



FCC RADIO TEST REPORT

FCC ID : PY7-04606A
Equipment : GSM/WCDMA/LTE Phone+Bluetooth,
DTS/UNII a/b/g/n/ac and NFC
Brand Name : Sony
Applicant : Sony Mobile Communications Inc.
4-12-3 Higashi-Shinagawa, Shinagawa-ku,
Tokyo, 140-0002, Japan
Manufacturer : Sony Mobile Communications Inc.
4-12-3 Higashi-Shinagawa, Shinagawa-ku,
Tokyo, 140-0002, Japan
Standard : 47 CFR Part 2, 22(H), 24(E)

The product was received on Mar. 25, 2018 and testing was started from Apr. 12, 2018 and completed on May 17, 2018. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Jones Tsai

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issued Date
FG832501-01A	01	Initial issue of report	May 29, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Pass	-
	§22.913 (a)(2)	Effective Radiated Power		
	§24.232 (c)	Equivalent Isotropic Radiated Power		
3.3	§24.232 (d)	Peak-to-Average Ratio	Pass	-
3.4	§2.1049 §22.917 (b) §24.238 (b)	Occupied Bandwidth	Pass	-
3.5	§2.1051 §22.917 (a) §24.238 (a)	Band Edge Measurement	Pass	-
3.6	§2.1051 §22.917 (a) §24.238 (a)	Conducted Emission	Pass	-
3.7	§2.1055 §22.355	Frequency Stability Temperature & Voltage	Pass	-
	§2.1055 §24.235			-
4.4	§2.1053 §22.917 (a) §24.238 (a)	Field Strength of Spurious Radiation	Pass	Under limit 29.54 dB at 5548.000 MHz

Reviewed by: Joseph Lin

Report Producer: Maggie Chiang



1 General Description

1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, DTS/UNII a/b/g/n, FM Receiver, NFC, and GNSS.

Product Specification subjective to this standard	
Antenna Type	Main Antenna : PIFA Antenna Aux. Antenna : PIFA Antenna

EUT Information List			
HW Version	SW Version	S/N	Performed Test Item
A	9.29	CQ3000NYWX	Conducted Measurement ERP/EIRP Test
		CQ3000TZAJ	Radiated Spurious Emission

Accessory List	
AC Adapter	Model Name: UCH20
	S/N: 3515W45302495
USB Cable	Model Name: UCB20
	S/N: N/A
Earphone	Model Name: MH410c
	S/N: N/A

Note:

1. Above EUT list used are electrically identical per declared by manufacturer.
2. Above the accessories list are used to exercise the EUT during test, and the serial number of each type of accessories is listed in each section of this report. .
3. For other wireless features of this EUT, test report will be issued separately.

1.2 Modification of EUT

No modifications are made to the EUT during all test items.



1.3 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	Frequency Range (MHz)	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
Part 22	824.2 ~848.8	GSM850 GPRS class 8	GMSK	0.3917	0.0395 ppm	245KGXW
Part 22	824.2 ~848.8	GSM850 EDGE class 8	8PSK	0.0867	0.0132 ppm	247KG7W
Part 22	826.4 ~846.6	WCDMA Band V RMC 12.2Kbps	BPSK	0.0631	0.0239 ppm	4M22F9W
Part 24	1850.2 ~1909.8	GSM1900 GPRS class 8	GMSK	0.7586	0.0138 ppm	245KGXW
Part 24	1850.2 ~1909.8	GSM1900 EDGE class 8	8PSK	0.2624	0.0059 ppm	249KG7W
Part 24	1852.4 ~ 1907.6	WCDMA Band II RMC 12.2Kbps	BPSK	0.1968	0.0064 ppm	4M13F9W

1.4 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 and TW0007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No.
	TH03-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No.
	03CH13-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

1.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ 47 CFR Part 2, 22(H), 24(E)
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.

Radiated emissions were investigated as following frequency range:

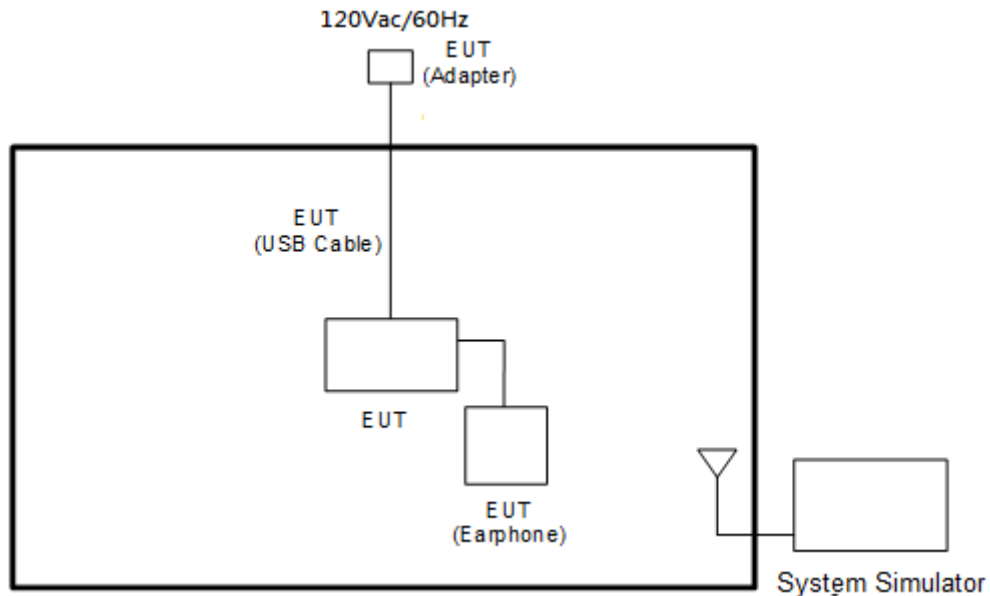
1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 19100 MHz for GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	■ GPRS Class 8 Link	■ GPRS Class 8 Link
	■ EDGE Class 8 Link	■ EDGE Class 8 Link
GSM 1900	■ GPRS Class 8 Link	■ GPRS Class 8 Link
	■ EDGE Class 8 Link	■ EDGE Class 8 Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 4.2 dB and a 10dB attenuator.

Example:

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\
 &= 4.2 + 10 = 14.2 \text{ (dB)}
 \end{aligned}$$



2.5 Frequency List of Low/Middle/High Channels

Frequency List				
Band	Channel/Frequency(MHz)	Lowest	Middle	Highest
GSM850	Channel	128	189	251
	Frequency	824.2	836.4	848.8
WCDMA Band V	Channel	4132	4182	4233
	Frequency	826.4	836.4	846.6
GSM1900	Channel	512	661	810
	Frequency	1850.2	1880.0	1909.8
WCDMA Band II	Channel	9262	9400	9538
	Frequency	1852.4	1880.0	1907.6

3 Conducted Test Result

3.1 Measuring Instruments

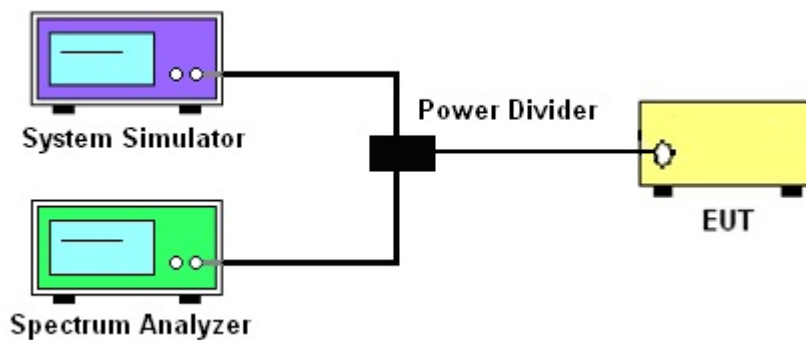
See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge and Conducted Spurious Emission



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.

3.2 Conducted Output Power and ERP/EIRP

3.2.1 Description of the Conducted Output Power and ERP/EIRP

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for GSM850 and WCDMA Band V.

The EIRP of mobile transmitters must not exceed 2 Watts for GSM1900 and WCDMA Band II.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.



3.3 Peak-to-Average Ratio

3.3.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.3.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 5.7.1

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. Set EUT to transmit at maximum output power.
3. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
4. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer.
5. Record the maximum PAPR level associated with a probability of 0.1%.

3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.4.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

3.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 4.2

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
3. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
4. Set the detection mode to peak, and the trace mode to max hold.
5. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace. (this is the reference value)
6. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
7. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
8. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.



3.5 Conducted Band Edge

3.5.1 Description of Conducted Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

3.5.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator.
The path loss was compensated to the results for each measurement.
3. The band edges of low and high channels for the highest RF powers were measured.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

3.6 Conducted Spurious Emission

3.6.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.0.

1. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator.
The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

3.7 Frequency Stability

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

3.7.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C steps up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.7.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was placed in a temperature chamber at $20\pm 5^{\circ}\text{C}$ and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

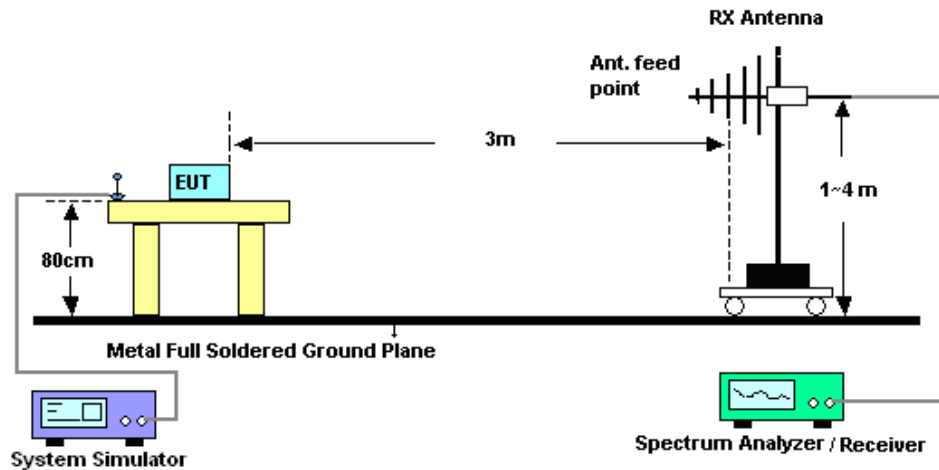
4 Radiated Test Items

4.1 Measuring Instruments

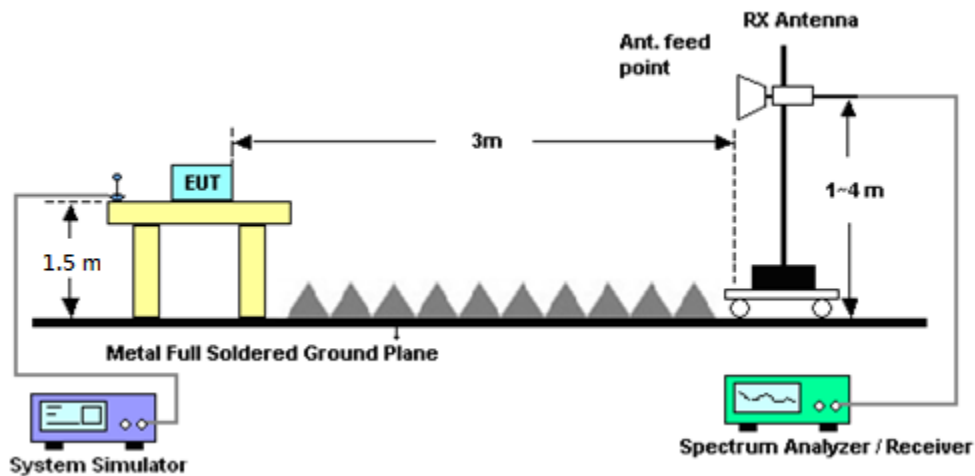
See list of measuring instruments of this test report.

4.2 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.



4.4 Field Strength of Spurious Radiation Measurement

4.4.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 5.8 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Base Station (Measure)	Rohde & Schwarz	CMU200	117995	GSM / GPRS / WCDMA / CDMA	Aug. 09, 2017	Apr. 12, 2018	Aug. 08, 2018	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Jun. 26, 2017	Apr. 12, 2018	Jun. 25, 2018	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30℃ ~70℃	Dec. 06, 2017	Apr. 12, 2018	Dec. 05, 2019	Conducted (TH03-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL883644	Voltage:0~20V; Current:0~5A	Dec. 06, 2017	Apr. 12, 2018	Dec. 05, 2019	Conducted (TH03-HY)
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 18, 2018	Apr. 12, 2018	Mar. 17, 2019	Conducted (TH03-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY84209521	1GHz~26GHz	Dec. 01, 2017	Apr. 12, 2018	Nov. 30, 2018	Conducted (TH03-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	40103&07	30MHz to 1GHz	Jan. 10, 2018	May 15, 2018~ May 17, 2018	Jan. 09, 2019	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	Jun. 15, 2017	May 15, 2018~ May 17, 2018	Jun. 14, 2018	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1522	1G~18GHz	May 10, 2018	May 15, 2018~ May 17, 2018	May 09, 2019	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz- 40GHz	Nov. 10, 2017	May 15, 2018~ May 17, 2018	Nov. 09, 2018	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 27, 2017	May 15, 2018~ May 17, 2018	Nov. 26, 2018	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Jan. 19, 2018	May 15, 2018~ May 17, 2018	Jan. 18, 2020	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz~18GHz	May 22, 2017	May 15, 2018~ May 17, 2018	May 21, 2018	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Feb. 02, 2018	May 15, 2018~ May 17, 2018	Feb. 01, 2019	Radiation (03CH13-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	May 15, 2018~ May 17, 2018	Jul. 17, 2018	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	10Hz~44GHz	Mar. 15, 2018	May 15, 2018~ May 17, 2018	Mar. 14, 2019	Radiation (03CH13-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	May 15, 2018~ May 17, 2018	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	May 15, 2018~ May 17, 2018	N/A	Radiation (03CH13-HY)
Hygrometer	TECPEL	DTM-303B	TP140320	N/A	Mar. 19, 2018	May 15, 2018~ May 17, 2018	Mar. 18, 2019	Radiation (03CH13-HY)
Signal Generator	Anritsu	MG3694C	163401	0.1Hz~40GHz	Jan. 15, 2018	May 15, 2018~ May 17, 2018	Jan. 14, 2019	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY249564 MY249524 MY283184	25GHz~40GHz	Mar. 26, 2018	May 15, 2018~ May 17, 2018	Mar. 25, 2019	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY249564 MY249524 MY283184	30MHz~1GHz	Jan. 26, 2018	May 15, 2018~ May 17, 2018	Jan. 25, 2019	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY249564 MY249524 MY283184	1GHz~25GHz	Jan. 26, 2018	May 15, 2018~ May 17, 2018	Jan. 25, 2019	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60ST	SN2	3 GHz High Pass	Sep. 18, 2017	May 15, 2018~ May 17, 2018	Sep. 17, 2018	Radiation (03CH13-HY)
Filter	Wainwright	WHKX12-108 0-1200-15000 -60ST	SN1	1.2 GHz High Pass	Sep. 18, 2017	May 15, 2018~ May 17, 2018	Sep. 17, 2018	Radiation (03CH13-HY)
Filter	Wainwright	WLKS1200-1 2SS	SN2	1.2G Low Pass	Sep. 18, 2017	May 15, 2018~ May 17, 2018	Sep. 17, 2018	Radiation (03CH13-HY)
Notch Filter	Wainwright	WRCT/800/9 60-0.2/40-8S SK	SN11	GSM850	Jul. 06, 2017	May 15, 2018~ May 17, 2018	Jul. 05, 2018	Radiation (03CH13-HY)
Notch Filter	Wainwright	WRCT1850/1 910-40/8SS	SN21	1900	Jul. 06, 2017	May 15, 2018~ May 17, 2018	Jul. 05, 2018	Radiation (03CH13-HY)
Test Software	N/A	E3	6.2009-8-24	N/A	N/A	May 15, 2018~ May 17, 2018	N/A	Radiation (03CH13-HY)



6 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.07
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.48
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.92
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

Conducted Power (*Unit: dBm)						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880	1909.8
GSM	32.29	32.37	31.94	29.66	29.69	29.50
GPRS class 8	32.29	32.38	31.94	29.66	29.70	29.51
GPRS class 10	30.97	30.64	30.29	27.61	27.85	27.56
GPRS class 11	28.66	28.43	28.39	25.83	26.01	25.84
GPRS class 12	27.58	27.29	27.30	24.91	24.95	24.60
EGPRS class 8	25.83	25.62	25.50	24.81	25.09	24.92
EGPRS class 10	25.32	25.30	25.31	24.42	24.75	24.49
EGPRS class 11	25.54	25.10	25.10	24.39	24.26	24.39
EGPRS class 12	25.36	25.00	24.91	24.09	24.70	24.22

Conducted Power (*Unit: dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4182	4233	9262	9400	9538
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6
RMC 12.2K	24.45	24.34	24.40	23.84	23.41	23.52
HSDPA Subtest-1	23.41	23.31	23.32	22.82	22.41	22.47
HSDPA Subtest-2	23.45	23.33	23.34	22.88	22.44	22.49
HSDPA Subtest-3	22.97	22.81	22.81	22.39	21.94	21.98
HSDPA Subtest-4	22.93	22.84	22.88	22.39	21.91	21.98
HSUPA Subtest-1	23.39	23.28	23.29	22.49	22.40	22.46
HSUPA Subtest-2	21.44	21.33	21.26	20.82	20.39	20.49
HSUPA Subtest-3	22.42	22.32	22.26	21.82	21.44	21.43
HSUPA Subtest-4	21.47	21.21	21.34	20.48	20.40	20.43
HSUPA Subtest-5	23.40	23.30	23.30	22.45	22.40	22.50



A2. GSM

Peak-to-Average Ratio

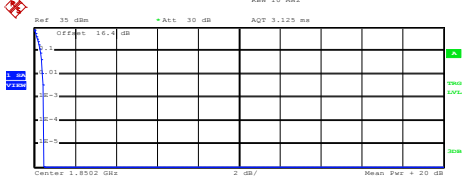
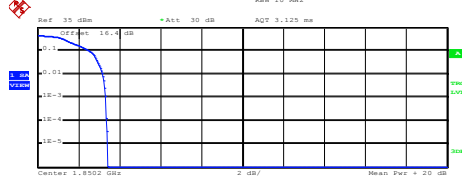
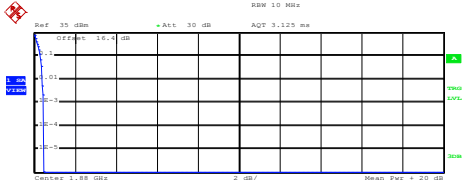
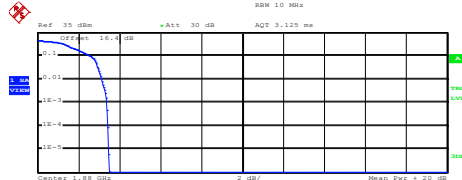
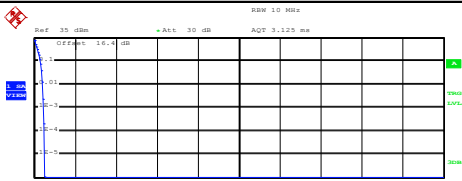
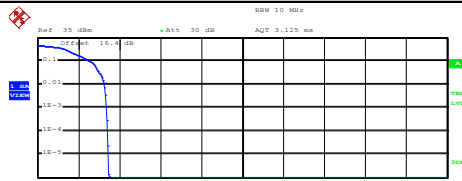
Mode	GSM850		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.60	3.44	PASS
Middle CH	0.56	3.44	
Highest CH	0.56	3.64	

Mode	GSM1900		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.48	3.32	PASS
Middle CH	0.48	3.40	
Highest CH	0.48	3.36	



GSM850 (GPRS class 8)		GSM850 (EDGE class 8)	
Lowest Channel		Lowest Channel	
Ref: 35 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz, Center: 824.2 MHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 31.97 dBm Peak 32.57 dBm Crest 0.60 dB 10 % 0.36 dB 1 % 0.52 dB .1 % 0.60 dB .01 % 0.60 dB Date: 12.APR.2018 17:39:54		Ref: 35 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz, Center: 824.2 MHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 26.38 dBm Peak 29.89 dBm Crest 3.51 dB 10 % 2.64 dB 1 % 3.28 dB .1 % 3.44 dB .01 % 3.52 dB Date: 12.APR.2018 17:49:56	
Middle Channel		Middle Channel	
Ref: 35 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz, Center: 836.4 MHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 32.11 dBm Peak 32.71 dBm Crest 0.61 dB 10 % 0.36 dB 1 % 0.52 dB .1 % 0.56 dB .01 % 0.60 dB Date: 12.APR.2018 17:40:12		Ref: 35 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz, Center: 836.4 MHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 26.33 dBm Peak 29.82 dBm Crest 3.49 dB 10 % 2.60 dB 1 % 3.28 dB .1 % 3.44 dB .01 % 3.52 dB Date: 12.APR.2018 17:50:10	
Highest Channel		Highest Channel	
Ref: 35 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz, Center: 848.6 MHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 32.18 dBm Peak 32.71 dBm Crest 0.54 dB 10 % 0.32 dB 1 % 0.48 dB .1 % 0.56 dB .01 % 0.56 dB Date: 12.APR.2018 17:40:29		Ref: 35 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz, Center: 848.6 MHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 26.16 dBm Peak 29.89 dBm Crest 3.74 dB 10 % 2.64 dB 1 % 3.44 dB .1 % 3.64 dB .01 % 3.72 dB Date: 12.APR.2018 17:50:27	

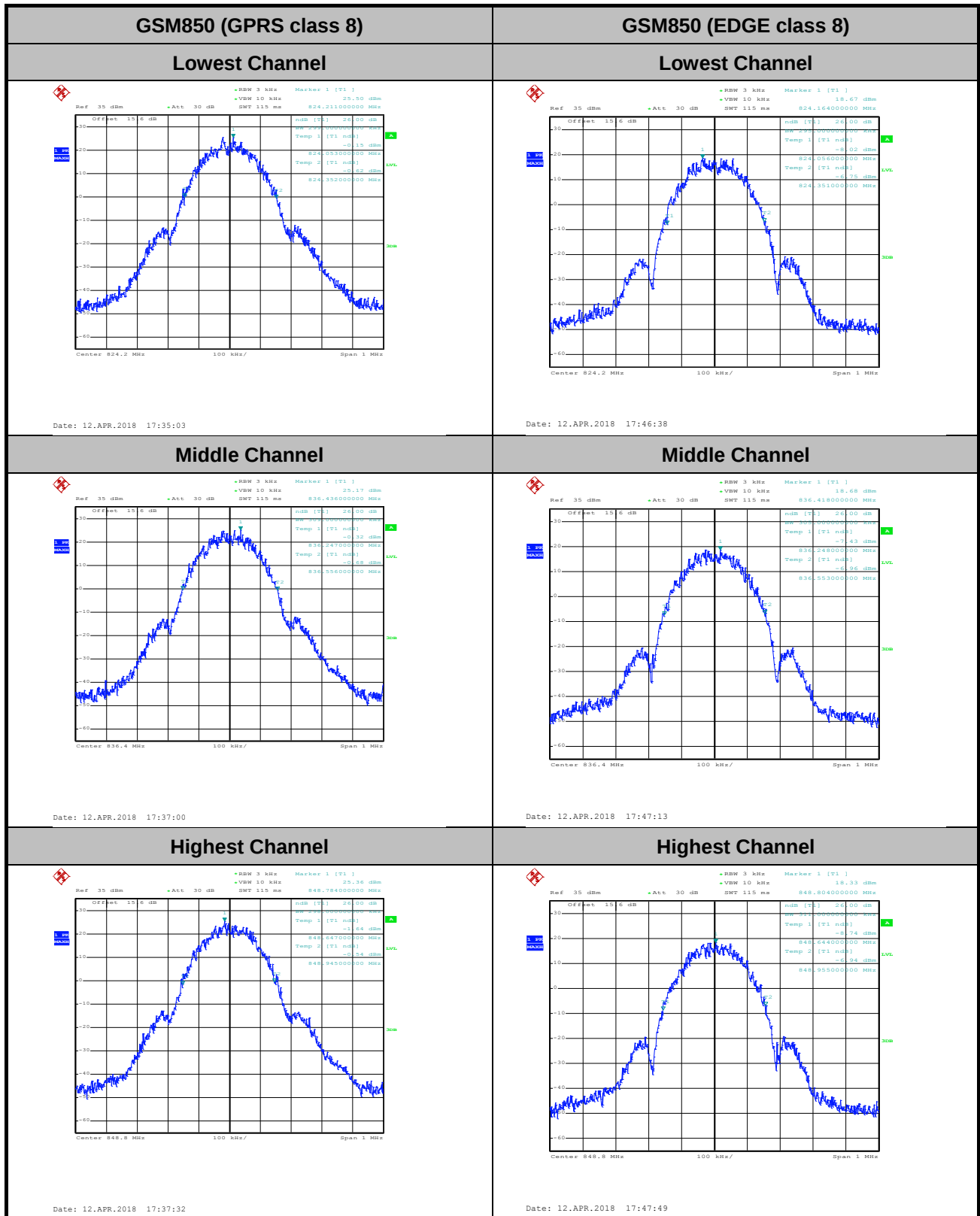


GSM1900 (GPRS class 8)		GSM1900 (EDGE class 8)	
Lowest Channel		Lowest Channel	
 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.8502 GHz 2 dB/ Mean: 29.91 dBm Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 29.91 dBm Peak: 30.39 dBm Crest: 0.47 dB 10 %: 0.32 dB 1 %: 0.40 dB 0.1 %: 0.48 dB 0.01 %: 0.48 dB Date: 12.APR.2018 17:24:48		 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.8502 GHz 2 dB/ Mean: 24.93 dBm Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 24.93 dBm Peak: 28.34 dBm Crest: 3.41 dB 10 %: 2.52 dB 1 %: 3.20 dB 0.1 %: 3.32 dB 0.01 %: 3.36 dB Date: 12.APR.2018 18:31:21	
Middle Channel		Middle Channel	
 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.85 GHz 2 dB/ Mean: 29.92 dBm Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 29.92 dBm Peak: 30.39 dBm Crest: 0.47 dB 10 %: 0.28 dB 1 %: 0.40 dB 0.1 %: 0.48 dB 0.01 %: 0.48 dB Date: 12.APR.2018 17:25:02		 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.85 GHz 2 dB/ Mean: 24.93 dBm Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 24.93 dBm Peak: 28.41 dBm Crest: 3.48 dB 10 %: 2.60 dB 1 %: 3.12 dB 0.1 %: 3.40 dB 0.01 %: 3.44 dB Date: 12.APR.2018 18:31:44	
Highest Channel		Highest Channel	
 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.9098 GHz 2 dB/ Mean: 29.90 dBm Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 29.90 dBm Peak: 30.39 dBm Crest: 0.48 dB 10 %: 0.32 dB 1 %: 0.40 dB 0.1 %: 0.48 dB 0.01 %: 0.52 dB Date: 12.APR.2018 17:25:16		 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.9098 GHz 2 dB/ Mean: 24.86 dBm Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 24.86 dBm Peak: 28.34 dBm Crest: 3.48 dB 10 %: 2.56 dB 1 %: 3.24 dB 0.1 %: 3.36 dB 0.01 %: 3.44 dB Date: 12.APR.2018 18:32:02	

**26dB Bandwidth**

Mode	GSM850 : 26dB BW(MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.299	0.295
Middle CH	0.309	0.305
Highest CH	0.298	0.311

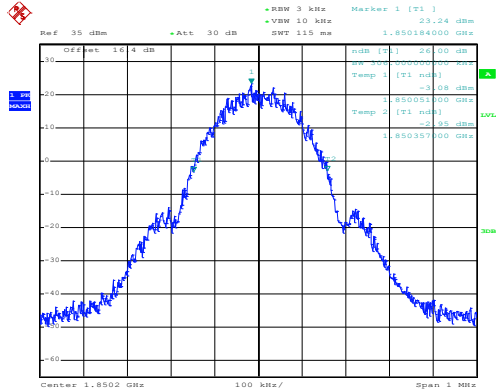
Mode	GSM1900 : 26dB BW(MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.306	0.302
Middle CH	0.311	0.304
Highest CH	0.313	0.309





GSM1900 (GPRS class 8)

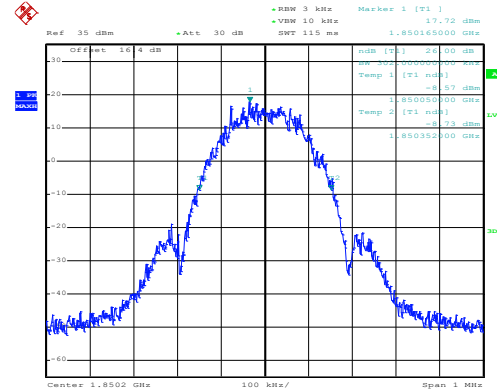
Lowest Channel



Date: 12.APR.2018 17:18:51

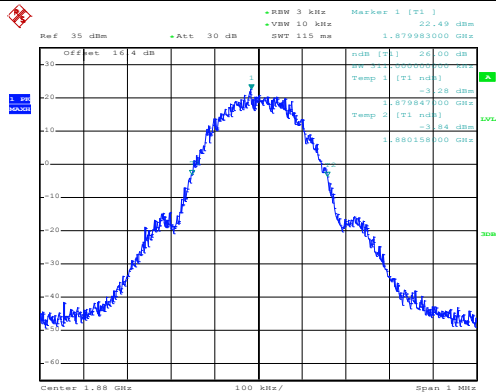
GSM1900 (EDGE class 8)

Lowest Channel



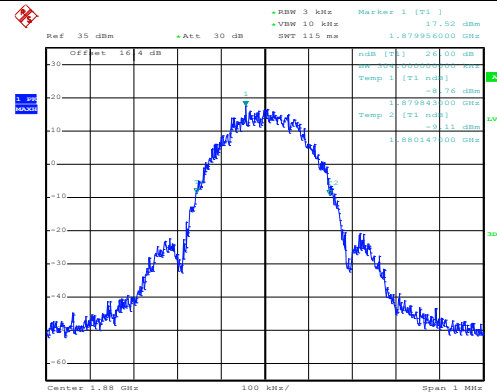
Date: 12.APR.2018 17:59:21

Middle Channel



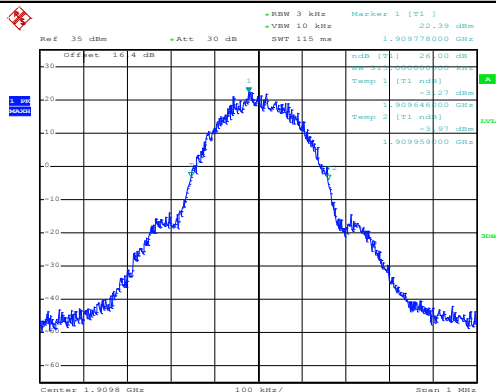
Date: 12.APR.2018 17:19:24

Middle Channel



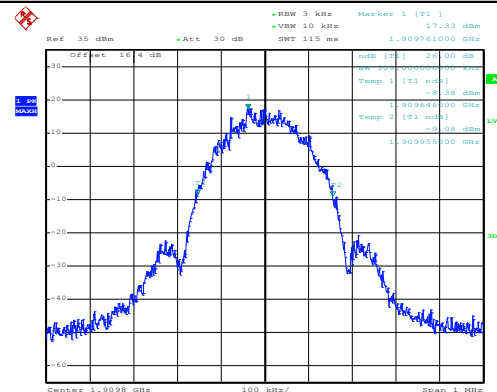
Date: 12.APR.2018 17:59:54

Highest Channel



Date: 12.APR.2018 17:19:56

Highest Channel

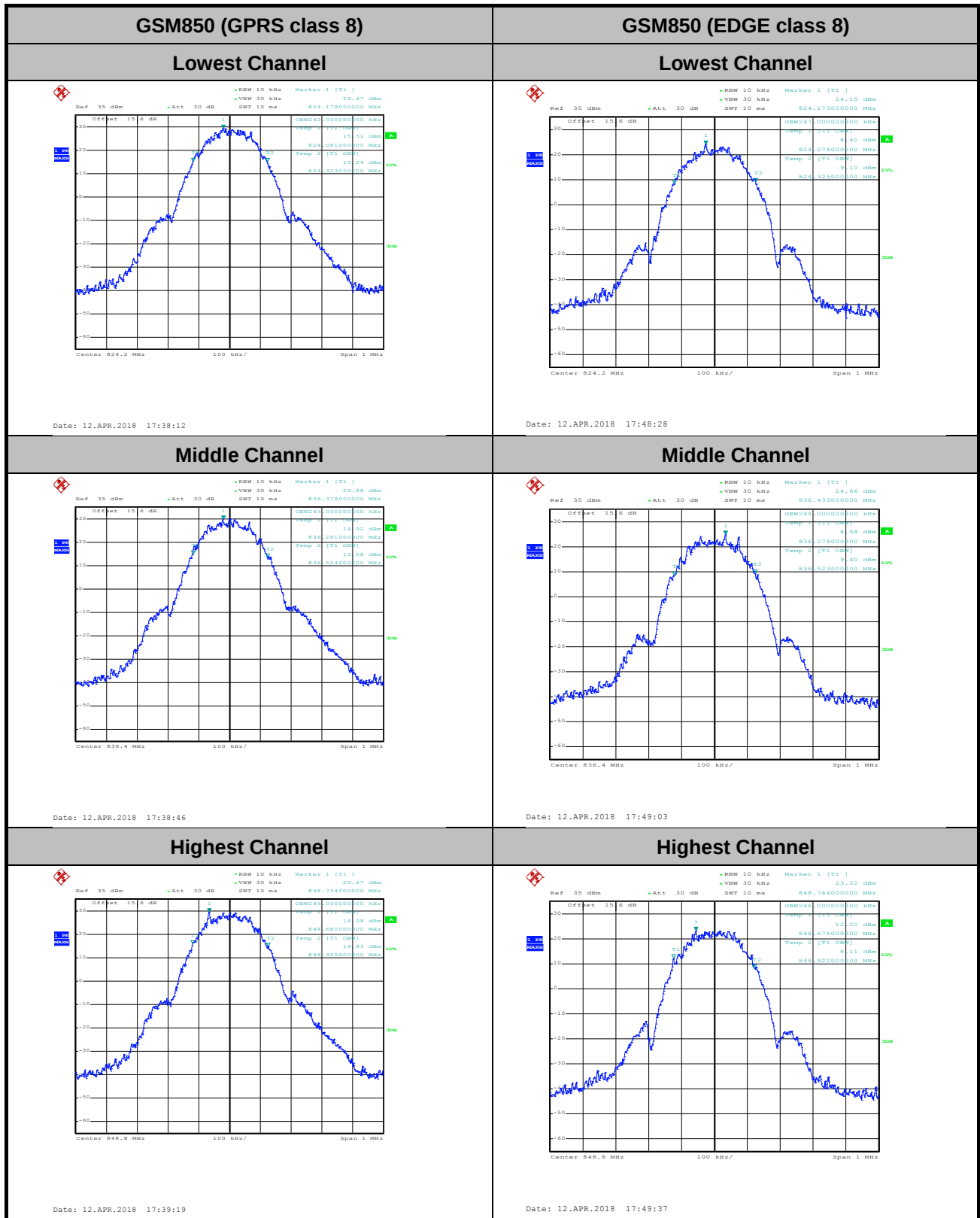


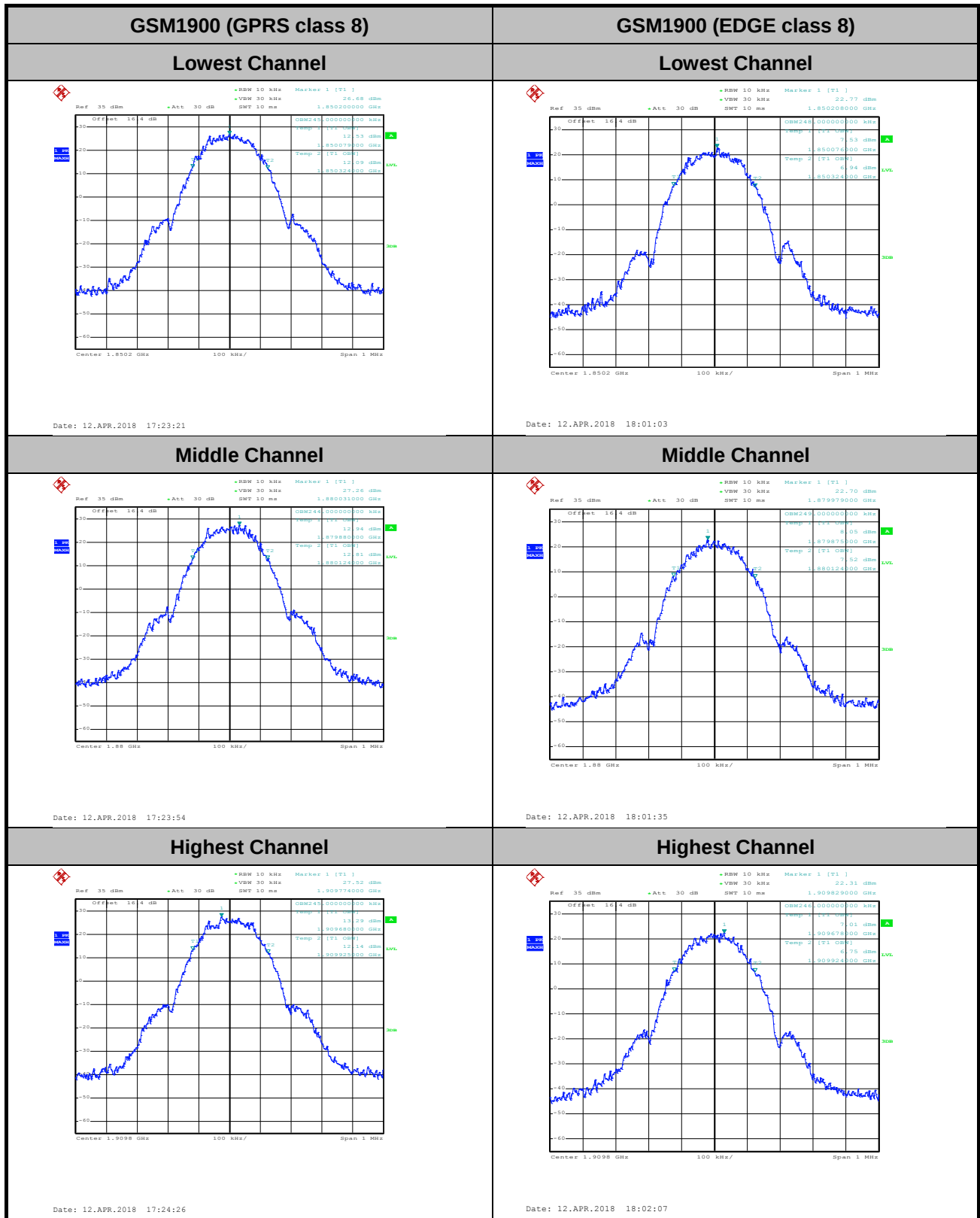
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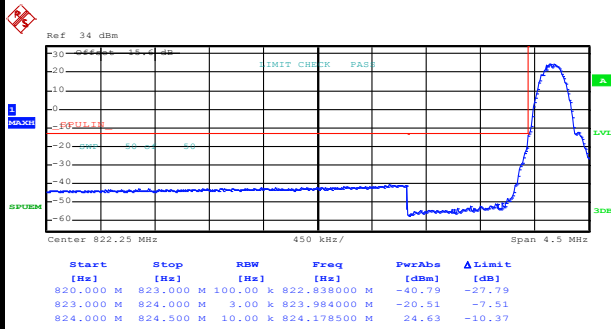
**Occupied Bandwidth**

Mode	GSM850 : 99% OBW(MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.242	0.247
Middle CH	0.243	0.245
Highest CH	0.245	0.246

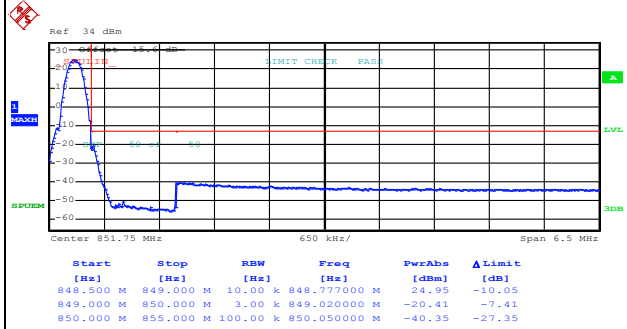
Mode	GSM1900 : 99% OBW(MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.245	0.248
Middle CH	0.244	0.249
Highest CH	0.245	0.246



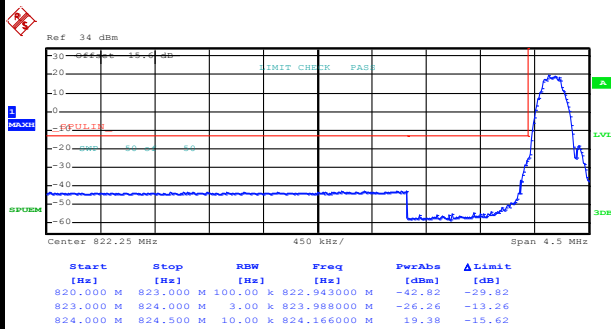


**Conducted Band Edge****GSM850 (GPRS class 8)****Lowest Band Edge**

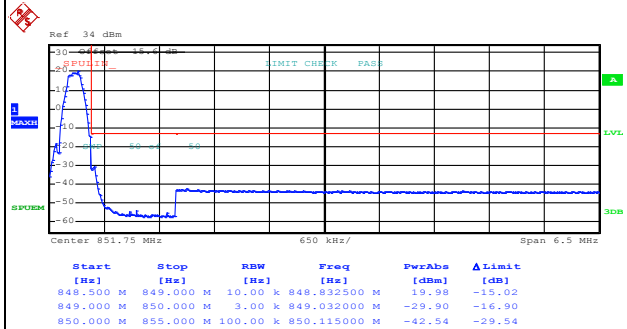
Date: 12.APR.2018 17:42:07

Highest Band Edge

Date: 12.APR.2018 17:43:48

GSM850 (EDGE class 8)**Lowest Band Edge**

Date: 12.APR.2018 17:55:15

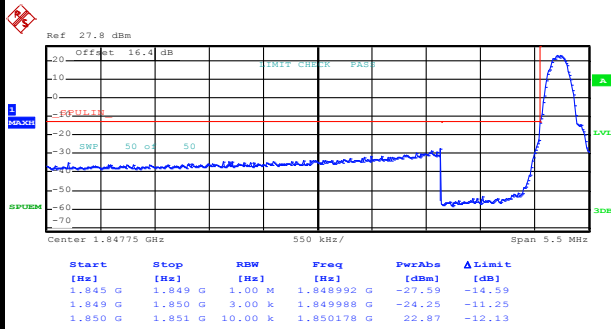
Highest Band Edge

Date: 12.APR.2018 17:56:46



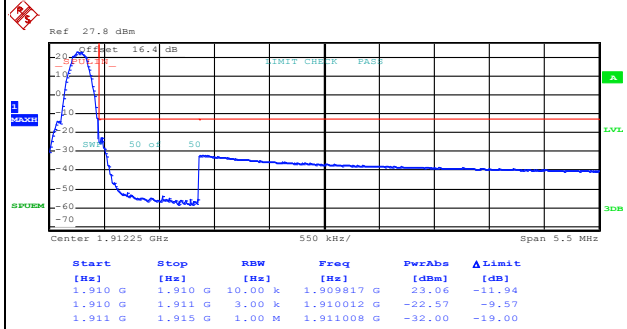
GSM1900 (GPRS class 8)

Lowest Band Edge



Date: 12.APR.2018 17:26:46

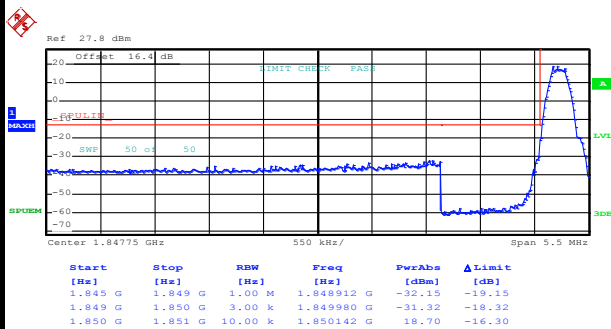
Highest Band Edge



Date: 12.APR.2018 17:28:33

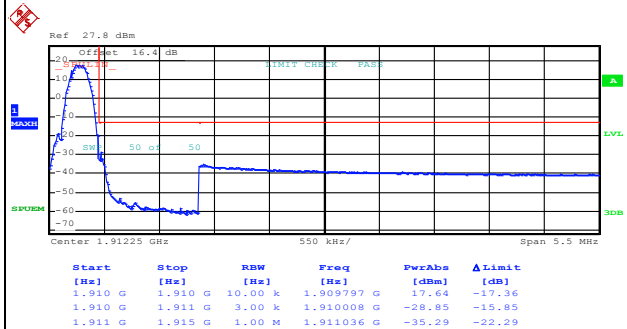
GSM1900 (EDGE class 8)

Lowest Band Edge



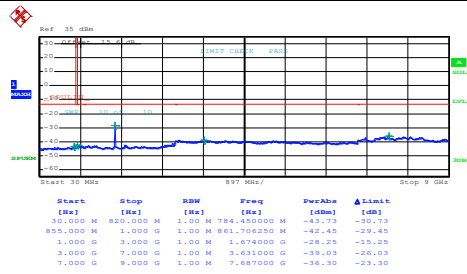
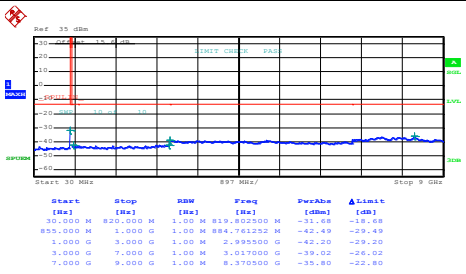
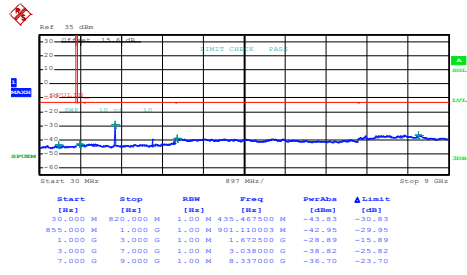
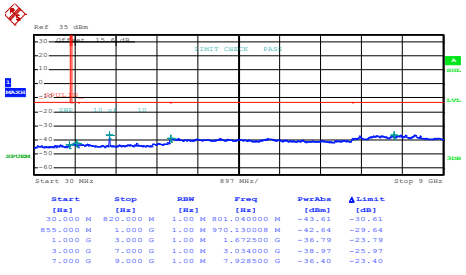
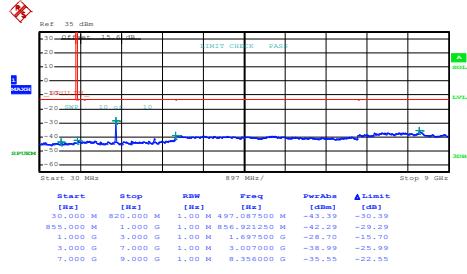
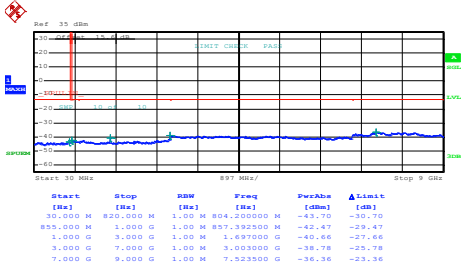
Date: 12.APR.2018 18:03:39

Highest Band Edge



Date: 12.APR.2018 18:27:41

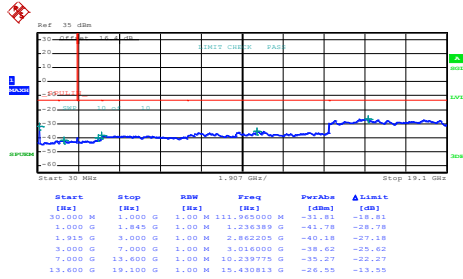
**Conducted Spurious Emission**

GSM850 (GPRS class 8)		GSM850 (EDGE class 8)																																																																																					
Lowest Channel		Lowest Channel																																																																																					
 <table><tr><th>Start</th><th>Stop</th><th>RBW</th><th>Freq</th><th>PerAbn</th><th>ΔLimit</th></tr><tr><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[dBm]</th><th>[dB]</th></tr><tr><td>30,000 M</td><td>820,000 M</td><td>1,00 M</td><td>784.450000 M</td><td>-43.73</td><td>-30.73</td></tr><tr><td>855,000 M</td><td>1,000 G</td><td>1,00 M</td><td>861.706250 M</td><td>-42.45</td><td>-29.45</td></tr><tr><td>1,000 G</td><td>3,000 G</td><td>1,00 M</td><td>1.674000 G</td><td>-28.25</td><td>-15.25</td></tr><tr><td>3,000 G</td><td>7,000 G</td><td>1,00 M</td><td>3.631000 G</td><td>-39.03</td><td>-26.03</td></tr><tr><td>7,000 G</td><td>9,000 G</td><td>1,00 M</td><td>7.687000 G</td><td>-36.30</td><td>-23.30</td></tr></table> Date: 12.APR.2018 17:32:16		Start	Stop	RBW	Freq	PerAbn	ΔLimit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	820,000 M	1,00 M	784.450000 M	-43.73	-30.73	855,000 M	1,000 G	1,00 M	861.706250 M	-42.45	-29.45	1,000 G	3,000 G	1,00 M	1.674000 G	-28.25	-15.25	3,000 G	7,000 G	1,00 M	3.631000 G	-39.03	-26.03	7,000 G	9,000 G	1,00 M	7.687000 G	-36.30	-23.30	 <table><tr><th>Start</th><th>Stop</th><th>RBW</th><th>Freq</th><th>PerAbn</th><th>ΔLimit</th></tr><tr><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[dBm]</th><th>[dB]</th></tr><tr><td>30,000 M</td><td>820,000 M</td><td>1,00 M</td><td>819.802500 M</td><td>-31.68</td><td>-18.68</td></tr><tr><td>855,000 M</td><td>1,000 G</td><td>1,00 M</td><td>884.761252 M</td><td>-42.49</td><td>-29.49</td></tr><tr><td>1,000 G</td><td>3,000 G</td><td>1,00 M</td><td>2.995500 G</td><td>-42.20</td><td>-29.20</td></tr><tr><td>3,000 G</td><td>7,000 G</td><td>1,00 M</td><td>3.017000 G</td><td>-39.02</td><td>-26.02</td></tr><tr><td>7,000 G</td><td>9,000 G</td><td>1,00 M</td><td>8.370500 G</td><td>-35.80</td><td>-22.80</td></tr></table> Date: 12.APR.2018 17:51:56		Start	Stop	RBW	Freq	PerAbn	ΔLimit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	820,000 M	1,00 M	819.802500 M	-31.68	-18.68	855,000 M	1,000 G	1,00 M	884.761252 M	-42.49	-29.49	1,000 G	3,000 G	1,00 M	2.995500 G	-42.20	-29.20	3,000 G	7,000 G	1,00 M	3.017000 G	-39.02	-26.02	7,000 G	9,000 G	1,00 M	8.370500 G	-35.80	-22.80
Start	Stop	RBW	Freq	PerAbn	ΔLimit																																																																																		
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3,000 G	7,000 G	1,00 M	3.017000 G	-39.02	-26.02																																																																																		
7,000 G	9,000 G	1,00 M	8.370500 G	-35.80	-22.80																																																																																		
Middle Channel		Middle Channel																																																																																					
 <table><tr><th>Start</th><th>Stop</th><th>RBW</th><th>Freq</th><th>PerAbn</th><th>ΔLimit</th></tr><tr><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[dBm]</th><th>[dB]</th></tr><tr><td>30,000 M</td><td>820,000 M</td><td>1,00 M</td><td>435.467500 M</td><td>-43.83</td><td>-30.83</td></tr><tr><td>855,000 M</td><td>1,000 G</td><td>1,00 M</td><td>901.110003 M</td><td>-42.95</td><td>-29.95</td></tr><tr><td>1,000 G</td><td>3,000 G</td><td>1,00 M</td><td>1.672500 G</td><td>-28.89</td><td>-15.89</td></tr><tr><td>3,000 G</td><td>7,000 G</td><td>1,00 M</td><td>3.038000 G</td><td>-38.82</td><td>-25.82</td></tr><tr><td>7,000 G</td><td>9,000 G</td><td>1,00 M</td><td>8.337000 G</td><td>-36.70</td><td>-23.70</td></tr></table> Date: 12.APR.2018 17:33:12		Start	Stop	RBW	Freq	PerAbn	ΔLimit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	820,000 M	1,00 M	435.467500 M	-43.83	-30.83	855,000 M	1,000 G	1,00 M	901.110003 M	-42.95	-29.95	1,000 G	3,000 G	1,00 M	1.672500 G	-28.89	-15.89	3,000 G	7,000 G	1,00 M	3.038000 G	-38.82	-25.82	7,000 G	9,000 G	1,00 M	8.337000 G	-36.70	-23.70	 <table><tr><th>Start</th><th>Stop</th><th>RBW</th><th>Freq</th><th>PerAbn</th><th>ΔLimit</th></tr><tr><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[dBm]</th><th>[dB]</th></tr><tr><td>30,000 M</td><td>820,000 M</td><td>1,00 M</td><td>801.040000 M</td><td>-43.61</td><td>-30.61</td></tr><tr><td>855,000 M</td><td>1,000 G</td><td>1,00 M</td><td>870.130008 M</td><td>-42.64</td><td>-29.64</td></tr><tr><td>1,000 G</td><td>3,000 G</td><td>1,00 M</td><td>1.672500 G</td><td>-36.79</td><td>-23.79</td></tr><tr><td>3,000 G</td><td>7,000 G</td><td>1,00 M</td><td>3.034000 G</td><td>-38.97</td><td>-25.97</td></tr><tr><td>7,000 G</td><td>9,000 G</td><td>1,00 M</td><td>7.928500 G</td><td>-36.40</td><td>-23.40</td></tr></table> Date: 12.APR.2018 17:52:46		Start	Stop	RBW	Freq	PerAbn	ΔLimit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	820,000 M	1,00 M	801.040000 M	-43.61	-30.61	855,000 M	1,000 G	1,00 M	870.130008 M	-42.64	-29.64	1,000 G	3,000 G	1,00 M	1.672500 G	-36.79	-23.79	3,000 G	7,000 G	1,00 M	3.034000 G	-38.97	-25.97	7,000 G	9,000 G	1,00 M	7.928500 G	-36.40	-23.40
Start	Stop	RBW	Freq	PerAbn	ΔLimit																																																																																		
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1,000 G	3,000 G	1,00 M	1.672500 G	-28.89	-15.89																																																																																		
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855,000 M	1,000 G	1,00 M	870.130008 M	-42.64	-29.64																																																																																		
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Start	Stop	RBW	Freq	PerAbn	ΔLimit																																																																																		
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30,000 M	820,000 M	1,00 M	804.200000 M	-43.70	-30.70																																																																																		
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GSM1900 (GPRS class 8)

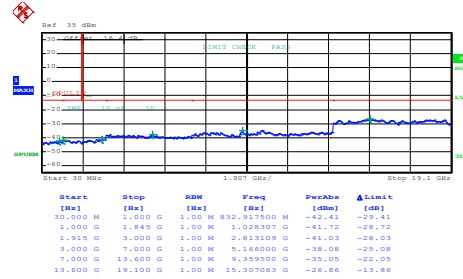
Lowest Channel



Date: 12.APR.2018 17:20:51

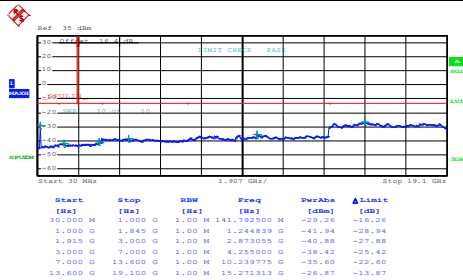
GSM1900 (EDGE class 8)

Lowest Channel



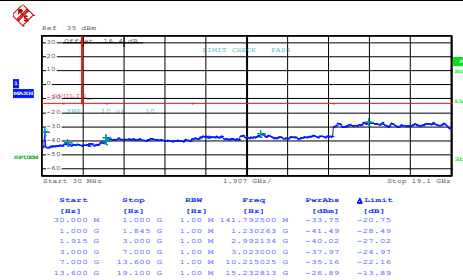
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Middle Channel



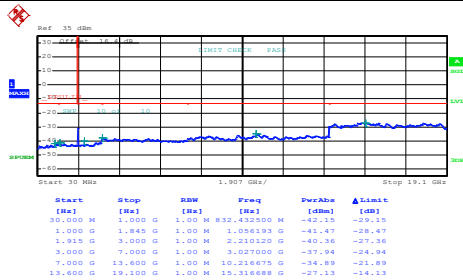
Date: 12.APR.2018 17:21:42

Middle Channel



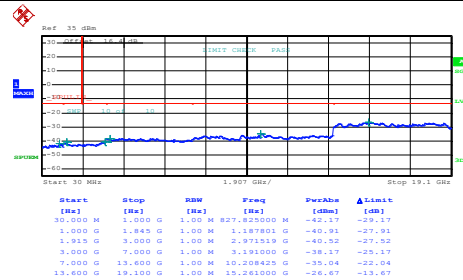
Date: 12.APR.2018 18:29:51

Highest Channel



Date: 12.APR.2018 17:22:34

Highest Channel



Date: 12.APR.2018 18:30:41

**Frequency Stability**

Test Conditions	Middle Channel	GSM850 (GPRS class 8)	GSM850 (EDGE class 8)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0072	0.0012	PASS
40	Normal Voltage	0.0012	0.0000	
30	Normal Voltage	0.0012	0.0000	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0084	0.0036	
0	Normal Voltage	0.0012	0.0000	
-10	Normal Voltage	0.0048	0.0084	
-20	Normal Voltage	0.0203	0.0084	
-30	Normal Voltage	0.0395	0.0132	
20	Maximum Voltage	0.0084	0.0036	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0024	0.0024	

Test Conditions	Middle Channel	GSM1900 (GPRS class 8)	GSM1900 (EDGE class 8)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0021	0.0059	PASS
40	Normal Voltage	0.0005	0.0043	
30	Normal Voltage	0.0000	0.0021	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0000	0.0016	
0	Normal Voltage	0.0037	0.0011	
-10	Normal Voltage	0.0027	0.0021	
-20	Normal Voltage	0.0053	0.0021	
-30	Normal Voltage	0.0138	0.0053	
20	Maximum Voltage	0.0016	0.0027	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0011	0.0005	

Note:

1. Normal Voltage = 3.3V ; Battery End Point (BEP) = 3.0 V ; Maximum Voltage =3.6 V
2. The frequency fundamental emissions stay within the authorized frequency block.

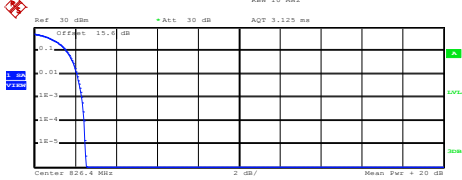
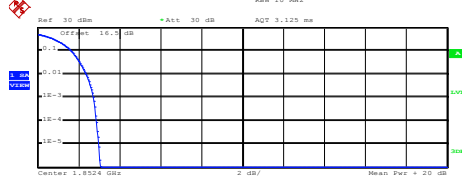
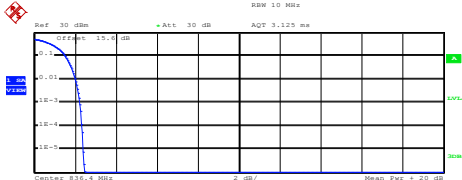
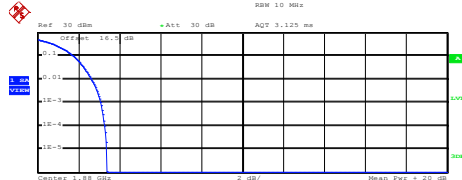
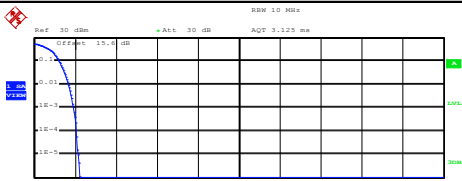
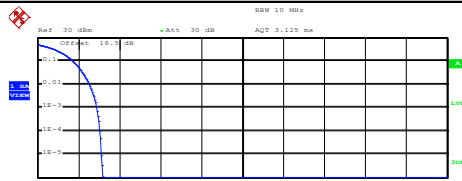


A3. WCDMA

Peak-to-Average Ratio

Mode	WCDMA Band V	WCDMA Band II	Limit: 13dB
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	Result
Lowest CH	2.32	2.72	PASS
Middle CH	2.24	3.08	
Highest CH	1.92	2.88	



WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)																
Lowest Channel	Lowest Channel																
 Ref: 30 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz Center: 826.4 MHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 24.27 dBm Peak: 26.80 dBm Crest: 2.53 dB <table><tr><td>10 %</td><td>1.56 dB</td></tr><tr><td>1 %</td><td>2.08 dB</td></tr><tr><td>.1 %</td><td>2.32 dB</td></tr><tr><td>.01 %</td><td>2.44 dB</td></tr></table> Date: 12.APR.2018 19:02:38	10 %	1.56 dB	1 %	2.08 dB	.1 %	2.32 dB	.01 %	2.44 dB	 Ref: 30 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz Center: 1.8524 GHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 22.83 dBm Peak: 25.88 dBm Crest: 3.05 dB <table><tr><td>10 %</td><td>1.64 dB</td></tr><tr><td>1 %</td><td>2.36 dB</td></tr><tr><td>.1 %</td><td>2.72 dB</td></tr><tr><td>.01 %</td><td>2.88 dB</td></tr></table> Date: 12.APR.2018 18:50:19	10 %	1.64 dB	1 %	2.36 dB	.1 %	2.72 dB	.01 %	2.88 dB
10 %	1.56 dB																
1 %	2.08 dB																
.1 %	2.32 dB																
.01 %	2.44 dB																
10 %	1.64 dB																
1 %	2.36 dB																
.1 %	2.72 dB																
.01 %	2.88 dB																
Middle Channel	Middle Channel																
 Ref: 30 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz Center: 836.4 MHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 24.20 dBm Peak: 26.66 dBm Crest: 2.45 dB <table><tr><td>10 %</td><td>1.52 dB</td></tr><tr><td>1 %</td><td>2.00 dB</td></tr><tr><td>.1 %</td><td>2.24 dB</td></tr><tr><td>.01 %</td><td>2.32 dB</td></tr></table> Date: 12.APR.2018 19:02:52	10 %	1.52 dB	1 %	2.00 dB	.1 %	2.24 dB	.01 %	2.32 dB	 Ref: 30 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz Center: 1.85 GHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 22.50 dBm Peak: 25.88 dBm Crest: 3.38 dB <table><tr><td>10 %</td><td>1.76 dB</td></tr><tr><td>1 %</td><td>2.64 dB</td></tr><tr><td>.1 %</td><td>3.08 dB</td></tr><tr><td>.01 %</td><td>3.28 dB</td></tr></table> Date: 12.APR.2018 18:50:33	10 %	1.76 dB	1 %	2.64 dB	.1 %	3.08 dB	.01 %	3.28 dB
10 %	1.52 dB																
1 %	2.00 dB																
.1 %	2.24 dB																
.01 %	2.32 dB																
10 %	1.76 dB																
1 %	2.64 dB																
.1 %	3.08 dB																
.01 %	3.28 dB																
Highest Channel	Highest Channel																
 Ref: 30 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz Center: 846.6 MHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 24.36 dBm Peak: 26.59 dBm Crest: 2.23 dB <table><tr><td>10 %</td><td>1.24 dB</td></tr><tr><td>1 %</td><td>1.68 dB</td></tr><tr><td>.1 %</td><td>1.92 dB</td></tr><tr><td>.01 %</td><td>2.08 dB</td></tr></table> Date: 12.APR.2018 19:03:05	10 %	1.24 dB	1 %	1.68 dB	.1 %	1.92 dB	.01 %	2.08 dB	 Ref: 30 dBm, Att: 30 dB, AQT: 3.125 ms, RSW: 10 MHz Center: 1.9076 GHz, 2 dB/ Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean: 22.70 dBm Peak: 25.88 dBm Crest: 3.18 dB <table><tr><td>10 %</td><td>1.72 dB</td></tr><tr><td>1 %</td><td>2.52 dB</td></tr><tr><td>.1 %</td><td>2.88 dB</td></tr><tr><td>.01 %</td><td>3.04 dB</td></tr></table> Date: 12.APR.2018 18:50:48	10 %	1.72 dB	1 %	2.52 dB	.1 %	2.88 dB	.01 %	3.04 dB
10 %	1.24 dB																
1 %	1.68 dB																
.1 %	1.92 dB																
.01 %	2.08 dB																
10 %	1.72 dB																
1 %	2.52 dB																
.1 %	2.88 dB																
.01 %	3.04 dB																



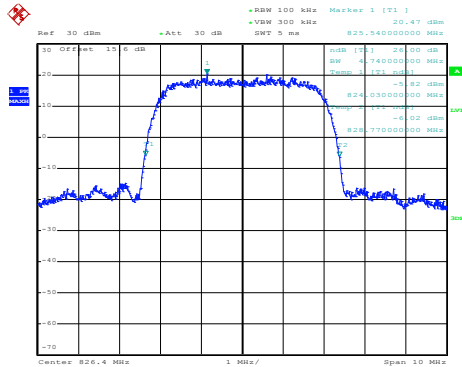
26dB Bandwidth

Mode	WCDMA Band V 26dB BW(MHz)	WCDMA Band II 26dB BW(MHz)
Mod.	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.74	4.71
Middle CH	4.76	4.69
Highest CH	4.86	4.70



WCDMA Band V (RMC 12.2Kbps)

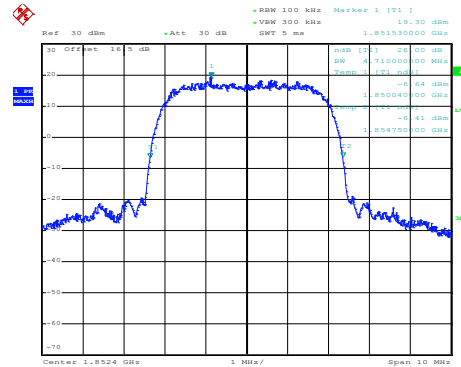
Lowest Channel



Date: 12.APR.2018 19:01:09

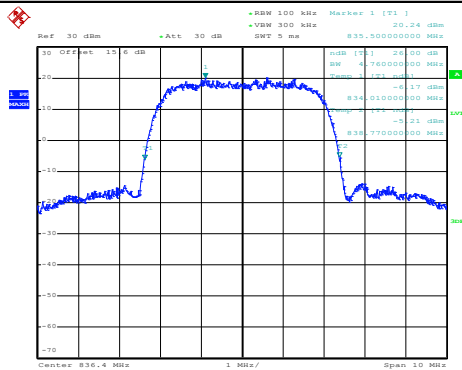
WCDMA Band II (RMC 12.2Kbps)

Lowest Channel



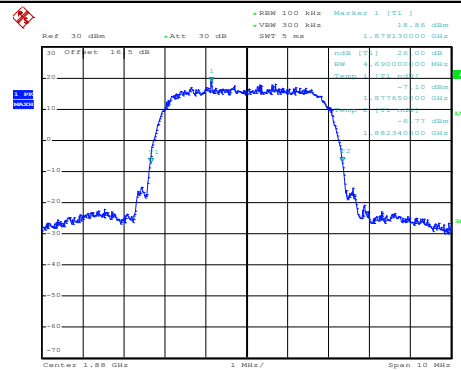
Date: 12.APR.2018 18:47:04

Middle Channel



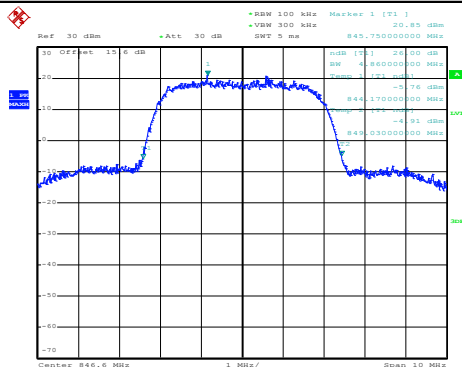
Date: 12.APR.2018 19:01:42

Middle Channel



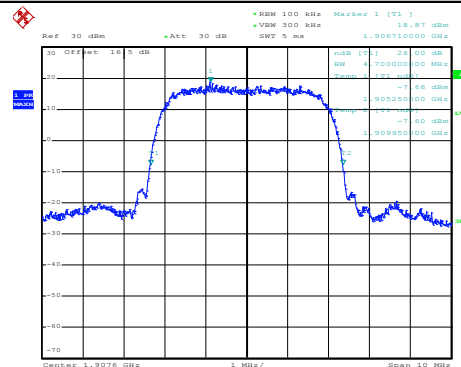
Date: 12.APR.2018 18:47:37

Highest Channel



Date: 12.APR.2018 19:02:15

Highest Channel



Date: 12.APR.2018 18:48:11

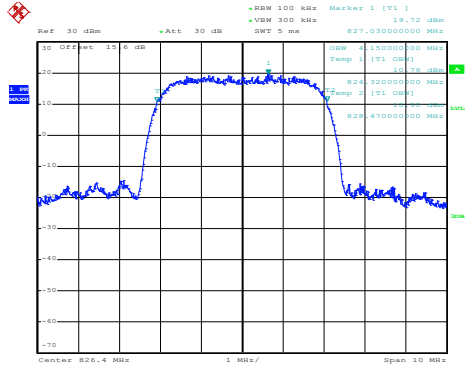
**Occupied Bandwidth**

Mode	WCDMA Band V 99% OBW(MHz)	WCDMA Band II 99% OBW(MHz)
Mod.	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.15	4.13
Middle CH	4.15	4.13
Highest CH	4.22	4.13



WCDMA Band V (RMC 12.2Kbps)

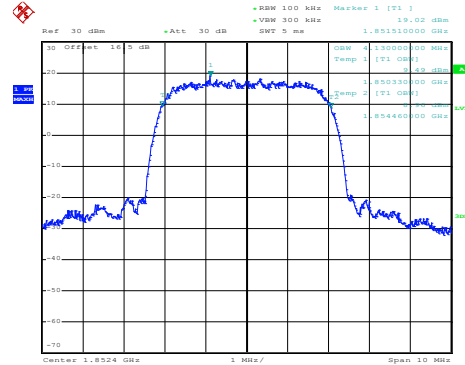
Lowest Channel



Date: 12.APR.2018 19:03:50

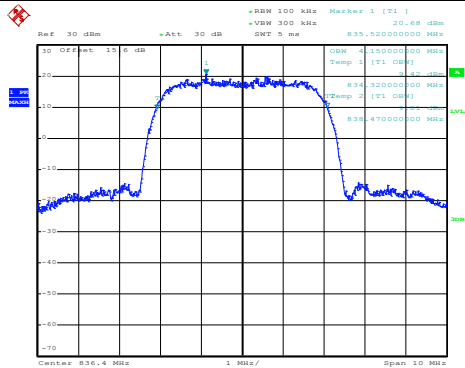
WCDMA Band II (RMC 12.2Kbps)

Lowest Channel



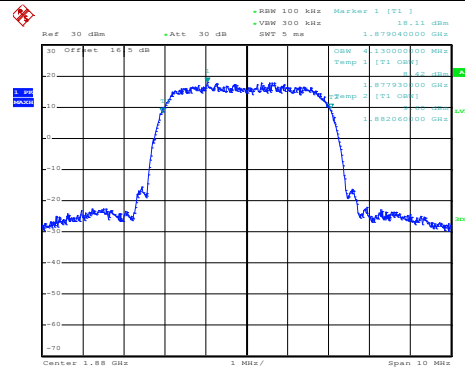
Date: 12.APR.2018 18:48:54

Middle Channel



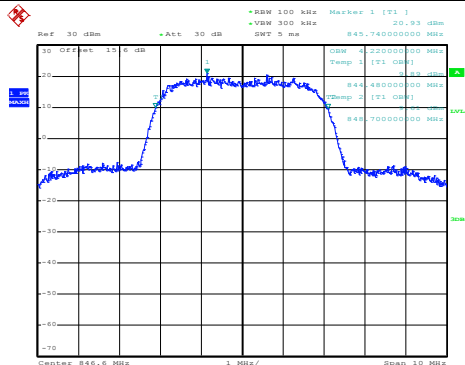
Date: 12.APR.2018 19:04:24

Middle Channel



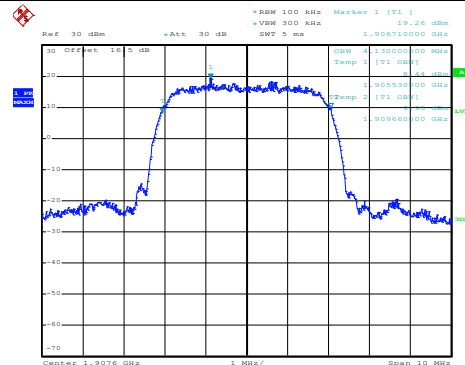
Date: 12.APR.2018 18:49:28

Highest Channel

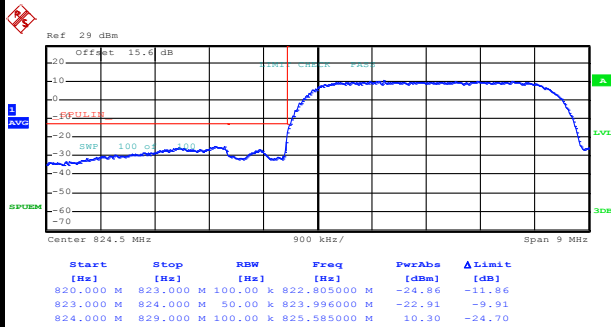


Date: 12.APR.2018 19:04:57

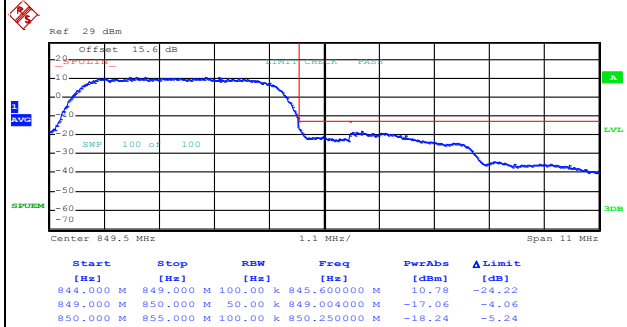
Highest Channel



Date: 12.APR.2018 18:50:01

**Conducted Band Edge****WCDMA Band V (RMC 12.2Kbps)****Lowest Band Edge**

Date: 12.APR.2018 19:07:51

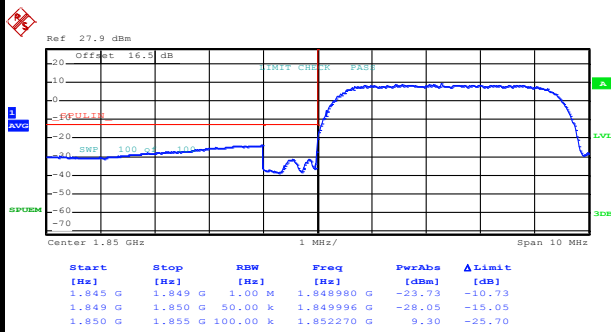
Highest Band Edge

Date: 12.APR.2018 19:10:38



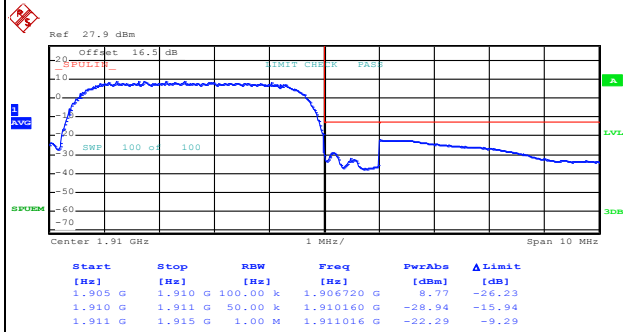
WCDMA Band II (RMC 12.2Kbps)

Lowest Band Edge

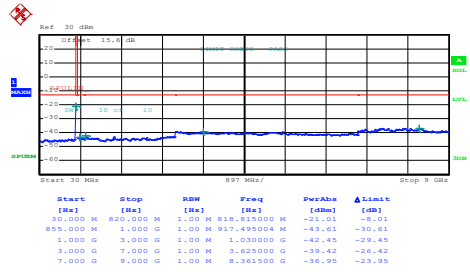


Date: 12.APR.2018 18:53:51

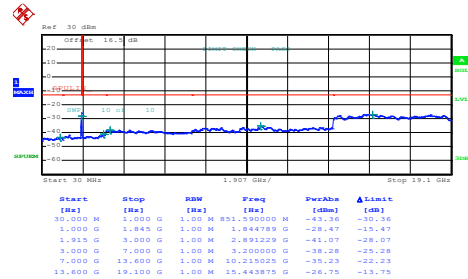
Highest Band Edge



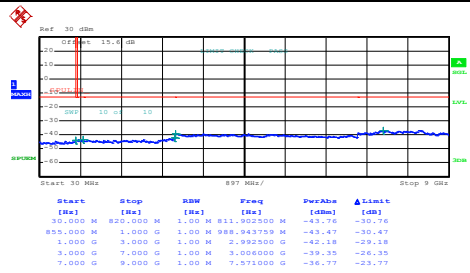
Date: 12.APR.2018 18:56:40

**Conducted Spurious Emission****WCDMA Band V (RMC 12.2Kbps)****Lowest Channel**

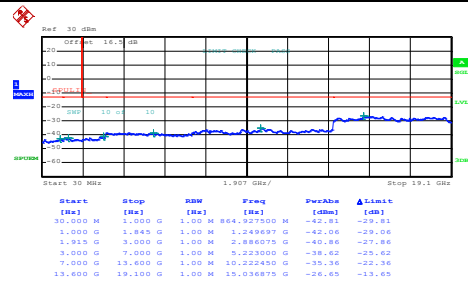
Date: 12.APR.2018 18:58:15

WCDMA Band II (RMC 12.2Kbps)**Lowest Channel**

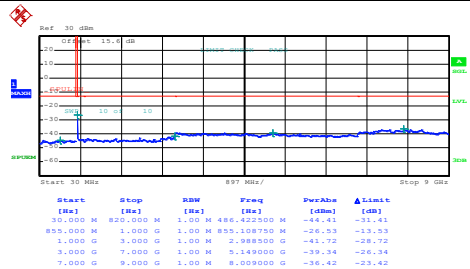
Date: 12.APR.2018 18:44:35

Middle Channel

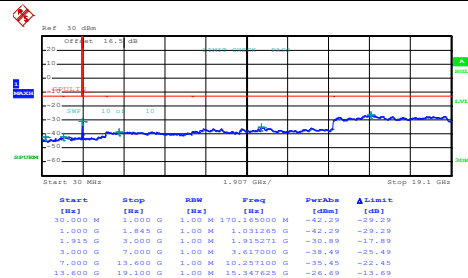
Date: 12.APR.2018 18:59:15

Middle Channel

Date: 12.APR.2018 18:45:27

Highest Channel

Date: 12.APR.2018 19:00:05

Highest Channel

Date: 12.APR.2018 18:46:19

**Frequency Stability**

Test Conditions	Middle Channel	WCDMA Band V (RMC 12.2Kbps)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0024	PASS
40	Normal Voltage	0.0036	
30	Normal Voltage	0.0239	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0239	
0	Normal Voltage	0.0227	
-10	Normal Voltage	0.0227	
-20	Normal Voltage	0.0215	
-30	Normal Voltage	0.0203	
20	Maximum Voltage	0.0036	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0036	

Test Conditions	Middle Channel	WCDMA Band II (RMC 12.2Kbps)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0064	PASS
40	Normal Voltage	0.0032	
30	Normal Voltage	0.0032	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0011	
0	Normal Voltage	0.0000	
-10	Normal Voltage	0.0000	
-20	Normal Voltage	0.0000	
-30	Normal Voltage	0.0005	
20	Maximum Voltage	0.0053	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0016	

Note:

1. Normal Voltage = 3.3V ; Battery End Point (BEP) = 3.0 V ; Maximum Voltage =3.6 V
2. The frequency fundamental emissions stay within the authorized frequency block.

**Appendix B. Test Results of ERP/EIRP and Radiated Test****ERP/EIRP**

Channel	Mode	Conducted		ERP	
		Power (dBm)	Power (Watts)	ERP(dBm)	ERP(W)
Lowest	GSM850 GPRS class 8 (GT - LC = -4.3 dB)	32.29	1.6943	25.84	0.3837
Middle		32.38	1.7298	25.93	0.3917
Highest		31.94	1.5631	25.49	0.3540
Lowest	GSM850 EDGE class 8 (GT - LC = -4.3 dB)	25.83	0.3828	19.38	0.0867
Middle		25.62	0.3648	19.17	0.0826
Highest		25.50	0.3548	19.05	0.0804
Lowest	WCDMA Band V RMC 12.2Kbps (GT - LC = -4.3 dB)	24.45	0.2786	18.00	0.0631
Middle		24.34	0.2716	17.89	0.0615
Highest		24.40	0.2754	17.95	0.0624
Limit	ERP < 7W	Result		PASS	

Channel	Mode	Conducted		EIRP	
		Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)
Lowest	GSM1900 GPRS class 8 (GT - LC = -0.9 dB)	29.66	0.9247	28.76	0.7516
Middle		29.70	0.9333	28.80	0.7586
Highest		29.51	0.8933	28.61	0.7261
Lowest	GSM1900 EDGE class 8 (GT - LC = -0.9 dB)	24.81	0.3027	23.91	0.2460
Middle		25.09	0.3228	24.19	0.2624
Highest		24.92	0.3105	24.02	0.2523
Lowest	WCDMA Band II RMC 12.2Kbps (GT - LC = -0.9 dB)	23.84	0.2421	22.94	0.1968
Middle		23.41	0.2193	22.51	0.1782
Highest		23.52	0.2249	22.62	0.1828
Limit	EIRP < 2W	Result		PASS	

**Radiated Spurious Emission****Part 24E GPRS 1900**

GPRS 1900									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3700	-57.50	-13	-44.50	-75.36	-67.81	1.97	12.28	H
	5548	-42.54	-13	-29.54	-63.83	-52.66	2.14	12.27	H
	7403	-52.01	-13	-39.01	-76.77	-60.01	2.17	10.17	H
									H
	3700	-58.53	-13	-45.53	-75.79	-68.84	1.97	12.28	V
	5548	-45.29	-13	-32.29	-66.82	-55.41	2.14	12.27	V
	7403	-51.68	-13	-38.68	-75.5	-59.68	2.17	10.17	V
									V
Middle	3763	-55.54	-13	-42.54	-73.2	-65.78	2.01	12.24	H
	5639	-44.53	-13	-31.53	-65.7	-54.80	2.12	12.39	H
	7522	-51.15	-13	-38.15	-76.64	-59.11	2.11	10.08	H
									H
	3763	-57.33	-13	-44.33	-74.49	-67.57	2.01	12.24	V
	5639	-44.59	-13	-31.59	-65.95	-54.86	2.12	12.39	V
	7522	-52.03	-13	-39.03	-76.76	-59.99	2.11	10.08	V
									V
Highest	3189	-52.77	-13	-39.77	-70.39	-62.62	1.61	11.47	H
	5730	-42.60	-13	-29.60	-63.82	-53.02	2.10	12.52	H
	7641	-50.48	-13	-37.48	-75.69	-58.87	2.11	10.51	H
									H
	3189	-55.57	-13	-42.57	-72.75	-65.42	1.61	11.47	V
	5730	-43.81	-13	-30.81	-65.16	-54.23	2.10	12.52	V
	7641	-50.78	-13	-37.78	-75.57	-59.17	2.11	10.51	V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

**Part 24E EDGE 1900**

EDGE 1900									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3700	-59.18	-13	-46.18	-77.04	-69.49	1.97	12.28	H
	5548	-50.52	-13	-37.52	-71.81	-60.64	2.14	12.27	H
	7403	-51.88	-13	-38.88	-76.64	-59.88	2.17	10.17	H
									H
									H
									H
									H
	3700	-59.83	-13	-46.83	-77.09	-70.14	1.97	12.28	V
	5548	-51.48	-13	-38.48	-73.01	-61.60	2.14	12.27	V
	7403	-52.66	-13	-39.66	-76.48	-60.66	2.17	10.17	V
									V
									V
									V
									V
Middle	3763	-58.70	-13	-45.70	-76.36	-68.94	2.01	12.24	H
	5639	-48.98	-13	-35.98	-70.15	-59.25	2.12	12.39	H
	7522	-51.66	-13	-38.66	-77.15	-59.62	2.11	10.08	H
									H
									H
									H
									H
	3763	-59.81	-13	-46.81	-76.97	-70.05	2.01	12.24	V
	5639	-50.18	-13	-37.18	-71.54	-60.45	2.12	12.39	V
	7522	-51.62	-13	-38.62	-76.35	-59.58	2.11	10.08	V
									V
									V
									V
									V



Highest	3819	-58.66	-13	-45.66	-76.28	-68.83	2.04	12.21	H
	5730	-46.85	-13	-33.85	-68.07	-57.27	2.10	12.52	H
	7641	-51.59	-13	-38.59	-76.8	-59.98	2.11	10.51	H
									H
									H
									H
									H
	3819	-59.21	-13	-46.21	-76.39	-69.38	2.04	12.21	V
	5730	-48.97	-13	-35.97	-70.32	-59.39	2.10	12.52	V
	7641	-52.12	-13	-39.12	-76.91	-60.51	2.11	10.51	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

**Part 24E WCDMA 1900**

WCDMA 1900									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3704	-58.75	-13	-45.75	-76.61	-69.05	1.98	12.28	H
	5555	-49.83	-13	-36.83	-71.11	-59.96	2.14	12.28	H
	7410	-51.76	-13	-38.76	-76.66	-59.75	2.17	10.16	H
									H
									H
									H
									H
	3704	-59.45	-13	-46.45	-76.71	-69.75	1.98	12.28	V
	5555	-51.43	-13	-38.43	-72.95	-61.56	2.14	12.28	V
	7410	-52.37	-13	-39.37	-76.35	-60.36	2.17	10.16	V
									V
									V
									V
									V
Middle	3760	-58.40	-13	-45.40	-76.06	-68.64	2.01	12.24	H
	5639	-47.12	-13	-34.12	-68.29	-57.39	2.12	12.39	H
	7520	-50.53	-13	-37.53	-76.02	-58.49	2.11	10.07	H
									H
									H
									H
									H
	3760	-59.39	-13	-46.39	-76.62	-69.63	2.01	12.24	V
	5639	-50.10	-13	-37.10	-71.46	-60.37	2.12	12.39	V
	7520	-51.40	-13	-38.40	-76.13	-59.36	2.11	10.07	V
									V
									V
									V
									V



Highest	3815	-58.69	-13	-45.69	-76.3	-68.87	2.03	12.21	H
	5723	-47.87	-13	-34.87	-69.09	-58.28	2.10	12.51	H
	7631	-50.79	-13	-37.79	-76.02	-59.15	2.11	10.47	H
									H
									H
									H
									H
	3815	-59.22	-13	-46.22	-76.39	-69.40	2.03	12.21	V
	5723	-47.90	-13	-34.90	-69.25	-58.31	2.10	12.51	V
	7631	-51.37	-13	-38.37	-76.18	-59.73	2.11	10.47	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

**Part 22H GPRS 850**

GPRS 850									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1648	-52.10	-13	-39.10	-64.63	-57.49	1.23	8.76	H
	2472	-50.33	-13	-37.33	-65.66	-57.22	1.44	10.48	H
	3296	-60.35	-13	-47.35	-77.42	-68.29	1.70	11.79	H
									H
									H
									H
									H
	1648	-52.33	-13	-39.33	-62.56	-57.72	1.23	8.76	V
	2472	-49.73	-13	-36.73	-64.45	-56.62	1.44	10.48	V
	3296	-60.79	-13	-47.79	-77.41	-68.73	1.70	11.79	V
									V
									V
									V
									V
Middle	1672	-52.56	-13	-39.56	-65.32	-58.03	1.24	8.85	H
	2509	-49.19	-13	-36.19	-64.34	-56.11	1.44	10.51	H
	3345	-60.22	-13	-47.22	77.16	-68.26	1.74	11.94	H
									H
									H
									H
									H
	1672	-53.45	-13	-40.45	-63.79	-58.92	1.24	8.85	V
	2509	-51.00	-13	-38.00	-65.7	-57.92	1.44	10.51	V
	3345	-60.62	-13	-47.62	-77.1	-68.66	1.74	11.94	V
									V
									V
									V
									V



Highest	1696	-56.74	-13	-43.74	-69.94	-62.29	1.24	8.94	H
	2544	-51.21	-13	-38.21	-66.24	-58.15	1.44	10.54	H
	3392	-60.68	-13	-47.68	-77.41	-68.82	1.78	12.08	H
									H
									H
									H
									H
	1696	-55.09	-13	-42.09	-65.63	-60.64	1.24	8.94	V
	2544	-49.35	-13	-36.35	-64.04	-56.29	1.44	10.54	V
	3392	-61.00	-13	-48.00	-77.27	-69.14	1.78	12.08	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

**Part 22H EDGE 850**

EDGE 850									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1648	-53.83	-13	-40.83	-66.35	-59.22	1.23	8.76	H
	2472	-50.44	-13	-37.44	-65.77	-57.33	1.44	10.48	H
	3296	-59.74	-13	-46.74	-76.81	-67.68	1.70	11.79	H
									H
									H
									H
									H
	1648	-52.38	-13	-39.38	-62.61	-57.77	1.23	8.76	V
	2472	-50.45	-13	-37.45	-65.17	-57.34	1.44	10.48	V
	3296	-60.48	-13	-47.48	-77.1	-68.42	1.70	11.79	V
									V
									V
									V
									V
Middle	1672	-53.05	-13	-40.05	-65.81	-58.52	1.24	8.85	H
	2512	-52.04	-13	-39.04	-67.19	-58.96	1.44	10.51	H
	3345	-60.08	-13	-47.08	-77.02	-68.12	1.74	11.94	H
									H
									H
									H
									H
	1672	-52.33	-13	-39.33	-62.67	-57.80	1.24	8.85	V
	2512	-49.67	-13	-36.67	-64.37	-56.59	1.44	10.51	V
	3345	-60.67	-13	-47.67	-77.15	-68.71	1.74	11.94	V
									V
									V
									V
									V



Highest	1696	-58.10	-13	-45.10	-71.3	-63.65	1.24	8.94	H
	2544	-49.55	-13	-36.55	-64.58	-56.49	1.44	10.54	H
	3392	-60.19	-13	-47.19	-76.92	-68.33	1.78	12.08	H
									H
									H
									H
									H
	1696	-61.62	-13	-48.62	-72.16	-67.17	1.24	8.94	V
	2544	-50.80	-13	-37.80	-65.49	-57.74	1.44	10.54	V
	3392	-60.66	-13	-47.66	-76.93	-68.80	1.78	12.08	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

**Part 22H WCDMA 850**

WCDMA 850									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1648	-58.14	-13	-45.14	-70.66	-63.53	1.23	8.76	H
	2479	-57.25	-13	-44.25	-72.58	-64.15	1.44	10.48	H
	3305	-60.23	-13	-47.23	-77.3	-68.18	1.71	11.82	H
									H
									H
									H
									H
	1648	-61.77	-13	-48.77	-72	-67.16	1.23	8.76	V
	2479	-58.69	-13	-45.69	-73.41	-65.59	1.44	10.48	V
	3305	-60.69	-13	-47.69	-77.31	-68.64	1.71	11.82	V
									V
									V
									V
									V
Middle	1672	-60.92	-13	-47.92	-73.68	-66.39	1.24	8.85	H
	2509	-58.14	-13	-45.14	-73.29	-65.06	1.44	10.51	H
	3345	-59.61	-13	-46.61	-76.55	-67.65	1.74	11.94	H
									H
									H
									H
									H
	1672	-62.03	-13	-49.03	-72.37	-67.50	1.24	8.85	V
	2509	-59.58	-13	-46.58	-74.28	-66.50	1.44	10.51	V
	3345	-60.46	-13	-47.46	-76.94	-68.50	1.74	11.94	V
									V
									V
									V
									V



Highest	1696	-60.65	-13	-47.65	-73.85	-66.20	1.24	8.94	H
	2540	-57.35	-13	-44.35	-72.38	-64.29	1.44	10.53	H
	3386	-60.25	-13	-47.25	-76.98	-68.38	1.78	12.06	H
									H
									H
									H
									H
	1696	-64.51	-13	-51.51	-75.05	-70.06	1.24	8.94	V
	2540	-57.10	-13	-44.10	-71.79	-64.04	1.44	10.53	V
	3386	-60.80	-13	-47.80	-77.07	-68.93	1.78	12.06	V
									V
									V
									V
									V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

————THE END————