FCC RF Test Report

APPLICANT	:	Telit Wireless Solutions Ltd.
EQUIPMENT	:	LE940B6-NA
BRAND NAME	:	Telit
MODEL NAME	:	LE940B6-NA
FCC ID	:	RI7LE940B6NA
STANDARD	:	FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION	:	PCS Licensed Transmitter (PCB)

The product was received on Jan. 04, 2017 and testing was completed on Jan. 26, 2017. 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 / EIA-603-D-2010 and has been in compliance with the applicable technical standards.

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

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG710425A	Rev. 01	Initial issue of report	Feb. 02, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§22.913(a)(2)	Effective Radiated Power	< 7 Watts	PASS	-
	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
	§27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
3.5	§24.232(d)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.6	§2.1049 §22.917(b) §24.238(b) §27.53(g)	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability for Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§2.1055 §24.235 §27.54		Within Authorized Band		
4.4	§2.1053 §22.917(a) §24.238(a) §27.53(h)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 33.26 dB at 1648.000 MHz

1 General Description

1.1 Applicant

Telit Wireless Solutions Ltd.
12th Fl. Shinyoung Securities Bldg., 34-12, Yeouido-dong, Yeongdeungpo-gu, Seoul, Korea

1.2 Manufacturer

Telit Wireless Solutions Ltd.
12th Fl. Shinyoung Securities Bldg., 34-12, Yeouido-dong, Yeongdeungpo-gu, Seoul, Korea

1.3 Product Feature of Equipment Under Test

GSM/WCDMA/LTE

Product Specification subjective to this standard	
Antenna Type	WWAN: Fixed External Antenna

1.4 Modification of EUT

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

1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	TH03-HY

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

1.6 Applicable Standards

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

- 47 CFR Part 2, 22(H), 24(E), 27(L)
- ANSI / TIA / EIA-603-D-2010
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02.
- 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 v02r02 with maximum output power.

Radiated emissions were investigated as following frequency range:

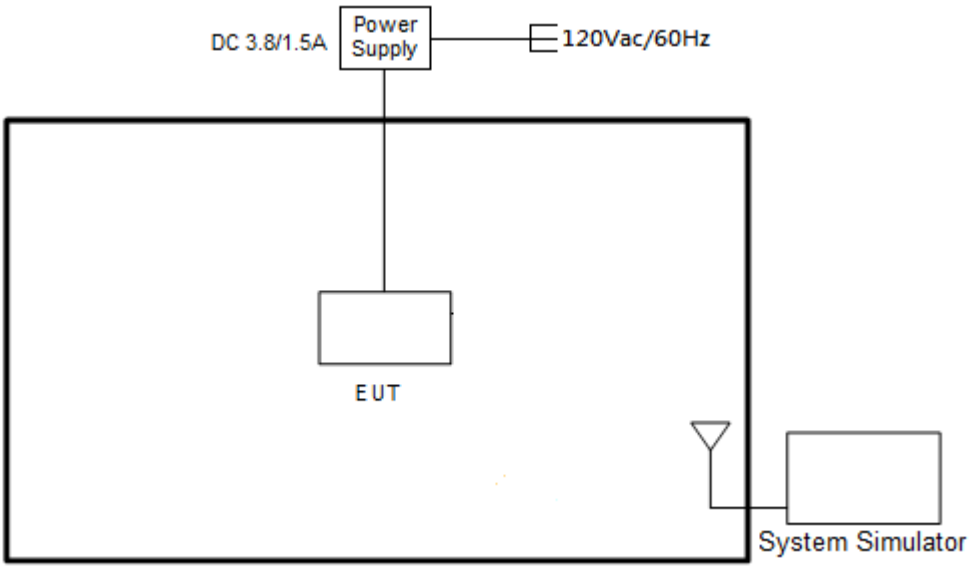
1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19100 MHz for GSM1900 and WCDMA Band II.

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 ■ EDGE class 8 Link	■ GPRS class 8 Link ■ EDGE class 8 Link
GSM 1900	■ GPRS class 8 Link ■ EDGE class 8 Link	■ GPRS 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
WCDMA Band IV	■ 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 :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

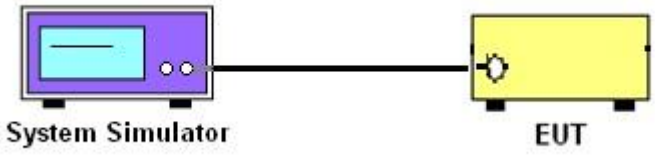
3 Conducted Test Result

3.1 Measuring Instruments

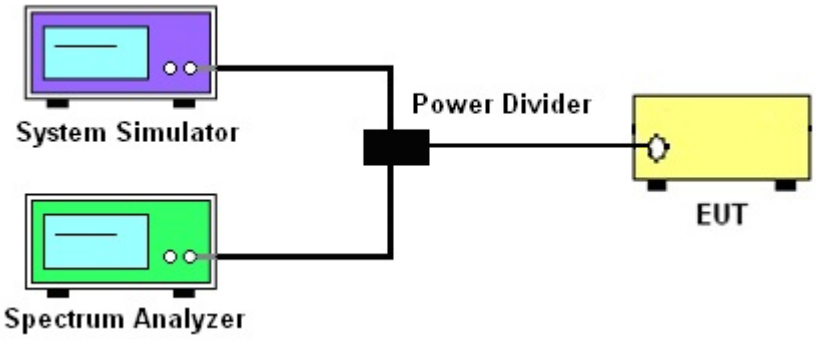
See list of measuring instruments of this test report.

3.2 Test Setup

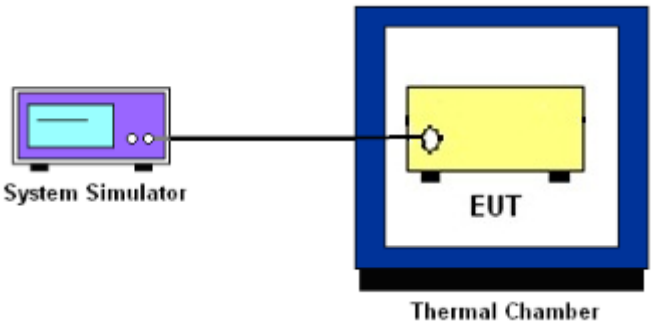
3.2.1 Conducted Output Power



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



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and ERP/EIRP

3.4.1 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.

The EIRP of mobile transmitters must not exceed 1 Watts for WCDMA Band IV.

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

3.4.2 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.

3.5 Peak-to-Average Ratio

3.5.1 Description of the PAR Measurement

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

3.5.2 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 5.7.1.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. Set EUT to transmit at maximum output power.
4. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
5. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer.
6. Record the maximum PAPR level associated with a probability of 0.1%.

3.6 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.6.1 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.

3.6.2 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 4.2.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. 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.
4. 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.
5. Set the detection mode to peak, and the trace mode to max hold.
6. 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)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. 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.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.7 Conducted Band Edge

3.7.1 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.

3.7.2 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. 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.
4. The band edges of low and high channels for the highest RF powers were measured.
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 + 10log(P) dB below the transmitter power P(Watts)
   =P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

3.8 Conducted Spurious Emission

3.8.1 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.

3.8.2 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. 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.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

3.9 Frequency Stability

3.9.1 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 ±0.00025% (±2.5ppm) of the center frequency.

3.9.2 Test Procedures for Temperature Variation

1. The testing follows FCC KDB 971168 D01 v02r02 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. 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.
4. 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.

3.9.3 Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 D01 v02r02 Section 9.0.
2. The EUT was placed in a temperature chamber at 20±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

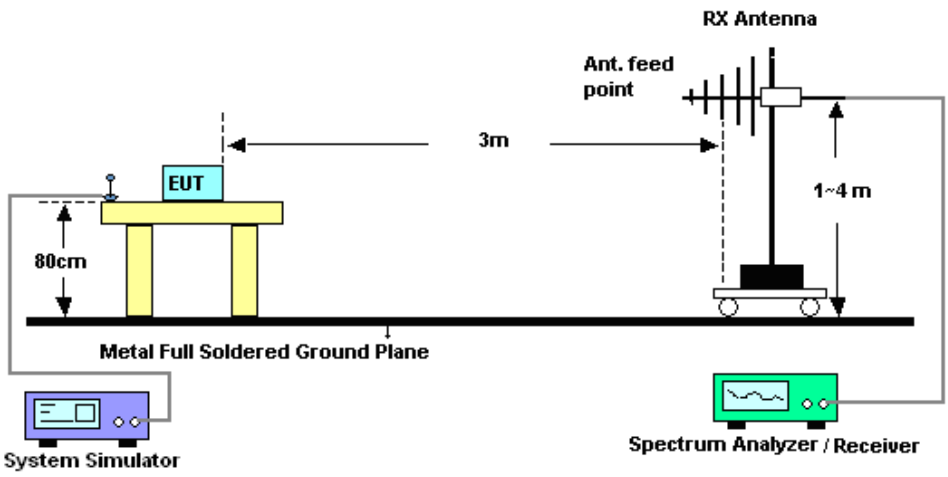
4 Radiated Test Items

4.1 Measuring Instruments

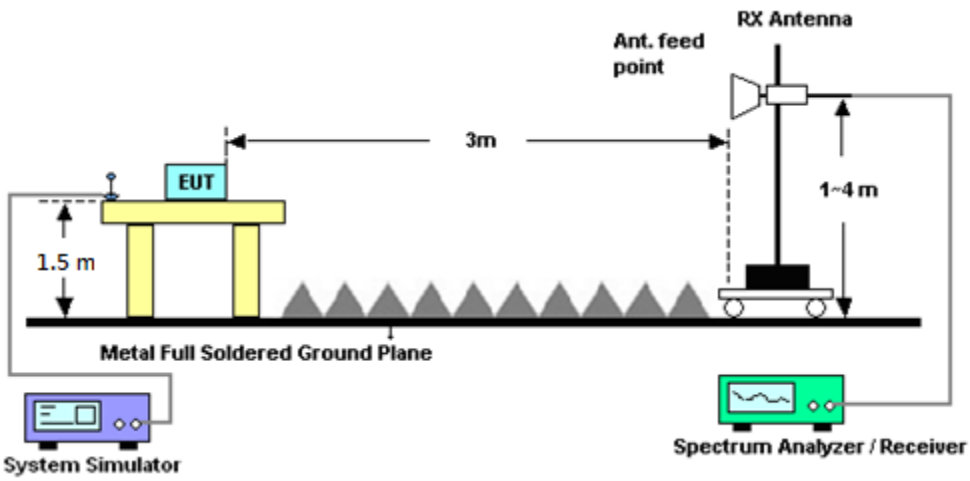
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 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

1. The testing follows FCC KDB 971168 D01 v02r02 Section 5.8 and ANSI / TIA-603-D-2010 Section 2.2.12.
2. 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.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. 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.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)
    = P(W) - [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Jun. 27, 2016	Jan.13, 2017 ~ Jan. 16, 2017	Jun. 26, 2017	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30℃ ~70℃	Nov. 16, 2016	Jan.13, 2017 ~ Jan. 16, 2017	Nov. 15, 2017	Conducted (TH03-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL883644	Voltage:0~20V; Current:0~5A	Nov. 22, 2016	Jan.13, 2017 ~ Jan. 16, 2017	Nov. 21, 2017	Conducted (TH03-HY)
Base Station (Measure)	Rohde & Schwarz	CMU200	117995	GSM / GPRS / WCDMA / CDMA	Aug. 03, 2016	Jan.13, 2017 ~ Jan. 16, 2017	Aug. 04, 2017	Conducted (TH03-HY)
Preamplifier	MITEQ	TTA0204	1872107	2GHz~40GHz	Feb. 15, 2016	Jan. 24, 2017 ~ Jan. 26, 2017	Feb. 14, 2017	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz ~ 40GHz	Apr. 15, 2016	Jan. 24, 2017 ~ Jan. 26, 2017	Apr. 14, 2017	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Dec. 21, 2016	Jan. 24, 2017 ~ Jan. 26, 2017	Dec. 20, 2017	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800N1D01N-06	40103&04	30MHz to 1GHz	Jan. 07, 2017	Jan. 24, 2017 ~ Jan. 26, 2017	Jan. 06, 2018	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	Apr. 25, 2016	Jan. 24, 2017 ~ Jan. 26, 2017	Apr. 24, 2017	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370526	N/A	Mar. 14, 2016	Jan. 24, 2017 ~ Jan. 26, 2017	Mar. 13, 2017	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jan. 24, 2017 ~ Jan. 26, 2017	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jan. 24, 2017 ~ Jan. 26, 2017	N/A	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1522	1G~18GHz	Mar. 31, 2016	Jan. 24, 2017 ~ Jan. 26, 2017	Mar. 30, 2017	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 08, 2016	Jan. 24, 2017 ~ Jan. 26, 2017	Nov. 07, 2017	Radiation (03CH13-HY)
Signal Generator	Anritsu	MG3694C	163401	0.1Hz~40GHz	Jan. 04, 2017	Jan. 24, 2017 ~ Jan. 26, 2017	Jan. 03, 2018	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 = 2Uc(y))	4.9

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.4

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	1880.0	1909.8
GPRS class 8	32.06	32.02	32.02	29.09	29.20	29.24
GPRS class 10	31.54	31.47	31.47	29.06	29.17	29.23
GPRS class 11	30.76	30.63	30.62	28.22	28.36	28.38
GPRS class 12	29.50	29.40	29.41	27.02	27.14	27.14
EGPRS class 8	26.67	26.68	26.62	26.14	25.80	25.50
EGPRS class 10	26.49	26.55	26.71	26.12	25.70	25.43
EGPRS class 11	25.70	25.87	25.83	25.29	24.94	24.67
EGPRS class 12	24.55	24.68	24.57	24.27	23.80	23.51

Conducted Power (*Unit: dBm)									
Band	WCDMA Band V			WCDMA Band II			WCDMA Band IV		
Channel	4132	4182	4233	9262	9400	9538	1312	1413	1513
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6
RMC 12.2K	23.28	23.19	23.21	23.21	23.26	23.30	22.95	23.05	22.93
HSDPA Subtest-1	23.25	23.15	23.19	23.19	23.24	23.28	22.94	23.04	22.91
HSDPA Subtest-2	23.24	23.14	23.17	23.20	23.25	23.27	22.80	22.95	22.89
HSDPA Subtest-3	22.76	22.72	22.76	22.73	22.81	22.81	22.44	22.57	22.47
HSDPA Subtest-4	22.54	22.44	22.53	22.50	22.61	22.55	22.21	22.32	22.21
HSUPA Subtest-1	22.82	22.78	22.81	22.40	21.90	21.89	21.55	21.60	21.55
HSUPA Subtest-2	20.92	20.90	20.95	21.17	21.23	21.21	20.86	20.94	20.89
HSUPA Subtest-3	21.99	22.00	22.04	21.97	22.12	22.10	21.76	21.81	21.75
HSUPA Subtest-4	21.12	21.04	21.09	21.35	21.57	21.53	21.25	21.29	21.20
HSUPA Subtest-5	23.20	23.20	23.20	22.90	23.10	23.10	22.70	22.80	22.70

Radiated Spurious Emission

GSM850 (GPRS class 8)									
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	-46.26	-13	-33.26	-60	-48.02	0.98	4.89	H
	2472	-47.26	-13	-34.26	-64.58	-49.14	1.28	5.32	H
	3296	-55.40	-13	-42.40	-75.6	-58.81	1.54	7.10	H
	1648	-51.50	-13	-38.50	-64.56	-53.26	0.98	4.89	V
	2472	-47.23	-13	-34.23	-63.64	-49.11	1.28	5.32	V
	3296	-55.01	-13	-42.01	-75.52	-58.42	1.54	7.10	V

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

GSM850 (EDGE class 8)									
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)
Highest	1696	-60.30	-13	-47.30	-73.94	-61.9	1.00	4.75	H
	2544	-58.95	-13	-45.95	-75.93	-60.93	1.30	5.44	H
	3393	-59.32	-13	-46.32	-79.58	-63.13	1.57	7.53	H
	1696	-63.20	-13	-50.20	-76.84	-64.8	1.00	4.75	V
	2544	-59.47	-13	-46.47	-76.45	-61.45	1.30	5.44	V
	3393	-59.35	-13	-46.35	-79.61	-63.16	1.57	7.53	V

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

GSM1900 (GPRS class 8)									
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)
Highest	3819	-56.83	-13	-43.83	-77.82	-63.51	1.70	8.38	H
	5730	-51.42	-13	-38.42	-78.91	-58.45	2.76	9.79	H
	7638	-46.50	-13	-33.50	-80.4	-56	2.38	11.88	H
	3819	-53.14	-13	-40.14	-74.13	-59.82	1.70	8.38	V
	5730	-46.76	-13	-33.76	-74.25	-53.79	2.76	9.79	V
	7638	-46.52	-13	-33.52	-80.42	-56.02	2.38	11.88	V

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

GSM1900 (GPRS class 8)									
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	-57.94	-13	-44.94	-78.21	-64.51	1.67	8.24	H
	5548	-52.95	-13	-39.95	-79.04	-60.02	2.65	9.72	H
	7400	-47.70	-13	-34.70	-80.53	-56.84	2.46	11.60	H
	3700	-53.75	-13	-40.75	-74.55	-60.32	1.67	8.24	V
	5548	-50.34	-13	-37.34	-76.98	-57.41	2.65	9.72	V
	7400	-47.97	-13	-34.97	-80.68	-57.11	2.46	11.60	V

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

WCDMA Band V (RMC 12.2Kbps)									
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	-63.88	-13	-50.88	-77.39	-65.61	0.98	4.86	H
	2480	-60.20	-13	-47.20	-76.84	-62.11	1.28	5.34	H
	3305	-59.67	-13	-46.67	-79.7	-63.12	1.54	7.14	H
	1656	-63.97	-13	-50.97	-77.5	-65.7	0.98	4.86	V
	2480	-61.61	-13	-48.61	-78.25	-63.52	1.28	5.34	V
	3305	-59.26	-13	-46.26	-79.29	-62.71	1.54	7.14	V

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

WCDMA Band II (RMC 12.2Kbps)									
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)
Highest	5812	-56.70	-13	-43.70	-77.66	-63.72	2.80	9.82	H
	5723	-52.17	-13	-39.17	-79.66	-59.21	2.75	9.79	H
	7630	-46.29	-13	-33.29	-80.2	-55.78	2.39	11.88	H
	5812	-55.78	-13	-42.78	-76.74	-62.8	2.80	9.82	V
	5723	-50.33	-13	-37.33	-77.82	-57.37	2.75	9.79	V
	7630	-46.19	-13	-33.19	-80.1	-55.68	2.39	11.88	V

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

WCDMA Band IV (RMC 12.2Kbps)									
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)
Middle	3462	-58.02	-13	-45.02	-79.18	-64.26	1.59	7.83	H
	5197	-52.86	-13	-39.86	-78.67	-60.11	2.45	9.70	H
	6930	-47.98	-13	-34.98	-80.55	-56.08	2.61	10.72	H
	3462	-58.01	-13	-45.01	-79.16	-64.25	1.59	7.83	V
	5197	-54.86	-13	-41.86	-80.26	-62.11	2.45	9.70	V
	6930	-47.61	-13	-34.61	-80.35	-55.71	2.61	10.72	V

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

A1. GSM

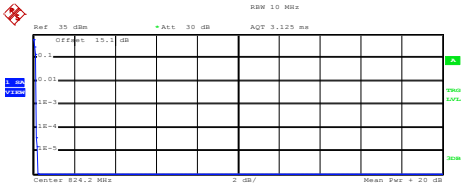
Peak-to-Average Ratio

Mode	GSM850		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.16	3.32	PASS
Middle CH	0.20	3.44	
Highest CH	0.20	3.48	

Mode	GSM1900		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.16	2.28	PASS
Middle CH	0.20	2.36	
Highest CH	0.16	2.52	

GSM850 (GPRS class 8)

Lowest Channel



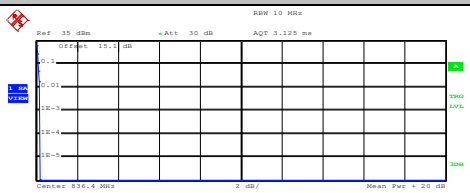
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 31.33 dBm
Peak 31.56 dBm
Crest 0.23 dB

10 % 0.12 dB
1 % 0.16 dB
.1 % 0.16 dB
.01 % 0.16 dB

Date: 13.JAN.2017 07:11:51

Middle Channel



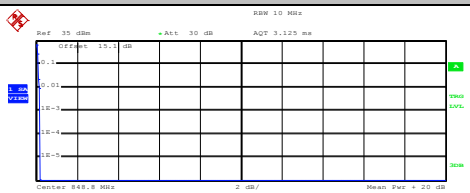
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 31.24 dBm
Peak 31.42 dBm
Crest 0.18 dB

10 % 0.12 dB
1 % 0.16 dB
.1 % 0.20 dB
.01 % 0.20 dB

Date: 13.JAN.2017 07:12:52

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

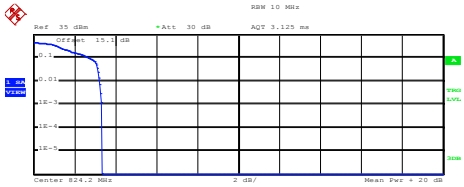
Trace 1
Mean 31.30 dBm
Peak 31.49 dBm
Crest 0.19 dB

10 % 0.12 dB
1 % 0.16 dB
.1 % 0.20 dB
.01 % 0.20 dB

Date: 13.JAN.2017 07:13:26

GSM850 (EDGE class 8)

Lowest Channel



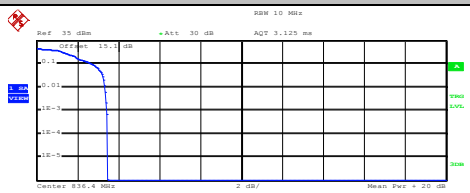
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 26.38 dBm
Peak 29.72 dBm
Crest 3.35 dB

10 % 2.76 dB
1 % 3.24 dB
.1 % 3.32 dB
.01 % 3.36 dB

Date: 13.JAN.2017 07:27:36

Middle Channel



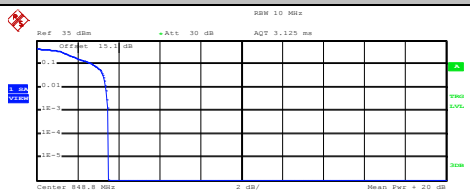
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 26.25 dBm
Peak 29.72 dBm
Crest 3.47 dB

10 % 2.72 dB
1 % 3.32 dB
.1 % 3.44 dB
.01 % 3.48 dB

Date: 13.JAN.2017 07:28:35

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

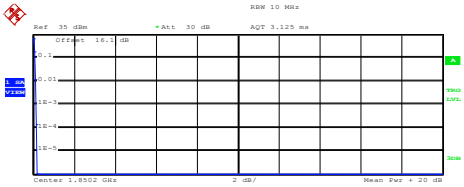
Trace 1
Mean 26.22 dBm
Peak 29.72 dBm
Crest 3.50 dB

10 % 2.76 dB
1 % 3.36 dB
.1 % 3.48 dB
.01 % 3.52 dB

Date: 13.JAN.2017 07:29:21

GSM1900 (GPRS class 8)

Lowest Channel



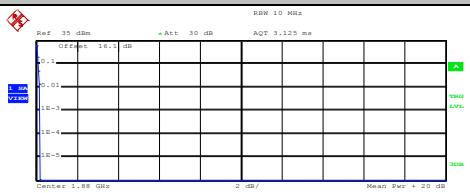
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 28.54 dBm
Peak 28.74 dBm
Crest 0.19 dB

10 % 0.12 dB
1 % 0.12 dB
.1 % 0.16 dB
.01 % 0.16 dB

Date: 13.JAN.2017 07:45:48

Middle Channel



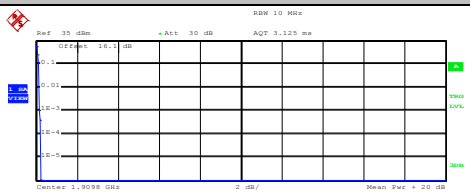
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 28.77 dBm
Peak 28.95 dBm
Crest 0.17 dB

10 % 0.12 dB
1 % 0.16 dB
.1 % 0.20 dB
.01 % 0.20 dB

Date: 13.JAN.2017 07:46:26

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

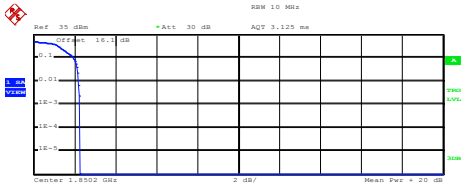
Trace 1
Mean 28.65 dBm
Peak 28.88 dBm
Crest 0.22 dB

10 % 0.12 dB
1 % 0.16 dB
.1 % 0.16 dB
.01 % 0.24 dB

Date: 13.JAN.2017 07:47:11

GSM1900 (EDGE class 8)

Lowest Channel



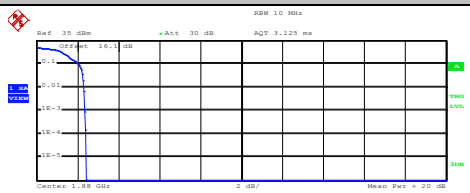
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 25.56 dBm
Peak 27.82 dBm
Crest 2.26 dB

10 % 1.92 dB
1 % 2.20 dB
.1 % 2.28 dB
.01 % 2.28 dB

Date: 13.JAN.2017 08:07:34

Middle Channel



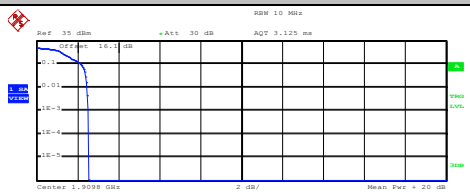
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 25.41 dBm
Peak 27.82 dBm
Crest 2.40 dB

10 % 2.04 dB
1 % 2.32 dB
.1 % 2.36 dB
.01 % 2.40 dB

Date: 13.JAN.2017 08:09:37

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 24.91 dBm
Peak 27.47 dBm
Crest 2.55 dB

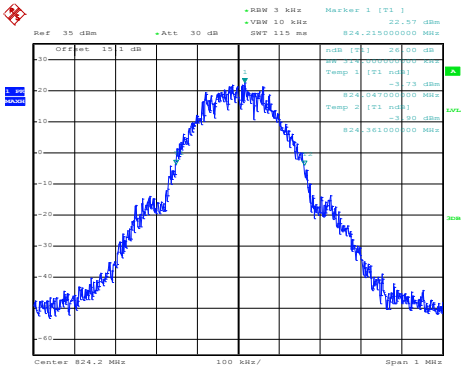
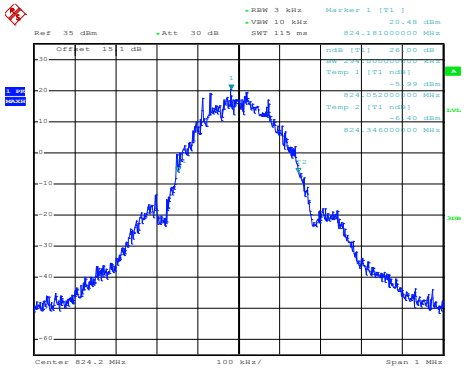
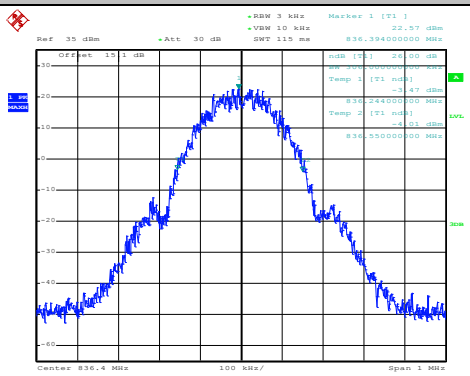
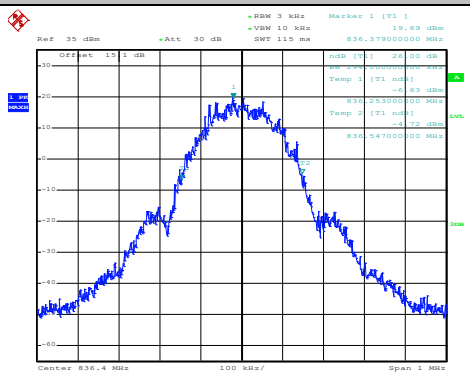
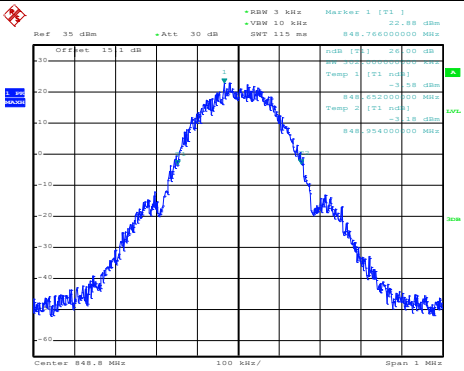
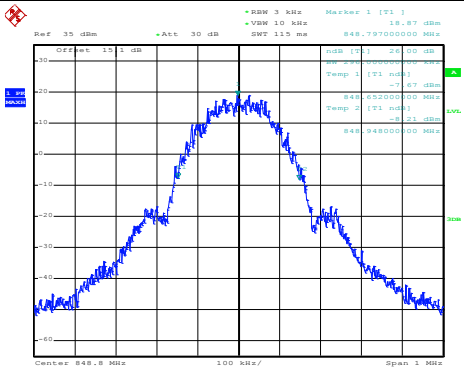
10 % 2.16 dB
1 % 2.48 dB
.1 % 2.52 dB
.01 % 2.56 dB

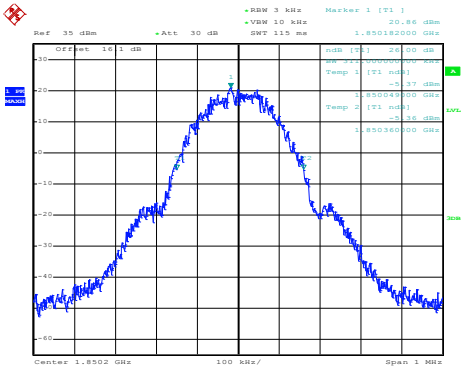
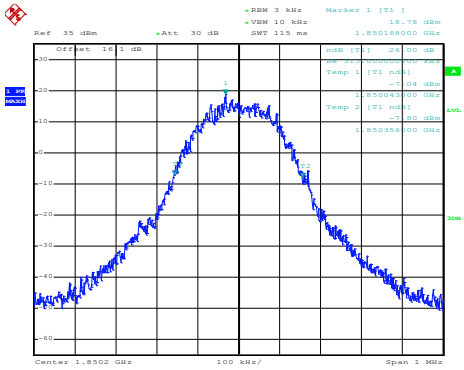
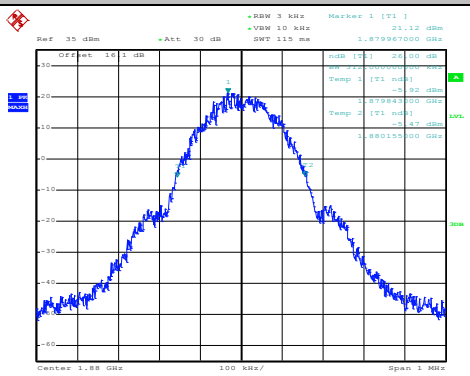
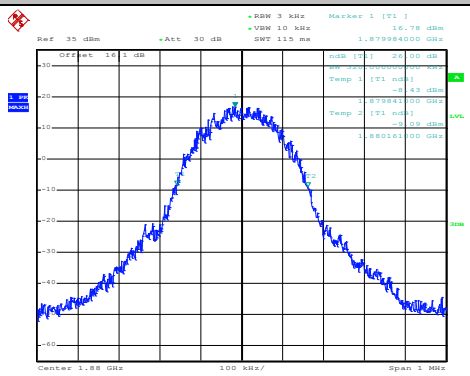
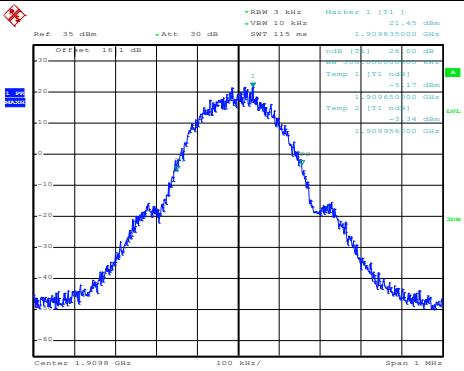
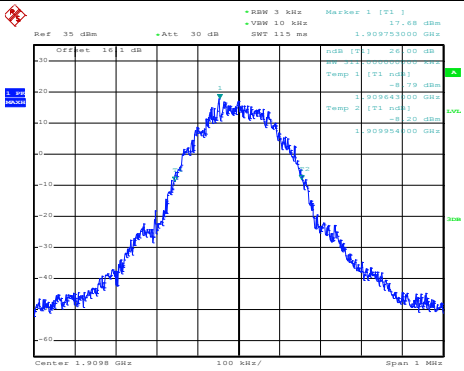
Date: 13.JAN.2017 08:11:47

26dB Bandwidth

Mode	GSM850	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.314	0.294
Middle CH	0.306	0.294
Highest CH	0.302	0.296

Mode	GSM1900	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.311	0.313
Middle CH	0.312	0.320
Highest CH	0.306	0.311

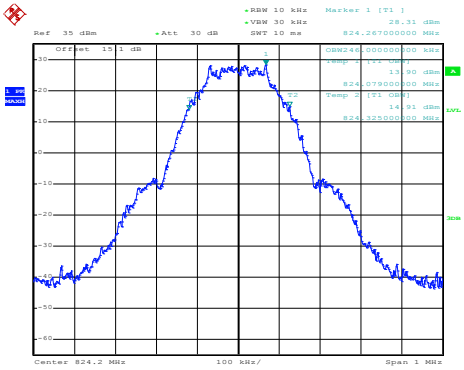
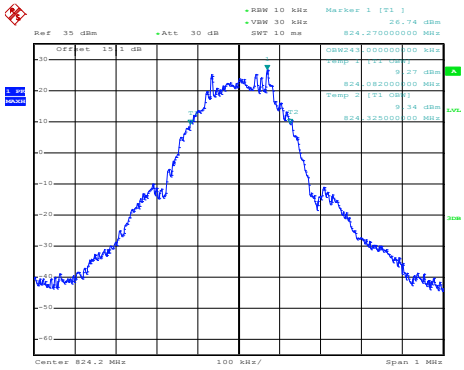
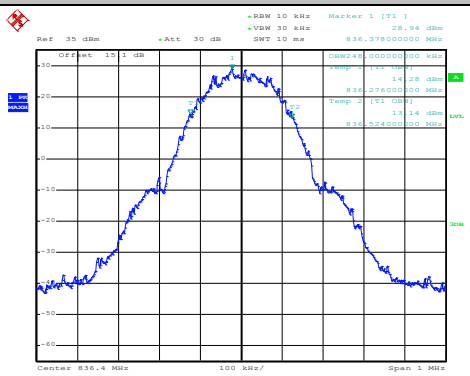
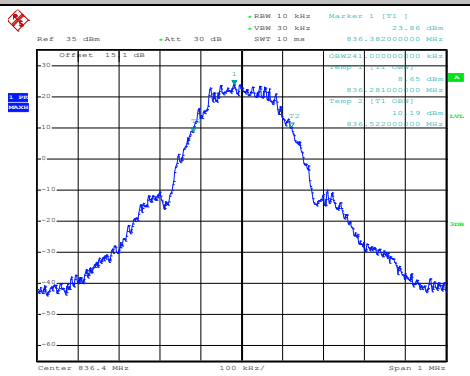
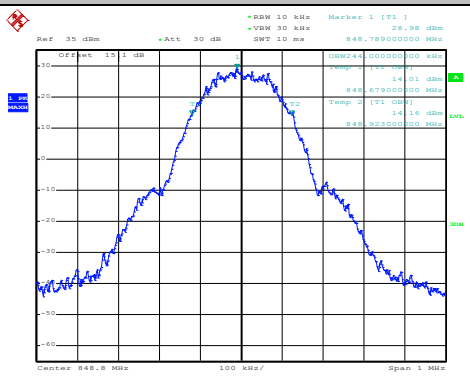
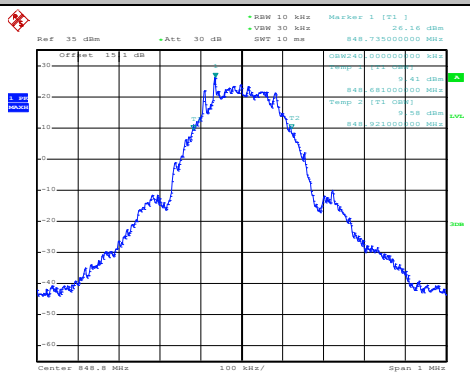
GSM850 (GPRS class 8)	GSM850 (EDGE class 8)
Lowest Channel	**Lowest Channel**
 Date: 13.JAN.2017 06:55:33	 Date: 13.JAN.2017 07:15:00
Middle Channel	**Middle Channel**
 Date: 13.JAN.2017 06:56:01	 Date: 13.JAN.2017 07:15:29
Highest Channel	**Highest Channel**
 Date: 13.JAN.2017 06:56:30	 Date: 13.JAN.2017 07:16:00

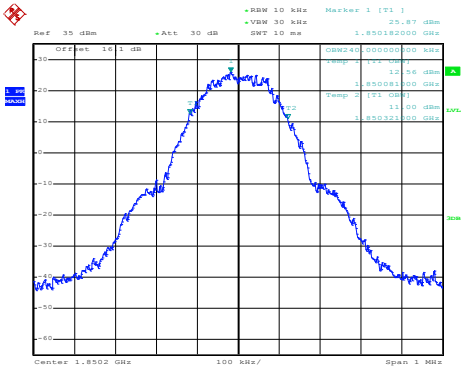
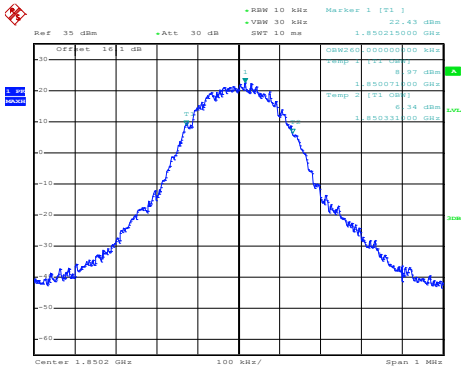
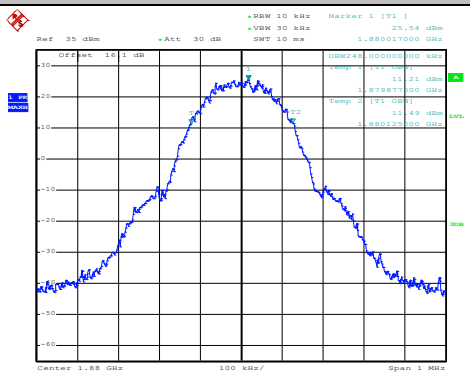
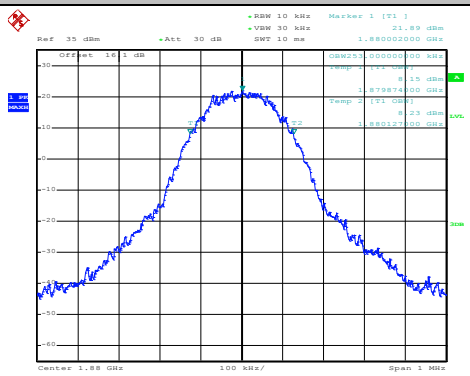
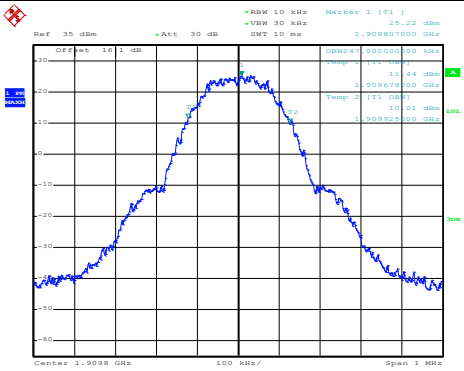
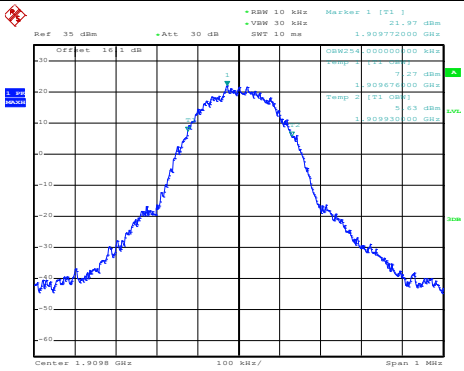
GSM1900 (GPRS class 8)	GSM1900 (EDGE class 8)
Lowest Channel	**Lowest Channel**
 Date: 13.JAN.2017 07:35:37	 Date: 13.JAN.2017 07:49:07
Middle Channel	**Middle Channel**
 Date: 13.JAN.2017 07:36:14	 Date: 13.JAN.2017 07:49:42
Highest Channel	**Highest Channel**
 Date: 13.JAN.2017 07:36:50	 Date: 13.JAN.2017 07:50:15

Occupied Bandwidth

Mode	GSM850	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.246	0.243
Middle CH	0.248	0.241
Highest CH	0.244	0.240

Mode	GSM1900	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.240	0.260
Middle CH	0.248	0.253
Highest CH	0.247	0.254

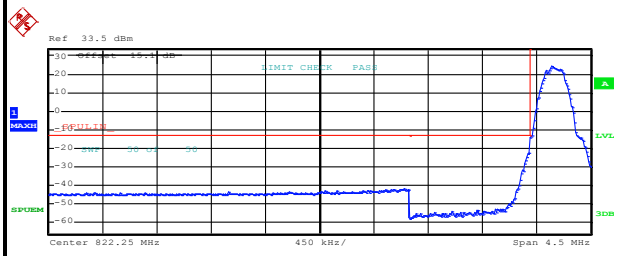
GSM850 (GPRS class 8)	GSM850 (EDGE class 8)
Lowest Channel	**Lowest Channel**
 Date: 13.JAN.2017 06:59:13	 Date: 13.JAN.2017 07:16:43
Middle Channel	**Middle Channel**
 Date: 13.JAN.2017 06:59:48	 Date: 13.JAN.2017 07:17:17
Highest Channel	**Highest Channel**
 Date: 13.JAN.2017 07:00:45	 Date: 13.JAN.2017 07:17:52

GSM1900 (GPRS class 8)	GSM1900 (EDGE class 8)
Lowest Channel	**Lowest Channel**
 Date: 13.JAN.2017 07:37:33	 Date: 13.JAN.2017 07:51:03
Middle Channel	**Middle Channel**
 Date: 13.JAN.2017 07:38:06	 Date: 13.JAN.2017 07:51:58
Highest Channel	**Highest Channel**
 Date: 13.JAN.2017 07:38:40	 Date: 13.JAN.2017 07:52:32

Conducted Band Edge

GSM850 (GPRS class 8)

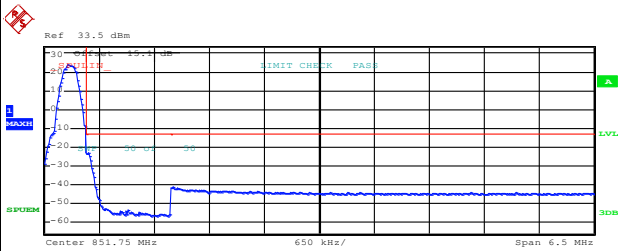
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
820.000 M	823.000 M	100.00 k	822.946000 M	-41.72	-28.72
823.000 M	824.000 M	3.00 k	823.992000 M	-22.38	-9.38
824.000 M	824.500 M	10.00 k	824.179000 M	24.21	-10.79

Date: 13.JAN.2017 07:02:53

Highest Band Edge

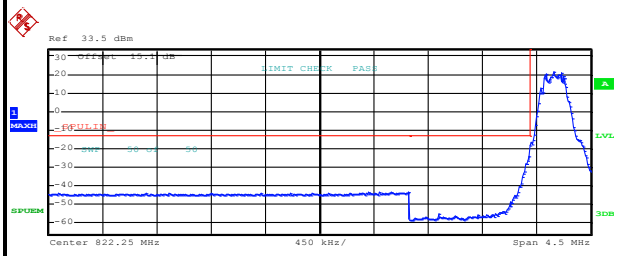


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
848.500 M	849.000 M	10.00 k	848.775500 M	23.76	-11.24
849.000 M	850.000 M	3.00 k	849.016000 M	-22.95	-9.95
850.000 M	855.000 M	100.00 k	850.010000 M	-41.05	-28.05

Date: 13.JAN.2017 07:04:26

GSM850 (EDGE class 8)

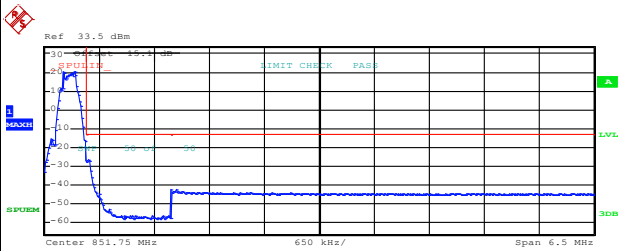
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
820.000 M	823.000 M	100.00 k	822.997000 M	-43.38	-30.38
823.000 M	824.000 M	3.00 k	823.988000 M	-24.08	-11.08
824.000 M	824.500 M	10.00 k	824.198000 M	21.60	-13.40

Date: 13.JAN.2017 07:19:43

Highest Band Edge

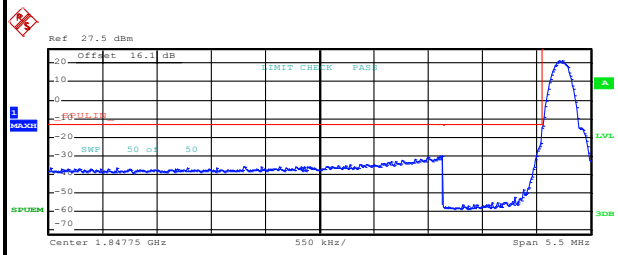


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
848.500 M	849.000 M	10.00 k	848.854500 M	20.58	-14.42
849.000 M	850.000 M	3.00 k	849.020000 M	-26.14	-13.14
850.000 M	855.000 M	100.00 k	850.000000 M	-42.11	-29.11

Date: 13.JAN.2017 07:22:20

GSM1900 (GPRS class 8)

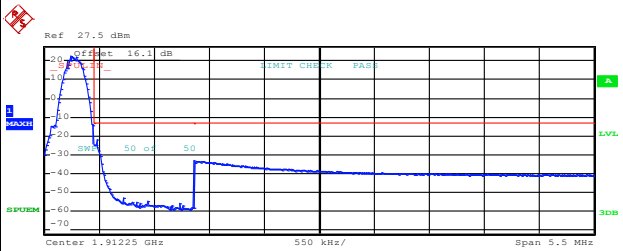
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.845 G	1.849 G	1.00 M	1.848972 G	-30.17	-17.17
1.849 G	1.850 G	3.00 k	1.849988 G	-24.93	-11.93
1.850 G	1.851 G	10.00 k	1.850183 G	21.30	-13.70

Date: 13.JAN.2017 07:40:14

Highest Band Edge

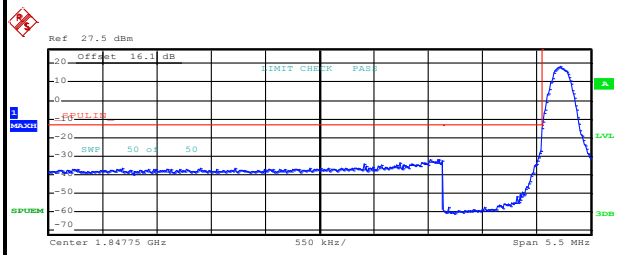


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.910 G	1.910 G	10.00 k	1.909769 G	22.24	-12.76
1.910 G	1.911 G	3.00 k	1.910020 G	-22.02	-9.02
1.911 G	1.915 G	1.00 M	1.911000 G	-33.28	-20.28

Date: 13.JAN.2017 07:41:56

GSM1900 (EDGE class 8)

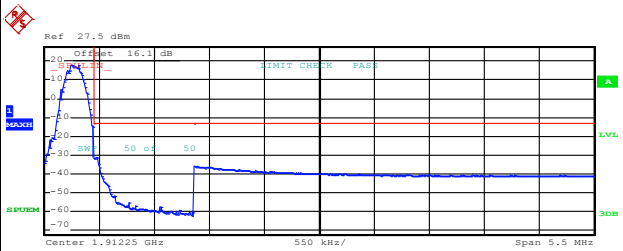
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.845 G	1.849 G	1.00 M	1.848872 G	-31.67	-18.67
1.849 G	1.850 G	3.00 k	1.849996 G	-27.41	-14.41
1.850 G	1.851 G	10.00 k	1.850195 G	18.67	-16.33

Date: 13.JAN.2017 07:54:03

Highest Band Edge



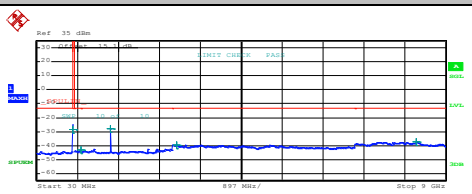
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.910 G	1.910 G	10.00 k	1.909773 G	17.84	-17.16
1.910 G	1.911 G	3.00 k	1.910008 G	-30.76	-17.76
1.911 G	1.915 G	1.00 M	1.911004 G	-36.04	-23.04

Date: 13.JAN.2017 07:55:34

Conducted Spurious Emission

GSM850 (GPRS class 8)

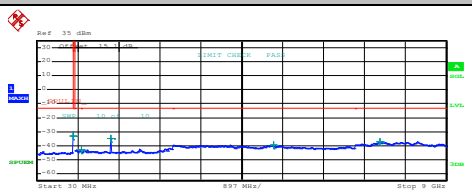
Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	819.802500 M	-28.26	-15.26
855.000 M	1.000 G	1.00 M	990.466259 M	-43.36	-30.36
1.000 G	3.000 G	1.00 M	1.648500 G	-27.84	-14.84
3.000 G	7.000 G	1.00 M	3.096000 G	-39.37	-26.37
7.000 G	9.000 G	1.00 M	8.356500 G	-37.35	-24.35

Date: 13.JAN.2017 07:05:26

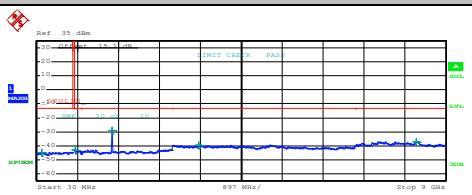
Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	819.802500 M	-33.02	-20.02
855.000 M	1.000 G	1.00 M	996.230010 M	-42.99	-29.99
1.000 G	3.000 G	1.00 M	1.648500 G	-35.02	-22.02
3.000 G	7.000 G	1.00 M	5.213000 G	-39.50	-26.50
7.000 G	9.000 G	1.00 M	7.553000 G	-37.42	-24.42

Date: 13.JAN.2017 07:23:20

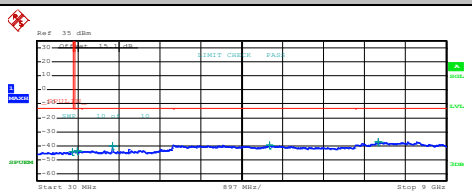
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	136.057500 M	-44.59	-31.59
855.000 M	1.000 G	1.00 M	865.113751 M	-43.24	-30.24
1.000 G	3.000 G	1.00 M	1.673000 G	-29.13	-16.13
3.000 G	7.000 G	1.00 M	3.584000 G	-39.60	-26.60
7.000 G	9.000 G	1.00 M	8.358500 G	-37.03	-24.03

Date: 13.JAN.2017 07:07:17

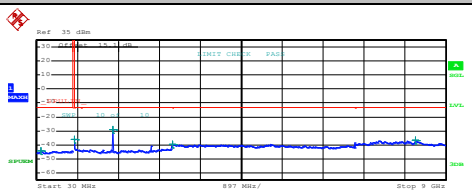
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	810.322500 M	-44.42	-31.42
855.000 M	1.000 G	1.00 M	916.987504 M	-43.44	-30.44
1.000 G	3.000 G	1.00 M	1.673000 G	-40.11	-27.11
3.000 G	7.000 G	1.00 M	5.129000 G	-39.43	-26.43
7.000 G	9.000 G	1.00 M	7.506000 G	-37.06	-24.06

Date: 13.JAN.2017 07:24:11

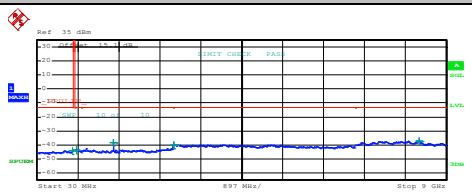
Highest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	111.172500 M	-44.14	-31.14
855.000 M	1.000 G	1.00 M	855.036250 M	-36.17	-23.17
1.000 G	3.000 G	1.00 M	1.697500 G	-29.25	-16.25
3.000 G	7.000 G	1.00 M	3.005000 G	-39.64	-26.64
7.000 G	9.000 G	1.00 M	8.343500 G	-36.84	-23.84

Date: 13.JAN.2017 07:08:07

Highest Channel

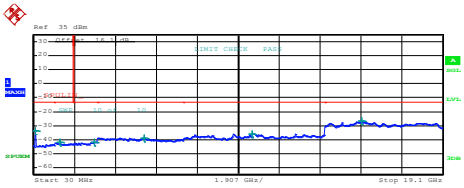


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	796.300000 M	-43.99	-30.99
855.000 M	1.000 G	1.00 M	886.573752 M	-43.37	-30.37
1.000 G	3.000 G	1.00 M	1.697500 G	-38.30	-25.30
3.000 G	7.000 G	1.00 M	3.033000 G	-39.88	-26.88
7.000 G	9.000 G	1.00 M	8.406500 G	-37.19	-24.19

Date: 13.JAN.2017 07:25:03

GSM1900 (GPRS class 8)

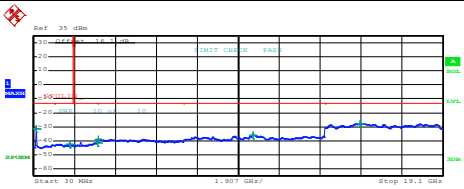
Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	111.965000 M	-33.99	-20.99
1.000 G	1.845 G	1.00 M	1.265119 G	-42.10	-29.10
1.915 G	3.000 G	1.00 M	2.870614 G	-41.67	-28.67
3.000 G	7.000 G	1.00 M	5.165000 G	-38.73	-25.73
7.000 G	13.600 G	1.00 M	10.212550 G	-35.78	-22.78
13.600 G	19.100 G	1.00 M	15.305687 G	-26.98	-13.98

Date: 13.JAN.2017 07:42:56

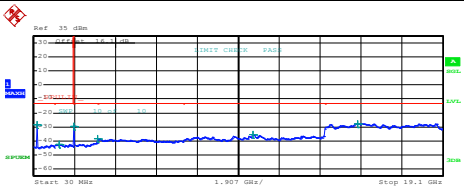
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	141.792500 M	-31.13	-18.13
1.000 G	1.845 G	1.00 M	1.710011 G	-42.57	-29.57
1.915 G	3.000 G	1.00 M	2.992134 G	-41.06	-28.06
3.000 G	7.000 G	1.00 M	3.047000 G	-38.81	-25.81
7.000 G	13.600 G	1.00 M	10.238950 G	-36.07	-23.07
13.600 G	19.100 G	1.00 M	15.231438 G	-27.67	-14.67

Date: 13.JAN.2017 07:43:47

Highest Channel

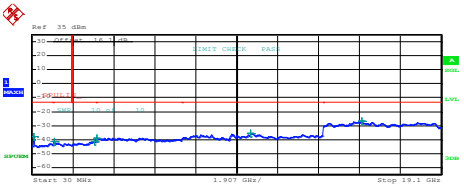


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	171.620000 M	-28.34	-15.34
1.000 G	1.845 G	1.00 M	1.211672 G	-42.39	-29.39
1.915 G	3.000 G	1.00 M	1.915271 G	-29.74	-16.74
3.000 G	7.000 G	1.00 M	3.007000 G	-38.46	-25.46
7.000 G	13.600 G	1.00 M	10.236475 G	-35.60	-22.60
13.600 G	19.100 G	1.00 M	15.127625 G	-27.60	-14.60

Date: 13.JAN.2017 07:44:41

GSM1900 (EDGE class 8)

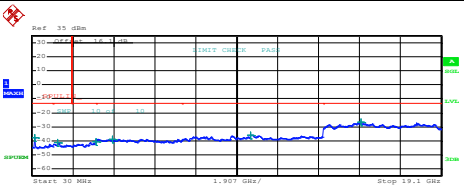
Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	111.965000 M	-37.90	-24.90
1.000 G	1.845 G	1.00 M	1.077740 G	-41.27	-28.27
1.915 G	3.000 G	1.00 M	2.941410 G	-41.43	-28.43
3.000 G	7.000 G	1.00 M	3.028000 G	-38.79	-25.79
7.000 G	13.600 G	1.00 M	10.224100 G	-35.50	-22.50
13.600 G	19.100 G	1.00 M	15.416375 G	-26.98	-13.98

Date: 13.JAN.2017 07:58:11

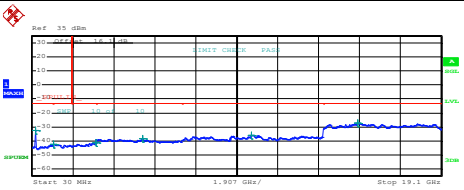
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	141.550000 M	-37.87	-24.87
1.000 G	1.845 G	1.00 M	1.217799 G	-41.24	-28.24
1.915 G	3.000 G	1.00 M	2.986438 G	-40.73	-27.73
3.000 G	7.000 G	1.00 M	3.783000 G	-39.01	-26.01
7.000 G	13.600 G	1.00 M	10.207600 G	-36.04	-23.04
13.600 G	19.100 G	1.00 M	15.359313 G	-26.68	-13.68

Date: 13.JAN.2017 08:01:05

Highest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	171.620000 M	-32.77	-19.77
1.000 G	1.845 G	1.00 M	1.035913 G	-42.47	-29.47
1.915 G	3.000 G	1.00 M	2.998915 G	-41.20	-28.20
3.000 G	7.000 G	1.00 M	5.165000 G	-38.68	-25.68
7.000 G	13.600 G	1.00 M	10.239775 G	-35.98	-22.98
13.600 G	19.100 G	1.00 M	15.227313 G	-27.30	-14.30

Date: 13.JAN.2017 08:01:58

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	0.0024	0.0012	PASS
40	Normal Voltage	0.0012	0.0012	
30	Normal Voltage	0.0000	0.0036	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0012	0.0072	
0	Normal Voltage	0.0036	0.0179	
-10	Normal Voltage	0.0096	0.0143	
-20	Normal Voltage	0.0072	0.0108	
-30	Normal Voltage	0.0108	0.0167	
20	Maximum Voltage	0.0024	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	0.0027	0.0011	PASS
40	Normal Voltage	0.0011	0.0011	
30	Normal Voltage	0.0021	0.0011	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0032	0.0005	
0	Normal Voltage	0.0085	0.0005	
-10	Normal Voltage	0.0101	0.0005	
-20	Normal Voltage	0.0112	0.0021	
-30	Normal Voltage	0.0112	0.0000	
20	Maximum Voltage	0.0011	0.0021	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0000	0.0011	

Note:

1. Normal Voltage = 3.8V. ；Battery End Point (BEP) = 3.4 V.；Maximum Voltage =4.2 V

2. The frequency fundamental emissions stay within the authorized frequency block.

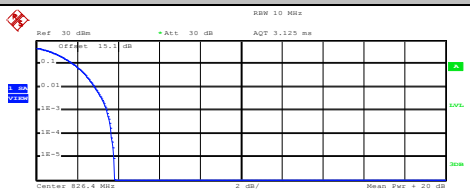
A2. WCDMA

Peak-to-Average Ratio

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV	Limit: 13dB
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps	Result
Lowest CH	3.44	3.40	3.36	PASS
Middle CH	3.00	3.40	3.04	
Highest CH	3.08	2.80	3.08	

WCDMA Band V (RMC 12.2Kbps)

Lowest Channel



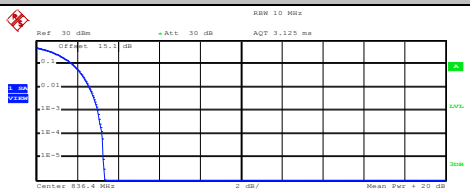
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 22.81 dBm
Peak 26.63 dBm
Crest 3.81 dB

10 % 1.80 dB
1 % 2.88 dB
.1 % 3.44 dB
.01 % 3.68 dB

Date: 13.JAN.2017 08:43:01

Middle Channel



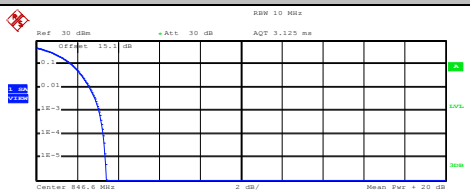
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 22.66 dBm
Peak 25.99 dBm
Crest 3.34 dB

10 % 1.76 dB
1 % 2.60 dB
.1 % 3.00 dB
.01 % 3.20 dB

Date: 13.JAN.2017 08:43:10

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

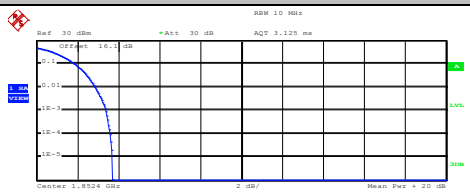
Trace 1
Mean 22.77 dBm
Peak 26.20 dBm
Crest 3.43 dB

10 % 1.72 dB
1 % 2.60 dB
.1 % 3.08 dB
.01 % 3.28 dB

Date: 13.JAN.2017 08:43:20

WCDMA Band II (RMC 12.2Kbps)

Lowest Channel



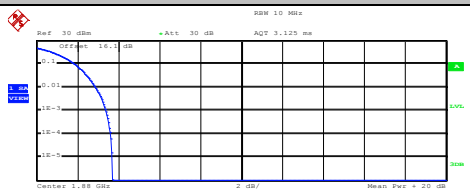
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 22.50 dBm
Peak 26.20 dBm
Crest 3.71 dB

10 % 1.88 dB
1 % 2.88 dB
.1 % 3.40 dB
.01 % 3.60 dB

Date: 13.JAN.2017 08:27:59

Middle Channel



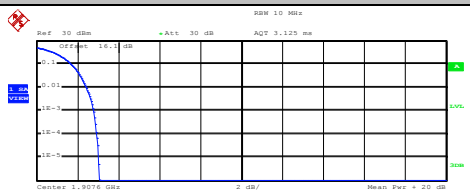
Complementary Cumulative Distribution Function (100000 samples)

Trace 1
Mean 22.66 dBm
Peak 26.35 dBm
Crest 3.69 dB

10 % 1.88 dB
1 % 2.88 dB
.1 % 3.40 dB
.01 % 3.60 dB

Date: 13.JAN.2017 08:28:08

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

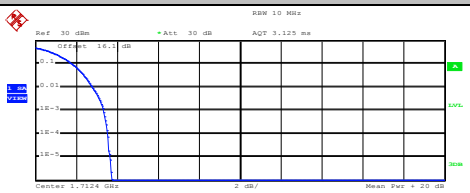
Trace 1
Mean 22.60 dBm
Peak 25.64 dBm
Crest 3.04 dB

10 % 1.68 dB
1 % 2.44 dB
.1 % 2.80 dB
.01 % 2.92 dB

Date: 13.JAN.2017 08:28:17

WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



Complementary Cumulative Distribution Function (100000 samples)

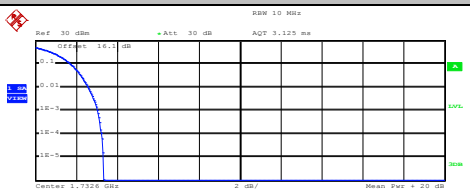
Trace 1

Mean 21.77 dBm
Peak 25.50 dBm
Crest 3.73 dB

10 % 1.80 dB
1 % 2.80 dB
.1 % 3.36 dB
.01 % 3.56 dB

Date: 16.JAN.2017 13:32:41

Middle Channel



Complementary Cumulative Distribution Function (100000 samples)

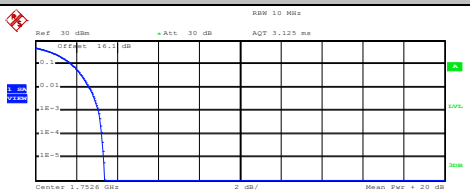
Trace 1

Mean 21.89 dBm
Peak 25.22 dBm
Crest 3.33 dB

10 % 1.72 dB
1 % 2.60 dB
.1 % 3.04 dB
.01 % 3.24 dB

Date: 16.JAN.2017 13:32:50

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

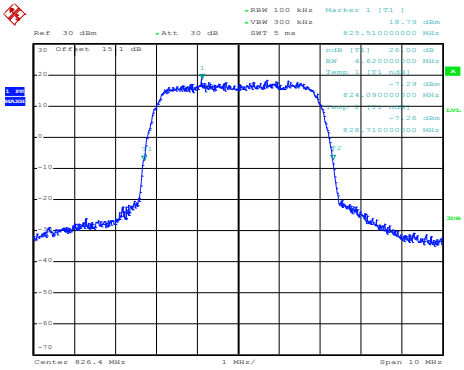
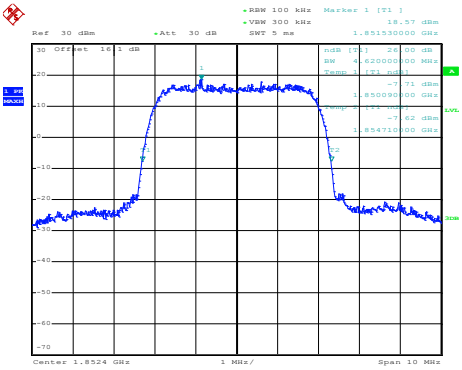
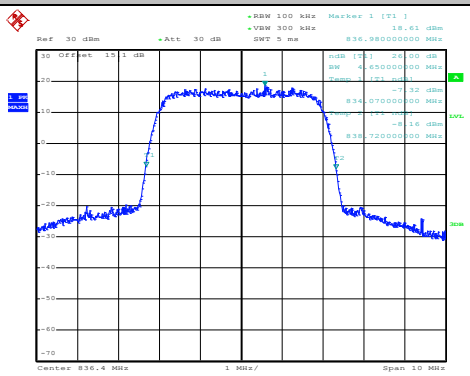
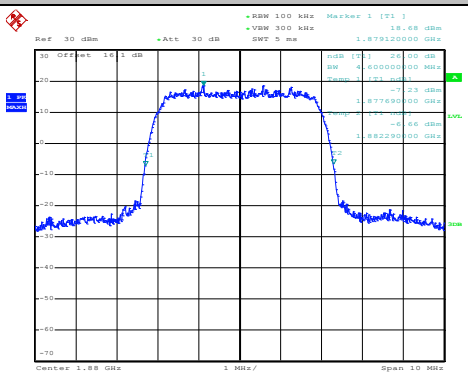
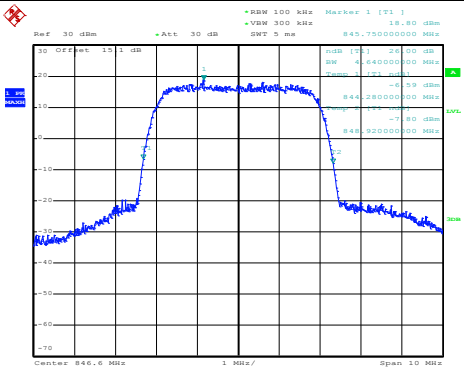
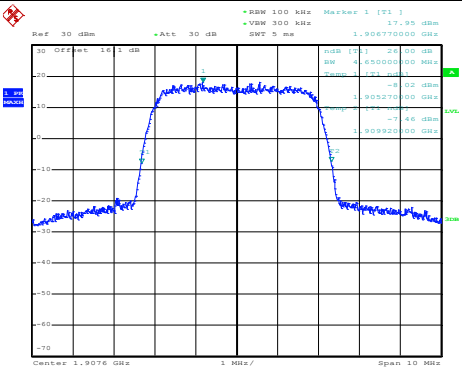
Mean 21.82 dBm
Peak 25.22 dBm
Crest 3.40 dB

10 % 1.76 dB
1 % 2.64 dB
.1 % 3.08 dB
.01 % 3.24 dB

Date: 16.JAN.2017 13:33:00

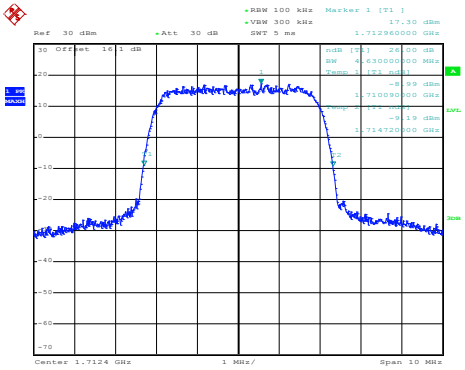
26dB Bandwidth

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.62	4.62	4.63
Middle CH	4.65	4.60	4.64
Highest CH	4.64	4.65	4.64

WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
 Date: 13.JAN.2017 08:29:48	 Date: 13.JAN.2017 08:15:32
Middle Channel	**Middle Channel**
 Date: 13.JAN.2017 08:30:16	 Date: 13.JAN.2017 08:16:00
Highest Channel	**Highest Channel**
 Date: 13.JAN.2017 08:30:44	 Date: 13.JAN.2017 08:16:28

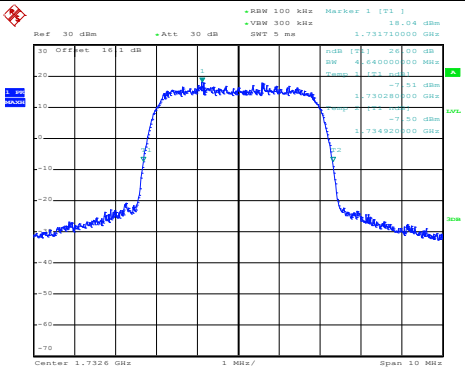
WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



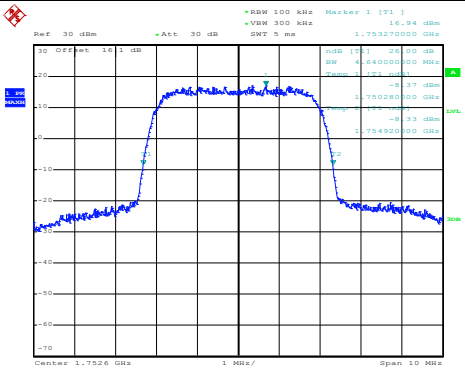
Date: 16.JAN.2017 13:21:59

Middle Channel



Date: 16.JAN.2017 13:22:26

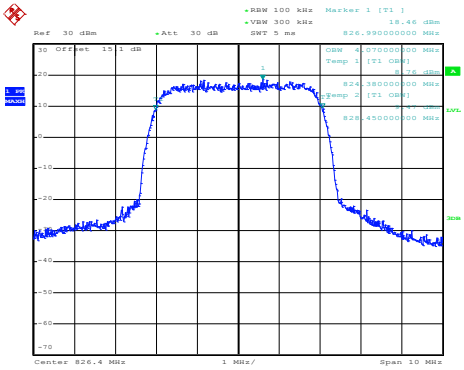
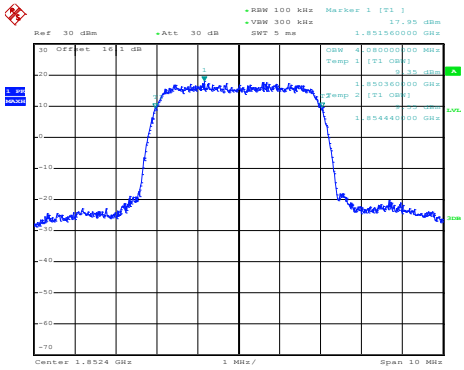
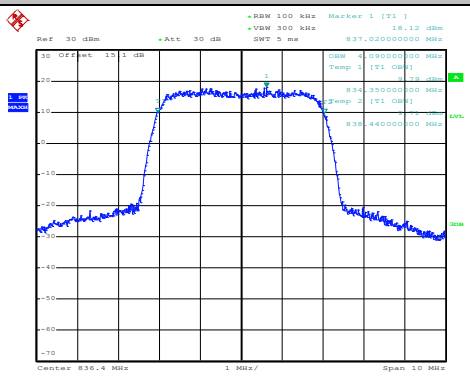
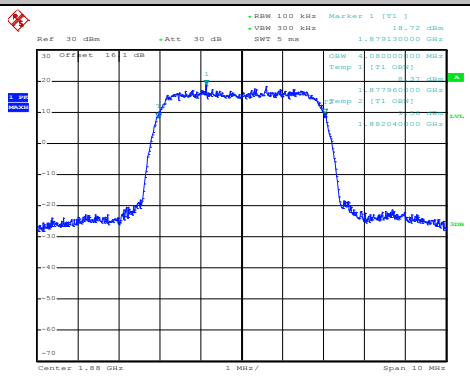
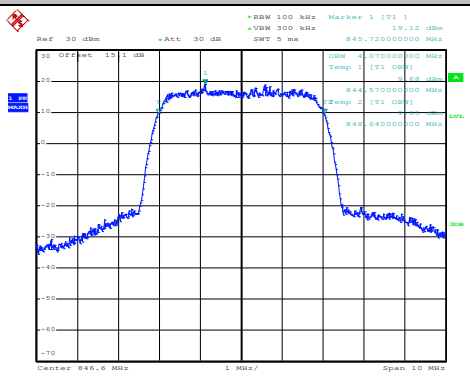
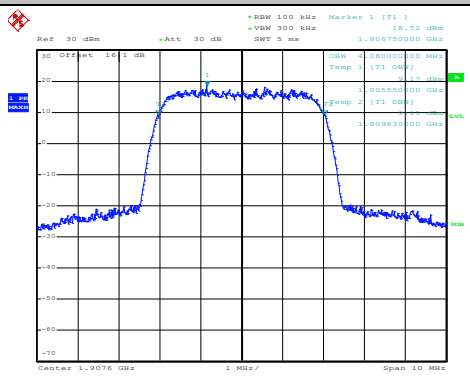
Highest Channel



Date: 16.JAN.2017 13:22:54

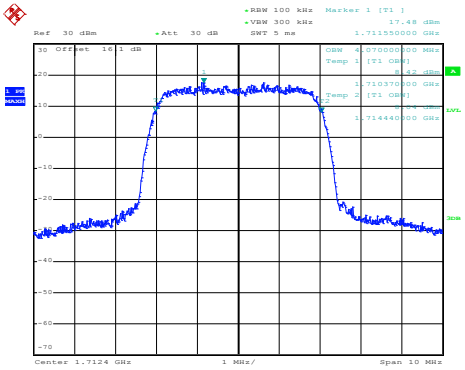
Occupied Bandwidth

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.07	4.08	4.07
Middle CH	4.09	4.08	4.08
Highest CH	4.07	4.08	4.08

WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
 Date: 13.JAN.2017 08:32:29	 Date: 13.JAN.2017 08:17:40
Middle Channel	**Middle Channel**
 Date: 13.JAN.2017 08:32:57	 Date: 13.JAN.2017 08:18:08
Highest Channel	**Highest Channel**
 Date: 13.JAN.2017 08:33:25	 Date: 13.JAN.2017 08:18:36

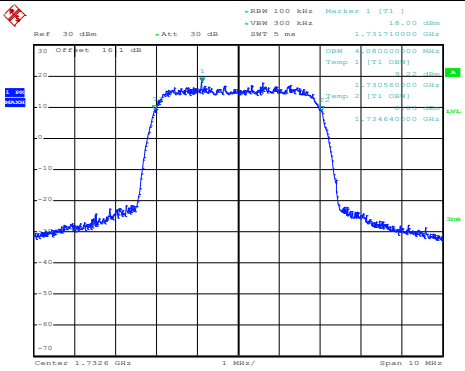
WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



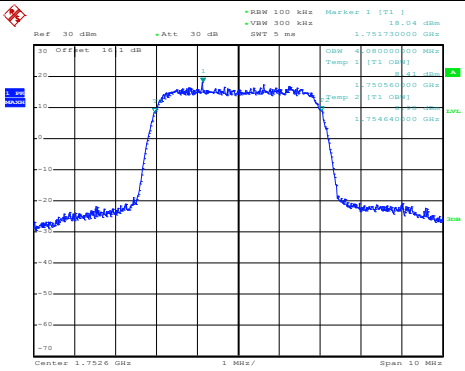
Date: 16.JAN.2017 13:23:26

Middle Channel



Date: 16.JAN.2017 13:23:54

Highest Channel

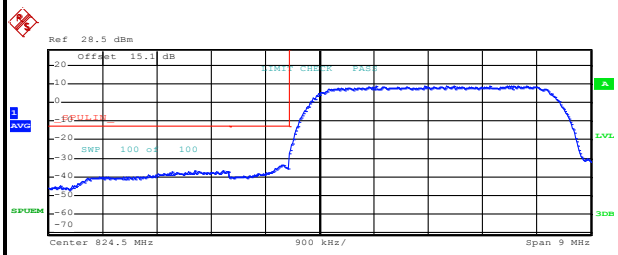


Date: 16.JAN.2017 13:24:22

Conducted Band Edge

WCDMA Band V (RMC 12.2Kbps)

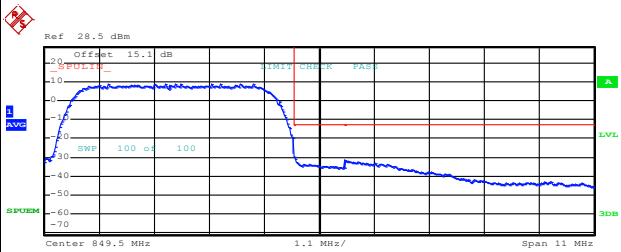
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
820.000 M	823.000 M	100.00 k	822.898000 M	-36.88	-23.88
823.000 M	824.000 M	50.00 k	823.888000 M	-33.74	-20.74
824.000 M	829.000 M	100.00 k	827.925000 M	9.18	-25.82

Date: 13.JAN.2017 08:36:28

Highest Band Edge

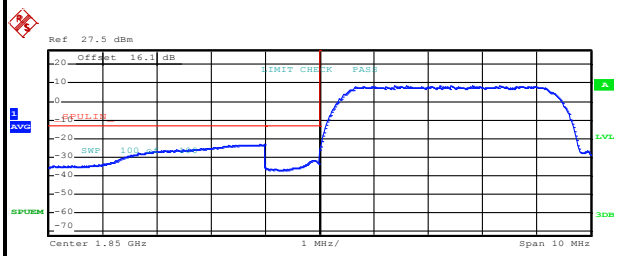


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
844.000 M	849.000 M	100.00 k	848.175000 M	9.07	-25.93
849.000 M	850.000 M	50.00 k	849.008000 M	-30.17	-17.17
850.000 M	855.000 M	100.00 k	850.005000 M	-31.48	-18.48

Date: 13.JAN.2017 08:39:10

WCDMA Band II (RMC 12.2Kbps)

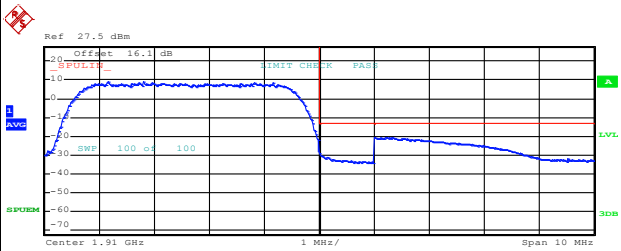
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.845 G	1.849 G	1.00 M	1.848892 G	-23.25	-10.25
1.849 G	1.850 G	50.00 k	1.849908 G	-31.30	-18.30
1.850 G	1.855 G	100.00 k	1.851600 G	8.59	-26.41

Date: 13.JAN.2017 08:21:42

Highest Band Edge

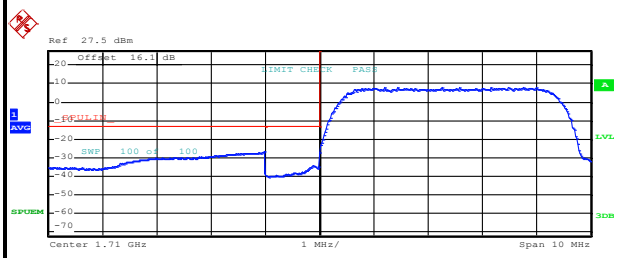


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.905 G	1.910 G	100.00 k	1.906160 G	9.02	-25.98
1.910 G	1.911 G	50.00 k	1.910008 G	-29.11	-16.11
1.911 G	1.915 G	1.00 M	1.911272 G	-20.72	-7.72

Date: 13.JAN.2017 08:24:24

WCDMA Band IV (RMC 12.2Kbps)

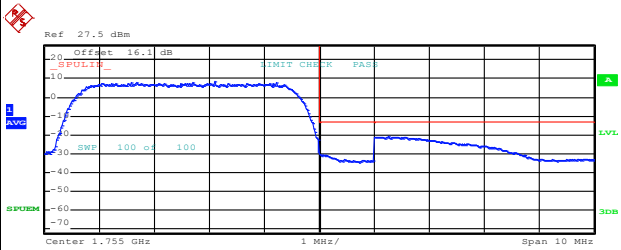
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.705 G	1.709 G	1.00 M	1.708980 G	-26.80	-13.80
1.709 G	1.710 G	50.00 k	1.709872 G	-34.47	-21.47
1.710 G	1.715 G	100.00 k	1.712265 G	8.00	-27.00

Date: 16.JAN.2017 13:27:07

Highest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.750 G	1.755 G	100.00 k	1.753095 G	8.26	-26.74
1.755 G	1.756 G	50.00 k	1.755012 G	-30.43	-17.43
1.756 G	1.760 G	1.00 M	1.756264 G	-20.96	-7.96

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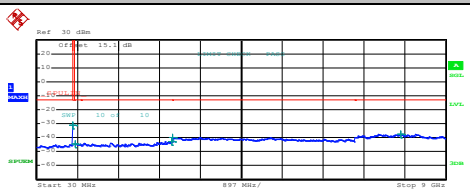
Conducted Spurious Emission

WCDMA Band V (RMC 12.2Kbps)

Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	819.210000 M	-30.96	-17.96
855.000 M	1.000 G	1.00 M	866.926251 M	-44.40	-31.40
1.000 G	3.000 G	1.00 M	2.994500 G	-42.75	-29.75
3.000 G	7.000 G	1.00 M	3.006000 G	-39.79	-26.79
7.000 G	9.000 G	1.00 M	8.017500 G	-37.45	-24.45

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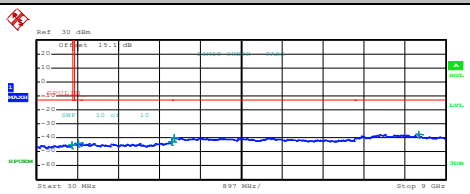
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	807.162500 M	-44.89	-31.89
855.000 M	1.000 G	1.00 M	941.420006 M	-43.87	-30.87
1.000 G	3.000 G	1.00 M	2.996500 G	-43.10	-30.10
3.000 G	7.000 G	1.00 M	3.036000 G	-39.73	-26.73
7.000 G	9.000 G	1.00 M	8.415000 G	-37.46	-24.46

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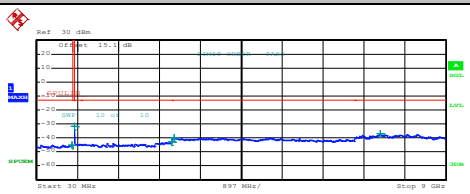
Highest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	795.510000 M	-45.05	-32.05
855.000 M	1.000 G	1.00 M	855.362500 M	-31.98	-18.98
1.000 G	3.000 G	1.00 M	2.984500 G	-42.55	-29.55
3.000 G	7.000 G	1.00 M	3.041000 G	-40.03	-27.03
7.000 G	9.000 G	1.00 M	7.560000 G	-37.23	-24.23

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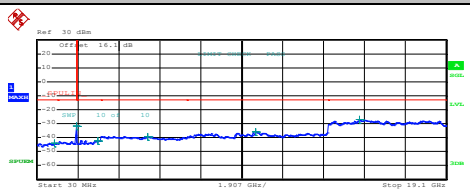
WCDMA Band II (RMC 12.2Kbps)

Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	844.557500 M	-43.78	-30.78
1.000 G	1.845 G	1.00 M	1.844155 G	-31.82	-18.82
1.915 G	3.000 G	1.00 M	2.866816 G	-41.98	-28.98
3.000 G	7.000 G	1.00 M	5.166000 G	-39.06	-26.06
7.000 G	13.600 G	1.00 M	10.222450 G	-36.03	-23.03
13.600 G	19.100 G	1.00 M	15.047875 G	-27.30	-14.30

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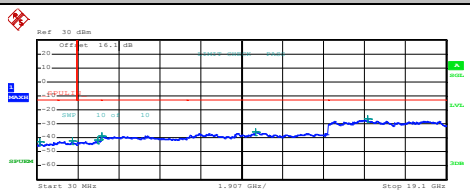
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	142.762500 M	-42.89	-29.89
1.000 G	1.845 G	1.00 M	1.661213 G	-42.33	-29.33
1.915 G	3.000 G	1.00 M	2.870343 G	-41.73	-28.73
3.000 G	7.000 G	1.00 M	3.047000 G	-38.81	-25.81
7.000 G	13.600 G	1.00 M	10.217500 G	-35.69	-22.69
13.600 G	19.100 G	1.00 M	15.437687 G	-26.69	-13.69

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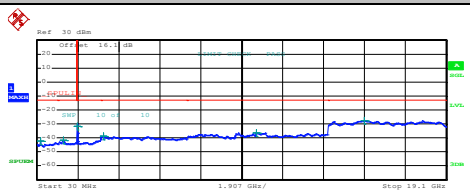
Highest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	170.407500 M	-42.41	-29.41
1.000 G	1.845 G	1.00 M	1.252866 G	-41.85	-28.85
1.915 G	3.000 G	1.00 M	1.915271 G	-31.41	-18.41
3.000 G	7.000 G	1.00 M	3.116000 G	-38.82	-25.82
7.000 G	13.600 G	1.00 M	10.249675 G	-36.10	-23.10
13.600 G	19.100 G	1.00 M	15.285063 G	-27.57	-14.57

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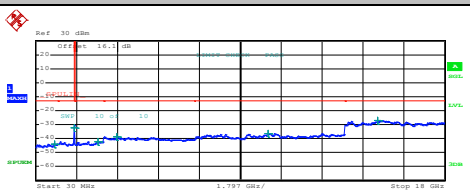
WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	1.00 M	862.260000 M	-44.04	-31.04
1.000 G	1.705 G	1.00 M	1.704824 G	-32.44	-19.44
1.760 G	3.000 G	1.00 M	2.747040 G	-42.16	-29.16
3.000 G	7.000 G	1.00 M	3.604000 G	-38.87	-25.87
7.000 G	13.600 G	1.00 M	10.220800 G	-36.18	-23.18
13.600 G	18.000 G	1.00 M	15.050900 G	-27.05	-14.05

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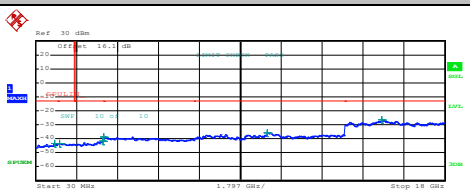
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	1.00 M	845.527500 M	-43.31	-30.31
1.000 G	1.705 G	1.00 M	1.069090 G	-43.22	-30.22
1.760 G	3.000 G	1.00 M	2.993800 G	-41.48	-28.48
3.000 G	7.000 G	1.00 M	3.002000 G	-38.75	-25.75
7.000 G	13.600 G	1.00 M	10.215025 G	-35.79	-22.79
13.600 G	18.000 G	1.00 M	15.230200 G	-26.44	-13.44

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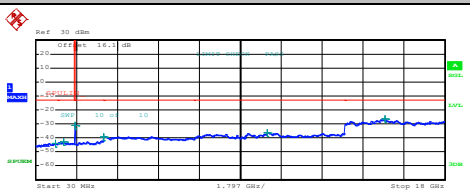
Highest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	1.00 M	886.510000 M	-43.81	-30.81
1.000 G	1.705 G	1.00 M	1.265433 G	-42.73	-29.73
1.760 G	3.000 G	1.00 M	1.760310 G	-30.83	-17.83
3.000 G	7.000 G	1.00 M	3.017000 G	-39.24	-26.24
7.000 G	13.600 G	1.00 M	10.209250 G	-36.30	-23.30
13.600 G	18.000 G	1.00 M	15.381450 G	-26.72	-13.72

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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	0.0024	PASS
40	Normal Voltage	0.0048	
30	Normal Voltage	0.0060	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0179	
0	Normal Voltage	0.0215	
-10	Normal Voltage	0.0227	
-20	Normal Voltage	0.0227	
-30	Normal Voltage	0.0179	
20	Maximum Voltage	0.0000	
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	0.0011	PASS
40	Normal Voltage	0.0005	
30	Normal Voltage	0.0005	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0011	
0	Normal Voltage	0.0016	
-10	Normal Voltage	0.0021	
-20	Normal Voltage	0.0016	
-30	Normal Voltage	0.0011	
20	Maximum Voltage	0.0016	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0016	

Test Conditions	Middle Channel	WCDMA Band IV (RMC 12.2Kbps)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0029	PASS
40	Normal Voltage	0.0023	
30	Normal Voltage	0.0012	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0029	
0	Normal Voltage	0.0035	
-10	Normal Voltage	0.0017	
-20	Normal Voltage	0.0012	
-30	Normal Voltage	0.0012	
20	Maximum Voltage	0.0017	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0023	

Note:

1. Normal Voltage = 3.8V. ；Battery End Point (BEP) = 3.4 V.；Maximum Voltage =4.2 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	32.06	1.6069	31.82	1.5212
Middle	GSM	32.02	1.5922	31.78	1.5073
Highest	GT - LC = 1.912 dB	32.02	1.5922	31.78	1.5073
Lowest	GSM850	26.49	0.4457	26.25	0.4219
Middle	EDGE class 8	26.55	0.4519	26.31	0.4278
Highest	GT - LC = 1.912 dB	26.71	0.4688	26.47	0.4438
Lowest	WCDMA Band V	23.28	0.2128	23.04	0.2015
Middle	AMR 12.2Kbps	23.19	0.2084	22.95	0.1973
Highest	GT - LC = 1.912 dB	23.21	0.2094	22.97	0.1982
Limit	ERP < 7W	Result		PASS	

Channel	Mode	Conducted		EIRP	
		Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)
Lowest	GSM1900	29.09	0.8110	32.53	1.7923
Middle	GSM	29.20	0.8318	32.64	1.8382
Highest	GT - LC = 3.444 dB	29.24	0.8395	32.68	1.8552
Lowest	GSM1900	26.14	0.4111	29.58	0.9087
Middle	EDGE class 8	25.80	0.3802	29.24	0.8402
Highest	GT - LC = 3.444 dB	25.50	0.3548	28.94	0.7842
Lowest	WCDMA Band II	23.21	0.2094	26.65	0.4628
Middle	AMR 12.2Kbps	23.26	0.2118	26.70	0.4682
Highest	GT - LC = 3.444 dB	23.30	0.2138	26.74	0.4725
Limit	EIRP < 2W	Result		PASS	

Channel	Mode	Conducted		EIRP	
		Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)
Lowest	WCDMA Band IV	22.95	0.1972	27.20	0.5246
Middle	AMR 12.2Kbps	23.05	0.2018	27.30	0.5368
Highest	GT - LC = 4.248 dB	22.93	0.1963	27.18	0.5222
Limit	EIRP < 1W	Result		PASS	