TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID: 2AIT9PG-103

Product: Alarm Host

Model No.: PG-103

Additional Model No.: N/A

Trade Mark: PGST

Report No.: TCT171023E011

Issued Date: Oct. 25, 2017

Issued for:

SZ PGST CO., LTD

No.3, Xinggong 1 Rd, Hongxing Community, Gongming Agency, Guangming New District, Shenzhen City, China

Issued By:

Shenzhen Tongce Testing Lab.

1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

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Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

1. Test Certification

Product:	Alarm Host
Model No.:	PG-103
Additional Model:	N/A
Trade Mark:	**PGST**
Applicant:	SZ PGST CO., LTD
Address:	No.3, Xinggong 1 Rd, Hongxing Community, Gongming Agency, Guangming New District, Shenzhen City, China
Manufacturer:	SZ PGST CO., LTD
Address:	No.3, Xinggong 1 Rd, Hongxing Community, Gongming Agency, Guangming New District, Shenzhen City, China
Date of Test:	Jun. 21, 2017 - Jul. 05, 2017
Applicable Standards:	FCC CFR Title 47 Part 2 FCC CFR Title 47 Part22 FCC CFR Title 47 Part24

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:	Garen	***Date:***	***Jul. 05, 2017***
Reviewed By:		***Date:***	***Oct. 25, 2017***
Approved By:	Tomsin	***Date:***	***Oct. 25, 2017***

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2. Test Result Summary

Requirement	CFR 47 Section	Result
Conducted Output Power	§22.913; §2.1046 §24.232	PASS
Peak-to-Average Ratio	§2.1046; §24.232(d)	PASS
Effective Radiated Power	§2.1046; §22.913(a) §24.232	PASS
Equivalent Isotropic Radiated Power	§2.1046; §22.913(a) §24.232	PASS
Occupied Bandwidth	§2.1049	PASS
Band Edge	§2.1051 §22.917(a) §24.238(a)	PASS
Conducted Spurious Emission	§2.1051; §22.917 §24.238	PASS
Field Strength of Spurious Radiation	§2.1053; §22.917(a) §24.238	PASS
Frequency Stability for Temperature & Voltage	§2.1055;§22.355 §24.235	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

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3. EUT Description

Product:	Alarm Host
Model No.:	PG-103
Additional Model:	N/A
Trade Mark:	**PGST**
Hardware version:	PG-103 V2.3
Software version:	103-3G-H
3G Version:	WCDMA:R99 HSDPA: Release 5 HSUPA: Release 6
Tx Frequency:	GPRS 850: 824.2 MHz ~ 848.8 MHz GPRS 1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz
Rx Frequency:	GPRS 850: 869.2 MHz ~ 893.8 MHz GPRS 1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz
Maximum Output Power to Antenna:	GPRS 850: 32.21dBm GPRS 1900: 28.66dBm WCDMA Band V: 21.88dBm WCDMA Band II: 22.71dBm
99% Occupied Bandwidth:	GPRS850 Class 8: 247KGXW GPRS1900 Class 8: 247KGXW WCDMA Band V RMC 12.2Kbps: 4M23F9W WCDMA Band II RMC 12.2Kbps: 4M23F9W
Type of Modulation:	GPRS: GMSK WCDMA/HSDPA/HSUPA: QPSK
Antenna Type:	GSM/WCDMA :Internal Antenna
Antenna Gain:	GPRS 850: -3.2dBi GPRS 1900: -0.29dBi WCDMA Band II : 2dBi WCDMA Band V : 2dBi
Power Supply:	Rechargeable Li-ion Battery DC3.7V/300mAh
Adapter:	Adapter: RD0501000-USBA-18MG Input: AC 100~240V 50/60Hz 0.25A Output: DC 5V⎓1000mA

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4. Genera Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Operation mode:	Keep the EUT in communication with CMU200 and select channel with modulation
Remark: This product has a built-in rechargeable battery, so in an independent test, the EUT battery was fully-charged.	
The sample was placed (0.8m below 1GHz, 0.8m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

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Description Operation Frequency

GRPS850		PCS1900	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
128	824.20	512	1850.20
129	824.40	513	1850.40
….	….	….	….
189	836.40	660	1879.80
190	836.60	661	1880.00
191	836.80	662	1880.20
…	…	…	…
250	848.60	809	1909.60
251	848.80	810	1909.80

WCDMA Band V		WCDMA Band II	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)
4132	826.40	9262	1852.40
4133	826.60	9263	1852.60
….	….	….	….
4182	836.40	9399	1879.80
4183	836.60	9400	1880.00
4184	836.80	9401	1880.20
…	…	…	…
4233	846.60	9538	1907.60

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4.2. 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 measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.
Radiated emissions were investigated as following frequency range:

1. 30 MHz to 10000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 20000 MHz for PCS1900, WCDMA Band II and WCDMA Band IV.

All modes and data rates and positions were investigated.
Test modes are chosen to be reported as the worst case configuration below:

Test Mode		
Band	**Radiated TCs**	**Conducted TCs**
GSM 850	GSM Link GPRS class 12 Link EGPRS class 12 Link	GSM Link GPRS class 12 Link EGPRS class 12 Link
PCS 1900	GSM Link GPRS class 12 Link EGPRS class 12 Link	GSM Link GPRS class 12 Link EGPRS class 12 Link
WCDMA Band V	RMC 12.2Kbps Link	RMC 12.2Kbps Link
WCDM Band II	RMC 12.2Kbps Link	RMC 12.2Kbps Link

Note: *The maximum power levels are chosen to test as the worst case configuration as follows: GPRS multi-slot class 8 mode for GMSK modulation, EDGE multi-slot class 8 mode for 8PSK modulation. RMC 12.2Kbps mode for WCDMA band V and WCDMA band II, only these modes were used for all tests. In addition to above worst-case test, below investigating on all data rates and all modes are compliance with each FCC test case which has specific test limits. For spurious emissions at antenna port, the EUT was investigated the band edges on low and high channels, and the unwanted spurious emissions on middle channel for all modes, the results are PASS, then only the worst-results were reported in the test report. The Radiated Spurious emissions for GPRS and EDGE modes were investigated on the middle channel and the PASS results were not worst than those data tested from the highest power channels.*

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4.3. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

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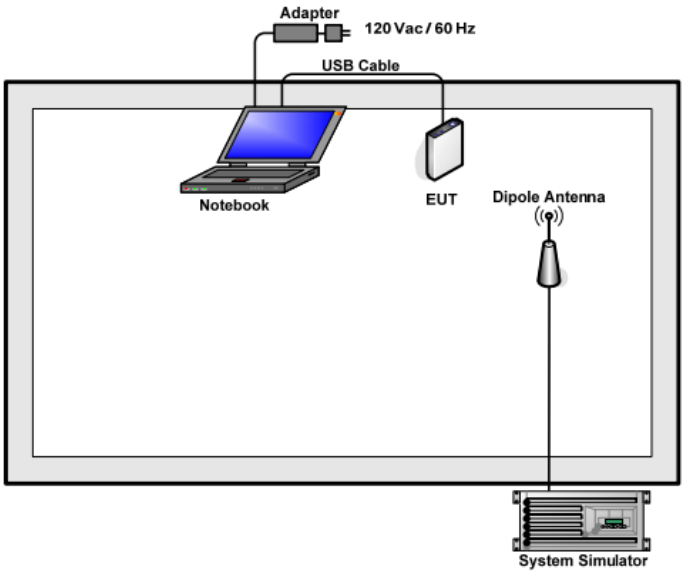
4.4. Configuration of Tested System



4.5. 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 3 dB and a 5dB attenuator.

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

= 8(dB)

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5. Facilities and Accreditations

5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

  Shenzhen Tongce Testing Lab

  The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

  The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

5.3. Measurement Uncertainty

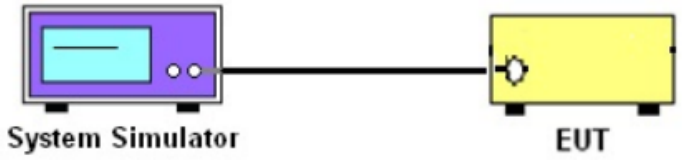
The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1G)	±3.92dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

6. Test Results and Measurement Data

6.1. Conducted Output Power Measurement

6.1.1. Test Specification

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(b)
Test Method:	FCC part 2.1046
Operation mode:	Refer to item 4.1
Limits:	GPRS 850 7W PCS 1900 2W WCDMA Band V:7W WCDMA Band II: 2W
Test Setup:	
Test Procedure:	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.
Test Result:	PASS

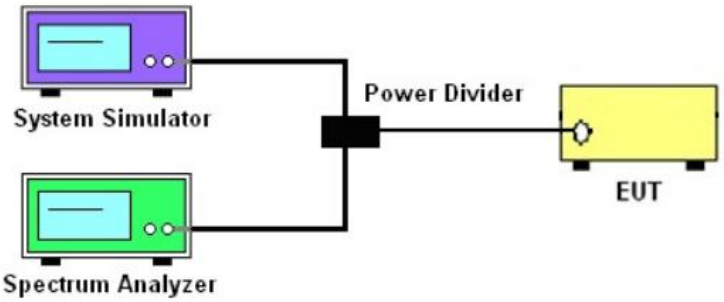
6.1.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	111382	Sep. 27, 2018
RF cable (9kHz-40GHz)	TCT	RE-05	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-02	N/A	Sep. 27, 2018

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.2. Peak to Average Ratio

6.2.1. Test Specification

Test Requirement:	FCC part 24.232(d) ; FCC part 22.913;
Test Method:	FCC KDB 971168 v02r02 Section 5.7.1
Operation mode:	Refer to item 4.1
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test Setup:	
Test Procedure:	1. The testing follows FCC KDB 971168 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. For GSM/EGPRS operating modes, signal gating is implemented on the spectrum analyzer by triggering from the system simulator. 5. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.
Test Result:	PASS

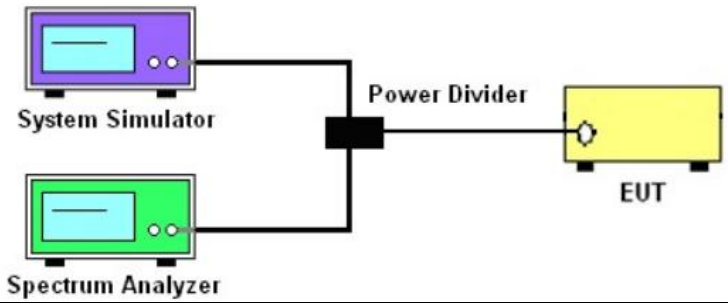
6.2.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	111382	Sep. 27, 2018
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018
RF cable (9kHz-40GHz)	TCT	RE-05	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-02	N/A	Sep. 27, 2018

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.3. 99% Occupied Bandwidth and 26dB Bandwidth Measurement

6.3.1. Test Specification

Test Requirement:	FCC part 2.1049
Test Method:	FCC part 2.1049
Operation mode:	Refer to item 4.1
Limit:	N/A
Test Setup:	
Test Procedure:	1. The testing follows FCC KDB 971168 v02r02 Section 4.2. 2. The EUT was connected to the spectrum analyzer and system simulator via a power divider. 3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. 4. The 99% occupied bandwidth were measured, set RBW= 1% of span, VBW= 3*RBW, sample detector, trace maximum hold. 5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.
Test Result:	PASS

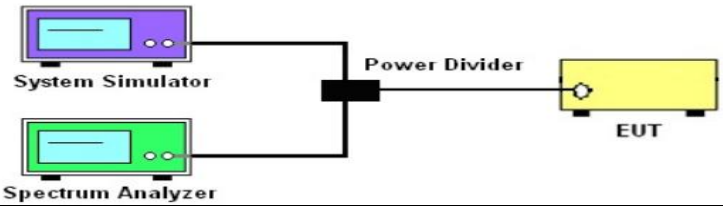
6.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	111382	Sep. 27, 2018
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018
RF cable (9kHz-40GHz)	TCT	RE-05	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-02	N/A	Sep. 27, 2018

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.4. Band Edge and Conducted Spurious Emission Measurement

6.4.1. Test Specification

Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	FCC part2.1051
Operation mode:	Refer to item 4.1
Limit:	-13dBm
Test Setup:	
Test Procedure:	1. The testing follows FCC KDB 971168 v02r02 Section 6. 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 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.
Test Result:	PASS

6.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	111382	Sep. 27, 2018
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018
RF cable (9kHz-40GHz)	TCT	RE-05	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-02	N/A	Sep. 27, 2018

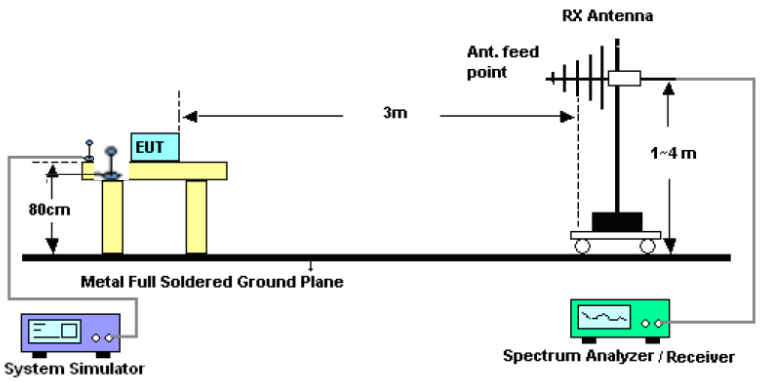
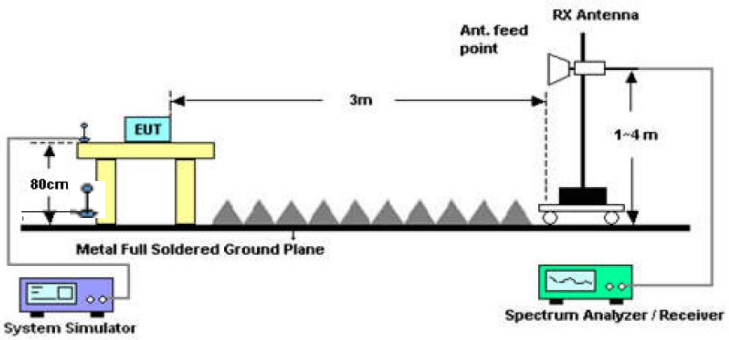
Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.5. Effective Radiated Power and Effective Isotropic Radiated Power Measurement

6.5.1. Test Specification

Test Requirement:	FCC part 22.913(a) and FCC part 24.232(b)
Test Method:	FCC part 2.1046
Receiver Setup:	

	GSM/GPRS/EDGE	WCDMA/HSPA
SPAN	500kHz	10MHz
RBW	10kHz	100kHz
VBW	30kHz	300kHz
Detector	RMS	RMS
Trace	Average	Average
Average Type	Power	Power
Sweep Count	100	100

Limit:	GPRS850 7W ERP PCS1900 2W EIRP WCDMA Band V: 7W ERP WCDMA Band II: 2W EIRP
Test Setup:	From 30MHz to 1GHz  Above 1GHz 
Test Procedure:	1. The testing follows FCC KDB 971168 v02r02 Section 5.8. and ANSI / TIA-603-D-2010 Section 2.2.17. 2. The EUT was placed on a non-conductive rotating

	platform 0.8 meters high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector per section 5. of KDB 971168 D01. 3. Key the transmitter, then rotate the EUT 360^{o} azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. 4. Replace the transmitter under test with a substitution antenna. The center of the antenna should be at the same location as the center of the antenna under test. 5. Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading. LOSS = Generator Output Power (dBm) – Analyzer reading (dBm) 6. Determine the effective radiated output power at each angular position from the readings in steps 3) and 5) using the following equation: ERP (dBm) = LVL (dBm) + LOSS (dB) 7. The maximum ERP is the maximum value determined in the preceding step. 8. Calculating ERP: ERP (dBm) = Output Power (dBm) - Losses (dB) + Antenna Gain (dBd) Antenna Gain (dBd) = Antenna Gain (dBi) - 2.15 EIRP = ERP – 2.15
Test results:	PASS

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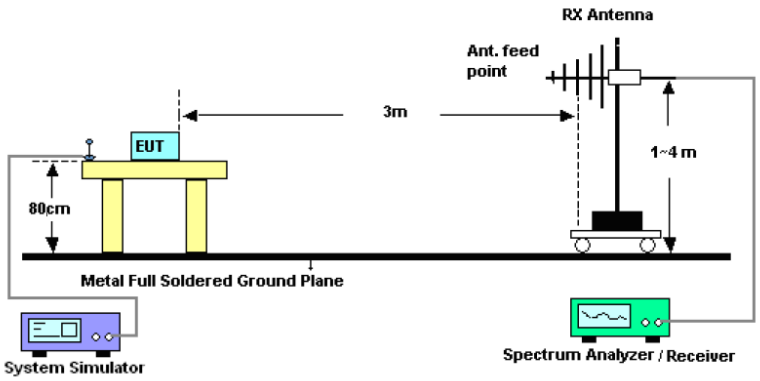
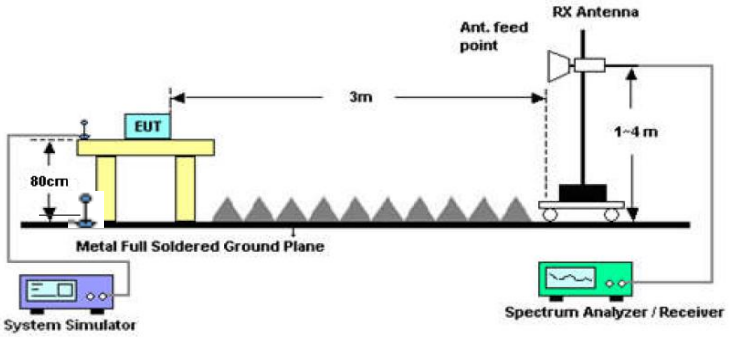
6.5.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
System simulator	R&S	CMU200	111382	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHWARZ	R&S	FSQ	Sep. 27, 2018
Signal Generator	HP	83623B	3614A00396	Sep. 27, 2018
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 27, 2018
Broadband Antenna	Schwarzbeck	VULB9163	412	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBHA 9120D	1201	Mar. 05, 2018
Dipole Antenna	TCT	TCT-RF	N/A	Sep. 27, 2018
Coax cable (9kHz-1GHz)	TCT	RE-low-01	N/A	Sep. 27, 2018
Coax cable (9kHz-40GHz)	TCT	RE-high-02	N/A	Sep. 27, 2018
Coax cable (9kHz-1GHz)	TCT	RE-low-03	N/A	Sep. 27, 2018
Coax cable (9kHz-40GHz)	TCT	RE-High-04	N/A	Sep. 27, 2018
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.6. Field Strength of Spurious Radiation Measurement

6.6.1. Test Specification

Test Requirement:	FCC part 22.917(a) and FCC part 24.238(a)
Test Method:	FCC part 2.1053
Operation mode:	Refer to item 4.1
Limit:	-13dBm
Test setup:	For 30MHz~1GHz  Above 1GHz 
Test Procedure:	1. The testing follows FCC KDB 971168 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 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.
Test results:	PASS
Remark:	All modulations have been tested, but only the worst modulation show in this test item.

6.6.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
System simulator	R&S	CMU200	111382	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHWARZ	R&S	FSQ	Sep. 27, 2018
Signal Generator	HP	83623B	3614A00396	Sep. 27, 2018
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 27, 2018
Broadband Antenna	Schwarzbeck	VULB9163	412	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBHA 9120D	1201	Mar. 05, 2018
Horn Antenna	Schwarzbeck	BBH 9170	582	Jun. 07, 2018
Dipole Antenna	TCT	TCT-RF	N/A	Sep. 27, 2018
Coax cable (9kHz-1GHz)	TCT	RE-low-01	N/A	Sep. 27, 2018
Coax cable (9kHz-40GHz)	TCT	RE-high-02	N/A	Sep. 27, 2018
Coax cable (9kHz-1GHz)	TCT	RE-low-03	N/A	Sep. 27, 2018
Coax cable (9kHz-40GHz)	TCT	RE-High-04	N/A	Sep. 27, 2018
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.6.3. Test Data

Frequency Range (9 kHz-30MHz)

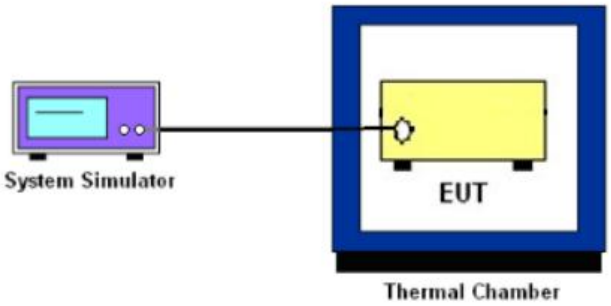
Frequency (MHz)	Level@3m (dBμV/m)	Limit@3m (dBμV/m)
--	--	--
--	--	--
--	--	--
--	--	--

Note: *1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor*

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

6.7. Frequency Stability Measurement

6.7.1. Test Specification

Test Requirement:	FCC Part 2.1055 ; FCC Part 22.355 ; FCC Part 24.235
Test Method:	FCC Part 2.1055(a)(1)(b)
Operation mode:	Refer to item 4.1
Limit:	±2.5 ppm
Test Setup:	
Test Procedure:	**Test Procedures for Temperature Variation** 1. The testing follows FCC KDB 971168 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. **Test Procedures for Voltage Variation** 1. The testing follows FCC KDB 971168 v02r02 Section 9.0. 2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator. 3. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT. 4. The variation in frequency was measured for the worst case.
Test Result:	PASS
Remark:	All three channels of all modulations have been tested, but only the worst channel and the worst modulation show in this test item.

6.7.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
System simulator	R&S	CMU200	111382	Sep. 27, 2018
Programable tempratuce and humidity chamber	JQ	JQ-2000	N/A	Sep. 27, 2018
DC power supply	Kingrang	KR3005K 30V/5A	N/A	Sep. 27, 2018
RF cable (9kHz-40GHz)	TCT	RE-04	N/A	Sep. 27, 2018
Antenna Connector	TCT	RFC-03	N/A	Sep. 27, 2018

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

Appendix A: Test Data

A.1 Conducted Output Power and Peak to Average Ratio

GPRS850 BAND:

Mode		Frequency (MHz)	Peak Power(dBm)	Avg.Burst Power(dBm)	PAP	Duty cycle Factor(dB)	Frame Power(dBm)
GPRS850	1 Tx Slots	824.2	33.12	32.21	0.91	-9.03	23.18
		836.6	33.13	32.13	1.00	-9.03	23.10
		848.8	33.12	32.15	0.97	-9.03	23.12
	2 Tx Slots	824.2	32.33	31.57	0.76	-6.02	25.55
		836.6	32.18	31.59	0.59	-6.02	25.57
		848.8	32.18	31.58	0.60	-6.02	25.56
	3 Tx Slots	824.2	31.33	30.38	0.95	-4.26	26.12
		836.6	31.22	30.36	0.86	-4.26	26.10
		848.8	31.21	30.35	0.86	-4.26	26.09
	4 Tx Slots	824.2	30.23	29.89	0.34	-3.01	26.88
		836.6	30.28	29.86	0.42	-3.01	26.85
		848.8	30.26	29.88	0.38	-3.01	26.87

PCS1900 BAND:

Mode		Frequency (MHz)	Peak Power(dBm)	Avg.Burst Power(dBm)	PAP	Duty cycle Factor(dB)	Frame Power(dBm)
GPRS1900	1 Tx Slots	1850.2	29.31	28.65	0.66	-9.03	19.62
		1880	29.22	28.62	0.60	-9.03	19.59
		1909.8	29.21	28.66	0.55	-9.03	19.63
	2 Tx Slots	1850.2	28.21	27.76	0.45	-6.02	21.74
		1880	28.23	27.62	0.61	-6.02	21.60
		1909.8	28.23	27.78	0.45	-6.02	21.76
	3 Tx Slots	1850.2	28.24	27.58	0.66	-4.26	23.32
		1880	28.41	27.56	0.85	-4.26	23.30
		1909.8	28.15	27.62	0.53	-4.26	23.36
	4 Tx Slots	1850.2	27.21	26.78	0.43	-3.01	23.77
		1880	27.28	26.66	0.62	-3.01	23.65
		1909.8	27.36	26.83	0.53	-3.01	23.82

Duty cycle Factor = 1 Tx Slots, 10*log(1/8)= -9.03dB, 2 Tx Slots, 10*log(2/8)= -6.02dB,
3Tx Slots, 10*log(3/8)= -4.26dB, 4 Tx Slots, 10*log(4/8)= -3.01dB

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UTRA BANDS:
BAND 2：

Mode		Frequency (MHz)	Peak Power (dBm)	Avg.Burst Power(dBm)	PAPR (dB)
RMC 12.2K		1852.4	22.23	21.20	1.03
		1880	22.65	21.88	0.77
		1907.6	22.32	21.44	0.88
HSDPA	1 Tx Slots	1852.4	22.12	21.55	0.57
		1880	22.21	21.42	0.79
		1907.6	22.28	21.11	1.17
	2 Tx Slots	1852.4	21.09	20.18	0.91
		1880	21.22	20.33	0.89
		1907.6	21.12	20.31	0.81
	3 Tx Slots	1852.4	21.32	20.82	0.50
		1880	21.66	20.75	0.91
		1907.6	21.52	20.87	0.65
	4 Tx Slots	1852.4	21.33	20.68	0.65
		1880	21.47	20.74	0.73
		1907.6	21.55	20.72	0.83
HSUPA	1 Tx Slots	1852.4	21.57	20.86	0.71
		1880	21.71	20.92	0.79
		1907.6	21.64	20.51	1.13
	2 Tx Slots	1852.4	21.44	20.83	0.61
		1880	21.41	20.78	0.63
		1907.6	21.44	20.52	0.92
	3 Tx Slots	1852.4	21.56	20.70	0.86
		1880	21.52	20.71	0.81
		1907.6	21.41	20.60	0.81
	4 Tx Slots	1852.4	21.33	20.70	0.63
		1880	21.38	20.53	0.85
		1907.6	21.52	20.61	0.91
	5 Tx Slots	1852.4	21.40	20.81	0.59
		1880	21.19	20.72	0.47
		1907.6	21.43	20.58	0.85

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BAND 5：

Mode		Frequency (MHz)	Peak Power (dBm)	Avg.Burst Power(dBm)	PAPR (dB)
RMC 12.2K		826.4	23.58	22.62	0.96
		836.4	23.46	22.71	0.75
		846.6	23.23	22.56	0.67
HSDPA	1 Tx Slots	826.4	23.23	22.22	1.01
		836.4	23.22	22.32	0.90
		846.6	23.28	22.11	1.17
	2 Tx Slots	826.4	22.62	21.36	1.26
		836.4	22.41	21.14	1.27
		846.6	22.16	21.46	0.70
	3 Tx Slots	826.4	22.52	21.42	1.10
		836.4	22.11	21.33	0.78
		846.6	22.63	21.31	1.32
	4 Tx Slots	826.4	22.65	21.12	1.53
		836.4	22.67	21.10	1.57
		846.6	22.25	21.13	1.12
HSUPA	1 Tx Slots	826.4	22.56	21.16	1.40
		836.4	22.34	21.15	1.19
		846.6	22.56	21.02	1.54
	2 Tx Slots	826.4	22.34	21.52	0.82
		836.4	22.19	21.72	0.47
		846.6	22.52	21.52	1.00
	3 Tx Slots	826.4	22.19	21.64	0.55
		836.4	22.36	21.47	0.89
		846.6	22.63	21.88	0.75
	4 Tx Slots	826.4	22.25	21.35	0.90
		836.4	22.54	21.46	1.08
		846.6	22.26	21.44	0.82
	5 Tx Slots	826.4	22.62	21.52	1.10
		836.4	22.34	21.36	0.98
		846.6	22.31	21.18	1.13

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A.2 99% Occupied Bandwidth and 26dB Bandwidth Measurement

GPRS 850:

Frequency (MHz)	OBW(99%)	26dB BW
824.2	246.795KHz	314.423KHz
836.6	245.192KHz	315.064KHz
848.8	245.192KHz	311.218KHz

GPRS 1900:

Frequency (MHz)	OBW(99%)	26dB BW
1850.2	246.975 KHz	309.615KHz
1880	245.192KHz	315.385KHz
1909.8	245.192KHz	314.423KHz

UTRA BANDS
BAND 2:

Frequency	OBW(99%)	26dB BW
1852.4	4.215MHz	4.872MHz
1880	4.231MHz	4.856MHz
1907.6	4.215MHz	4.885MHz

BAND 5:

Frequency	OBW(99%)	26dB BW
826.4	4.231MHz	4.898MHz
836.4	4.215MHz	4.879MHz
846.6	4.231MHz	4.894MHz

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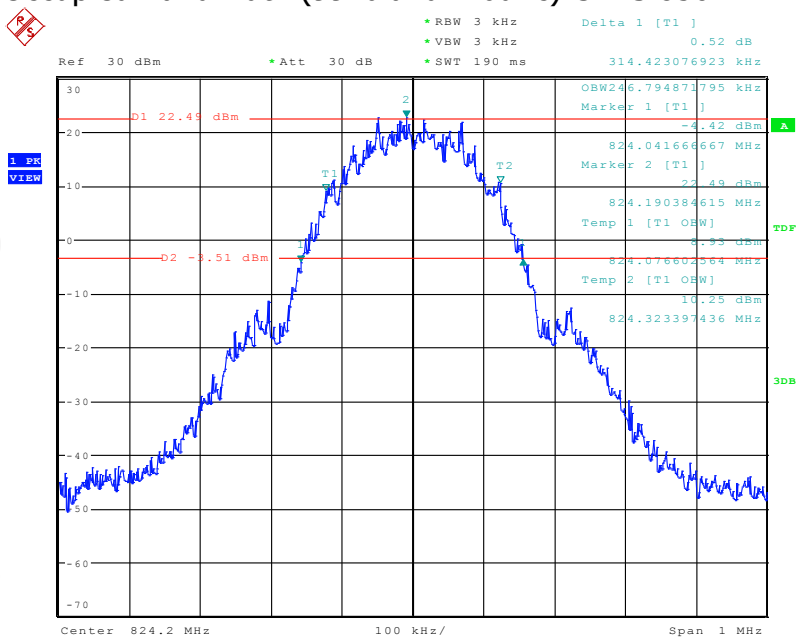
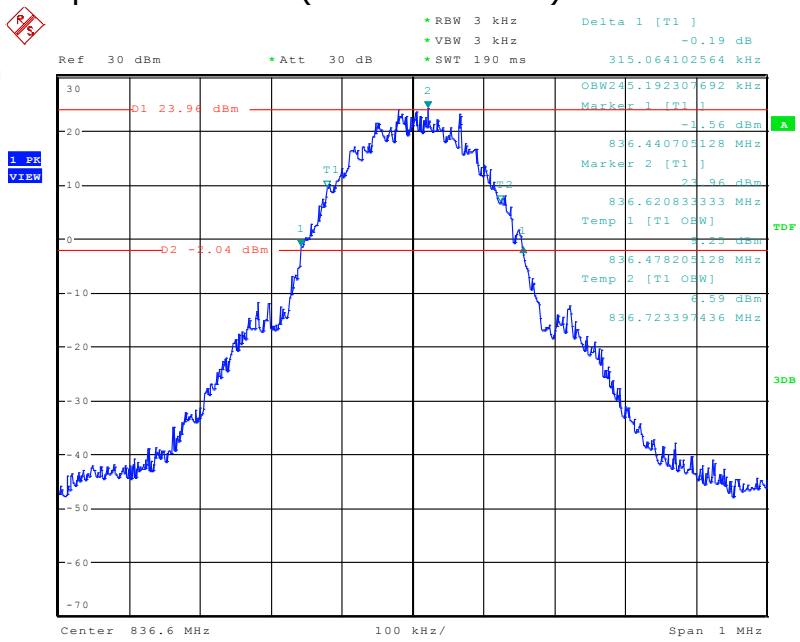
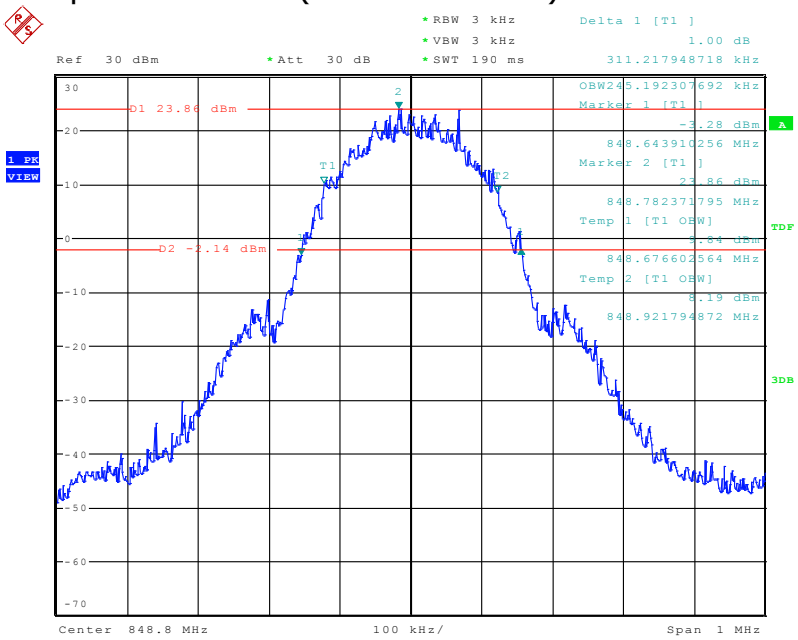
Occupied Bandwidth (99% and -26dBc) GPRS 850 BAND CH 128



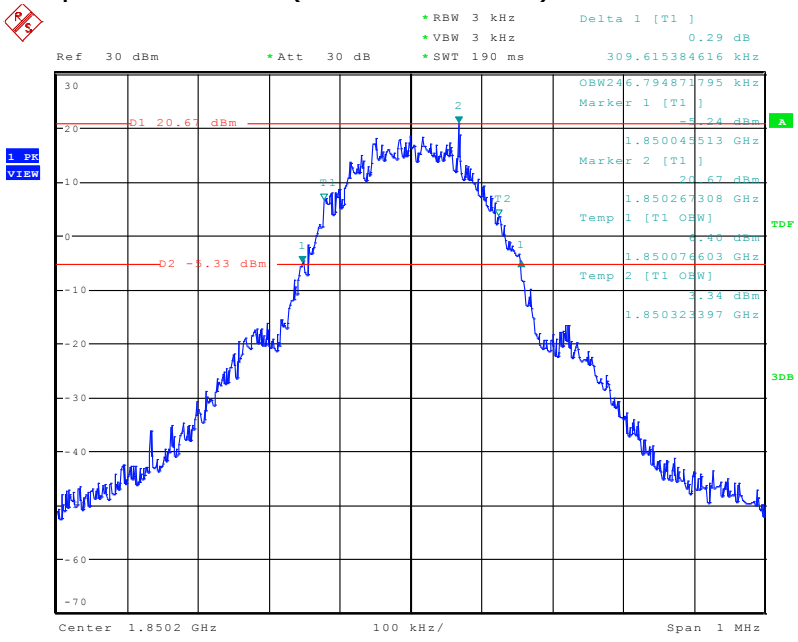
Occupied Bandwidth (99% and -26dBc) GPRS 850 BAND CH 190



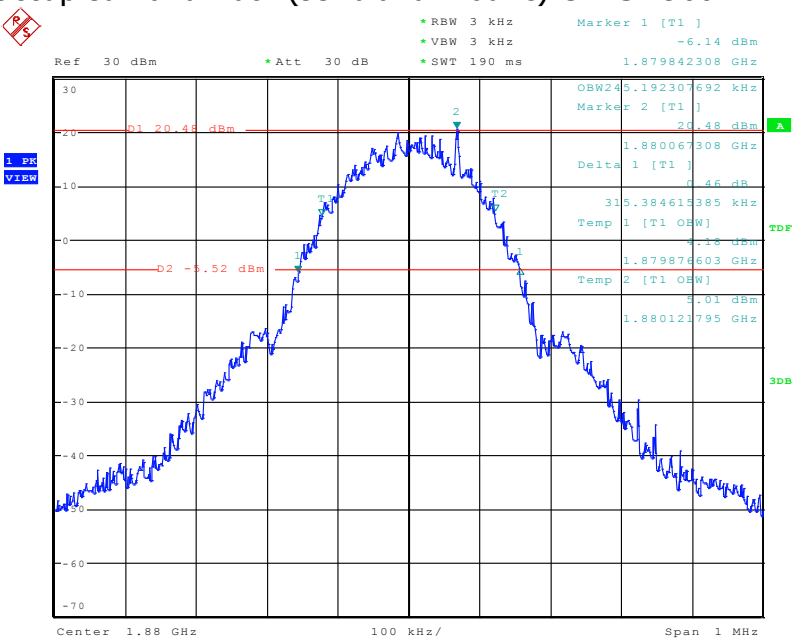
Occupied Bandwidth (99% and -26dBc) GPRS 850 BAND CH 251



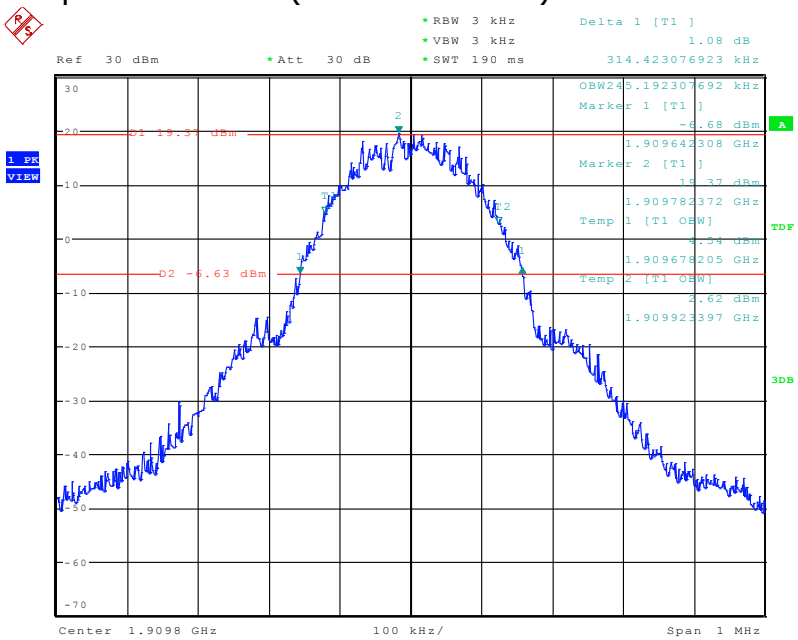
Occupied Bandwidth (99% and -26dBc) GPRS 1900 BAND CH 512



Occupied Bandwidth (99% and -26dBc) GPRS 1900 BAND CH 661

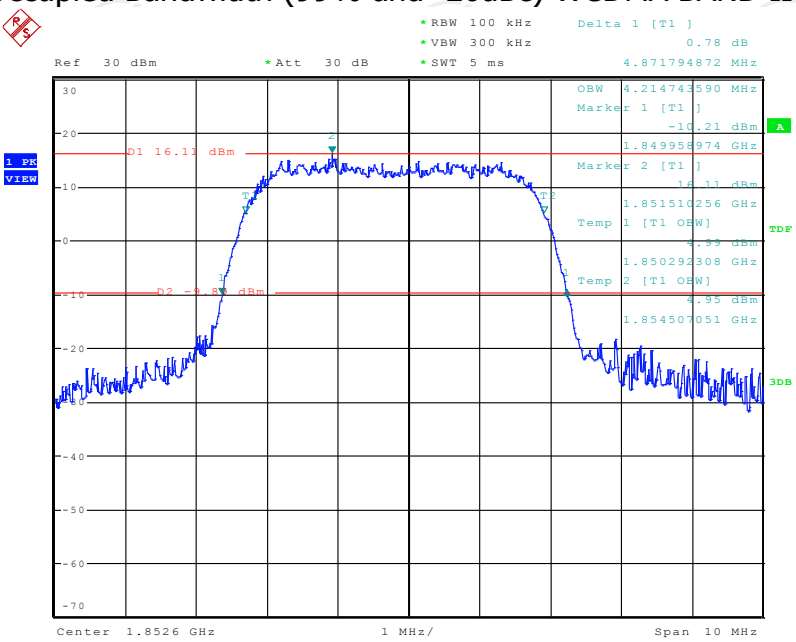


Occupied Bandwidth (99% and -26dBc) GPRS 1900 BAND CH 810

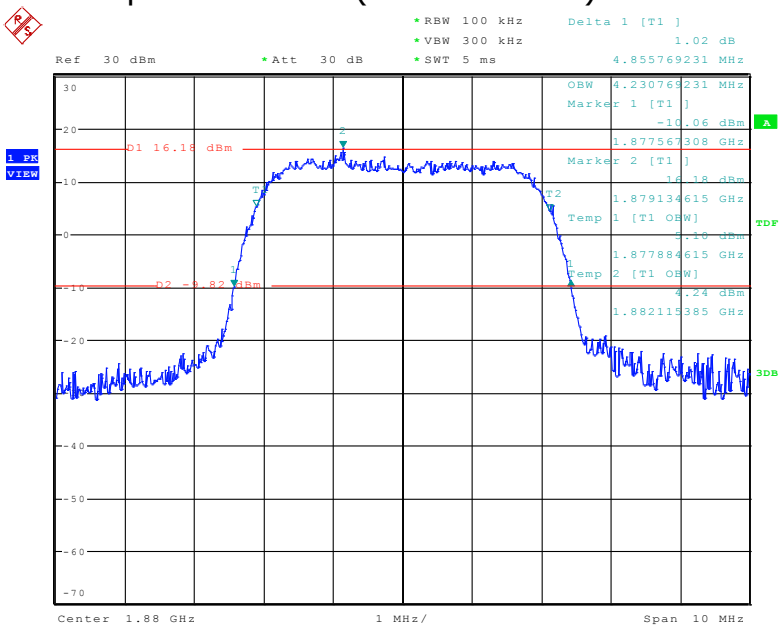


UTRA BANDS

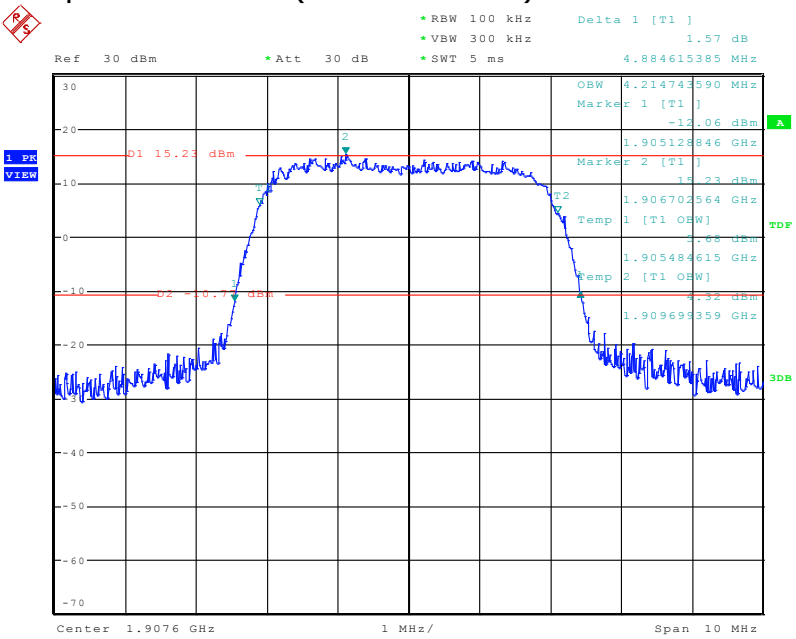
Occupied Bandwidth (99% and -26dBc) WCDMA BAND II CH 9262



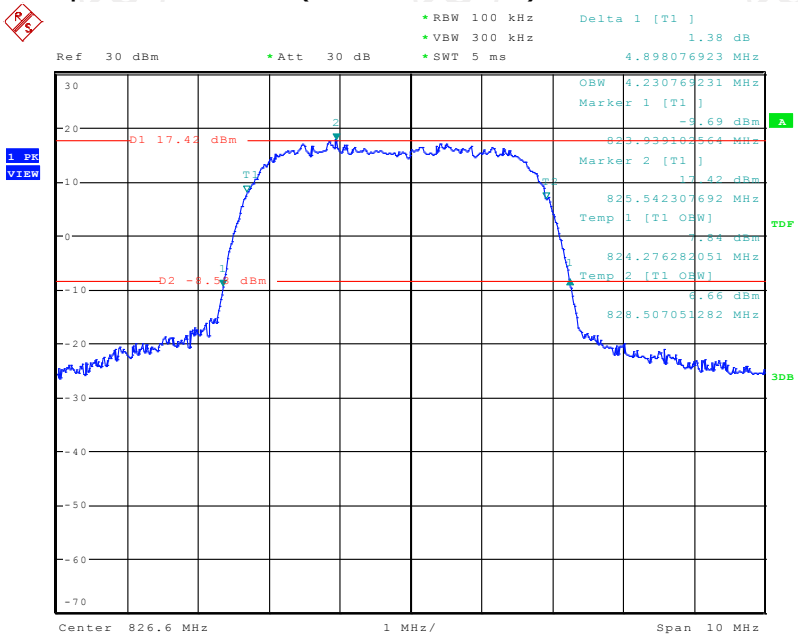
Occupied Bandwidth (99%and-26dBc) WCDMA BAND II CH 9400



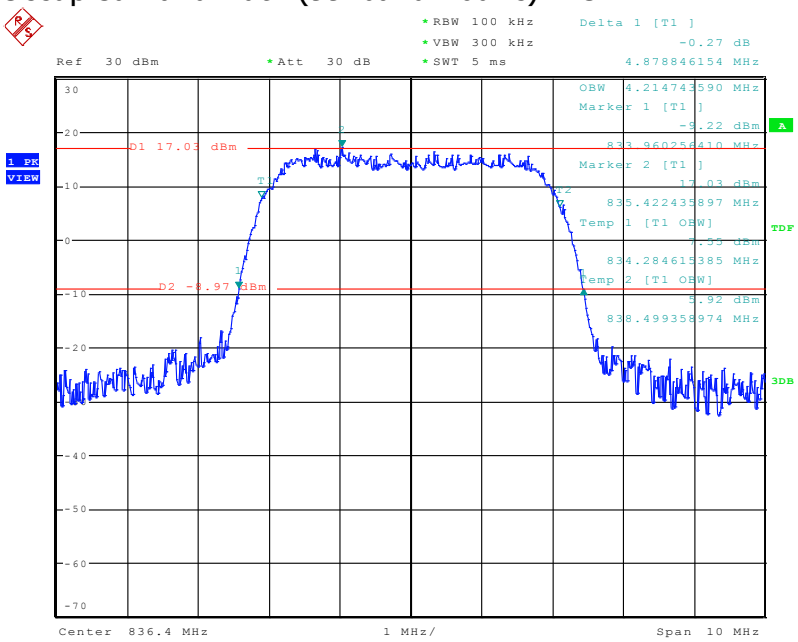
Occupied Bandwidth (99%and-26dBc) WCDMA BAND II CH 9538



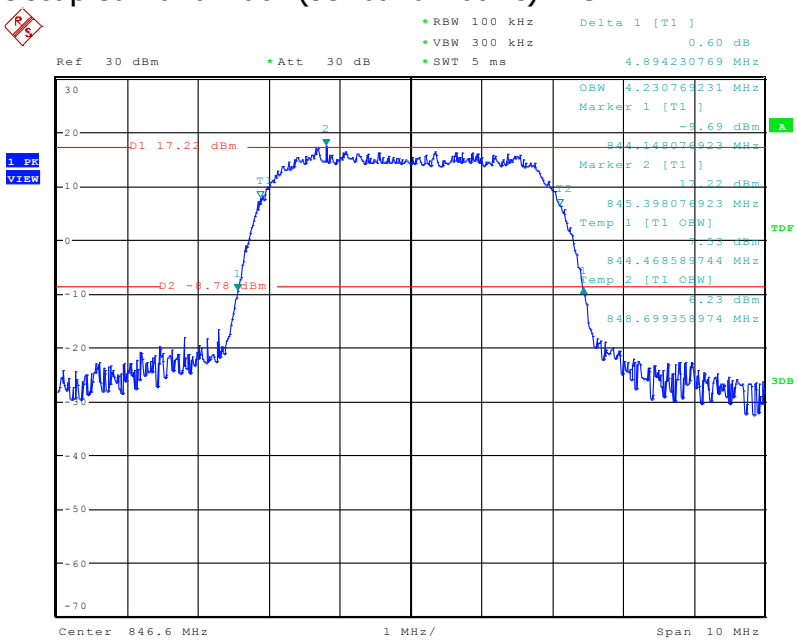
Occupied Bandwidth (99%and-26dBc) WCDMA BAND V CH 4132



Occupied Bandwidth (99%and-26dBc) WCDMA BAND V CH 4182



Occupied Bandwidth (99%and-26dBc) WCDMA BAND V CH 4233



A.3 Band Edge and Conducted Spurious Emission Measurement

Test Plot(s)

GPRS 850:

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgment
Low Range	0.2	128	824.2	Pass
High Range	0.2	251	848.8	Pass

PCS 1900：

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgment
Low Range	0.2	512	1850.2	Pass
High Range	0.2	810	1909.8	Pass

UTRA BANDS

BAND 2:

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgement
Low Range	5	9263	1852.4	Pass
High Range	5	9537	1907.6	Pass

BAND 5:

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgement
Low Range	5	4132	826.4	Pass
High Range	5	4233	846.6	Pass

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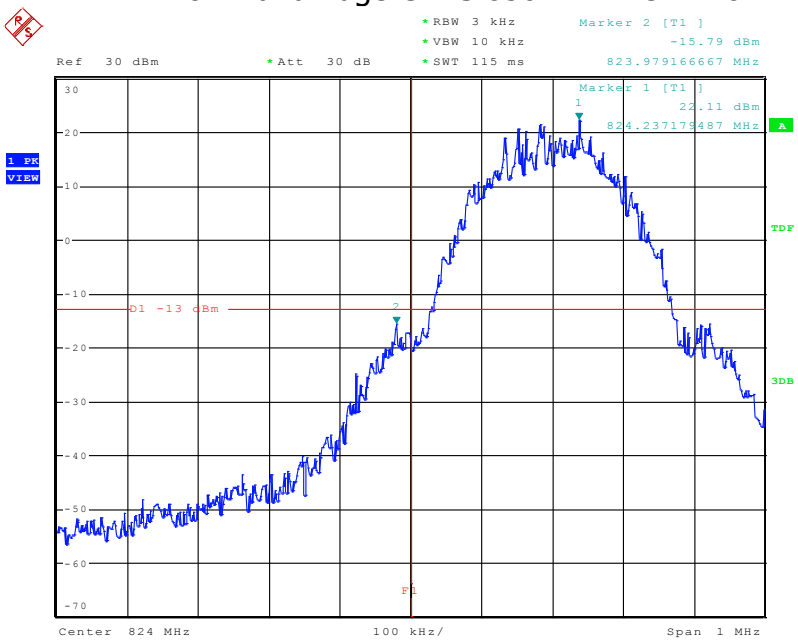
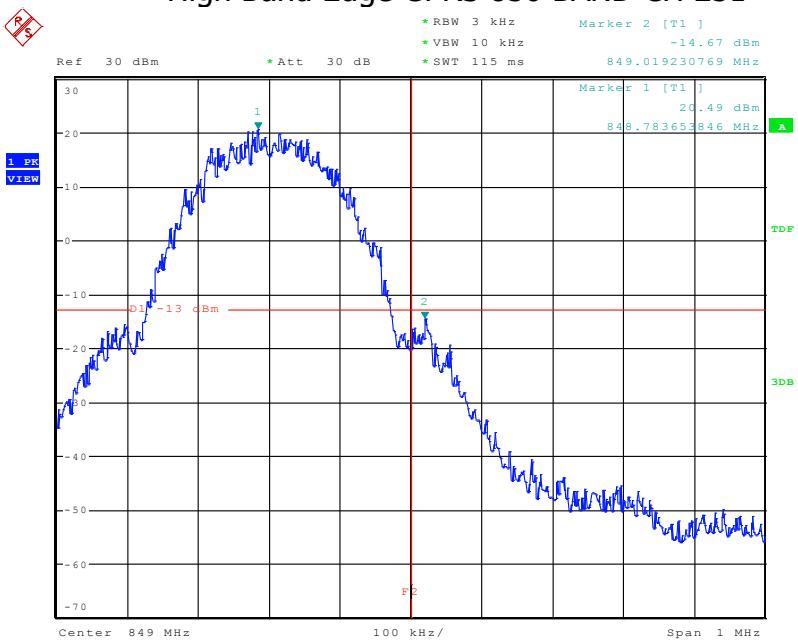
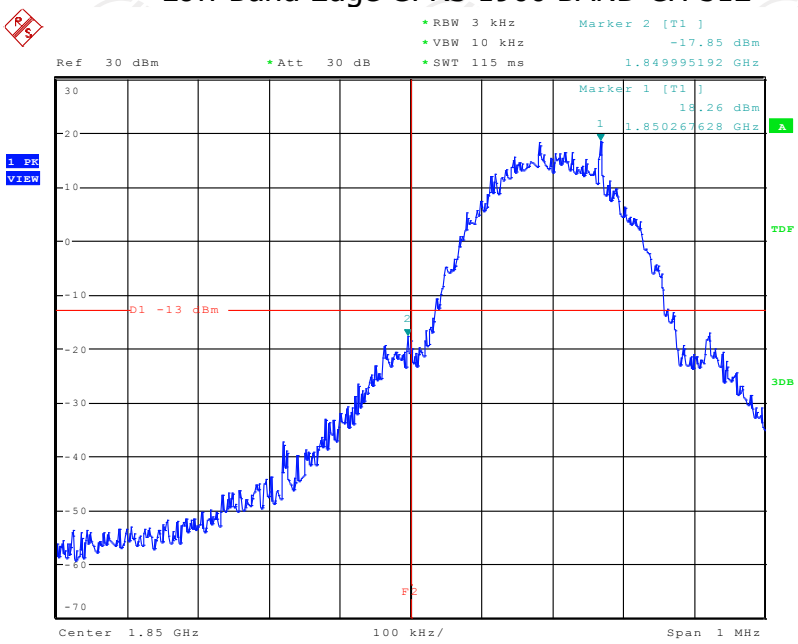
Low Band Edge GPRS 850 BAND CH 128



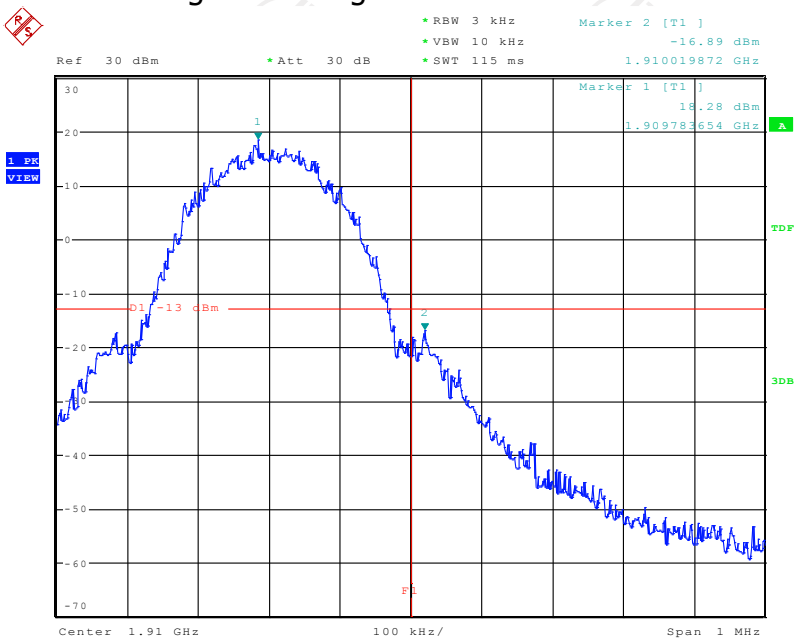
High Band Edge GPRS 850 BAND CH 251



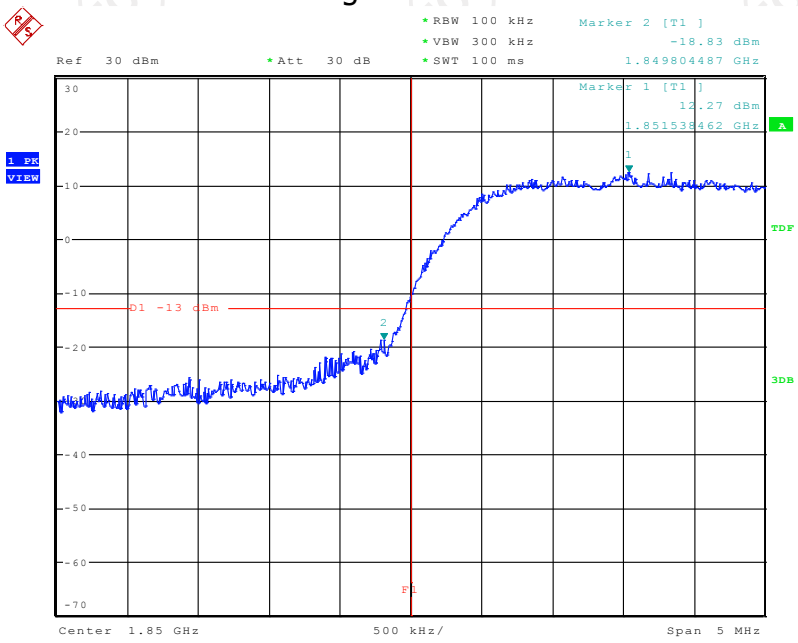
Low Band Edge GPRS 1900 BAND CH 512



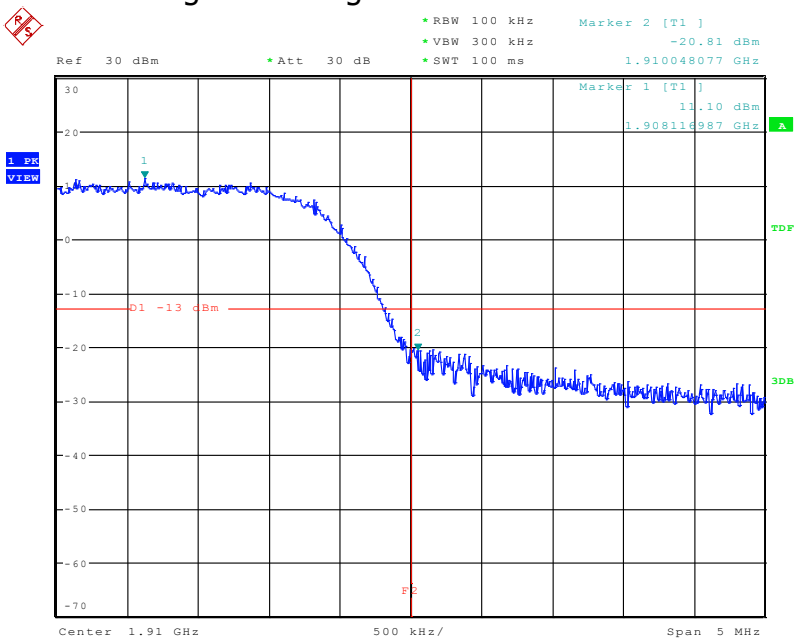
High Band Edge GPRS 1900 BAND CH 810



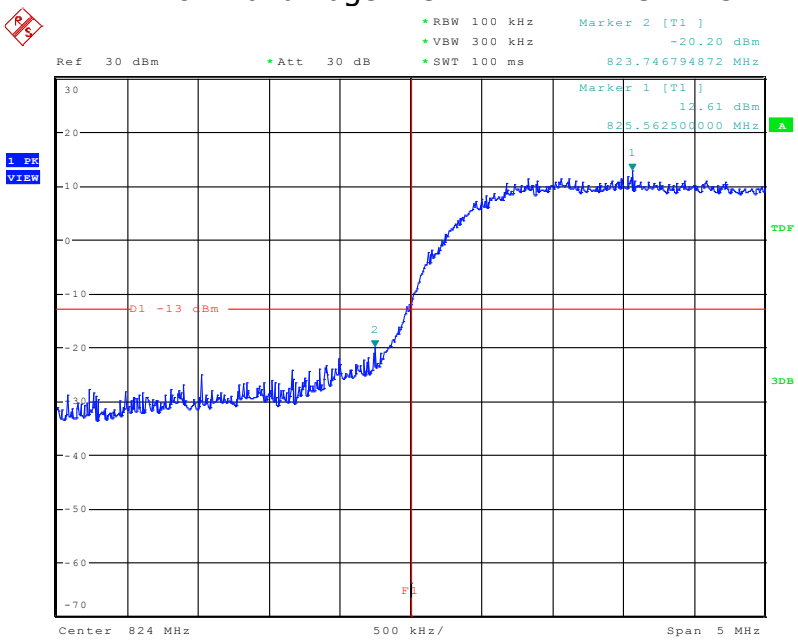
Low Band Edge WCDMA BAND II CH 9263



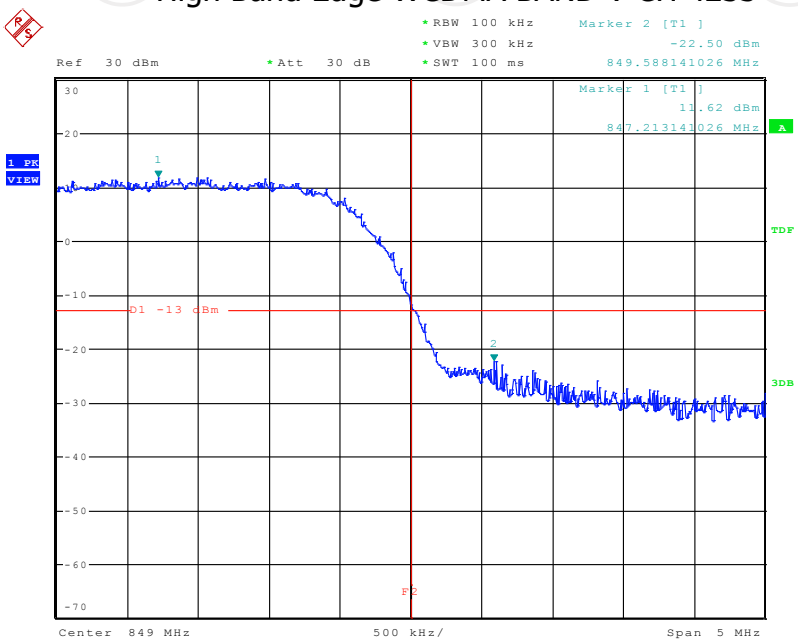
High Band Edge WCDMA BAND II CH 9537



Low Band Edge WCDMA BAND V CH 4132

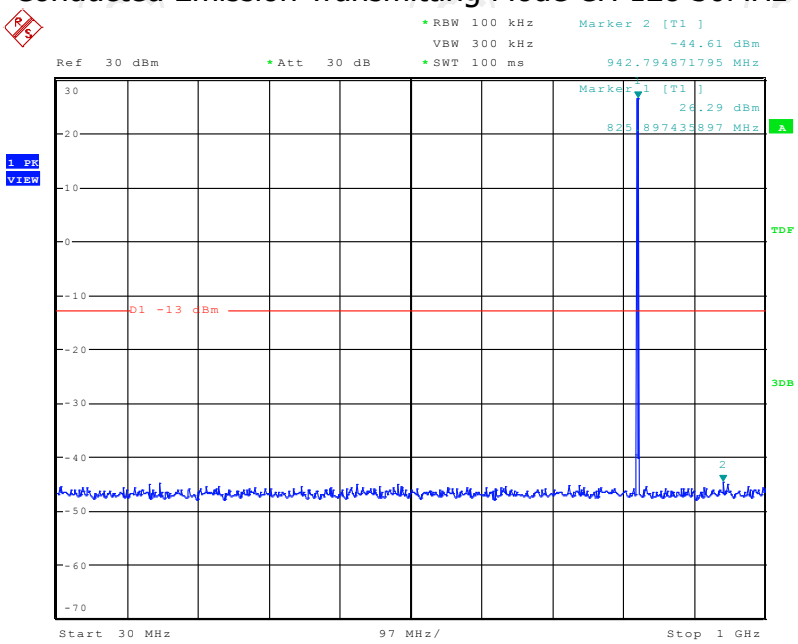


High Band Edge WCDMA BAND V CH 4233

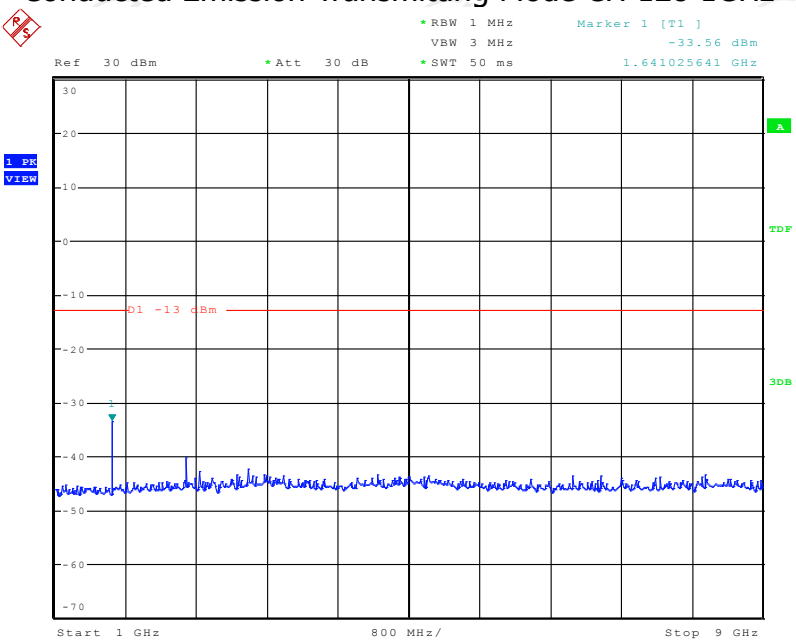


CONDUCTED EMISSION IN GPRS 850 BAND

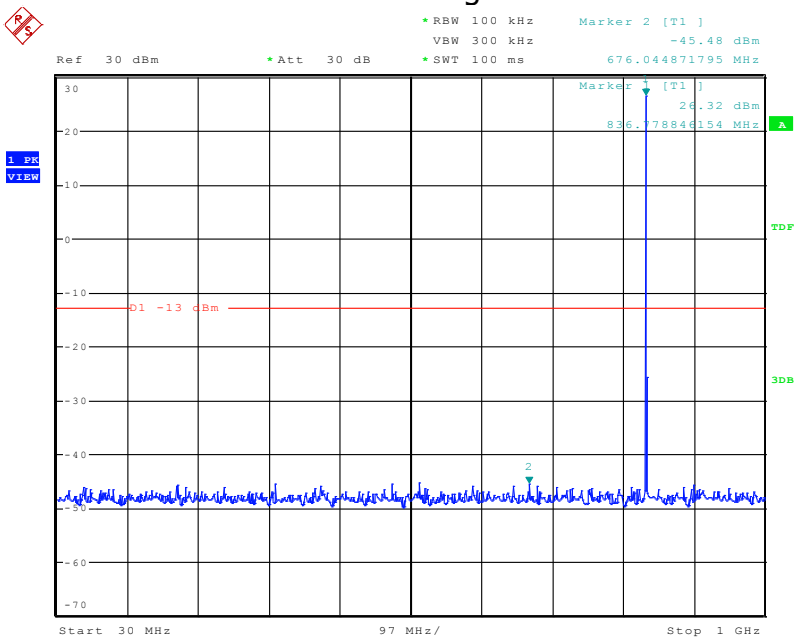
Conducted Emission Transmitting Mode CH 128 30MHz – 1GHz



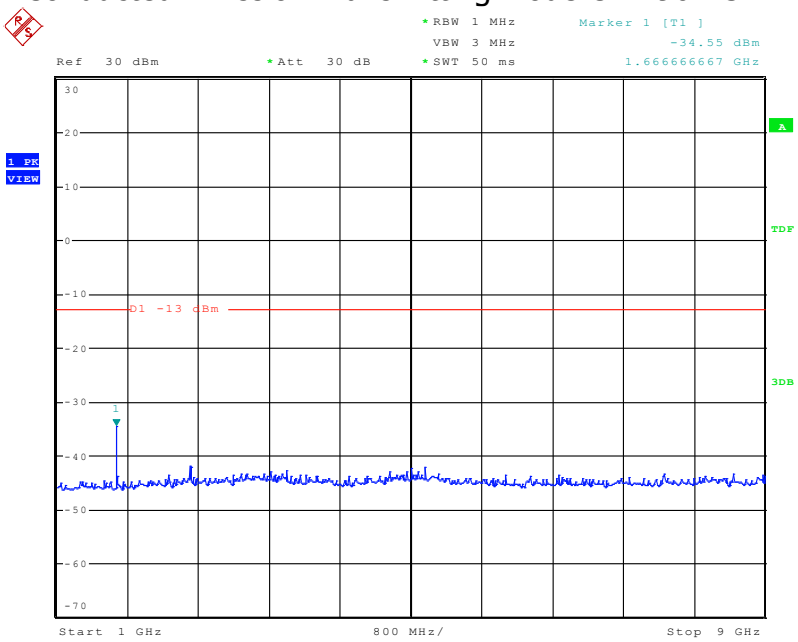
Conducted Emission Transmitting Mode CH 128 1GHz – 9GHz



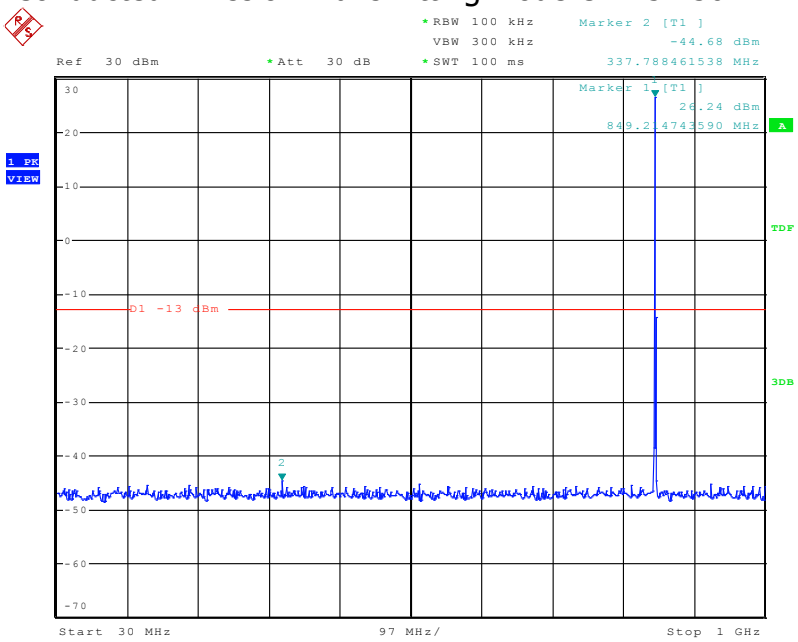
Conducted Emission Transmitting Mode CH 190 30MHz – 1GHz



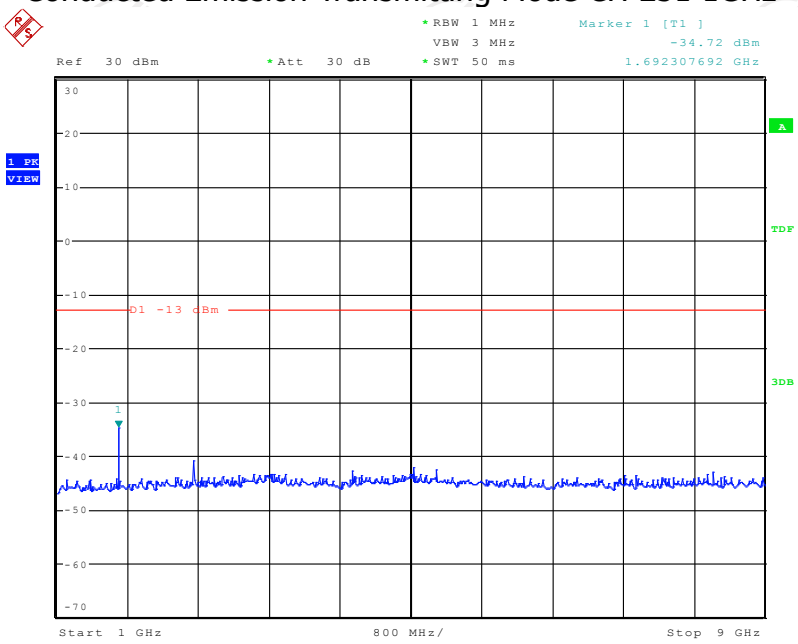
Conducted Emission Transmitting Mode CH 190 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 1GHz

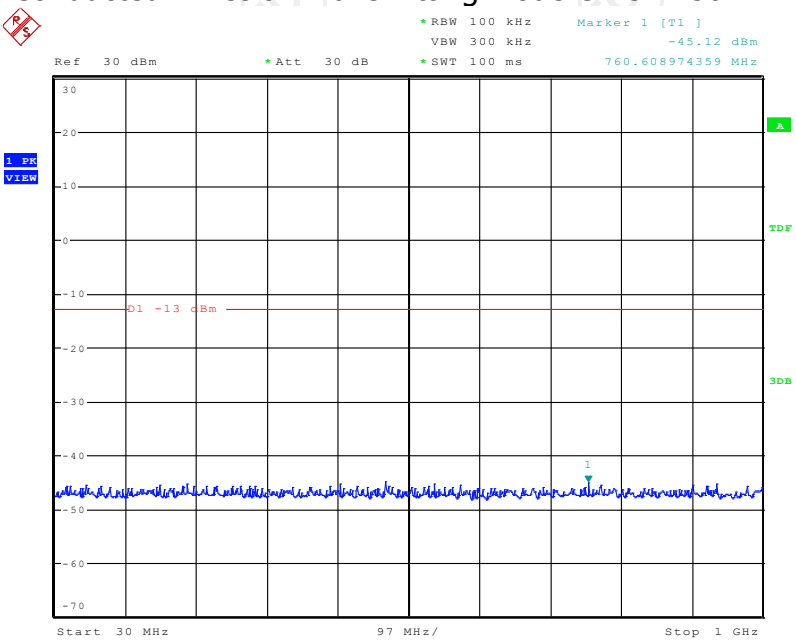


Conducted Emission Transmitting Mode CH 251 1GHz – 9GHz

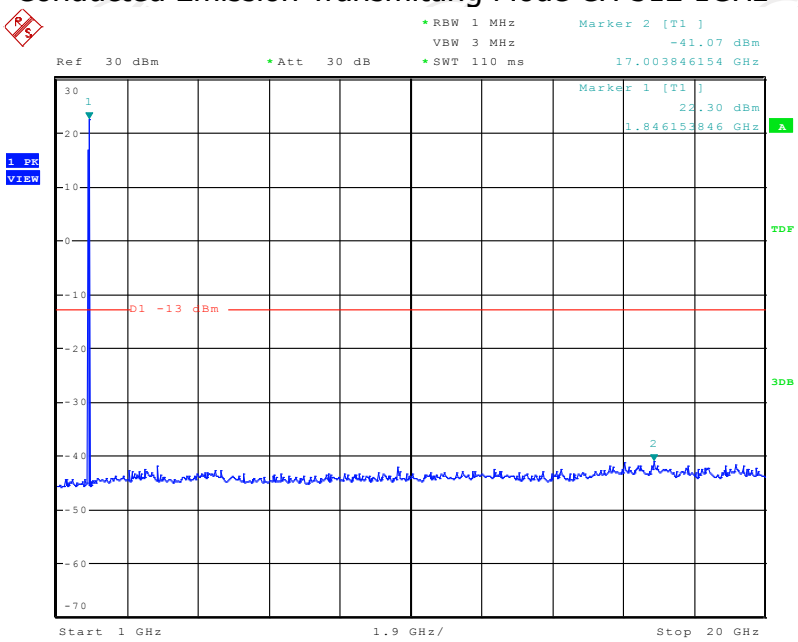


CONDUCTED EMISSION IN PCS1900 BAND

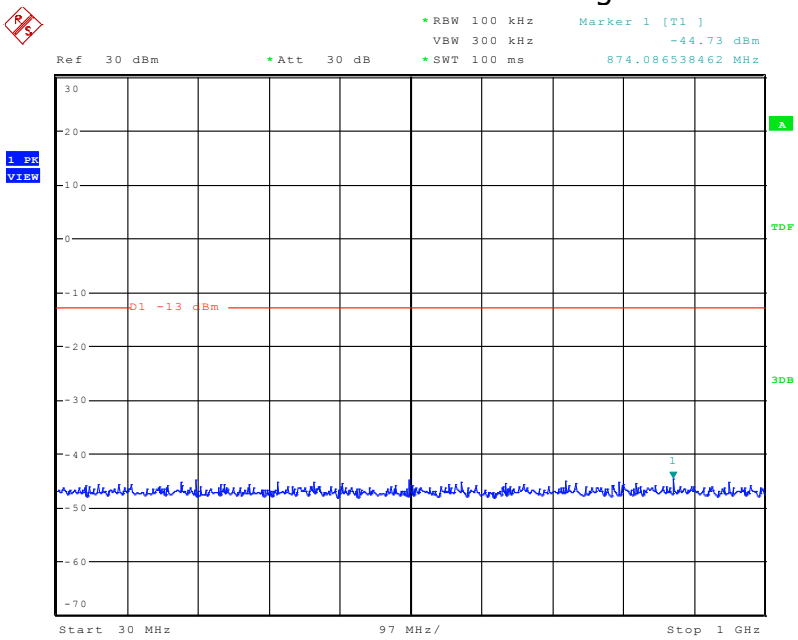
Conducted Emission Transmitting Mode CH 512 30MHz – 1GHz



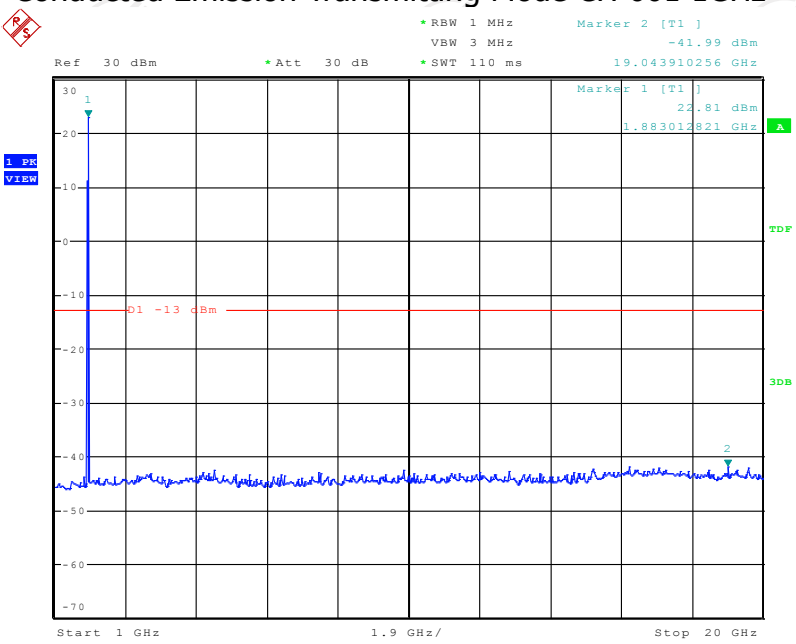
Conducted Emission Transmitting Mode CH 512 1GHz – 20GHz



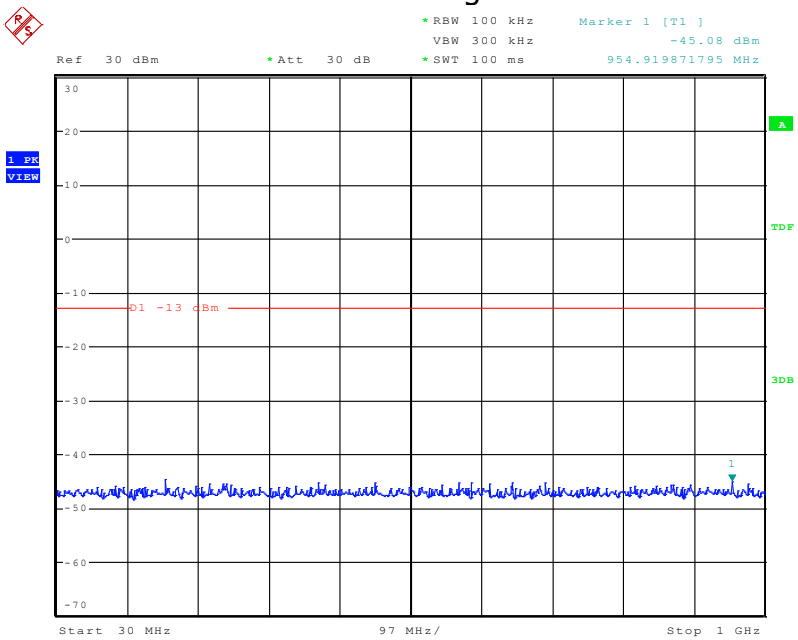
Conducted Emission Transmitting Mode CH 661 30MHz – 1GHz



Conducted Emission Transmitting Mode CH 661 1GHz – 20GHz



Conducted Emission Transmitting Mode CH 810 30MHz – 1GHz



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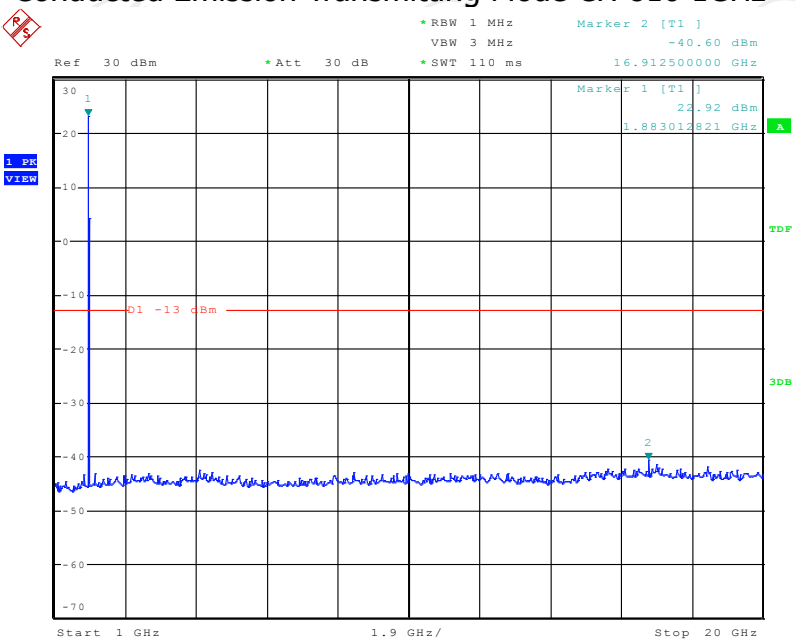
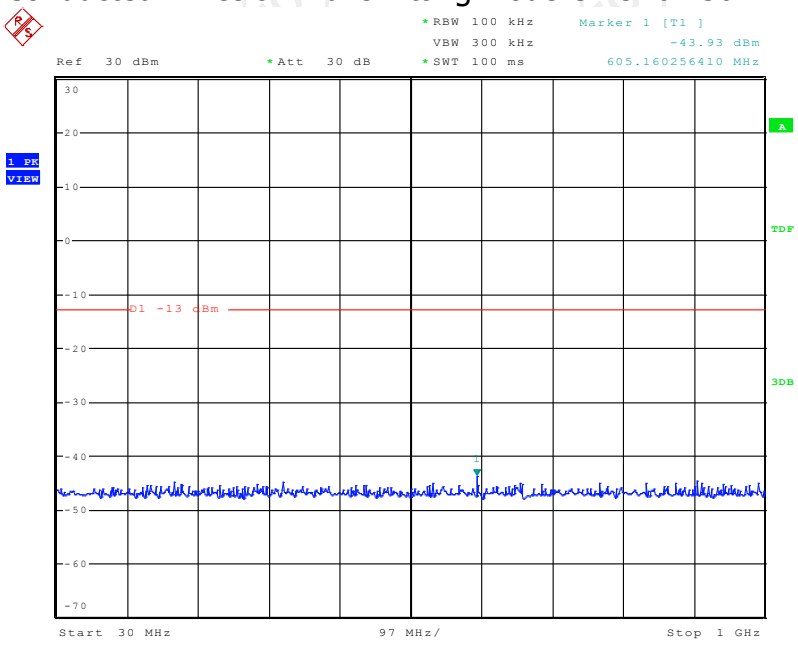
Conducted Emission Transmitting Mode CH 810 1GHz – 20GHz

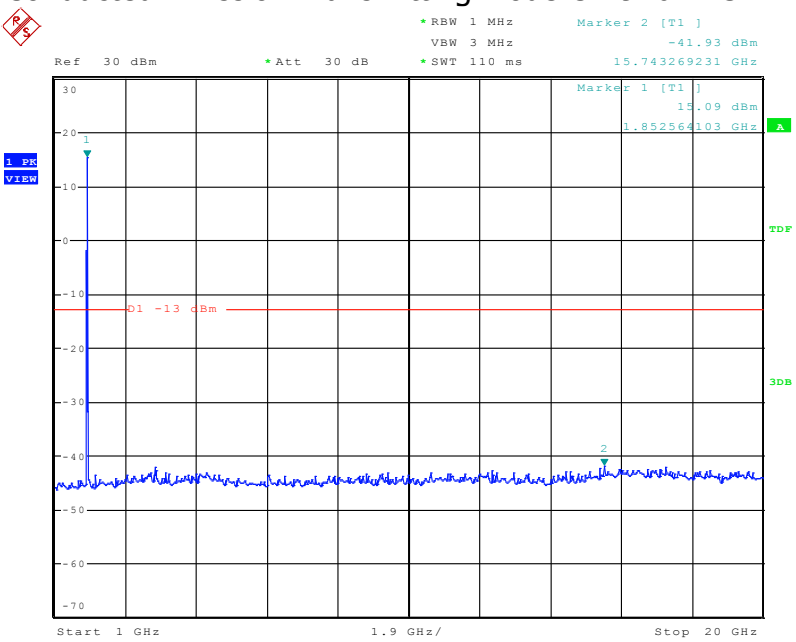


CONDUCTED EMISSION IN WCDMA Band II

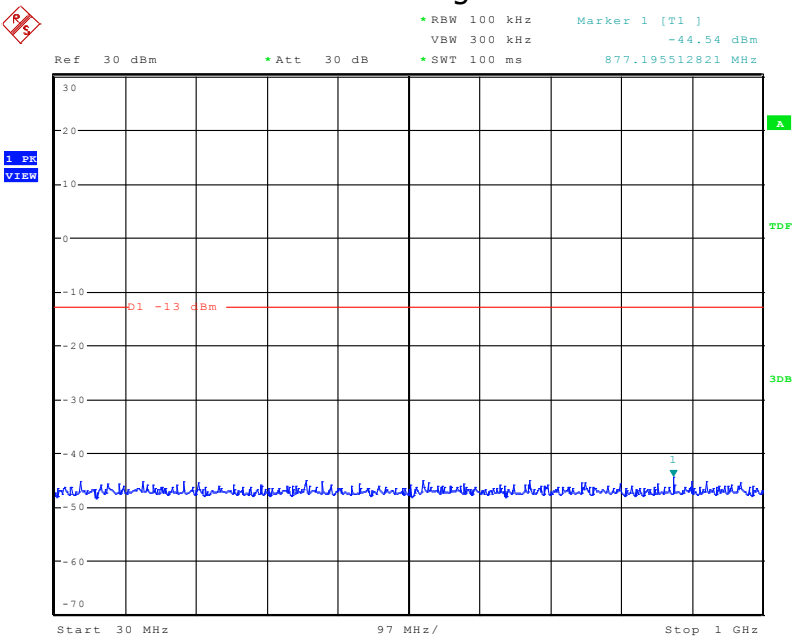
Conducted Emission Transmitting Mode CH 9262 30MHz – 1GHz



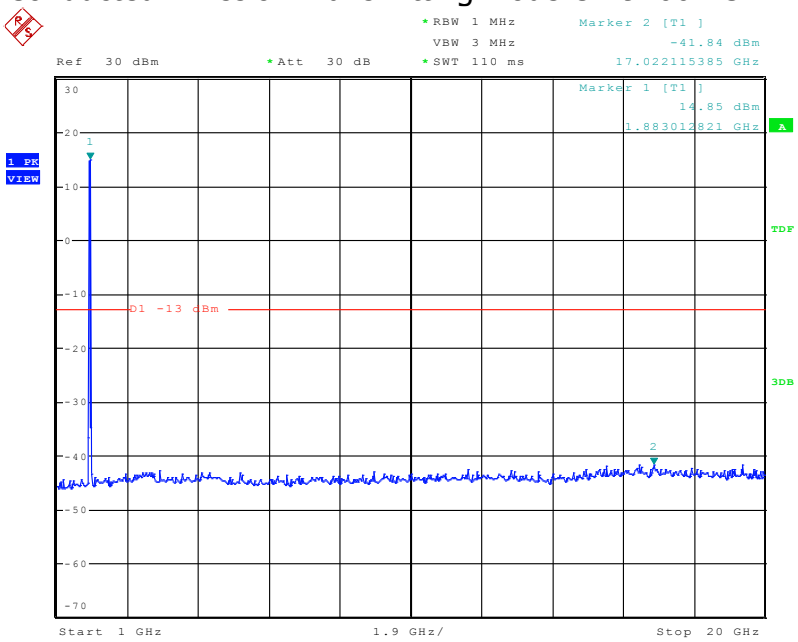
Conducted Emission Transmitting Mode CH 9262 1GHz – 20GHz



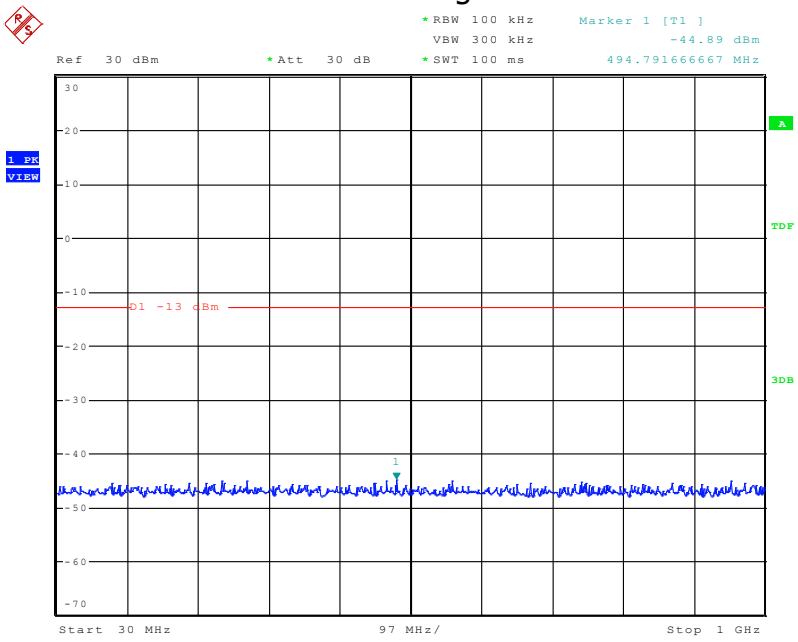
Conducted Emission Transmitting Mode CH 9400 30MHz – 1GHz



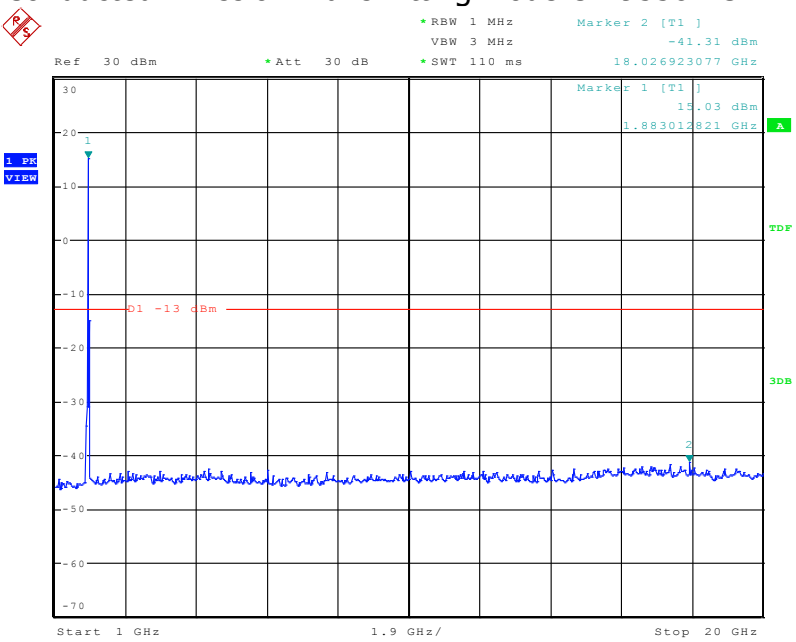
Conducted Emission Transmitting Mode CH 9400 1GHz – 20GHz



Conducted Emission Transmitting Mode CH 9538 30MHz – 1GHz

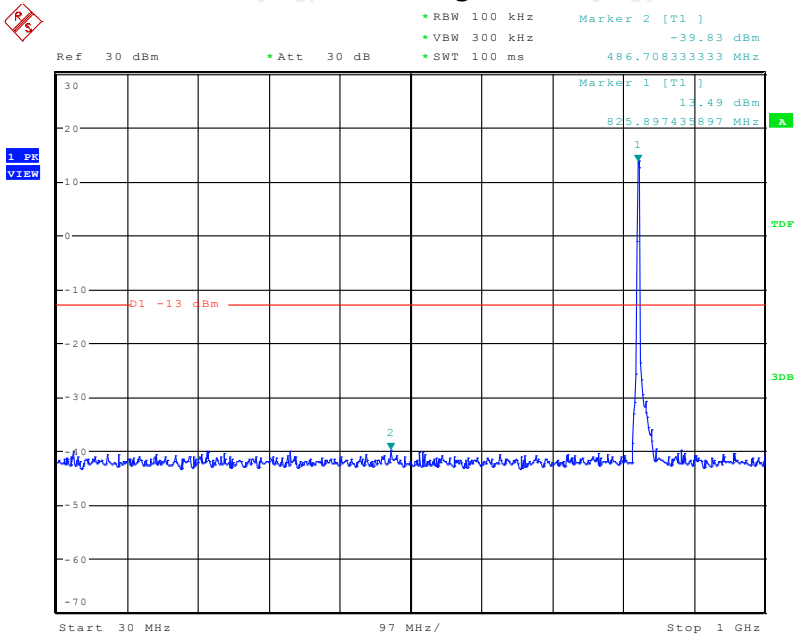


Conducted Emission Transmitting Mode CH 9538 1GHz – 20GHz

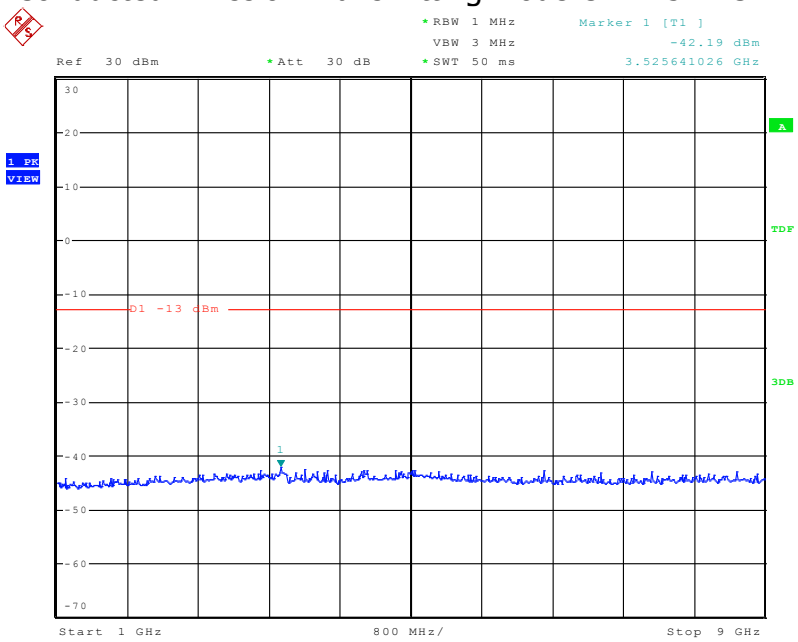


CONDUCTED EMISSION IN WCDMA Band V

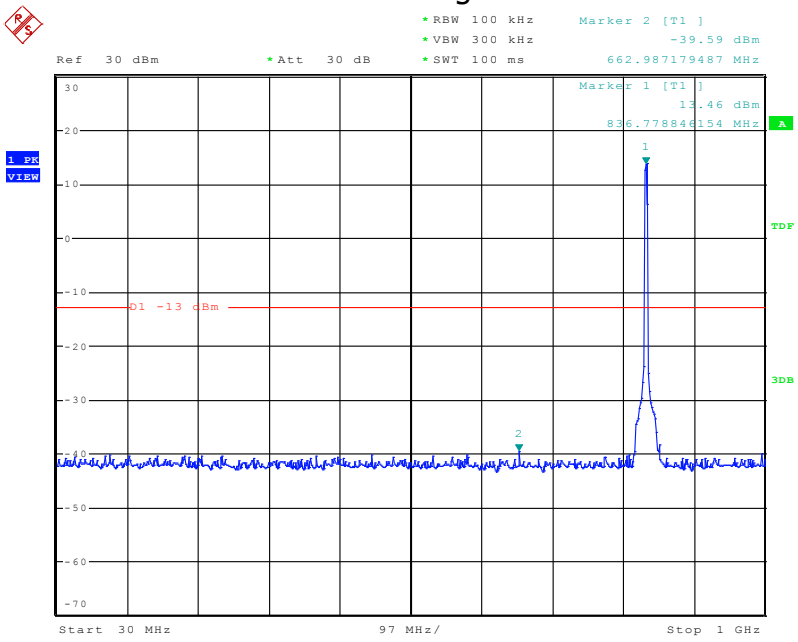
Conducted Emission Transmitting Mode CH 4132 30MHz – 1GHz



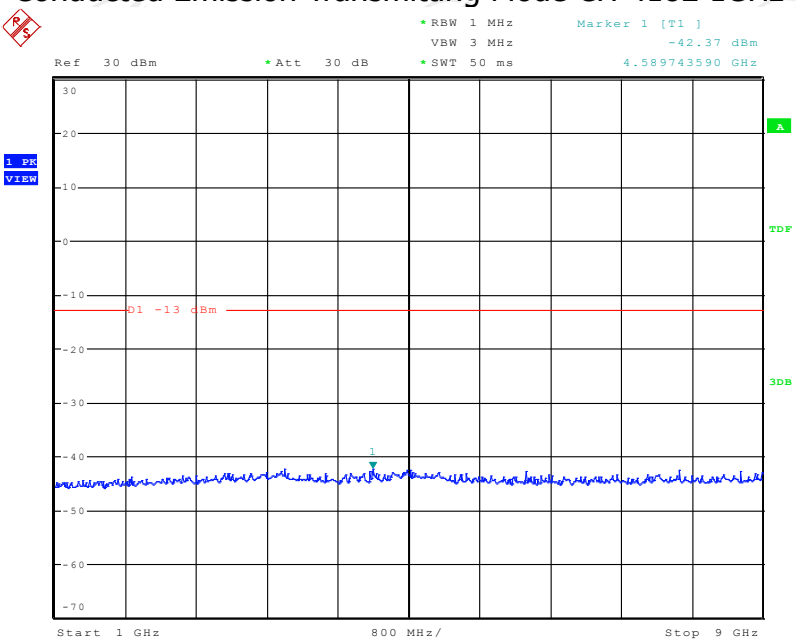
Conducted Emission Transmitting Mode CH 4132 1GHz – 9GHz



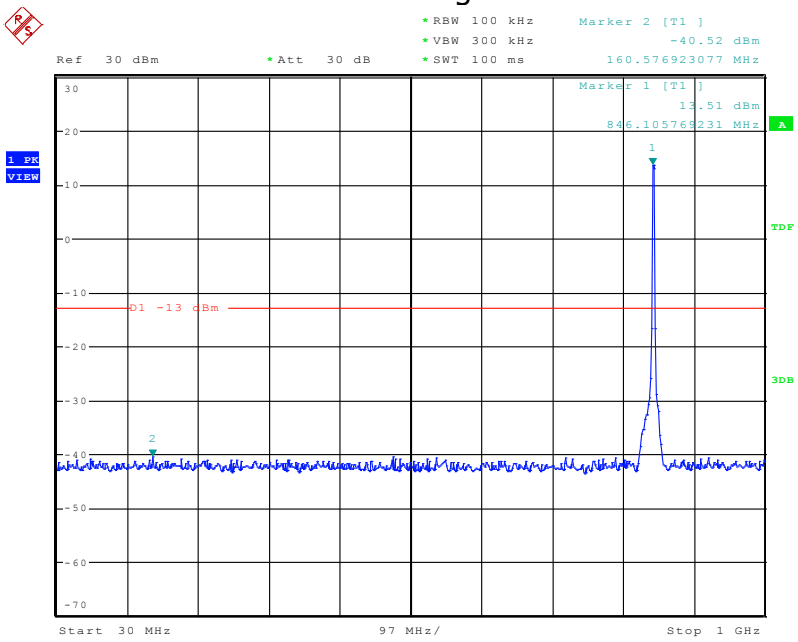
Conducted Emission Transmitting Mode CH 4182 30MHz – 1GHz



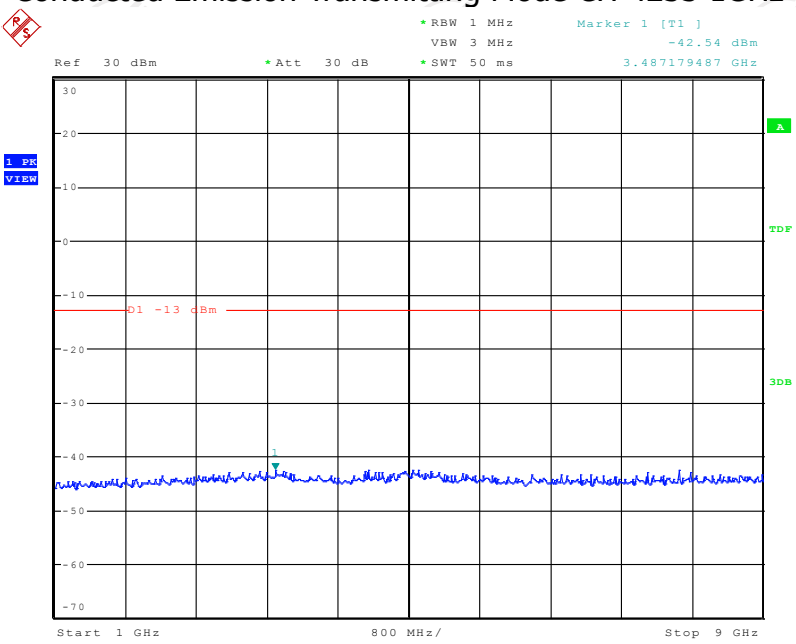
Conducted Emission Transmitting Mode CH 4182 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 4233 30MHz – 1GHz



Conducted Emission Transmitting Mode CH 4233 1GHz – 9GHz



A.4 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

Radiated Power (ERP) for GPRS 850 MHZ

Mode	Frequency (MHz)	P_{Mea} (dBm)	Amplifier Gain (dBi)	Path Loss	Antenna Gain	Correction (dB)	ERP (dBm)	Polarization
GPRS 850	824.2	8.10	31.23	1.02	-3.2	2.15	32.96	H
	836.6	8.03	31.23	1.02	-3.2	2.15	32.89	H
	848.8	8.11	31.23	1.02	-3.2	2.15	32.97	H

Radiated Power (E.I.R.P) for PCS 1900 MHZ

Mode	Frequency (MHz)	P_{Mea} (dBm)	Amplifier Gain (dBi)	Path Loss (dB)	Antenna Gain (dB)	Correction (dB)	E.I.R.P. (dBm)	Polarization
GPRS 1900	1850.2	-0.10	31.23	1.02	-0.29	0.00	29.82	H
	1880.0	-0.03	31.23	1.02	-0.29	0.00	29.89	H
	1909.8	-0.06	31.23	1.02	-0.29	0.00	29.86	H

Radiated Power (E.I.R.P) for UTRA Band 2

Mode	Frequency (MHz)	P_{Mea} (dBm)	Amplifier Gain (dBi)	Path Loss	Antenna Gain	Correction (dB)	ERP (dBm)	Polarization
UTRA Band 2	1852.4	-10.33	31.23	1.02	2	0.00	21.88	H
	1880	-10.26	31.23	1.02	2	0.00	21.95	H
	1907.6	-10.24	31.23	1.02	2	0.00	21.97	H

Radiated Power (ERP) for UTRA Band 5

Mode	Frequency (MHz)	P_{Mea} (dBm)	Amplifier Gain (dBi)	Path Loss (dB)	Antenna Gain (dB)	Correction (dB)	E.I.R.P. (dBm)	Polarization
UTRA Band 5	826.4	-8.12	31.23	1.02	2	2.15	21.94	H
	836.4	-8.11	31.23	1.02	2	2.15	21.95	H
	846.6	-8.14	31.23	1.02	2	2.15	21.92	H

ERP or E.I.R.P = PMea + Amplifier Gain – Path Loss + Antenna Gain –Correction Factor
Note: Each channel is scanned 10 times, and the peak value of each channel is recorded.

A.5 Field Strength of Spurious Radiation Measurement

GPRS850:

Mode 1					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1648.4	-36.99	0.73	-37.72	-13	Horizontal
1648.4	-37.40	0.73	-38.13	-13	Vertical
2472.6	-30.13	0.73	-30.86	-13	Horizontal
2472.6	-29.43	0.73	-30.16	-13	Vertical

Mode 2					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1673.2	-30.81	0.73	-31.54	-13	Horizontal
1673.2	-35.01	0.73	-35.74	-13	Vertical
2509.8	-35.52	0.73	-36.25	-13	Horizontal
2509.8	-32.60	0.73	-33.33	-13	Vertical

Mode 3					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1697.6	-29.42	0.73	-30.15	-13	Horizontal
1697.6	-32.84	0.73	-33.57	-13	Vertical
2546.4	-36.30	0.73	-37.03	-13	Horizontal
2546.4	-36.01	0.73	-36.74	-13	Vertical

PCS1900:

Mode 1					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3700.4	-31.16	-2.81	-28.35	-13	Horizontal
3700.4	-33.14	-2.81	-30.33	-13	Vertical
5550.6	-29.45	-2.81	-26.64	-13	Horizontal
5550.6	-37.48	-2.81	-34.67	-13	Vertical

Mode 2					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3760	-35.14	-2.81	-32.33	-13	Horizontal
3760	-37.62	-2.81	-34.81	-13	Vertical
5640	-32.61	-2.81	-29.80	-13	Horizontal
5640	-34.04	-2.81	-31.23	-13	Vertical

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Mode 3					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3819.6	-29.14	-2.81	-26.33	-13	Horizontal
3819.6	-30.36	-2.81	-27.55	-13	Vertical
5729.4	-30.73	-2.81	-27.92	-13	Horizontal
5729.4	-30.49	-2.81	-27.68	-13	Vertical

UTRA BANDS
BAND 2:

Mode 1					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3704.8	-63.03	3.02	-60.01	-13	Horizontal
3704.8	-62.65	3.02	-59.63	-13	Vertical
5557.2	-63.96	3.02	-60.94	-13	Horizontal
5557.2	-65.48	3.02	-62.46	-13	Vertical

Mode 2					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3760	-63.09	3.02	-60.07	-13	Horizontal
3760	-63.12	3.02	-60.10	-13	Vertical
5640	-64.35	3.02	-61.33	-13	Horizontal
5640	-64.77	3.02	-61.75	-13	Vertical

Mode 3					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3815.2	-63.01	3.02	-59.99	-13	Horizontal
3815.2	-62.77	3.02	-59.75	-13	Vertical
5722.8	-64.22	3.02	-61.20	-13	Horizontal
5722.8	-64.52	3.02	-61.50	-13	Vertical

BAND 5:

Mode 1					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1652.8	-62.57	3.02	-59.55	-13	Horizontal
1652.8	-63.43	3.02	-60.41	-13	Vertical
2479.2	-63.78	3.02	-60.76	-13	Horizontal
2479.2	-64.99	3.02	-61.97	-13	Vertical

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Mode 2					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1673.2	-62.25	3.02	-59.23	-13	Horizontal
1673.2	-63.22	3.02	-60.20	-13	Vertical
2509.8	-64.45	3.02	-61.43	-13	Horizontal
2509.8	-65.12	3.02	-62.10	-13	Vertical

Mode 3					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1693.2	-62.83	3.02	-59.81	-13	Horizontal
1693.2	-62.97	3.02	-59.95	-13	Vertical
2539.8	-63.86	3.02	-60.84	-13	Horizontal
2539.8	-64.57	3.02	-61.55	-13	Vertical

Note: Below 30MHZ no Spurious found.

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A.6 Frequency Stability Measurement

Frequency Error against Voltage for GPRS 850 band (Mid channel)

Voltage(V)	Frequency error(Hz)	Frequency error (ppm)
3.45	37	0.044
3.7	35	0.042
4.2	34	0.041

Frequency Error against Temperature for GPRS 850 band (Mid channel)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	33	0.039
0	30	0.036
10	38	0.045
20	31	0.037
30	35	0.042
40	36	0.042
50	34	0.041

Frequency Error against Voltage for GPRS 1900 band (Mid channel)

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.45	33	0.018
3.7	36	0.019
4.2	34	0.018

Frequency Error against Temperature for GPRS 1900 band (Mid channel)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	31	0.016
0	34	0.018
10	35	0.019
20	36	0.019
30	34	0.018
40	32	0.017
50	31	0.017

UTRA BANDS

Frequency Error against Voltage for WCDMA BAND 2 (Mid channel)

Voltage(V)	Frequency error(Hz)	Frequency error (ppm)
3.45	29	0.015
3.7	36	0.019
4.2	34	0.018

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Frequency Error against Temperature for WCDMA BAND 2 (Mid channel)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	40	0.021
0	32	0.017
10	35	0.019
20	38	0.020
30	41	0.022
40	38	0.020
50	39	0.021

Frequency Error against Voltage for WCDMA BAND 5 (Mid channel)

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.45	37	0.044
3.7	41	0.049
4.2	28	0.034

Frequency Error against Temperature for WCDMA BAND 5 (Mid channel)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	40	0.047
0	29	0.035
10	35	0.041
20	37	0.045
30	29	0.035
40	30	0.036
50	37	0.044

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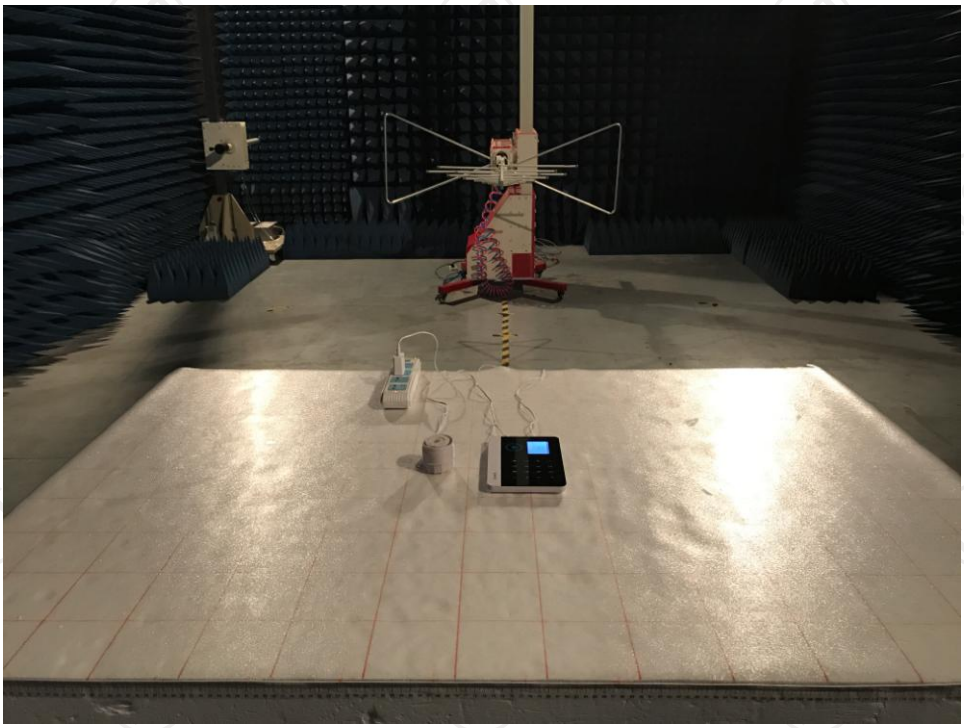
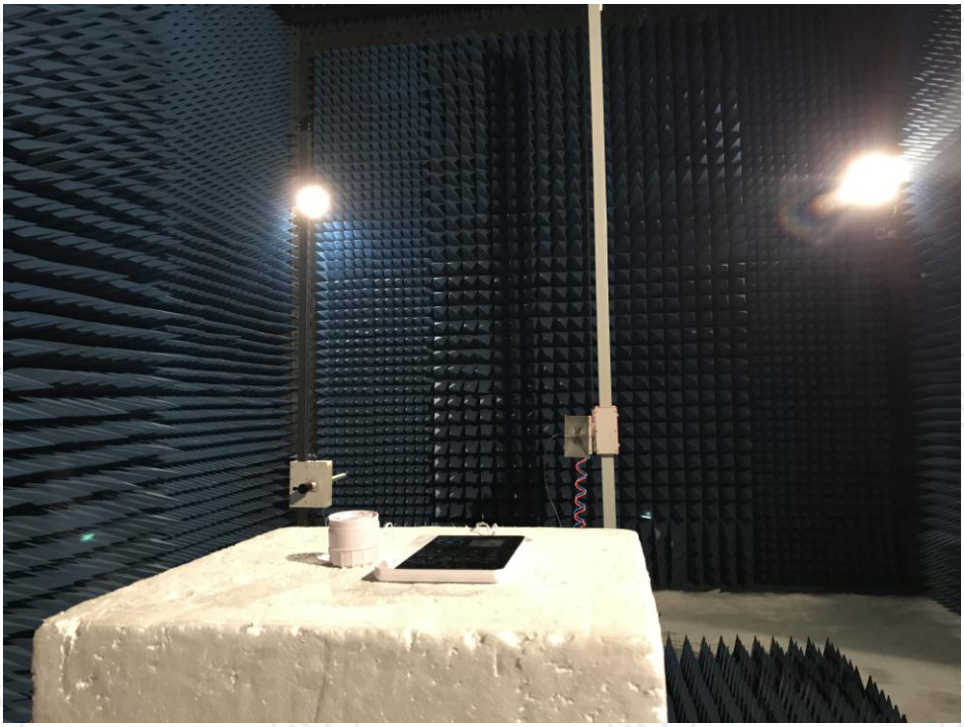
Appendix B: Photographs of Test Setup

Radiated Emission





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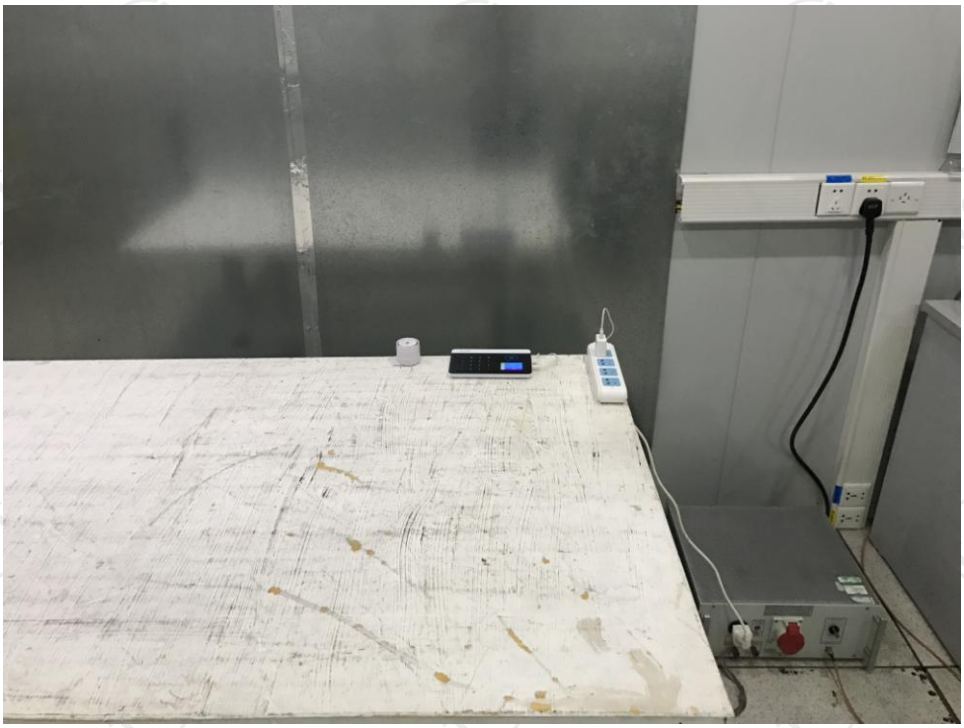
RF TEST



Appendix C: Photographs of EUT

Refer to test report TCT171023E035

*****END OF REPORT*****

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