TEST REPORT

Report No.:	BCTC2307096488-7E
Applicant:	SHENZHEN YUNJI INTELLIGENT TECHNOLOGY CO.,LTD
Product Name:	Smart Phone
Model/Type Ref.:	C36
Tested Date:	2023-09-04 to 2023-09-11
Issued Date:	2023-09-21

Shenzhen BCTC Testing Co., Ltd.

FCC ID: 2ANMU-C36SPUT

Product Name:	Smart Phone
Trademark:	OUKITEL
Model/Type Ref.:	C36 C36 S, C36 Pro, C36 Ultra
Applicant:	SHENZHEN YUNJI INTELLIGENT TECHNOLOGY CO.,LTD
Address:	A2 2F BUILDING ENET NEW INDUSTRIAL PARK, DAFU INDUSTRIAL ZONE, GUANLAN, LONGHUA SHENZHEN, 518XXX China
Manufacturer:	SHENZHEN YUNJI INTELLIGENT TECHNOLOGY CO.,LTD
Address:	A2 2F BUILDING ENET NEW INDUSTRIAL PARK, DAFU INDUSTRIAL ZONE, GUANLAN, LONGHUA SHENZHEN, 518XXX China
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2023-09-04
Sample tested Date:	2023-09-04 to 2023-09-11
Issue Date:	2023-09-21
SAR Max. Values is：	1.006 W/kg (1g) for Head 0.923 W/kg (1g) for Body 0.892 W/kg (1g) for Hotspot
Test Standards:	IEEE Std C95.1, 2019/ IEEE Std 1528™-2013/FCC Part 2.1093
Test Results:	PASS
Remark:	This is SAR test report

Tested by:	Approved by:
Min zhi Cheng	
Min Zhi Cheng/ Project Handler	Zero Zhou/Reviewer

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Table Of Content

(Note: N/A Means Not Applicable)

1. Version

Report No.	Issue Date	Description	Approved
BCTC2307096488-7E	2023-09-21	Original	Valid

2. Test Standards

IEEE Std C95.1-2019: IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz. It specifies the maximum exposure limit of 1.6 W/kg as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.
IEEE Std 1528™-2013: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.
FCC Part 2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices
KDB 447498 D01 General RF Exposure Guidance v06: Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04: SAR Measurement Requirements for 100 MHz to 6 GHz
KDB 865664 D02 RF Exposure Reporting v01r02: RF Exposure Compliance Reporting and Documentation Considerations
KDB 248227 D01 802.11 Wi-Fi SAR v02r02: SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS
KDB 941225 D01 3G SAR Procedures: 3G SAR MEAUREMENT PROCEDURES
KDB 941225 D05 SAR for LTE Devices: SAR EVALUATION CONSIDERATIONS FOR LTE DEVICES
KDB 941225 D06 Hotspot Mode v02r01: SAR EVALUATION PROCEDURES FOR PORTABLE DEVICES WITH WIRELESS ROUTER CAPABILITIES
KDB 648474 D04 Handset SAR v01r03: SAR EVALUATION CONSIDERATIONS FOR WIRELESS HANDSETS

3. Test Summary

The maximum results of Specific Absorption Rate (SAR) have found during testing are as follows:

Frequency Band	Report SAR1g (W/kg)			SAR1g Limit (W/kg)
	Head	Body (10mm Gap)	Hotspot (10mm Gap)	
GSM	0.542	0.422	0.251	1.6
WCDMA	0.825	0.441	0.331	1.6
LTE	**1.006**	**0.565**	**0.573**	1.6
WLAN 2.4G	0.404	0.358	0.319	1.6
WLAN 5G	0.447	0.350	0.308	1.6
Simultaneous Transmission	1.453	0.923	0.892	1.6

The device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-2019, and had been tested in accordance with the measurement methods and procedure specified in IEEE 1528-2013.

4. SAR Limits

FCC Limit (1g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average(averaged over the whole body)	0.08	0.4
Spatial Peak(averaged over any 1 g of tissue)	1.6	8.0
Spatial Peak(hands/wrists/ feet/anklesaveraged over 10 g)	4.0	20.0

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.
Occupational/Controlled Environments are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).

5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is <3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k=2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.

6. Product Information and Test Setup

6.1 Product Information

Model/Type Ref.:	C36 C36 S, C36 Pro, C36 Ultra
Model differences:	All the model are the same circuit and RF module, except model names.
Hardware Version:	FS311-MB-V0.1A
Software Version:	OUKITEL_C36_EEA_V01
Ratings:	DC 5V from adapter/DC 3.87V from battery
Adapter:	Model: PS10UA050K2000EU Input: 100-240V~50/60Hz 0.35A Max. Output: 5.0V ⎓ 2.0A 10.0W

2,3G

Operation Frequency:	GSM/GPRS/EGPRS 850: TX: 824~849MHz; RX: 869~894MHz; GSM/GPRS/EGPRS 1900: TX:1850~1910MHz; RX:1930~1990MHz; WCDMA Band II: TX: 1852.40~1907.60MHz; Rx: 1932.60~1987.40MHz; WCDMA Band IV: TX: 1712.40~1752.60MHz; RX: 2112.60 – 2452.40MHz WCDMA Band V: TX: 826.40~846.60MHz; RX: 871.40~ 891.60MHz;
GPRS Class:	Class 12
Max RF Output Power:	GSM/GPRS/EGPRS 850: 33.22 dBm, GSM/GPRS/EGPRS 1900: 29.25 dBm WCDMA Band II: 22.50 dBm WCDMA Band IV: 22.55 dBm WCDMA Band V: 23.00 dBm
Type of Modulation:	GSM with GMSK Modulation WCDMA Mode with BPSK Modulation HSDPA Mode with QPSK, 16QAM Modulation HSUPA Mode with QPSK, 16QAM Modulation
Antenna installation:	Internal antenna
Antenna Gain:	GSM850: -0.21 dBi GSM1900: 0.13 dBi WCDMA Band II: 0.11 dBi WCDMA Band IV: 0.3 dBi WCDMA Band V: -0.20 dBi

4G

Tx Frequency:	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500MHz-2570MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 17: 704MHz-716MHz
Rx Frequency:	LTE Band 2: 1930 MHz ~ 1990 MHz LTE Band 4: 2110 MHz ~ 2155 MHz LTE Band 5: 869 MHz ~ 894 MHz LTE Band 7: 2620MHz-2690MHz LTE Band 12: 729 MHz ~ 746 MHz LTE Band 17: 734MHz-746MHz
Bandwidth:	LTE Band 2: 1.4MHz /3MHz /5MHz /10MHz /15MHz /20MHz LTE Band 4: 1.4MHz /3MHz /5MHz /10MHz /15MHz /20MHz

	LTE Band 5: 1.4MHz /3MHz /5MHz /10MHz LTE Band 7: 5MHz /10MHz /15MHz /20MHz LTE Band 12: 1.4MHz /3MHz /5MHz /10MHz LTE Band 17: 5MHz /10MHz
Type of Modulation:	QPSK/16QAM
Antenna Type:	Internal Antenna
Antenna Gain:	LTE Band 2: 0.11 dBi LTE Band 4: 0.15 dBi LTE Band 5: -0.20 dBi LTE Band 7: 0.26 dBi LTE Band 12: -0.22 dBi LTE Band 17: -0.28 dBi

BT

BT	
Operation Frequency:	2402-2480MHz
Bluetooth Version:	5.0
Type of Modulation:	GFSK, π/ 4 DQPSK, 8DPSK
Number Of Channel	79CH
Antenna installation:	Internal antenna
Antenna Gain:	0.22 dBi
BLE	
Operation Frequency:	2402-2480MHz
Bluetooth Version:	5.0
Type of Modulation:	GFSK
Data Rate:	LE 1M PHY, LE 2M PHY
Number Of Channel	40CH
Antenna installation:	Internal antenna
Antenna Gain:	0.22 dBi

WLAN

WIFI2.4G	
Operation Frequency:	802.11b/g/n20MHz:2412~2462MHz 802.11n40MHz:2422~2452 MHz
Bit Rate of Transmitter	802.11b:11/5.5/2/1Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n Up to 150Mbps
Type of Modulation:	OFDM/DSSS
Number Of Channel	802.11b/g/n20MHz:11CH 802.11n40MHz: 7 CH
Antenna Gain:	0.22 dBi
WIFI5G	
IEEE 802.11 WLAN Mode Supported	802.11a/n/ac(20MHz channel bandwidth) 802.11n/ac(40MHz channel bandwidth) 802.11ac(80MHz channel bandwidth)
Operation Frequency:	5180-5240MHz for 802.11a/n(HT20); 5190-5230MHz for 802.11n(HT40); 5210MHz for 802.11 ac80; 5745-5825 MHz for 802.11a/n(HT20); 5755-5795 MHz for 802.11n(HT40);

	5775MHz for 802.11 ac80;
Data Rate	802.11a: 6,9,12,18,24,36,48,54Mbps; 802.11n(HT20/HT40): MCS0-MCS15; 802.11ac(VHT20): NSS1, MCS0-MCS8 802.11ac(VHT40/VHT80):NSS1, MCS0-MCS
Type of Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n/ac;
Number Of Channel	4 channels for 802.11a/n20 in the 5180-5240MHz band ; 2 channels for 802.11 n40 in the 5190-5230MHz band ; 1 channels for 802.11 ac80 in the 5210MHz band ; 5 channels for 802.11a/n20 in the 5745-5825MHz band ; 2 channels for 802.11 n40 in the 5755-5795MHz band ; 1 channels for 802.11 ac80 in the 5775MHz band
Antenna installation:	Internal antenna
Antenna Gain:	0.05 dBi

6.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

6.3 Support Equipment

Cable of Product

No.	Cable Type	Quantity	Provider	Length (m)	Shielded	Note
1	--	--	Applicant	---	Yes/No	--
2	--	--	BCTC	--	Yes/No	--

No.	Device Type	Brand	Model	Series No.	Note
1.	---	---	---	---	---
2.	--	--	--	--	--

Notes:
1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

6.4 Test Environment

1. Normal Test Conditions:

Humidity(%):	35-75
Atmospheric Pressure(kPa):	95-105
Temperature(℃):	18-25

2. Extreme Test Conditions:
N/A

7. Test Facility and Test Instrument Used

7.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

FCC Test Firm Registration Number: 712850
A2LA certificate registration number is: CN1212
ISED Registered No.: 23583
ISED CAB identifier: CN0017

7.2 Test Instrument Used

Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
PC	DELL	\	\	N/A	N/A
SAR Measurement system	SATIMO	\	\	N/A	N/A
Signal Generator	Keysight	83711B	US37100131	Aug. 29, 2023	Aug. 28, 2024
Multimeter	Keithley	1160271	\	Nov. 10, 2022	Nov 09, 2023
S-parameter Network Analyzer	R&S	ZVB 8	101353	Dec. 07, 2022	Dec. 06, 2023
Wideband Radio Communication Tester	R&S	CMW500	\	Nov. 10, 2022	Nov 09, 2023
E SAR PROBE 6GHz	MVG	SSE2	2623-EPGO-420	July 18, 2023	July 17, 2024
DIPOLE 750	SATIMO	SID 750	SN 47/21 DIP 0G835-620	Nov. 25, 2021	Nov. 24, 2024
DIPOLE 835	SATIMO	SID 835	SN 47/21 DIP 0G835-621	Nov. 25, 2021	Nov. 24, 2024
DIPOLE 1800	SATIMO	SID 1800	SN 47/21 DIP 1G800-623	Nov. 25, 2021	Nov. 24, 2024
DIPOLE 1900	SATIMO	SID 1900	SN 47/21 DIP 2G100-624	Nov. 25, 2021	Nov. 24, 2024
DIPOLE 2450	SATIMO	SID 2450	SN 47/21 DIP 2G450-627	Nov. 25, 2021	Nov. 24, 2024
DIPOLE 2600	SATIMO	SID 2600	SN 47/21 DIP 2G600-628	Nov. 25, 2021	Nov. 24, 2024
DIPOLE 5000	SATIMO	SID5000	SN 47/21 DIP 5G000-629	Nov. 25, 2021	Nov. 24, 2024
COMOSAR OPENCoaxial Probe	SATIMO	\	\	Nov. 18, 2022	Nov. 17, 2023
SAR Locator	SATIMO	\	\	Nov. 18, 2022	Nov. 17, 2023
Communication Antenna	SATIMO	\	\	Nov. 18, 2022	Nov. 17, 2023
FEATURE PHONEPOSITIONING DEVICE	SATIMO	\	\	N/A	N/A
DUMMY PROBE	SATIMO	\	\	N/A	N/A
SAM Phantom	MVG	\	SN 13/09 SAM68	N/A	N/A
Liquid measurement Kit	HP	85033D	3423A08186	N/A	N/A
Power meter	Agilent	E4419	\	May 15, 2023	May 14, 2024

Power meter	Agilent	E4419	\	May 15, 2023	May 14, 2024
Power sensor	Agilent	E9300A	\	May 15, 2023	May 14, 2024
Power sensor	Agilent	E9300A	\	May 15, 2023	May 14, 2024
Directional Coupler	Krytar 158020	131467	\	Nov. 10, 2022	Nov 09, 2023

Note:
Per KDB865664D01 requirements for dipole calibration, the test laboratory has adopted three year extended calibration interval. Each measured dipole is expected to evalute with following criteria at least on annual interval.

1. There is no physical damage on the dipole;
2. System check with specific dipole is within 10% of calibrated values;
3. The most recent return-loss results, measued at least annually, deviates by no more than 20% from the previous measurement;
4. The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the provious measurement.

Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

8. Specific Absorption Rate (SAR)

8.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techiques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

8.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dv}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = C\left(\frac{\delta T}{\delta t}\right)$$

Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the

electrical field in the tissue by

$$SAR = \frac{\sigma|E|^2}{\rho}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

9. SAR Measurement System

9.1 The Measurement System

Comosar is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The Comosar system consists of the following items:
- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

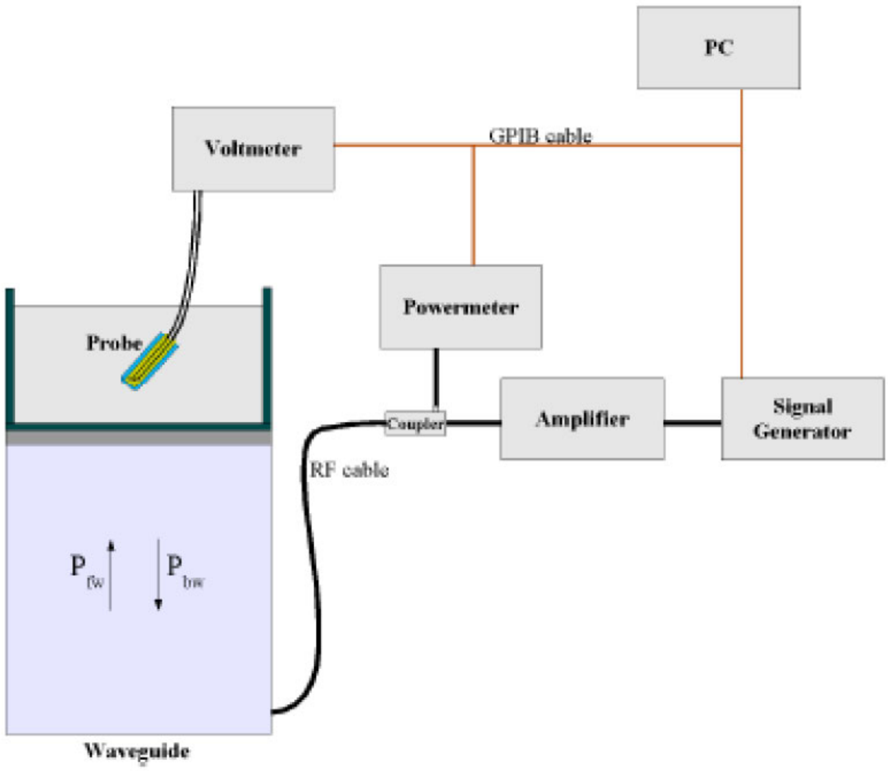
The following figure shows the system.

The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The OpenSAR software computes the results to give a SAR value in a 1g or 10g mass.

9.2 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 46/21 EPGO362 with following specifications is used
- Dynamic range: 0.01-100 W/kg
- Tip Diameter : 5 mm
- Distance between probe tip and sensor center: 2.10mm
- Distance between sensor center and the inner phantom surface: 4 mm (repeatability better than +/- 1mm)
- Probe linearity: ＜0.25 dB
- Axial Isotropy: ＜0.25 dB
- Spherical Isotropy: ＜0.50 dB
- Calibration range: 835 to 2500MHz for head & body simulating liquid.

Angle between probe axis (evaluation axis) and surface normal line:1ess than 30°
Probe calibration is realized, in compliance with EN 62209-1 and IEEE 1528 STD, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the EN 62209-1 annex technique using reference guide at the five frequencies.



$$SAR = \frac{4(p_{fw} - p_{Pbw})}{ab\delta} cos^2 \ (\pi\frac{y}{a}) \ c^{(2\pi/\delta)}$$

Where :
Pfw = Forward Power
Pbw = Backward Power
a and b =Waveguide dimensions
l = Skin depth

Keithley configuration:
Rate = Medium; Filter = ON; RDGS = 10; Filter type = Moving Average; Range auto after each calibration, a SAR measurement is performed on a validation dipole and compared with a NPL calibrated probe, to verify it.

The calibration factors, CF(N), for the 3 sensors corresponding to dipole 1, dipole 2 and dipole 3 are:

CF(N)=SAR(N)/Vlin(N) (N=1,2,3)

The linearised output voltage Vlin(N) is obtained from the displayed output voltage V(N) using

Vlin(N)=V(N)*(1+V(N)/DCP(N)) (N=1,2,3)

where DCP is the diode compression point in mV.

9.3 Probe Calibration Process

Dosimetric Assessment Procedure
Each E-Probe/Probe Amplifier combination has unique calibration parameters. SATIMO Probe calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm2) using an with CALISAR, Antenna proprietary calibration system.

Free Space Assessment Procedure
The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1mW/cm2.

Temperature Assessment Procedure
E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated head tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where:
Δt = exposure time (30 seconds),
C = heat capacity of tissue (brain or muscle),
ΔT = temperature increase due to RF exposure.

SAR is proportional to ΔT/Δt, the initial rate of tissue heating, before thermal diffusion takes place. The electric field in the simulated tissue can be used to estimate SAR by equating the thermally derived SAR to that with the E- field component.

$$SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

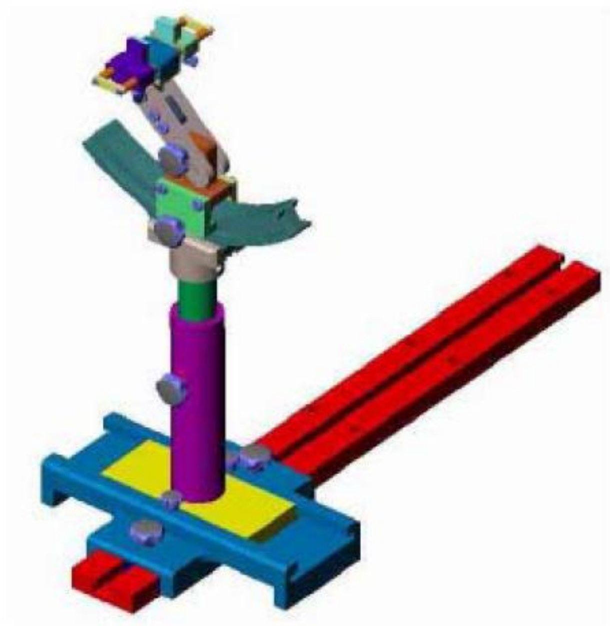
Where:
σ = simulated tissue conductivity,
ρ = Tissue density (1.25 g/cm3 for brain tissue)

9.4 Phantom

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.

9.5 Device Holder

The positioning system allows obtaining cheek and tilting position with a very good accuracy. In compliance with CENELEC, the tilt angle uncertainty is lower than 1°.



System Material	Permittivity	Loss Tangent
Delrin	3.7	0.005

10. Tissue Simulating Liquids

10.1 Composition of Tissue Simulating Liquid

For the measurement of the field distribution inside the SAM phantom with SMTIMO, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. Please see the following photos for the liquid height.

Liquid Height for Body SAR

The Composition of Tissue Simulating Liquid

Frequency (MHz)	Water (%)	Salt (%)	1,2-Propane diol (%)	HEC (%)	Preventol (%)	DGBE (%)
Head/Body						
835	40.3	1.4	57.9	0.2	0.2	0
900	40.3	1.4	57.9	0.2	0.2	0
1800-2000	55.2	0.3	0	0	0	44.5
2450	55.0	0.1	0	0	0	44.9
2600	54.9	0.1	0	0	0	45.0

Frequency (MHz)	Water (%)	Hexyl Carbitol (%)	Triton X-100 (%)
Head/Body			
5000-6000	65.52	17.24	17.24

10.2 Limit

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters

computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Target Frequency (MHz)	Head	
	Conductivity (σ)	Permittivity (ε_r)
150	0.76	52.3
300	0.87	45.3
450	0.87	43.5
750	0.89	41.9
835	0.90	41.5
900	0.97	41.5
915	0.98	41.5
1450	1.20	40.5
1610	1.29	40.3
1800-2000	1.40	40.0
2450	1.80	39.2
2600	1.96	39.0
3000	2.40	38.5
5200	4.66	36.0
5400	4.86	35.8
5600	5.07	35.5
5800	5.27	35.3

10.3 Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an R&S ZVB 8. Dielectric Probe Kit and an Agilent Network Analyzer.

Calibration Result for Dielectric Parameters of Tissue Simulating Liquid

Frequency (MHz)	Liquid	Target Conductivity (σ)	Target Permitivity (εr)	Measured Conductivity (σ)	Measured Permitivity (εr)	Delta (σ)%	Delta (εr)%	Limit (%)	Temp . TSL (°C)	Date
750	Head	0.89	41.90	0.924	40.257	3.82	-3.92	±5	23.7	09/07/2023
835	Head	0.90	41.50	0.920	42.930	2.22	3.45	±5	23.7	09/07/2023
1800	Head	1.40	40.0	1.365	39.943	-2.50	-0.14	±5	23.3	09/05/2023
1900	Head	1.40	40.0	1.427	40.990	1.93	2.48	±5	23.3	09/05/2023
2450	Head	1.80	39.2	1.841	39.085	2.28	-0.29	±5	23.3	09/05/2023
2600	Head	1.96	39.0	1.872	39.292	-4.49	0.75	±5	23.3	09/05/2023
5200	Head	4.66	36.0	4.488	36.294	-3.69	0.82	±5	23.3	09/05/2023
5800	Head	5.27	35.3	5.184	34.028	-1.63	-3.60	±5	23.3	09/05/2023

Remark:

1. The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.
2. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

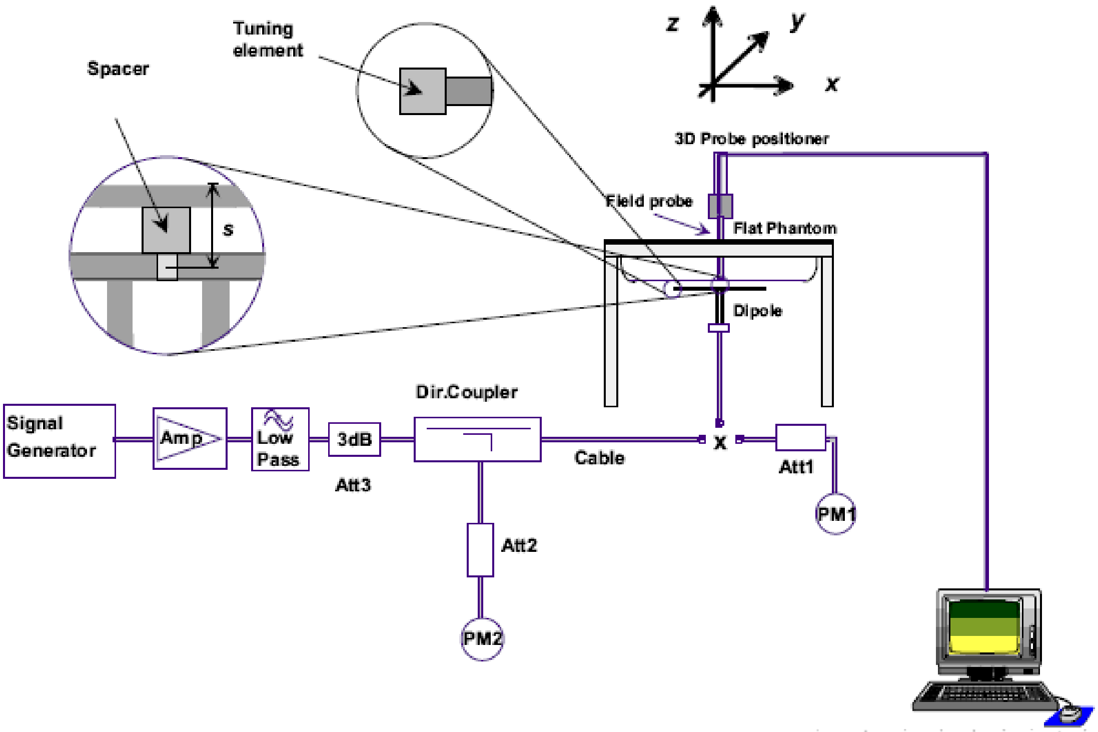
11. System Check

11.1 Purpose of System Performance Check

At the device test frequencies. System check verifies the measurement repeatability of a SAR system before compliance testing and is not a validation of all system specifications. The latter is not required for testing a device but is mandatory before the system is deployed. The system check detects possible short-term drift and unacceptable measurement errors or uncertainties in the system.

11.2 System Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave which comes from a signal generator at frequency 600MHz-6000MHz. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The output power on dipole port must be calibrated to 20 dBm (100 mW) before dipole is connected.



System Verification Setup Block Diagram

Setup Photo of Dipole Antenna

11.3 Validation Results

Comparing to the original SAR value provided by SATIMO, the validation data should be within its specification of 10 %. The following table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion.

Frequency (MHz)	Power	Measured SAR_{1g} (W/Kg)	Normalize to 1 Watt	Drift (%)	1W Target SAR_{1g} (W/Kg)	Difference Percentage (%)	Limit (%)	Liquid Temp	Date
750	250 mW	2.116	8.464	3.51	8.58	-1.35	±10	23.7	09/07/2023
835	250 mW	2.517	10.068	-0.25	10.01	0.58	±10	23.7	09/07/2023
1800	250 mW	10.159	40.636	3.81	39.74	2.25	±10	23.5	09/06/2023
1900	250 mW	10.736	42.944	0.71	41.26	4.08	±10	23.5	09/06/2023
2450	250 mW	13.785	55.14	-2.78	55.16	-0.04	±10	23.5	09/06/2023
2600	250 mW	14.617	58.468	3.63	56.50	3.48	±10	23.5	09/06/2023
5200	250 mW	18.511	74.044	1.90	76.41	-3.10	±10	23.5	09/06/2023
5800	250 mW	18.979	75.916	-1.02	76.49	-0.75	±10	23.5	09/06/2023

12. EUT Testing Position

12.1 Define Two Imaginary Lines on the Handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width wt of the handset at the level of the acoustic output, and the midpoint of the width wb of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic
output. The horizontal line is also tangential to the face of the handset at point A.

(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

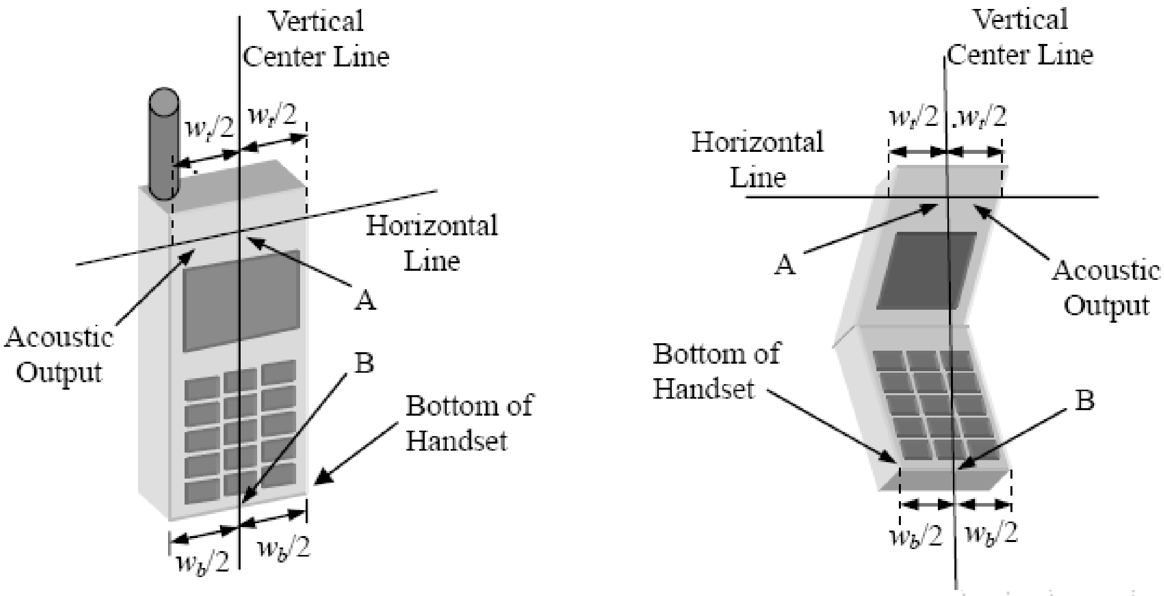


Illustration for Handset Vertical and Horizontal Reference Lines

12.2 Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see below).

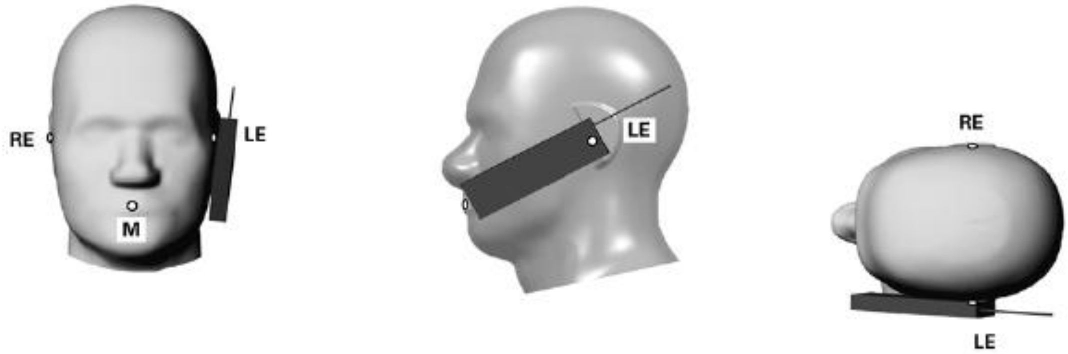


Illustration for Cheek Position

12.3 Tilted Position

(a) To position the device in the “cheek” position described above.

(b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see below).

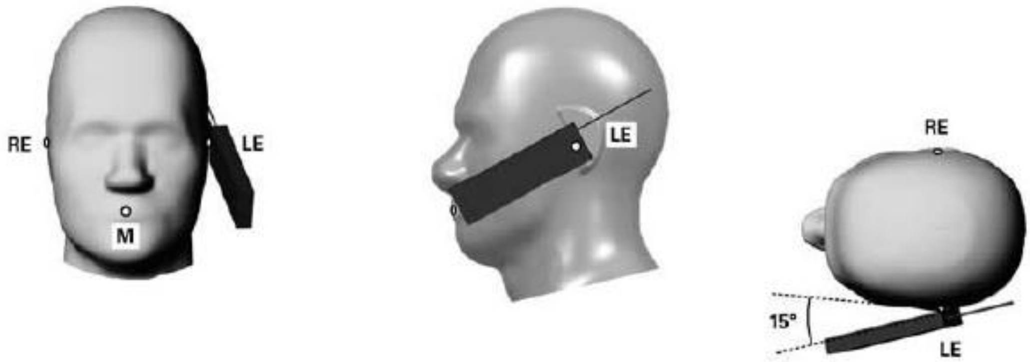
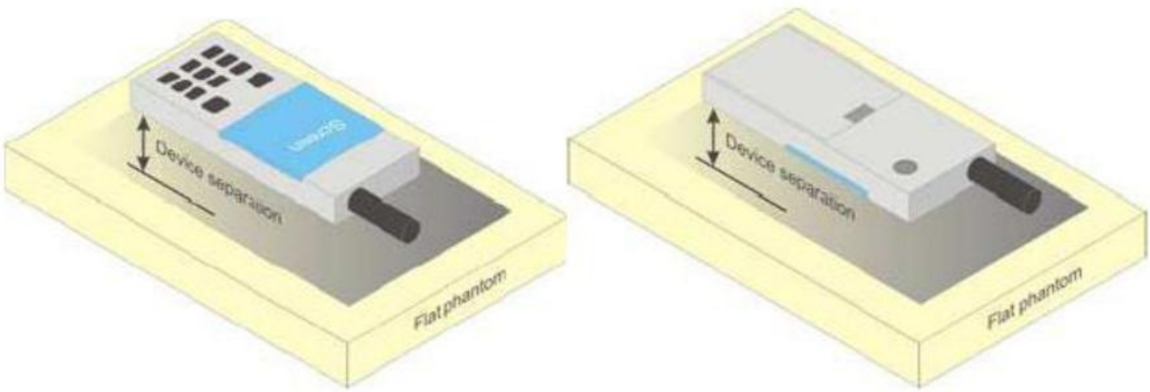


Illustration for Tilted Position

12.4 Body Position

A typical example of a body-worn device is a Mobile Phone , wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person’s body using a carry accessory approved by the wireless device manufacturer.



Test positions for body-worn devices

13. SAR Measurement Procedures

13.1 Measurement Procedures

The measurement procedures are as follows:
(a) Use base station simulator (if applicable) or engineering software to transmit RF power continuously (continuous Tx) in the highest power channel.
(b) Keep EUT to radiate maximum output power or 100% factor (if applicable)
(c) Measure output power through RF cable and power meter.
(d) Place the EUT in the positions as Annex D demonstrates.
(e) Set scan area, grid size and other setting on the SATIMO software.
(f) Measure SAR results for the highest power channel on each testing position.
(g) Find out the largest SAR result on these testing positions of each band
(h) Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:
(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

13.2 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The SATIMO software includes all numerical procedures necessary to evaluate the spatial peak SAR value.
The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.
The entire evaluation of the spatial peak values is performed within the post-processing engine. The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:
(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

13.3 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures 5x5x7 points with step size 8, 8 and 5 mm for 300 MHz to 3 GHz, and 8x8x8 points with step size 4, 4 and 2.5 mm for 3 GHz to 6 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

<table>
<tr><th colspan="3"></th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 mm ± 1 mm</td><td>$\frac{1}{2}\cdot\delta\cdot\ln(2)$ mm ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$ mm</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

13.4 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing (step-size is 4, 4 and 2.5 mm). When all volume scan were completed, the software can combine and subsequently superpose these measurement data to calculating the multiband SAR.

13.5 SAR Averaged Methods

The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimize measurements errors, but the highest local SAR will occur at the surface of the phantom.

An extrapolation is using to determinate this highest local SAR values. The extrapolation is based on a fourth-order least-square polynomial fit of measured data. The local SAR value is then extrapolated from the liquid surface with a 1mm step.

The measurements have to be performed over a limited time (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8 mm. To obtain an accurate assessment of the maximum SAR averaged over 10g and 1 g requires a very fine resolution in the three dimensional scanned data array.

13.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In SATIMO measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

14. SAR Test Result

14.1 Conducted RF Output Power

According KDB 447498 D01 General RF Exposure Guidance v06 Section 4.1 2) states that “Unless it is specified differently in the published RF exposure KDB procedures, these requirements also apply to test reduction and test exclusion considerations. Time-averaged maximum conducted output power applies to SAR and, as required by § 2.1091(c), time-averaged ERP applies to MPE. When an antenna port is not available on the device to support conducted power measurement, such as FRS and certain Part 15 transmitters with built-in integral antennas, the maximum output power allowed for production units should be used to determine RF exposure test exclusion and compliance.”

The Tune-up limit already includes component tolerance. KDB 447498 sec.4.1.(d) at the maximum rated output power and within the tune-up tolerance range specified for the product, but not more than 2 dB lower than the maximum tune-up tolerance limit.

<GSM>

General Note:

1. Per KDB 447498 D01, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions.
3. Per October 2013 TCB Workshop: When the maximum frame-averaged powers levels are within 0.25 dB of each other, test the configuration with the most number of time slots.

Conducted power measurement results

GSM - Burst Average Power (dBm)								
Band	**GSM850**			**Tune-up**	**GSM1900**			**Tune-up**
Channel	**128**	**190**	**251**		**512**	**661**	**810**	
Frequency (MHz)	**824.2**	**836.6**	**848.8**		**1850.2**	**1880**	**1909.8**	
GSM	33.16	32.81	32.86	33.5	26.96	27.06	26.91	27.5
GPRS (1 slot)	33.17	32.84	32.89	33.5	25.47	**27.10**	26.95	27.5
GPRS (2 slots)	30.83	30.45	30.41	31.5	24.75	24.69	24.44	25.5
GPRS (3 slots)	28.69	28.35	28.30	29.0	22.65	22.60	22.32	23.0
GPRS (4 slots)	26.47	26.19	26.15	27.0	20.52	20.47	20.19	21.0
EGPRS (1 slot)	**33.22**	32.86	32.94	33.5	24.51	24.43	24.77	25.5
EGPRS (2 slots)	30.88	30.49	30.44	31.5	22.65	22.81	22.90	23.5
EGPRS (3 slots)	28.74	28.39	28.34	29.0	20.91	20.59	21.01	21.5
EGPRS (4 slots)	26.53	26.23	26.23	27.0	19.49	18.41	18.90	20.0

GSM - Source-Based Time-Average Power (dBm)						
Band	**GSM850**			**GSM1900**		
Channel	**128**	**190**	**251**	**512**	**661**	**810**
Frequency (MHz)	**824.2**	**836.6**	**848.8**	**1850.2**	**1880**	**1909.8**
GSM	24.16	23.81	23.86	17.96	18.06	17.91
GPRS (1 slot)	24.17	23.84	23.89	16.47	18.10	17.95
GPRS (2 slots)	24.83	24.45	24.41	**18.75**	18.69	18.44
GPRS (3 slots)	24.44	24.10	24.05	18.40	18.35	18.07
GPRS (4 slots)	23.47	23.19	23.15	17.52	17.47	17.19
EGPRS (1 slot)	24.22	23.86	23.94	15.51	15.43	15.77
EGPRS (2 slots)	**24.88**	24.49	24.44	16.65	16.81	16.90
EGPRS (3 slots)	24.49	24.14	24.09	16.66	16.34	16.76
EGPRS (4 slots)	23.53	23.23	23.23	16.49	15.41	15.90

Notes:
1. Division Factors
To average the power, the division factor is as follows:
1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.00dB
2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.00dB
3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB
4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.00dB

2. According to the conducted power as above, the GPRS measurements are performed with 2Txslot for GPRS850 and 2Txslot GPRS1900.

3. Per KDB 941225 D01, SAR is not required for EDGE (8PSK) mode because the maximum output power and tune-up limit is ≤ 1/4dB higher than GPRS/EDGE (GMSK) or the adjusted SAR of the highest reported SAR of GPRS/EDGE (GMSK) is ≤ 1.2W/kg.

<W-CDMA>

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station E5515C referred to theSetup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (βc and βd) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$, and Δ_{CQI} = 24/15 with $\beta_{hs} = 24/15 * \beta_c$.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base StationR&S CMU200 referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (βc and βd) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

General Note
1. Per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If AMR 12.2kbps power is < 0.25dB higher than RMC 12.2kbps, SAR tests with AMR 12.2kbps can be excluded.
2. By design, AMR and HSDPA/HSUPA RF power will not be larger than RMC 12.2kbps, detailed information is included in Tune-up Procure exhibit.
3. It is expected by the manufacturer that MPR for some HSDPA/HSUPA subtests may differ from the specification of 3GPP, according to the chipset implementation in this model. The implementation and expected deviation are detailed in tune-up procedure exhibit.

Conducted power measurement results

Band	WCDMA Band II				WCDMA Band IV			
Channel	9262	9400	9538	Tune-up	1312	1450	1513	Tune-up
Frequency (MHz)	1852.4	1880.0	1907.6		1712.4	1740	1752.6	
RMC 12.2K	22.14	22.49	**22.50**	23.0	**22.55**	22.54	22.37	23.0
HSDPA Subtest-1	22.10	21.93	21.55	22.5	21.79	22.48	21.96	23.0
HSDPA Subtest-2	21.80	21.65	21.26		21.43	22.16	21.64	
HSDPA Subtest-3	21.47	21.26	20.97		21.12	21.94	21.23	
HSDPA Subtest-4	21.28	21.33	20.96		21.02	21.71	21.08	
HSUPA Subtest-1	21.79	21.64	21.40	22.5	21.67	22.13	21.76	23.0
HSUPA Subtest-2	21.88	21.82	21.49		21.61	22.40	21.89	
HSUPA Subtest-3	21.55	21.34	21.20		21.16	21.99	21.58	
HSUPA Subtest-4	21.84	21.82	21.54		21.69	22.43	21.89	
HSUPA Subtest-5	21.37	21.40	21.14		21.34	22.10	21.57	

Band	WCDMA Band V				/			
Channel	4132	4182	4233	Tune-up	/	/	/	Tune-up
Frequency (MHz)	826.4	836.4	846.6		/	/	/	
RMC 12.2K	22.59	22.68	**22.91**	23.5	/	/	/	/
HSDPA Subtest-1	23.00	22.67	22.48	23.5	/	/	/	/
HSDPA Subtest-2	22.73	22.37	22.29		/	/	/	
HSDPA Subtest-3	22.14	22.19	21.81		/	/	/	
HSDPA Subtest-4	22.22	22.15	21.75		/	/	/	
HSUPA Subtest-1	22.87	22.55	22.37	23.5	/	/	/	/
HSUPA Subtest-2	22.83	22.59	22.48		/	/	/	
HSUPA Subtest-3	22.44	22.36	22.03		/	/	/	
HSUPA Subtest-4	22.85	22.67	22.43		/	/	/	
HSUPA Subtest-5	22.57	22.42	22.11		/	/	/	

Note:

1. Per KDB 941225 D01 v03, the 12.2kbps RMC mode was selected for SAR testing (the primary mode).
2. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤1/4dB higher than the primary mode (RMC12.2kbps) or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

<LTE>

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.
LTE QPSK configuration has the highest maximum average output power per 3GPP standard.

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					18607	18900	19193
Band2	1.4	1	#0	QPSK	22.51	22.86	23.05
		1	#Mid		22.57	22.92	23.08
		1	#Max		22.56	22.92	23.14
		3	#0		22.68	22.99	23.00
		3	#Mid		22.72	22.97	22.95
		3	#Max		22.64	22.96	23.01
		6	#0		22.12	22.40	22.47
	1.4	1	#0	QAM16	23.01	22.26	**23.58**
		1	#Mid		22.97	22.30	23.58
		1	#Max		23.06	22.30	23.56
		3	#0		22.40	22.64	22.78
		3	#Mid		22.35	22.68	22.77
		3	#Max		22.39	22.65	22.80
		6	#0		21.25	21.59	21.71

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					18615	18900	19185
Band2	3	1	#0	QPSK	22.59	22.86	23.02
		1	#Mid		22.65	22.89	22.97
		1	#Max		22.62	22.90	23.05
		8	#0		22.15	22.49	22.49
		8	#Mid		22.18	22.51	22.54
		8	#Max		22.16	22.44	22.51
		15	#0		22.14	22.47	22.52
	3	1	#0	QAM16	**23.47**	22.09	22.53
		1	#Mid		23.44	22.00	22.60
		1	#Max		23.49	22.02	22.60
		8	#0		21.26	21.66	21.62
		8	#Mid		21.31	21.67	21.59
		8	#Max		21.26	21.60	21.64
		15	#0		21.46	21.60	21.78

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					18625	18900	19175
Band2	5	1	#0	QPSK	22.54	23.03	22.70
		1	#Mid		22.56	23.06	22.73
		1	#Max		22.60	23.00	22.72
		12	#0		22.27	22.51	22.46
		12	#Mid		22.18	22.50	22.42
		12	#Max		22.28	22.54	22.52
		25	#0		22.17	22.49	22.51
	5	1	#0	QAM16	22.50	22.67	**23.13**
		1	#Mid		22.51	22.67	23.07
		1	#Max		22.53	22.59	23.09
		12	#0		21.29	21.44	21.67
		12	#Mid		21.22	21.39	21.66
		12	#Max		21.33	21.43	21.65
		25	#0		21.29	21.65	21.74

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					18650	18900	19150
Band2	10	1	#0	QPSK	22.63	22.88	22.94
		1	#Mid		22.60	22.81	22.90
		1	#Max		22.67	22.80	23.01
		25	#0		22.22	22.46	22.42
		25	#Mid		22.08	22.52	22.48
		25	#Max		22.26	22.38	22.44
		50	#0		22.12	22.54	22.40
	10	1	#0	QAM16	23.45	23.32	22.87
		1	#Mid		23.49	23.34	22.91
		1	#Max		**23.57**	23.25	22.85
		25	#0		21.25	21.71	21.65
		25	#Mid		21.27	21.65	21.68
		25	#Max		21.30	21.60	21.71
		50	#0		21.33	21.65	21.55

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					18675	18900	19125
Band2	15	1	#0	QPSK	22.62	22.95	22.79
		1	#Mid		22.65	22.84	22.82
		1	#Max		22.80	22.88	22.83
		36	#0		22.19	22.43	22.47
		36	#Mid		22.18	22.47	22.40
		36	#Max		22.31	22.37	22.47
		75	#0		22.18	22.45	22.39
	15	1	#0	QAM16	23.48	23.37	23.31
		1	#Mid		23.48	23.39	23.36
		1	#Max		**23.58**	23.31	23.42
		36	#0		21.26	21.77	21.58
		36	#Mid		21.32	21.78	21.51
		36	#Max		21.41	21.79	21.56
		75	#0		21.42	21.66	21.56

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					18700	18900	19100
Band2	20	1	#0	QPSK	22.74	**23.22**	23.01
		1	#Mid		22.84	23.21	23.13
		1	#Max		23.06	23.21	23.21
		50	#0		22.26	22.51	22.42
		50	#Mid		22.26	22.48	22.39
		50	#Max		22.35	22.44	22.39
		100	#0		22.30	22.50	22.50
	20	1	#0	QAM16	22.38	22.27	22.42
		1	#Mid		22.39	22.20	22.49
		1	#Max		22.62	22.26	22.54
		50	#0		21.46	21.64	21.60
		50	#Mid		21.53	21.71	21.64
		50	#Max		21.63	21.55	21.58
		100	#0		21.42	21.60	21.59

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					19957	20175	20393
Band4	1.4	1	#0	QPSK	23.15	22.99	22.92
		1	#Mid		23.19	23.07	22.85
		1	#Max		23.23	23.11	22.89
		3	#0		23.02	23.01	22.70
		3	#Mid		23.01	22.92	22.75
		3	#Max		23.08	23.00	22.67
		6	#0		22.62	22.50	22.20
	1.4	1	#0	QAM16	23.67	22.65	21.96
		1	#Mid		23.66	22.66	21.99
		1	#Max		**23.69**	22.66	21.96
		3	#0		22.84	22.53	22.31
		3	#Mid		22.85	22.57	22.30
		3	#Max		22.79	22.53	22.30
		6	#0		21.77	21.79	21.44

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					19965	20175	20385
Band4	3	1	#0	QPSK	22.93	23.05	22.96
		1	#Mid		22.92	23.04	22.85
		1	#Max		22.79	23.10	22.88
		8	#0		22.49	22.51	22.25
		8	#Mid		22.52	22.37	22.27
		8	#Max		22.48	22.50	22.20
		15	#0		22.49	22.51	22.25
	3	1	#0	QAM16	23.76	22.64	22.00
		1	#Mid		**23.77**	22.69	22.02
		1	#Max		23.70	22.63	21.92
		8	#0		21.61	21.74	21.53
		8	#Mid		21.54	21.79	21.54
		8	#Max		21.52	21.75	21.60
		15	#0		21.75	21.60	21.39

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					19975	20175	20375
Band4	5	1	#0	QPSK	22.97	23.10	22.51
		1	#Mid		22.84	23.12	22.51
		1	#Max		22.90	**23.14**	22.45
		12	#0		22.50	22.48	22.21
		12	#Mid		22.43	22.53	22.31
		12	#Max		22.49	22.51	22.31
		25	#0		22.50	22.52	22.34
	5	1	#0	QAM16	22.88	22.66	22.83
		1	#Mid		22.82	22.65	22.79
		1	#Max		22.77	22.72	22.79
		12	#0		21.58	21.45	21.40
		12	#Mid		21.50	21.49	21.41
		12	#Max		21.49	21.49	21.37
		25	#0		21.59	21.66	21.55

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20000	20175	20350
Band4	10	1	#0	QPSK	22.94	22.82	22.89
		1	#Mid		22.85	22.85	22.85
		1	#Max		22.90	23.01	22.86
		25	#0		22.45	22.48	22.37
		25	#Mid		22.48	22.58	22.33
		25	#Max		22.35	22.39	22.39
		50	#0		22.37	22.47	22.37
	10	1	#0	QAM16	**23.78**	23.24	23.31
		1	#Mid		23.75	23.28	23.25
		1	#Max		23.77	23.32	23.19
		25	#0		21.56	21.69	21.53
		25	#Mid		21.58	21.69	21.52
		25	#Max		21.47	21.67	21.47
		50	#0		21.64	21.66	21.43

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20025	20175	20325
Band4	15	1	#0	QPSK	22.94	22.87	22.89
		1	#Mid		22.83	22.93	22.76
		1	#Max		22.89	22.99	22.71
		36	#0		22.45	22.40	22.36
		36	#Mid		22.37	22.51	22.27
		36	#Max		22.39	22.52	22.30
		75	#0		22.33	22.42	22.43
	15	1	#0	QAM16	**23.82**	23.24	23.56
		1	#Mid		23.72	23.27	23.46
		1	#Max		23.79	23.28	23.44
		36	#0		21.55	21.72	21.47
		36	#Mid		21.56	21.76	21.41
		36	#Max		21.52	21.80	21.41
		75	#0		21.68	21.68	21.51

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20050	20175	20300
Band4	20	1	#0	QPSK	**23.18**	23.20	22.98
		1	#Mid		23.05	23.28	22.91
		1	#Max		23.13	23.20	22.86
		50	#0		22.52	22.35	22.46
		50	#Mid		22.36	22.61	22.40
		50	#Max		22.53	22.63	22.42
		100	#0		22.48	22.58	22.31
	20	1	#0	QAM16	22.78	22.63	23.12
		1	#Mid		22.61	22.70	23.04
		1	#Max		22.71	22.69	22.92
		50	#0		21.68	21.62	21.68
		50	#Mid		21.75	21.73	21.73
		50	#Max		21.63	21.69	21.64
		100	#0		21.61	21.65	21.59

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20407	20525	20643
Band5	1.4	1	#0	QPSK	22.84	22.93	23.13
		1	#Mid		22.84	22.92	23.21
		1	#Max		22.79	22.93	23.12
		3	#0		22.89	22.87	23.03
		3	#Mid		22.92	22.95	23.05
		3	#Max		22.79	22.93	22.98
		6	#0		22.33	22.47	22.56
	1.4	1	#0	QAM16	23.16	22.42	23.56
		1	#Mid		23.15	22.42	**23.64**
		1	#Max		23.13	22.43	23.56
		3	#0		22.42	22.29	22.79
		3	#Mid		22.32	22.38	22.76
		3	#Max		22.37	22.38	22.78
		6	#0		21.19	21.46	21.64

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20415	20525	20635
Band5	3	1	#0	QPSK	22.73	22.96	23.21
		1	#Mid		22.74	23.01	23.15
		1	#Max		22.71	23.02	23.17
		8	#0		22.29	22.28	22.65
		8	#Mid		22.26	22.41	22.57
		8	#Max		22.25	22.46	22.60
		15	#0		22.34	22.39	22.54
	3	1	#0	QAM16	**23.35**	22.42	22.66
		1	#Mid		23.34	22.47	22.69
		1	#Max		23.35	22.54	22.75
		8	#0		21.23	21.42	21.61
		8	#Mid		21.21	21.38	21.64
		8	#Max		21.22	21.43	21.58
		15	#0		21.35	21.38	21.63

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20425	**20525**	**20625**
Band5	5	1	#0	QPSK	22.69	22.82	22.96
		1	#Mid		22.61	22.93	22.91
		1	#Max		22.68	22.96	22.89
		12	#0		22.26	22.47	22.62
		12	#Mid		22.29	22.36	22.50
		12	#Max		22.31	22.48	22.60
		25	#0		22.25	22.38	22.67
	5	1	#0	QAM16	22.53	22.39	23.20
		1	#Mid		22.45	22.45	**23.22**
		1	#Max		22.42	22.48	23.08
		12	#0		21.29	21.16	21.57
		12	#Mid		21.18	21.27	21.55
		12	#Max		21.22	21.28	21.60
		25	#0		21.36	21.52	21.73

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20450	**20525**	**20600**
Band5	10	1	#0	QPSK	22.78	22.66	22.90
		1	#Mid		22.73	22.88	23.00
		1	#Max		22.92	23.01	23.12
		25	#0		22.24	22.37	22.42
		25	#Mid		22.30	22.36	22.62
		25	#Max		22.35	22.40	22.61
		50	#0		22.16	22.45	22.60
	10	1	#0	QAM16	23.43	23.05	22.79
		1	#Mid		23.41	23.13	22.88
		1	#Max		**23.56**	23.29	22.95
		25	#0		21.26	21.38	21.61
		25	#Mid		21.53	21.48	21.66
		25	#Max		21.57	21.54	21.68
		50	#0		21.63	21.46	21.55

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20775	21100	21425
Band7	5	1	#0	QPSK	22.17	21.76	21.51
		1	#Mid		22.23	21.78	21.48
		1	#Max		**22.28**	21.83	21.49
		12	#0		21.80	21.51	21.21
		12	#Mid		21.73	21.56	21.03
		12	#Max		21.75	21.57	21.03
		25	#0		21.74	21.69	21.15
	5	1	#0	QAM16	21.57	22.07	21.56
		1	#Mid		21.58	22.06	21.52
		1	#Max		21.56	22.13	21.46
		12	#0		20.72	20.65	20.23
		12	#Mid		20.73	20.61	20.08
		12	#Max		20.74	20.68	20.10
		25	#0		20.93	20.86	20.30

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20800	21100	21400
Band7	10	1	#0	QPSK	22.21	21.97	21.76
		1	#Mid		22.27	21.98	21.67
		1	#Max		22.28	22.07	21.66
		25	#0		21.71	21.43	21.16
		25	#Mid		21.65	21.52	21.11
		25	#Max		21.65	21.65	21.08
		50	#0		21.76	21.54	21.21
	10	1	#0	QAM16	22.95	22.35	21.77
		1	#Mid		22.96	22.34	21.71
		1	#Max		**23.01**	22.42	21.66
		25	#0		20.79	20.72	20.38
		25	#Mid		20.76	20.70	20.30
		25	#Max		20.77	20.77	20.29
		50	#0		20.91	20.73	20.28

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20825	21100	21375
Band7	15	1	#0	QPSK	22.29	21.90	21.77
		1	#Mid		22.04	21.85	21.57
		1	#Max		22.07	22.03	21.50
		36	#0		21.67	21.51	21.28
		36	#Mid		21.80	21.54	21.22
		36	#Max		21.68	21.65	21.09
		75	#0		21.66	21.56	21.25
	15	1	#0	QAM16	22.93	22.27	22.51
		1	#Mid		22.94	22.30	22.32
		1	#Max		**22.97**	22.42	22.20
		36	#0		20.90	20.77	20.35
		36	#Mid		20.87	20.77	20.21
		36	#Max		20.91	20.87	20.23
		75	#0		20.85	20.59	20.33

Band	Bandwidth (MHz)	RB Size	RB Position	Modulation	Channel		
					20850	21100	21350
Band7	20	1	#0	QPSK	22.24	22.44	22.06
		1	#Mid		22.11	22.41	21.80
		1	#Max		22.05	**22.57**	21.68
		50	#0		21.62	21.56	21.25
		50	#Mid		21.72	21.47	21.20
		50	#Max		21.59	21.63	21.19
		100	#0		21.72	21.58	21.29
	20	1	#0	QAM16	21.99	21.61	22.11
		1	#Mid		21.97	21.68	21.73
		1	#Max		21.95	21.75	21.65
		50	#0		20.88	20.72	20.56
		50	#Mid		20.87	20.66	20.49
		50	#Max		20.91	20.75	20.31
		100	#0		20.72	20.72	20.49