0958

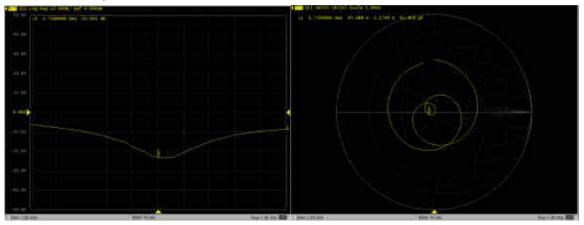


Dipole Verification Data> D1750V2, serial no. 1090

1750MHz - Head



1750MHz - Body



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In Collaboration with

CALIBRATION LABORATORY

CALIBRATION **CNAS L0570**

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Client

Sporton

Certificate No:

Z19-60085

CALIBRATION CERTIFICATE

Object D1900V2 - SN: 5d170

Calibration Procedure(s)

FF-Z11-003-01

Calibration Procedures for dipole validation kits

Calibration date:

March 26, 2019

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3) to and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Power sensor NRP8S	104291	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20
DAE4	SN 1331	06-Feb-19(SPEAG,No.DAE4-1331_Feb19)	Feb-20
Secondary Standards	ID#	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20
NetworkAnalyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan-20

Name Function Signature Calibrated by: Zhao Jing SAR Test Engineer Reviewed by: Lin Hao SAR Test Engineer

Approved by: Qi Dianyuan SAR Project Leader

Issued: March 29, 2019

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Certificate No: Z19-60085

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lossary:

TSL tissue simulating liquid

ConvF sensitivity in TSL / NORMx,y,z N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point.
 No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

Certificate No: Z19-60085



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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	52,10,2,1495
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) *C	40.5 ± 6 %	1.44 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C		M++1

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.90 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	39.0 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.12 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.3 W/kg ± 18.7 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53,3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.5 ± 6 %	1.56 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C		-

SAR result with Body TSL

SAR averaged over 1 cm3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.1 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	40.0 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.28 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.0 W/kg ± 18.7 % (k=2)

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.7Ω+ 6.73jΩ			
Return Loss	- 23.3dB			

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.8Ω+ 6.72jΩ	
Return Loss	- 22.8dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.066 ns
Electrical Delay (offe difection)	T,UDD HS

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

		_
Manufactured by	SPEAG	

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DASY5 Validation Report for Head TSL

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d170

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; $\sigma = 1.441 \text{ S/m}$; $\varepsilon_r = 40.48$; $\rho = 1000 \text{ kg/m}3$

Phantom section: Center Section

DASY5 Configuration:

 Probe: EX3DV4 - SN3617; ConvF(8.14, 8.14, 8.14) @ 1900 MHz; Calibrated: 1/31/2019

Date: 03.26,2019

- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:

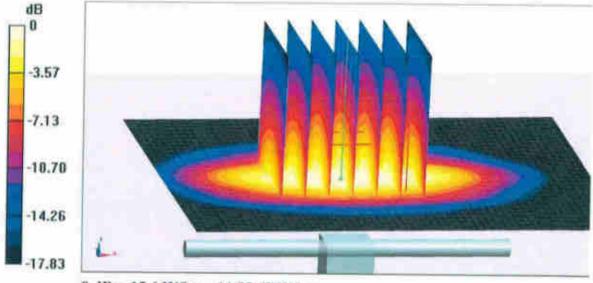
dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.54 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 18.9 W/kg

SAR(1 g) = 9.9 W/kg; SAR(10 g) = 5.12 W/kg

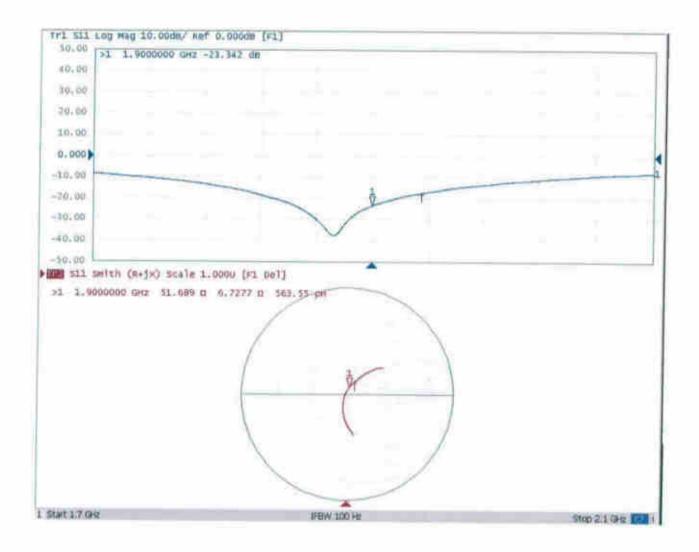
Maximum value of SAR (measured) = 15.6 W/kg



0 dB = 15.6 W/kg = 11.93 dBW/kg

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Impedance Measurement Plot for Head TSL.



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DASY5 Validation Report for Body TSL

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d170

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1900 MHz; $\sigma = 1.56$ S/m; $\varepsilon_r = 54.52$; $\rho = 1000$ kg/m3

Phantom section: Right Section

DASY5 Configuration:

 Probe: EX3DV4 - SN3617; ConvF(7.78, 7.78, 7.78) @ 1900 MHz; Calibrated: 1/31/2019

Date: 03.26.2019

- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:

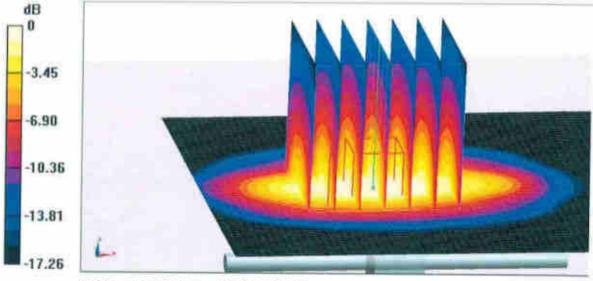
dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.48 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 18.6 W/kg

SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.28 W/kg

Maximum value of SAR (measured) = 15.7 W/kg

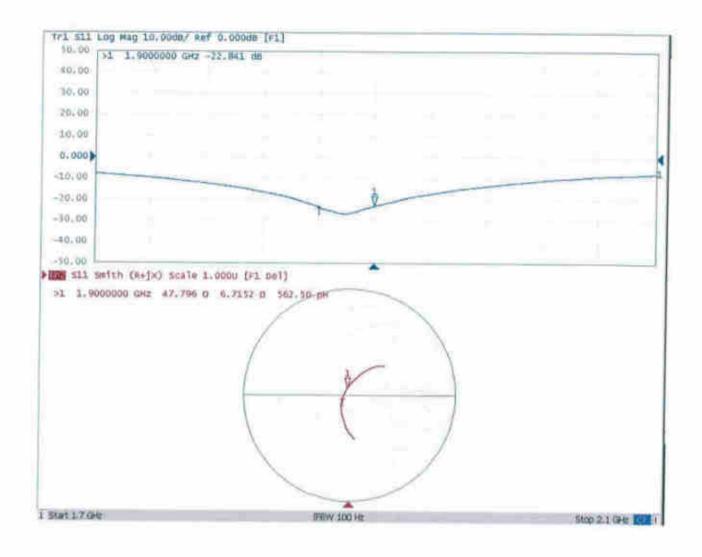


0 dB = 15.7 W/kg = 11.96 dBW/kg

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Impedance Measurement Plot for Body TSL





D1900V2, Serial No. 5d170 Extended Dipole Calibrations

Referring to KDB 865664 D01 v01r02, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

	1900V2 – serial no. 5d170											
		1900 Head						1900 Body				
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2019.3.26	-23.3		51.7		6.7		-22.8		47.8		6.7	
2020.3.25	-22.3	0.05	53.0	-1.26	7.4	-0.64	-22.5	0.01	49.2	-1.37	7.41	-0.69

<Justification of the extended calibration>

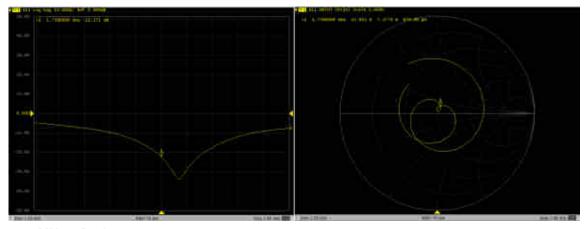
The return loss is < -20dB, within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

TEL: 86-0512-5790-0158 FAX: 86-0512-5790-0958

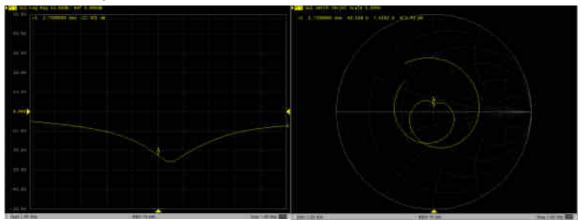


Dipole Verification Data> D1900V2, serial no. 5d170

1900MHz - Head



1900MHz - Body



TEL: 86-0512-5790-0158 FAX: 86-0512-5790-0958



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Client

Sporton

Certificate No:

Z19-60087

CALIBRATION CERTIFICATE

Object D2450V2 - SN: 908

Calibration Procedure(s)

FF-Z11-003-01

Calibration Procedures for dipole validation kits

Calibration date:

March 25, 2019

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3) and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration	
Power Meter NRP2	106277	20-Aug-18 (CTTL, No.J18X06862)	Aug-19	
Power sensor NRP8S	104291	20-Aug-18 (CTTL, No.J18X06862)	Aug-19	
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20	
DAE4	SN 1331	06-Feb-19(SPEAG,No.DAE4-1331_Feb19)	Feb-20	
Secondary Standards	ID#	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration	
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20	
NetworkAnalyzer E5071C MY46110673		24-Jan-19 (CTTL, No.J19X00547)	Jan-20	

Name Function Signature Calibrated by: Zhao Jing SAR Test Engineer Reviewed by: Lin Hao SAR Test Engineer Approved by: Qi Dianyuan SAR Project Leader

Issued: March 28, 2019

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Glossary:

TSL tissue simulating liquid

ConvF sensitivity in TSL / NORMx,y,z N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point.
 No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

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Measurement Conditions

DASY system configuration, as far as not given on page 1

DASY Version	DASY52	52.10.2.1495
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) "C	39.6 ± 6 %	1.84 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	1200	

SAR result with Head TSL

SAR averaged over 1 cm3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.8 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.2 W/kg ± 18.7 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.8 ± 6 %	2.00 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	2000	

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.8 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	50.8 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.91 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	23.6 W/kg ± 18.7 % (k=2)

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	57.3Ω+ 5.18 jΩ		
Return Loss	- 21.6dB		

Antenna Parameters with Body TSL

Impedance, transformed to feed point	52.6Ω+ 5.81 μΩ		
Return Loss	- 24.1dB		

General Antenna Parameters and Design

Electrical Delay (one direction)	1.020 ns
Ciscinesi Beisy (one direction)	1.020 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

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DASY5 Validation Report for Head TSL

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 908

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz; $\sigma = 1.841$ S/m; $\varepsilon_t = 39.63$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

 Probe: EX3DV4 - SN3617; ConvF(7.62, 7.62, 7.62) @ 2450 MHz; Calibrated: 1/31/2019

Date: 03.25.2019

- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

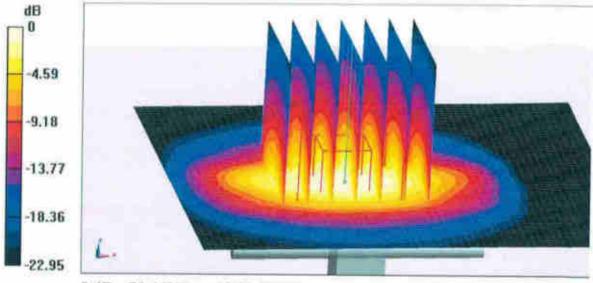
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.04 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 28.3 W/kg

SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.07 W/kg

Maximum value of SAR (measured) = 22.4 W/kg



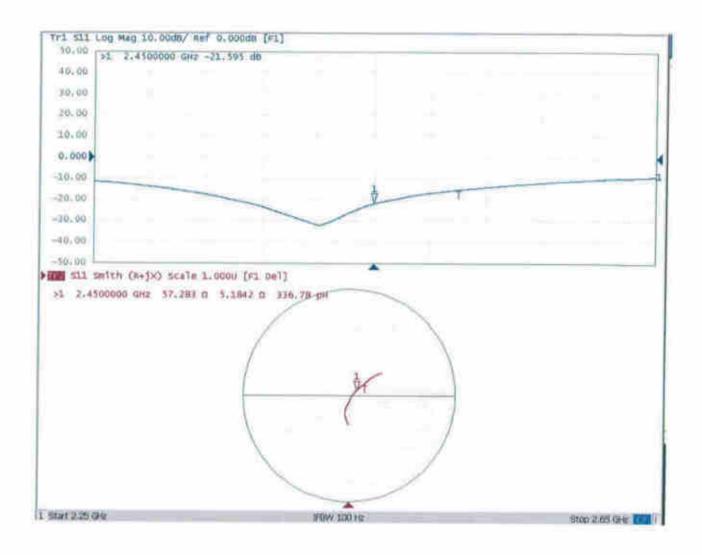
0 dB = 22.4 W/kg = 13.50 dBW/kg

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Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 908

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz; $\sigma = 2.003$ S/m; $\varepsilon_r = 53.78$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY5 Configuration:

 Probe: EX3DV4 - SN3617; ConvF(7.79, 7.79, 7.79) @ 2450 MHz; Calibrated: 1/31/2019

Date: 03.25.2019

- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm,

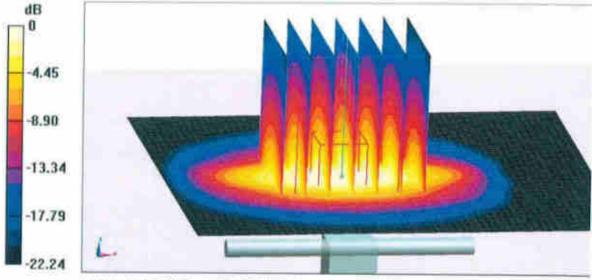
dy=5mm, dz=5mm

Reference Value = 95.51 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 27.1 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 5.91 W/kg

Maximum value of SAR (measured) = 21.4 W/kg

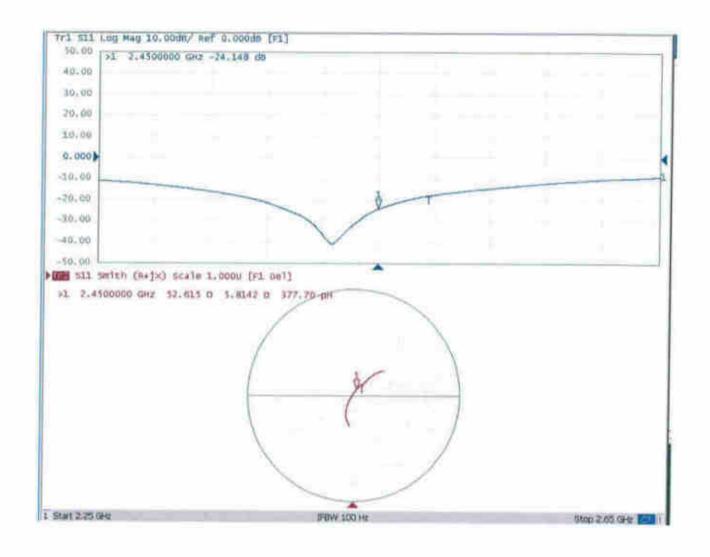


0 dB = 21.4 W/kg = 13.30 dBW/kg

Certificate No: Z19-60087 Page 7 of 8



Impedance Measurement Plot for Body TSL





D2450V2, Serial No. 908 Extended Dipole Calibrations

Referring to KDB 865664 D01 v01r02, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

2450V2 – serial no. 908												
	2450 Head				2450 Body							
Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2019.3.25	-21.6		57.3		5.2		-24.1		52.6		5.8	
2020.3.24	-22.7	-0.05	57.5	-0.18	2.4	2.81	-26.1	-0.08	55.01	-2.40	1.493	4.32

<Justification of the extended calibration>

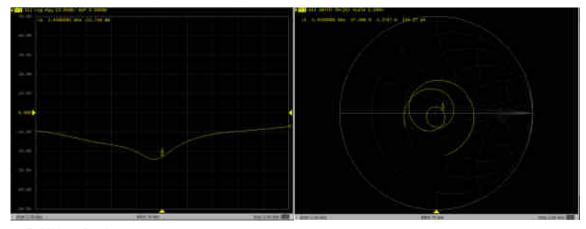
The return loss is < -20dB, within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

TEL: 86-0512-5790-0158 FAX: 86-0512-5790-0958

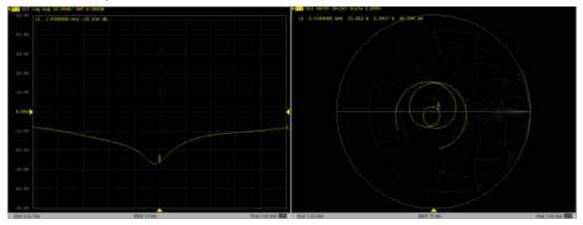


Dipole Verification Data> D2450V2, serial no. 908

2450MHz - Head



2450MHz - Body



TEL: 86-0512-5790-0158 FAX: 86-0512-5790-0958

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





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Accreditation No.: SCS 0108

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Client

Sporton

Certificate No: D2600V2-1061 Nov20

CALIBRATION CERTIFICATE

Object D2600V2 - SN:1061

Calibration procedure(s) QA CAL-05.v11

Calibration Procedure for SAR Validation Sources between 0.7-3 GHz

Calibration date: November 26, 2020

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).

The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: BH9394 (20k)	31-Mar-20 (No. 217-03106)	Apr-21
Type-N mismatch combination	SN: 310982 / 06327	31-Mar-20 (No. 217-03104)	Apr-21
Reference Probe EX3DV4	SN: 7405	29-Jun-20 (No. EX3-7405_Jun20)	Jun-21
DAE4	SN: 601	02-Nov-20 (No. DAE4-601_Nov20)	Nov-21
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-20)	In house check: Oct-22
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-21
	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
access of the second	NAMES HOLD OF STREET	**************************************	y G
Approved by:	Katja Pokovic	Technical Manager	deles_

Issued: November 26, 2020

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Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL tissue simulating liquid

ConvF sensitivity in TSL / NORM x,y,z N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- iEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed
 point exactly below the center marking of the flat phantom section, with the arms oriented
 parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point.
 No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2600 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.0	1.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.6 ± 6 %	2.03 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	State	****

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	14.5 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	56.6 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	25.1 W/kg ± 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.6 Ω - 2.3 jΩ	
Return Loss	- 24.8 dB	

General Antenna Parameters and Design

ANTER WASSEN TO ME AND N	7/05/920
Electrical Delay (one direction)	1.149 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Certificate No: D2600V2-1061_Nov20 Page 4 of 6

DASY5 Validation Report for Head TSL

Date: 26.11.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN:1061

Communication System: UID 0 - CW; Frequency: 2600 MHz

Medium parameters used: f = 2600 MHz; $\sigma = 2.03 \text{ S/m}$; $\varepsilon_r = 37.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

Probe: EX3DV4 - SN7405; ConvF(7.54, 7.54, 7.54) @ 2600 MHz; Calibrated: 29.06.2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 02.11.2020

Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001

DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 119.2 V/m; Power Drift = -0.04 dB

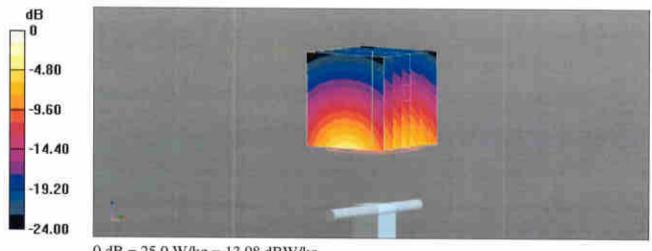
Peak SAR (extrapolated) = 30.9 W/kg

SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.37 W/kg

Smallest distance from peaks to all points 3 dB below = 8.9 mm

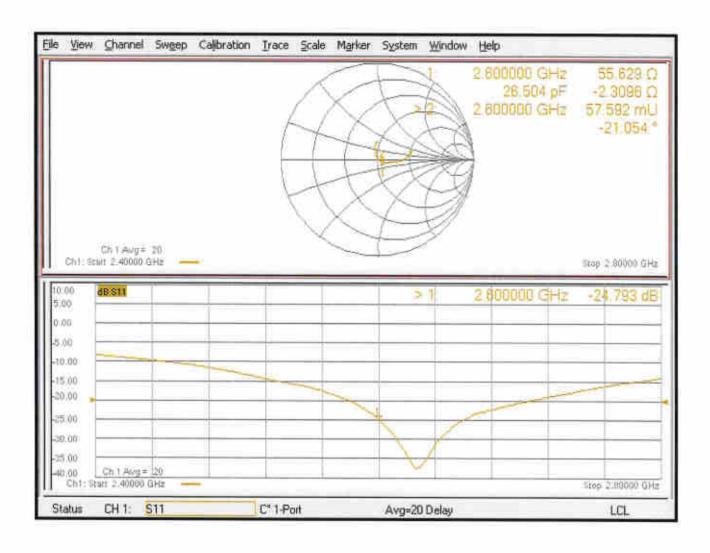
Ratio of SAR at M2 to SAR at M1 = 47%

Maximum value of SAR (measured) = 25.0 W/kg



0 dB = 25.0 W/kg = 13.98 dBW/kg

Impedance Measurement Plot for Head TSL



Zeughausstrasse 43, 8004 Zurich, Switzerland Phone +41 44 245 9700, Fax +41 44 245 9779 www.speag.swiss, info@speag.swiss

IMPORTANT NOTICE

USAGE OF THE DAE4

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

Battery Exchange: The battery cover of the DAE4 unit is fixed using a screw, over tightening the screw may cause the threads inside the DAE to wear out.

Shipping of the DAE: Before shipping the DAE to SPEAG for calibration, remove the batteries and pack the DAE in an antistatic bag. This antistatic bag shall then be packed into a larger box or container which protects the DAE from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside.

E-Stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, the customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

DASY Configuration Files: Since the exact values of the DAE input resistances, as measured during the calibration procedure of a DAE unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file.

Important Note:

Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.

Important Note:

Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the Estop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.

Important Note:

To prevent damage of the DAE probe connector pins, use great care when installing the probe to the DAE. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE.

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Accreditation No.: SCS 0108

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Client

Sporton

Certificate No: DAE4-1279_Aug20

CALIBRATION CERTIFICATE

Object

DAE4 - SD 000 D04 BM - SN: 1279

Calibration procedure(s)

QA CAL-06.v30

Calibration procedure for the data acquisition electronics (DAE)

Calibration date:

August 25, 2020

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	03-Sep-19 (No:25949)	Sep-20
Secondary Standards	ID#	Check Date (in house)	Scheduled Check
Auto DAE Calibration Unit	SE UWS 053 AA 1001	09-Jan-20 (in house check)	In house check: Jan-21
Calibrator Box V2.1	SE UMS 006 AA 1002	09-Jan-20 (in house check)	In house check: Jan-21

Calibrated by:

Name

Function

Signature

Approved by:

Sven Kühn

Dominique Steffen

Deputy Manager

Laboratory Technician

Issued: August 25, 2020

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Certificate No: DAE4-1279_Aug20

Page 1 of 5

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Accreditation No.: SCS 0108

Glossary

DAE data acquisition electronics

Connector angle information used in DASY system to align probe sensor X to the robot

coordinate system.

Methods Applied and Interpretation of Parameters

- DC Voltage Measurement: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- Connector angle: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - DC Voltage Measurement Linearity: Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
 - Common mode sensitivity: Influence of a positive or negative common mode voltage on the differential measurement.
 - Channel separation: Influence of a voltage on the neighbor channels not subject to an input voltage.
 - AD Converter Values with inputs shorted: Values on the internal AD converter corresponding to zero input voltage
 - Input Offset Measurement: Output voltage and statistical results over a large number of zero voltage measurements.
 - Input Offset Current: Typical value for information; Maximum channel input offset current, not considering the input resistance.
 - Input resistance: Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - Low Battery Alarm Voltage: Typical value for information. Below this voltage, a battery alarm signal is generated.
 - Power consumption: Typical value for information. Supply currents in various operating modes.

Certificate No: DAE4-1279_Aug20 Page 2 of 5

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: $1LSB = 6.1\mu V$, full range = -100...+300 mVLow Range: 1LSB = 61nV, full range = -1......+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	х	Υ	z
High Range	403.992 ± 0.02% (k=2)	403.936 ± 0.02% (k=2)	404.671 ± 0.02% (k=2)
Low Range	3.98386 ± 1.50% (k=2)	3.98923 ± 1.50% (k=2)	3.99029 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	114.0 ° ± 1 °
---	---------------

Certificate No: DAE4-1279_Aug20 Page 3 of 5

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	199992.98	-3.60	-0.00
Channel X	+ Input	20004.41	2.27	0.01
Channel X	- Input	-20000.14	1.42	-0.01
Channel Y	+ Input	199993.98	-2.71	-0.00
Channel Y	+ Input	20004.10	2.00	0.01
Channel Y	- Input	-20002.55	-0.86	0.00
Channel Z	+ Input	199996.29	-0.02	-0.00
Channel Z	+ Input	20001.83	-0.15	-0.00
Channel Z	- Input	-20002.45	-0.66	0.00

Low Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	2001.76	0.43	0.02
Channel X + Input	201.97	0.41	0.20
Channel X - Input	-197.75	0.55	-0.28
Channel Y + Input	2001.59	0.39	0.02
Channel Y + Input	201.77	0.37	0.18
Channel Y - Input	-198.61	-0.14	0.07
Channel Z + Input	2001.73	0.62	0.03
Channel Z + Input	202.53	1.20	0.60
Channel Z - Input	-198.78	-0.27	0.13

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-18.13	-19.89
	- 200	20.83	19.81
Channel Y	200	5.56	5.45
	- 200	-5.67	-5.95
Channel Z	200	6.42	6.28
	- 200	-7.70	-7.94

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	3.63	-3.17
Channel Y	200	8.74	-	3.69
Channel Z	200	9.20	7.14	=0

Certificate No: DAE4-1279_Aug20 Page 4 of 5

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15970	16495
Channel Y	15941	15166
Channel Z	15692	14666

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (µV)
Channel X	0.79	-0.20	1.79	0.42
Channel Y	-0.22	-1.72	0.62	0.46
Channel Z	0.74	-0.45	2.00	0.50

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values Alarm Level (VDC)		
Supply (+ Vcc)	+7.9	
Supply (- Vcc)	-7.6	

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)	
Supply (+ Vcc)	+0.01	+6	+14	
Supply (- Vcc)	-0.01	-8	-9	

Certificate No: DAE4-1279_Aug20 Page 5 of 5

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Client

Sporton

Accreditation No.: SCS 0108

S

Certificate No: DAE4-1303 Jul20

CALIBRATION CERTIFICATE

Object DAE4 - SD 000 D04 BO - SN: 1303

Calibration procedure(s) QA CAL-06.v30

Calibration procedure for the data acquisition electronics (DAE)

Calibration date:

July 07, 2020

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate,

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3) C and humidity < 70%

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID#	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	03-Sep-19 (No:25949)	Sep-20
Secondary Standards	ID#	Check Date (in house)	Scheduled Check
Auto DAE Calibration Unit	SE UWS 053 AA 1001	09-Jan-20 (in house check)	In house check: Jan-21
Calibrator Box V2.1	SE UMS 006 AA 1002	09-Jan-20 (in house check)	In house check: Jan-21

Calibrated by:

Name

Function

Signature

Cambrated by

Approved by:

Eric Hainfeld

Sven Kühn

Laboratory Technician

Deputy Manager

Issued: July 7, 2020

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Certificate No: DAE4-1303_Jul20

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Glossary

DAE data acquisition electronics

Connector angle information used in DASY system to align probe sensor X to the robot

coordinate system.

Methods Applied and Interpretation of Parameters

- DC Voltage Measurement: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- Connector angle: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - DC Voltage Measurement Linearity: Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
 - Common mode sensitivity: Influence of a positive or negative common mode voltage on the differential measurement.
 - Channel separation: Influence of a voltage on the neighbor channels not subject to an input voltage.
 - AD Converter Values with inputs shorted: Values on the internal AD converter corresponding to zero input voltage
 - Input Offset Measurement: Output voltage and statistical results over a large number of zero voltage measurements.
 - Input Offset Current: Typical value for information; Maximum channel input offset current, not considering the input resistance.
 - Input resistance: Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - Low Battery Alarm Voltage: Typical value for information. Below this voltage, a battery alarm signal is generated.
 - Power consumption: Typical value for information. Supply currents in various operating modes.

Certificate No: DAE4-1303_Jul20 Page 2 of 5

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:

1LSB =

6.1µV,

full range = -100...+300 mV

Low Range: 1LSB = 61nV,

full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	x	Y	Z
High Range	405.621 ± 0.02% (k=2)	405.288 ± 0.02% (k=2)	405.521 ± 0.02% (k=2)
Low Range		4.00177 ± 1.50% (k=2)	

Connector Angle

Connector Angle to be used in DASY system	36.0 ° ± 1 °
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Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	200028.13	-4.41	-0.00
Channel X + Input	20005.33	0.15	0.00
Channel X - Input	-20003,94	1.66	-0.01
Channel Y + Input	200034.95	3.01	0.00
Channel Y + Input	20004.62	-0.42	-0.00
Channel Y - Input	-20006.63	-0.88	0.00
Channel Z + Input	200029.72	-2.88	-0.00
Channel Z + Input	20001.10	-3.93	-0.02
Channel Z - Input	-20007.10	-1.35	0.01

Low Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	2000.83	-0.06	-0.00
Channel X + Input	201.48	0.52	0.26
Channel X - Input	-198.72	0.43	-0.22
Channel Y + Input	2000.87	0.12	0.01
Channel Y + Input	199.93	-0.88	-0.44
Channel Y - Input	-199.89	-0.62	0.31
Channel Z + Input	2000.93	0.20	0.01
Channel Z + Input	200.16	-0.59	-0.30
Channel Z - Input	-199.91	-0.57	0.28

Common mode sensitivity
 DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-2.91	-4.53
	- 200	5.99	4.24
Channel Y	200	1.24	1.13
	- 200	-2.94	-3.20
Channel Z	200	-1.62	-1.40
	- 200	-0.52	-0.26

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (µV)	Channel Z (μV)
Channel X	200	8	0.82	-4.08
Channel Y	200	7.63		2.53
Channel Z	200	10.14	5.17	<u>:</u>

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16198	15926
Channel Y	15904	15641
Channel Z	16229	15177

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10MO

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (µV)
Channel X	0.70	-0.97	2.67	0.58
Channel Y	-0.62	-1.86	0.89	0.42
Channel Z	-0.13	-1.67	0.85	0.41

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)	
Supply (+ Vcc)	+7.9	
Supply (- Vcc)	-7.6	

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

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Client

Sporton

Certificate No: ES3-3293_Sep20

CALIBRATION CERTIFICATE

Object

ES3DV3 - SN:3293

Calibration procedure(s)

QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v7 Calibration procedure for dosimetric E-field probes

Calibration date:

September 23, 2020

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: CC2552 (20x)	31-Mar-20 (No. 217-03106)	Apr-21
DAE4	SN: 660	27-Dec-19 (No. DAE4-660_Dec19)	Dec-20
Reference Probe ES3DV2	SN: 3013	31-Dec-19 (No. ES3-3013_Dec19)	Dec-20
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-20)	In house check: Jun-22
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

Function Calibrated by: Michael Weber Laboratory Technician Approved by: Katja Pokovic Technical Manager

Issued: September 29, 2020

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Glossary:

TSL NORMx,y,z tissue simulating liquid sensitivity in free space

ConvF DCP

sensitivity in TSL / NORMx,y,z diode compression point

CF A, B, C, D crest factor (1/duty_cycle) of the RF signal modulation dependent linearization parameters

Polarization φ

o rotation around probe axis

Polarization 9

9 rotation around an axis that is in the plane normal to probe axis (at measurement center),

i.e., 9 = 0 is normal to probe axis

Connector Angle

information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- iEC 62209-1, ", "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from handheld and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices
 used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization 9 = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is
 implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included
 in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

Certificate No: ES3-3293_Sep20 Page 2 of 9

ES3DV3 - SN:3293

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3293

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (µV/(V/m) ²) ^A	1.10	0.90	0.73	± 10.1 %
DCP (mV) ⁸	102.3	109.5	106.9	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Max dev.	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	199.2	± 3.5 %	±4.7 %
		Y	0.0	0.0	1.0		179.4		
		Z	0.0	0.0	1.0		183.6		

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^B Numerical linearization parameter: uncertainty not required.

A The uncertainties of Norm X,Y,Z do not affect the E2-field uncertainty inside TSL (see Page 5).

E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3293

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-5.0
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Note: Measurement distance from surface can be increased to 3-4 mm for an Area Scan job.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3293

Calibration Parameter Determined in Head Tissue Simulating Media

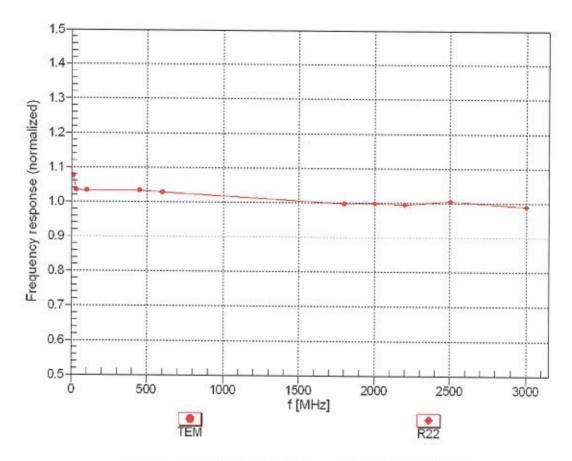
f (MHz) ^C	Relative Permittivity F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
750	41.9	0.89	6.51	6.51	6.51	0.80	1.18	± 12.0 %
835	41.5	0.90	6.43	6.43	6.43	0.78	1.16	± 12.0 %
900	41.5	0.97	6.24	6.24	6.24	0.80	1.18	± 12.0 %
1750	40.1	1.37	5.37	5.37	5.37	0.63	1.28	± 12.0 %
1900	40.0	1.40	5.14	5.14	5.14	0.50	1.44	± 12.0 %
2000	40.0	1.40	5.11	5.11	5.11	0.72	1.25	± 12.0 %
2300	39.5	1.67	4.81	4.81	4.81	0.65	1.34	± 12.0 %
2450	39.2	1.80	4.51	4.51	4.51	0.57	1.50	± 12.0 %
2600	39.0	1.96	4.38	4.38	4.38	0.80	1.23	± 12.0 %

Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to \pm 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to \pm 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

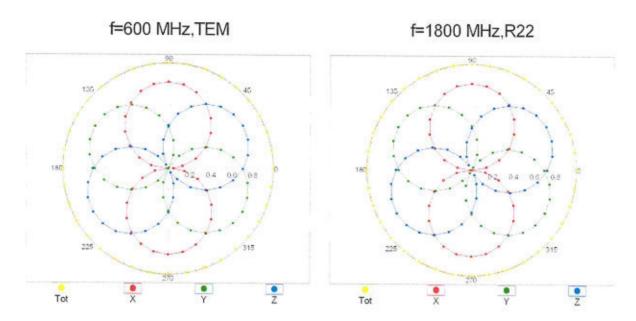
⁶ Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

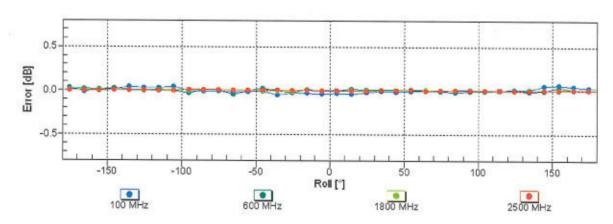
Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

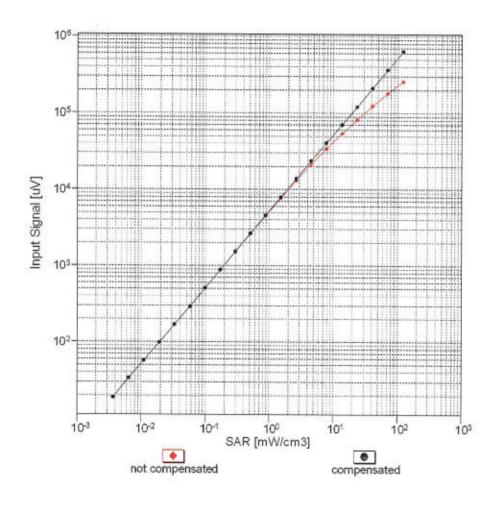
Receiving Pattern (ϕ), $\vartheta = 0^{\circ}$

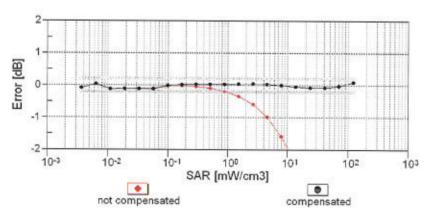




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

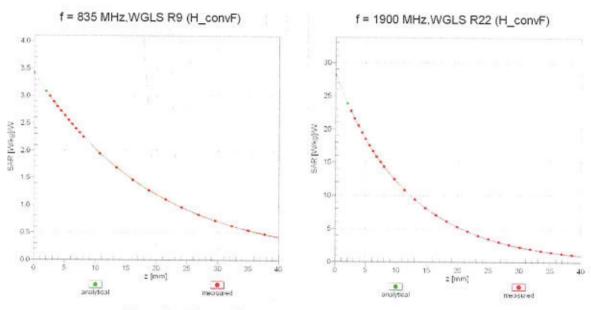
Dynamic Range f(SAR_{head}) (TEM cell , f_{eval}= 1900 MHz)



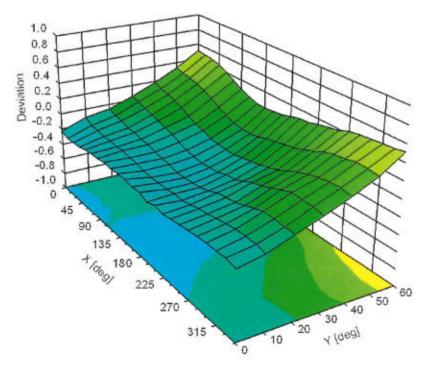


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (φ, θ), f = 900 MHz



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Client

Sporton

Certificate No: EX3-3857 Sep20

CALIBRATION CERTIFICATE

Object

EX3DV4 - SN:3857

Calibration procedure(s)

QA CAL-01.v9, QA CAL-14.v6, QA CAL-23.v5, QA CAL-25.v7

Calibration procedure for dosimetric E-field probes

Calibration date:

September 25, 2020

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: CC2552 (20x)	31-Mar-20 (No. 217-03106)	Apr-21
DAE4	SN: 660	27-Dec-19 (No. DAE4-660_Dec19)	Dec-20
Reference Probe ES3DV2	SN: 3013	31-Dec-19 (No. ES3-3013_Dec19)	Dec-20
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-20)	In house check: Jun-22
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

Name Function Signature Calibrated by: Leif Klysner Laboratory Technician Approved by: Katja Pokovic Technical Manager

Issued: September 30, 2020

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Accreditation No.: SCS 0108

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Glossary:

TSL NORMx,y,z tissue simulating liquid sensitivity in free space

ConvF

sensitivity in TSL / NORMx,y,z

DCP CF diode compression point crest factor (1/duty_cycle) of the RF signal

A, B, C, D

modulation dependent linearization parameters

Polarization @

φ rotation around probe axis

Polarization 9

9 rotation around an axis that is in the plane normal to probe axis (at measurement center),

i.e., 9 = 0 is normal to probe axis

Connector Angle

information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- EC 62209-1, ", "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from handheld and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization 9 = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is
 implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included
 in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

Certificate No: EX3-3857_Sep20 Page 2 of 9

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3857

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μV/(V/m) ²) ^A	0.18	0.43	0.46	± 10.1 %
DCP (mV) ^B	99.3	100.5	102.2	2 10.1 /6

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Max dev.	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	182.0	± 3.0 %	±4.7 %
		Y	0.0	0.0	1.0		178.6		,0
		Z	0.0	0.0	1.0		188.1		

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

A The uncertainties of Norm X,Y,Z do not affect the E2-field uncertainty inside TSL (see Page 5).

^{*}The uncertainties of Norm A, Y, Z do not affect the E -field uncertainty inside 102 (355) age 3).

**B. Numerical linearization parameter: uncertainty not required.

**Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3857

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	
Mechanical Surface Detection Mode	-118.9
Optical Surface Detection Mode	enabled
	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	
Tip Diameter	9 mm
Probe Tip to Sensor X Calibration Point	2.5 mm
Probe Tip to Sensor Y Calibration Point	1 mm
	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Note: Measurement distance from surface can be increased to 3-4 mm for an Area Scan job.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3857

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^c	Relative Permittivity ^F	Conductivity (S/m) F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
750	41.9	0.89	9.50	9.50	9.50	0.32	0.99	± 12.0 9
835	41.5	0.90	9.18	9.18	9.18	0.45	0.80	± 12.0 %
900	41.5	0.97	9.10	9.10	9.10	0.47	0.80	± 12.0 %
1750	40.1	1.37	8.06	8.06	8.06	0.27	0.86	± 12.0 9
1900	40.0	1.40	7.81	7.81	7.81	0.37	0.86	± 12.0 9
2000	40.0	1.40	7.78	7.78	7.78	0.40	0.86	± 12.0 %
2300	39.5	1.67	7.56	7.56	7.56	0.31	0.92	± 12.0 9
2450	39.2	1.80	7.44	7.44	7.44	0.40	0.92	± 12.0 %
2600	39.0	1.96	7.19	7.19	7.19	0.37	0.92	± 12.0 %
3300	38.2	2.71	6.70	6.70	6.70	0.30	1.35	± 14.0 %
3500	37.9	2.91	6.67	6.67	6.67	0.30	1.35	± 14.0 %
3700	37.7	3.12	6.61	6.61	6.61	0.30	1.35	± 14.0 %
3900	37.5	3.32	6.58	6.58	6.58	0.40	1.50	± 14.0 %
4100	37.2	3.53	6.08	6.08	6.08	0.35	1.50	± 14.0 %
4200	37.1	3.63	5.99	5.99	5.99	0.35	1.50	± 14.0 %
4400	36.9	3.84	5.93	5.93	5.93	0.35	1.70	± 14.0 %
4600	36.7	4.04	5.91	5.91	5.91	0.40	1.70	± 14.0 %
4800	36.4	4.25	5.76	5.76	5.76	0.40	1.80	± 14.0 %
4950	36.3	4.40	5.45	5.45	5.45	0.40	1.80	± 14.0 %
5250	35.9	4.71	5.04	5.04	5.04	0.40	1.80	± 14.0 %
5600	35.5	5.07	4.67	4.67	4.67	0.40	1.80	± 14.0 %
5750	35.4	5.22	4.93	4.93	4.93	0.40	1.80	± 14.0 %

^c Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

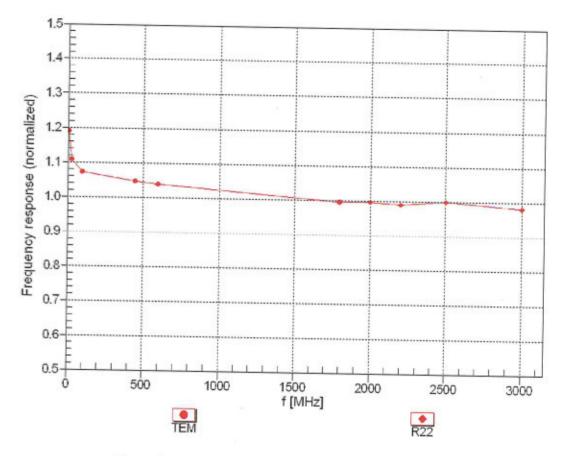
F At frequencies up to 6 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to

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measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

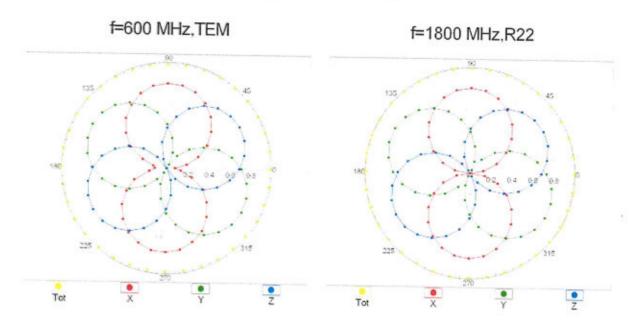
Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

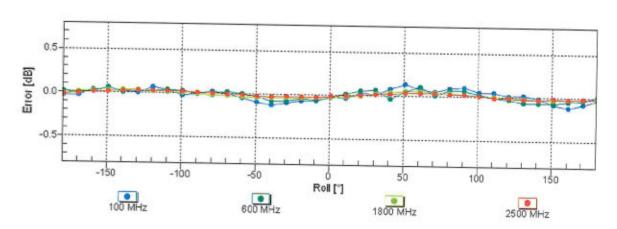
Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

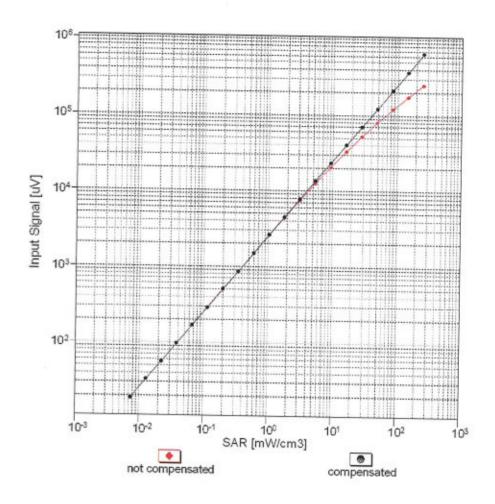
Receiving Pattern (φ), 9 = 0°

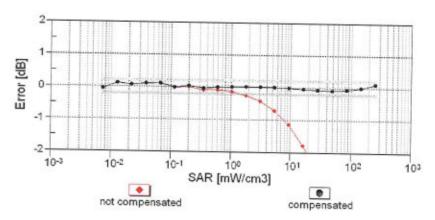




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

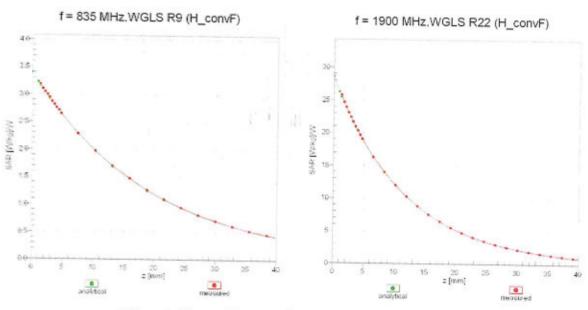
Dynamic Range f(SAR_{head}) (TEM cell , f_{eval}= 1900 MHz)



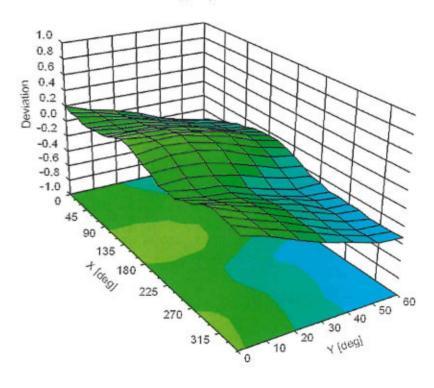


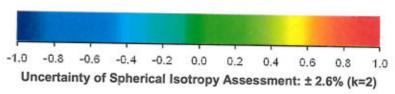
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (\$\phi\$, \$\theta\$), f = 900 MHz





Appendix E. Conducted RF Output Power Table

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The detailed power table are shown as follows.

Sporton International (Kunshan) Inc.



Receiver On / Receiver Off / Hotspot On / Extremity

GSM850	Burst .	Average Powe	r (dBm)	Tune-up	Frame-	Average Powe	r (dBm)	Tune-up
TX Channel	128	189	251	Limit	128	189	251	Limit
Frequency (MHz)	824.2	836.4	848.8	(dBm)	824.2	836.4	848.8	(dBm)
GSM 1 Tx slot	33.21	33.14	33.17	33.50	24.21	24.14	24.17	24.50
GPRS 1 Tx slot	33.19	33.13	33.16	33.50	24.19	24.13	24.16	24.50
GPRS 2 Tx slots	31.04	31.06	30.96	32.00	25.04	25.06	24.96	26.00
GPRS 3 Tx slots	29.19	29.22	29.21	30.50	24.93	24.96	24.95	26.24
GPRS 4 Tx slots	27.20	27.14	27.20	28.50	24.20	24.14	24.20	25.50
EDGE 1 Tx slot	25.65	25.60	25.50	26.50	16.65	16.60	16.50	17.50
EDGE 2 Tx slots	24.24	24.30	24.30	25.50	18.24	18.30	18.30	19.50
EDGE 3 Tx slots	21.60	21.72	21.64	22.50	17.34	17.46	17.38	18.24
EDGE 4 Tx slots	18.80	19.00	18.84	19.50	15.80	16.00	15.84	16.50

Receiver On / Receiver Off / Extremity

GSM1900	Burst	Average Powe	r (dBm)	Tune-up	Frame-	Average Powe	r (dBm)	Tune-up	
TX Channel	512	661	810	Limit	512	661 810		Limit	
Frequency (MHz)	1850.2	1880	1909.8	(dBm)	1850.2	1880	1909.8	(dBm)	
GSM 1 Tx slot	29.35	29.53	29.82	30.50	20.35	20.53	20.82	21.50	
GPRS 1 Tx slot	29.34	29.51	29.81	30.50	20.34	20.51	20.81	21.50	
GPRS 2 Tx slots	27.21	27.54	27.53	28.50	21.21	21.54	21.53	22.50	
GPRS 3 Tx slots	25.68	25.79	25.97	26.50	21.42	21.53	21.71	22.24	
GPRS 4 Tx slots	23.69	23.82	23.95	24.50	20.69	20.82	20.95	21.50	
EDGE 1 Tx slot	28.31	27.96	27.85	28.50	19.31	18.96	18.85	19.50	
EDGE 2 Tx slots	27.08	26.92	26.90	27.50	21.08	20.92	20.90	21.50	
EDGE 3 Tx slots	25.13	24.67	24.68	25.50	20.87	20.41	20.42	21.24	
EDGE 4 Tx slots	22.70	22.56	22.35	23.50	19.70	19.56	19.35	20.50	

	70L 4 1X 0000	22.10	22.00	22.00	20.00	10.10	10.00	10.00	20.00					
			Recei	ver On			Recei	ver On		Receiver On / Receiver Off / Hotspot On / Extremity				
	Band		WCDMA II			WCDMA IV				WCDMA V				
TX Channel		9262	9400	9538	Tune-up Limit	1312	1413	1513	Tune-up Limit	4132	4182	4233	Tune-up Limit	
	Rx Channel	9662	9800	9938	(dBm)	1537	1638	1738	(dBm)	4357	4407	4458	(dBm)	
Fre	equency (MHz)	1852.4	1880	1907.6	(dbiii)	1712.4	1732.6	1752.6	(dbiii)	826.4	836.4	846.6	(GBIII)	
3GPP Rel 99	AMR 12.2Kbps	23.71	23.56	23.24	24.00	23.57	23.62	23.67	24.00	23.52	23.55	23.43	24.00	
3GPP Rel 99	RMC 12.2Kbps	23.58	23.73	23.23	24.00	23.59	23.69	23.68	24.00	23.53	23.58	23.44	24.00	
3GPP Rel 6	HSDPA Subtest-1	22.61	22.65	22.65	23.00	22.54	22.31	22.50	23.00	22.67	22.65	22.66	23.00	
3GPP Rel 6	HSDPA Subtest-2	22.56	22.83	22.75	23.00	22.94	22.75	22.89	23.00	22.76	22.56	22.86	23.00	
3GPP Rel 6	HSDPA Subtest-3	22.12	22.05	21.98	22.50	22.10	22.12	22.21	22.50	22.23	22.23	22.32	22.50	
3GPP Rel 6	HSDPA Subtest-4	22.09	22.03	22.04	22.50	22.24	22.21	22.12	22.50	22.32	22.12	22.21	22.50	
3GPP Rel 8	DC-HSDPA Subtest-1	22.58	22.63	22.61	23.00	22.52	22.27	22.47	23.00	22.63	22.62	22.64	23.00	
3GPP Rel 8	DC-HSDPA Subtest-2	22.53	22.81	22.71	23.00	22.92	22.71	22.86	23.00	22.72	22.53	22.84	23.00	
3GPP Rel 8	DC-HSDPA Subtest-3	22.09	22.03	21.94	22.50	22.08	22.08	22.18	22.50	22.19	22.20	22.30	22.50	
3GPP Rel 8	DC-HSDPA Subtest-4	22.06	22.01	22.00	22.50	22.22	22.17	22.09	22.50	22.28	22.09	22.19	22.50	
3GPP Rel 6	HSUPA Subtest-1	22.23	22.25	22.54	23.00	22.44	22.54	22.43	23.00	22.65	22.56	22.74	23.00	
3GPP Rel 6	HSUPA Subtest-2	20.36	20.21	20.30	21.00	20.84	20.86	20.93	21.00	20.56	20.54	20.67	21.00	
3GPP Rel 6	HSUPA Subtest-3	21.49	21.52	21.54	22.00	21.31	21.29	21.39	22.00	21.38	20.99	21.24	22.00	
3GPP Rel 6	HSUPA Subtest-4	20.25	20.32	20.43	21.00	20.86	20.87	20.56	21.00	20.34	20.76	20.81	21.00	
3GPP Rel 6	HSUPA Subtest-5	22.65	22.54	22.45	23.00	22.50	22.65	22.56	23.00	22.65	22.56	22.67	23.00	
3GPP Rel 7	HSPA+ (16QAM) Subtest-1	20.13	20.06	19.97	20.50	20.04	20.17	20.08	20.50	20.26	20.17	20.23	20.50	



		Rece	Band iver On /	2 (1900M Part 24E Receiver		emity		
BW [MHz]	Modulation	RB Size	RB Offset	Power Low	Power Middle	Power High	Tune-up	MPR
	Cha Frequent			Ch. / Freq. 18700 1860	Ch. / Freq. 18900 1880	Ch. / Freq. 19100 1900	limit (dBm)	(dB)
20 20	QPSK QPSK	1	0 49	23.67	23.85	23.75	24	0
20	QPSK QPSK	1 50	99	23.72	23.64	23.52		
20 20	QPSK QPSK	50 50	24 50	22.70 22.74	22.93 22.80	22.72 22.58	23	1
20 20	QPSK 16QAM	100	0	22.61 22.63	22.89 22.44	22.73 22.54		
20 20	16QAM 16QAM	1	49 99	22.64 22.76	22.46 22.34	22.45 22.50	23	1
20 20	16QAM 16QAM	50 50	0 24	21.46 21.23	21.46 21.55	21.25	22	2
20 20	16QAM 16QAM	50 100	50 0	21.31 21.29	21.34 21.34	21.15 21.33	22	2
20 20	64QAM 64QAM	1	0 49	21.30 21.36	21.38 21.40	21.53 21.41	22	2
20 20	64QAM 64QAM	1 50	99	21.50 20.58	21.27 20.68	21.17 20.46		
20 20	64QAM 64QAM	50 50	24 50	20.40 20.46	20.66 20.55	20.47 20.30	21	3
20	64QAM Cha		0	20.36 18675	20.56 18900	20.45 19125	Tune-up limit	MPR
15	Frequent QPSK	cy (MHz) 1	0	1857.5 23.54	1880 23.80	1902.5 23.67	(dBm)	(dB)
15 15	QPSK QPSK	1	37 74	23.60 23.72	23.80 23.62	23.60 23.44	24	0
15 15	QPSK QPSK	36 36	0 20	22.67 22.63	22.96 22.97	22.79 22.64	23	1
15 15	QPSK QPSK	36 75	39 0	22.65 22.67	22.84 22.95	22.64 22.65	2.0	·
15 15	16QAM 16QAM	1	0 37	22.66 22.67	22.99 22.94	22.75 22.69	23	1
15 15	16QAM 16QAM	1 36	74 0	22.78 21.48	22.76 21.46	22.53 21.31		
15 15	16QAM 16QAM	36 36	20 39	21.44 21.34	21.64 21.55	21.25 21.41	22	2
15 15	16QAM 64QAM	75 1	0	21.48 21.33	21.74 21.57	21.25 21.39		
15 15	64QAM 64QAM	1	37 74	21.46 21.38	21.67 21.38	21.42 21.22	22	2
15 15	64QAM 64QAM	36 36	0 20	20.71	20.76 20.76	20.44	21	3
15 15	64QAM 64QAM	36 75	39 0	20.50 20.52	20.67 20.67	20.63		
	Cha Frequen			18650 1855	18900 1880	19150 1905	Tune-up limit (dBm)	MPR (dB)
10 10	QPSK QPSK	1	0 25	23.62 23.63	23.56 23.56	23.52 23.65	24	0
10 10	QPSK QPSK	1 25	49 0	23.61 22.60	23.54 22.86	23.65 22.65		
10 10	QPSK QPSK	25 25	12 25	22.67 22.65	22.99 22.92	22.60 22.60	23	1
10 10	QPSK 16QAM	50 1	0	22.57 22.64	22.65 22.45	22.63 22.60		
10 10	16QAM 16QAM	1	25 49	22.64 22.66	22.54 22.85	22.43 22.57	23	1
10 10	16QAM 16QAM	25 25	0 12	21.56 21.60	21.47 21.54	21.23 21.34	22	2
10 10	16QAM 16QAM	25 50	25 0	21.59 21.41	21.64 21.45	21.56 21.17	22	2
10 10	64QAM 64QAM	1	0 25	21.25 21.24	21.63 21.56	21.55 21.34	22	2
10 10	64QAM 64QAM	1 25	49 0	21.29 20.61	21.46 20.77	21.34 20.51		
10 10	64QAM 64QAM	25 25	12 25	20.47	20.66 20.68	20.40 20.48	21	3
10	64QAM Cha	50 nnel	0	20.52 18625	20.56 18900	20.32 19175	Tune-up limit	MPR
5	Frequent QPSK	cy (MHz) 1	0	1852.5 23.62	1880 23.44	1907.5 23.68	(dBm)	(dB)
5 5	QPSK QPSK	1	12 24	23.57 23.63	23.54 23.78	23.56 23.54	24	0
5 5	QPSK QPSK	12 12	7	22.53 22.51	22.76 22.96	22.63 22.64	23	1
5 5	QPSK QPSK	12 25	13 0	22.50 22.51	22.93 22.98	22.57 22.64		
5 5	16QAM 16QAM	1	0 12	22.51 22.45	22.80 22.83	22.45 22.54	23	1
5	16QAM 16QAM	12	24 0	22.43	22.72 21.79	22.41 21.45		
5 5	16QAM 16QAM	12 12	7 13	21.41 21.38	21.53 21.52	21.47 21.42	22	2
5 5	16QAM 64QAM	25 1	0	21.53 21.38	21.91 21.77	21.63 21.37		
5 5	64QAM 64QAM	1	12 24	21.31 21.40	21.78 21.52	21.44 21.35	22	2
5 5	64QAM 64QAM	12 12	7	20.54	20.65	20.62	21	3
5 5	64QAM 64QAM	12 25	13 0	20.58 20.61	20.74 20.97	20.35 20.65	Tune-up	
	Cha Frequen			18615 1851.5	18900 1880	19185 1908.5	limit (dBm)	MPR (dB)
3	QPSK QPSK	1	0 8	23.48 23.41	23.55 23.82	23.54 23.58	24	0
3	QPSK QPSK	1 8	14 0	23.65 22.56	23.83 23.00	23.60 22.68		
3	QPSK QPSK	8	7	22.65 22.60	22.78 22.54	22.66 22.63	23	1
3	QPSK 16QAM	15 1	0	22.60 22.63	22.91 22.56	22.53 22.66		
3	16QAM 16QAM	1	8 14	22.55 22.50	22.58 22.60	22.55 22.50	23	1
3	16QAM 16QAM	8	4	21.45	21.80	21.56	22	2
3	16QAM 16QAM	8 15	7	21.44 21.38	21.53 21.79	21.53 21.51		
3	64QAM 64QAM	1	8	21.28	21.49	21.34	22	2
3	64QAM 64QAM	8	14 0	21.21	21.54	21.26		
3	64QAM 64QAM	8	7	20.41	20.62	20.57	21	3
3	64QAM Cha		0	20.53 18607	20.91 18900	20.61 19193	Tune-up limit	MPR
1.4	Frequent QPSK	- 1	0	1850.7 23.37	1880 23.66	1909.3 23.54	(dBm)	(dB)
1.4	QPSK QPSK	1	3 5	23.44 23.42	23.67 23.83	23.60 23.55	24	0
	QPSK QPSK	3	0	23.51 23.57	23.56 23.56	23.59 23.63		
1.4	QPSK QPSK	3 6	3 0	23.53 22.59	23.78 22.93	23.67 22.65	23	1
1.4 1.4 1.4		1	0	22.56 22.57	22.55 22.56	22.54 22.58		
1.4 1.4 1.4 1.4 1.4	16QAM 16QAM	1	3					
1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM	1 1 3	5 0	22.59 22.27	22.31 22.50	22.35 22.25	23	1
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM 16QAM	1 1 3 3 3	5 0 1 3	22.27 22.32 22.29	22.50 22.38 22.38	22.25 22.30 22.30		
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM	1 1 3 3 3 6	5 0 1 3 0	22.27 22.32 22.29 21.01 21.30	22.50 22.38 22.38 21.32 21.37	22.25 22.30 22.30 21.09 21.29	23	2
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM	1 1 3 3 3 6 1 1	5 0 1 3 0 0 3 5	22.27 22.32 22.29 21.01 21.30 21.24 21.22	22.50 22.38 22.38 21.32 21.37 21.46 21.37	22.25 22.30 22.30 21.09 21.29 21.26 21.24	22	2
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM 64QAM 64QAM	1 1 3 3 3 6 1 1 1 3 3	5 0 1 3 0 0 3 5 0	22.27 22.32 22.29 21.01 21.30 21.24 21.22 21.17 21.17	22.50 22.38 22.38 21.32 21.37 21.46 21.37 21.45 21.34	22.25 22.30 22.30 21.09 21.29 21.26 21.24 21.32 21.34		
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM 64QAM	1 1 3 3 3 6 1 1 1	5 0 1 3 0 0 3 5	22.27 22.32 22.29 21.01 21.30 21.24 21.22 21.17	22.50 22.38 22.38 21.32 21.37 21.46 21.37 21.45	22.25 22.30 22.30 21.09 21.29 21.26 21.24 21.32	22	2

				eceiver O		Power		
BW [MHz]	Modulation Cha	RB Size	RB Offset	Low Ch. / Freq. 20050	Middle Ch. / Freq. 20175	High Ch. / Freq. 20300	Tune-up limit	MPR (dB)
20	Frequen	oy (MHz)	0	1720 23.20	1732.5 23.33	1745 23.15	(dBm)	
20 20	QPSK QPSK	1	49 99	23.13 23.09	23.15 23.05	23.27 22.99	24	0
20 20	QPSK QPSK	50 50	0 24	22.31 22.30	22.32	22.27	23	1
20 20	QPSK QPSK	50 100	50 0	22.22 22.21	22.18 22.29	22.26 22.17	- 23	,
20	16QAM 16QAM	1 1	49	22.29	22.29	22.43	23	1
20 20 20	16QAM 16QAM 16QAM	50 50	99 0 24	22.08 20.85 20.80	22.22 20.71 21.03	22.17 21.06 20.85		
20	16QAM 16QAM	50 100	50	20.73	20.81	20.75	22	2
20 20	64QAM 64QAM	1	0 49	21.02 20.94	20.97 20.93	21.21 21.14	22	2
20 20	64QAM 64QAM	1 50	99 0	20.76 19.96	20.94 19.86	21.02 20.29		
20	64QAM 64QAM	50	24 50	19.99	20.13	19.97	21	3
20	64QAM Cha Frequen		0	19.96 20025 1717.5	20.16 20175 1732.5	19.94 20325 1747.5	Tune-up limit	MPR (dB)
15 15	QPSK QPSK	1 1	0 37	23.19	23.18	23.23	(dBm) 24	0
15 15	QPSK QPSK	1 36	74	23.03	23.06	22.92		-
15 15	QPSK QPSK	36 36	20 39	22.33 22.25	22.24 22.12	22.25 22.20	23	1
15 15	QPSK 16QAM	75 1	0	22.28 22.24	22.23 22.11	22.25 22.23		
15 15	16QAM 16QAM	1	37 74	22.33 22.10	22.20 22.14	22.23 21.92	23	1
15 15	16QAM 16QAM	36 36	0 20	20.84	20.66	20.94	22	2
15 15	16QAM 16QAM	36 75	39 0	21.15	20.85	20.80		
15 15	64QAM 64QAM	1	0 37	20.92	20.85	20.97	22	2
15 15 15	64QAM 64QAM	1 36 36	74 0 20	20.83 20.13 20.17	20.82 19.80 20.28	20.69 20.11 20.16		
15 15 15	64QAM 64QAM	36 36 75	20 39 0	20.17 20.26 19.99	20.28 20.06 20.20	20.16 19.99 19.93	21	3
-13	Cha Frequen	nnel		20000 1715	20.20 20175 1732.5	20350 1750	Tune-up limit	MPR (dB)
10	QPSK QPSK	1 1	0 25	23.21	23.30 23.12	23.29	(dBm) 24	0
10 10 10	QPSK QPSK QPSK	1 1 25	25 49 0	23.20 23.10 22.29	23.12 23.09 22.17	23.17 23.01 22.31	24	J
10	QPSK QPSK	25 25	12 25	22.25	22.19	22.18	23	1
10	QPSK 16QAM	50	0	22.20	22.22	22.27		
10 10	16QAM 16QAM	1 1	25 49	22.09	22.09 22.04	21.97	23	1
10 10	16QAM 16QAM	25 25	0 12	20.78 20.99	20.81 21.00	21.10 21.06	- 22	2
10 10	16QAM 16QAM	25 50	25 0	21.08 20.86	20.94 21.02	20.88 20.89	22	2
10	64QAM 64QAM	1	0 25	21.15	20.96	20.99	22	2
10	64QAM 64QAM	1 25	49 0	21.02 19.97	20.91 19.93	20.87		
10 10 10	64QAM 64QAM	25 25 50	12 25 0	20.05 19.97 19.96	20.26 20.02 20.24	20.13 19.92 20.03	21	3
10	Cha Frequen	nnel	0	19.96 19975 1712.5	20.24 20175 1732.5	20.03 20375 1752.5	Tune-up limit	MPR (dB)
5	QPSK QPSK	cy (MHz) 1	0	23.20	23.28	22.96 22.89	(dBm) 24	(db)
5 5	QPSK QPSK	1 12	12 24 0	23.18 23.30 22.23	23.27 23.16 22.28	22.89 22.83 22.19	. 24	U
5	QPSK	12	7	22.22	22.27	22.04	23	1
5	QPSK 16QAM	25	0	22.25	22.25	22.13	•	
5 5	16QAM 16QAM	1	12 24	22.08 22.25	22.06 22.07	22.00 22.06	23	1
5 5	16QAM 16QAM	12 12	7	20.85 20.85	20.82 21.03	20.79 20.65	22	2
5	16QAM 16QAM	12 25	13 0	20.84	21.09	20.63		_
	64QAM 64QAM				20.98			
5		1	12	21.08 21.08	20.98 20.94 21.11	20.91	22	2
5 5	64QAM 64QAM	1 12	12 24 0	21.08 21.08 20.94 19.81	20.98 20.94 21.11 20.87 19.80	20.97 20.83 19.97	22	2
5 5 5 5	64QAM 64QAM 64QAM 64QAM	1 12 12 12	12 24 0 7 13	21.08 21.08 20.94 19.81 20.04 20.04	20.98 20.94 21.11 20.87 19.80 20.29 20.25	20.97 20.83 19.97 19.83 19.84	22	2
5 5 5	64QAM 64QAM 64QAM 64QAM 64QAM Cha	1 12 12 12 12 25	12 24 0 7	21.08 21.08 20.94 19.81 20.04 20.04 20.08 19965	20.98 20.94 21.11 20.87 19.80 20.29 20.25 20.29 20175	20.97 20.83 19.97 19.83 19.84 19.90 20385	21 Tune-up	3 MPR
5 5 5 5 5	64QAM 64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK	1 12 12 12 12 25 nnel cy (MHz)	12 24 0 7 13 0	21.08 21.08 20.94 19.81 20.04 20.04 20.08 19965 1711.5 23.22	20.98 20.94 21.11 20.87 19.80 20.29 20.25 20.29 20175 1732.5 23.20	20.97 20.83 19.97 19.83 19.84 19.90 20385 1753.5 22.97	Z1 Tune-up limit (dBm)	3 MPR (dB)
5 5 5 5 5 3 3	64QAM 64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK	1 12 12 12 25 12 25 nnel cy (MHz)	12 24 0 7 13 0	21.08 21.08 20.94 19.81 20.04 20.04 20.08 19965 1711.5 23.22 23.20 23.18	20.98 20.94 21.11 20.87 19.80 20.29 20.25 20.25 20.175 1732.5 23.20 23.14 23.09	20.97 20.83 19.97 19.83 19.84 19.90 20385 1753.5 22.97 23.00 22.93	21 Tune-up	3 MPR
5 5 5 5 5 3 3 3 3	64QAM 64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK	1 12 12 12 12 25 nnel cy (MHz) 1 1 1 8 8 8	12 24 0 7 13 0	21.08 21.08 20.94 19.81 20.04 20.04 20.08 19965 1711.5 23.22 23.20 23.18 22.31 22.36	20.98 20.94 21.11 20.87 19.80 20.29 20.25 20.29 20175 1732.5 23.20 23.14	20.97 20.83 19.97 19.83 19.84 19.90 20385 1753.5 22.97 23.00 22.93 22.10 22.12	Z1 Tune-up limit (dBm)	3 MPR (dB)
5 5 5 5 5 3 3 3	64QAM 64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK	1 12 12 12 12 25 nnel cy (MHz) 1 1	12 24 0 7 13 0 0 8 14 0	21.08 21.08 20.94 19.81 20.04 20.04 20.08 19965 1711.5 23.22 23.20 23.18 22.31	20.98 20.94 21.11 20.87 19.80 20.29 20.25 20.29 20175 1732.5 23.20 23.14 23.09 22.26 22.28	20.97 20.83 19.97 19.83 19.84 19.90 20385 1753.5 22.97 23.00 22.93 22.10 22.11 22.03	Tune-up limit (dBm)	MPR (dB)
5 5 5 5 5 5 3 3 3 3 3 3 3	64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	1 1 12 12 12 12 25 nnel cy (MHz) 1 1 1 1 8 8 8 15 1 1 1 1 1	12 24 0 7 13 0 0 8 14 0 4 7 0 0 8	21.08 21.08 20.94 19.81 20.04 20.08 19965 1711.5 23.22 23.20 23.18 22.31 22.33 22.33	20.98 20.94 21.11 20.87 19.80 20.29 20.25 20.29 20.175 23.20 23.14 23.09 22.26 22.28 22.26 22.25	20.97 20.83 19.97 19.83 19.84 19.90 20385 1753.5 22.97 23.00 22.93 22.10 22.12 22.11	Tune-up limit (dBm)	MPR (dB)
5 5 5 5 5 5 3 3 3 3 3 3 3 3 3 3 3 3 3 3	64QAM 64QAM 64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	1 1 12 12 12 12 25 nnel Ey (MHz) 1 1 1 1 8 8 8 8 15 1 1 1 1 1 8 8 8 8 8	12 24 0 7 13 0 0 8 14 0 4 7 0 8	21.08 21.08 20.94 20.04 20.04 20.08 19965 1711.5 23.22 23.20 23.20 23.21 22.36 22.31 22.33 22.31 22.31 22.31 22.31 22.31	20.98 20.94 21.11 20.87 19.80 20.29 20.25 20.29 20175 1732-2 23.20 23.14 23.09 22.26 22.28 22.26 22.25 22.26 22.25 22.26 22.25 22.26 22.25 22.25 22.25	20.97 20.83 19.97 19.83 19.84 19.90 20385 22.97 23.00 22.93 22.10 22.11 22.01 22.12 22.11 22.03 21.97 22.95 21.98 20.75 20.77	Tune-up limit (dBm) 24 23 23	3 MPR (dB) 0
5 5 5 5 5 5 5 5 3 3 3 3 3 3 3 3 3 3 3 3	64QAM 64QAM 64QAM 64QAM 64QAM Frequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	1 1 12 12 12 12 25 nnel cy (MHz) 1 1 1 8 8 8 15 1 1 1 8 8 8 15 15 1 1 1 1	12 24 0 7 13 0 8 14 7 0 0 8 14 0 0 4 7 7 0 0 4 7 7 0 0 0 0 0 0 0 0 0	21.08 21.08 21.08 20.94 19.81 20.04 20.08 19965 1711.5 23.22 23.22 23.20 23.18 22.31 22.31 22.32 22.31 22.31 22.32 22.31 22.33 22.31 22.31 22.32 22.31 22.31 22.32 22.31 22.31 22.32 23.32	20.98 20.94 21.11 20.87 19.80 20.29 20.25 20.29 20.175 1732.5 23.20 23.14 23.09 22.26 22.28 22.26 22.25 22.24 22.26 22.25 22.25 22.21 22.26 22.25 22.21 22.26 22.25 22.26 22.27 22.28 22.26 22.27 22.28 22.2	20.97 20.83 19.97 19.83 19.84 19.90 20385 1753.5 22.97 23.00 22.10 22.11 22.11 22.03 21.97 22.25 21.19 21.98 20.75 20.77 20.96 20.95	Tune-up limit (dBm)	3 MPR (dB) 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM 64QAM 64QAM Frequen OPSK OPSK OPSK OPSK OPSK OPSK OPSK OPSK	1 1 12 12 12 25 nnel cy (MHz) 1 1 1 1 8 8 8 15 1 1 1 1 1 1 1 1	12 24 0 7 13 0 0 8 14 0 0 8 14 7 0 0 8 14 0 0 0 8 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21.08 21.08 21.08 20.94 19.81 20.04 20.08 19965 17711.5 23.22 23.20 23.18 22.31 22.36 22.31 22.36 22.31 22.39 22.31 22.39 22.31 22.39 22.31 22.39 22.31 22.39 22.31 22.39 22.31 23.31 23.3	20.98 20.94 21.11 20.87 19.80 20.29 20.25 20.29 20.175 1732.5 23.20 22.26 22.26 22.26 22.26 22.26 22.26 22.26 22.26 22.26 22.27 22.28 22.2	20.97 20.83 19.97 19.83 19.84 19.90 20385 1753.5 22.97 23.00 22.93 22.10 22.11 22.11 22.03 21.97 22.25 21.97 22.26 20.75 20.77 20.96 20.95 21.10 20.95	Tune-up limit (dBm) 24 23 23	3 MPR (dB) 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM 64QAM 64QAM Chs Prequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	1 1 12 12 25 nnel Ey (MHz) 1 1 1 8 8 8 15 1 1 1 1 8 8 8 15 1 1 1 1	12 24 0 0 7 13 0 0 8 14 0 0 8 14 0 0 8 8 14 0 0 0 8 8 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21.08 21.08 21.08 20.94 20.04 20.08 19985 1711.5 23.22 23.20 23.18 22.31 22.36 22.38 22.31 22.28 22.27 23.20 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91	20.98 20.94 20.94 21.11 20.87 19.80 20.29 20.25 20.29 20.175 1732.5 23.20 23.20 23.20 22.26 22.26 22.26 22.26 22.26 22.27 22.29 22.26 22.29 22.20 22.2	20.97 20.83 19.97 19.83 19.84 19.90 20385 1753.5 22.97 23.00 22.93 22.10 22.12 22.11 22.03 21.97 22.25 21.98 20.75 20.96 20.95 21.12 21.07 21.07 21.07	21 Tune-up limit (dBm) 24 23 23	3 MPR (dB) 0 1 1 2
5 5 5 5 5 5 5 5 5 5 5 3 3 3 3 3 3 3 3 3	640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM	1 1 12 12 12 25 nnel cy (MHz) 1 1 1 8 8 8 15 1 1 1 1 8 8 8 15 1 1 1 1	12 24 0 7 13 0 8 14 0 0 8 14 7 0 0 8 14 0 0 8 14 0 0 7	21.08 21.08 21.09 20.94 20.04 20.04 20.08 19965 1711.15 23.22 23.20 23.18 22.31 22.31 22.32 22.31 22.31 22.39 22.31 22.31 22.39 22.31 22.31 22.31 22.31 22.31 22.31 22.31 22.31 23.09 23.09 24.09 25.09 26.09 27.0	20.98 20.94 20.94 21.11 20.87 19.80 20.29 20.25 20.29 20175 1732.5 23.20 23.14 23.09 22.26 22.26 22.26 22.26 22.26 22.25 22.24 22.26 22.25 23.11 21.18 21.19 21.18 21.03 20.96 20.96 20.96	20,97 20,83 19,97 19,83 19,84 19,90 20385 22,97 23,00 22,93 22,10 22,12 22,11 22,03 21,97 22,25 21,19 20,75 20,96 20,95 21,12 21,07 21,07 21,07 21,07 19,69	21 Tune-up limit (dBm) 24 23 23	3 MPR (dB) 0 1 1 2
5 5 5 5 5 5 5 5 5 5 5 3 3 3 3 3 3 3 3 3	640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 640AM 640AM 640AM 640AM	1 1 12 12 12 12 25 nnel cy (MHz) 1 1 1 8 8 8 15 1 1 1 1 8 8 8 15 1 1 1 1	12 24 0 7 13 0 8 14 0 4 7 0 0 8 14 0 0 4 7 0 0 0 8 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21.08 21.08 21.08 21.08 20.94 20.04 20.04 20.00 20.00 21.02 23.22 23.20 22.35	20.98 20.111 19.80 20.29 20.21 19.80 20.29	20.97 20.83 19.97 19.83 19.98 19.90 20395 22.97 23.00 22.93 22.10 22.11 22.11 22.11 22.12 22.11 22.11 22.12 21.10 21.07 20.96 20.95 21.12 21.07 21.07 21.07 21.07 21.08 19.50 19.88 19.52 19.88	21 Tune-up limit (dBm) 24 23 23 23 22 21 Tune-up limit	3 MPR (dB) 0 1 1 2 2 3 MPR MPR
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	640AM 640AM	1 1 12 12 12 12 12 12 12 12 12 12 12 12	12 24 0 7 13 0 8 8 14 0 0 8 14 7 7 0 0 8 8 14 7 7 0 0 8 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21.08 21.08 21.08 21.08 19.01	20.98 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.92 20.29 20.29 20.29 20.29 20.29 20.29 20.29 20.29 20.92 20.91	2097 20.83 19.97 19.83 19.84 19.84 19.80 22.95 2	21 Tune-up limit (dBm) 24 23 23 22 22 21 Tune-up limit (dBm)	3 MPR (dB) 0 1 1 2 2 2 3
5 5 5 5 5 5 5 5 5 5 5 5 5 5 3 3 3 3 3 3	GGOAM SGOAM GGOAM GGOAM GGOAM Cha GGOAM GG	1 1 12 12 12 12 12 12 12 12 12 12 12 12	12 24 0 7 7 13 0 0 8 14 0 0 8 14 0 0 8 14 0 0 0 8 14 0 0 0 8 15 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21.08 21.08 21.08 21.08 21.08 21.08 20.04	20.98 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.91 20.92 20.29 20.29 20.29 20.29 20.29 20.29 20.29 20.91	2097 2088 19.97 19.87 19.87 19.87 19.87 19.88 19.89 22.87 22.97 23.00 22.87 22.10 22.17 22.19 20.58 20.85 20	21 Tune-up limit (dBm) 24 23 23 23 22 21 Tune-up limit	3 MPR (dB) 0 1 1 2 2 3 MPR MPR
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	GGOAM GGOAM GGOAM GGOAM GGOAM Cha GGOAM GGOA	1 1 1 2 12 12 12 12 12 12 12 12 12 12 12	12 24 0 7 7 13 0 0 8 14 0 0 4 7 7 0 0 0 8 14 0 0 4 7 7 0 0 0 8 5 0 0 1 1	21 08 20 94 19 20 94	20.98 20.91 20.11	2097 2088 1989 2088 1989 2088 1989 2088 1989 2088 2088 2088 2088 2088 2088 2088 2	21 Tune-up limit (dBm) 24 23 23 22 21 10ne-up limit (dBm)	3 MPR (dB) 0 1 1 2 2 3 MPR (dB)
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	GGOAM	1 12 12 25 14 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16	12 24 0 7 7 13 0 0 8 14 0 0 4 7 7 0 0 0 8 14 0 0 4 7 7 0 0 0 5 5 0 0 1 1 3 0 0 0 1 1 3 0 0 0 1 1 1 1 1 1	21 08 20 04 12 08	20.98 20.91 20.11	2097. 2083. 1997. 1998. 1998. 1998. 1998. 1998. 1998. 1998. 1998. 1998. 1998. 1998. 2300. 2210. 2210. 2211. 2211. 2211. 2211. 21197. 2077. 2077. 2077. 2077. 2077. 2079. 2099.	21 Tune-up limit (dBm) 24 23 23 22 21 10ne-up limit (dBm)	3 MPR (dB) 0 1 1 2 2 3 MPR (dB)
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	GGOAM	1 12 12 12 12 12 12 12 12 12 12 12 12 12	24 0 0 7 13 0 8 14 0 0 8 14 0 0 8 14 0 0 0 8 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21 08 2 10 98 1 12 10 10 10 10 10 10 10 10 10 10 10 10 10	20.98 20.91 20.11	2097. 1987. 1987. 1988. 1997. 1988. 1998. 1998. 1998. 1998. 2300. 2300. 2210. 2210. 2211. 2211. 2211. 2212. 2212. 2213. 2307. 2056. 1988.	21 Tune-up limit (dbm) 24 23 23 22 22 21 tune-up limit (dbm) 44 24 23 23	3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0 0 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	660AM	1 12 12 25 12 12 12 12 12 12 12 12 12 12 12 12 12	22 22 27 10 10 10 10 10 10 10 10 10 10 10 10 10	21 08 20 20 21 08 20 20 21 08 20 20 21 08 20 20 21 08 20 20 20 21 20 20 20 20 20 20 20 20 20 20 20 20 20	20.98 20.11	2097 2083 31997 2098 31997 2099 2099 2099 2099 2099 2099 2099 2	21 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	SSCAM SCAME	1 12 12 25 12 12 12 12 12 12 12 12 12 12 12 12 12	22 22 27 10 10 10 10 10 10 10 10 10 10 10 10 10	21 08 21 08 19 19 19 19 19 19 19 19 19 19 19 19 19	20.99 20.91 20.11	2097 2097 1997 1997 1997 1997 1998 1999 2299 2290 2210 2211 2211 2219 2219	21 Tune-up limit (dbm) 24 23 23 22 22 21 tune-up limit (dbm) 44 24 23 23	3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0 0 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	SEGAM SECAM	1 12 12 12 12 12 12 12 12 12 12 12 12 12	22 22 27 10 10 10 10 10 10 10 10 10 10 10 10 10	210.9 20.94	20.98 20.91 20.11	2097 2291 2219 2219 2219 2193 2095 2294 2212 2192 2193 2095 2095 2095 2095 2095 2095 2095 2095	21 Tune-up limit (dbm) 24 23 22 22 24 21 1une-up limit (dbm) 24 24 24 24 24 25 25 25 25 26 27 27 27 27 27 27 27 27 27 27 27 27 27	3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0 1 1 1 1 1 1 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	SEGAM SECOND SEC	1 12 12 12 12 12 12 12 12 12 12 12 12 12	22 24 27 13 20 27 13 20 27 14 27 27 27 27 27 27 27 27 27 27 27 27 27	21 08 20 20 20 20 20 20 20 20 20 20 20 20 20	20.98 20.91 20.11	2097 2097 2097 2098 2098 2098 2098 2098 2098 2098 2098	21 Tune-up limit (dbm) 24 23 22 22 24 21 1une-up limit (dbm) 24 24 24 24 24 24 25 25 25 25 26 26 27 27 27 27 27 27 27 27 27 27 27 27 27	3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0 1 1 1 1 1 1 1 1

	R	Par eceiver O	t 22H(onl	er Off / H	nel requir	ed) / Extremit	ty	
BW [MHz]	Modulation Cha	RB Size	RB Offset	Power Low Ch. / Freq. 20450	Power Middle Ch. / Freq. 20525	Power High Ch. / Freq. 20600	Tune-up limit (dBm)	MPR (dB)
	Frequen	cy (MHz)		829	836.5	844		
10	QPSK	1	0	23.73	23.79	23.61	24	0
10 10	QPSK	1 1	25 49	23.77	23.71	23.54	24	U
10	QPSK QPSK	25	0	22.70	22.72	22.63		
10	QPSK	25	12	22.67	22.65	22.51	23	1
10	QPSK	25	25	22.67	22.59	22.61	23	
10 10	QPSK 16QAM	50 1	0	22.55	22.66	22.44		
10	16QAM	1	0 25	22.31 22.65	22.53 22.48	22.49 22.40	23	1
10	16QAM	1	49	22.62	22.35	22.54	20	
10	16QAM	25	0	21.67	21.94	21.85		
10	16QAM	25	12	21.56	21.78	21.89	22	2
10	16QAM	25	25	21.65	21.84	21.54		_
10 10	16QAM 64QAM	50 1	0	21.82 21.55	21.66 21.66	21.65 21.63		
10	64QAM	1	25	21.62	21.65	21.47	22	2
10	64QAM		49	21.67	21.58	21.67		
10	64QAM	25	0	20.74	20.84	20.94		
10 10	64QAM 64QAM	25 25	12 25	20.67	20.74	20.67	21	3
10	64QAM 64QAM	25 50	25 0	20.98	20.73	20.96		
	Cha	nnel		20425	20525	20625	Tune-up	MPR
	Frequen			826.5	836.5	846.5	limit (dBm)	(dB)
5	QPSK	1	0	23.61	23.62	23.63		
5	QPSK	1	12	23.61	23.57	23.68	24	0
5 5	QPSK QPSK	1 12	24 0	23.64 22.63	23.62	23.64 22.59		
5	QPSK	12	7	22.63	22.65	22.59		
5	QPSK	12	13	22.73	22.62	22.59	23	1
5	QPSK	25	0	22.67	22.59	22.47		
5	16QAM		0	22.54	22.60	22.56		
5	16QAM 16QAM	1	12	22.77	22.66	22.38	23	1
5 5	16QAM 16QAM	12	24 0	22.66 21.44	22.59 21.61	22.56 21.47		
5	16QAM	12	7	21.44	21.58	21.59		
5	16QAM	12	13	21.50	21.53	21.55	22	2
5	16QAM	25	0	21.61	21.80	21.47		
5	64QAM 64QAM	1	0 12	21.58	21.76	21.52		
5	64QAM 64QAM	1	12 24	21.73 21.89	21.56 21.68	21.63 21.61	22	2
5	64QAM	12	0	20.77	20.71	20.76		
5	64QAM	12	7	20.60	20.66	20.86	21	3
5	64QAM	12	13	20.84	20.89	20.89	21	3
5	64QAM	25	0	20.86	20.78	20.92	Tune-un	
	Cha Frequen	nnei		20415 825.5	20525 836.5	20635 847.5	limit	MPR (dB)
3	QPSK	ty (MH2)	0	23.64	23.51	23.49	(dBm)	(05)
3	QPSK	1	8	23.51	23.40	23.48	24	0
3	QPSK		14	23.44	23.38	23.57		
3	QPSK	8	0	22.67	22.61	22.49		
3	QPSK	8	4	22.52	22.64	22.56	23	1
3	QPSK QPSK	8 15	7	22.74 22.60	22.69 22.68	22.56 22.49		
3	16QAM	1	0	22.49	22.77	22.45		
3	16QAM	1	8	22.44	22.55	22.40	23	1
3	16QAM	1	14	22.70	22.49	22.43		
3	16QAM	8	0	21.52	21.71	21.64		
3	16QAM 16QAM	8	4	21.50 21.58	21.63 21.58	21.69 21.30	22	2
3	16QAM	15	0	21.56	21.62	21.69		
3	64QAM	1	0	21.70	21.74	21.60		
3	64QAM		8	21.45	21.59	21.59	22	2
3	64QAM	1	14	21.72	21.68	21.54		
3	64QAM 64QAM	8	0	20.56	20.67	20.74		
3	64QAM	8	7	20.49	20.53	20.79	21	3
3	64QAM	15	o O	20.75	20.88	20.93		
		nnel		20407	20525	20643	Tune-up limit	MPR
	Frequen			824.7	836.5	848.3	(dBm)	(dB)
1.4	QPSK	1	0	23.53	23.58	23.49		
1.4	QPSK QPSK	1	3 5	23.48 23.45	23.43 23.39	23.53 23.52		
1.4	QPSK	3	0	23.45	23.68	23.69	24	0
1.4	QPSK	3	1	23.67	23.62	23.70		
1.4	QPSK	3	3	23.60	23.66	23.63		
1.4	QPSK	6	0	22.63	22.62	22.61	23	1
1.4	16QAM 16QAM	1 1	0 3	22.47 22.42	22.66 22.53	22.28		
1.4	16QAM 16QAM	1 -	3 5	22.42	22.53	22.28		
1.4	16QAM	3	0	22.57	22.64	22.46	23	1
1.4	16QAM	3	1	22.55	22.64	22.52		
1.4	16QAM	3	3	22.41	22.49	22.51		
1.4	16QAM 64QAM	6	0	21.11	21.35	21.10	22	2
1.4	64QAM 64QAM	1	0	21.47	21.72	21.49		
1.4	64QAM	1	5	21.43	21.44	21.48		
1.4	64QAM	3	0	21.57	21.72	21.67	22	2
1.4	64QAM	3	1	21.63	21.78	21.71		
1.4	64QAM 64QAM	3	0	21.67	21.72	21.67	21	3



				(2600MH Part 27 deceiver C				
BW [MHz]	Modulation Cha	RB Size	RB Offset	Power Low Ch. / Freq. 20850	Power Middle Ch. / Freq. 21100	Power High Ch. / Freq. 21350	Tune-up limit (dBm)	MPR (dB)
	Frequen			2510	2535	2560	(GDIII)	
20	QPSK	1	0	23.12	23.15	23.11		
20	QPSK	1	49	23.11	22.77	22.95	24	0
20	QPSK QPSK	1 50	99 0	22.91	22.88	23.13		
20 20	QPSK	50	24	22.36 22.36	22.39	22.22 22.04		
20	QPSK	50	50	22.09	21.91	22.04	23	1
20	QPSK	100	0	22.14	22.25	22.06		
20	16QAM	1	0	22.02	21.89	22.03		
20	16QAM		49	22.12	21.67	22.14	23	1
20	16QAM	1	99	21.91	21.69	22.08		
20	16QAM	50	0	20.65	20.46	20.65		
20 20	16QAM 16QAM	50 50	24 50	20.88	20.43	20.63	22	2
20	16QAM	100	0	20.58	20.68	20.69	ł	
20	64QAM	1	0	20.72	20.68	20.59		
20	64QAM	1	49	20.95	20.45	20.80	22	2
20	64QAM	1	99	20.58	20.48	20.72	i	
20	64QAM	50	0	20.01	19.63	19.82		
20	64QAM	50	24	20.02	19.56	19.85	21	3
20	64QAM	50	50	19.80	19.81	19.93		-
20	64QAM	100	0	20.09	19.80	19.80	Tune-up	
	Cha	mnei		20825	21100	21375	limit (dBm)	MPR (dR)
	Frequen			2507.5	2535	2562.5	(dBm)	(dB)
15 15	QPSK QPSK	1	0 37	22.73 22.84	22.99	22.78	24	0
15 15	QPSK	1	37 74	22.84	22.53	22.79	24	
15	QPSK	36	0	22.00	21.77	21.97		
15	QPSK	36	20	22.03	21.87	21.92		
15	QPSK	36	39	21.65	21.81	22.07	23	1
15	QPSK	75	0	21.79	21.79	22.03		
15	16QAM	1	0	21.86	21.77	21.88		
15	16QAM	1	37	21.83	21.48	21.86	23	1
15	16QAM	1	74	21.47	21.45	21.95		
15 15	16QAM 16QAM	36 36	0 20	20.14	20.24	20.43		
15	16QAM	36	39	20.58	20.17	20.38	22	2
15	16QAM	75	0	20.25	20.33	20.45		
15	64QAM	1	0	20.38	20.44	20.34		
15	64QAM	1	37	20.56	20.23	20.66	22	2
15	64QAM	1	74	20.45	20.37	20.50		
15	64QAM	36	0	19.82	19.46	19.69		
15	64QAM	36	20	19.62	19.55	19.59	21	3
15 15	64QAM 64QAM	36	39 0	19.62	19.58	19.88		
15	64QAM Cha	75		19.56 20800	19.56 21100	19.74 21400	Tune-up	MPR
	Frequen			2505	2535	2565	limit (dBm)	(dB)
10	QPSK	1	0	23.03	22.94	22.60	(dBm)	
10	QPSK	1	25	23.02	22.58	22.90	24	0
10	QPSK	1	49	22.81	22.69	23.06		
10	QPSK	25	0	22.25	21.95	21.90		
10	QPSK	25	12	22.25	21.80	21.87	23	1
10	QPSK	25	25	21.99	21.77	22.10		
10 10	QPSK 16QAM	50 1	0	22.29	21.99	21.82		
10	16QAM	1	25		21.77	21.81	23	1
10	16QAM	1	49	22.05 21.89	21.68	21.90	23	
10	16QAM	25	0	20.49	20.26	20.46		
10	16QAM	25	12	20.69	20.39	20.45	22	2
10	16QAM	25	25	20.54	20.63	20.63	22	2
10	16QAM	50	0	20.28	20.27	20.33		
10	64QAM 64QAM	1	0	20.69	20.58	20.37	22	2
10 10	64QAM 64QAM	1	25 49	20.74	20.29	20.61	22	2
10	64QAM	25	49	19.77	19.35	19.60		
10	64QAM	25	12	19.77	19.35	19.68		
10	64QAM	25	25	19.78	19.55	19.60	21	3
10	64QAM	50	0	19.96	19.69	19.72		
	Cha	innel		20775	21100	21425	Tune-up	MPR
		cy (MHz)		2502.5	2535	2567.5	limit (dBm)	(dB)
5	QPSK QPSK	1	0	23.08	22.93	22.65		
5		1	12	22.96	22.62	22.77	24	0
5 5	QPSK QPSK	1 12	24 0	22.82	22.81	22.92		
5	QPSK	12	7	22.24	21.93	21.93		
5	QPSK	12	13	21.87	21.84	22.09	23	1
5	QPSK	25	0	22.01	21.61	21.88	1	
5	16QAM	1	0	21.68	21.64	21.87		
5	16QAM	1	12	21.65	21.45	21.66	23	- 1
5	16QAM	1	24	21.65	21.56	21.80		
5	16QAM 16QAM	12	0	20.32	20.29	20.55		
5 5	16QAM 16QAM	12	7 13	20.69	20.37	20.45	22	2
5	16QAM	12 25	13	20.45	20.43	20.46		
5	64QAM	1	0	20.52	20.52	20.42		
5	64QAM	1	12	20.55	20.30	20.56	22	2
5	64QAM	1	24	20.21	20.24	20.69		
5	64QAM	12	0	19.69	19.49	19.69		
5	64QAM	12	7	19.75	19.35	19.73	21	3
5	64QAM	12	13	19.41	19.72	19.71		
	64QAM			19.82	19.67	19.67		

			F	Band 66 teceiver O	n			
BW [MHz]	Modulation Cha Frequence	RB Size	RB Offset	Power Low Ch. / Freq. 132072 1720	Power Middle Ch. / Freq. 132322 1745	Power High Ch. / Freq. 132572 1770	Tune-up limit (dBm)	MPR (dB)
20 20 20	QPSK QPSK QPSK	1 1	0 49 99	23.21 23.18 23.20	23.38 23.09 23.08	23.18 23.13 23.09	24	0
20 20	QPSK QPSK	50 50	0 24	22.23 22.21	22.28 22.16	22.27 22.27	23	1
20 20 20	QPSK QPSK 16QAM	50 100 1	50 0 0	22.25 22.17 22.36	22.16 22.24 22.41	22.22 22.16 22.24		
20 20	16QAM 16QAM	1	49 99	22.25 22.18	22.31 22.25	22.22 22.12	23	1
20 20 20	16QAM 16QAM 16QAM	50 50 50	0 24 50	20.83 20.85 20.78	20.82 20.80 20.72	20.77 20.80 20.79	22	2
20 20 20	16QAM 64QAM 64QAM	100 1	0 0 49	20.85 21.02 20.97	20.82 21.22 21.17	20.84 20.96 20.95	22	2
20 20	64QAM 64QAM	1 50	99 0	20.89 20.05	21.05 19.93	20.87 19.97		
20 20 20	64QAM 64QAM 64QAM	50 50 100	24 50 0	19.98 19.94 19.95	19.93 19.92 19.90	20.00 19.90 19.92	21	3
	Cha Frequent	nnel		132047 1717.5	132322 1745	132597 1772.5	Tune-up limit (dBm)	MPR (dB)
15 15 15	QPSK QPSK QPSK	1 1	0 37 74	23.19 23.16 23.16	23.28 23.16 23.12	23.17 23.17 23.10	24	0
15 15	QPSK QPSK	36 36	0 20	22.29 22.17	22.18 22.18	22.22 22.16	23	1
15 15	QPSK QPSK 16QAM	36 75	39 0	22.17 22.25 22.30	22.19 22.28 22.20	22.16 22.16 22.36		
15 15	16QAM 16QAM	1	37 74	22.24 22.04	22.15 22.11	22.25 22.14	23	1
15 15 15	16QAM 16QAM 16QAM	36 36 36	0 20 39	20.80 20.91 20.86	20.86 20.87 20.85	20.78 20.77 20.83	22	2
15 15	16QAM 64QAM	75 1	0	20.82 20.99	20.87 20.94	20.78 20.99		
15 15 15	64QAM 64QAM 64QAM	1 1 36	37 74 0	20.94 20.89 20.00	20.94 20.99 20.14	20.98 20.96 19.98	22	2
15 15	64QAM 64QAM	36 36	20 39	20.10 20.04	19.97 20.07	20.04	21	3
15	64QAM Cha		0	19.91 132022	19.95 132322	19.95 132622	Tune-up limit	MPR (dB)
10	QPSK QPSK	2y (MHz) 1 1	0 25	1715 23.20 23.18	1745 23.16 23.25	1775 23.20 23.21	(dBm)	(dB)
10 10	QPSK QPSK	1 25	49 0	23.27 22.31	23.22 22.19	23.14 22.22		
10 10 10	QPSK QPSK QPSK	25 25 50	12 25 0	22.33 22.24 22.25	22.22 22.17 22.32	22.26 22.30 22.25	23	1
10 10	16QAM 16QAM	1 1	0 25	22.28	22.04	22.30 22.14	23	1
10 10 10	16QAM 16QAM 16QAM	1 25 25	49 0 12	22.14 21.01 21.00	21.98 20.85 20.99	22.22 20.80 21.03		
10 10	16QAM 16QAM	25 50	25 0	20.81	20.99	20.96	22	2
10 10 10	64QAM 64QAM 64QAM	1 1	0 25 49	21.12 21.13 21.06	21.05 20.99 21.00	21.10 21.04 20.99	22	2
10 10 10	64QAM 64QAM	25 25	0 12	20.03 20.11	20.10 20.06	20.99 20.06 20.06	21	3
10 10	64QAM 64QAM Cha	25 50	25 0	20.08 20.03 131997	20.07 19.97 132322	20.06 20.01 132647	Tune-up	MPR
5	Frequent	y (MHz)	0	1712.5	1745	1777.5	limit (dBm)	(dB)
5 5	QPSK QPSK	1	12 24	23.18	23.18	23.31 23.27	24	0
5 5 5	QPSK QPSK QPSK	12 12 12	0 7 13	22.23 22.25 22.23	22.25 22.30 22.21	22.29 22.28 22.18	23	1
5 5	QPSK 16QAM	25 1	0	22.29 22.25	22.18 22.10	22.21 22.18		
5 5	16QAM 16QAM	1 12	12 24 0	22.30 22.16 20.90	22.16 22.20 20.78	22.20 22.14 20.87	23	1
5	16QAM 16QAM	12	7	20.90 20.87	20.79	20.91	22	2
5 5	16QAM 64QAM 64QAM	25 1 1	0 0 12	21.04 21.12 21.10	20.79 20.97 21.08	21.03 20.96 21.05	22	2
5	64QAM 64QAM	1 12	24	20.94	20.89	21.06 19.83		-
5 5 5	64QAM 64QAM 64QAM	12 12 25	7 13 0	20.07 19.86 20.09	20.02 20.03 20.03	20.03 20.03 20.12	21	3
	Cha	nnel		131987 1711.5	132322 1745	132657 1778.5	Tune-up limit (dBm)	MPR (dB)
3	QPSK QPSK	1	0	23.19 23.23	23.15 23.15	23.23 23.17	24	0
3 3 3	QPSK QPSK QPSK	1 8 8	14 0 4	23.17 22.28 22.35	23.09 22.15	23.26		
3					22.21	22.30	23	1
3	QPSK QPSK	8 15	7	22.29 22.26	22.09 22.17	22.26 22.24		
				22.29	22.09	22.26	23	1
3 3 3 3 3	QPSK 16QAM 16QAM 16QAM 16QAM	15 1 1 1 8 8	0 0 8 14 0	22.29 22.26 22.27 22.22 22.24 20.97 20.94	22.09 22.17 22.30 22.32 22.25 20.90 20.93	22.24 22.21 22.22 22.14 20.95 20.95		1 2
3 3 3 3	QPSK 16QAM 16QAM 16QAM 16QAM	15 1 1 1 8	0 0 8 14	22.29 22.26 22.27 22.22 22.24 20.97	22.09 22.17 22.30 22.32 22.25 20.90	22.26 22.24 22.21 22.22 22.14 20.95	23	
3 3 3 3 3 3 3 3 3 3	QPSK 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM 64QAM	15 1 1 1 8 8 8 15 1	0 0 8 14 0 4 7 0 0 8	22.29 22.26 22.27 22.22 22.24 20.97 20.94 20.97 20.93 20.97 21.01 20.96	22.09 22.17 22.30 22.32 22.25 20.90 20.93 20.94 20.89 21.42 21.24 21.18	22.26 22.24 22.21 22.22 22.14 20.95 20.95 20.94 20.88 20.98 20.94 20.97	23	
3 3 3 3 3 3 3 3 3	QPSK 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM	15 1 1 1 8 8 8 8 15	0 0 8 14 0 4 7 0	22.29 22.26 22.27 22.22 22.24 20.97 20.94 20.97 20.93 20.97 21.01	22.09 22.17 22.30 22.32 22.25 20.90 20.93 20.94 20.89 21.42 21.24	22.26 22.24 22.21 22.22 22.14 20.95 20.95 20.94 20.88 20.98	23	2
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	OPSK 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM	15 1 1 1 1 8 8 8 8 15 1 1 1 1 1 8 8 8 15	0 0 8 14 0 4 7 0 8 14 0	22.29 22.26 22.27 22.22 22.24 20.97 20.94 20.97 20.97 20.91 20.96 19.89 20.00 20.00 20.03	22.09 22.17 22.30 22.32 22.25 20.90 20.93 20.94 20.89 21.42 21.24 21.18 19.77 19.87 20.03 132322	22.26 22.24 22.21 22.22 22.14 20.95 20.95 20.94 20.88 20.94 20.97 19.88 19.98 19.99 20.03	23 22 22 21 Tune-up	2 2 3 MPR
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	OPSK 160AM 160AM 160AM 160AM 160AM 160AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM	15 1 1 1 1 8 8 8 15 1 1 1 1 8 8 8 15 1 1 1 1	0 0 8 14 0 4 7 0 0 8 14 7 0 0 4 7 7	22.29 22.26 22.27 22.22 22.24 20.97 20.94 20.97 20.93 20.97 21.01 20.96 19.89 20.00 20.00 20.00 20.01 131979 1710.7	22.09 22.17 22.30 22.32 22.25 20.90 20.93 20.94 21.42 21.24 21.18 19.77 19.87 19.77 20.03 132322 1745 23.15	22.26 22.24 22.21 22.22 22.14 20.95 20.95 20.98 20.98 20.94 20.97 19.88 19.98 19.99 20.03 132665 1779.3	23 22 22 21	2 2 3
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	OPSK 16OAM 16OAM 16OAM 16OAM 16OAM 16OAM 64OAM 64OAM 64OAM 64OAM 64OAM 64OAM 64OAM 64OAM	15 1 1 1 1 8 8 8 15 1 1 1 1 8 8 8 15 1 1 1 1	0 0 8 14 0 4 7 0 0 8 14 0 4 7	22.29 22.26 22.27 22.22 22.24 20.97 20.94 20.97 20.93 20.97 21.01 20.96 19.89 20.00 20.00 20.00 3131979 1710.7	22.09 22.17 22.30 22.32 22.25 20.90 20.93 20.94 20.89 21.42 21.24 21.18 19.77 19.87 19.77 20.03 152322 1745	22.26 22.24 22.21 22.22 22.14 20.95 20.95 20.98 20.98 20.94 20.97 19.88 19.98 19.99 20.03 13.2665	23 22 22 21 Tune-up limit	2 2 3 MPR
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	OPSK 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 640AM 640AM 640AM 640AM 640AM 640AM Cha Frequenc OPSK OPSK OPSK OPSK	15 1 1 1 1 8 8 8 15 1 1 1 1 1 8 8 8 15 1 1 1 1	0 0 0 8 14 0 4 7 0 0 8 14 0 4 7 7 0 0 3 5 5 0 0	22.29 22.26 22.27 22.27 22.29 20.94 20.97 20.93 20.97 21.01 20.96 19.89 20.00 20.00 20.00 20.01 20.93 131979 1710.7 23.19 23.14 23.24 23.22 23.30 23.22	22.09 22.17 22.30 22.30 22.32 22.25 20.90 20.93 20.94 20.89 21.42 21.24 21.24 21.79 20.03 19.77 20.03 19.87 20.30 19.37 20.30 23.315 23.08 23.26 23.31	22.26 22.24 22.24 22.21 22.21 22.29 20.95 20.95 20.98 20.98 20.98 20.97 19.88 19.99 20.03 132.665 1779.3 23.15 23.15 23.20 23.28 23.27	22 22 21 Tune-up limit (dBm) 24	2 2 3 MPR (dB)
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	OPSK 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 6	15 1 1 1 1 8 8 8 15 1 1 1 1 8 8 15 1 1 1 1	0 0 0 8 14 0 4 7 0 0 8 8 14 0 4 7 7 0 0 3 5 5 0 1 1 1 0 0 1 1 1 0 0 1 1 1 0 0 1 0 1	22.29 22.26 22.27 22.27 22.29 20.97 20.94 20.97 20.98 20.97 21.01 20.96 19.89 20.00 20.00 20.00 20.03 131979 1710.7 23.19 23.14 23.24 23.22 23.30 23.22 22.29	22.09 22.17 22.30 22.32 22.25 20.90 20.93 20.94 21.42 21.18 19.77 19.87 19.77 20.03 132322 1745 23.15 23.08 23.26 23.26 23.27 22.19	22.26 22.24 22.24 22.21 22.22 20.95 20.95 20.95 20.98 20.98 20.98 19.98 19.98 19.99 20.03 132665 1779.3 23.15 23.20 23.28 23.27 23.37	22 22 21 Tune-up limit (dBm)	2 2 3 MPR (dB)
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	OPSK 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 160AM	15 1 1 1 1 8 8 8 15 1 1 1 1 8 8 15 1 1 1 1	0 0 0 8 14 0 0 4 7 7 0 8 14 0 4 7 7 0 0 3 5 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	22.29 22.26 22.27 22.27 22.29 20.97 20.94 20.97 20.93 20.97 21.01 20.96 19.89 20.00 20.00 20.00 313199 23.14 23.24 23.22 23.30 23.22 22.29 22.29 22.29 22.25	22.09 22.17 22.30 22.32 22.32 22.25 20.90 20.93 20.94 20.89 21.42 21.18 19.87 19.87 19.77 19.87 20.03 132322 13.38 23.38 23.26 23.31 23.27 22.19 22.38 22.39 22.36 21.83	22.26 22.24 22.24 22.21 22.29 22.14 20.95 20.95 20.95 20.94 20.88 20.94 20.97 19.88 19.98 20.31 13265 23.21 23.37 22.29 23.37 22.29 22.26 22.26	22 22 21 Tune-up limit (dBm) 24	2 2 3 MPR (dB)
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	OPSK 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 160AM 640AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM	15 1 1 1 1 1 8 8 8 1 15 1 1 1 1 1 3 3 3 3 3 3 3 3 3 3 3 3	0 0 8 14 0 0 4 7 0 0 8 14 7 7 0 0 3 5 5 0 0 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0	22.29 22.27 22.27 22.22 22.24 20.97 20.93 20.97 21.01 20.96 20.00 20.00 20.00 21.01 23.19 23.14 23.24 23.22 23.30 22.22 22.29 22.29 22.29 22.29 22.29 22.20 22.00	22.09 22.17 22.30 22.32 22.25 20.90 20.93 20.94 20.89 21.42 21.24 21.24 21.77 19.77 19.77 20.03 152.32 1745 23.15 23.09 23.35 23.26 23.31 23.27 22.19 23.28 23.29 23.29 23.31 23.29 23.31 23.29 23.31 23.29 23.31 23.29 23.31 23.29 23.31 23.29 23.31 23.29 23.31 23.29 23.31 23.31 23.29 23.31 23	22.26 22.21 22.22 22.24 20.95 20.95 20.96 20.97 20.95 20.97 20.95 20.97 20.95 20.97 20.95 20.97	23 22 21 Tune-up limit (dBm) 24 23	2 2 3 MPR (dB) 0 1 1
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	OPSIC TECOAM TEC	155 1 1 1 1 1 8 8 8 8 15 1 1 1 1 1 1 1 1 1 1	0 0 8 8 14 14 0 0 0 8 8 14 14 17 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22.29 22.27 22.27 22.27 22.29 20.97 20.97 20.93 20.97 21.01 20.96 19.89 20.00 20.00 20.03 21.01 23.19 23.14 23.24 23.24 23.24 23.24 23.22 23.30 23.22 22.29 22.26 22.26 22.25 21.98	22.09 22.17 22.30 22.32 22.25 20.90 20.93 20.94 20.89 21.42 21.24 21.24 21.18 19.77 19.87 20.03 132.32 1745 23.15 23.08 23.36 23.31 23.27 22.38 22.38 22.38 22.38 22.38	22.26 22.24 22.21 22.22 22.14 20.95 20.94 20.88 20.94 20.98 20.99 20.99 20.93 31.96	23 22 21 21 Tune-up limit (dBm) 24	2 2 3 MPR (dB) 0
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	OPSK. FIGOAM FIG	15	0 0 8 8 144 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22.29 22.27 22.27 22.22 22.27 22.22 20.54 20.57 20.54 20.57 20.54 20.57	22 09 22 35 22 35 22 35 22 36 23 36 23 36 23 36 22 37 22 38 22 39 22 38	22.26 22.24 22.24 22.24 20.95 20.95 20.94 20.25 22.24 20.25	23 22 21 Tune-up limit (dBm) 24 23	2 2 3 MPR (dB) 0 1 1
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	OPSIC TEGOAM TEG	155 1 1 1 1 8 8 8 8 15 15 1 1 1 1 1 3 3 3 3 6 6 1 1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	22.29 22.27 22.28 22.27 22.29 22.24 20.97 20.94 20.97 20.99 20.93 20.91 20.90	22 09 22 37 22 37 22 38 22 38 23 37 23 38 23 38 22 39 22 30 20 20 20 20 20 20 20 20 20 20 20 20 20	22.26 22.21 22.22 24 20.95 20.94 20.95 20.94 20.95 20.94 20.95 20.94 20.95 20.	23 22 21 21 1une-up limt (dtlm) 24 23 23	2 2 3 3 MPR (dB) 0 1 1 1 2 2



Receiver Off / Extremity Receiver Off / Extremity

	Band		WCDMA II		Ŧ		WCDMA IV		Ŧ
	TX Channel	9262	9400	9538	Tune-up Limit	1312	1413	1513	Tune-up Limit
	Rx Channel	9662	9800	9938	(dBm)	1537	1638	1738	(dBm)
Fre	equency (MHz)	1852.4	1880	1907.6	(3511)	1712.4	1732.6	1752.6	(05)
3GPP Rel 99	AMR 12.2Kbps	22.48	22.51	22.47	23.00	16.94	17.16	17.06	17.50
3GPP Rel 99	RMC 12.2Kbps	22.44	22.52	22.48	23.00	16.95	17.17	17.07	17.50
3GPP Rel 6	HSDPA Subtest-1	21.84	21.54	21.64	22.00	15.91	15.86	16.08	16.50
3GPP Rel 6	HSDPA Subtest-2	21.49	21.18	21.31	22.00	15.95	15.82	15.95	16.50
3GPP Rel 6	HSDPA Subtest-3	21.30	21.34	21.38	21.50	15.94	15.80	15.91	16.00
3GPP Rel 6	HSDPA Subtest-4	21.23	21.12	21.22	21.50	15.98	15.82	15.92	16.00
3GPP Rel 8	DC-HSDPA Subtest-1	21.77	21.47	21.37	22.00	16.12	15.81	16.02	16.50
3GPP Rel 8	DC-HSDPA Subtest-2	21.42	21.44	21.24	22.00	15.11	15.06	15.28	16.50
3GPP Rel 8	DC-HSDPA Subtest-3	21.23	21.27	21.41	21.50	15.71	15.58	15.71	16.00
3GPP Rel 8	DC-HSDPA Subtest-4	21.16	21.11	21.06	21.50	15.70	15.56	15.67	16.00
3GPP Rel 6	HSUPA Subtest-1	20.52	20.61	20.72	22.00	16.00	15.80	16.03	16.50
3GPP Rel 6	HSUPA Subtest-2	18.63	18.57	18.38	20.00	14.27	14.08	14.12	14.50
3GPP Rel 6	HSUPA Subtest-3	19.71	19.62	19.56	21.00	14.93	14.66	14.74	15.50
3GPP Rel 6	HSUPA Subtest-4	18.87	18.79	18.66	20.00	14.03	14.20	14.11	14.50
3GPP Rel 6	HSUPA Subtest-5	20.60	20.70	20.50	22.00	16.50	16.30	16.50	16.50
3GPP Rel 7	HSPA+ (16QAM) Subtest-1	18.08	18.17	18.02	19.50	13.97	13.82	13.88	14.00



Hotspot On

GSM1900	Burst .	Average Powe	r (dBm)	Tune-up	Frame-	Average Powe	r (dBm)	Tune-up
TX Channel	512	661	810	Limit	512	661	810	Limit
Frequency (MHz)	1850.2	1880	1909.8	(dBm)	1850.2	1880	1909.8	(dBm)
GSM 1 Tx slot	27.40	27.42	27.35	28.50	18.40	18.42	18.35	19.50
GPRS 1 Tx slot	27.45	27.62	27.51	28.50	18.45	18.62	18.51	19.50
GPRS 2 Tx slots	25.62	25.68	25.51	26.50	19.62	19.68	19.51	20.50
GPRS 3 Tx slots	23.75	23.98	23.82	24.50	19.49	19.72	19.56	20.24
GPRS 4 Tx slots	21.61	21.75	21.68	22.50	18.61	18.75	18.68	19.50
EDGE 1 Tx slot	28.31	27.96	27.85	28.50	19.31	18.96	18.85	19.50
EDGE 2 Tx slots	27.08	26.92	26.90	27.50	21.08	20.92	20.90	21.50
EDGE 3 Tx slots	25.13	24.67	24.68	25.50	20.87	20.41	20.42	21.24
EDGE 4 Tx slots	22.70	22.56	22.35	23.50	19.70	19.56	19.35	20.50

	Band		WCDMA II		_		WCDMA IV		_
	TX Channel	9262	9400	9538	Tune-up Limit	1312	1413	1513	Tune-up Limit
	Rx Channel	9662	9800	9938	(dBm)	1537	1638	1738	(dBm)
Fre	quency (MHz)	1852.4	1880	1907.6	(dbiii)	1712.4	1732.6	1752.6	(dbiii)
3GPP Rel 99	AMR 12.2Kbps	19.40	19.35	19.51	20.00	16.44	16.55	16.51	17.00
3GPP Rel 99	RMC 12.2Kbps	19.52	19.54	19.48	20.00	16.69	16.75	16.73	17.00
3GPP Rel 6	HSDPA Subtest-1	18.63	18.80	18.34	19.00	15.54	15.44	15.70	16.00
3GPP Rel 6	HSDPA Subtest-2	18.21	18.45	18.01	19.00	15.58	15.48	15.69	16.00
3GPP Rel 6	HSDPA Subtest-3	18.45	18.12	18.22	18.50	15.12	15.16	15.06	15.50
3GPP Rel 6	HSDPA Subtest-4	18.08	18.27	17.86	18.50	15.06	15.05	15.19	15.50
3GPP Rel 8	DC-HSDPA Subtest-1	18.56	18.73	18.27	19.00	15.45	15.44	15.61	16.00
3GPP Rel 8	DC-HSDPA Subtest-2	18.14	18.38	17.94	19.00	15.51	15.48	15.69	16.00
3GPP Rel 8	DC-HSDPA Subtest-3	18.38	18.35	18.15	18.50	15.22	15.21	15.05	15.50
3GPP Rel 8	DC-HSDPA Subtest-4	18.01	18.20	17.79	18.50	15.16	15.07	15.01	15.50
3GPP Rel 6	HSUPA Subtest-1	18.08	17.99	17.98	19.00	15.05	15.16	15.32	16.00
3GPP Rel 6	HSUPA Subtest-2	16.59	16.74	16.71	17.00	13.42	13.44	13.25	14.00
3GPP Rel 6	HSUPA Subtest-3	17.09	16.77	16.76	18.00	14.60	14.32	14.53	15.00
3GPP Rel 6	HSUPA Subtest-4	16.88	16.77	16.80	17.00	13.50	13.75	13.65	14.00
3GPP Rel 6	HSUPA Subtest-5	18.47	18.57	18.41	19.00	15.60	15.50	15.70	16.00



		Par	t 27L (onl Receive	er Off / Ex	nnel requi			
BW [MHz]	Modulation		RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit	MPR
	Cha Frequen	cy (MHz)		20050 1720	20175 1732.5	20300 1745	(dBm)	
20 20	QPSK QPSK	1	0 49	17.10 16.85	17.18 16.77	17.08 17.07	17.5	0
20	QPSK QPSK QPSK	50	99	16.80 16.10	16.76 16.14	16.92 16.12 15.88		
20 20 20	QPSK QPSK QPSK	50 50 100	24 50 0	16.02 15.91	15.92 16.13 16.11	16.07 16.02	16.5	1
20	16QAM 16QAM	1 1	0 49	16.32	16.47	16.50 16.14	16.5	1
20 20	16QAM 16QAM	1 50	99 0	16.27 15.14	16.24 15.15	16.07 15.04		
20 20	16QAM 16QAM	50 50	24 50	15.12 15.11	15.12 15.01	15.02 15.07	15.5	2
20 20	16QAM 64QAM	100	0	15.09 15.13	15.12 15.08	15.22 15.06		
20 20 20	64QAM 64QAM 64QAM	1 1 50	49 99 0	15.17 15.07 14.18	15.02 15.14 14.48	15.02 15.03 14.11	15.5	2
20	64QAM 64QAM	50	24 50	14.44	14.32	14.14	14.5	3
20	64QAM Cha	100 nnel	0	14.09 20025	14.09 20175	14.34 20325	Tune-up	MPR
15	Frequen QPSK		0	1717.5 16.84	1732.5 16.88	1747.5 16.81	limit (dBm)	(dB)
15 15	QPSK QPSK	1	37 74	16.68 16.48	16.64 16.65	16.84 16.82	17.5	0
15 15	QPSK QPSK QPSK	36 36	20	15.94 15.56 15.79	15.85 15.69 16.02	15.85 15.67 15.85	16.5	1
15 15 15	QPSK QPSK 16QAM	36 75	39 0	15.79 15.69 16.00	16.02 15.97 16.22	15.85 15.89 16.12		
15	16QAM 16QAM	1	37 74	15.89	15.87 16.07	15.92 15.83	16.5	1
15 15	16QAM 16QAM	36 36	0 20	14.88 14.98	14.91 14.84	14.94 14.84	,,,,	
15 15	16QAM 16QAM	36 75	39 0	14.93 14.81	14.78 14.79	14.87 14.91	15.5	2
15 15	64QAM 64QAM	1	0 37	14.95 15.00	14.91 14.77	14.82 14.74	15.5	2
15 15	64QAM 64QAM	1 36	74 0	14.85	14.87	14.90 13.94		
15 15	64QAM 64QAM	36 36	20 39	14.32	14.17	14.11	14.5	3
15	64QAM Cha Frequen		0	13.98 20000 1715	13.87 20175 1732.5	14.05 20350 1750	Tune-up limit	MPR (dB)
10	QPSK QPSK	1 1	0 25	16.79	16.88 16.54	16.79	(dBm)	(db)
10	QPSK QPSK	1 25	49 0	16.53	16.44 15.87	16.75 16.82 15.82	17.5	U
10	QPSK QPSK	25 25	12 25	15.66	15.77	15.78	16.5	1
10	QPSK 16QAM	50 1	0	15.68 16.05	15.80 16.11	15.78 16.12		
10 10	16QAM 16QAM	1	25 49	16.02 16.00	15.76 15.92	16.02 15.75	16.5	1
10 10	16QAM 16QAM	25 25	0 12	14.88 15.00	14.88 14.98	14.83 14.88	15.5	2
10 10	16QAM 16QAM	25 50	25 0	14.99 14.98	14.77 14.81	14.90 14.92	10.5	•
10	64QAM							
10	64QAM	- 1	25	15.01 14.86	14.85 14.81	14.79 14.85	15.5	2
10 10	64QAM 64QAM	1 25	49 0	14.86 14.90 13.91	14.81 14.90 14.21	14.85 14.87 13.79	15.5	2
10 10 10 10	64QAM 64QAM 64QAM 64QAM	1 25 25 25	49 0 12 25	14.86 14.90 13.91 14.20 14.13	14.81 14.90 14.21 14.06 13.93	14.85 14.87 13.79 13.90 14.01	15.5	3
10 10 10	64QAM 64QAM 64QAM	1 25 25 25 25 50	49 0 12	14.86 14.90 13.91 14.20	14.81 14.90 14.21 14.06	14.85 14.87 13.79 13.90	14.5 Tune-up	
10 10 10 10 10 10	64QAM 64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK	1 25 25 25 25 50	49 0 12 25	14.86 14.90 13.91 14.20 14.13 13.78 19975 1712.5 16.93 16.72	14.81 14.90 14.21 14.06 13.93 13.97 20175 1732.5 16.88 16.59	14.85 14.87 13.79 13.90 14.01 14.18 20375 1752.5 16.91 16.83	14.5 Tune-up	3 MPR
10 10 10 10 10 10 5 5 5	64QAM 64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK	1 25 25 25 50 nnel cy (MHz) 1 1 1 1 12	49 0 12 25 0 0 12 24 0	14.86 14.90 13.91 14.20 14.13 13.78 19975 1712.5 16.93 16.72 16.70 15.85	14.81 14.90 14.21 14.06 13.93 13.97 20175 1732.5 16.88 16.59 16.61 15.94	14.85 14.87 13.79 13.90 14.01 14.16 20375 1752.5 16.91 16.83 16.80 15.95	14.5 Tune-up limit (dBm)	3 MPR (dB)
10 10 10 10 10 10 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	1 25 25 25 50 nnel 59 (MHz) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	49 0 12 25 0 0 12 24 0 7	14.86 14.90 13.91 14.20 14.13 13.78 19975 1712.5 16.93 16.72 16.72 15.85 15.57	14.81 14.90 14.21 14.08 13.93 13.97 20175 1732.5 16.88 16.59 16.61 15.94	14.85 14.87 13.79 13.90 14.01 14.16 20375 1752.5 16.91 16.83 16.80 15.95 15.66	14.5 Tune-up limit (dBm)	3 MPR (dB)
10 10 10 10 10 10 5 5 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	1 25 25 25 50 nnnel 5y (MHz) 1 1 1 1 1 1 1 1 2 1 2 1 2 2 5 1	0 12 25 0 12 24 0 7 13 0 0 0	14.86 14.90 13.91 14.20 14.13 13.78 19975 1712.5 16.93 16.72 16.70 15.85 15.57 15.89	14.81 14.90 14.21 14.06 13.93 13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.60 15.94 15.96 16.12	14.85 14.87 13.79 13.90 14.01 14.16 20375 16.81 16.83 16.80 15.95 15.66 15.94 16.31	14.5 Tune-up smit (dBm) 17.5	3 MPR (dB) 0
10 10 10 10 10 10 5 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	1 25 25 25 50 nnnel sy (MHz) 1 1 1 1 1 2 12 12 25	49 0 12 25 0 0 12 24 0 7 13	14.86 14.90 13.91 14.20 14.13 13.78 19975 1712.5 16.93 16.72 16.72 15.85 15.57 15.89	14.81 14.90 14.21 14.08 13.93 13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.94	14.85 14.87 13.79 13.90 14.01 14.16 20375 16.83 16.80 15.95 15.96 15.94	Tune-up fmil (dBm)	3 MPR (dB)
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5	640AM 640AM	1 25 25 25 50 nnel sy (MHz) 1 1 1 1 2 12 25 11 1 1 1 1 1	49 0 12 25 0 0 12 24 0 7 13 0 0 12 24 24 24 24 24 24 24 24 24 24 24 24 24	14.86 14.90 13.91 14.20 14.13 13.78 19975 1712.5 16.93 16.72 16.93 15.85 15.57 15.89 15.75 16.05	14.81 14.90 14.21 14.06 13.93 13.97 20175 16.88 16.59 16.61 15.94 15.60 15.94 15.60 15.94 15.85 16.12	14.85 14.87 13.79 13.90 14.01 14.18 20375 16.81 16.83 16.80 15.94 15.94 15.74 16.31 16.00 15.81 14.82 14.88	14.5 Tune-up smit (dBm) 17.5	3 MPR (dB) 0
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	640AM 640AM 640AM 640AM 640AM 640AM Frequen OPSK OPSK OPSK OPSK OPSK OPSK OPSK OPSK	1 25 25 50 nnel cy (MHz) 1 1 1 1 1 1 2 1 2 2 5 1 1 1 1 1 1 1 1 1	49 0 12 25 0 12 24 0 7 13 0 0 12 24 0 7 13 0 0 0	14.86 14.90 13.91 14.20 14.13 13.78 16.72 16.72 16.72 15.85 15.57 15.85 15.57 15.85 14.88 14.88 14.88 14.88	14.81 14.90 14.21 14.06 13.93 13.97 20175 16.88 16.59 16.61 15.94 15.96 16.12 15.95 16.85 15.93 14.76 14.76 14.83	14.85 14.87 13.79 13.90 14.01 14.18 20375 16.91 16.83 16.80 15.95 15.94 15.74 16.31 16.00 15.81 14.88 14.87 14.89	14.5 Tune-up sinit (dBm) 17.5 16.5 16.5	3 MPR (dB) 0 1 1 2
10 10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5	640AM 640AM 640AM 640AM 640AM Cha Frequen OPSK OPSK OPSK OPSK OPSK OPSK OPSK OPSK	1 25 25 25 50 nnel 1 1 1 1 1 2 1 2 1 2 2 5 1 1 1 1 2 1 2 2 5 1 1 1 1	0 12 25 0 12 24 0 7 13 0 0 12 24 0 7 7 13 0 0 12 24 0 0 12 24 0 0 12 24 0 0 0 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14.86 14.90 13.91 14.20 14.13 13.78 19975 1712.5 16.72 16.70 15.85 15.57 15.89 16.16 16.16 14.98 14.88 14.88 14.83 14.88	14.81 14.90 14.21 14.06 13.93 13.97 20175 1732.5 16.69 16.61 15.60 15.94 15.85 16.12 15.85 15.01 14.96 14.96 14.98 14.98 14.98	14.85 14.87 13.79 13.90 14.01 14.18 20375 1752.5 16.83 16.80 15.94 15.94 15.74 16.31 16.00 15.94 14.88 14.88 14.88 14.88 14.88	14.5 Tune-up Emit (dBm) 17.5 16.5	3 MPR (dB) 0 1
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM	1 25 50 nnel 50 nnel 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	49 0 12 25 0 12 24 0 7 13 0 0 12 24 0 7 13 0 0 12 24 0 7 7 13 0 0 12 12 12 12 12 12 12 12 12 12 12 12 12	14.86 14.90 13.91 14.20 14.13 13.78 19975 1712.5 16.72 16.70 15.80 15.57 15.85 15.57 15.85 15.91 16.16 14.98 14.88 14.83 14.83 14.93 14.93 14.93	14.81 14.90 14.21 14.06 13.93 13.97 20175 16.88 16.59 16.81 15.94 15.94 15.96 15.94 15.96 15.93 15.93 14.96 14.83 14.98 14.98 14.99 14.38	14.85 14.87 13.79 13.90 14.01 14.16 20375 16.81 16.83 16.80 15.95 15.96 15.96 15.74 16.31 16.00 15.81 14.82 14.88 14.83 14.83 14.85 13.96	14.5 Tune-up sinit (dBm) 17.5 16.5 16.5	3 MPR (dB) 0 1 1 2
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM 64QAM 64QAM	1 25 25 25 50 hnel Ey (MHz) 1 1 1 1 2 12 12 12 12 12 12 12 12 12 12	0 12 24 0 13 0 0 12 24 0 0 12 24 0 0 12 24 0 0 12 24 0 0 15 0 0 15 0 0 0 15 0 0 0 15 0 0 0 0	14.86 14.90 13.91 14.20 14.13 13.78 19975 16.72 16.70 15.85 15.75 16.85 15.75 16.91 16.16 14.98 14.88 14.83 14.83 14.83 14.83 14.83 14.83 14.83 14.93 14.93 14.93 14.93 14.93	14.81 14.90 14.21 14.06 13.93 13.97 20175 16.88 16.59 16.61 15.94 15.96 16.12 15.96 16.12 15.85 15.93 14.96 14.96 14.98 14.98 14.98 14.98 14.98 14.99 14.38	14.85 14.87 13.79 13.90 14.01 14.16 20575 16.91 16.83 16.80 15.95 15.94 15.74 16.00 15.81 14.82 14.83 14.83 14.83 14.83 14.83 14.85 14.85 14.99 14.63 14.85 14.99	14.5 Tune-up emit (49m) 17.5 16.5 16.5 15.5	3 MPR (dB) 0 1 1 2 2 2 3
10 10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5	640AM	1	49 0 12 25 0 12 25 0 7 13 0 0 0 12 24 0 7 13 0 0 0 7 13 0 0 0 7 7 13 0 0 0 7 7 13 0 0 0 7 7 13 0	14.88 14.90 14.20 14.20 1975 16.93 16.72 15.85 16.75 15.89 14.89 16.89 1	14.81 14.90 14.21 14.02 11.393 13.97 20175 16.88 16.59 15.94 15.94 15.94 15.85 16.12 15.85 16.12 14.96 14.76 14.98 14.76 14.39 14.91	14.85 14.87 13.99 13.99 14.01 14.19 20376 16.91 16.80 15.95 15.94 16.31 16.31 14.82 14.82 14.82 14.83 16.83	14.5 Tune-up imit (dBm) 17.5 16.5 16.5 15.5	3 MPR (dB) 0 1 1 1 2 2 2
10 10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5	GGDAM GGDAM GGDAM GGDAM GGDAM Cha GGDAM Cha GGBAM GGBAM GGBAM GGBAM GGBAM GGBAM GGBAM GGDAM GGDA	1 1 25 25 25 25 25 26 26 26 26 26 26 26 26 26 26 26 26 26	0 12 25 0 0 12 24 0 7 7 13 0 0 12 24 0 7 7 13 0 0 0 8 8	14.88 14.90 14.20 14.20 19.21 16.72 16.72 16.72 16.72 16.72 16.72 16.72 16.72 16.72 16.72 16.72 16.83 14.89 16.89	14.80 14.20	14.85 14.87 13.99 14.00	14.5 Tune-up emit (49m) 17.5 16.5 16.5 15.5	3 MPR (dB) 0 1 1 2 2 3 3 MPR MPR
10 10 10 10 10 10 10 10 5 5 5 5 5 5 5 5	GGDAM	1 1 25 25 25 25 25 26 26 26 26 26 26 26 26 26 26 26 26 26	0 12 24 0 7 7 13 0 0 12 24 0 7 7 13 0 0 8 8 14 0 0 0	14.86 14.90 14.81 14.81 14.92 14.93 16.72 16.70	14.80 14.21 14.00 14.21 14.00 14.21 14.00 14.21 14.00 14.21 14.00 15.00 16.65 16.61 15.69 15.60 15.60 15.60 15.85 15.85 15.81 15.85 15.81 15.85 15.81 15.85 15.81 15.85 15.81 15.85 15.81 15.85 15.81 15.85	14.85 14.87 13.96 14.87 13.96 14.87 13.96 14.87 13.96 14.61	14.5 Tune-up ind (dbm) 17.5 16.5 15.5 15.5 17.5 17.5 17.5 17.5 17.5 17	3 MPR (dB) 0 1 1 2 2 2 3 MPR (dB) 0
10 10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5	GGDAM GGDAM GGDAM GGDAM GGDAM GGDAM GGDAM Cha GGDAM Cha GGDAM Cha GGDAM CPSK CPSK CPSK CPSK CPSK GPSK GPSK GPSK GPSK GPSK GPSK GPSK G	1 1 25 25 25 25 25 25 25 25 25 25 25 25 25	0 12 24 0 7 7 13 0 0 12 24 0 7 7 13 0 0 8 14	1488 1490 1490 1490 1490 1490 1490 1792 1792 1792 1670 1672 1670 1672 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1672 1670 1670 1670 1670 1670 1670 1670 1670	14.81 14.82 14.83	14.85 13.79 13.80 14.81 14.85 13.79 13.80 14.81	14.5 14.5 16.5 16.5 16.5 16.5 16.5 16.6 16.6 16	3 MPR (dB)
10 10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5	GGCAM	1 1 25 25 25 25 25 26 26 26 26 26 27 26 27 27 27 27 27 27 27 27 27 27 27 27 27	0 0 12 25 0 0 0 12 24 0 0 0 12 24 0 0 0 0 0 12 24 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14.86 14.90 14.20 14.20 17.25 16.70	14.81 14.80 14.20 14.20 14.20 15.20	14.85 13.76 14.10	14.5 Tune-up ind (dbm) 17.5 16.5 15.5 15.5 17.5 17.5 17.5 17.5 17.5 17	3 MPR (dB) 0 1 1 2 2 2 3 MPR (dB) 0
10 10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5	SECAM SECAM SECAM SECAM SECAM SECAM SECAM Character SECAM Character SECAM SECA	1 1 2 25 1 1 1 1 1 2 25 1 1 1 1 1 2 25 1 1 1 1	49 0 1 12 25 0 0 1 12 24 24 0 0 0 1 12 24 24 0 0 0 0 1 12 24 24 0 0 0 0 0 1 12 24 24 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14.88 (1.92) (1.	14.81 14.81 14.81 14.20 13.92 120 120 120 13.93 120 120 120 120 13.93 120 120 120 120 120 120 120 120 120 120	14.85 15.84	14.5 Ture-up finit (dBm) 17.5 16.5 16.5 15.5 15.5 17.5 14.5 17.5 16.5 17.5	3 MPR (dB) 0 1 1 2 2 MPR (dB) 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	SECAM	1 25 25 25 26 27 27 27 27 27 27 27 27 27 27 27 27 27	49 0 1 12 24 0 7 7 13 0 0 12 24 0 7 7 15 15 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14.80 13.91 14.91 13.91 14.92 13.91 14.20 14.13 16.21	14.81 14.81 14.01 13.97 13.97 17.72 17.72 18.81	14.87 13.79 14.87 13.79 14.87 13.79 14.87 14.87 14.87 14.87 15.84 15.84 15.84 15.84 15.84 15.84 15.84 15.84 15.84 15.84 15.84	14.5 Ture-up finit (dBm) 17.5 16.5 16.5 15.5 15.5 17.5 14.5 17.5 16.5 17.5	3 MPR (dB) 0 1 1 2 2 MPR (dB) 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	SECAM	1	490 0 112 25 0 0 112 24 0 0 7 7 13 13 0 0 12 24 1 0 0 0 1 12 24 1 0 0 0 0 1 12 1 1 1 1 1 1 1 1 1 1 1 1	14.89 14.89 14.89 14.89 14.89 14.89 14.89 14.89 14.89 16.89	14.8 90 14.2 11 14.8 90 14.2 11 14.0 10 13.9 97 20172 20172 10.8 80 16.5 91 16	14.87 13.79 14.87 15.84 14.80 15.84 14.80 15.84 14.80 15.84	14.5 Ture-up Isrid (GRB) (17.5 16.5 16.5 15.5 15.5 16.5 16.5 16.5 16	3 MPR (dB) 0 1 1 2 2 3 3 MPR (dB) 0 1 1 1 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1
100 100 100 100 100 100 100 100 100 100	GECAM	1 1 25 25 25 25 26 26 26 26 26 26 26 26 26 26 26 26 26	49 0 1 12 25 0 0 1 12 24 0 0 7 7 13 13 0 0 12 24 0 0 7 7 13 13 10 0 0 14 7 7 0 0 0 6 8 14 7 7 0 0 0 8 8 14 10 0 0 0 8 8 14 10 0 0 0 8 8 14 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14.89 14.89 16.72 16.73	14.89 14.21 14.89 14.21 14.00 13.99 20172 16.89 16.59 16.59 16.51 16.59 16.59 16.69	14.87 13.79 14.87 13.79 14.87 13.79 14.87 13.79 14.87 13.80 14.01 14.01 14.10	14.5 10.0 e.g. film (dBm) 17.5 16.5 16.5 15.5 15.5 14.5 10.6 film (dBm) 17.5 16.5 16.5	3 MPR (dB) 0 1 1 2 2 3 3 MPR (dB) 0 1 1 1 1 1 1 1
100 100 100 100 100 100 100 100 5 5 5 5	SECAM	1 1 25 25 25 26 26 27 26 27 27 27 27 27 27 27 27 27 27 27 27 27	49 0 1 12 25 0 0 1 12 24 0 0 7 7 13 0 0 0 12 24 0 0 0 0 12 24 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14.80 14.91	14.81 14.90 14.20 14.90	14.87 13.79 14.87 13.79 14.87 15.80 15.80 15.58 15.80 15.58 15.80 15.58 15.80 15.58 15.80 15.58 15.80	14.5 Ture-up Isrid (GRB) (17.5 16.5 16.5 15.5 15.5 16.5 16.5 16.5 16	3 MPR (dB) 0 1 1 2 2 3 3 MPR (dB) 0 1 1 1 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1
100 100 100 100 100 100 100 100 100 100	SECAM	1 1 25 25 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	49 0 12 25 0 0 12 24 0 0 0 12 24 0 0 0 0 12 24 14 15 0 0 0 0 0 12 15 16 16 16 16 16 16 16 16 16 16 16 16 16	14.89 14.91	14.89 14.21 14.00 13.97 17.22 16.89 16.99 16.91	14.87 13.79 14.87 13.79 14.87 13.90 14.07 14.07 14.07 15.00 16.01 16.01 16.01 16.01 16.01 16.01 16.01 16.01 16.01 16.01 16.01 16.00 16.01 16.00 16.01 16.00	14.5 Turn-up fant (505) 17.5 16.5 16.5 15.5 16.5	3 MPR (db) 0 1 1 2 2 3 3 MPR 2 2 3 3
100 100 100 100 100 100 100 100 100 100	SECOMI SE	1 1 25 25 25 25 25 25 25 25 25 25 25 25 25	49 0 12 25 0 0 12 24 0 0 12 24 0 0 0 12 24 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14.80 13.91 14.91 13.91 14.20 14.13 14.13 14.21 14.21 16.72 16.72 16.73 16.72 16.73 16.73 16.74 16.75 16.76 16.76 16.76 16.76 16.77 16.76 16.77 16.76 16.77 16.76 16.77 16.76 16.77 16.76 16.77 16.76 16.77 16.76 16.77 16.76 16.77 16.76 16.77 16.76 16.77 16.76 16.77 16.76	14.89 14.21 14.00 13.97 1072 1088 1089 1089 1089 1089 1089 1089 1089	14.87 13.90 15.84 14.87 15.81	14.5 Turn-up land (Olin) 17.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5	3 MPR (dB) 0 1 1 1 2 2 2 3 3 MPR (dB) 0 2 1 1 2 2 2 3 3 MPR (dB) 0 1 1 1 2 2 2 3 3 MPR (dB) 0 1 1 1 2 2 2 3 3 MPR (dB) 0 1 1 1 2 2 3 3 3 MPR (dB) 0 1 1 1 1 2 2 3 3 3 MPR (dB) 0 1 1 1 1 2 2 3 3 3 MPR (dB) 0 1 1 1 1 2 2 3 3 3 MPR (dB) 0 1 1 1 1 1 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3
100 100 100 100 100 100 100 100 100 100	SECAM	1 1 25 25 25 25 25 25 25 25 25 25 25 25 25	49 0 1 12 25 0 0 1 12 24 0 0 7 7 13 0 0 0 8 14 14 0 0 0 8 14 7 7 0 0 0 8 14 14 0 0 0 8 14 7 7 0 0 0 8 14 14 0 0 0 0 8 14 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14.80 (1.57) (1.	14.81 14.90 14.20 14.90	14.87 13.79 14.87 13.79 14.87 13.79 14.87 13.79 14.87 13.80 15.50	14.5 Tune-up Isrid (GER) 17.5 16.5 16.5 15.5 15.5 16.5 16.5 16.5 16	3 MPR (dB) 0 1 1 2 2 3 3 MPR (dB) 1 1 2 2 3 3 MPR (dB) 1 1 1 2 2 3 3 MPR (dB) 1 1 1 2 2 3 3 MPR (dB) 1 1 1 1 2 2 3 3 MPR (dB) 1 1 1 1 1 2 2 3 3 MPR (dB) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
10 10 10 10 10 10 10 10 10 10 10 10 10 1	660AM 660AM 670AM	1 1 25 25 25 26 26 27 27 27 27 27 27 27 27 27 27 27 27 27	49 0 1 12 25 0 0 1 12 24 0 0 7 7 13 13 0 0 12 24 0 0 7 7 13 13 10 0 12 24 10 10 10 10 10 10 10 10 10 10 10 10 10	14.80 14.91	14.89 14.21 14.89 14.21 14.00 13.99 20172.5 16.80 15.91 15.9	14.87 13.79 13.79 14.87 13.79 14.87 13.90 14.01 14.01 13.90 14.01 14.01 15.00	14.5 Turn-up fant (505) 17.5 16.5 16.5 15.5 16.5	3 MPR (dB) 0 1 1 2 2 3 3 MPR R 1 2 2 3 3 MPR R 1 3 3 MPR R 1 2 2 3 3 MPR R 1 3
10 10 10 10 10 10 10 10 10 5 5 5 5 5 5 5	660AM 660AM 760AM	1	49 0 12 25 0 0 12 24 0 7 7 13 0 0 12 24 1 0 0 7 7 13 0 0 14 7 7 0 0 1 14 1 0 0 1 14 1 0 0 1 14 1 0 0 1 1 1 1	14.80 13.91 14.95 14.99 14.95 16.96	14.8 19 14.8 1	14.87 13.79 14.87 13.79 14.87 13.79 14.07 14.07 14.10 15.81	14.5 Tune-up Isrid (GER) 17.5 16.5 16.5 15.5 15.5 16.5 16.5 16.5 16	3 MPR (dB) 0 1 1 2 2 3 3 MPR (dB) 1 1 2 2 3 3 MPR (dB) 1 1 1 2 2 3 3 MPR (dB) 1 1 1 2 2 3 3 MPR (dB) 1 1 1 1 2 2 3 3 MPR (dB) 1 1 1 1 2 2 3 3 MPR (dB) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
10 10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5	660AM 660AM 76 PROJECT OF SECOND 660AM 660	1	49 0 12 25 0 0 12 24 0 7 7 13 0 0 12 24 1 0 0 7 7 13 0 0 14 7 7 0 0 14 1 7 7 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	14.80 13.91 14.91 13.91 14.20 14.13 14.20 14.13 14.13 14.20 14.13 16.93	14.89 14.21 14.80 14.21 14.00 13.93 13.93 12.17 16.80 16.91	14.87 13.79 14.87 13.79 14.87 13.79 14.87 13.80 14.01 13.90 14.01 15.91 16.91	14.5 Ture-up land (dilan) 17.5 16.5 16.5 15.5 14.5 16.5 16.5 16.5 16.5 17.5 16.5 17.5 17.5 17.5 17.5	3 MPR (db) 0 1 1 2 2 3 3 MPR (db) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
10 10 10 10 10 10 10 10 10 10 10 10 10 1	660AM 660AM 760AM	1 1 2 25 25 26 26 27 27 28 27 28 28 28 28 28 28 28 28 28 28 28 28 28	49 0 12 25 0 0 12 24 0 0 7 7 13 0 0 12 24 1 0 0 0 1 12 24 1 0 0 0 1 12 24 1 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1	14.80 14.91	14.89 14.21 14.89 14.21 14.00 13.99 20172 16.89 16.99 16.91 16.91 16.90 16.91	14.87 13.79 14.87 13.79 14.87 13.79 14.87 13.80 14.01 14.01 15.91 16.91 16.93 16.90 16.91 16.91 16.93 16.90 16.91	14.5 Ture-up land (dilan) 17.5 16.5 16.5 15.5 14.5 16.5 16.5 16.5 16.5 17.5 16.5 17.5 17.5 17.5 17.5	3 MPR (db) 0 1 1 2 2 3 3 MPR (db) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
10 10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5	660AM 660AM 670AM	1 1 25 25 25 25 26 26 27 26 27 27 27 27 27 27 27 27 27 27 27 27 27	49 0 12 25 0 0 12 24 0 0 7 7 13 0 0 12 24 1 0 0 0 1 12 24 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	14.80 13.91 14.91 13.91 14.91 14.91 14.92 14.13 14.13 14.13 14.13 16.93	14.89 14.21 14.89 14.21 14.00 13.99 13.99 15.91 16.80 16.91	14.87 13.79 14.87 13.79 14.87 13.79 14.87 13.80 14.01 14.01 15.90 16.91	14.5 Turn-up Isnit (SEE) (SEE	3 MPR (db) 0 1 1 2 2 3 3 MPR (db) 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
10 10 10 10 10 10 10 10 10 10 10 5 5 5 5	SECAM	1 1 25 25 25 25 26 26 27 26 27 27 27 27 27 27 27 27 27 27 27 27 27	49 0 12 25 0 0 12 24 0 0 7 7 13 0 0 12 24 1 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	14.80 14.81 14.82 14.82 14.83 16.83	14.89 14.21 14.89 14.21 14.00 13.99 13.99 14.21 16.89 16.89 16.59	14.87 13.99 14.87 15.86	14.5 Turne-up family 17.5 16.5 16.5 15.5 15.5 15.5 16.5 16.5 16.5 16.5 17.5 16.5 17.5 16.5	3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0 1 1 2 2 3 3 MPR (dB) 0 0 1 1 1 2 2 3 3 MPR (dB) 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
10 10 10 10 10 10 10 10 10 10 10 10 10 1	SECAM	1	49 0 12 25 0 0 12 24 0 0 12 24 0 0 12 24 0 0 12 24 0 0 0 12 24 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14.80 13.91 14.90 13.91 14.20 14.73 14.73 14.73 16.73 16.72 16.76	14.81 14.81 14.81 14.81 14.00 13.93 13.93 16.88 16.81 16.89 16.81	14.87 13.79 14.87 13.79 14.87 13.79 14.87 13.90 14.01 14.01 13.90 14.01 14.01 15.00	14.5 Turn-up Isnit (SEE) (SEE	3 MPR (db) 0 1 1 2 2 3 3 MPR (db) 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

				(2600MH Part 27 or Off / Ex				
BW [MHz]	Modulation Cha	RB Size	RB Offset	Power Low Ch. / Freq. 20850	Power Middle Ch. / Freq. 21100	Power High Ch. / Freq. 21350	Tune-up limit (dBm)	MPR (dB)
	Frequen	cy (MHz)		2510	2535	2560		
20	QPSK		0		19.61	19.48		
20	QPSK	1	49	19.42	19.32	19.47	20.5	0
20 20	QPSK QPSK	1 50	99 0	19.21	19.41	19.46 18.90		
20	QPSK	50	24	19.02	18.91	18.93		
20	QPSK	50	50	18.94	18.89	18.86	19.5	1
20	QPSK	100	0	18.99	19.04	18.86		
20	16QAM	1	0	19.12	19.10	18.97		
20 20	16QAM 16QAM	1 1	49 99	19.08 19.00	18.82 19.26	18.85 18.84	19.5	1
20	16QAM	50	99	18.17	17.89	17.90		
20	16QAM	50	24	18.29	17.81	17.86		
20	16QAM	50	50	18.21	17.95	17.89	18.5	2
20	16QAM	100	0	18.12	17.91	17.88		
20 20	64QAM 64QAM	1	0 49	18.23 18.21	18.22 17.81	17.79 17.77	18.5	2
20	64QAM	1	99	18.12	18.12	17.77	18.5	2
20	64QAM	50	0	17.16	16.89	16.90		
20	64QAM	50	24	17.29	16.80	16.86	17.5	3
20	64QAM	50	50	17.22	16.95	16.89	17.5	3
20	64QAM	100	0	17.23	16.91	16.89	Tune-up	
	Cha			20825	21100	21375	limit	MPR (dB)
15	Frequen	cy (MHz)	0	2507.5 19.39	2535 19.40	2562.5 19.24	(dBm)	(dB)
15	QPSK QPSK	1	0 37	19.39	19.40	19.24	20.5	0
15	QPSK	1	74	18.99	19.10	19.28	20.0	
15	QPSK	36	0	18.66	18.87	18.62		
15	QPSK	36	20	18.91	18.83	18.81	19.5	1
15	QPSK	36	39	18.81	18.71	18.61	19.0	
15	QPSK	75	0	18.82	18.82	18.75		
15 15	16QAM 16QAM	1	0 37	19.02 18.88	18.93 18.67	18.66 18.62	19.5	1
15	16QAM	1	74	18.85	19.03	18.73	19.5	1
15	16QAM	36	0	17.89	17.74	17.82		
15	16QAM	36	20	18.05	17.69	17.73	18.5	2
15	16QAM	36	39	17.96	17.72	17.81	18.5	2
15	16QAM	75	0	17.93	17.60	17.69		
15	64QAM	1	0	18.00	18.11	17.99		
15 15	64QAM 64QAM	1	37 74	17.94	17.74	17.85	18.5	2
15	64QAM	36	0	18.04 16.92	17.88 16.58	17.65 16.69		
15	64QAM	36	20	16.85	16.50	16.76		
15	64QAM	36	39	16.92	16.70	16.65	17.5	3
15	64QAM	75	0	16.99	16.64	16.61		
	Cha	nnel		20800	21100	21400	Tune-up limit (dBm)	MPR
	Frequen	cy (MHz)		2505	2535	2565	(dBm)	(dB)
10	QPSK	1 1	0 25	19.33	19.45	19.19	20.5	0
10	QPSK	1	49	19.20	19.12	19.38	20.0	
10	QPSK	25	0	18.69	18.79	18.80		
10	QPSK	25	12	18.75	18.68	18.75	19.5	1
10	QPSK	25	25	18.82	18.66	18.74		
10	QPSK 16QAM	50	0	18.71	18.97	18.73		
10	16QAM 16QAM	1	25	18.84	18.86	18.74	19.5	1
10	16QAM	1	49	18.92	19.07	18.62		
10	16QAM	25	0	17.56	17.62	17.63		
10	16QAM	25	12	17.61	17.68	17.67	18.5	2
10 10	16QAM 16QAM	25 50	25 0	17.97	17.68	17.75		
10	16QAM 64QAM	50 1	0	17.82 18.12	17.77	17.73 18.05		
10	64QAM	1	25	17.90	18.10	17.65	18.5	2
		1	49	17.93	18.02	17.68		
10	64QAM							
10 10	64QAM	25	0	16.55	16.65	16.70		
10 10 10	64QAM 64QAM	25 25	12	16.68	16.65 16.56	16.59	17.5	3
10 10 10	64QAM 64QAM 64QAM	25 25 25	12 25	16.68 16.61	16.65 16.56 16.77	16.59 16.59	17.5	3
10 10 10	64QAM 64QAM	25 25 25 50	12	16.68	16.65 16.56	16.59 16.59	17.5 Tune-up	
10 10 10	64QAM 64QAM 64QAM 64QAM Cha	nnel	12 25	16.68 16.61 16.46 20775	16.65 16.56 16.77 16.71 21100	16.59 16.59 16.65 21425		
10 10 10	64QAM 64QAM 64QAM 64QAM Cha	25 25 25 50 nnel cy (MHz)	12 25	16.68 16.61 16.46	16.65 16.56 16.77 16.71	16.59 16.59		3 MPR (dB)
10 10 10 10 10	64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK	nnel cy (MHz)	12 25 0	16.68 16.61 16.46 20775 2502.5	16.65 16.56 16.77 16.71 21100 2535	16.59 16.59 16.65 21425 2567.5		
10 10 10 10 10 5 5	64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK	nnel cy (MHz) 1 1	12 25 0 0 12 24	16.68 16.61 16.46 20775 2502.5 19.31 19.31 18.97	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15	16.59 16.59 18.65 21425 2567.5 19.41 19.32 19.29	Tune-up limit (dBm)	MPR (dB)
10 10 10 10 10 10	64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 1	12 25 0 0 12 24 0	16.68 16.61 16.46 20775 2502.5 19.31 19.31 18.97 18.51	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15	16.59 16.59 16.65 21425 2567.5 19.41 19.32 19.29 18.66	Tune-up limit (dBm)	MPR (dB)
10 10 10 10 10 10 5 5 5 5	64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 25 0 0 12 24 0 7	16.68 16.61 16.46 20775 2502.5 19.31 19.31 18.97 18.51 18.93	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.82 18.63	16.59 16.59 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68	Tune-up limit (dBm)	MPR (dB)
10 10 10 10 10 10 5 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 1 1 12 12 12	12 25 0 0 12 24 0 7	16.68 16.61 16.46 20775 2502.5 19.31 19.31 18.97 18.51 18.93 18.66	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.82 18.63 18.65	16.59 16.59 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68	Tune-up limit (dBm)	MPR (dB)
10 10 10 10 10 10 5 5 5 5	64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 25 0 0 12 24 0 7	16.68 16.61 16.46 20775 2502.5 19.31 19.31 18.97 18.51 18.93	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.82 18.63	16.59 16.59 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68	Tune-up limit (dBm)	MPR (dB)
10 10 10 10 10 10 5 5 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM Cha Prequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 1 12 12 12 25	12 25 0 0 12 24 0 7 13	16.68 16.61 16.46 20775 2502.5 19.31 19.31 18.97 18.51 18.93 18.66 18.86	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.82 18.63 18.65 18.93	16.59 16.59 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68 18.64	Tune-up limit (dBm)	MPR (dB)
10 10 10 10 10 10 5 5 5 5 5 5 5 5	640AM 640AM 640AM 640AM 640AM Cha Frequen 0PSK 0PSK 0PSK 0PSK 0PSK 0PSK 0PSK 160AM 160AM	nnel cy (MHz) 1 1 1 12 12 12 11 11 11 11	12 25 0 12 24 0 7 13 0 0 12 24	16.68 16.61 16.46 20775 2502.5 19.31 18.97 18.51 18.93 18.66 18.86 18.87 18.90	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.82 18.63 18.65 18.93 18.93	16.59 16.59 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68 18.64 18.57 18.87 18.87	Tune-up limit (dBm) 20.5	MPR (dB)
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	640AM 640AM 640AM 640AM 640AM Cha Prequen- 0PSK 0PSK 0PSK 0PSK 0PSK 0PSK 0PSK 160AM 160AM 160AM	nnel cy (MHz) 1 1 1 12 12 12 14 10 12 12 12 12 12 12 11 11 11	12 25 0 12 24 0 7 13 0 0 12 24	16.68 16.61 16.46 20775 2502.5 19.31 18.97 18.51 18.93 18.66 18.86 18.87 18.90 18.93	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.63 18.65 18.93 18.93 18.56 18.96 17.64	16.59 16.59 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68 18.64 18.57 18.87 18.87	Tune-up limit (dBm) 20.5	MPR (dB)
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 12 12 12 11 12 12 12	12 25 0 12 24 0 7 13 0 0 12 24 0 7 7 7	16.68 16.61 16.46 20775 2502.5 19.31 19.31 18.97 18.51 18.96 18.86 18.87 18.90 18.93 18.10	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.82 18.63 18.63 18.93 18.93 18.93 18.96 17.64	16.59 16.55 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68 18.64 18.57 18.87 18.65 18.71 17.69	Tune-up limit (dBm) 20.5	MPR (dB)
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM Cha Frequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 12 12 12 14 10 12 12 12 12 12 12 11 11 11	12 25 0 12 24 0 7 13 0 0 12 24 0 7	16.68 16.61 16.46 20775 2502.5 19.31 19.31 18.97 18.93 18.66 18.86 18.87 18.90 18.93 18.10 18.90	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.63 18.65 18.93 18.56 18.93 18.56 18.96 17.64 17.64	16.59 16.65 16.65 21525 2567.5 19.41 19.32 19.29 18.66 18.68 18.64 18.57 18.65 18.71 17.69 17.70 17.65	Tune-up limit (dbm) 20.5	MPR (dB) 0 1
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM	nnel cy (MHz) 1 1 1 12 12 12 11 12 12 12	12 25 0 12 24 0 7 13 0 0 12 24 0 7 7 13 0	16.68 16.61 16.46 20775 2502.5 19.31 19.31 18.97 18.51 18.93 18.66 18.86 18.87 18.90 18.93 18.10	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.82 18.63 18.93 18.93 18.93 18.76 18.94 18.96 17.64 17.60	16.59 16.65 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68 18.64 18.57 18.87 18.87 17.69 17.70 17.85	Tune-up limit (dbm) 20.5	MPR (dB) 0 1
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	84QAM 64QAM 64QAM Cha 64QAM Cha Prequen QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 12 12 12 14 1 12 12 15 1 1 1 1 1 1 1 1 1 1	12 25 0 12 24 0 7 13 0 0 12 24 0 7 7 13 0 0	16.68 16.61 16.46 20775 2502.5 19.31 19.31 18.97 18.51 18.93 18.66 18.86 18.87 18.90 18.90 18.00 17.98	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.82 18.63 18.93 18.93 18.93 18.96 17.64 17.60 17.74	16.59 16.55 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68 18.68 18.67 18.87 18.70 17.70 17.65 17.79 17.65	Tune-up limit (dBm) 20.5 19.5	MPR (dB) 0 1 1 2
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	840AM 640AM 640AM Cha Frequen OPSK OPSK OPSK OPSK OPSK OPSK OPSK 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM	nnel cy (MHz) 1 1 1 12 12 12 11 12 12 12	12 25 0 12 24 0 7 13 0 0 12 24 0 7 7 13 0	16.68 16.61 16.46 20775 2502.5 19.31 18.97 18.51 18.93 18.66 18.86 18.87 18.93 18.10 18.93 18.10 18.01 17.96	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.82 18.63 18.93 18.93 18.93 18.76 18.94 18.96 17.64 17.60	16.59 16.65 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68 18.64 18.57 18.87 18.87 17.69 17.70 17.85	Tune-up limit (dbm) 20.5	MPR (dB) 0 1
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	840AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM 640AM	nnel ey (MHz) 1 1 1 12 12 25 1 1 12 25 1 1 12 12	12 25 0 12 24 0 7 13 0 0 12 24 0 7 13 0 0 12 24 0 0 12 12 13 0 0 0 14 15 16 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	16.68 16.61 16.46 20775 2502.5 19.31 18.97 18.51 18.93 18.66 18.86 18.87 18.90 18.93 18.10 18.00 17.96 17.96 17.96 17.96	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.63 18.93 18.93 18.93 18.95 17.64 17.64 17.64 17.63 17.74 17.63 17.66 17.66 17.66 17.84	16.59 16.55 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.64 18.57 18.87 18.67 17.69 17.70 17.65 17.79 17.65	Tune-up limit (dBm) 20.5 19.5	MPR (dB) 0 1 1 2
10 10 10 10 10 10 5 5 5 5 5 5 5 5 5 5 5	840AM 640AM 640AM Cha Frequen OPSK OPSK OPSK OPSK OPSK OPSK OPSK 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM	nnel cy (MHz) 1 1 12 12 12 12 12 12 12 11 1	12 25 0 12 24 0 7 13 0 0 0 7 13 0 0 0 7 12 24 0 0 7 13 0 0 0 12 24 0 0 0 12 24 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16.68 16.61 16.46 20775 2502.5 19.31 18.97 18.51 18.93 18.66 18.86 18.87 18.93 18.10 18.00 17.96 18.01	16.65 16.56 16.77 16.71 21100 2535 19.33 19.22 19.15 18.63 18.65 18.93 18.93 18.93 18.76 17.64 17.60 17.74 17.63 17.98 17.68	16.59 16.55 16.65 21425 2567.5 19.41 19.32 19.29 18.66 18.68 18.67 18.87 18.87 18.87 17.69 17.70 17.65 17.79 17.62 17.53 17.58	Tune-up limit (dBm) 20.5 19.5	MPR (dB) 0 1 1 2

			Receive	Band 66 or Off / Ex	tremity			
BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit	MPR
	Cha Frequen	cy (MHz)		132072 1720	132322 1745	132572 1770	(dBm)	(dB)
20 20 20	QPSK QPSK QPSK	1 1	0 49 99	17.09 16.69 16.79	17.19 16.89 16.73	17.13 16.78 16.80	17.5	0
20 20 20	QPSK QPSK	50 50	0 24	15.71	15.86 15.48	15.62 15.67		
20 20	QPSK QPSK	50 100	50 0	15.45 15.45	15.85 15.59	15.74 15.52	16.5	1
20 20 20	16QAM 16QAM 16QAM	1 1	0 49 99	15.41 15.46 15.52	15.63 15.18 15.55	15.42 15.42 15.46	16.5	1
20 20	16QAM 16QAM	50	0 24	14.65	14.68	14.92		
20 20	16QAM 16QAM	50 100	50 0	14.77 14.74	14.78 14.79	14.82 14.84	15.5	2
20 20 20	64QAM 64QAM 64QAM	1 1	0 49 99	15.12	14.90 15.05	15.24 15.25 14.84	15.5	2
20	64QAM 64QAM	50	0 24	15.14 14.06 14.29	15.24 14.17 14.24	14.13		
20 20	64QAM 64QAM	50 100	50 0	14.27 14.38	14.19 14.23	14.42 14.21	14.5	3
	Cha Frequen	cy (MHz)		132047 1717.5	132322 1745	132597 1772.5	Tune-up limit (dBm)	MPR (dB)
15 15 15	QPSK QPSK QPSK	1 1	0 37 74	16.77 16.52 16.47	16.68 16.56 16.43	16.86 16.65	17.5	0
15 15	QPSK QPSK	36 36	0 20	15.45 15.46	15.50 15.22	15.33 15.41	16.5	1
15 15	QPSK QPSK 16QAM	36 75 1	39 0	15.27 15.23 15.08	15.52 15.23 15.44	15.41 15.21 15.22		,
15 15	16QAM 16QAM	1	37 74	15.26 15.30	15.54	15.24	16.5	1
15 15	16QAM 16QAM	36 36	20	14.44 14.55	14.47 14.34	14.69 14.30	15.5	2
15 15	16QAM 16QAM 64QAM	36 75	39 0	14.53 14.37 14.96	14.61 14.51 14.66	14.68 14.59 15.01		
15 15	64QAM 64QAM	1	37 74	14.96	14.82 14.98	15.01 14.56	15.5	2
15 15	64QAM 64QAM	36 36	0 20	13.76 14.16	14.01	13.79	14.5	3
15 15	64QAM 64QAM Cha	36 75	39 0	13.97 14.04 132022	13.97 13.96 132322	14.06 13.89 132622	Tune-up	
10	Frequen		0	132022 1715 16.80	132322 1745 16.95	132622 1775 16.79	limit (dBm)	MPR (dB)
10 10	QPSK QPSK	1	25 49	16.53 16.57	16.55 16.59	16.61 16.48	17.5	0
10 10	QPSK QPSK QPSK	25 25 25	0 12	15.43 15.42	15.60 15.23	15.44 15.51	16.5	1
10 10 10	QPSK QPSK 16QAM	25 50 1	25 0 0	15.25 15.09 15.23	15.69 15.32 15.42	15.38 15.21 15.27		
10	16QAM 16QAM	1 1	25 49	15.33 15.34	15.15	15.14	16.5	1
10	16QAM 16QAM 16QAM	25 25 25	0 12 25	14.29	14.49	14.76	15.5	2
10 10 10	16QAM 16QAM 64QAM	50 1	25 0 0	14.61 14.55 14.98	14.53 14.48 14.57	14.56 14.48 14.94		
10	64QAM 64QAM	1	25 49	14.88	14.88 14.99	15.01 14.64	15.5	2
10	64QAM 64QAM	25 25 25	0 12 25	13.75	14.00	13.95	14.5	3
10	64QAM 64QAM Cha	50	0	13.96 14.17 131997	13.90 14.01 132322	14.18 13.93 132647	Tune-up	MPR
5	Frequen	cy (MHz)	0	1712.5 16.72	1745 16.60	1777.5 16.56	limit (dBm)	(dB)
5 5	QPSK QPSK	1	12 24	16.49 16.43	16.58 16.46	16.48 16.27	17.5	0
5 5	QPSK QPSK	12 12 12	0 7 13	15.43 15.33 15.19	15.58 15.25 15.48	15.25 15.42 15.43	16.5	1
5	QPSK	25	0	15.03	15.29	15.22		
	16QAM	1		15.05	15.37			
5 5	16QAM 16QAM 16QAM	1	12 24	15.09 15.25	15.25 15.27	15.22 15.13	16.5	1
5 5 5	16QAM 16QAM 16QAM 16QAM 16QAM	1 1 12 12	12 24 0 7	15.09 15.25 14.45 14.29	15.25 15.27 14.47 14.40	15.13 14.49 14.40	16.5	2
5	16QAM 16QAM 16QAM 16QAM	1 1 12	12 24 0	15.09 15.25 14.45	15.25 15.27 14.47	15.13 14.49 14.40 14.52 14.51 14.94	15.5	
5 5 5 5 5 5 5	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM 64QAM	1 1 12 12 12 12 25 1 1	12 24 0 7 13 0 0 12 24	15.09 15.25 14.45 14.29 14.49 14.49 14.79 14.90	15.25 15.27 14.47 14.40 14.51 14.45 14.56 14.70	15.13 14.49 14.40 14.52 14.51 14.94 15.03 14.55		
5 5 5 5 5 5 5 5 5	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM 64QAM 64QAM 64QAM	1 1 12 12 12 12 25 1 1 1 1 12	12 24 0 7 13 0 0 12 24 0 7	15.09 15.25 14.45 14.29 14.49 14.79 14.79 14.77 13.77	15.25 15.27 14.47 14.40 14.51 14.45 14.56 14.70 14.86 13.75	15.13 14.49 14.40 14.52 14.51 14.94 15.03 14.55 13.76	15.5	2
5 5 5 5 5 5 5 5	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 13 0 0 12 24	15.09 15.25 14.45 14.29 14.49 14.79 14.79 14.90 14.77	15.25 15.27 14.47 14.40 14.51 14.45 14.58 14.70 14.86 13.75	15.13 14.49 14.40 14.52 14.51 14.94 15.03 14.55 13.76 14.01 14.14 13.84	15.5	2 2 3
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM 64QAM	1 1 1 12 12 12 12 15 1 1 1 1 1 1 1 1 1 1	12 24 0 7 13 0 0 0 12 24 0 7 13 0	15.09 15.25 14.45 14.29 14.49 14.79 14.90 14.77 13.77 14.07 13.98 14.15 131987 1711.5	15.25 15.27 14.47 14.40 14.51 14.45 14.70 14.86 13.75 13.96 13.94 13.94 13.222 17.45	15.13 14.49 14.40 14.52 14.51 14.94 15.03 14.55 13.76 14.01 14.14 13.84 132657 1778.5	15.5 15.5 14.5 Tune-up limit (dBm)	2 2 3 MPR (dB)
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 13 0 0 12 24 0 7 13 0	15.09 15.25 14.45 14.29 14.49 14.79 14.90 14.77 13.77 14.07 13.98 14.15 131997 1711.5 16.80 16.33 16.41	15.25 15.27 14.47 14.40 14.51 14.56 14.76 14.76 13.75 13.98 13.94 13.90 132322 1745 16.78 16.51	15.13 14.49 14.40 14.52 14.51 14.94 15.03 14.55 13.76 14.01 14.14 13.84 132657 1778.5 16.80 16.47 16.39	15.5 15.5 14.5 Tune-up limit	2 2 3
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM	1 1 1 1 1 1 2 1 2 2 5 1 1 1 1 1 2 1 2 1	12 24 0 7 13 0 0 12 24 0 7 13 0 0 7 13 0 0 7 13 0 0 7 7 13 0 0 7 7 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 15.25 14.45 14.29 14.49 14.79 14.77 13.77 14.77 13.98 14.15 131987 1711.5 16.80 16.33 16.41 15.35 15.24	15.25 15.27 14.47 14.40 14.51 14.45 14.76 14.76 13.75 13.94 13.90 132322 1745 16.78 16.51 16.35 15.50 15.18	15.13 14.49 14.49 14.52 14.51 14.94 15.03 14.55 13.76 14.01 14.14 13.84 132867 1778.5 16.80 16.47 16.39 15.27 15.27	15.5 15.5 14.5 Tune-up limit (dBm)	2 2 3 MPR (dB)
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	160AM 160AM 160AM 160AM 160AM 160AM 160AM 640AM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 13 0 0 12 24 0 7 7 13 0 0 0 8 14 0 0 4 7 7 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 15.26 14.45 14.49 14.49 14.79 14.90 14.77 13.77 14.07 13.98 14.15 131987 1711.5 16.33 16.41 15.35 15.24 15.15	15.25 15.27 14.47 14.40 14.51 14.45 14.56 14.70 14.86 13.75 13.98 13.94 13.94 13.94 13.92 17.45 16.78 16.78 16.51 16.35 15.51 15.18	15.13 14.49 14.40 14.52 14.51 14.94 15.03 14.55 13.76 14.01 14.14 13.84 13.85 16.60 16.47 16.39 15.27 15.40 15.27	15.5 15.5 14.5 Tune-up limit (dBm) 17.5	2 2 3 MPR (dB) 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	160AM 160AM 160AM 160AM 160AM 160AM 160AM 640AM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 13 0 0 12 24 0 0 7 13 0 0 8 14 4 7 7 0 0 8 14 4 14	15.09 15.25 14.45 14.49 14.49 14.79 14.90 14.77 13.77 14.07 13.98 14.15 13.997 17.11.5 16.80 16.33 16.41 15.35 15.24 15.15 15.06 15.07 15.24	15.25 15.27 14.47 14.40 14.51 14.45 14.56 14.70 14.86 13.75 13.98 13.90 132322 13.90 15.18 16.51 16.51 16.55 15.18 15.38 15.38 15.38 15.38 15.38	15.13 14.49 14.40 14.52 14.51 14.94 15.03 14.55 13.76 14.01 14.14 13.84 14.01 14.14 13.86 16.47 16.39 15.27 15.27 15.27 15.27 15.27 15.26 15.25 15.25 15.25 15.25 15.25 15.25 15.25 15.25 15.25 15.25 15.25 15.25 15.25 15.25	15.5 15.5 14.5 Tune-up limit (dBm)	2 2 3 MPR (dB) 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	160AM 160AM 160AM 160AM 160AM 160AM 160AM 160AM 640AM	1 1 1 1 1 1 2 1 2 2 5 1 1 1 1 1 2 1 2 2 5 1 1 1 1	12 24 0 7 13 0 0 12 24 0 7 13 0 0 0 7 13 0 0 7 13 0 0 7 13 0 0 7 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 15.25 14.45 14.49 14.49 14.79 14.90 14.77 13.77 14.07 13.98 14.15 131997 1711.5 16.80 16.33 16.41 15.35 15.24 15.15 15.07 15.24 15.17 15.24 15.17 15.24 15.17 16.33 16.41 17.24 17.2	15.25 15.27 14.47 14.40 14.51 14.46 14.56 14.76 13.76 13.98 13.94 13.90 13.93 13.94 13.94 13.95 16.51 16.35 15.18 15.18 15.35 15.55 15.58 15.36	15.13 14.49 14.40 14.52 14.51 14.94 15.03 14.55 13.76 14.01 14.14 13.84 13.84 13.85 16.60 16.47 16.39 15.27	15.5 15.5 14.5 Tune-up limit (dBm) 17.5	2 2 3 MPR (dB) 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	160AM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 7 13 0 0 0 12 24 0 7 13 3 0 0 7 13 0 0 7 13 0 0 0 7 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 15.25 15.20 14.49 14.49 14.49 14.79 13.77 13.77 13.19 14.77 13.19 15.15 15.15 15.24 15.25	15.25 15.27 14.47 14.40 14.51 14.51 14.52 14.70 14.86 13.75 13.98 13.98 13.99 13.90 13.745 16.78 16.78 16.78 16.50 15.50 15.35 15.35 15.35 15.35 15.35 15.35 15.36	15.13 14.49 14.40 14.52 14.51 14.94 15.03 14.55 13.76 14.01 14.14 13.84 13.84 13.85 16.60 16.47 16.39 15.27 15.25 15.25 15.25 15.27 15.25 15.25 15.27 14.51 14.51 14.50 14.51 14.50 14.51 14.50 14.51	15.5 14.5 Tune-up limit (dBm) 17.5 16.5 18.5	2 2 3 MPR (dB) 0 1 1 2
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	HEOAM HOOM HEOAM H	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 13 0 0 12 24 0 7 7 13 0 0 0 0 7 7 13 0 0 0 7 7 7 7 7 0 0 0 0 0 0 0 0 0 0 0	15.09 15.25 14.45 14.49 14.49 14.79 14.77 13.77 13.98 14.15 131997 1711.5 16.80 16.33 16.41 15.35 15.24 15.15 15.06 15.06 15.07 15.24 15.12 14.32 14.42 14.43 14.43 14.44 14.44 14.45	15.25 15.27 15.27 14.47 14.40 14.51 14.45 14.51 14.45 14.51 14.45 13.20 13.20 13.20 13.20 13.20 15.21 15.51	15.13 14.49 14.40 14.52 14.51 14.94 15.03 14.55 13.76 14.01 14.14 13.84 15.05 16.60 16.47 16.80 16.47 15.27 15.27 15.27 15.27 15.27 15.27 15.27 15.27 15.26 15.05 15.05 15.05 15.07 14.55 14.55 14.55 14.55 14.55 14.55 14.55 14.55 15.07 14.55 14.55 14.55 14.55 14.55 14.55 14.55 14.55 15.07 14.55 14.55 14.55 14.55 14.55 14.55 14.55 14.55 15.07 14.55 15.07 14.55 14.55 14.55 14.55 14.55 14.55 14.55 14.55 15.07 14.55 14.55 15.07 14.55 15.07 14.55 15.07	15.5 15.5 14.5 Tune-up limit (dBm) 17.5	2 2 3 MPR (dB) 0 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	HEGAM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 13 0 0 15 12 24 0 0 7 7 13 0 0 0 7 7 13 0 0 0 7 7 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 16.25 14.45 14.29 14.49 14.49 14.49 14.49 14.49 14.49 14.49 14.91 15.91	15.25 16.27 14.47 14.40 14.47 14.45 14.45 14.45 14.45 14.45 14.78 13.96 15.37 15.38	15.13 14.49 14.52 14.51 14.51 14.51 14.51 14.51 14.51 14.51 14.51 14.51 14.51 14.51 14.51 15.03 14.55 15.03 14.55 15.03 16.03 16.03 1778.5 15.27 15.27 15.27 15.27 15.27 14.50 14.50 14.50 15.21	15.5 14.5 Tune-up limit (dBm) 17.5 16.5 18.5	2 2 3 MPR (dB) 0 1 1 2
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ISOAM ISOA	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 7 13 0 0 8 14 0 0 8 14 0 0 8 14 0 0 8 14 0 0 8 14 0 0 8 14 0 0 8 14 0 0 8 15 0 0 0 8 15 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 15.25 14.45 14.49 15.04 16.33 16.41 15.04 16.33 16.41 16.51 15.00 16.33 16.41 16.51 16.00 16.33 16.41 16.51 16.00 16.33 16.41 16.51 16.00 16.33 16.41 16.51 16.00 16.33 16.41 16.51 16.00 16.33 16.41 16.51 16.00 16.33 16.41 16.51 16.00 16.33 16.41 16.51 16.00 16.33 16.41 16.51 16.00 16.33 16.41 16.51 16.00 16.33 16.41 16.51 16.50 16.30	15.25 15.27 14.47 14.45 14.45 14.45 14.75 14.45 14.70 13.78 13.39 13.39 13.39 13.39 13.39 15.50 15.50 15.50 15.50 15.30	15.13 14.49 14.40 14.51 14.51 14.51 14.51 14.51 14.51 14.51 15.03 14.55 14.55 14.55 14.55 16.60 17.72 15.27	15.5 15.5 15.5 14.5 14.5 16.5 16.5 16.5 16.5 16.5 16.5 16.5 16	2 2 3 MPR (dt) 1 1 2 2 3 MPR
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 24 27 13 3 0 0 12 24 0 7 7 13 0 0 12 24 0 7 7 13 0 0 12 24 0 0 7 7 15 0 0 15 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 15.21 15.25	15.25 15.27 14.47 14.45 14.45 14.51 16.51	15.13 14.49 14.49 14.52 14.51 14.51 14.51 14.51 14.51 14.51 15.03 14.55 17.8.5 16.00 17.8.5 16.00 17.8.5 16.00 17.8.5 16.00 16.27 16	15.5 15.5 14.5 14.5 14.5 16.5 15.5 15.5	2 2 3 MPR (dB) 0 1 1 2 2 2 3 3
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ISOAM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	124 0 7 13 0 0 122 0 7 13 0 0 0 122 0 7 7 13 0 0 8 14 0 0 8 14 0 0 8 8 14 0 0 0 8 14 0 0 0 8 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 15.25	15.25 14.47 14.40 15.27 14.47 14.51 14.45 14.45 14.45 14.47 14.51 14.45 14.70 14.70 15.27 16.51 15.50 15.50 15.50 15.50 15.50 15.50 15.50 15.35	15:13 14:49 14:49 14:49 14:52 14:51 14:51 14:51 14:51 14:51 14:51 14:51 14:51 14:51 14:51 14:51 15:03 14:51 15:03	15.5 15.5 14.5 14.5 14.5 16.5 16.5 16.5 15.5 16.5 17.5 18.5	2 2 3 MPR (dt) 1 1 2 2 3 MPR
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ISCAM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 24 25 27 13 3 0 0 12 24 15 15 16 16 17 17 17 17 17 17 17 17 17 17 17 17 17	15.09 15.09 15.09 15.29	15.25 15.27 14.47 14.47 14.49 14.59 14.50 14.50 15.50 15.50 15.50 15.50 15.50 15.50 15.40 14.40	15.13 14.49 14.50 14.50 15.00	16.5 16.5 14.5 14.5 16.5 16.5 16.5 16.5 16.5 17.5 17.5 17.5 17.5	2 2 3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ISCAM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 7 13 0 0 0 14 7 7 0 0 0 8 14 4 7 7 0 0 0 8 14 4 7 7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 15.09 15.29 14.29 14.49 15.29 16.39	15.26 15.27 14.47 14.47 14.49 14.50	15.13 14.49 14.40 14.52 14.51 14.52 14.51 15.03 13.70 14.14 14.15 15.03 13.70 16.00 16.47 16.27	15.5 15.5 14.5 14.5 14.5 14.5 16.5 16.5 16.5 16.5 16.5 17.5 16.5 17.5 18.5	2 2 3 MPR (dB) 0 1 1 2 3 MPR (dB)
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ISCAM ISCA	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 13 10 0 0 12 24 10 10 10 10 10 10 10 10 10 10 10 10 10	15.09 14.49 14.29 14.49 14.49 14.79 15.24 15.24 15.24 15.24 15.24 15.24 15.24 15.24 15.24 15.24 15.24 15.24 15.24 15.24 15.25 15.26	15.26 15.27 14.47 14.40 14.51 14.50 14.50 14.50 14.50 14.50 14.50 14.50 14.50 14.50 14.50 14.50 14.50 15.50 15.50 15.50 15.50 15.50 15.50 16.51 16.51 16.51 16.51 16.50 16	15.13 14.40 14.40 14.52 14.51 15.03 13.76 15.03 13.76 16.00 15.27	16.5 16.5 14.5 14.5 16.5 16.5 16.5 16.5 16.5 17.5 17.5 17.5 17.5	2 2 3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ISCAM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 7 13 0 0 0 7 7 13 14 0 0 0 14 7 7 0 0 0 8 14 14 7 7 0 0 0 8 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16	15.09 14.49 14.29 14.49 14.49 14.49 14.49 14.49 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.10 14.10 14.10 14.10 14.10 14.10 14.10 14.10 14.10 14.10 15.24 16.10 16.20	15.25 14.47 14.40 14.51 14.50	15.13 14.49 14.40 14.52 14.51 14.51 15.03 15.03 15.03 15.03 16.47	15.5 15.5 14.5 14.5 16.5 16.5 16.5 16.5 17.5 16.5 17.5 17.5 17.5 17.5 18.5 18.5 18.5	2 2 3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0 0 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	IBOAM	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 14.49 14.29 14.49 14.49 14.79 14.47 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 14.10 14.79 15.79 16.59 16.59 16.59 16.59 16.59	15.25 14.47 14.51 14.40 14.51 14.52 15.53 16.53	15.13 14.49 14.50 15.00 15.50	15.5 15.5 14.5 14.5 16.5 16.5 16.5 16.5 17.5 16.5 17.5 17.5 17.5 17.5 18.5 18.5 18.5	2 2 3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0 0 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ISCAM ISCA	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 7 15 0 0 0 12 24 0 7 7 15 0 0 0 12 24 0 7 7 15 0 0 0 12 24 0 7 7 15 0 0 0 0 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15.09 15.29	15.25 14.47 14.51 14.40 14.51 14.52 14.52 14.53 14.50 14.50 15.50 15.50 15.50 15.50 16.51 16.55 16.50	16:13 14:40 14:40 14:40 14:40 14:50 14:51 15:03 13:76 16:37 16:47 16:39 16:47	15.5 15.5 14.5 14.5 14.5 16.5 16.5 16.5 16.5 17.5 16.5 17.5 16.5 17.5 16.5 17.5 16.5	2 2 3 MERR (((d)) 0 1 1 2 2 3 3 MERR (((d)) 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ISCAM ISCA	1 1 1 1 2 2 5 1 1 1 1 1 2 5 1 1 1 1 1 1	12 24 0 7 7 13 0 0 0 12 24 14 10 0 0 0 14 7 7 0 0 0 15 5 0 0 1 1 3 0 0 0 3 3 5 0 0 0 0 3 3 5 0 0 0 0 3 3 5 0 0 0 0	15.09 14.49 14.29 14.49 14.79 14.79 14.79 14.79 14.79 14.79 14.79 15.24 14.79 15.24 14.80 15.60 15.60 16.50	15.25 14.47 14.40 14.51 14.50 14.55 14.50	16:13 14:40 14:40 14:40 14:40 14:50 14:51 15:03 13:76 16:37	15.5 15.5 14.5 14.5 16.5 16.5 16.5 16.5 16.5 17.5 16.5 16.5 16.5 17.5 16.5 17.5 16.5	2 3 MPR (dB) 0 1 1 2 3 MPR (dB) 0 1 1 2
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ISCAM ISCA	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	12 24 0 7 7 15 0 0 0 12 24 0 7 7 15 0 0 0 0 12 2 14 14 10 14 14 7 7 0 0 0 14 14 14 14 17 17 18 18 14 14 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	15.09 15.29 14.49 14.29 14.49 14.49 14.49 14.49 14.49 14.79 16.30 16.31	15.25 14.47 14.51 14.40 14.51 14.52 14.52 14.53 14.50 14.50 15.50 15.50 15.50 15.50 16.50	15.13 14.49 14.49 14.52 14.51 15.03 13.76 15.03 13.76 16.47 16.39 16.47 16.57	15.5 15.5 14.5 14.5 16.5 16.5 16.5 16.5 16.5 17.5 16.5 16.5 16.5 17.5 16.5 17.5 16.5	2 2 3 MPR (dB) 0 1 1 2 2 3 MPR (dB) 0 1 1 2 2



				(1900MH Part 24E lotspot C	n			
V [MHz]	Modulation		RB Offset	Power Low	Power Middle	Power High Ch. / Freq.	Tune-up	MPR
	Cha Frequeni			Ch. / Freq. 18700 1860	Ch. / Freq. 18900 1880	Ch. / Freq. 19100 1900	limit (dBm)	
20	QPSK	1	0	19.59	19.78	19.68 19.73	20.5	0
20	QPSK QPSK	1 50	99	19.76	19.59	19.70		
20	QPSK QPSK	50 50	24 50	18.80	19.11 18.86	18.99	19.5	1
20	QPSK 16QAM	100	0	18.82	19.00	18.93		
20	16QAM 16QAM	1	49 99	18.80	18.79	18.66	19.5	1
20	16QAM 16QAM	50 50	0 24	18.05 17.95	18.05	17.92 17.93		
20	16QAM 16QAM	50 100	50	17.75	18.08	17.94 17.82	18.5	2
20	64QAM 64QAM	1	0 49	18.13	18.00	18.24	18.5	2
20	64QAM 64QAM	1 50	99	18.21	17.99	17.94	10.5	•
20	64QAM 64QAM	50 50	24 50	17.00 16.92	16.91	16.85	17.5	3
20	64QAM Cha	100	0	17.00 18675	17.22 18900	16.90 19125	Tune-up	MPR
	Frequen	cy (MHz)		1857.5	1880	1902.5	limit (dBm)	(dB)
15	QPSK QPSK QPSK	1	37	19.40	19.71	19.64	20.5	0
15 15	QPSK QPSK	36	74 0	19.63	19.41	19.51		
15	QPSK	36 36	20 39	18.70	18.98	18.92	19.5	1
15 15	QPSK 16QAM	75 1	0	18.68 18.61	18.92 18.53	18.79 18.72		
15	16QAM 16QAM	1	37 74	18.57	18.76 18.69	18.60 18.67	19.5	1
15	16QAM 16QAM	36 36	20	17.83	17.83	17.88	18.5	2
15	16QAM 16QAM	36 75	39 0	17.71	18.01	17.85		
15	64QAM 64QAM	1	37	17.88	17.88	17.97 17.80	18.5	2
15 15	64QAM 64QAM	1 36	74 0	18.14 16.70	17.86 16.75	17.78 16.82		
15	64QAM 64QAM	36 36	20 39	16.90	16.68	16.74	17.5	3
15	64QAM Cha		0	16.92 18650	17.03 18900	16.78 19150	Tune-up limit	MPR
10	Frequeni QPSK	1	0	1855 19.42	1880 19.70	1905 19.42	(dBm)	(dB)
10 10	QPSK QPSK	1	25 49	19.66 19.60	19.69 19.53	19.60 19.44	20.5	0
10 10	QPSK QPSK	25 25	0 12	18.85 18.69	19.03 18.86	18.89 18.79	19.5	1
10 10	QPSK QPSK	25 50	25 0	18.96 18.59	18.60 18.91	18.55 18.88		Ť
10 10	16QAM 16QAM	1	0 25	18.53 18.75	18.58 18.73	18.70 18.63	19.5	1
10 10	16QAM 16QAM	1 25	49 0	18.94 17.96	18.53 17.81	18.64 17.87		
10 10	16QAM 16QAM	25 25	12 25	17.76 17.60	17.63 17.96	17.90 17.78	18.5	2
10 10	16QAM 64QAM	50 1	0	17.74 18.09	17.87 17.79	17.67 18.07		
10 10	64QAM 64QAM	1	25 49	17.92 18.08	17.85 17.77	17.67 17.78	18.5	2
10 10	64QAM 64QAM	25 25	0 12	16.77 16.85	16.68 16.72	17.03 16.75	17.5	3
10 10	64QAM 64QAM	25 50	25 0	16.73 16.94	16.96 17.13	16.94 16.86	17.5	3
	Cha Frequen			18625 1852.5	18900 1880	19175 1907.5	Tune-up limit (dBm)	MPR (dB)
5	QPSK QPSK	1	0 12	19.36 19.53	19.49 19.50	19.58 19.44	20.5	0
5	QPSK QPSK	1	24 0	19.56 18.81	19.47	19.55 18.72		
5	QPSK QPSK	12 12	7 13	18.54 19.00	18.78 18.66	18.87 18.66	19.5	1
5	QPSK 16QAM	25 1	0	18.64 18.50	18.69 18.33	18.61 18.62		
5	16QAM 16QAM	1	12 24	18.59 18.68	18.63 18.47	18.40 18.55	19.5	1
5	16QAM 16QAM	12 12	7	17.78 17.84	17.72 17.65	17.81 17.63	18.5	2
5	16QAM 16QAM	12 25	13 0	17.44 17.69	17.88 17.76	17.69 17.58	10.5	2
5 5	64QAM 64QAM	1 1	0 12	17.93 17.82	17.79 17.72	18.11 17.75	18.5	2
5 5	64QAM 64QAM	1 12	24 0	17.91 16.61	17.75 16.62	17.64 16.82		
5 5	64QAM 64QAM	12 12	7 13	16.74 16.79	16.78 16.77	16.58 16.71	17.5	3
5	64QAM Cha		0	16.86 18615	17.00 18900	16.59 19185	Tune-up	MPR
3	Frequeni QPSK	cy (MHz)	0	1851.5 19.32	1880 19.52	1908.5 19.40	limit (dBm)	(dB)
3	QPSK QPSK	1	8	19.40	19.61	19.46	20.5	0
3	QPSK QPSK	8	0	18.94 18.56	18.75 18.92	18.82 18.69	10.5	
3	QPSK QPSK	8	7	18.84	18.73	18.48	19.5	1
3	16QAM 16QAM	1	0 8	18.54 18.57	18.36 18.65	18.44 18.53	19.5	1
3	16QAM 16QAM	1 8	14	18.66	18.60	18.50 17.79		
3	16QAM 16QAM	8	4	17.84 17.43	17.49 17.92	17.68 17.84	18.5	2
3	16QAM 64QAM	15 1	0	17.65 17.84	17.90 17.74	17.60 17.97		
3	64QAM 64QAM	1	8 14	17.85 18.03	17.82 17.83	17.59 17.65	18.5	2
3	64QAM 64QAM	8	0 4	16.63 16.73	16.79 16.59	16.78 16.67	17.5	3
3	64QAM 64QAM	8 15	7	16.61 16.72	16.89 16.92	16.85 16.72		3
	Cha Frequen	nnel		18607 1850.7	18900 1880	19193 1909.3	Tune-up limit (dBm)	MPR (dB)
	QPSK QPSK	1	0	19.36 19.46	19.51 19.59	19.53 19.51	(dom)	
1.4	QPSK QPSK	1 3	5	19.48	19.37	19.40	20.5	0
1.4	QPSK QPSK	3	1 3	19.33	19.44 19.50	19.52		
1.4 1.4 1.4 1.4		6	0	19.54 18.59 18.53	19.36 18.84 18.34	19.22 18.74 18.62	19.5	1
1.4 1.4 1.4 1.4 1.4 1.4	QPSK 16OAM	1	0 3 5	18.53 18.53 18.76	18.34 18.56 18.59	18.62 18.34 18.53		
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM	1			18.47	18.32	19.5	1
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM	3	0	18.54	18 20			
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM 16QAM	3 3 3	0 1 3	18.38 18.14	18.28 18.45	18.32 18.37	18 =	2
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM	3 3 3 6	0 1 3 0	18.38 18.14 17.76 17.86	18.45 17.91 17.70	18.37 17.56 18.02	18.5	2
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM	3 3 3 6 1 1	0 1 3 0 0 3 5	18.38 18.14 17.76 17.86 17.79 17.88	18.45 17.91 17.70 17.69 17.68	18.37 17.56 18.02 17.66 17.75	18.5	2
1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 16QAM 64QAM 64QAM	3 3 3 6 1	0 1 3 0 0	18.38 18.14 17.76 17.86 17.79	18.45 17.91 17.70 17.69	18.37 17.56 18.02 17.66		

		Par	t 27L (onl	I 4 (AWS E y on chan Hotspot O	nel requi	red)		
BW [MHz]	Modulation		RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freg.	Power High Ch. / Freq.	Tune-up limit	MPR
	Cha Frequen	cy (MHz)		20050 1720	20175 1732.5	20300 1745	(dBm)	(dB)
20	QPSK QPSK	1	0 49	17.10	17.18	17.08	17.5	0
20 20 20	QPSK QPSK QPSK	50 50	99 0 24	16.80 16.10 15.84	16.76 16.14 15.92	16.92 16.12 15.88		
20	QPSK QPSK	50 100	50	16.02	16.13	16.07	16.5	1
20 20	16QAM 16QAM	1 1	0 49	16.32 16.16	16.47 16.04	16.50 16.14	16.5	1
20 20	16QAM 16QAM	1 50	99	16.27 15.14	16.24 15.15	16.07 15.04		
20	16QAM 16QAM	50 50	24 50	15.12 15.11	15.12 15.01	15.02 15.07	15.5	2
20 20 20	16QAM 64QAM	100 1	0 0 49	15.09 15.13 15.17	15.12 15.08 15.02	15.22 15.06 15.02	15.5	2
20	64QAM 64QAM	1 50	99	15.07	15.14	15.03		_
20 20	64QAM 64QAM	50 50	24 50	14.44 14.40	14.32 14.11	14.14 14.24	14.5	3
20	64QAM Cha		0	14.09 20025	14.09 20175	14.34 20325	Tune-up limit	MPR
15 15	QPSK QPSK	1 1	0 37	1717.5 16.84 16.68	1732.5 16.88 16.64	1747.5 16.81 16.84	(dBm) 17.5	(dB) 0
15 15	QPSK QPSK	1 36	74 0	16.48	16.65	16.82 15.85	17.5	
15 15	QPSK QPSK	36 36	20 39	15.56 15.79	15.69	15.67 15.85	16.5	1
15 15	QPSK 16QAM	75 1	0	15.69 16.00	15.97 16.22	15.89 16.12		
15 15	16QAM 16QAM	1	37 74	15.89 16.16	15.87 16.07	15.92 15.83	16.5	1
15 15 15	16QAM 16QAM 16QAM	36 36 36	0 20 39	14.88 14.98 14.93	14.91 14.84 14.78	14.94 14.84 14.87	15.5	2
15 15	16QAM 64QAM	75 1	0	14.95 14.81 14.95	14.79	14.91		
15 15	64QAM 64QAM	1	37 74	15.00 14.85	14.77 14.87	14.74 14.90	15.5	2
15 15	64QAM 64QAM	36 36	0 20	14.02 14.32	14.12 14.17	13.94 13.91	14.5	3
15 15	64QAM 64QAM	36 75	39 0	14.30	13.87	14.11	Tune-up	
	Frequen			20000 1715	20175 1732.5	20350 1750	limit (dBm)	MPR (dB)
10 10 10	QPSK QPSK QPSK	1 1	0 25 49	16.79 16.60 16.53	16.88 16.54 16.44	16.79 16.75 16.82	17.5	0
10 10	QPSK QPSK	25 25	0 12	15.95 15.66	15.87 15.77	15.82 15.78	16.5	1
10 10	QPSK QPSK	25 50	25 0	15.88 15.68	15.82 15.80	15.86 15.78	16.5	1
10 10	16QAM 16QAM	1	0 25	16.05 16.02	16.11 15.76	16.12 16.02	16.5	1
10 10 10	16QAM 16QAM	25 25	49 0 12	16.00 14.88 15.00	15.92 14.88 14.98	15.75 14.83 14.88		
10	16QAM 16QAM	25 25 50	25 0	14.99	14.90	14.90	15.5	2
10	64QAM 64QAM	1	0 25	15.01	14.85	14.79	15.5	2
10 10	64QAM 64QAM	1 25	49 0	14.90 13.91	14.90 14.21	14.87 13.79		
10	64QAM 64QAM	25 25	12 25	14.20 14.13	14.06	13.90 14.01	14.5	3
		50			13.93			
10	64QAM Cha		0	13.78 19975	13.97 20175	14.16 20375	Tune-up limit	MPR (dB)
5		nnel	0	13.78 19975 1712.5 16.93	13.97 20175 1732.5 16.88	14.16 20375 1752.5 16.91		MPR (dB)
	Cha Frequent QPSK	nnel cy (MHz) 1	0	13.78 19975 1712.5	13.97 20175 1732.5 16.88 16.59 16.61	14.16 20375 1752.5	limit (dBm)	(dB)
5 5 5 5 5	Cha Frequent QPSK QPSK QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 1 12 12	0 12 24 0 7	13.78 19975 1712.5 16.93 16.72 16.70 15.85 15.57	13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.60	14.16 20375 1752.5 16.91 16.83 16.80 15.95 15.66	limit (dBm)	(dB)
5 5 5 5 5 5	Cha Frequent QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 12 12 12 12 25 1	0 12 24 0 7 13 0	13.78 19975 1712.5 16.93 16.72 16.70 15.85 15.57 15.89 15.75	13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.60 15.94 15.96	14.16 20375 1752.5 16.91 16.83 16.80 15.95 15.66 15.94 15.74	limit (dBm) 17.5	0 1
5 5 5 5 5 5 5	Cha Frequent QPSK QPSK QPSK QPSK QPSK QPSK QPSK 16QAM 16QAM	nnel cy (MHz) 1 1 1 1 12 12 12 12 25 1 1	0 12 24 0 7 13 0 0	13.78 19975 1712.5 16.93 16.72 16.70 15.85 15.57 15.89 15.75 16.05 15.91 16.16	13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.60 15.94 15.96 16.12 15.85 15.93	14.16 20375 1752.5 16.91 16.83 16.80 15.95 15.66 15.94 15.74 16.31 16.00	limit (dBm) 17.5	(dB) 0
5 5 5 5 5 5 5	Cha Frequent QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	nnel cy (MHz) 1 1 1 1 12 12 12 12 25 1	0 12 24 0 7 13 0	13.78 19975 1712.5 16.93 16.72 16.70 15.85 15.57 15.89 15.75 16.05 15.91 16.16 14.98	13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.96 16.12 15.96 16.12 15.93 15.01	14.16 20375 1752.5 16.91 16.83 16.80 15.95 15.66 15.94 15.74 16.31	limit (dBm) 17.5	0 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Cha Frequent OPSK OPSK OPSK OPSK OPSK OPSK OPSK OPSK	nnel cy (MHz) 1 1 1 12 12 12 14 1 12 12 15 1 1 1 12 12 12 12 12 12 12 12	0 12 24 0 7 13 0 0 12 24 0 7	13.78 19975 1712.5 16.72 16.70 15.85 15.57 15.89 15.75 16.05 15.91 16.16 14.98 14.89 14.88 14.88	13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.60 15.96 16.12 15.85 15.93 15.01 14.96 14.76 14.83	14.16 20375 1752.5 16.83 16.80 15.95 15.66 15.74 16.31 16.00 15.81 14.82 14.88 14.87 14.99	17.5 16.5 15.5	(dB) 0 1 2
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Cha Frequent OPSK OPSK OPSK OPSK OPSK OPSK OPSK OPSK	nnel cy (MHz) 1 1 1 12 12 12 12 12 12 11 1	0 12 24 0 7 13 0 0 12 24 0 7 13 0 0 12 24 0 7	13.78 19975 1712.5 16.93 16.72 16.70 15.85 15.57 15.89 15.75 16.05 16.16 14.98 14.88 14.83 14.83 14.93	13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.96 15.94 15.96 16.12 15.93 15.01 14.96 14.76 14.83 14.98 14.91	14.16 20375 1752.5 16.91 16.83 16.80 15.95 15.94 15.74 16.30 16.00 15.81 14.82 14.83 14.87 14.83 14.83	17.5 16.5	0 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Cha Frequent OPSK OPSK OPSK OPSK OPSK OPSK OPSK OPSK	nnel cy (MHz) 1	0 12 24 0 7 13 0 0 12 24 0 7 7	13.78 19975 1712.5 16.93 16.72 15.85 15.57 15.85 15.57 15.85 16.05 15.75 16.05 14.98 14.88 14.83 14.83 14.83 14.92 14.93	13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.96 15.95 15.93 15.93 15.93 14.76 14.83 14.96 14.91 14.90 14.38	14.16 20375 1752.5 16.91 16.83 15.95 15.66 15.94 16.31 16.31 16.31 14.82 14.82 14.83 14.87 14.83 14.83 14.83 14.83	17.5 16.5 15.5	(dB) 0 1 2
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Cha Frequent OPSK OPSK OPSK OPSK OPSK OPSK OPSK OPSK	nnel cy (MHz) 1	0 12 24 0 7 13 0 0 12 24 0 7 13 0 0 7 13 0 0 7	13.78 19975 16.93 16.72 16.70 15.85 15.57 15.89 15.75 16.05 15.91 16.16 14.98 14.89 14.89 14.88 14.83 14.88 14.92	13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.96 15.94 15.96 16.12 15.95 15.85 15.93 15.01 14.96 14.76 14.83 14.98 14.91 14.90	14.16 20375 17525 16.91 16.83 16.80 15.95 15.96 15.94 15.74 16.31 16.00 15.81 14.82 14.88 14.87 14.99 14.83 14.86 14.86 14.86	17.5 16.5 16.5 15.5 15.5 14.5	(dB) 0 1 1 2
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Cha Frequent OPSK OPSK OPSK OPSK OPSK OPSK OPSK OPSK	nnel cy (MHz) 1 1 1 1 1 12 12 25 1 1 12 12	0 12 24 0 7 13 0 0 12 24 0 7 13 0 0 0 7 13 0 0 7 13 0 0 7 13 0 0 7 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 1975 16.93 16.72 16.70 15.85 15.57 15.89 15.75 16.05 14.98 14.88 14.83 14.88 14.82 14.92 14.92 14.93	13.97 20175 17325 16.88 16.59 16.61 15.94 15.96 16.12 15.85 15.93 15.01 14.96 14.78 14.98 14.91 14.98 14.91 14.98 14.38 14.92	14.16 20375 16.91 16.83 16.80 15.95 15.66 15.74 16.31 16.00 15.81 14.82 14.87 14.99 14.83 14.85 14.85 13.94 14.05	17.5 16.5 16.5 15.5	(dB) 0 1 1 2 2 3
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Cha Frequent QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPS	nnel cy (MHz) 1 1 1 1 1 12 12 12 12 11 1	0 0 12 24 0 7 13 0 0 12 24 0 7 13 0 0 0 7 13 0 0 7 7 13 0 0 7 7 13 0 0 0 7 7 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 19275 1712.5 16.93 16.72 16.70 15.85 15.75 15.89 15.75 16.05 16.05 16.16 14.98 14.89 14.83 14.83 14.93 14.93 14.93 14.93 14.95	13.97 20175 1732.5 16.88 16.59 16.61 15.94 15.96 15.94 15.96 16.12 15.85 16.12 14.96 14.76 14.83 14.91 14.90 14.30 14.91 14.90 14.38 14.02 13.89 13.75 20175 20175 16.90 16.46	14.16 20375 1752.5 16.91 16.83 16.80 15.94 15.95 15.66 15.94 16.31 16.00 15.81 14.82 14.88 14.87 14.83 14.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85	17.5 16.5 16.5 15.5 14.5	(dB) 0 1 1 2 2 3 MPR
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Cha Frequent QPSK QPSK QPSK QPSK QPSK QPSK QPSK GPSK QPSK ISGAM I	nnel cy (MHz) 1 1 1 1 12 12 25 1 1 12 25 1 1 12 25 1 1 12 25 1 1 12 25 1 1 12 25 1 1 1 12 25 1 1 12 25 1 1 12 25 1 1 12 25 1 1 12 25 1 1 1 12 25 1 1 12 25 1 1 12 12	0 0 12 24 0 7 13 0 0 0 12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 7 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 19275 1712.5 16.93 16.72 16.70 15.85 15.57 15.85 15.75 16.05 15.75 16.05 14.98 14.89 14.89 14.89 14.89 14.83 14.83 14.83 14.93 14.93 14.93 14.93 14.93 14.93 14.95	13.97 20175 16.88 16.59 16.81 15.94 15.96 15.94 15.91 15.94 15.99 14.75 14.96 14.76 14.76 14.96 14.76 14.86 15.96 15.94 14.96 14.76 14.87 15.96	14.16 20375 1752.5 16.91 16.83 16.80 15.95 15.96 15.94 16.31 16.00 15.81 14.82 14.88 14.87 14.97 14.83 14.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85 16.85	Ilimit (dBm) 17.5 16.5 16.5 15.5 15.5 14.5	(dB) 0 1 1 2 2 3 MPR (dB)
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chiban Chipan Chiban Chiban Chipan Ch	annel (continue) (cont	0 0 12 24 0 7 13 0 0 0 12 24 0 7 7 13 0 0 0 0 7 7 7 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 1975 1712.5 16.93 16.93 16.72 16.70	13.97 2.5 16.88 2.10 17.92 5.10 1	14.16 20075 17762.5 16.91 16.93 16.93 16.90 16.93 16.90 16.93 16.90 16.90 15.95 15.95 15.94 16.31 16.90 15.94 16.31 16.90 16.9	18.5 16.5 16.5 16.5 15.5 17.5 17.5	(dB) 0 1 1 2 2 3 MPR (dB) 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chs Frequent OPSK OPSK OPSK OPSK OPSK OPSK OPSK OPSK	annel y (MHz) 1 1 1 1 2 2 1 1 1 1	0 0 12 24 0 0 7 13 0 0 0 12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 7 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 (1975) 1712.5 (1975) 171	13.97 1722.5 16.88 16.50 16.81 15.90 16.61 15.90 16.61 15.90 16.12 15.90 16.12 15.90 16.12 15.90 16.12 16.12 16.13 16.10 16.12 17.10 16.10 16.12 17.10 16.10	14.16 20375 1762.5 16.91 16.83 16.80 15.95 15.66 15.74 16.31 16.00 15.81 14.83 14.88 14.88 14.89 14.83 14.85 15.96 16.81 16.85 16.85 16.85 16.85 16.85	18.5 16.5 16.5 16.5 15.5 17.5 17.5	(dB) 0 1 1 2 2 3 MPR (dB) 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequency Chair Ch	nnel (y (MHz) (MHz	0 0 122 4 0 7 7 13 0 0 122 24 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 14 2 24 0 0 7 7 13 0 0 0 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 16.93 17.12.5 16.93 17.12.5 16.93 17.12.5 16.93 17.12.5 16.93 17.12.5 16.93 17.12.5 16.93 17.12.5 17.12.	13.97 13.75 14.90 15.91 15.91 15.97	14.16 16.23 16.29 16.29 16.29 16.29 16.29 16.20	(dbm) 17.5 18.5 18.5 18.5 15.5 17.5 18.5 18.5 18.5 18.5 18.5 18.5 18.5 18	(dB) 0 1 1 2 2 3 MPR (dB) 0 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequency Chair Ch	nonel (y (MHz) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	0 122 24 0 7 7 13 0 0 12 24 0 7 7 13 0 0 8 14 4 7 7 0 0 0 8	13.78 10715 17712.5 16.77 178.2.5 16.72 16.70 16	13.97 16.99 16.90	14.16 19 20075 17762 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Init	(dB) 0 1 1 2 2 2 3 3 MPR (dB) 0 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Service Control of the Control	ennel (y (MHz) (MH	0 0 12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 0 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 19072 1712.25 176.93 176	13.97 2.0175 20175	14.16 19 20075 15.50 15.	(dbm) 17.5 18.5 18.5 18.5 15.5 17.5 18.5 18.5 18.5 18.5 18.5 18.5 18.5 18	(dB) 0 1 1 2 2 3 MPR (dB) 0 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequency of the control of th	nnel (y (MHz) (MHz	0 0 12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 0 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 19072 1712.25 176.93 176	13.97 20175 17.92	14.16 19 20075 15.50 15.	17.5 16.5 15.5 16.5 16.5 16.5 16.5 16.5 16	(dB) 0 1 1 2 2 3 3 MER (dB) 0 0 1 1 2 2 2 2 2 3 3 MER (dB) 0 0 1 1 2 2 2 3 3 3 MER (dB) 0 0 1 1 1 2 2 2 3 3 MER (dB) 0 0 1 1 1 2 2 2 3 3 3 MER (dB) 0 0 1 1 1 2 2 3 3 3 MER (dB) 0 0 1 1 1 1 2 2 3 3 3 MER (dB) 0 0 1 1 1 1 2 2 3 3 3 MER (dB) 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequent Chair Cha	annel	0 0 12 24 0 0 12 24 0 0 12 24 0 0 0 12 24 0 0 0 0 12 24 0 0 0 0 0 12 24 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 1975 1975 1975 1975 1975 1975 1975 1975	13.97 1792.5 15.97	14.16. 16.91 16.92	Init	(dB) 0 1 1 2 2 3 3 MiPR (dB) 0 1 1 1 1 2 2 2 3 3 MiPR (dB) 2 3 3 MiPR (dB) 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequency of the control of th	annel series	0 0 12 24 0 7 7 13 0 0 12 24 0 0 7 7 13 13 0 0 0 14 7 7 0 0 0 6 14 0 0 0 6 14 0 0 0 6 14 0 0 0 6 14 0 0 0 0 6 14 0 0 0 0 6 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 19075 1712.25 176.93 177.93 177	13.97 178.28 18.91 18.92	14.16 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	17.5 16.5 15.5 16.5 16.5 16.5 16.5 16.5 16	(dB) 0 1 1 2 2 3 3 MER (dB) 0 0 1 1 2 2 2 2 2 3 3 MER (dB) 0 0 1 1 2 2 2 3 3 MER (dB) 0 0 1 1 1 2 2 2 3 3 MER (dB) 0 0 1 1 1 2 2 2 3 3 MER (dB) 0 0 1 1 1 2 2 2 3 3 3 MER (dB) 0 0 1 1 1 2 2 3 3 3 MER (dB) 0 0 1 1 1 1 2 2 3 3 3 MER (dB) 0 0 1 1 1 1 2 2 3 3 3 MER (dB) 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequency Control of the Contr	ennel (y (MHz) (Hz) (Hz) (Hz) (Hz) (Hz) (Hz) (Hz) (0 0 12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 14 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 19075 177125 19075 14.89	13.97 1792.5 16.88 16.89 16.99	14.16. 16.87 17.94.3 14.40 15.91 14.47 14.40 15.91 14.47 14.	Innt	(dB) 0 1 1 2 2 3 3 MMPR 2 3 3 MMPR 2 2 3 3 MMPR 2 3 3 3 MMPR 2 3 MMPR 2 3 3 MMPR 2 3 MMPR 2 3 MMPR 2 3 3 MMPR 2 3 MMPR
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequency Control of the Control of Co	ennel (y (MHz) (Hz) (Hz) (Hz) (Hz) (Hz) (Hz) (Hz) (0 0 12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 14 7 7 15 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 1975 1975 1975 1975 1975 1975 1975 1975	13.97 1792.5 16.88 14.99 14.99 15.91 15.91 15.91 15.91 15.91 15.91 16.91	14.16. 16.91 17.72. 17. 17. 17. 18. 18. 18. 18. 18. 18. 18. 18. 18. 18	Innt	(dB) 0 1 1 2 2 3 3 MMPR 2 3 3 MMPR 2 2 3 3 MMPR 2 3 3 3 MMPR 2 3 MMPR 2 3 3 MMPR 2 3 MMPR 2 3 MMPR 2 3 3 MMPR 2 3 MMPR
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequency Control of the Control of Co	ennel (sp. (MHz) (sp. 4) (sp.	0 0 12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 14 7 7 0 0 0 0 8 8 14 14 0 0 0 0 0 8 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 19075 1712.25 16.72 16.83 16.72 16.87 15.89 16.72 15.89 15.87 16.80 15.87 16.80	13.97 1792.5 16.96 14.96 14.96 15.91 15.91 15.91 15.91 14.96 15.91	14.16. 16.91 17.92. 19.92 17.92. 19.92 17.92	Ilinat I	(dB) 0 1 1 2 2 3 3 MIPR (dB) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequency of the Chair C	annel (1975) (MHz) (MHz) (1975) (MHz)	0 0 12 24 0 7 7 13 0 0 12 24 0 7 7 13 0 0 0 14 7 7 0 0 0 8 14 0 0 0 8 14 7 7 0 0 0 8 14 7 7 0 0 0 8 14 7 7 0 0 0 8 14 7 7 0 0 0 8 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 19075 1712.25 16.93 16.72 16.93 16.72 15.85 15.89 15.89 14.89 14.89 14.89 14.89 14.89 15.86 16.16	13.97 1792.5 16.90 14.90	14.16 19 20075 15.50 15.	Innt	(dB) 0 1 1 2 2 3 MPR (dB) 1 1 1 2 3 MPR (dB)
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Orbit OFPM OFPM OFPM OFPM OFPM OFPM OFPM OFPM	ennel (sp. (MHz) (sp. 4) (sp.	0 0 12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 0 14 14 0 0 0 0 8 8 14 14 0 0 0 0 0 8 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 1975 1976 1976 1976 1976 1976 1976 1976 1976	13.97 1792.5 16.96 14.96 14.96 15.96 15.96 15.96 14.96 15.96 14.96 15.96 16.96 16.16	14.16. 16.91 17.92. 19.91 17.92. 19.91 16.91 16.91 16.90 15.	Ilinat I	(dB) 0 1 1 2 2 3 3 MPR (dB) 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Orbit OPSI OPPSI	annel (y (MHz) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 0 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 19075 1712.5 1712	13.97 179.25 16.49 14.94 14.94 14.94 14.94 14.94 14.94 14.74 19.95 16.62	14.16 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Initial Init	(dB) 0 1 1 2 2 3 MPR (dB) 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequency (1975) Chair	ennel (sp. (MHz) (sp.	0 0 0 12 24 0 0 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 0 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 19075 1712.5 1712	13.97 179.25 16.40 14.39	14.16. 19. 20090 15.50 16.20 1	Innt	(dB) 0 1 1 2 2 3 3 MPR (dB) 0 1 1 2 2 3 3 MPR (dB) 0 0 1 1 1 2 2 3 3 MPR (dB) 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Orbit	ennel (y (MHz) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	0 0 0 12 24 0 0 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 0 12 24 0 0 7 7 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 1975 1975 1975 1975 1975 1975 1975 1975	13.97 1 13.97	14.16. 19. 20090 15.91 15.92 15.92 15.93 1	Initial Init	(dB) 0 1 1 2 2 3 MPR (dB) 0 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Chair Frequency (1995) Chair	ennel (y (MHz) (Hz) (Hz) (Hz) (Hz) (Hz) (Hz) (Hz) (0 0 12 24 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 12 24 0 0 7 7 13 0 0 0 0 12 24 0 0 7 7 13 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13.78 1975 1976 1976 1976 1976 1976 1976 1976 1976	13.97 179.2.5 16.96 16.96 179.2.1 18.96 16.96 179.2.1 18.96 16.96 179.2.1 18.96 18.96 19.9	14.16. 16.91 16.92 16.95	Innt	(dB) 0 1 1 2 2 3 3 MIPR (dB) 0 1 1 2 2 3 3 MIPR (dB) 0 1 1 1 2 2 3 3 MIPR (dB) 0 1 1 1 1 2 2 3 3 MIPR (dB) 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1



				(2600MH: Part 27 Hotspot O	, On			
BW [MHz]	Modulation	RB Size	RB Offset	Power Low	Power Middle	Power High	Tune-un	
				Ch. / Freq.	Ch. / Frea.	Ch. / Freq. 21350	Tune-up limit	MPR (dB)
	Cha Frequen	nnel cy (MHz)		20850	21100		(dBm)	(05)
20	Frequent QPSK	cy (MHz)	0	2510	2535	2560 19.48		
20	QPSK	1	49	19.57 19.42	19.61	19.46	20.5	0
20	QPSK	1	99	19.21	19.41	19.46	20.0	
20	QPSK	50	0	18.79	19.04	18.90		
20	QPSK	50	24	19.02	18.91	18.93		
20	QPSK	50	50	18.94	18.89	18.86	19.5	1
20	QPSK	100	0	18.99	19.04	18.86		
20	16QAM		0	19.12	19.10	18.97	ļ	
20	16QAM	1	49	19.08	18.82	18.85	19.5	1
20	16QAM	- 1 - 50	99	19.00	19.26	18.84		
20 20	16QAM 16QAM	50 50	0 24	18.17 18.29	17.89 17.81	17.90 17.86	}	
20	16QAM	50	50	18.21	17.01	17.89	18.5	2
20	16QAM	100	0	18.12	17.91	17.88		
20	64QAM	1	0	18.23	18.22	17.79		
20	64QAM	1	49	18.21	17.81	17.77	18.5	2
20	64QAM	1	99	18.12	18.12	17.82		
20	64QAM	50	0	17.16	16.89	16.90		
20	64QAM	50	24	17.29	16.80	16.86	17.5	3
20	64QAM 64QAM	50	50	17.22	16.95	16.89		
20	64QAM Cha	100	0	17.23	16.91	16.89	Tune-up	
		nnel cy (MHz)		20825	21100 2535	21375 2562.5	limit (dBm)	MPR (dB)
15				2507.5	2535 19.40		(dBm)	(db)
15 15	QPSK QPSK	1	0 37	19.39 19.26	19.40	19.24 19.28	20.5	0
15	QPSK QPSK	1	37 74	19.26	19.10	19.28	20.5	U
15	QPSK	36	0	18.66	18.87	18.62		
15	QPSK	36	20	18.91	18.83	18.81		
15	QPSK	36	39	18.81	18.71	18.61	19.5	1
15	QPSK	75	0	18.82	18.82	18.75		
15	16QAM		0	19.02	18.93	18.66		
15	16QAM	1	37	18.88	18.67	18.62	19.5	1
15	16QAM	1	74	18.85	19.03	18.73		
15	16QAM	36	0	17.89	17.74	17.82		
15 15	16QAM 16QAM	36 36	20	18.05 17.96	17.69	17.73	18.5	2
15	16QAM	36 75	39 0	17.96	17.72 17.60	17.81 17.69	ł	
15	64QAM	1	0	18.00	18.11	17.09		
15	64QAM	1	37	17.94	17.74	17.85	18.5	2
15	64QAM	1	74	18.04	17.88	17.65		_
15	64QAM	36	0	16.92	16.58	16.69		
15	64QAM	36	20	16.85	16.50	16.76	17.5	3
15	64QAM	36	39	16.92	16.70	16.65	17.5	3
15	64QAM Cha	75	0	16.99	16.64	16.61	Tune-up	
		nnei		20800	21100	21400	limit	MPR (dB)
	Frequen	ty (MHZ)		2505	2535	2565	(dBm)	(db)
10 10	QPSK QPSK	1	0 25	19.33 19.22	19.45 19.23	19.19 19.28	20.5	0
10	OPSK	1	49	19.22	19.23	19.28	20.5	0
10	QPSK	25	0	18.69	18.79	18.80		
10	QPSK	25	12	18.75	18.68	18.75		
10	QPSK	25	25	18.82	18.66	18.74	19.5	1
10	QPSK	50	0	18.71	18.97	18.73		
10	16QAM		0	18.84	18.86	18.74		
10	16QAM 16QAM	1	25	18.98	18.69	18.61	19.5	1
10		1	49	18.92	19.07	18.62		
10	16QAM	25	0	17.56 17.61	17.62 17.68	17.63		
10 10	16QAM 16QAM	25 25	12 25	17.61 17.97	17.68	17.67 17.75	18.5	2
10	16QAM	25 50	0	17.97	17.68	17.75		
10	64QAM	1	0	18.12	18.08	18.05		
10	64QAM	1	25	17.90	18.10	17.65	18.5	2
10	64QAM	1	49	17.93	18.02	17.68		
10	64QAM	25	0	16.55	16.65	16.70		
	64QAM	25	12	16.68	16.56	16.59	17.5	3
10	64QAM	25	25	16.61	16.77	16.59		
10	64QAM	50	0	16.46	16.71 21100	16.65 21425	Tune-up	MPR
	Cha Frequen	nnei		20775 2502.5	21100 2535	21425 2567.5	limit	MPR (dB)
5	GPSK	cy (MHz)	0				(dBm)	(db)
5 5	QPSK QPSK	1	12	19.31 19.31	19.33 19.22	19.41 19.32	20.5	0
5	QPSK	1	12 24	19.31	19.22	19.32	20.0	0
5	QPSK	12	0	18.51	18.82	18.66		
5	QPSK	12	7	18.93	18.63	18.68	40	
5	QPSK	12	13	18.66	18.65	18.64	19.5	1
5	QPSK	25	0	18.86	18.93	18.57		
5	16QAM		0	18.87	18.93	18.87		
5	16QAM		12	18.90	18.56	18.65	19.5	1
5	16QAM	1	24	18.93	18.96	18.71		
5	16QAM	12	0	18.10	17.64	17.69		
5	16QAM	12	7	18.00	17.60	17.70	18.5	2
5	16QAM	12	13	17.98	17.74	17.65		
5	16QAM 64QAM	25	0	18.01	17.63	17.79		
5	64QAM 64QAM	1 1	0 12	17.95 17.93	17.98 17.66	17.62 17.53	18.5	2
5	64QAM	1	12 24	17.93	17.84	17.53	10.5	2
5	64QAM	12	0	17.96	16.81	16.70		
5	64QAM	12	7	17.15	16.71	16.73		
	64QAM	12	13	17.13	16.88	16.79	17.5	3
	64QAM							

			ı	Band 66 lotspot O				
W [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit	MPR (dB)
	Frequen	nnel cy (MHz)		132072 1720	132322 1745	132572 1770	(dBm)	(05)
20 20	QPSK QPSK	1	0 49	17.09 16.69	17.19 16.89	17.13 16.78	17.5	0
20 20	QPSK QPSK	1 50	99 0	16.79 15.71	16.73 15.86	16.88 15.62		
20 20	QPSK QPSK	50 50	24 50	15.66 15.45	15.48 15.85	15.67 15.74	16.5	1
20 20	QPSK 16QAM	100	0	15.45 15.41	15.59 15.63	15.52 15.42		
20 20	16QAM 16QAM	1 1	49 99	15.46 15.52	15.18 15.55	15.42 15.46	16.5	1
20 20	16QAM 16QAM	50 50	0 24	14.65 14.69	14.68 14.61	14.92 14.66	15.5	2
20 20	16QAM 16QAM	50 100	50 0	14.77	14.78	14.82	15.5	2
20	64QAM 64QAM	1	0 49	15.12 15.29	14.90	15.24 15.25	15.5	2
20	64QAM 64QAM	1 50	99	15.14 14.06	15.24	14.84		_
20	64QAM	50	24	14.29	14.17	14.26	14.5	3
20 20	64QAM 64QAM	50 100	50 0	14.27 14.38	14.23	14.21	Tune-up	
	Cha Frequen	nnei cy (MHz)		132047 1717.5	132322 1745	132597 1772.5	limit (dBm)	MPR (dB)
15 15	QPSK QPSK	1	0 37	16.77 16.52	16.68 16.56	16.86 16.65	17.5	0
15 15	QPSK QPSK	1 36	74 0	16.47 15.45	16.43 15.50	16.53 15.33		
15 15	QPSK QPSK	36 36	20 39	15.46 15.27	15.22 15.52	15.41 15.41	16.5	1
15 15	QPSK 16QAM	75 1	0	15.23 15.08	15.23 15.44	15.21 15.22		
15	16QAM 16QAM	1	37 74	15.26	15.54	15.24	16.5	1
15	16QAM	36	0	14.44	14.47	14.69		
15 15	16QAM 16QAM 16QAM	36 36	20 39	14.55 14.53	14.34	14.30 14.68	15.5	2
15	64QAM	75 1	0	14.37	14.51	14.59		
15 15	64QAM 64QAM	1	37 74	14.96 14.89	14.82 14.98	15.01 14.56	15.5	2
15 15	64QAM 64QAM	36 36	0 20	13.76 14.16	14.01 14.04	13.79 14.02	14.5	3
15 15	64QAM 64QAM	36 75	39 0	13.97 14.04	13.97 13.96	14.06 13.89		J
	Cha Frequen		•	132022 1715	132322 1745	132622 1775	Tune-up limit (dBm)	MPR (dB)
10	QPSK QPSK	1	0 25	16.80	16.95 16.55	16.79	17.5	0
10	QPSK QPSK	1	49 0	16.53 16.57 15.43	16.59 15.60	16.61 16.48 15.44	17.5	۰
10	QPSK	25 25	12	15.42	15.23	15.51	16.5	1
10 10	QPSK QPSK	25 50	25 0	15.25 15.09	15.69 15.32	15.38 15.21		
10 10	16QAM 16QAM	1	0 25	15.23 15.33	15.42 15.15	15.27 15.14	16.5	1
10 10	16QAM 16QAM	1 25	49 0	15.34 14.29	15.33 14.49	15.29 14.76		
10 10	16QAM 16QAM	25 25	12 25	14.43 14.61	14.37 14.53	14.31 14.56	15.5	2
10 10	16QAM 64QAM	50 1	0	14.55 14.98	14.48 14.57	14.48 14.94		
10 10	64QAM 64QAM	1	25 49	14.88 14.80	14.88 14.99	15.01 14.64	15.5	2
10	64QAM 64QAM	25 25	0	13.75	14.00	13.95		
10	64QAM 64QAM	25 25 50	25 0	13.96	13.90	14.18	14.5	3
10	Cha	nnel		131997	132322	132647	Tune-up limit	MPR (dP)
5	Frequen QPSK	1	0	1712.5 16.72	1745 16.60	1777.5 16.56	(dBm)	(dB)
5 5	QPSK QPSK	1	12 24	16.49 16.43	16.58 16.46	16.48 16.27	17.5	0
5 5	QPSK QPSK	12 12	0 7	15.43 15.33	15.58 15.25	15.25 15.42	16.5	1
5 5	QPSK QPSK	12 25	13 0	15.19 15.03	15.48 15.29	15.43 15.22	10.5	
5 5	16QAM 16QAM	1	0 12	15.05 15.09	15.37 15.25	15.02 15.22	16.5	1
5	16QAM 16QAM	1	24 0	15.25 14.45	15.27 14.47	15.13 14.49		
5	16QAM 16QAM	12	7	14.29	14.40	14.40	15.5	2
5	16QAM 16QAM 64QAM	12 25 1	0	14.49 14.49 14.79	14.51 14.45 14.56	14.52 14.51 14.94		
5	64QAM	1	12	14.90	14.70	15.03	15.5	2
5	64QAM 64QAM	1 12	24 0	14.77 13.77	14.86 13.75	14.55 13.76		
5 5	64QAM 64QAM	12 12	7 13	14.07 13.98	13.98 13.94	14.01 14.14	14.5	3
5	64QAM Cha		0	14.15 131987	13.90 132322	13.84 132657	Tune-up limit	MPR
3	Frequen QPSK	cy (MHz)	0	1711.5 16.80	1745 16.78	1778.5 16.60	(dBm)	(dB)
3	QPSK QPSK	1	8 14	16.33	16.51	16.47	17.5	0
3	QPSK QPSK	8	0 4	15.35 15.24	15.50 15.18	15.27		
3	QPSK	8	7	15.15	15.44	15.40	16.5	1
3	QPSK 16QAM	15	0	15.06 15.07	15.38	15.25 15.22		
3	16QAM 16QAM	1	14	15.24 15.12	15.35 15.18	15.05	16.5	1
3	16QAM 16QAM	8	4	14.39 14.32	14.44 14.38	14.50 14.45	15.5	2
3	16QAM 16QAM	8 15	7 0	14.44 14.51	14.49 14.47	14.51 14.49		
3	64QAM 64QAM	1	0	14.78 15.04	14.60 14.68	14.94 15.05	15.5	2
3	64QAM 64QAM	1 8	14	14.85	14.82	14.64		
3	64QAM 64QAM	8	4 7	13.88	13.91	13.88	14.5	3
3	64QAM Cha	15	0	14.04	14.01	13.98	Tune-up	MPR
	Frequen	cy (MHz)		1710.7	1745	1779.3	limit (dBm)	MPR (dB)
1.4	QPSK QPSK	1	3	16.86 16.57	16.88 16.53	16.82 16.86		
1.4	QPSK QPSK	3	5 0	16.50 16.59	16.47 16.64	16.63 16.64	17.5	0
1.4	QPSK QPSK	3	1 3	16.35 16.58	16.38 16.79	16.36 16.51		
1.4	QPSK 16QAM	6	0	15.67	15.88	15.85	16.5	1
1.4	16QAM 16QAM	1	3	15.59 15.62	15.58 15.88	15.80 15.56		
1.4	16QAM 16QAM	3	0	15.62 15.53 15.69	15.88 15.56 15.50	15.58 15.58	16.5	1
1.4	16QAM	3	3	15.41	15.45	15.57		
1.4	16QAM 64QAM	1	0	14.75	14.98	14.97	15.5	2
1.4	64QAM 64QAM	1	5	14.82	14.63 14.84	14.81	15.5	2
1.4			0	14.53	14.44	14.53		
	64QAM 64QAM	3 3 3	1 3	14.49	14.43	14.75 14.66		



WLAN Power

2.4GHz WLAN						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
		1	2412	18.46	19	
	802.11b 1Mbps	6	2437	18.45	19	100.00
		11	2462	17.97	19	
	802.11g 6Mbps	1	2412	13.18	14	
		2	2417	16.68	17	96.50 97.28
		6	2437	16.20	17	
2.4GHz WLAN		9	2452	16.03	17	
		10	2457	12.99	14	
		11	2462	11.55	12	
		1	2412	11.17	12	
		2	2417	16.58	17	
		6	2437	16.08	17	
	802.11n-HT20 MCS0	8	2447	16.38	17	
	,	9	2452	13.65	14	
		10	2457	11.85	12	
		11	2462	10.55	11	

BT BR / EDR

Mode	Channel	Frequency	Average power (dBm)			
Mode	Charmer	(MHz)	1Mbps	2Mbps	3Mbps	
	CH 00	2402	10.64	8.36	8.42	
BR / EDR	CH 39	2441	10.04	7.59	7.54	
	CH 78	2480	9.85	7.50	7.54	
	Tune-up Limit		11	9	9	

BT LE

Mode	Channel	Frequency	Average power (dBm)
Widde	ode Channel	(MHz)	GFSK
	CH 00	2402	0.65
LE	CH 19	2440	2.93
	CH 39	2480	2.27
	Tune-up Limit		3