



# FCC RADIO TEST REPORT

**FCC ID** : PY7-57442Y  
**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 Aug. 30, 2018 and testing was started from Sep. 28, 2018 and completed on Nov. 24, 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
FG882920-01A	01	Initial issue of report	Dec. 07, 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 20.63 dB at 11121.000 MHz

Reviewed by: Wii Chang

Report Producer: Natasha Hsieh



# 1 General Description

## 1.1 Product Feature of Equipment Under Test

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

Standards-related Product Specification	
Antenna Type	PIFA Antenna

EUT Information List			
HW Version	SW Version	S/N	Performed Test Item
A	1.129	CQ30015WUL	Conducted Measurement
		CQ3001BNHG	Radiated Spurious Emission ERP/EIRP Test

Accessory List	
AC Adapter	Model Name: UCH32
	S/N: 6218W30200038
Earphone	Model Name: MH410c
	S/N: N/A
USB Cable	Model Name: UCB24
	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	0.5534	0.0060 ppm	248KGXW
Part 22	824.2 ~848.8	GSM850 EDGE class 8	8PSK	0.1538	0.0096 ppm	249KG7W
Part 22	826.4 ~846.6	WCDMA Band V RMC 12.2Kbps	BPSK	0.0692	0.0179 ppm	4M19F9W
Part 24	1850.2 ~1909.8	GSM1900 GPRS class 8	GMSK	1.0864	0.0069 ppm	246KGXW
Part 24	1850.2 ~1909.8	GSM1900 EDGE class 8	8PSK	0.3784	0.0059 ppm	251KG7W
Part 24	1852.4 ~ 1907.6	WCDMA Band II RMC 12.2Kbps	BPSK	0.1945	0.0043 ppm	4M14F9W



### 1.4 Testing Location

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

<b>Test Site</b>	SPORTON INTERNATIONAL INC.
<b>Test Site Location</b>	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
<b>Test Site No.</b>	<b>Sporton Site No.</b> TH03-HY; 03CH07-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 (X plane for Cellular Band and Y plane for PCS Band) 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.

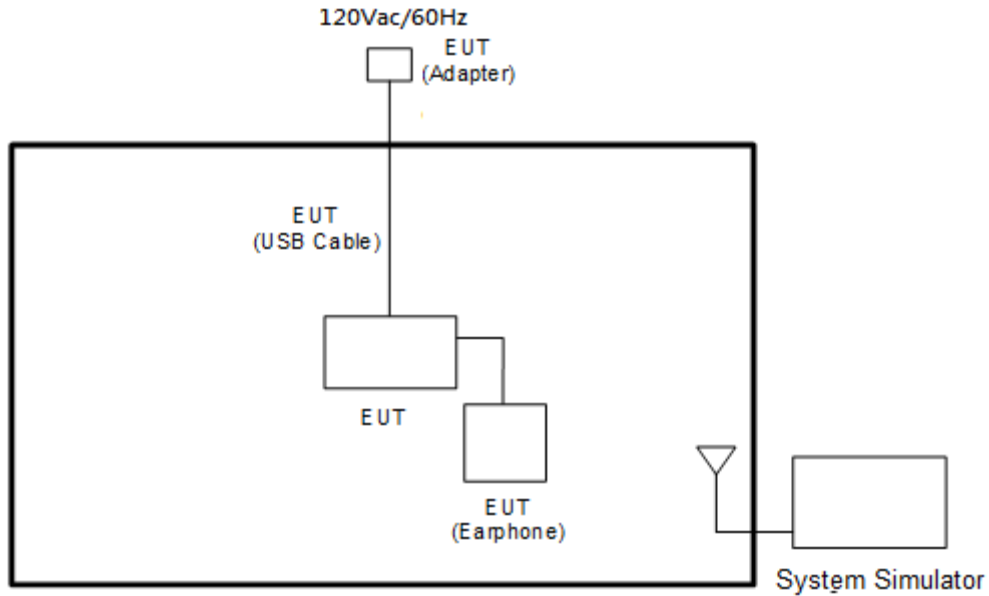
All modes and data rates and positions were investigated.

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

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	<ul style="list-style-type: none"><li>■ GPRS Class 8 Link</li><li>■ EDGE Class 8 Link</li></ul>	<ul style="list-style-type: none"><li>■ GPRS Class 8 Link</li><li>■ EDGE Class 8 Link</li></ul>
GSM 1900	<ul style="list-style-type: none"><li>■ GPRS Class 8 Link</li><li>■ EDGE Class 8 Link</li></ul>	<ul style="list-style-type: none"><li>■ GPRS Class 8 Link</li><li>■ EDGE Class 8 Link</li></ul>
WCDMA Band V	<ul style="list-style-type: none"><li>■ RMC 12.2Kbps Link</li></ul>	<ul style="list-style-type: none"><li>■ RMC 12.2Kbps Link</li></ul>
WCDMA Band II	<ul style="list-style-type: none"><li>■ RMC 12.2Kbps Link</li></ul>	<ul style="list-style-type: none"><li>■ RMC 12.2Kbps Link</li></ul>



## 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.	System Simulator	Anritsu	8820C	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:

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



## 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

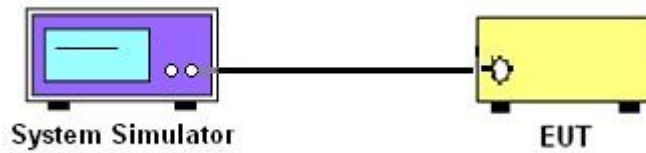
### 3 Conducted Test Result

#### 3.1 Measuring Instruments

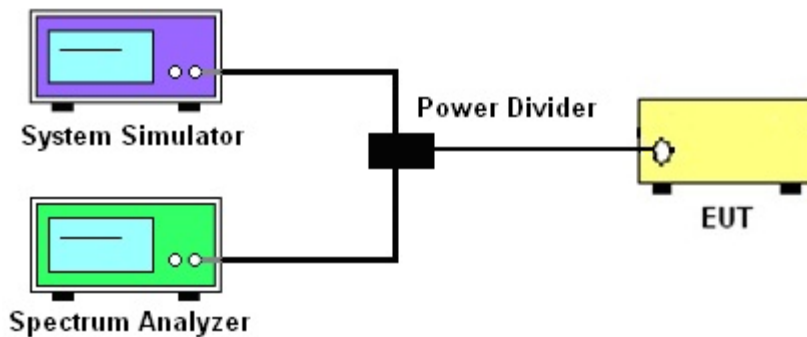
See list of measuring instruments of this test report.

##### 3.1.1 Test Setup

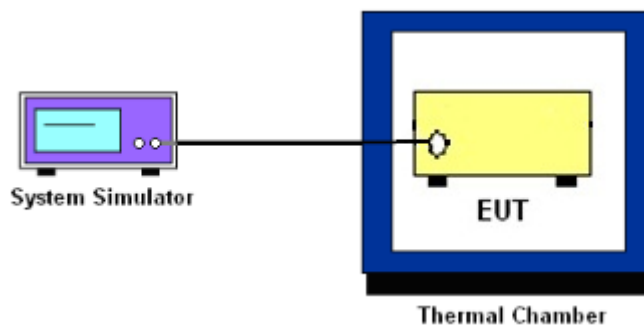
##### 3.1.2 Conducted Output Power



##### 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 10<sup>th</sup> 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

22.355

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.

24.235

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

#### 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  $-30^{\circ}\text{C}$  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  $10^{\circ}\text{C}$  steps up to  $50^{\circ}\text{C}$ . 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.

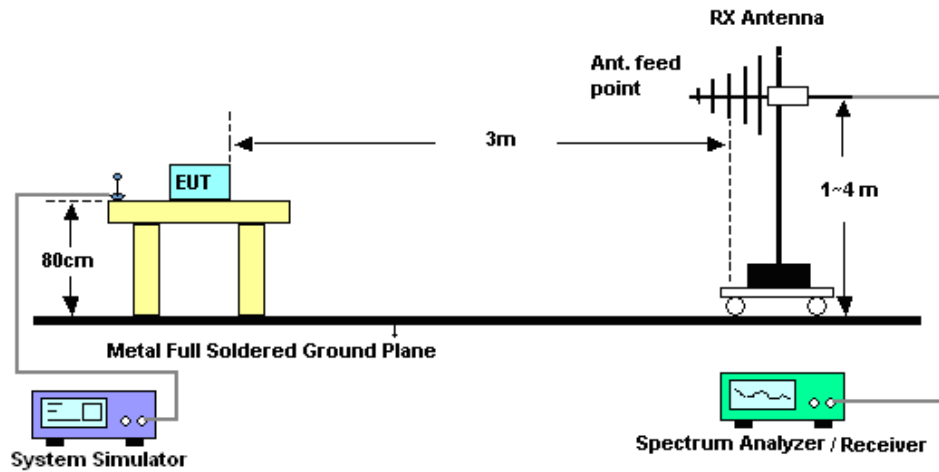
## 4 Radiated Test Items

### 4.1 Measuring Instruments

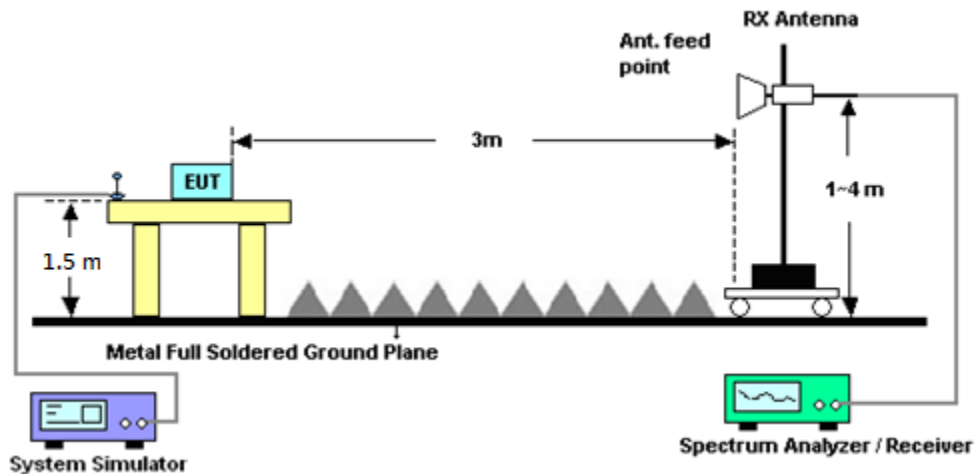
See list of measuring instruments of this test report.

### 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.  $EIRP (dBm) = S.G. Power - Tx Cable Loss + Tx Antenna Gain$
11.  $ERP (dBm) = EIRP - 2.15$
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. 10, 2018	Sep. 28, 2018~ Nov. 24, 2018	Aug. 09, 2019	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Jun. 29, 2018	Sep. 28, 2018~ Nov. 24, 2018	Jun. 28, 2019	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30℃ ~70℃	Dec. 06, 2017	Sep. 28, 2018~ Nov. 24, 2018	Dec. 05, 2018	Conducted (TH03-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL883644	Voltage:0~20V;Current:0~5A	Dec. 06, 2017	Sep. 28, 2018~ Nov. 24, 2018	Dec. 05, 2018	Conducted (TH03-HY)
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 06, 2018	Sep. 28, 2018~ Nov. 24, 2018	Mar. 05, 2019	Conducted (TH03-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Oct. 05, 2018~ Oct. 08, 2018	Nov. 22, 2018	Radiation (03CH07-HY)
Bilog Antenna	TESEQ	CBL 6111D&0080 0N1D01N-06	35419&03	30MHz to 1GHz	Dec. 18, 2017	Oct. 05, 2018~ Oct. 08, 2018	Dec. 17, 2018	Radiation (03CH07-HY)
Horn Antenna	ESCO	3117	00211469	1GHz~18GHz	Aug. 06, 2018	Oct. 05, 2018~ Oct. 08, 2018	Aug. 05, 2019	Radiation (03CH07-HY)
Horn Antenna	ESCO	3117	00143261	1GHz~18GHz	Dec. 27, 2017	Oct. 05, 2018~ Oct. 08, 2018	Dec. 26, 2018	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz ~ 40GHz	May 08, 2018	Oct. 05, 2018~ Oct. 08, 2018	May 07, 2019	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz- 40GHz	Nov. 10, 2017	Oct. 05, 2018~ Oct. 08, 2018	Nov. 09, 2018	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	May 21, 2018	Oct. 05, 2018~ Oct. 08, 2018	May 20, 2019	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-001 01800-30-10 P	1590075	1GHz ~ 18GHz	Apr. 25, 2018	Oct. 05, 2018~ Oct. 08, 2018	Apr. 24, 2019	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Oct. 30, 2017	Oct. 05, 2018~ Oct. 08, 2018	Oct. 29, 2018	Radiation (03CH07-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 16, 2018	Oct. 05, 2018~ Oct. 08, 2018	Jul. 15, 2019	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Apr. 17, 2018	Oct. 05, 2018~ Oct. 08, 2018	Apr. 16, 2019	Radiation (03CH07-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	HTC-2	1	N/A	May 12, 2018	Oct. 05, 2018~ Oct. 08, 2018	May 11, 2019	Radiation (03CH07-HY)
Notch Filter	Wainwright	WRCT1850/ 1910-40/8SS	SN21	1900	Nov. 08, 2017	Oct. 05, 2018~ Oct. 08, 2018	Nov. 07, 2018	Radiation (03CH07-HY)
Notch Filter	Wainwright	WTRCT5-82 4-849-20-70- 60SSK	SN1	824-849	Mar. 22, 2018	Oct. 05, 2018~ Oct. 08, 2018	Mar. 21, 2019	Radiation (03CH07-HY)
Filter	Wainwright	WLJ4-1000- 1530-6000-4 0ST	SN3	1.53 GHz Lowpass	Mar. 21, 2018	Oct. 05, 2018~ Oct. 08, 2018	Mar. 20, 2019	Radiation (03CH07-HY)
Filter	Microwave	H1G013G1	SN477215	1.0G High Pass	Dec. 07, 2017	Oct. 05, 2018~ Oct. 08, 2018	Dec. 06, 2018	Radiation (03CH07-HY)
Filter	Microwave	H3G018G1	SN477220	3.0G High Pass	Nov. 21, 2017	Oct. 05, 2018~ Oct. 08, 2018	Nov. 20, 2018	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4, MY28655/4	9KHz~30MHz	Jan. 02, 2018	Oct. 05, 2018~ Oct. 08, 2018	Jan. 01, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	30MHz~1GHz	Feb. 27, 2018	Oct. 05, 2018~ Oct. 08, 2018	Feb. 26, 2019	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	1GHz~18GHz	Feb. 27, 2018	Oct. 05, 2018~ Oct. 08, 2018	Feb. 26, 2019	Radiation (03CH07-HY)
Controller	ChainTek	Chaintek 3000	N/A	Control Turn table	N/A	Oct. 05, 2018~ Oct. 08, 2018	N/A	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF7802083 68	Control Ant Mast	N/A	Oct. 05, 2018~ Oct. 08, 2018	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Oct. 05, 2018~ Oct. 08, 2018	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Oct. 05, 2018~ Oct. 08, 2018	N/A	Radiation (03CH07-HY)
Signal Generator	Anritsu	MG3694C	163401	0.1Hz~40GHz	Jan. 15, 2018	Oct. 05, 2018~ Oct. 08, 2018	Jan. 14, 2019	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	RK-001042	N/A	N/A	Oct. 05, 2018~ Oct. 08, 2018	N/A	Radiation (03CH07-HY)



## 6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.70
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### Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.50
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### Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.20
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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	32.61	32.78	32.44	29.84	29.94	29.90
GPRS class 8	32.64	<b>32.80</b>	32.38	29.78	30.10	<b>30.16</b>
GPRS class 10	30.57	30.29	30.58	27.10	27.40	27.17
GPRS class 11	28.48	28.75	28.86	25.70	25.44	25.76
GPRS class 12	26.94	27.35	27.33	24.56	24.99	24.73
EGPRS class 8	<b>27.24</b>	26.95	26.69	<b>25.58</b>	25.11	25.25
EGPRS class 10	26.75	26.54	26.33	25.35	25.02	25.13
EGPRS class 11	26.53	26.38	26.17	25.38	25.30	24.95
EGPRS class 12	26.53	26.33	26.34	24.73	24.60	24.17

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	23.71	<b>23.77</b>	23.74	22.49	22.41	<b>22.69</b>
HSDPA Subtest-1	21.49	21.61	21.60	21.42	21.33	21.50
HSDPA Subtest-2	21.59	21.66	21.66	21.45	21.33	21.55
HSDPA Subtest-3	21.56	21.65	21.66	20.93	20.89	21.04
HSDPA Subtest-4	21.55	21.62	21.62	20.92	20.88	21.06
HSUPA Subtest-1	22.62	22.73	22.79	21.47	21.33	21.54
HSUPA Subtest-2	20.77	20.85	20.76	19.42	19.37	19.51
HSUPA Subtest-3	21.72	21.63	21.72	20.43	20.36	20.51
HSUPA Subtest-4	20.76	20.80	20.70	19.39	19.48	19.58
HSUPA Subtest-5	22.70	22.70	22.70	21.50	21.30	21.60



## A2. GSM

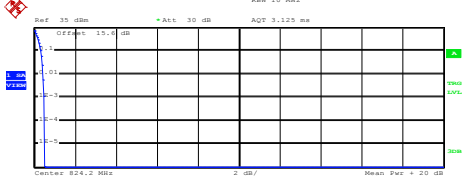
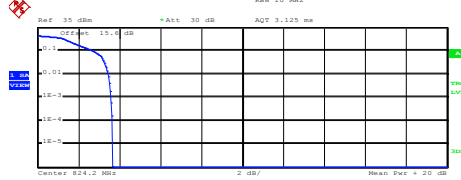
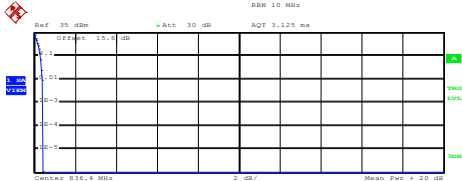
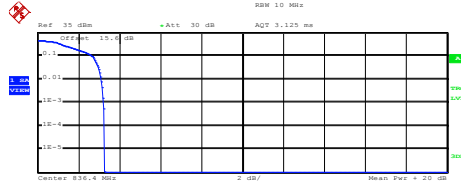
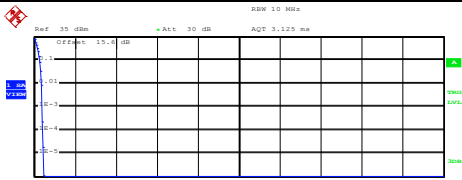
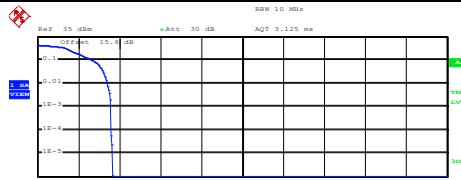
### Peak-to-Average Ratio

Mode	GSM850		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.48	3.60	PASS
Middle CH	0.44	3.24	
Highest CH	0.40	3.60	

Mode	GSM1900		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.32	3.08	PASS
Middle CH	0.32	3.04	
Highest CH	0.36	2.92	





GSM850 (GPRS class 8)	GSM850 (EDGE class 8)																
<p align="center"><b>Lowest Channel</b></p>  <p>Ref: 35 dBm    Att: 30 dB    AQT: 3.125 ms</p> <p>Center: 824.2 MHz    20 dB    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)</p> <p>Trace 1</p> <p>Mean: 31.94 dBm Peak: 32.43 dBm Crest: 0.49 dB</p> <table border="1"> <tr><td>10 %</td><td>0.32 dB</td></tr> <tr><td>1 %</td><td>0.44 dB</td></tr> <tr><td>.1 %</td><td>0.48 dB</td></tr> <tr><td>.01 %</td><td>0.52 dB</td></tr> </table> <p>Date: 19.SEP.2018 16:34:58</p>	10 %	0.32 dB	1 %	0.44 dB	.1 %	0.48 dB	.01 %	0.52 dB	<p align="center"><b>Lowest Channel</b></p>  <p>Ref: 35 dBm    Att: 30 dB    AQT: 3.125 ms</p> <p>Center: 824.2 MHz    20 dB    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)</p> <p>Trace 1</p> <p>Mean: 25.65 dBm Peak: 29.33 dBm Crest: 3.67 dB</p> <table border="1"> <tr><td>10 %</td><td>2.72 dB</td></tr> <tr><td>1 %</td><td>3.44 dB</td></tr> <tr><td>.1 %</td><td>3.60 dB</td></tr> <tr><td>.01 %</td><td>3.64 dB</td></tr> </table> <p>Date: 19.SEP.2018 16:47:39</p>	10 %	2.72 dB	1 %	3.44 dB	.1 %	3.60 dB	.01 %	3.64 dB
10 %	0.32 dB																
1 %	0.44 dB																
.1 %	0.48 dB																
.01 %	0.52 dB																
10 %	2.72 dB																
1 %	3.44 dB																
.1 %	3.60 dB																
.01 %	3.64 dB																
<p align="center"><b>Middle Channel</b></p>  <p>Ref: 35 dBm    Att: 30 dB    AQT: 3.125 ms</p> <p>Center: 836.4 MHz    20 dB    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)</p> <p>Trace 1</p> <p>Mean: 32.21 dBm Peak: 32.64 dBm Crest: 0.43 dB</p> <table border="1"> <tr><td>10 %</td><td>0.32 dB</td></tr> <tr><td>1 %</td><td>0.40 dB</td></tr> <tr><td>.1 %</td><td>0.44 dB</td></tr> <tr><td>.01 %</td><td>0.44 dB</td></tr> </table> <p>Date: 19.SEP.2018 16:35:16</p>	10 %	0.32 dB	1 %	0.40 dB	.1 %	0.44 dB	.01 %	0.44 dB	<p align="center"><b>Middle Channel</b></p>  <p>Ref: 35 dBm    Att: 30 dB    AQT: 3.125 ms</p> <p>Center: 836.4 MHz    20 dB    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)</p> <p>Trace 1</p> <p>Mean: 26.20 dBm Peak: 29.47 dBm Crest: 3.27 dB</p> <table border="1"> <tr><td>10 %</td><td>2.68 dB</td></tr> <tr><td>1 %</td><td>3.12 dB</td></tr> <tr><td>.1 %</td><td>3.24 dB</td></tr> <tr><td>.01 %</td><td>3.28 dB</td></tr> </table> <p>Date: 19.SEP.2018 16:47:55</p>	10 %	2.68 dB	1 %	3.12 dB	.1 %	3.24 dB	.01 %	3.28 dB
10 %	0.32 dB																
1 %	0.40 dB																
.1 %	0.44 dB																
.01 %	0.44 dB																
10 %	2.68 dB																
1 %	3.12 dB																
.1 %	3.24 dB																
.01 %	3.28 dB																
<p align="center"><b>Highest Channel</b></p>  <p>Ref: 35 dBm    Att: 30 dB    AQT: 3.125 ms</p> <p>Center: 848.8 MHz    20 dB    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)</p> <p>Trace 1</p> <p>Mean: 32.62 dBm Peak: 33.07 dBm Crest: 0.44 dB</p> <table border="1"> <tr><td>10 %</td><td>0.28 dB</td></tr> <tr><td>1 %</td><td>0.36 dB</td></tr> <tr><td>.1 %</td><td>0.40 dB</td></tr> <tr><td>.01 %</td><td>0.44 dB</td></tr> </table> <p>Date: 19.SEP.2018 16:35:34</p>	10 %	0.28 dB	1 %	0.36 dB	.1 %	0.40 dB	.01 %	0.44 dB	<p align="center"><b>Highest Channel</b></p>  <p>Ref: 35 dBm    Att: 30 dB    AQT: 3.125 ms</p> <p>Center: 848.8 MHz    20 dB    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)</p> <p>Trace 1</p> <p>Mean: 25.66 dBm Peak: 29.33 dBm Crest: 3.66 dB</p> <table border="1"> <tr><td>10 %</td><td>2.68 dB</td></tr> <tr><td>1 %</td><td>3.40 dB</td></tr> <tr><td>.1 %</td><td>3.60 dB</td></tr> <tr><td>.01 %</td><td>3.60 dB</td></tr> </table> <p>Date: 19.SEP.2018 16:48:12</p>	10 %	2.68 dB	1 %	3.40 dB	.1 %	3.60 dB	.01 %	3.60 dB
10 %	0.28 dB																
1 %	0.36 dB																
.1 %	0.40 dB																
.01 %	0.44 dB																
10 %	2.68 dB																
1 %	3.40 dB																
.1 %	3.60 dB																
.01 %	3.60 dB																



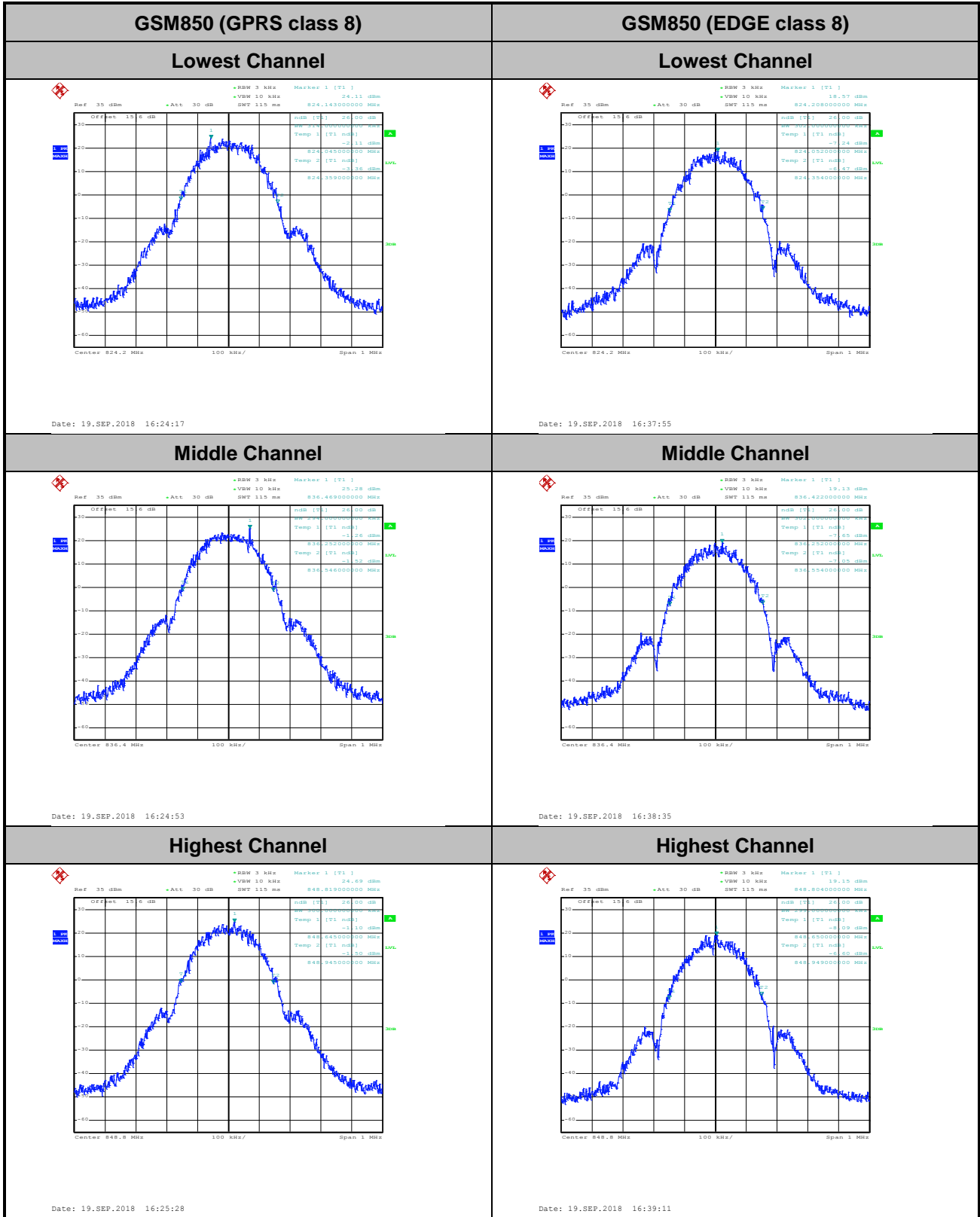
GSM1900 (GPRS class 8)	GSM1900 (EDGE class 8)																
<p style="text-align: center;"><b>Lowest Channel</b></p> <p>Ref: 35 dBm    RBW: 10 MHz    AQT: 3.125 ms  Att: 30 dB</p> <p>Center: 1.8502 GHz    2 dB/    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)  Trace 1  Mean 30.57 dBm  Peak 30.95 dBm  Crest 0.38 dB</p> <table border="1"> <tr><td>10 %</td><td>0.20 dB</td></tr> <tr><td>1 %</td><td>0.32 dB</td></tr> <tr><td>.1 %</td><td>0.32 dB</td></tr> <tr><td>.01 %</td><td>0.32 dB</td></tr> </table> <p>Date: 19_SEP.2018 16:01:29</p>	10 %	0.20 dB	1 %	0.32 dB	.1 %	0.32 dB	.01 %	0.32 dB	<p style="text-align: center;"><b>Lowest Channel</b></p> <p>Ref: 35 dBm    RBW: 10 MHz    AQT: 3.125 ms  Att: 30 dB</p> <p>Center: 1.8502 GHz    2 dB/    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)  Trace 1  Mean 26.27 dBm  Peak 29.40 dBm  Crest 3.13 dB</p> <table border="1"> <tr><td>10 %</td><td>2.48 dB</td></tr> <tr><td>1 %</td><td>2.96 dB</td></tr> <tr><td>.1 %</td><td>3.08 dB</td></tr> <tr><td>.01 %</td><td>3.16 dB</td></tr> </table> <p>Date: 19_SEP.2018 16:17:24</p>	10 %	2.48 dB	1 %	2.96 dB	.1 %	3.08 dB	.01 %	3.16 dB
10 %	0.20 dB																
1 %	0.32 dB																
.1 %	0.32 dB																
.01 %	0.32 dB																
10 %	2.48 dB																
1 %	2.96 dB																
.1 %	3.08 dB																
.01 %	3.16 dB																
<p style="text-align: center;"><b>Middle Channel</b></p> <p>Ref: 35 dBm    RBW: 10 MHz    AQT: 3.125 ms  Att: 30 dB</p> <p>Center: 1.88 GHz    2 dB/    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)  Trace 1  Mean 30.68 dBm  Peak 31.02 dBm  Crest 0.34 dB</p> <table border="1"> <tr><td>10 %</td><td>0.20 dB</td></tr> <tr><td>1 %</td><td>0.28 dB</td></tr> <tr><td>.1 %</td><td>0.32 dB</td></tr> <tr><td>.01 %</td><td>0.36 dB</td></tr> </table> <p>Date: 19_SEP.2018 16:01:48</p>	10 %	0.20 dB	1 %	0.28 dB	.1 %	0.32 dB	.01 %	0.36 dB	<p style="text-align: center;"><b>Middle Channel</b></p> <p>Ref: 35 dBm    RBW: 10 MHz    AQT: 3.125 ms  Att: 30 dB</p> <p>Center: 1.88 GHz    2 dB/    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)  Trace 1  Mean 26.48 dBm  Peak 29.61 dBm  Crest 3.13 dB</p> <table border="1"> <tr><td>10 %</td><td>2.40 dB</td></tr> <tr><td>1 %</td><td>2.92 dB</td></tr> <tr><td>.1 %</td><td>3.04 dB</td></tr> <tr><td>.01 %</td><td>3.08 dB</td></tr> </table> <p>Date: 19_SEP.2018 16:17:46</p>	10 %	2.40 dB	1 %	2.92 dB	.1 %	3.04 dB	.01 %	3.08 dB
10 %	0.20 dB																
1 %	0.28 dB																
.1 %	0.32 dB																
.01 %	0.36 dB																
10 %	2.40 dB																
1 %	2.92 dB																
.1 %	3.04 dB																
.01 %	3.08 dB																
<p style="text-align: center;"><b>Highest Channel</b></p> <p>Ref: 35 dBm    RBW: 10 MHz    AQT: 3.125 ms  Att: 30 dB</p> <p>Center: 1.9098 GHz    2 dB/    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)  Trace 1  Mean 30.54 dBm  Peak 30.88 dBm  Crest 0.34 dB</p> <table border="1"> <tr><td>10 %</td><td>0.24 dB</td></tr> <tr><td>1 %</td><td>0.28 dB</td></tr> <tr><td>.1 %</td><td>0.36 dB</td></tr> <tr><td>.01 %</td><td>0.36 dB</td></tr> </table> <p>Date: 19_SEP.2018 16:02:07</p>	10 %	0.24 dB	1 %	0.28 dB	.1 %	0.36 dB	.01 %	0.36 dB	<p style="text-align: center;"><b>Highest Channel</b></p> <p>Ref: 35 dBm    RBW: 10 MHz    AQT: 3.125 ms  Att: 30 dB</p> <p>Center: 1.9098 GHz    2 dB/    Mean Pwr: +20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples)  Trace 1  Mean 26.43 dBm  Peak 29.40 dBm  Crest 2.96 dB</p> <table border="1"> <tr><td>10 %</td><td>2.36 dB</td></tr> <tr><td>1 %</td><td>2.80 dB</td></tr> <tr><td>.1 %</td><td>2.92 dB</td></tr> <tr><td>.01 %</td><td>2.96 dB</td></tr> </table> <p>Date: 19_SEP.2018 16:18:04</p>	10 %	2.36 dB	1 %	2.80 dB	.1 %	2.92 dB	.01 %	2.96 dB
10 %	0.24 dB																
1 %	0.28 dB																
.1 %	0.36 dB																
.01 %	0.36 dB																
10 %	2.36 dB																
1 %	2.80 dB																
.1 %	2.92 dB																
.01 %	2.96 dB																

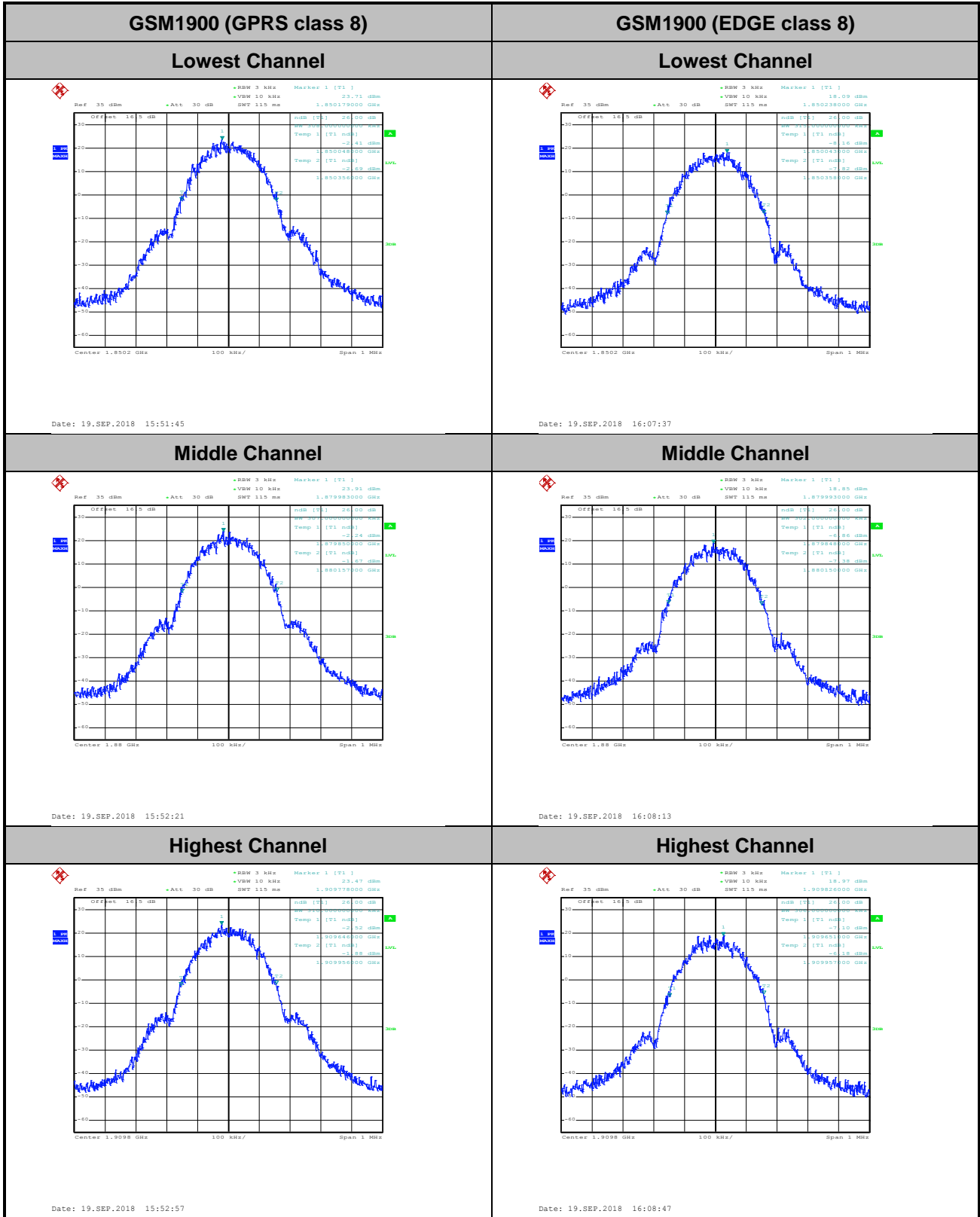


**26dB Bandwidth**

Mode	GSM850 : 26dB BW(MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.314	0.302
Middle CH	0.294	0.302
Highest CH	0.300	0.299

Mode	GSM1900 : 26dB BW(MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.308	0.315
Middle CH	0.307	0.302
Highest CH	0.310	0.306



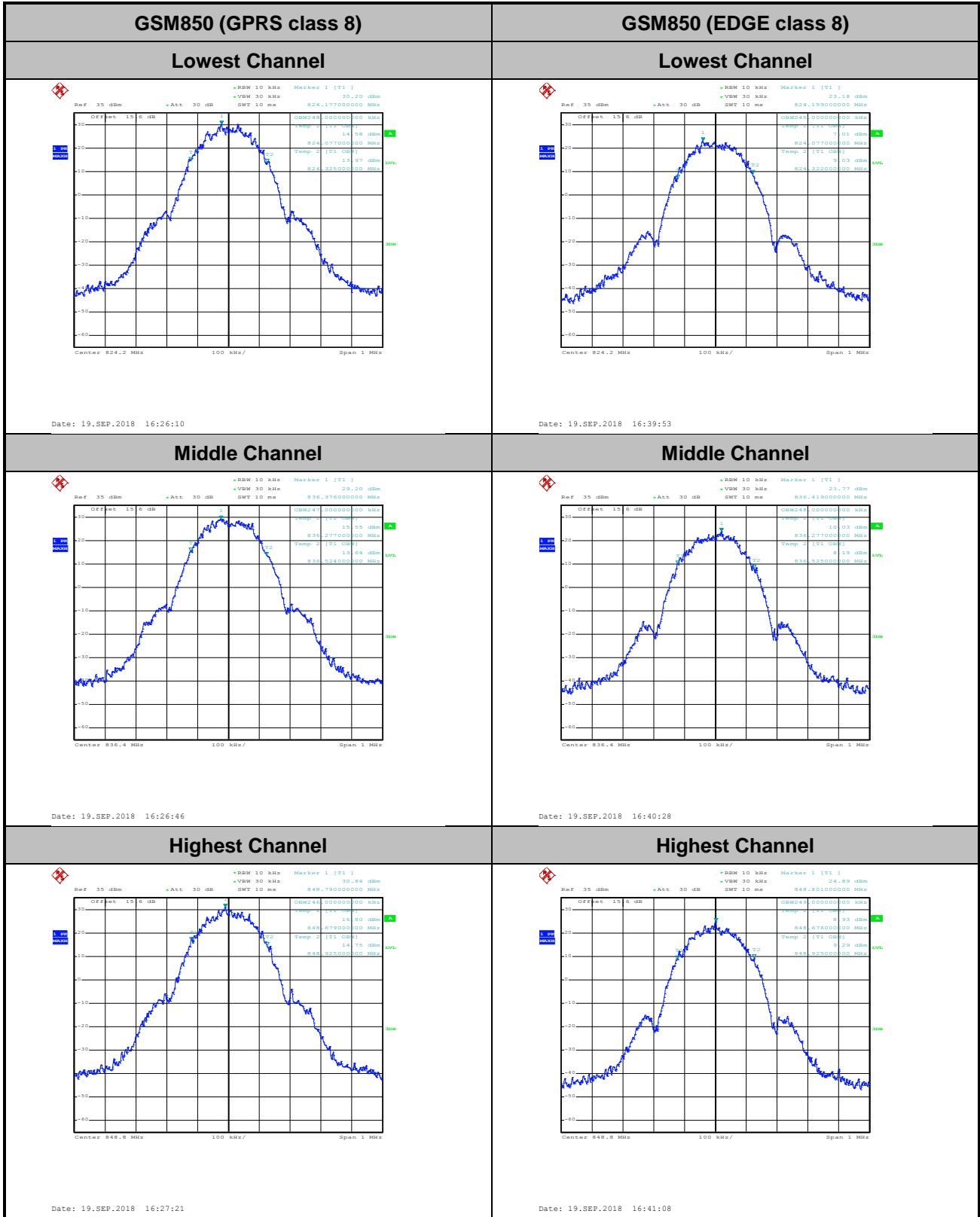




**Occupied Bandwidth**

Mode	GSM850 : 99% OBW(MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.248	0.245
Middle CH	0.247	0.248
Highest CH	0.246	0.249

Mode	GSM1900 : 99% OBW(MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.245	0.249
Middle CH	0.246	0.248
Highest CH	0.246	0.251



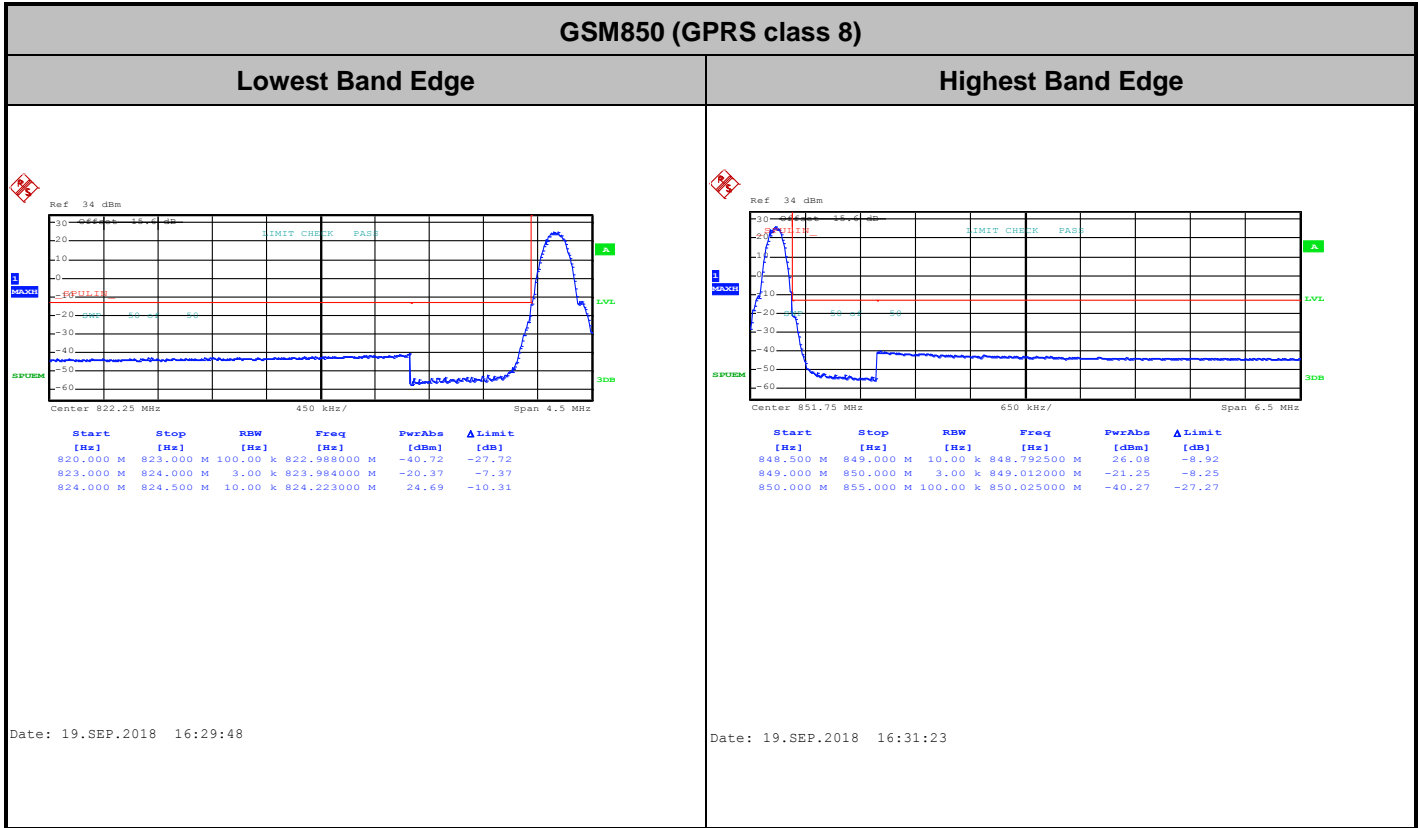


GSM1900 (GPRS class 8)	GSM1900 (EDGE class 8)
<p align="center"><b>Lowest Channel</b></p> <p>Date: 19.SEP.2018 15:53:38</p>	<p align="center"><b>Lowest Channel</b></p> <p>Date: 19.SEP.2018 16:09:35</p>
<p align="center"><b>Middle Channel</b></p> <p>Date: 19.SEP.2018 15:54:14</p>	<p align="center"><b>Middle Channel</b></p> <p>Date: 19.SEP.2018 16:10:11</p>
<p align="center"><b>Highest Channel</b></p> <p>Date: 19.SEP.2018 15:54:50</p>	<p align="center"><b>Highest Channel</b></p> <p>Date: 19.SEP.2018 16:10:45</p>





# Conducted Band Edge

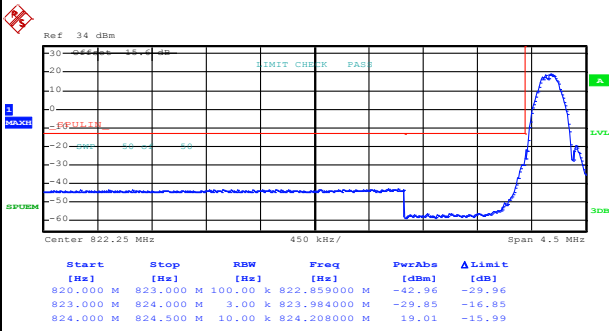




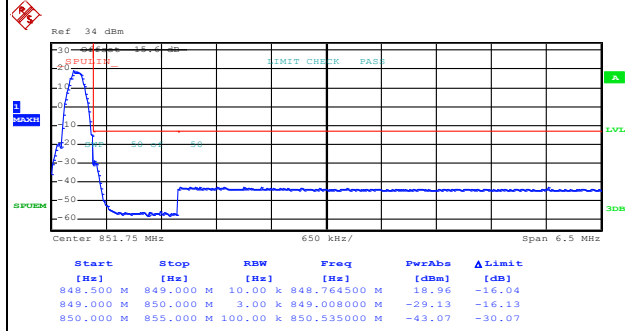
GSM850 (EDGE class 8)

Lowest Band Edge

Highest Band Edge



Date: 19.SEP.2018 16:42:47



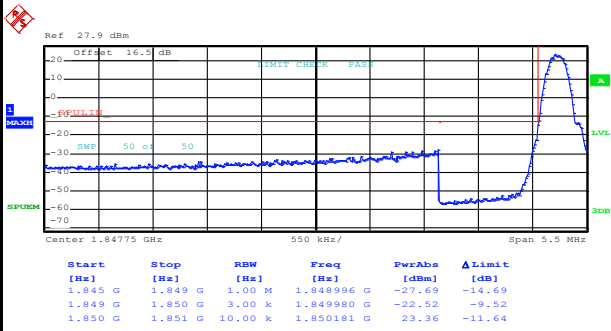
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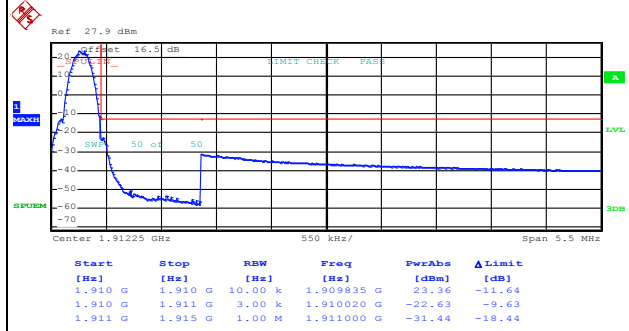
GSM1900 (GPRS class 8)

Lowest Band Edge

Highest Band Edge



Date: 19.SEP.2018 15:56:29



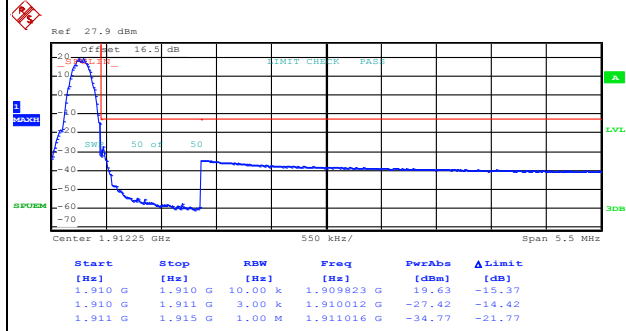
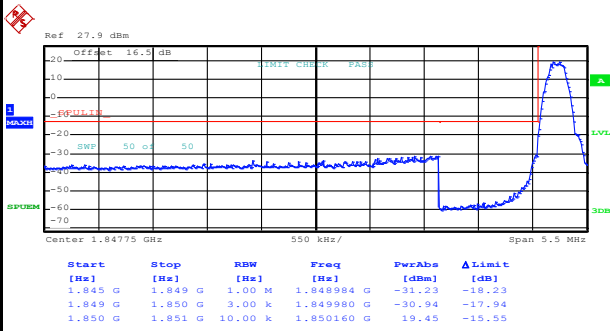
Date: 19.SEP.2018 15:58:04



GSM1900 (EDGE class 8)

Lowest Band Edge

Highest Band Edge

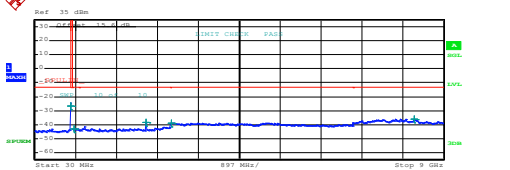
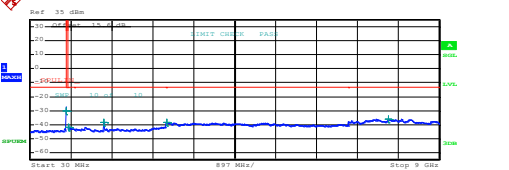
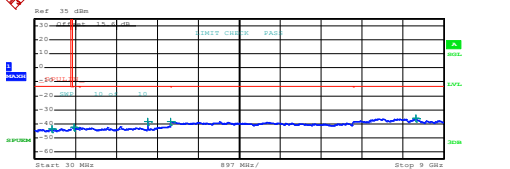
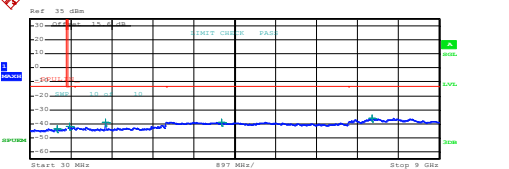
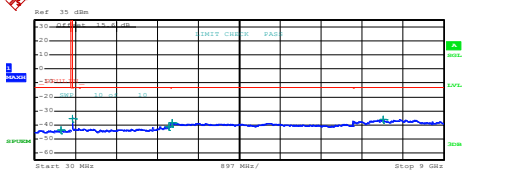
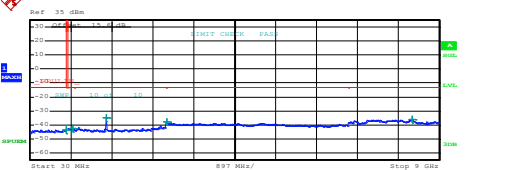


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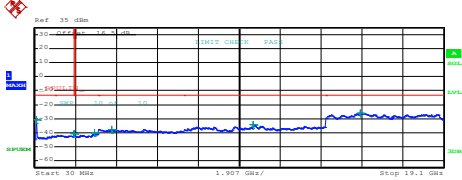
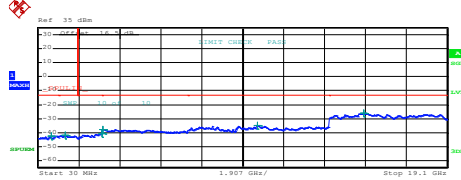
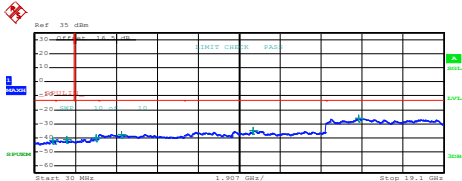
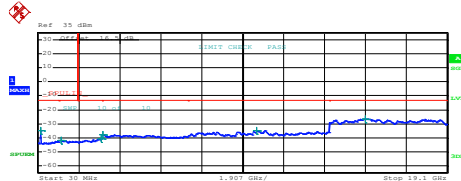
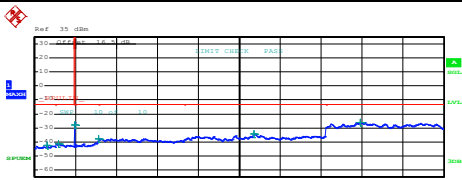
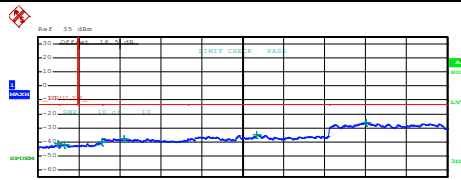
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# Conducted Spurious Emission

GSM850 (GPRS class 8)	GSM850 (EDGE class 8)																																																																								
Lowest Channel	Lowest Channel																																																																								
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**Frequency Stability**

Test Conditions	Middle Channel	GSM850 (GSM)	GSM850 (EDGE class 8)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0036	0.0096	PASS
40	Normal Voltage	0.0036	0.0084	
30	Normal Voltage	0.0012	0.0048	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0024	0.0000	
0	Normal Voltage	0.0024	0.0024	
-10	Normal Voltage	0.0048	0.0036	
-20	Normal Voltage	0.0060	0.0012	
-30	Normal Voltage	0.0060	0.0000	
20	Maximum Voltage	0.0000	0.0012	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0036	0.0024	



Test Conditions	Middle Channel	GSM1900 (GSM)	GSM1900 (EDGE class 8)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0048	0.0011	PASS
40	Normal Voltage	0.0027	0.0011	
30	Normal Voltage	0.0011	0.0000	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0021	0.0005	
0	Normal Voltage	0.0032	0.0005	
-10	Normal Voltage	0.0037	0.0011	
-20	Normal Voltage	0.0053	0.0021	
-30	Normal Voltage	0.0069	0.0032	
20	Maximum Voltage	0.0005	0.0027	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0000	0.0059	

**Note:**

- 1. Normal Voltage = 3.85V. ; Battery End Point (BEP) = 3.4 V. ; Maximum Voltage =4.4 V
- 2. The frequency fundamental emissions stay within the authorized frequency block.



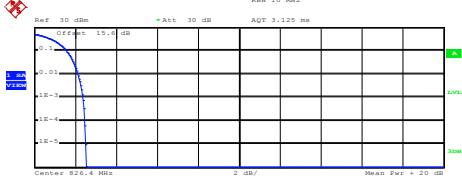
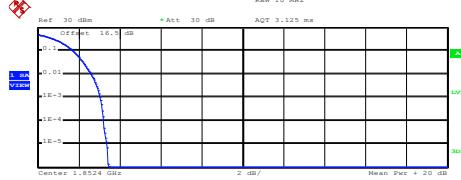
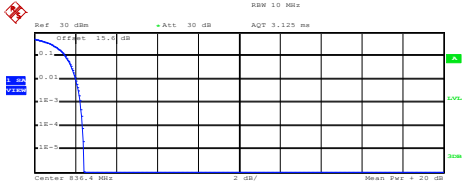
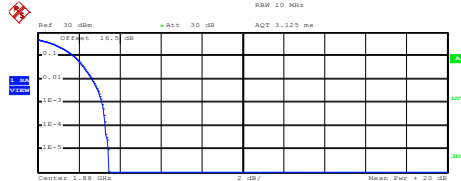
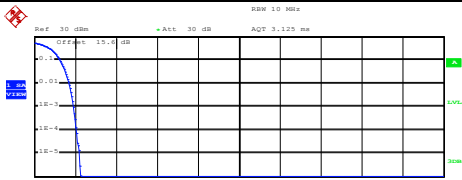
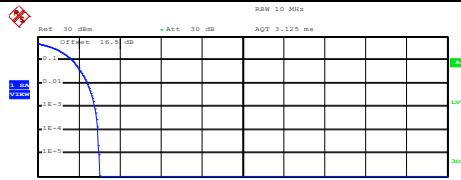


## A2. WCDMA

### Peak-to-Average Ratio

Mode	WCDMA Band V	WCDMA Band II	Limit: 13dB
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	Result
Lowest CH	2.40	3.04	<b>PASS</b>
Middle CH	2.24	3.12	
Highest CH	1.92	2.80	



WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)																
<p style="text-align: center;"><b>Lowest Channel</b></p>  <p>Center 826.4 MHz      2 dB/      Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 24.60 dBm Peak 27.15 dBm Crest 2.55 dB</p> <table border="1"> <tr><td>10 %</td><td>1.56 dB</td></tr> <tr><td>1 %</td><td>2.12 dB</td></tr> <tr><td>.1 %</td><td>2.40 dB</td></tr> <tr><td>.01 %</td><td>2.48 dB</td></tr> </table> <p>Date: 19.SEP.2018 15:31:58</p>	10 %	1.56 dB	1 %	2.12 dB	.1 %	2.40 dB	.01 %	2.48 dB	<p style="text-align: center;"><b>Lowest Channel</b></p>  <p>Center 1.8524 GHz      2 dB/      Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 22.08 dBm Peak 25.53 dBm Crest 3.44 dB</p> <table border="1"> <tr><td>10 %</td><td>1.72 dB</td></tr> <tr><td>1 %</td><td>2.60 dB</td></tr> <tr><td>.1 %</td><td>3.04 dB</td></tr> <tr><td>.01 %</td><td>3.24 dB</td></tr> </table> <p>Date: 19.SEP.2018 15:46:45</p>	10 %	1.72 dB	1 %	2.60 dB	.1 %	3.04 dB	.01 %	3.24 dB
10 %	1.56 dB																
1 %	2.12 dB																
.1 %	2.40 dB																
.01 %	2.48 dB																
10 %	1.72 dB																
1 %	2.60 dB																
.1 %	3.04 dB																
.01 %	3.24 dB																
<p style="text-align: center;"><b>Middle Channel</b></p>  <p>Center 836.4 MHz      2 dB/      Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 25.02 dBm Peak 27.43 dBm Crest 2.41 dB</p> <table border="1"> <tr><td>10 %</td><td>1.52 dB</td></tr> <tr><td>1 %</td><td>2.04 dB</td></tr> <tr><td>.1 %</td><td>2.24 dB</td></tr> <tr><td>.01 %</td><td>2.36 dB</td></tr> </table> <p>Date: 19.SEP.2018 15:32:17</p>	10 %	1.52 dB	1 %	2.04 dB	.1 %	2.24 dB	.01 %	2.36 dB	<p style="text-align: center;"><b>Middle Channel</b></p>  <p>Center 1.88 GHz      2 dB/      Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 22.28 dBm Peak 25.74 dBm Crest 3.46 dB</p> <table border="1"> <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>3.12 dB</td></tr> <tr><td>.01 %</td><td>3.32 dB</td></tr> </table> <p>Date: 19.SEP.2018 15:47:02</p>	10 %	1.76 dB	1 %	2.64 dB	.1 %	3.12 dB	.01 %	3.32 dB
10 %	1.52 dB																
1 %	2.04 dB																
.1 %	2.24 dB																
.01 %	2.36 dB																
10 %	1.76 dB																
1 %	2.64 dB																
.1 %	3.12 dB																
.01 %	3.32 dB																
<p style="text-align: center;"><b>Highest Channel</b></p>  <p>Center 846.6 MHz      2 dB/      Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 24.69 dBm Peak 26.94 dBm Crest 2.25 dB</p> <table border="1"> <tr><td>10 %</td><td>1.24 dB</td></tr> <tr><td>1 %</td><td>1.72 dB</td></tr> <tr><td>.1 %</td><td>1.92 dB</td></tr> <tr><td>.01 %</td><td>2.08 dB</td></tr> </table> <p>Date: 19.SEP.2018 15:32:34</p>	10 %	1.24 dB	1 %	1.72 dB	.1 %	1.92 dB	.01 %	2.08 dB	<p style="text-align: center;"><b>Highest Channel</b></p>  <p>Center 1.9076 GHz      2 dB/      Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 22.29 dBm Peak 25.31 dBm Crest 3.03 dB</p> <table border="1"> <tr><td>10 %</td><td>1.68 dB</td></tr> <tr><td>1 %</td><td>2.44 dB</td></tr> <tr><td>.1 %</td><td>2.80 dB</td></tr> <tr><td>.01 %</td><td>2.92 dB</td></tr> </table> <p>Date: 19.SEP.2018 15:47:21</p>	10 %	1.68 dB	1 %	2.44 dB	.1 %	2.80 dB	.01 %	2.92 dB
10 %	1.24 dB																
1 %	1.72 dB																
.1 %	1.92 dB																
.01 %	2.08 dB																
10 %	1.68 dB																
1 %	2.44 dB																
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.01 %	2.92 dB																



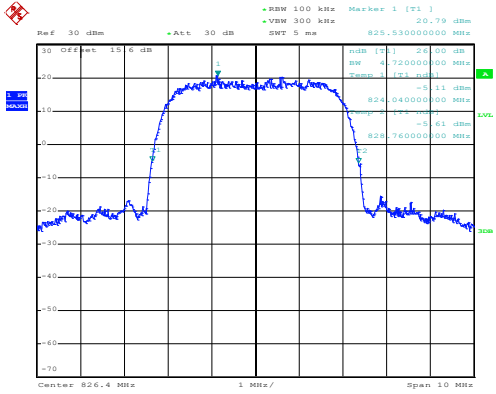
**26dB Bandwidth**

Mode	WCDMA Band V 26dB BW(MHz)	WCDMA Band II 26dB BW(MHz)
Mod.	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.72	4.70
Middle CH	4.75	4.70
Highest CH	4.82	4.73



WCDMA Band V (RMC 12.2Kbps)

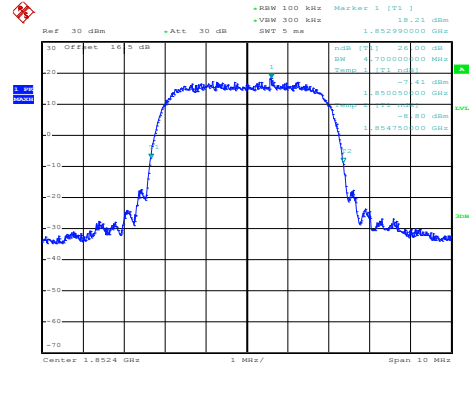
Lowest Channel



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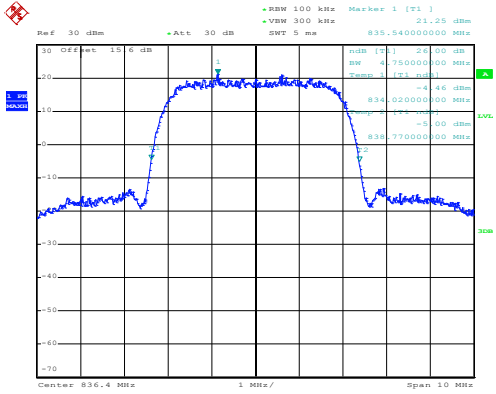
WCDMA Band II (RMC 12.2Kbps)

Lowest Channel



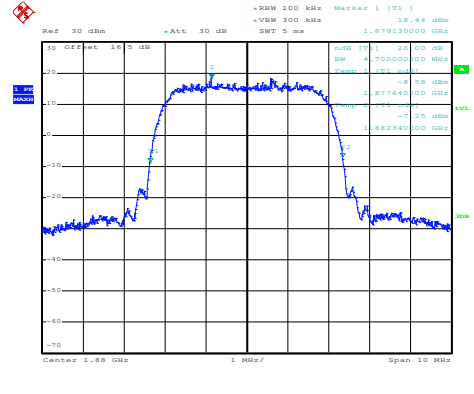
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Middle Channel



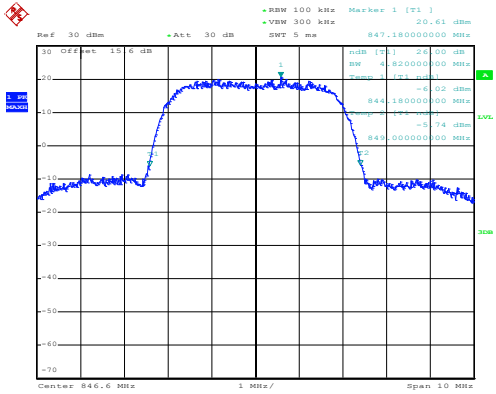
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Middle Channel



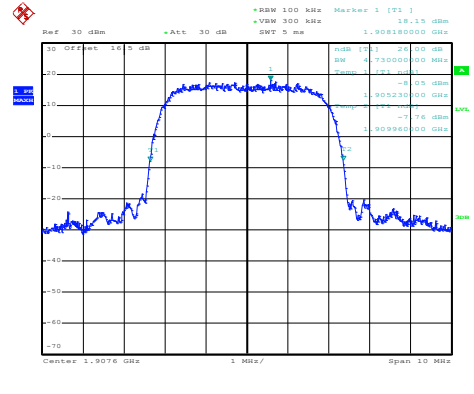
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Highest Channel



Date: 19\_SEP.2018 15:20:25

Highest Channel



Date: 19\_SEP.2018 15:34:51



### Occupied Bandwidth

Mode	WCDMA Band V 99% OBW(MHz)	WCDMA Band II 99% OBW(MHz)
Mod.	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.14	4.14
Middle CH	4.16	4.14
Highest CH	4.19	4.14

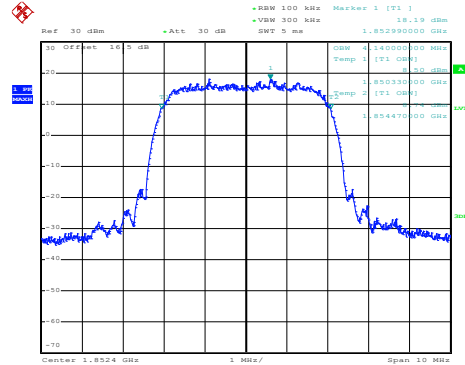
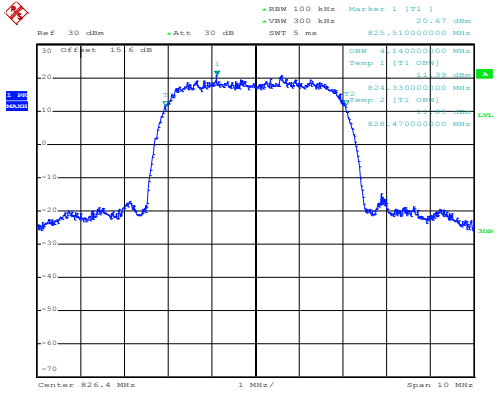


WCDMA Band V (RMC 12.2Kbps)

WCDMA Band II (RMC 12.2Kbps)

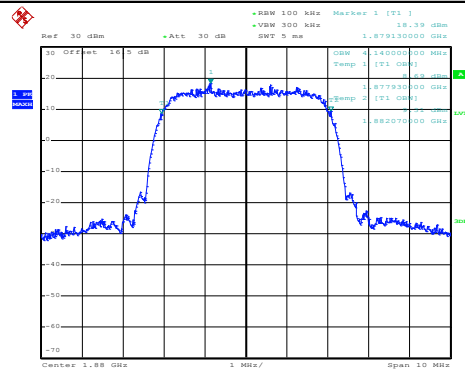
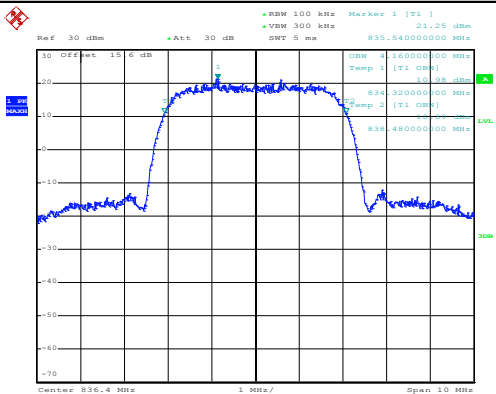
Lowest Channel

Lowest Channel



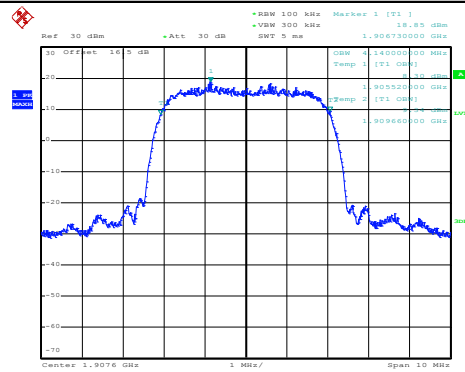
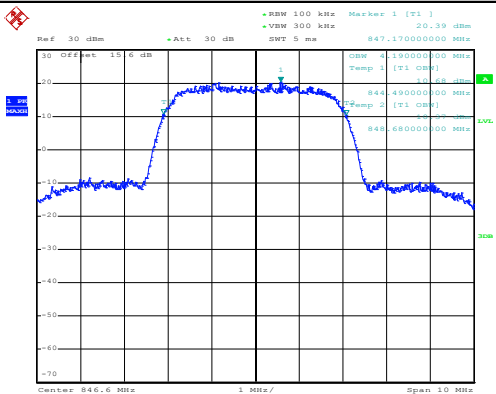
Middle Channel

Middle Channel



Highest Channel

Highest Channel

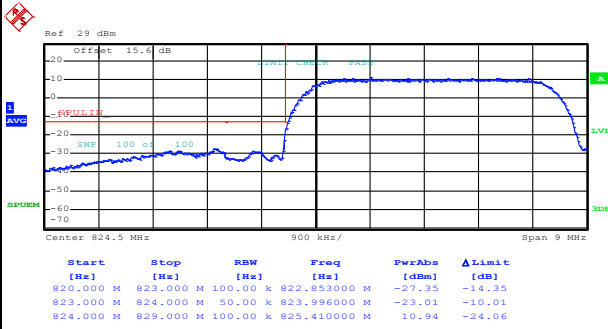




# Conducted Band Edge

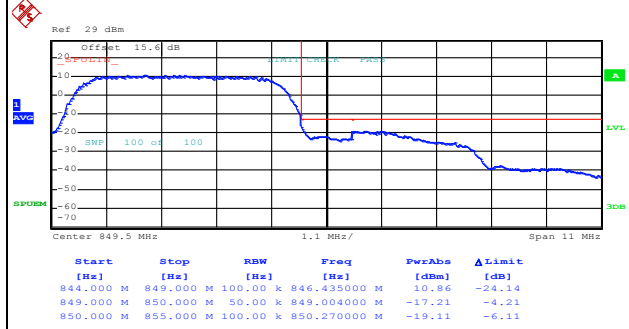
## WCDMA Band V (RMC 12.2Kbps)

### Lowest Band Edge



Date: 19.SEP.2018 15:25:49

### Highest Band Edge



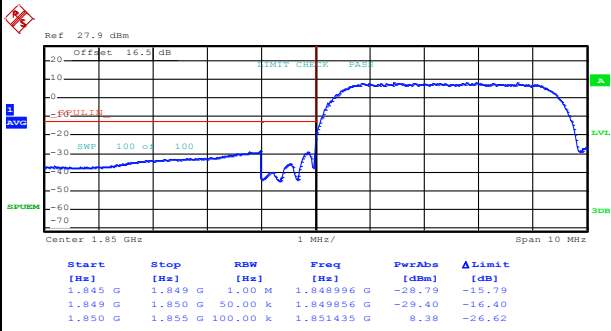
Date: 19.SEP.2018 15:28:43



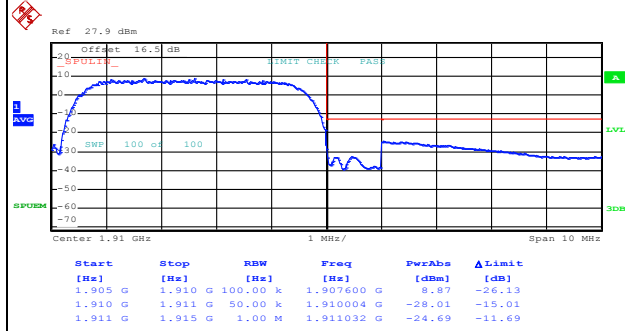
WCDMA Band II (RMC 12.2Kbps)

Lowest Band Edge

Highest Band Edge



Date: 19.SEP.2018 15:40:28

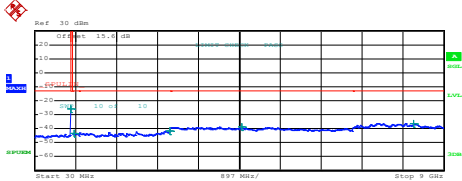
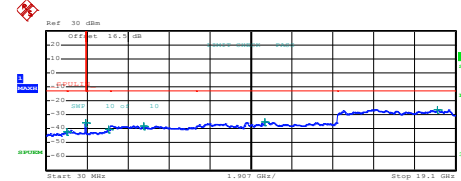
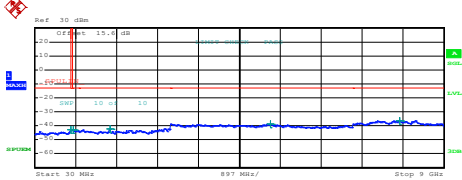
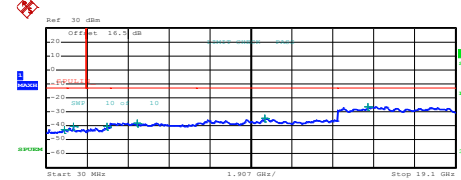
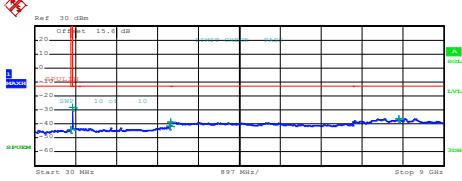
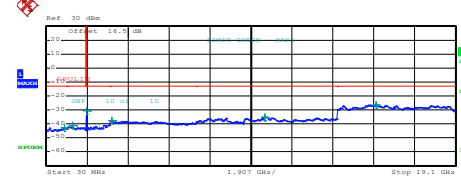


Date: 19.SEP.2018 15:43:20





Conducted Spurious Emission

WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)																																																																														
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**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	0.0036	PASS
40	Normal Voltage	0.0024	
30	Normal Voltage	0.0024	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0048	
0	Normal Voltage	0.0108	
-10	Normal Voltage	0.0155	
-20	Normal Voltage	0.0167	
-30	Normal Voltage	0.0179	
20	Maximum Voltage	0.0012	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0012	

Test Conditions	Middle Channel	WCDMA Band II (RMC 12.2Kbps)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0011	PASS
40	Normal Voltage	0.0011	
30	Normal Voltage	0.0005	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0005	
0	Normal Voltage	0.0016	
-10	Normal Voltage	0.0027	
-20	Normal Voltage	0.0037	
-30	Normal Voltage	0.0043	
20	Maximum Voltage	0.0005	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0005	

**Note:**

1. Normal Voltage = 3.85V. ; Battery End Point (BEP) = 3.4 V. ; Maximum Voltage =4.4 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	32.64	1.8365	27.27	0.5333
Middle	GPRS class 8	32.80	1.9055	27.43	0.5534
Highest	GT - LC = -3.22 dB	32.38	1.7298	27.01	0.5023
Lowest	GSM850	27.24	0.5297	21.87	0.1538
Middle	EDGE class 8	26.95	0.4955	21.58	0.1439
Highest	GT - LC = -3.22 dB	26.69	0.4667	21.32	0.1355
Lowest	WCDMA Band V	23.71	0.2350	18.34	0.0682
Middle	RMC 12.2Kbps	23.77	0.2382	18.40	0.0692
Highest	GT - LC = -3.22 dB	23.74	0.2366	18.37	0.0687
Limit	ERP < 7W	Result		PASS	

Channel	Mode	Conducted		EIRP	
		Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)
Lowest	GSM1900	29.78	0.9506	29.98	0.9954
Middle	GPRS class 8	30.10	1.0233	30.30	1.0715
Highest	(GT - LC = 0.2 dB)	30.16	1.0375	30.36	1.0864
Lowest	GSM1900	25.58	0.3614	25.78	0.3784
Middle	EDGE class 8	25.11	0.3243	25.31	0.3396
Highest	(GT - LC = 0.2 dB)	25.25	0.3350	25.45	0.3508
Lowest	WCDMA Band II	22.49	0.1774	22.69	0.1858
Middle	RMC 12.2Kbps	22.41	0.1742	22.61	0.1824
Highest	(GT - LC = 0.2 dB)	22.69	0.1858	22.89	0.1945
Limit	EIRP < 2W	Result		PASS	



**Radiated Spurious Emission**

**GPRS850**

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	-59.58	-13	-46.58	-71.91	-61.34	0.98	4.89	H
	2472	-58.58	-13	-45.58	-76.11	-60.46	1.28	5.32	H
	3296	-58.13	-13	-45.13	-77.73	-61.54	1.54	7.10	H
									H
									H
									H
									H
	1648	-61.51	-13	-48.51	-74.31	-63.27	0.98	4.89	V
	2476	-59.02	-13	-46.02	-74.99	-60.91	1.28	5.33	V
	3296	-57.82	-13	-44.82	-77.75	-61.23	1.54	7.10	V
									V
									V
									V
									V



Middle	1672	-58.91	-13	-45.91	-71.53	-60.59	0.99	4.82	H
	2509	-59.64	-13	-46.64	-77.26	-61.6	1.29	5.41	H
	3345	-57.48	-13	-44.48	-77.34	-61.09	1.56	7.32	H
									H
									H
									H
									H
	1672	-57.77	-13	-44.77	-70.85	-59.45	0.99	4.82	V
	2509	-59.05	-13	-46.05	-77.13	-61.014	1.29	5.41	V
	3344	-57.40	-13	-44.40	-77.47	-61.01	1.56	7.31	V
									V
									V
									V
									V
Highest	1696	-55.85	-13	-42.85	-68.62	-57.45	1.00	4.75	H
	2544	-58.00	-13	-45.00	-75.64	-59.98	1.30	5.44	H
	3392	-56.86	-13	-43.86	-76.98	-60.66	1.57	7.52	H
									H
									H
									H
									H
	1696	-58.24	-13	-45.24	-71.45	-59.84	1.00	4.75	V
	2544	-58.30	-13	-45.30	-76.44	-60.28	1.30	5.44	V
	3392	-57.44	-13	-44.44	-77.65	-61.24	1.57	7.52	V
									V
									V
									V
									V

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



**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	-53.20	-13	-40.20	-65.53	-54.96	0.98	4.89	H
	2472	-58.08	-13	-45.08	-75.61	-59.96	1.28	5.32	H
	3296	-57.61	-13	-44.61	-77.21	-61.02	1.54	7.10	H
									H
									H
									H
									H
	1648	-56.60	-13	-43.60	-69.4	-58.36	0.98	4.89	V
	2472	-59.03	-13	-46.03	-77	-60.91	1.28	5.32	V
	3296	-57.82	-13	-44.82	-77.75	-61.23	1.54	7.10	V
									V
									V
									V
									V
Middle	1672	-58.81	-13	-45.81	-71.43	-60.49	0.99	4.82	H
	2512	-52.50	-13	-39.50	-70.12	-54.47	1.29	5.41	H
	3344	-57.90	-13	-44.90	-77.76	-61.51	1.56	7.31	H
									H
									H
									H
									H
	1672	-57.67	-13	-44.67	-70.75	-59.35	0.99	4.82	V
	2512	-58.11	-13	-45.11	-76.19	-60.08	1.29	5.41	V
	3344	-58.07	-13	-45.07	-78.14	-61.68	1.56	7.31	V
									V
									V
									V
									V



Highest	1696	-50.30	-13	-37.30	-63.07	-51.9	1.00	4.75	H
	2544	-58.47	-13	-45.47	-76.11	-60.45	1.30	5.44	H
	3392	-56.67	-13	-43.67	-76.79	-60.47	1.57	7.52	H
									H
									H
									H
									H
	1696	-53.62	-13	-40.62	-66.83	-55.22	1.00	4.75	V
	2544	-59.13	-13	-46.13	-77.27	-61.11	1.30	5.44	V
	3392	-58.07	-13	-45.07	-78.28	-61.87	1.57	7.52	V
									V
									V
									V
									V

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



**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	1656	-62.90	-13	-49.90	-75.38	-64.63	0.98	4.86	H
	2480	-59.33	-13	-46.33	-76.86	-61.24	1.28	5.34	H
	3304	-58.28	-13	-45.28	-77.98	-61.72	1.54	7.14	H
									H
									H
									H
									H
	1656	-62.85	-13	-49.85	-75.8	-64.58	0.98	4.86	V
	2480	-58.94	-13	-45.94	-76.91	-60.85	1.28	5.34	V
	3304	-58.09	-13	-45.09	-78.07	-61.53	1.54	7.14	V
									V
									V
									V
									V
Middle	1672	-61.57	-13	-48.57	-74.19	-63.25	0.99	4.82	H
	2512	-59.25	-13	-46.25	-76.87	-61.22	1.29	5.41	H
	3344	-58.57	-13	-45.57	-78.43	-62.18	1.56	7.31	H
									H
									H
									H
									H
	1672	-61.81	-13	-48.81	-74.89	-63.49	0.99	4.82	V
	2512	-59.21	-13	-46.21	-77.29	-61.18	1.29	5.41	V
	3344	-58.31	-13	-45.31	-78.38	-61.92	1.56	7.31	V
									V
									V
									V
									V





Highest	1696	-62.50	-13	-49.50	-75.27	-64.1	1.00	4.75	H
	2536	-59.98	-13	-46.98	-77.6	-61.96	1.30	5.43	H
	3384	-58.12	-13	-45.12	-78.16	-61.89	1.57	7.49	H
									H
									H
									H
									H
	1696	-62.44	-13	-49.44	-75.65	-64.04	1.00	4.75	V
	2536	-59.33	-13	-46.33	-77.44	-61.31	1.30	5.43	V
	3384	-57.97	-13	-44.97	-78.14	-61.74	1.57	7.49	V
									V
									V
									V
									V

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**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	3702	-57.75	-13	-44.75	-78.72	-64.32	1.67	8.24	H
	5550	-49.17	-13	-36.17	-74.48	-56.24	2.65	9.72	H
	7398	-52.14	-13	-39.14	-79.31	-61.27	2.46	11.60	H
									H
									H
									H
									H
	3702	-57.76	-13	-44.76	-78.72	-64.33	1.67	8.24	V
	5550	-47.93	-13	-34.93	-73.21	-55	2.65	9.72	V
	7400	-51.88	-13	-38.88	-79.25	-61.02	2.46	11.60	V
									V
									V
									V
									V
Middle	3762	-55.21	-13	-42.21	-76.12	-61.84	1.69	8.31	H
	5640	-46.52	-13	-33.52	-72.02	-53.57	2.71	9.76	H
	7518	-52.12	-13	-39.12	-79.39	-61.51	2.42	11.81	H
									H
									H
									H
									H
	3762	-54.48	-13	-41.48	-75.41	-61.11	1.69	8.31	V
	5640	-48.33	-13	-35.33	-73.81	-55.38	2.71	9.76	V
	7518	-51.64	-13	-38.64	-79.15	-61.03	2.42	11.81	V
									V
									V
									V
									V



Highest	3822	-53.69	-13	-40.69	-74.54	-60.37	1.71	8.39	H
	5730	-51.41	-13	-38.41	-77.12	-58.44	2.76	9.79	H
	7640	-49.98	-13	-36.98	-77.57	-59.48	2.38	11.88	H
									H
									H
									H
									H
	3822	-48.79	-13	-35.79	-69.71	-55.47	1.71	8.39	V
	5730	-48.78	-13	-35.78	-74.48	-55.81	2.76	9.79	V
	7640	-49.79	-13	-36.79	-77.64	-59.29	2.38	11.88	V
									V
									V
									V
									V

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



**EDGE1900**

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	3702	-57.24	-13	-44.24	-78.21	-63.81	1.67	8.24	H
	5550	-47.38	-13	-34.38	-72.69	-54.45	2.65	9.72	H
	7398	-52.61	-13	-39.61	-79.77	-61.74	2.46	11.60	H
									H
									H
									H
									H
	3702	-57.31	-13	-44.31	-78.27	-63.88	1.67	8.24	V
	5550	-47.21	-13	-34.21	-72.49	-54.28	2.65	9.72	V
	7398	-51.80	-13	-38.80	-79.17	-60.93	2.46	11.60	V
									V
									V
									V
									V
Middle	3762	-57.78	-13	-44.78	-78.69	-64.41	1.69	8.31	H
	5640	-52.13	-13	-39.13	-77.63	-59.18	2.71	9.76	H
	7518	-52.01	-13	-39.01	-79.28	-61.4	2.42	11.81	H
									H
									H
									H
									H
	3762	-54.72	-13	-41.72	-75.65	-61.35	1.69	8.31	V
	5640	-49.79	-13	-36.79	-75.27	-56.84	2.71	9.76	V
	7518	-51.58	-13	-38.58	-79.09	-60.97	2.42	11.81	V
									V
									V
									V
									V



Highest	3822	-56.56	-13	-43.56	-77.41	-63.24	1.71	8.39	H
	5730	-49.57	-13	-36.57	-75.28	-56.6	2.76	9.79	H
	7638	-50.20	-13	-37.20	-77.79	-59.7	2.38	11.88	H
									H
									H
									H
									H
	3820	-52.26	-13	-39.26	-73.18	-58.94	1.70	8.38	V
	5730	-49.34	-13	-36.34	-75.04	-56.37	2.76	9.79	V
	7640	-49.71	-13	-36.71	-77.56	-59.21	2.38	11.88	V
									V
									V
									V
									V

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



**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	5562	-50.92	-13	-37.92	-76.23	-57.98	2.66	9.72	H
	7410	-51.91	-13	-38.91	-79.09	-61.07	2.46	11.62	H
	9262	-44.11	-13	-31.11	-74.74	-54.17	2.54	12.60	H
	11121	-35.80	-13	-22.80	-70.29	-45.57	2.69	12.45	H
									H
									H
									H
	5562	-51.48	-13	-38.48	-76.76	-58.54	2.66	9.72	V
	7410	-50.21	-13	-37.21	-77.6	-59.37	2.46	11.62	V
	9262	-41.04	-13	-28.04	-72.08	-51.1	2.54	12.60	V
	11121	-33.63	-13	-20.63	-67.96	-43.4	2.69	12.45	V
									V
									V
									V
Middle	5640	-50.63	-13	-37.63	-76.13	-57.68	2.71	9.76	H
	7518	-50.34	-13	-37.34	-77.61	-59.73	2.42	11.81	H
	9299	-43.16	-13	-30.16	-74.15	-53.19	2.55	12.58	H
	11289	-36.57	-13	-23.57	-71.31	-46.27	2.68	12.38	H
									H
									H
									H
	5640	-50.02	-13	-37.02	-75.5	-57.07	2.71	9.76	V
	7518	-48.98	-13	-35.98	-76.49	-58.37	2.42	11.81	V
	9299	-38.94	-13	-25.94	-70.33	-48.97	2.55	12.58	V
	11289	-34.60	-13	-21.60	-69.25	-44.3	2.68	12.38	V
									V
									V
									V



Highest	5724	-49.48	-13	-36.48	-75.19	-56.52	2.75	9.79	H
	7626	-47.81	-13	-34.81	-75.4	-57.3	2.39	11.88	H
	9535	-41.08	-13	-28.08	-72.25	-50.96	2.60	12.48	H
	11457	-38.93	-13	-25.93	-73.92	-48.56	2.68	12.32	H
									H
									H
									H
	5724	-48.40	-13	-35.40	-74.1	-55.44	2.75	9.79	V
	7626	-46.08	-13	-33.08	-73.93	-55.57	2.39	11.88	V
	9535	-38.01	-13	-25.01	-69.54	-47.89	2.60	12.48	V
	11457	-35.87	-13	-22.87	-70.83	-45.5	2.68	12.32	V
									V
									V
									V

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

————THE END————