



Shenzhen General Testing & Inspection Technology Co.,Ltd.

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TEST REPORT

Report No.: **GTI20181564F-4**

FCC ID.....: **2AC88-ELTP18A04**

IC: **24230-ELTP18A04**

Address.....: Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, Hong Kong, China

Manufacturer.....: HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED

Address.....: Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, Hong Kong, China

Product Name.....: **Smart Phone**

Trade Mark.....: GlocalMe

Model/Type reference.....: ELTP18A04

Listed Model(s): N/A

Standard.....: **FCC CFR Title 47 Part 2, Part 22 Subpart H, Part 24 Subpart E
FCC CFR Title 47 Part 27 Subpart L
RSS-Gen, RSS-132 issue 3, RSS-133 issue 6**

Date of receipt of test sample....: 2018-07-25

Date of testing.....: 2018-07-26 to 2018-08-10

Date of issue.....: 2018-08-11

Result.....: **PASS**

Compiled by:
(Printed name+signature) Terry Su

Supervised by:
(Printed name+signature) Cary Luo

Approved by:
(Printed name+signature) Walter Chen

Testing Laboratory Name..... **Shenzhen General Testing & Inspection Technology Co.,Ltd.**

Address..... 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park,
Shenzhen, Guangdong, China

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1. SUMMARY

1.1. Test Standards

[FCC Rules Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[FCC Rules Part 22](#): PRIVATE LAND MOBILE RADIO SERVICES.

[FCC Rules Part 24](#): PUBLIC MOBILE SERVICES

[FCC Rules Part 27](#): MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

[TIA/EIA 603 E March 2016](#): Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[ANSI C63.26: 2015](#): American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

[KDB 971168 D01 Power Meas License Digital Systems v03](#): MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

[RSS-Gen Issue 5](#): General Requirements for Compliance of Radio Apparatus.

[RSS-132 Issue 3](#): Cellular Telephone Systems Operating in the Bands 824-849MHz and 869-894MHz.

[RSS-133 Issue 6](#): 2 GHz Personal Communications Services.

1.2. Report version

Revised No.	Date of issue	Description
01	2018-08-11	Original

1.3. Test Description

Test Item	Section in CFR 47	RSS Rule	Result	Test Engineer
Conducted Output Power	Part 2.1046 Part 22.913(a) Part 24.232(c) Part 27.50	RSS-132(5.4) RSS-133(6.4)	Pass	Young He
Peak-to-Average Ratio	Part 24.232 Part 27.50	RSS-132(5.4) RSS-133(6.4)	Pass	Young He
99% Occupied Bandwidth & 26 dB Bandwidth	Part 2.1049 Part 22.917(b) Part 24.238(b) Part 27.53	RSS-GEN(6.6) RSS-133(6.5)	Pass	Young He
Band Edge	Part 2.1051 Part 22.917 Part 24.238 Part 27.53	RSS-132(5.5) RSS-133(6.5)	Pass	Young He
Conducted Spurious Emissions	Part 2.1051 Part 22.917 Part 24.238 Part 27.53	RSS-132(5.5) RSS-133(6.5)	Pass	Young He
Frequency stability vs temperature	Part 2.1055(a)(1)(b) Part 22.355 Part 24.235 Part 27.54	RSS-GEN(6.11) RSS-132(5.3)	Pass	Young He
Frequency stability vs voltage	Part 2.1055(d)(1)(2) Part 22.355 Part 24.235 Part 27.54	RSS-GEN(6.11) RSS-132(5.3)	Pass	Young He
ERP and EIRP	Part 22.913(a) Part 24.232(b) Part 27.50	RSS-132(5.4) RSS-133(6.4)	Pass	Young He
Radiated Spurious Emissions	Part 2.1053 Part 22.917 Part 24.238 Part 27.53	RSS-132(5.5) RSS-133(6.5)	Pass	Young He
Receiver Spurious Emissions	/	RSS-GEN(7.1.3)	Pass	Young He

Note: The measurement uncertainty is not included in the test result.

1.4. Test Facility

1.3.1 Address of the test laboratory

Shenzhen General Testing & Inspection Technology Co., Ltd.

Add: 1F, 2 Block, Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong, China

1.3.2 Laboratory accreditation

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

IC Registration No.: 9783A

The 3m alternate test site of Shenzhen GTI Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Aug, 2011.

FCC-Registration No.:214666

Shenzhen GTI Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 214666, Sep 19, 2011

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements and is documented in the Shenzhen General Testing & Inspection Technology Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for General Testing & Inspection laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Frequency stability	25 Hz	(1)
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-12.75 GHz	1.60 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emission 1~18GHz	5.16 dB	(1)
Radiated Emission 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	-----	(1)
Emission Mask	-----	(1)
Modulation Characteristic	-----	(1)
Transmitter Frequency Behavior	-----	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED
Address:	Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, Hong Kong, China
Manufacturer:	HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED
Address:	Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, Hong Kong, China
Factory:	Shenzhen uCloudlink Network Technology Co., Ltd.
Address:	3rd Floor, A part of Building 1, Shenzhen Software Industry Base, Nanshan District Xuefu Road, 518057 Shenzhen City, Guangdong, China

2.2. General Description of EUT

Product Name:	Smart Phone
Model/Type reference:	ELTP18A04
Marketing Name:	GlocalMe
Listed Model(s):	/
Power supply:	3.85Vdc 3400mAh from Li-ion Battery
Adapter 1:	Model:HJ-0502000W2-US Input:100-240V 50/60Hz 0.3A Output:5V/2A
Adapter 2:	Model:PS10J050K2000UU Input:100-240V 50/60Hz 0.35A Output:5V/2A
Hardware version:	P3_MB_PCB_VA
Software version:	P3S18_TSV1.0.000.001.180720
GSM	
Operation Band:	GSM850: UL: 824MHz~848MHz, DL: 869MHz~894MHz PCS1900: UL: 1850MHz~1910, DL: 1930MHz~1990MHz
Supported Type:	GSM/GPRS/EGPRS
Modulation Type:	GMSK for GSM/GPRS, 8PSK for EGPRS
Antenna Type:	PIFA Antenna
Antenna Gain:	GSM 850: -2.51dBi PCS 1900: 0.47dBi
WCDMA	
Operation Band:	Band II: UL: 1852.4MHz~1907.6MHz, DL: 1932.6MHz~1987.4MHz Band IV: UL: 1712.4MHz~1752.6MHz, DL: 2112.6MHz~2152.4MHz Band V: UL: 826.4MHz~846.6MHz, DL: 871.6MHz~1891.4MHz
Modulation Type:	QPSK for WCDMA/HSUPA/HSDPA
Antenna Type:	PIFA Antenna
Antenna Gain:	WCDMA II: 0.47dBi WCDMA IV: 0.22dBi WCDMA V: -2.51dBi

Remark: The Test EUT support two SIM card(SIM1,SIM2),so all the tests are performed at each SIM card (SIM1,SIM2) mode, the datum recorded is the worst case for all the mode at SIM1 Card mode.

2.3. Description of Test Modes and Test Frequency

The EUT has been tested under typical operating condition. The CUM200 used to control the EUT staying in continuous transmitting and receiving mode for testing.

Test Frequency:

GSM 850		PCS 1900	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20
190	836.60	661	1880.00
251	848.80	810	1909.80

WCDMA Band II		WCDMA Band IV		WCDMA Band V	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
9262	1852.40	1312	1712.40	4132	826.40
9400	1880.00	1413	1732.60	4183	836.60
9538	1907.60	1513	1752.60	4233	846.60

2.4. Measurement Instruments List

Output Power (Radiated) & Radiated Spurious Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100967	Jan. 04, 2019
2	High pass filter	Compliance Direction systems	BSU-6	34202	Jan. 04, 2019
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Jan. 04, 2019
4	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4181	Jan. 04, 2019
5	Spectrum Analyzer	HP	8563E	02052	Jan. 04, 2019
6	Horn Antenna	Schwarzbeck	BBHA 9120D	648	Jan. 04, 2019
7	Horn Antenna	Schwarzbeck	BBHA 9120D	649	Jan. 04, 2019
8	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Jan. 04, 2019
9	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25842	Jan. 04, 2019
10	Pre-Amplifier	HP	8447D	1937A03050	Jan. 04, 2019
11	Pre-Amplifier	EMCI	EMC051835	980075	Jan. 04, 2019
12	Splitter	Mini-Circuit	ZAPD-4	400059	Jan. 04, 2019
13	Signal Generator	Agilent	N5182A	1019356	Jan. 04, 2019
14	UNIVERSAL RADIO COMMUNICATION	Rohde & Schwarz	CMU200	114694	Jan. 04, 2019
15	Antenna Mast	UC	UC3000	N/A	N/A
16	Antenna mast	MATURO	TAM-4.0-P	N/A	N/A
17	Turn Table	UC	UC3000	N/A	N/A
18	Cable Below 1GHz	Schwarzbeck	AK9515E	33155	Jan. 04, 2019
19	Cable Above 1GHz	Hubersuhner	SUCOFLEX102	DA1580	Jan. 04, 2019

Output Power(Conducted) & Occupied Bandwidth & Emission Bandwidth & Band Edge Compliance & Conducted Spurious Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	UNIVERSAL RADIO COMMUNICATION	Rohde & Schwarz	CMU200	114694	Jan. 04, 2019
2	Spectrum Analyzer	Rohde & Schwarz	FSU	100105	Jan. 04, 2019
3	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Jan. 07, 2017
4	Splitter	Mini-Circuit	ZAPD-4	400059	Jan. 04, 2019
5	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	Jan. 04, 2019
6	RF Connection Cable	Chengdu E-Microwave	---	---	Jan. 04, 2019
7	Attenuator	Chengdu E-Microwave	EMCAXX-10R NZ-3	---	Jan. 04, 2019

Frequency Stability					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	UNIVERSAL RADIO COMMUNICATION	Rohde & Schwarz	CMU200	114694	Jan. 04, 2019
2	Spectrum Analyzer	Rohde & Schwarz	FSU	100105	Jan. 04, 2019
3	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Jan. 07, 2017
4	Splitter	Mini-Circuit	ZAPD-4	400059	Jan. 04, 2019
5	Climate Chamber	ESPEC	EL-10KA	05107008	Jan. 04, 2019

- Note: 1. The Cal. Interval was one year.
 2. The cable loss has calculated in test result which connection between each test instruments.

3. TEST ITEM AND RESULTS

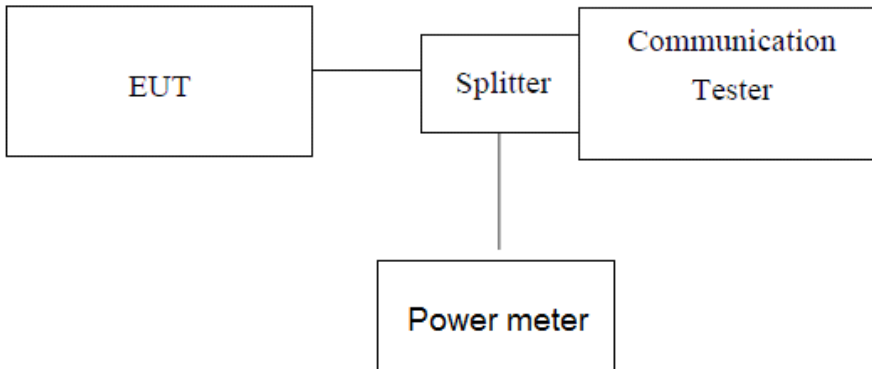
3.1. Conducted Output Power

LIMIT:

GSM850/WCDMA Band V: 7W

PCS1900/WCDMA Band II/WCDMA Band IV: 2W

TEST CONFIGURATION



Note: Measurement setup for testing on Antenna connector

TEST PROCEDURE

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum PK burst power and maximum Avg. burst power.

TEST RESULTS

GSM850		Conducted Power (dBm)		
		CH128	CH190	CH251
		824.20MHz	836.60MHz	848.80MHz
GSM		32.27	32.94	32.63
GPRS (GMSK)	1TXslot	31.23	31.19	31.43
	2TXslots	28.32	28.42	28.37
	3TXslots	27.28	27.02	27.42
	4TXslots	26.93	26.97	26.85
EGPRS (8PSK)	1TXslot	28.51	28.85	28.67
	2TXslots	27.82	27.94	27.91
	3TXslots	26.99	26.27	26.66
	4TXslots	25.60	25.47	25.75

GSM1900		Conducted Power (dBm)		
		CH512	CH661	CH810
		1850.2MHz	1880.0MHz	1909.8MHz
GSM		28.17	28.28	28.14
GPRS (GMSK)	1TXslot	28.10	28.29	28.13
	2TXslots	27.28	27.45	27.36
	3TXslots	25.35	25.41	25.21
	4TXslots	24.62	24.66	24.54
EGPRS (8PSK)	1TXslot	26.44	26.56	26.47
	2TXslots	25.30	25.38	25.33
	3TXslots	24.21	24.31	24.25
	4TXslots	23.06	23.14	23.11

WCDMA Band II		Conducted Power (dBm)		
		CH9262	CH9400	CH9538
		1852.40	1880.00	1907.60
AMR 12.2K		22.37	22.75	22.42
RMC 12.2K		22.41	22.98	22.52
HSDPA	Subtest-1	22.33	22.55	22.60
	Subtest-2	22.23	22.35	22.45
	Subtest-3	22.64	22.85	22.12
	Subtest-4	22.98	22.91	22.75
HSUPA	Subtest-1	22.96	22.57	22.94
	Subtest-2	22.66	22.87	22.63
	Subtest-3	22.01	22.30	22.01
	Subtest-4	22.52	22.61	22.43
	Subtest-5	22.35	22.51	22.25

WCDMA Band IV		Conducted Power (dBm)		
		CH1312	CH1413	CH1513
		1712.40	1732.60	1752.60
AMR 12.2K		23.12	23.05	23.11
RMC 12.2K		23.06	23.02	23.19
HSDPA	Subtest-1	23.26	23.35	22.82
	Subtest-2	23.25	23.17	22.98
	Subtest-3	22.73	22.64	22.84
	Subtest-4	22.54	22.58	22.78
HSUPA	Subtest-1	23.20	23.10	22.98
	Subtest-2	23.13	22.87	22.99
	Subtest-3	22.29	22.58	22.62
	Subtest-4	22.76	22.95	22.16
	Subtest-5	22.90	22.72	22.90

WCDMA Band V		Conducted Power (dBm)		
		CH4132	CH4183	CH4233
		826.40	836.60	846.60
AMR 12.2K		22.56	22.73	22.49
RMC 12.2K		22.77	22.89	22.69
HSDPA	Subtest-1	22.53	22.16	22.66
	Subtest-2	22.66	22.27	22.58
	Subtest-3	22.65	22.48	22.39
	Subtest-4	21.81	21.90	21.69
HSUPA	Subtest-1	21.54	21.83	21.59
	Subtest-2	22.26	22.32	22.43
	Subtest-3	22.53	22.35	22.28
	Subtest-4	22.05	22.16	21.96
	Subtest-5	21.87	21.95	21.75

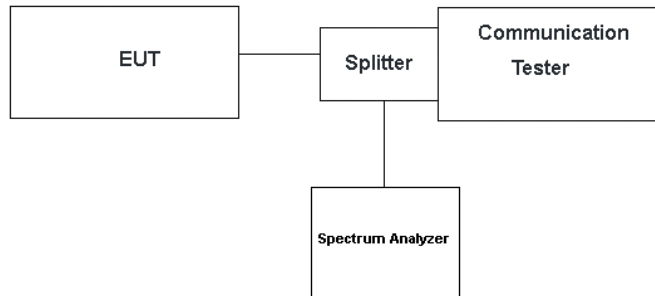
3.2. Peak-to-Average Ratio

LIMIT:

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13dB.

TEST CONFIGURATION

- For Peak-to-Average Ratio



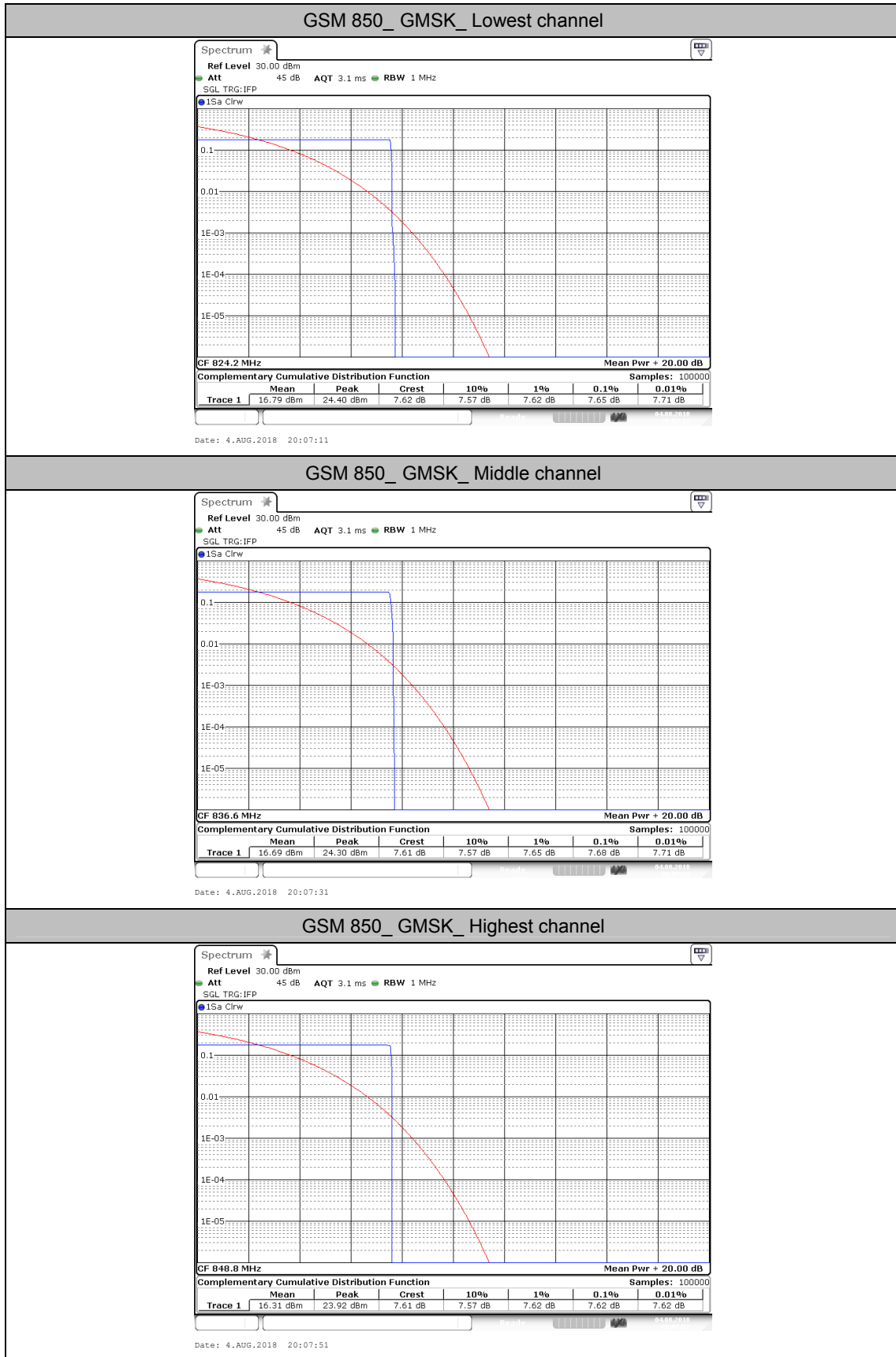
TEST PROCEDURE

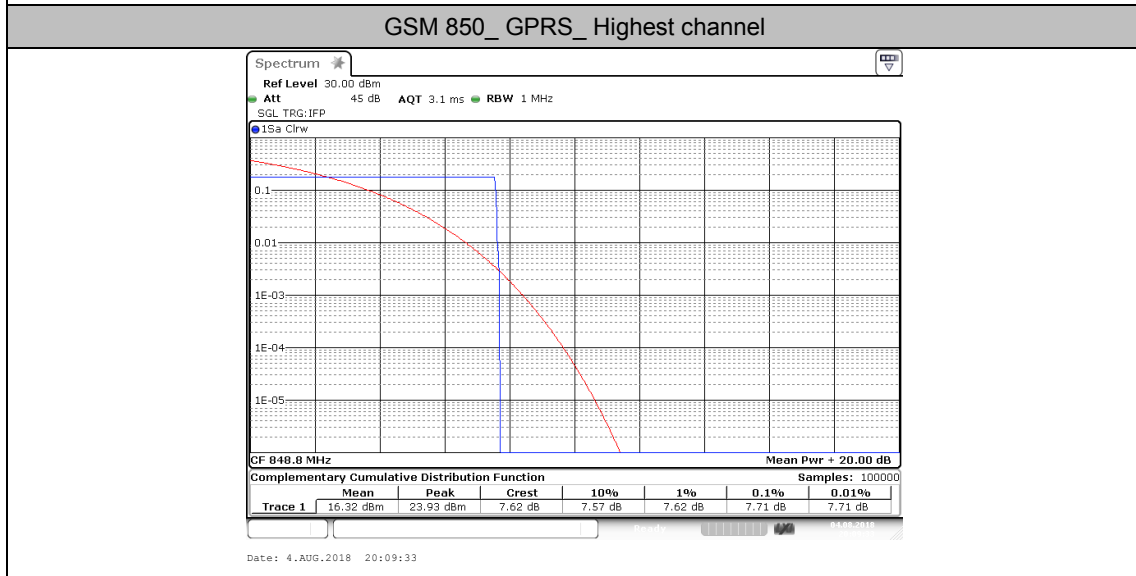
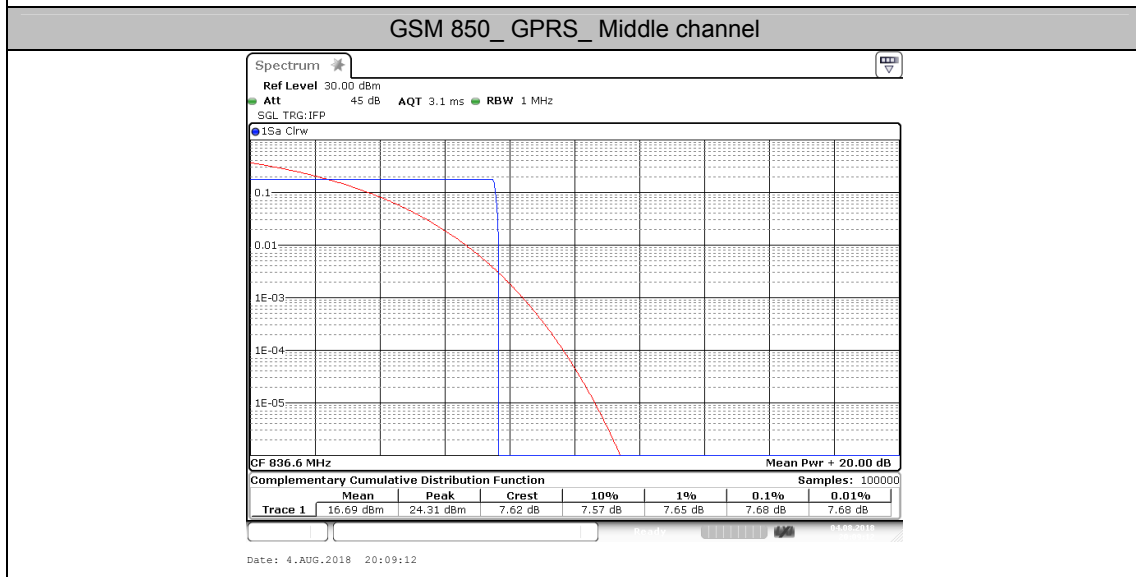
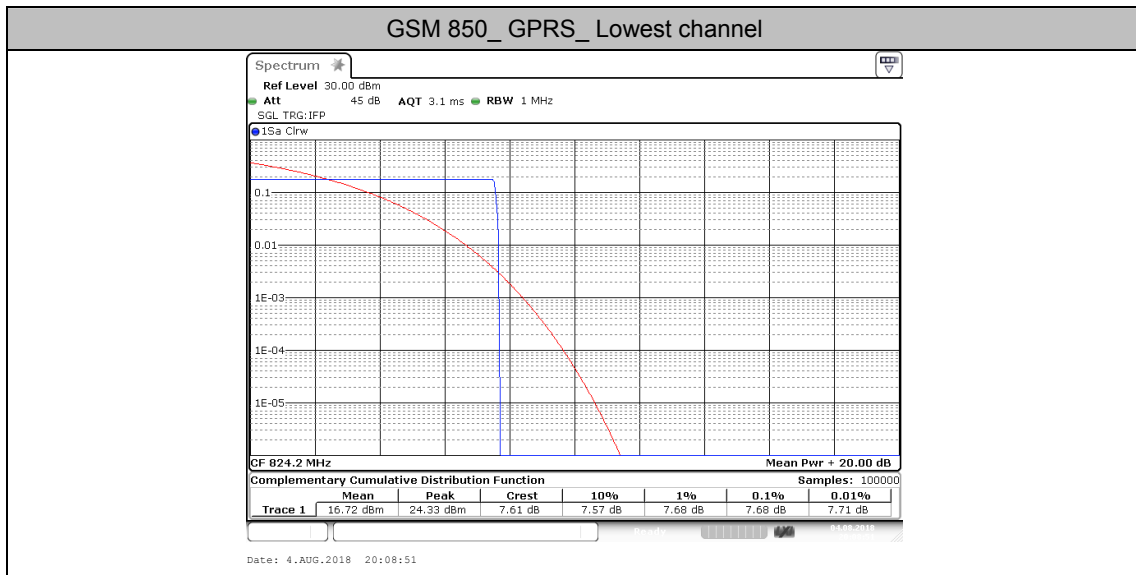
- For Peak-to-Average Ratio
 1. The testing follows FCC KDB 971168 v02r02 Section 5.7.1.
 2. The EUT was connected to spectrum and communication tester via a splitter
 3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
 6. Record the deviation as Peak to Average Ratio.

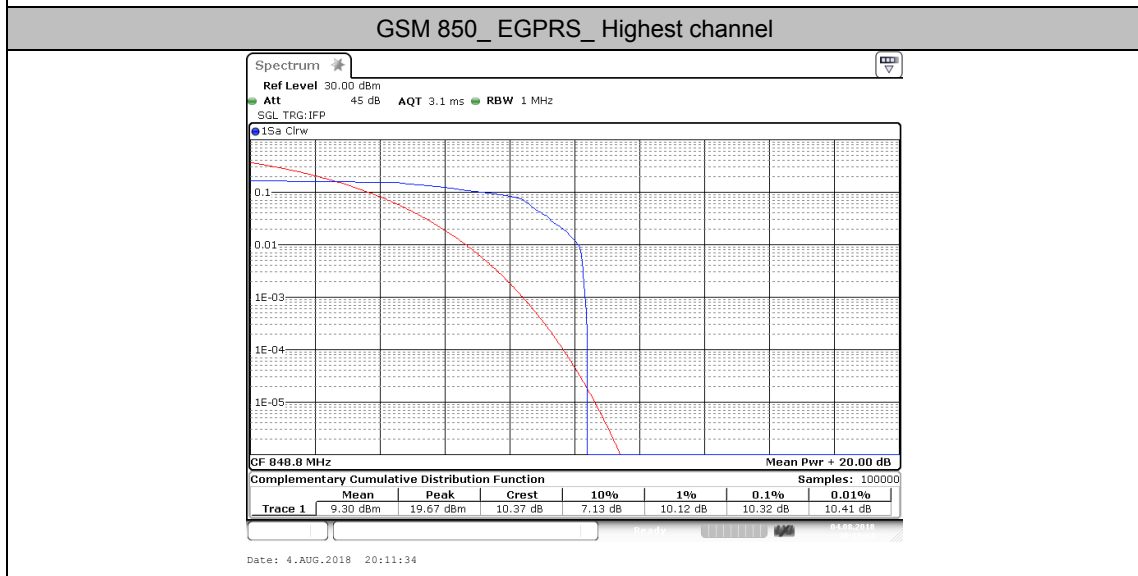
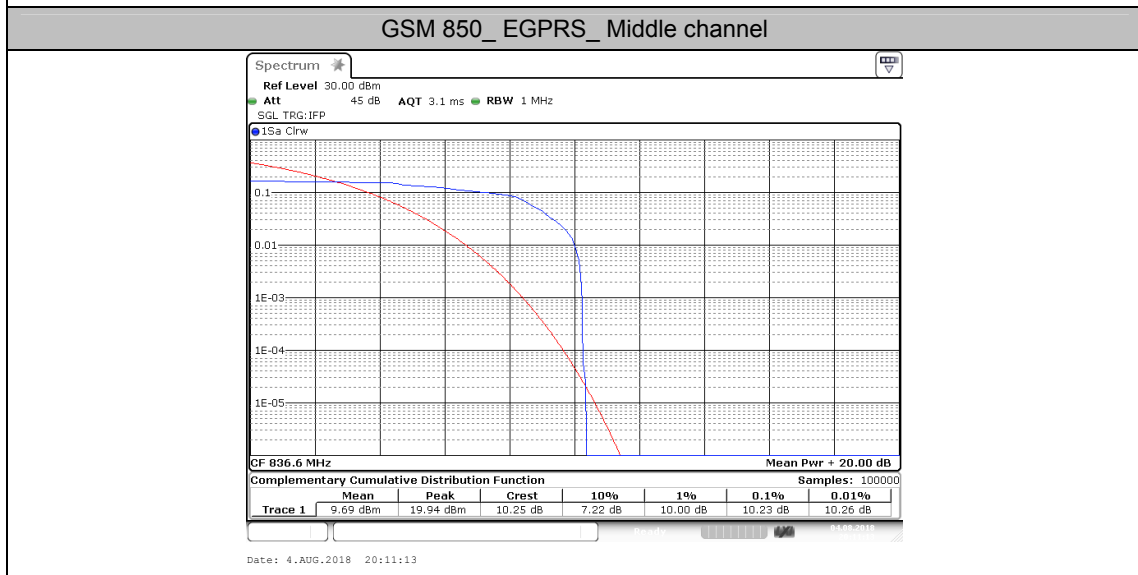
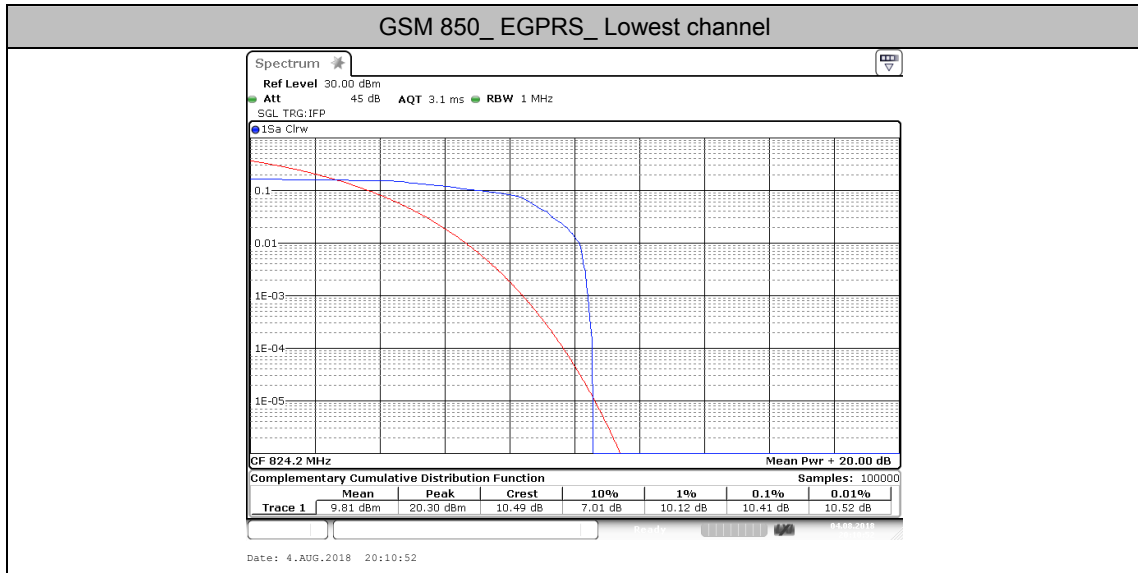
TEST RESULTS

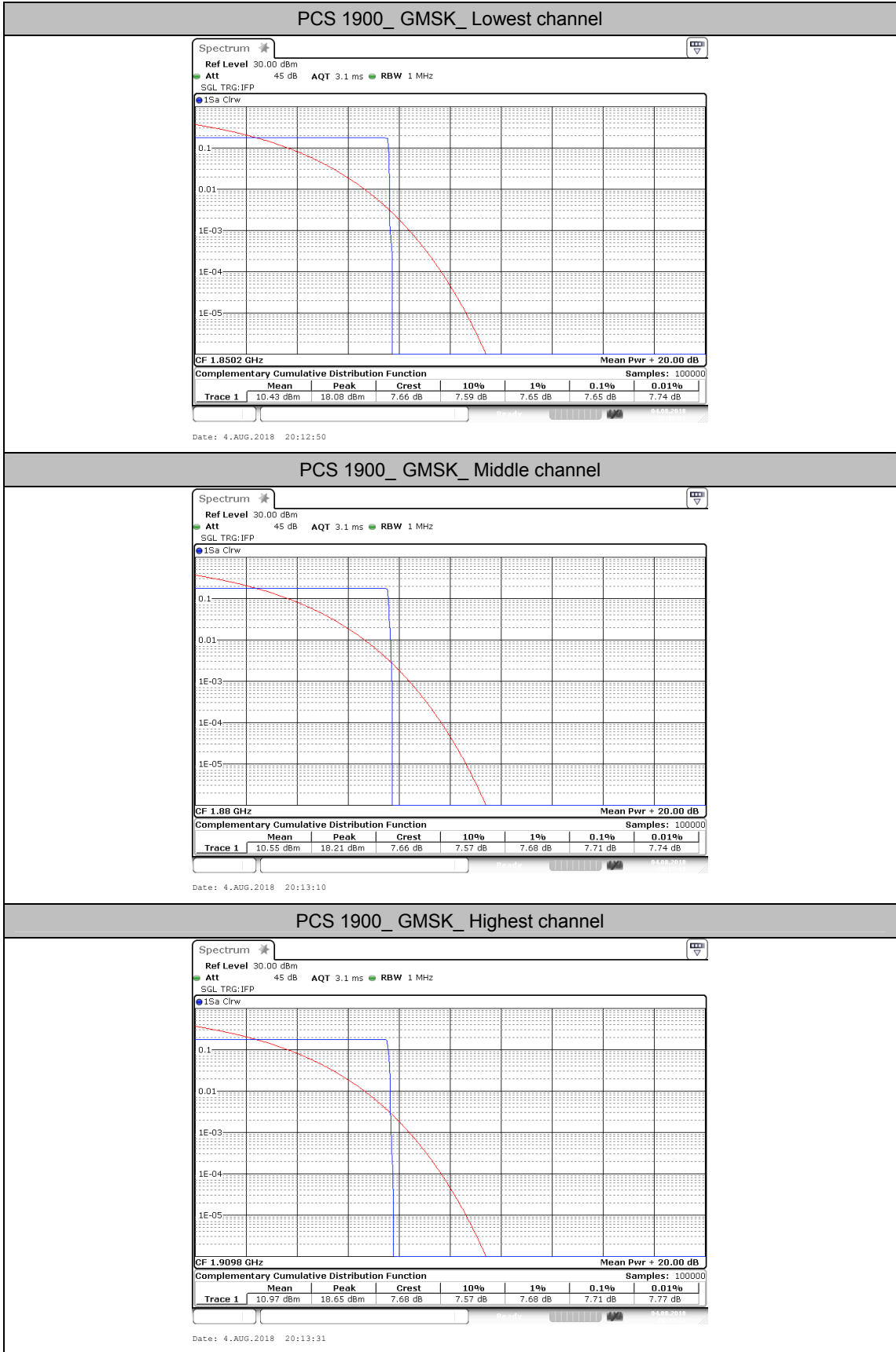
EUT Mode	Channel	Frequency (MHz)	Peak-to-Average Ratio(dB)	Limit (dB)	Result
GSM 850 GMSK	128	824.20	7.65	13	PASS
	190	836.60	7.68	13	
	251	848.80	7.62	13	
GSM 850 GPRS	128	824.20	7.68	13	
	190	836.60	7.68	13	
	251	848.80	7.71	13	
GSM 850 EGPRS	128	824.20	10.41	13	
	190	836.60	10.23	13	
	251	848.80	10.32	13	
PCS 1900 GMSK	512	1850.20	7.65	13	
	661	1880.00	7.71	13	
	810	1909.80	7.71	13	
PCS 1900 GPRS	512	1850.20	7.71	13	
	661	1880.00	7.68	13	
	810	1909.80	7.65	13	
PCS 1900 EGPRS	512	1850.20	7.68	13	
	661	1880.00	10.84	13	
	810	1909.80	10.67	13	

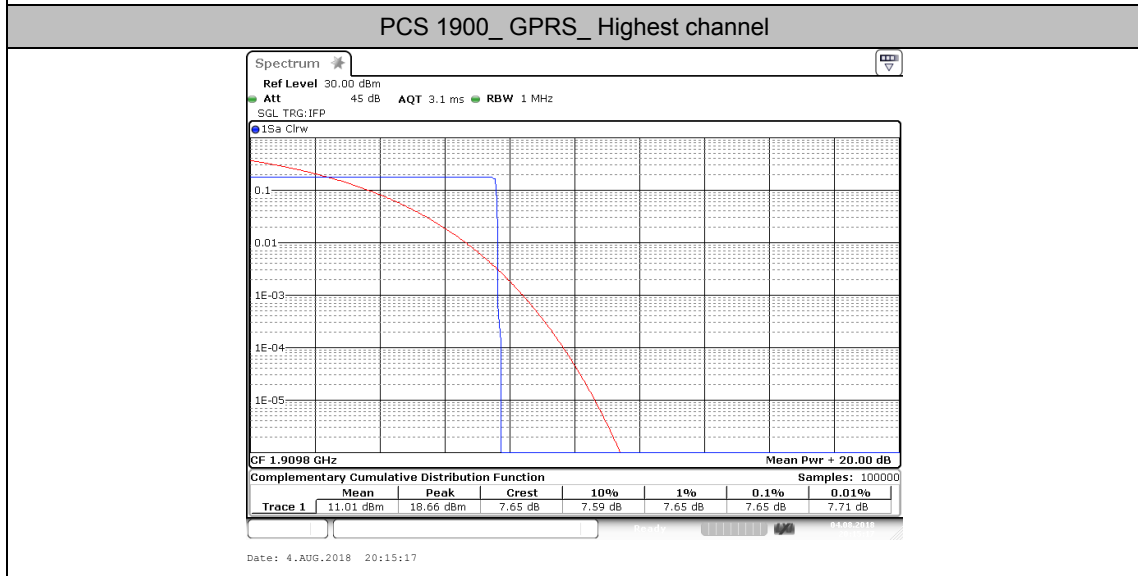
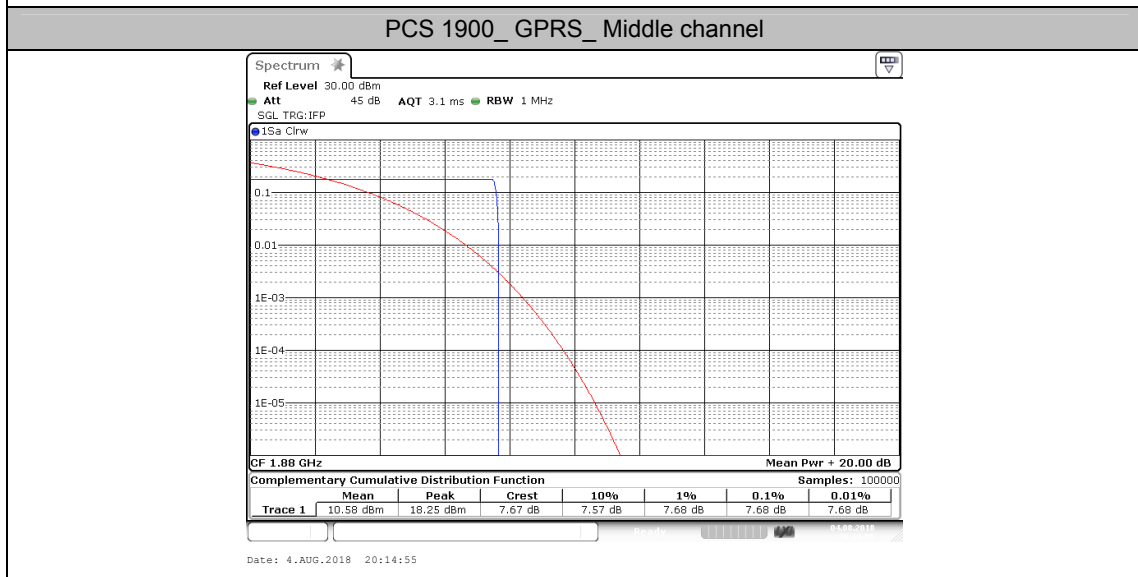
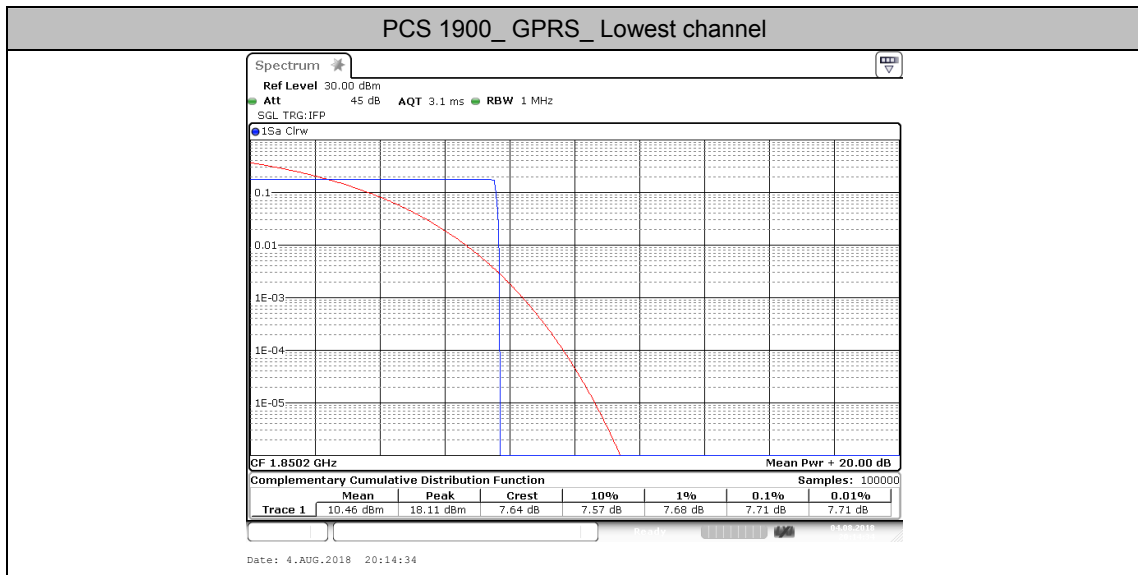
WCDMA Band II WCDMA	9262	1852.40	2.90	13	PASS
	9400	1880.00	3.07	13	
	9538	1907.60	2.96	13	
WCDMA Band II HSDPA	9262	1852.40	3.07	13	
	9400	1880.00	3.22	13	
	9538	1907.60	3.16	13	
WCDMA Band II HSUPA	9262	1852.40	3.16	13	
	9400	1880.00	3.28	13	
	9538	1907.60	3.19	13	
WCDMA Band IV WCDMA	1312	1712.40	3.04	13	
	1413	1732.60	3.10	13	
	1513	1752.60	2.99	13	
WCDMA Band IV HSDPA	1312	1712.40	3.25	13	
	1413	1732.60	3.36	13	
	1513	1752.60	3.30	13	
WCDMA Band IV HSUPA	1312	1712.40	3.33	13	
	1413	1732.60	3.33	13	
	1513	1752.60	3.28	13	
WCDMA Band V WCDMA	4132	826.40	3.62	13	
	4183	836.60	3.22	13	
	4233	846.60	3.51	13	
WCDMA Band V HSDPA	4132	826.40	3.74	13	
	4183	836.60	3.25	13	
	4233	846.60	3.65	13	
WCDMA Band V HSUPA	4132	826.40	3.71	13	
	4183	836.60	3.30	13	
	4233	846.60	3.54	13	

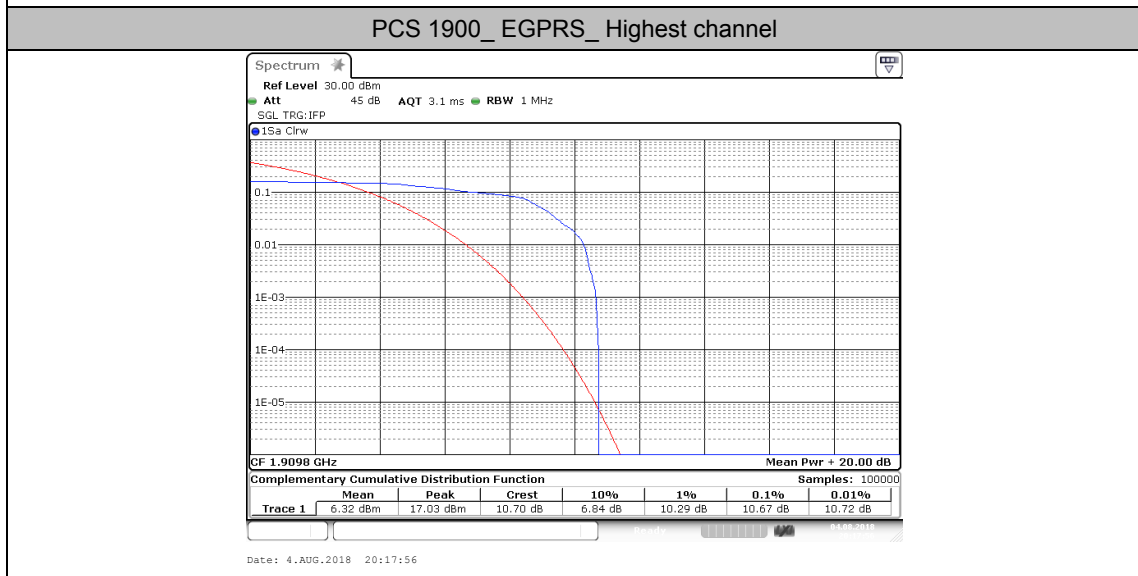
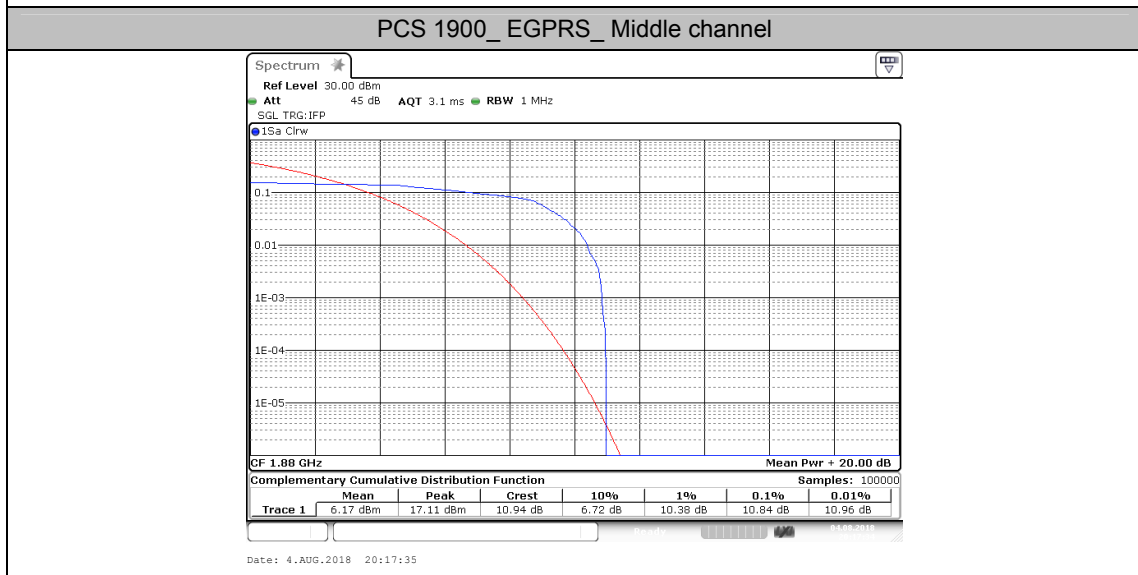
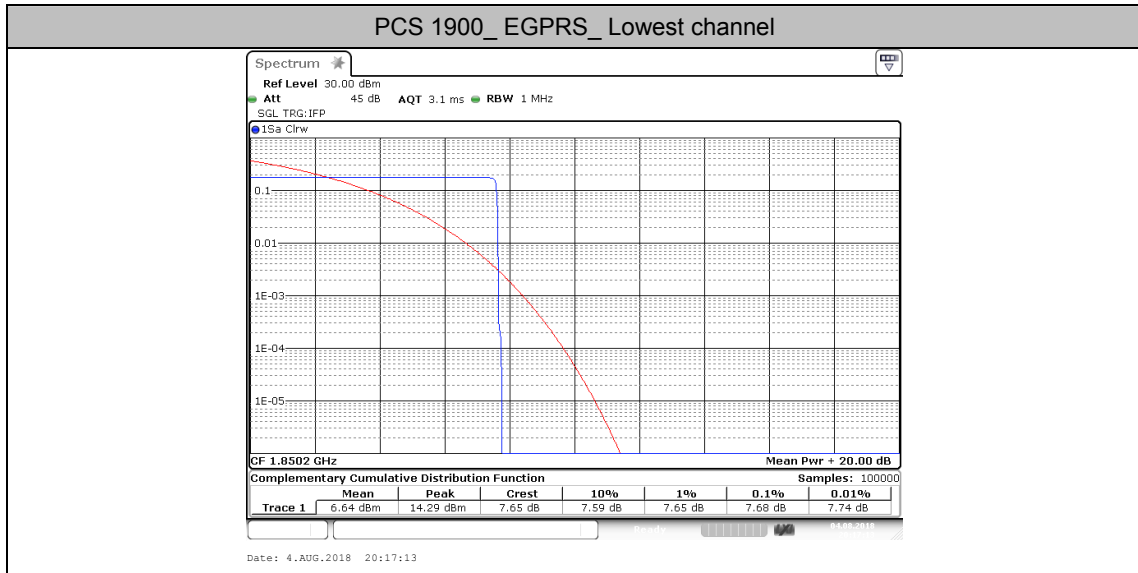


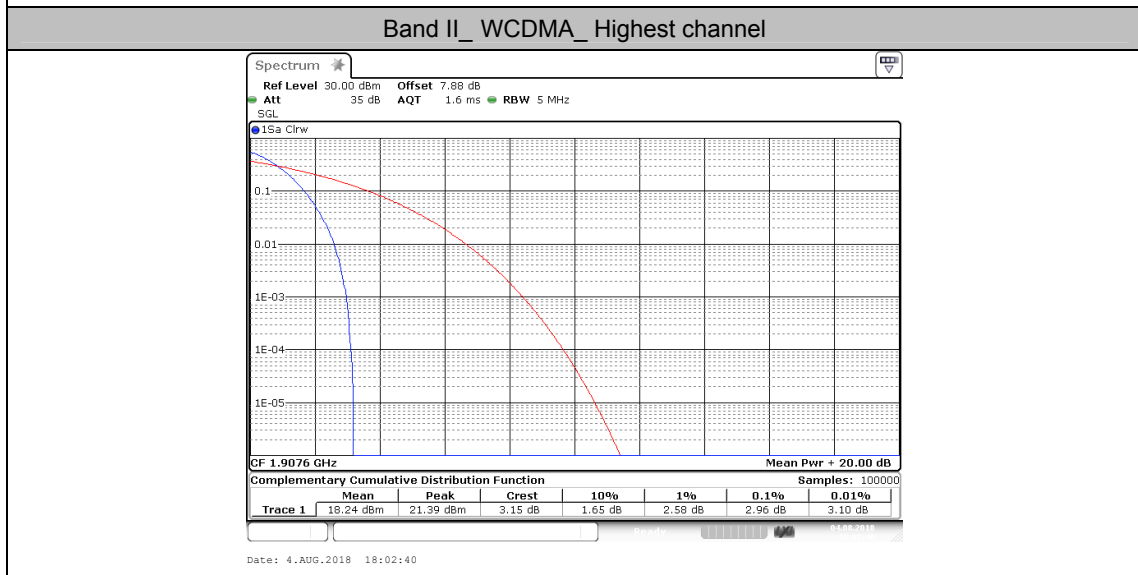
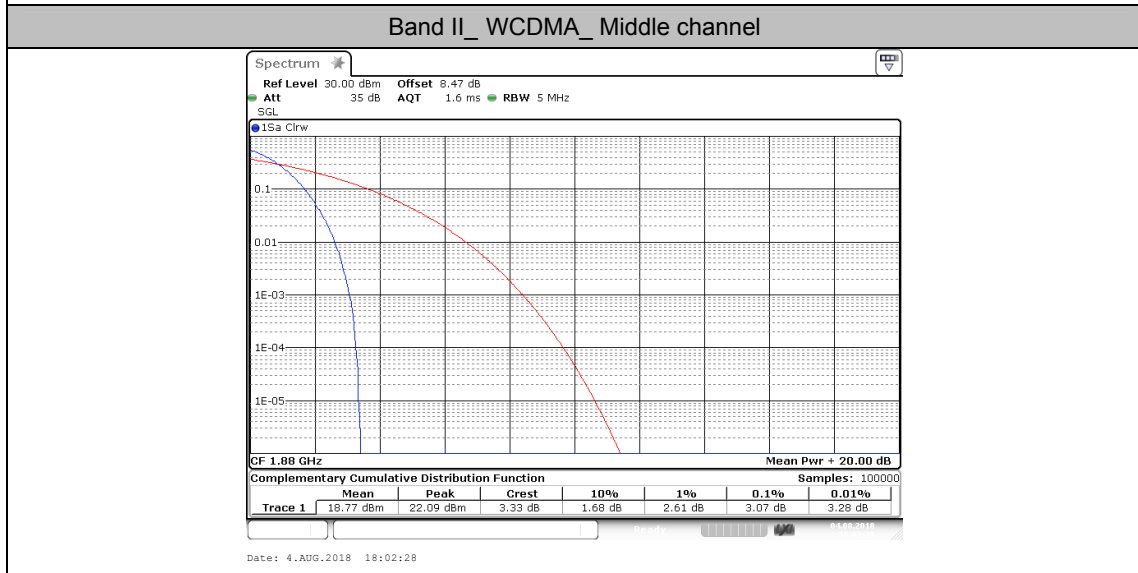
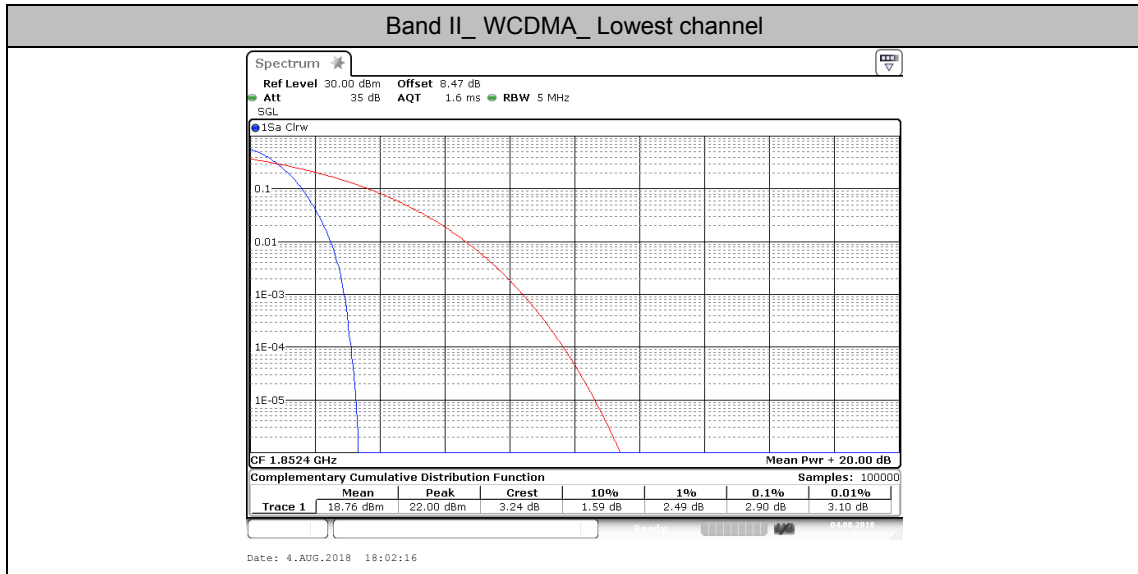


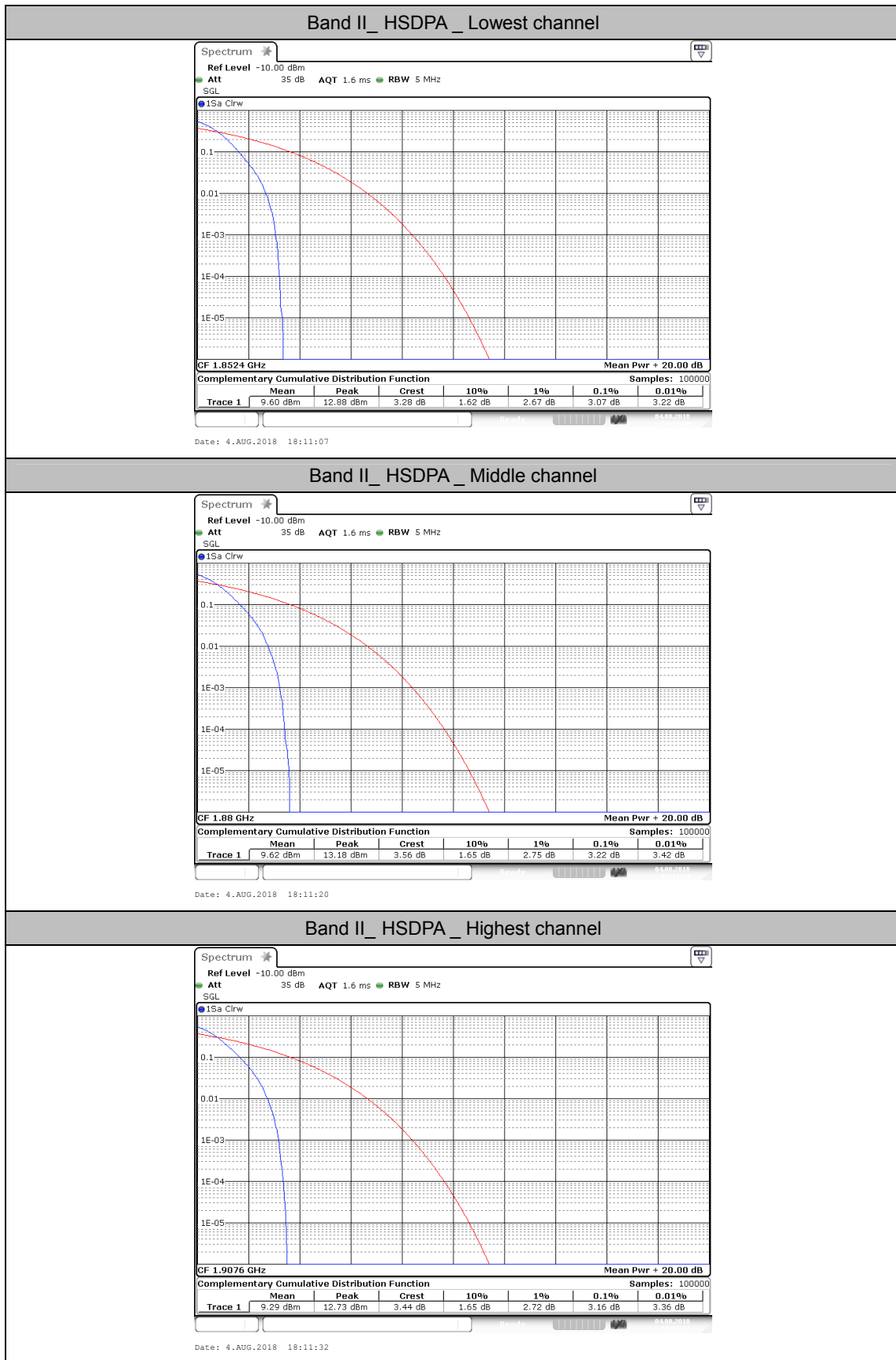


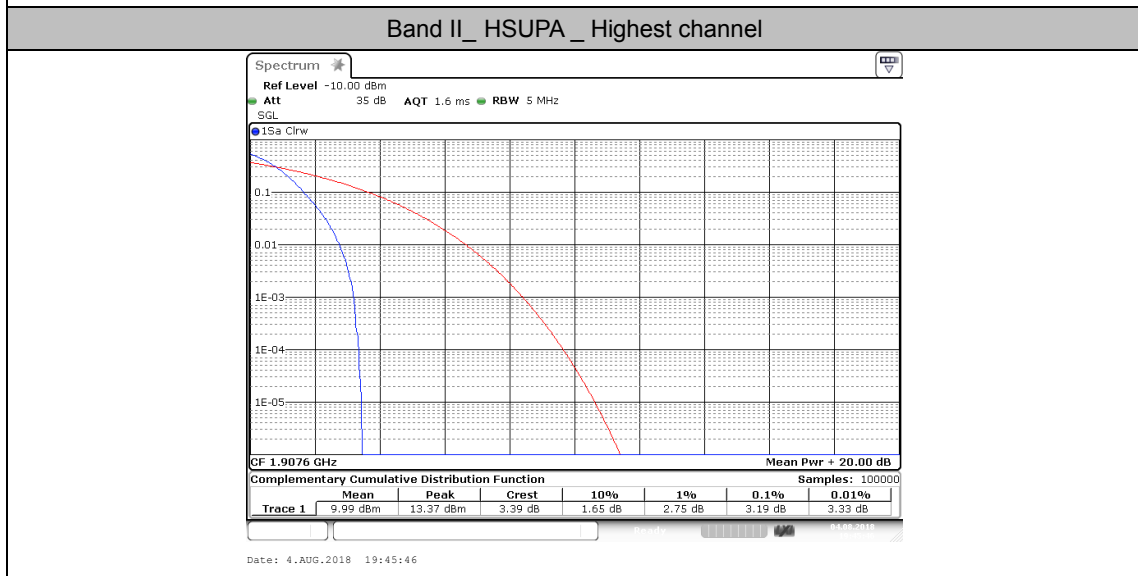
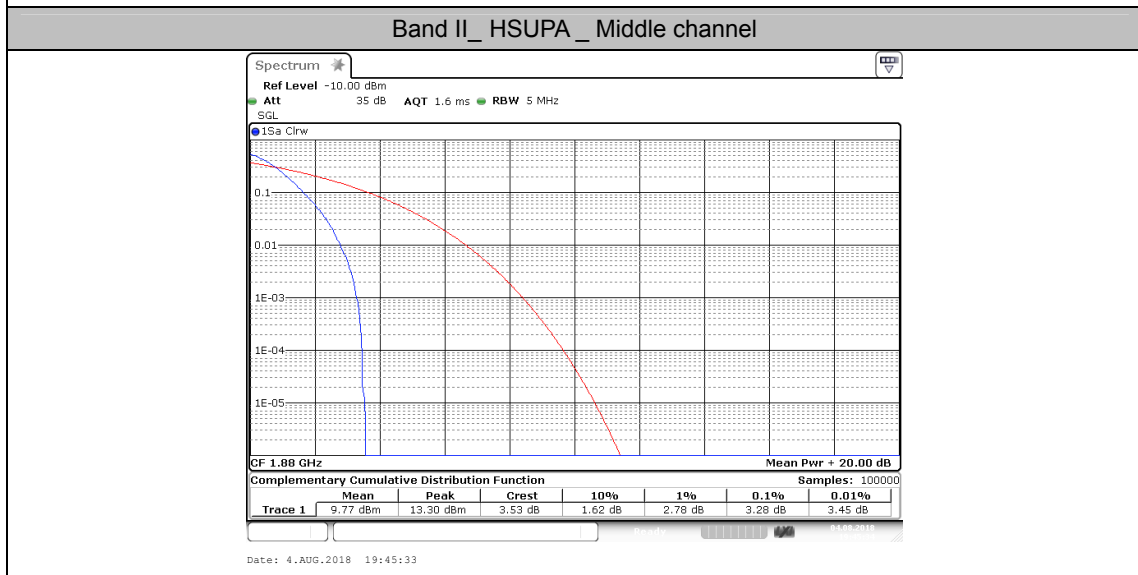
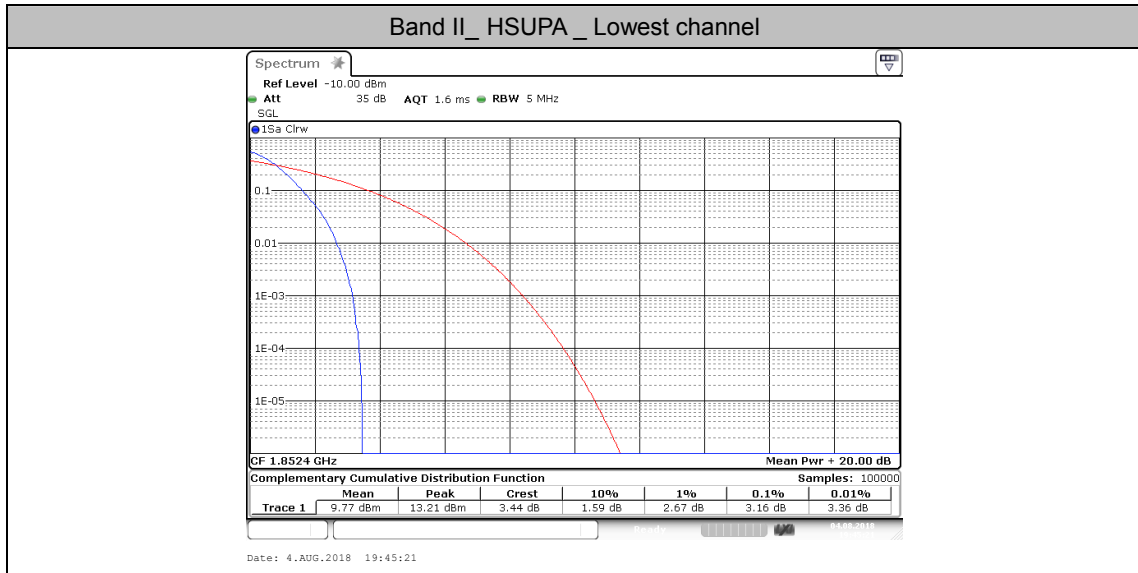


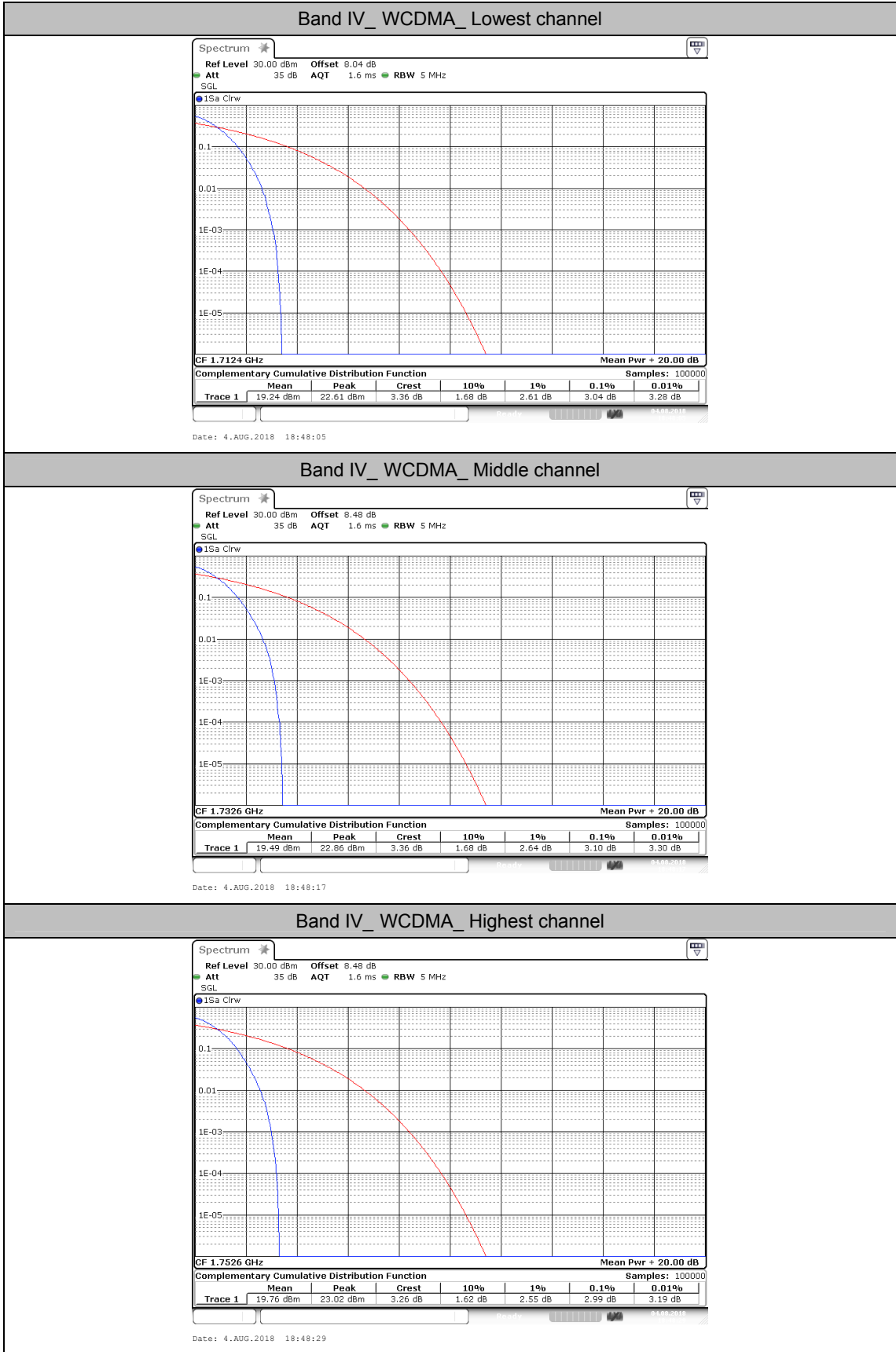


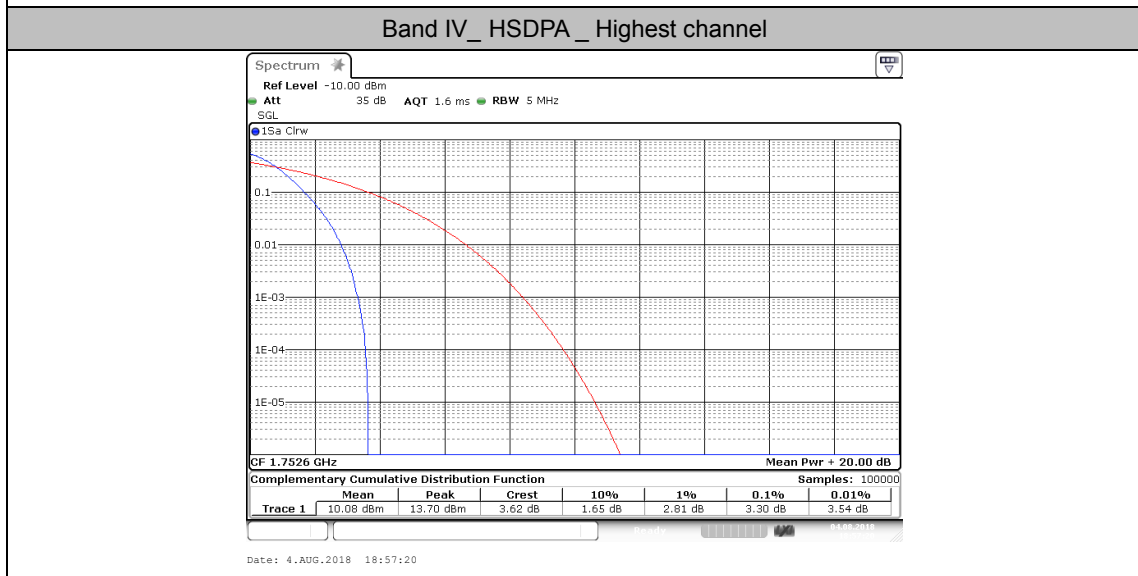
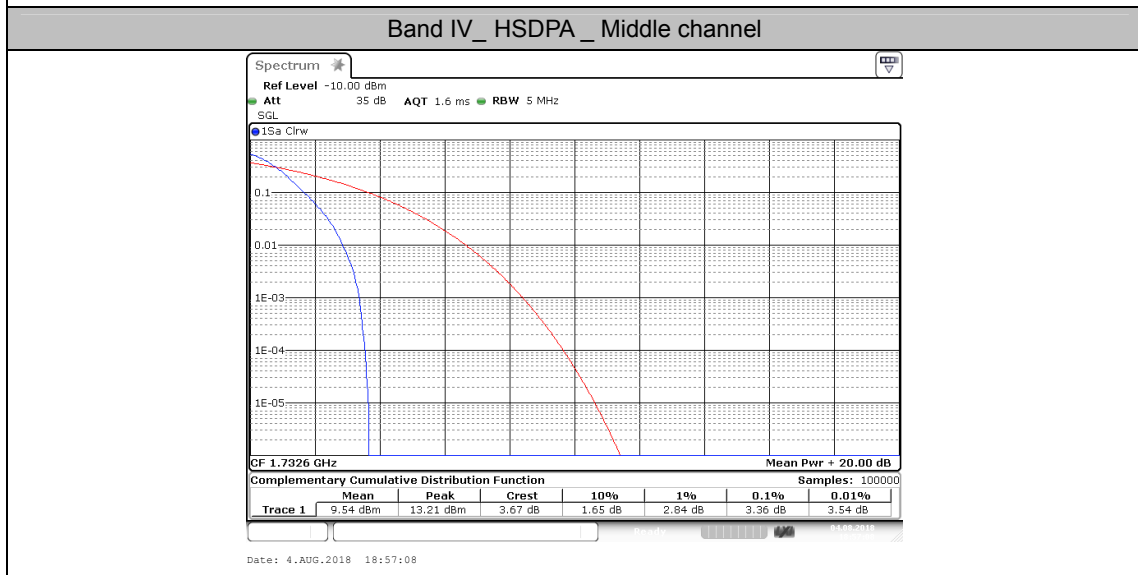
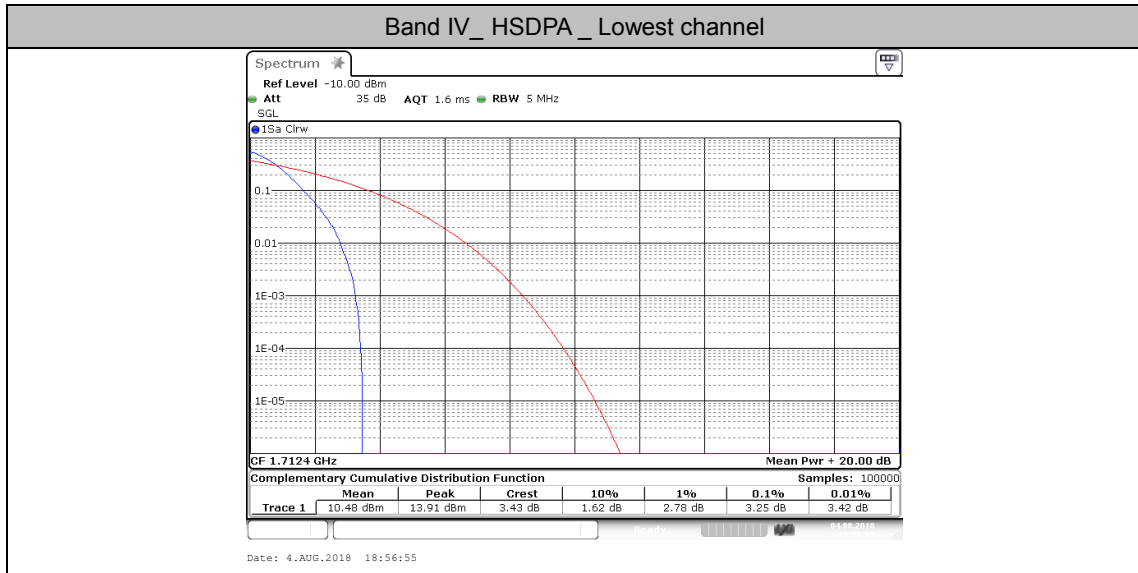


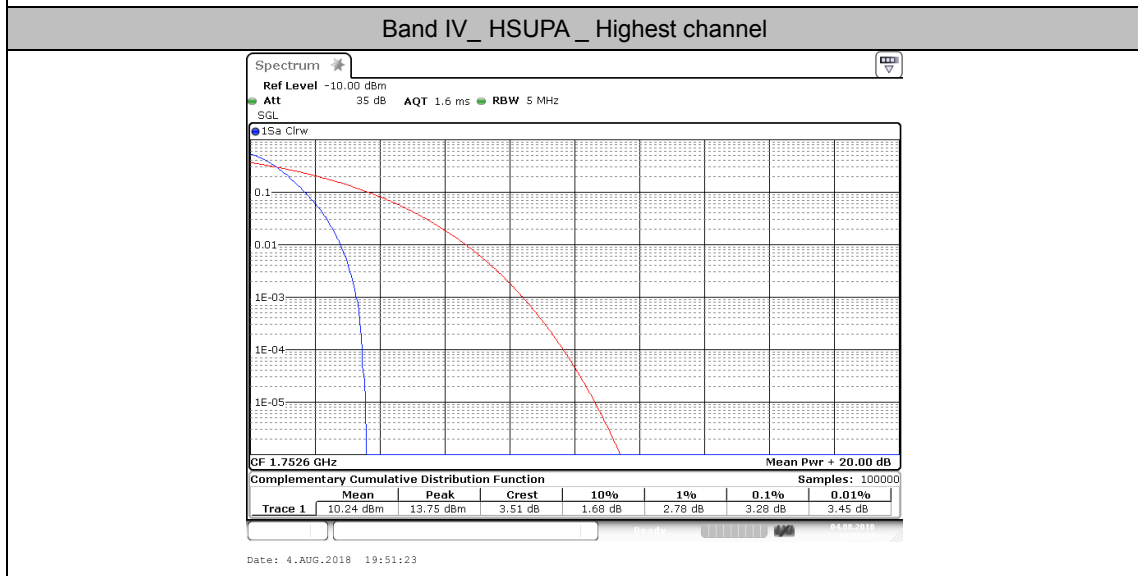
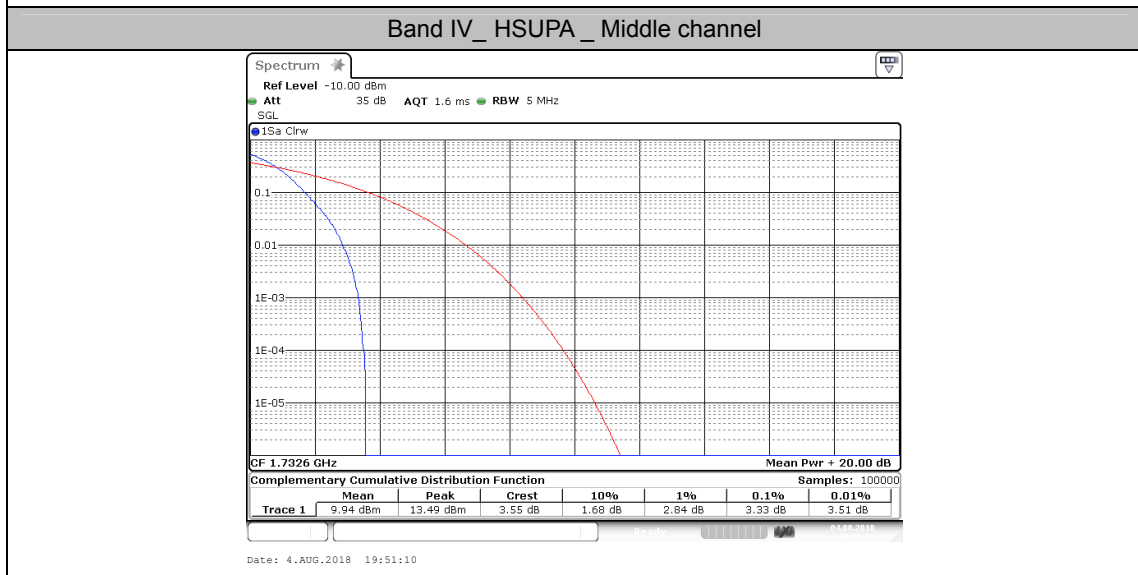
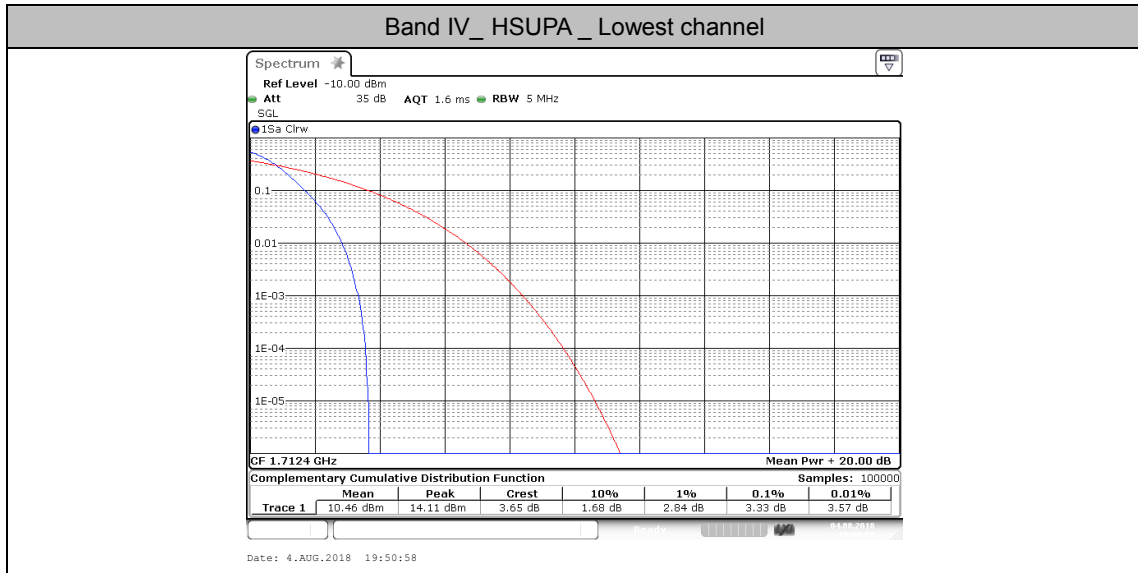


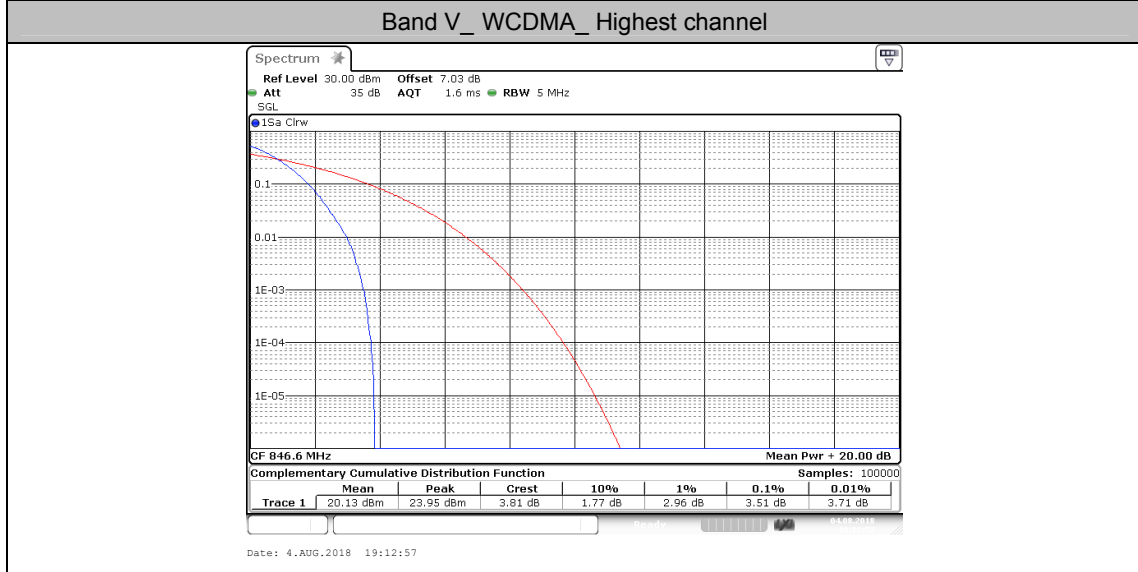
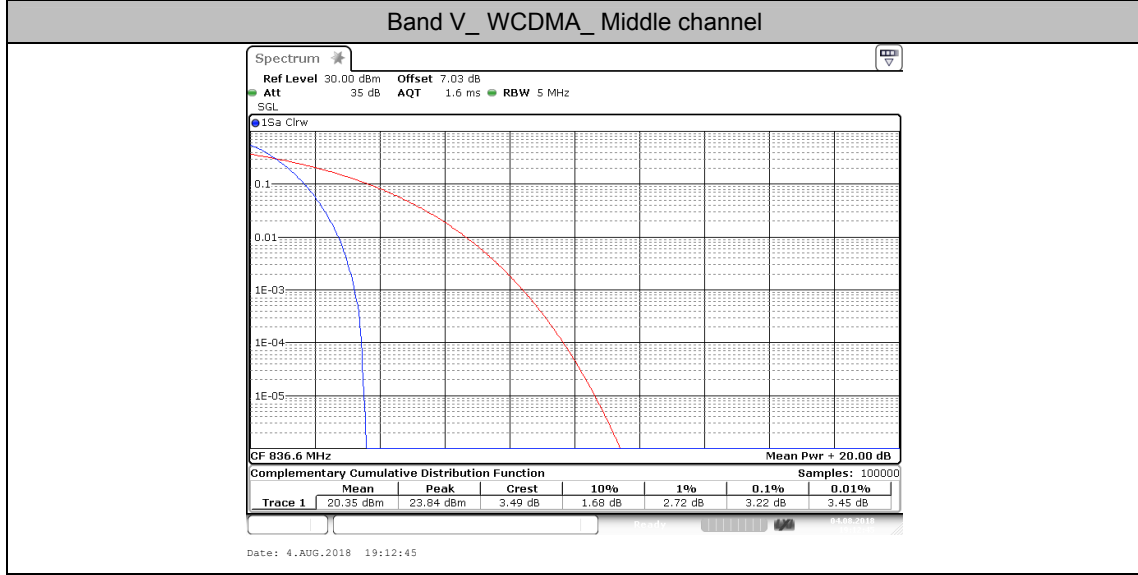
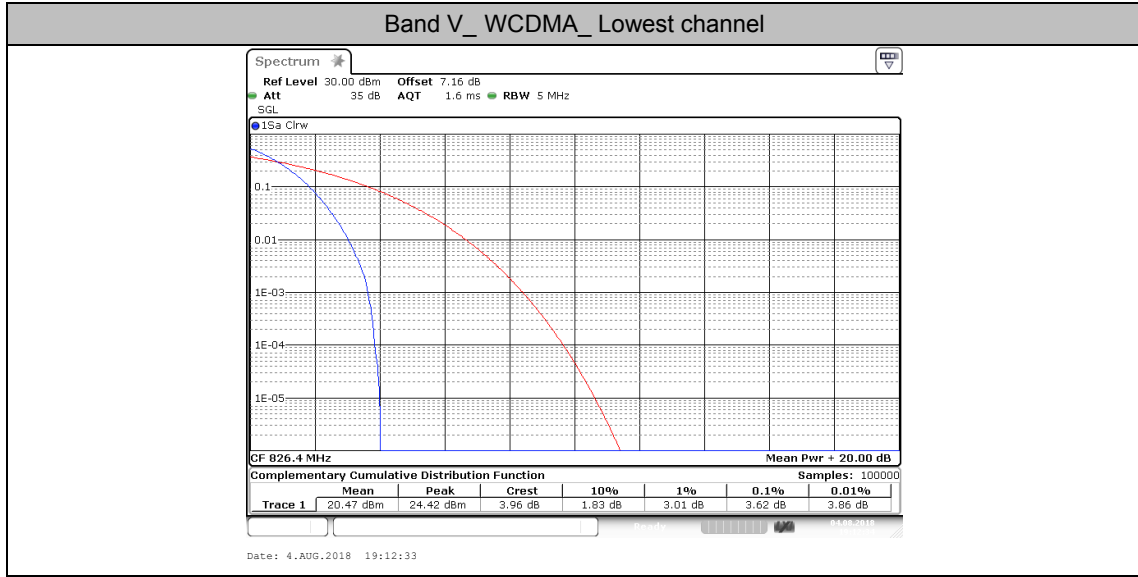


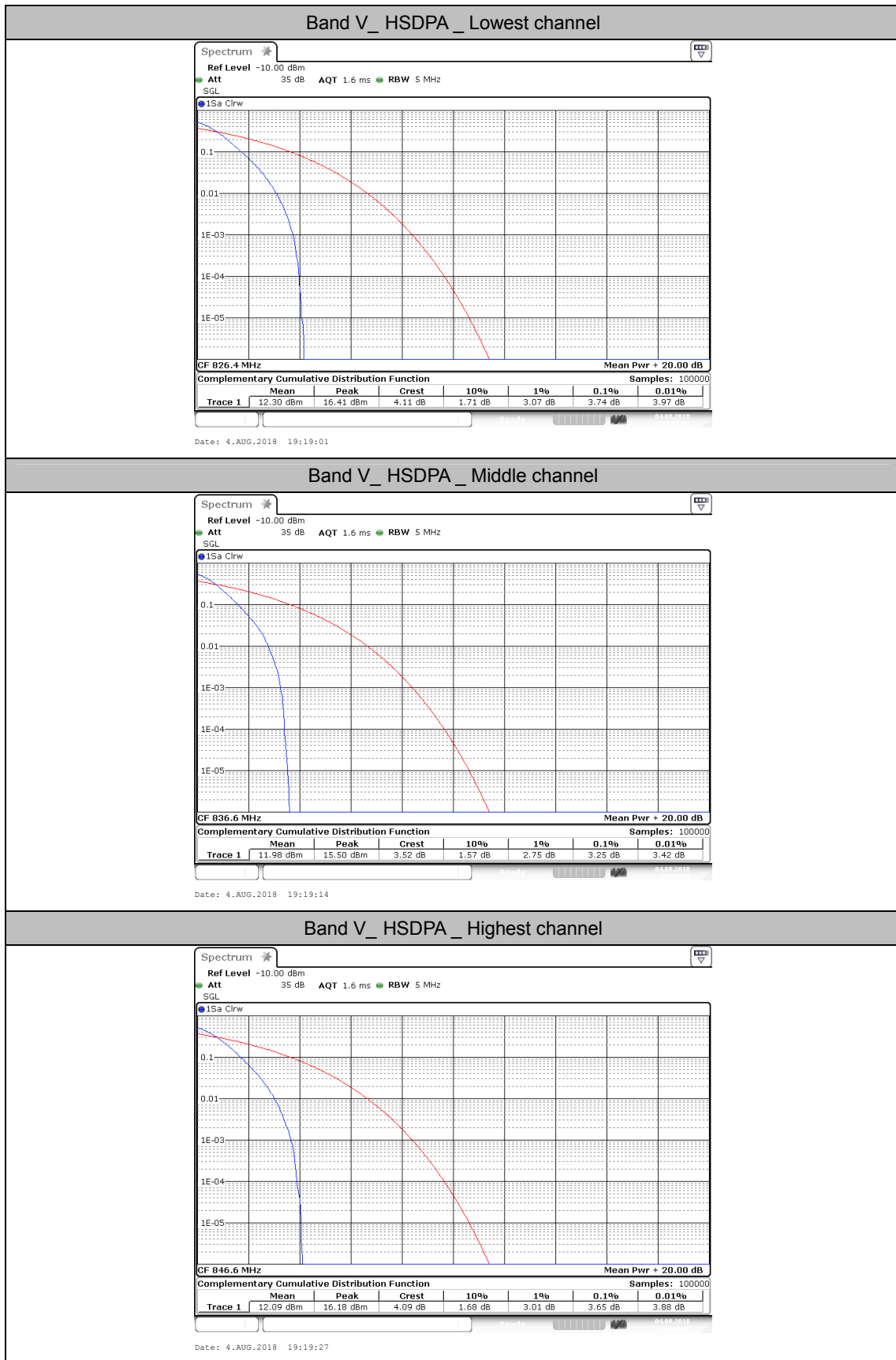


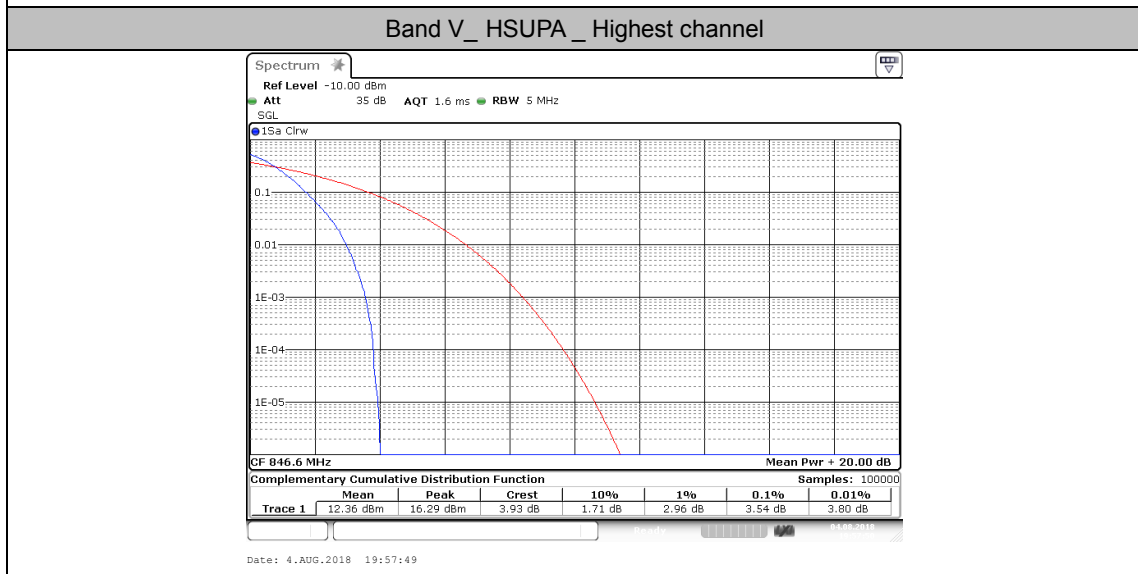
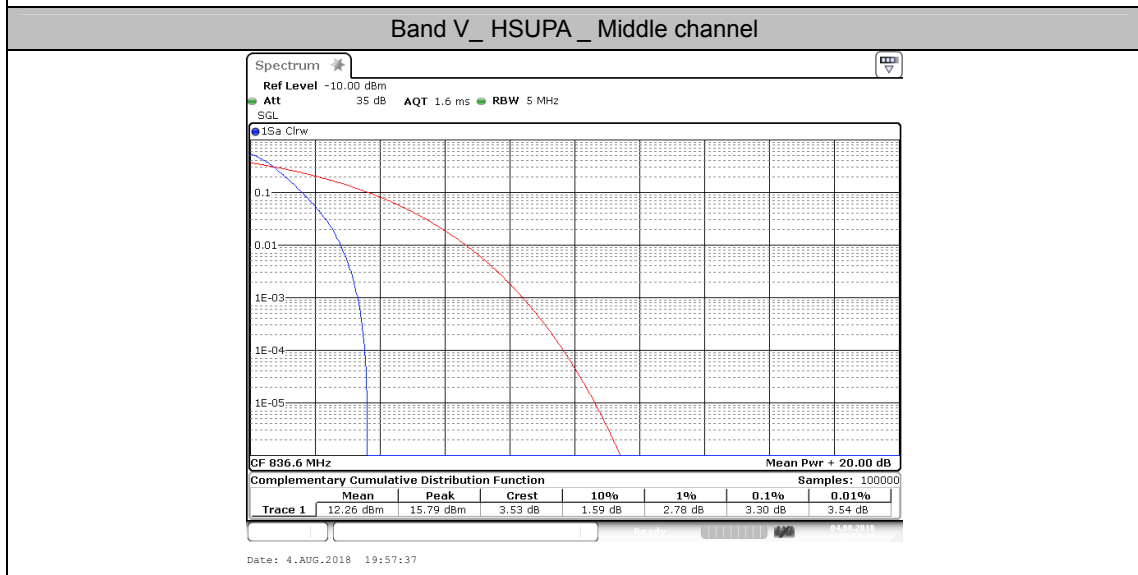
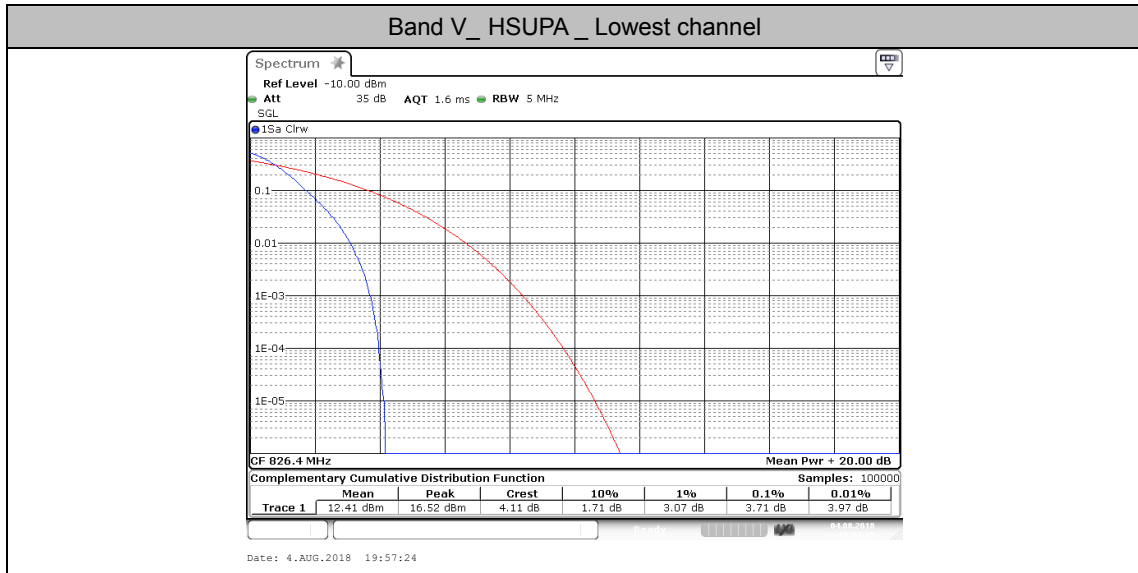






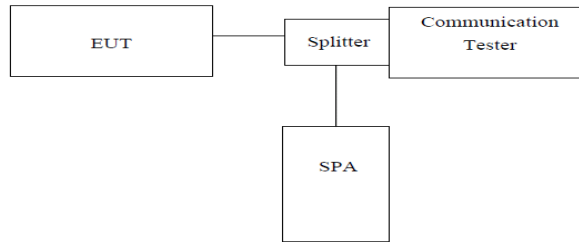






3.3. Occupy Bandwidth

TEST CONFIGURATION



Note: Measurement setup for testing on Antenna connector

TEST PROCEDURE

1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBW was set to about 1% of emission BW, $VBW \geq 3$ times RBW.
3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

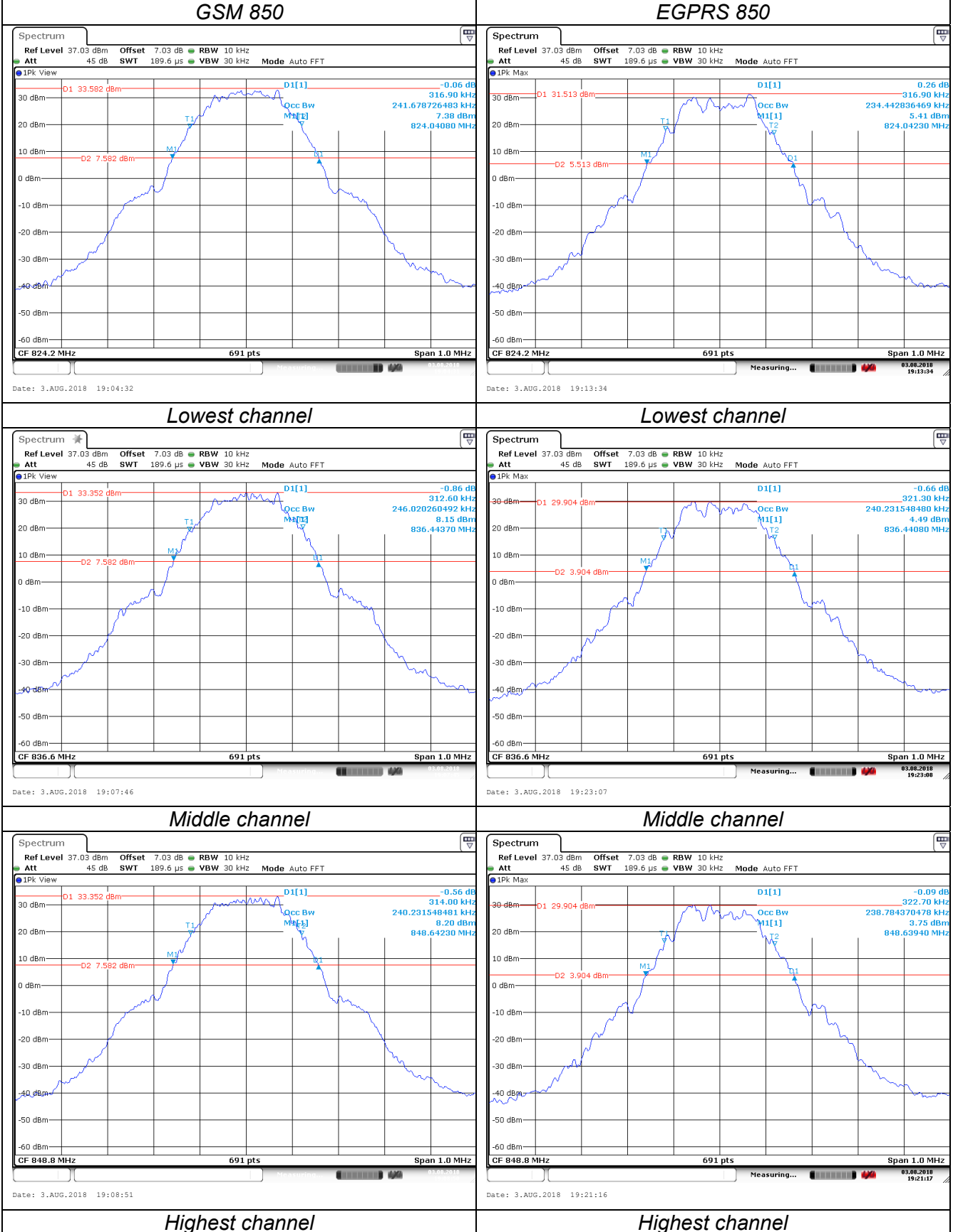
TEST RESULTS

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GMSK)	128	824.20	241.67	316.90
	190	836.60	246.02	312.60
	251	848.80	240.23	314.00
EGPRS850 (8PSK, 1Slot)	128	824.20	234.44	316.90
	190	836.60	240.23	321.30
	251	848.80	238.78	322.70
PCS1900 (GMSK)	512	1850.20	240.23	305.40
	661	1880.00	240.23	306.80
	810	1909.80	238.78	305.40
EGPRS1900 (GMSK, 1Slot)	512	1850.20	235.89	316.90
	661	1880.00	235.89	319.80
	810	1909.80	241.67	306.80
WCDMA Band II (QPSK)	9262	1852.40	4095.51	4507.30
	9400	1880.00	4153.40	4695.60
	9538	1907.60	4153.40	4695.60
WCDMA Band IV (QPSK)	1312	1712.40	4138.92	4710.10
	1413	1732.60	4138.92	4695.60
	1513	1752.60	4138.92	4695.60
WCDMA Band V (QPSK)	4132	826.40	4153.40	4695.60
	4183	836.60	4109.98	4695.60
	4233	846.60	4124.45	4681.10

Note: GSM&GPRS use the same modulation technical (GMSK), and with the same channels, so the 99% OBW and the -26dB of GPRS not performed.

Test plots as follow:

99% Occupancy bandwidth and -26dB bandwidth



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Http://www.sz-ctc.org.cn

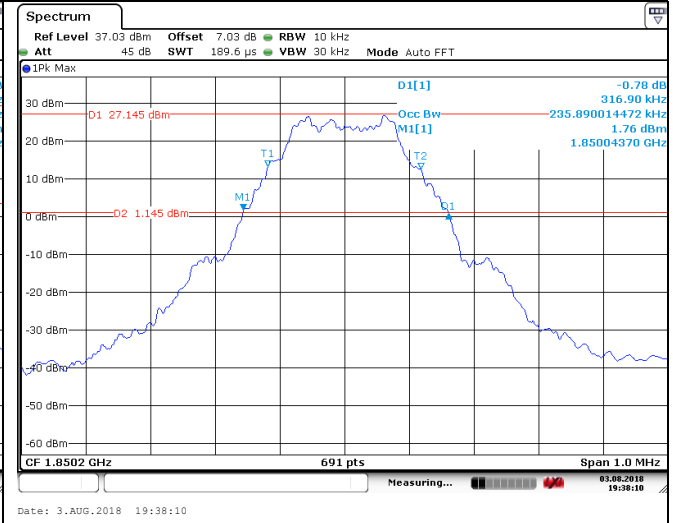
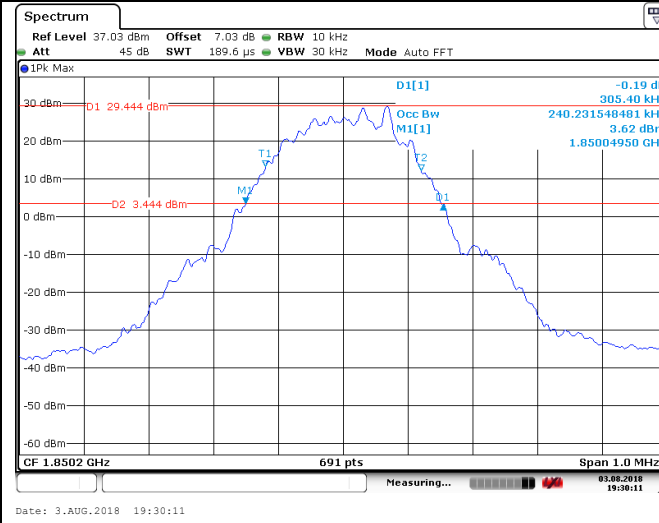


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99% Occupancy bandwidth and -26dB bandwidth

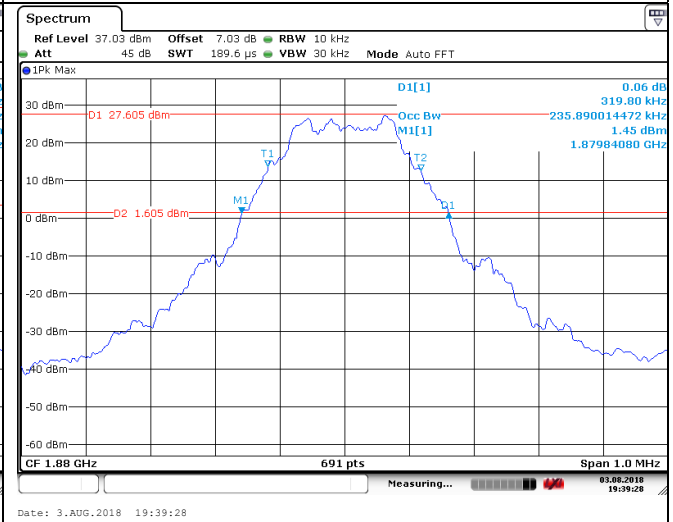
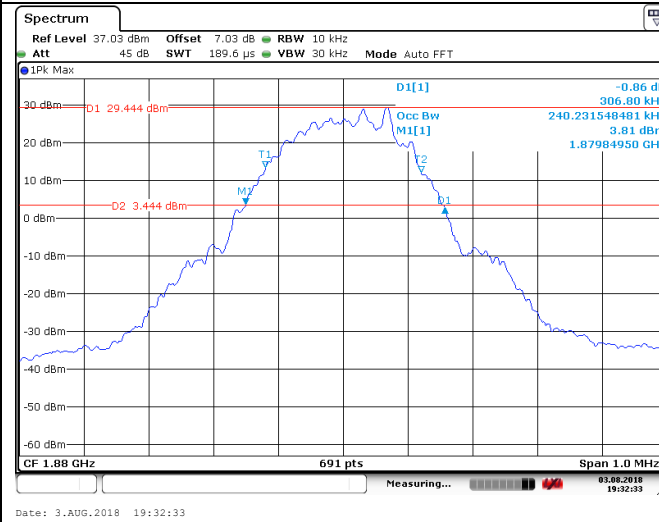
PCS 1900

EGPRS 1900



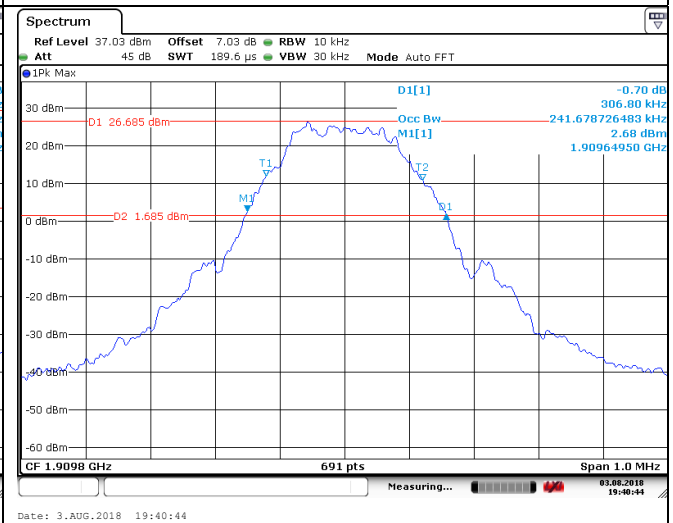
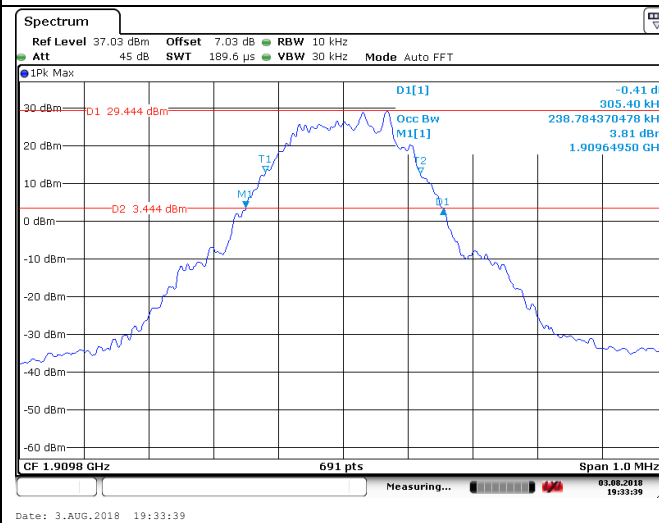
Lowest channel

Lowest channel



Middle channel

Middle channel



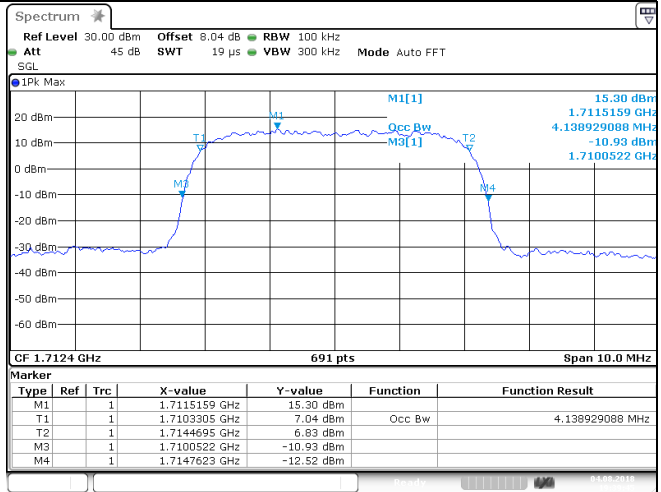
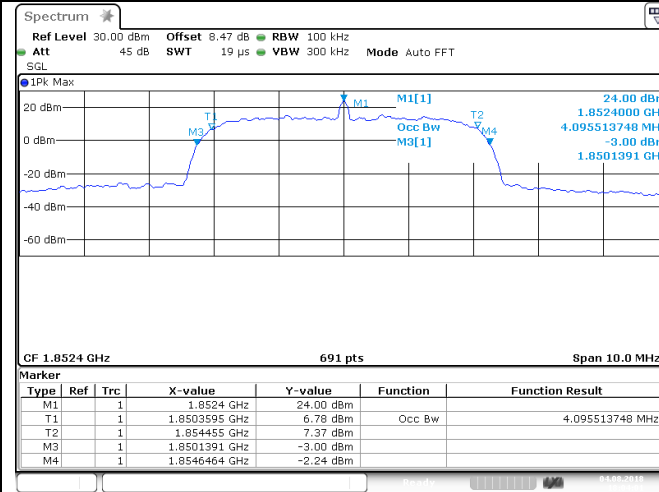
Highest channel

Highest channel

99% Occupancy bandwidth and -26dB bandwidth

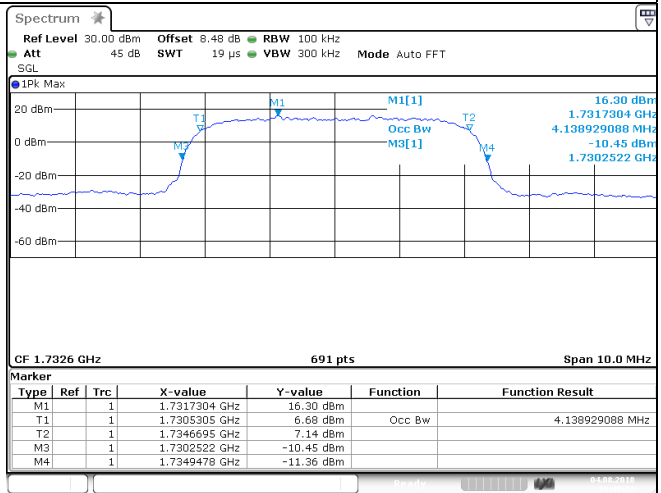
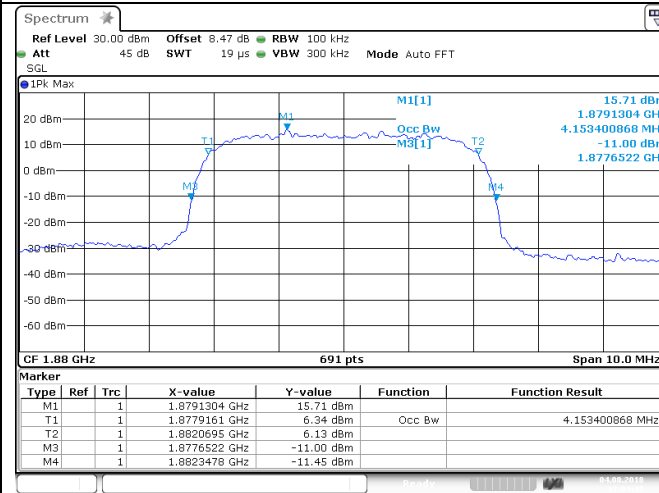
WCDMA II

WCDMA IV



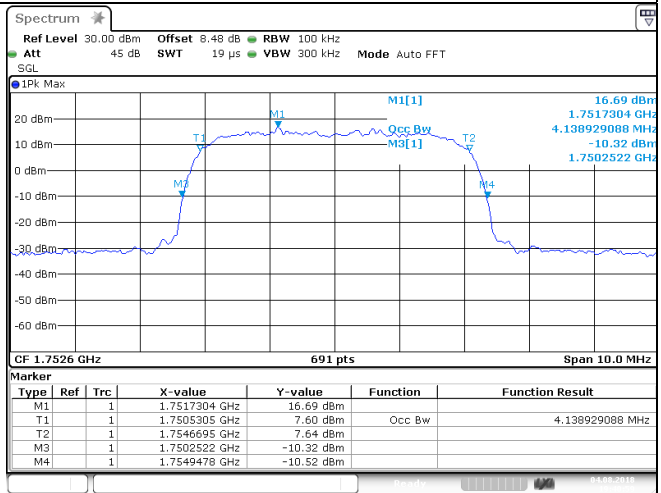
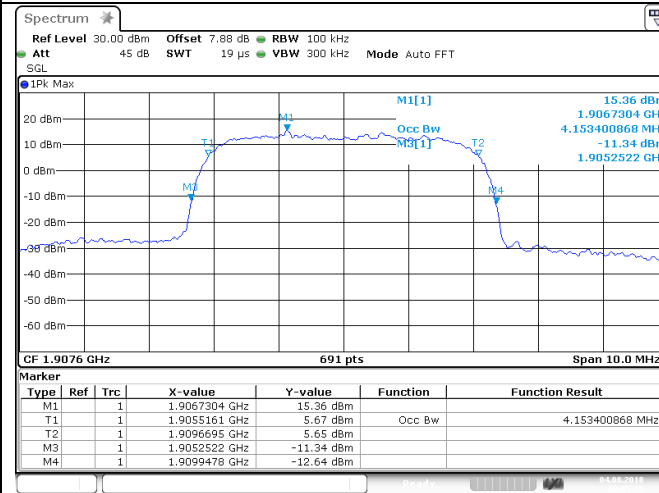
Lowest channel

Lowest channel



Middle channel

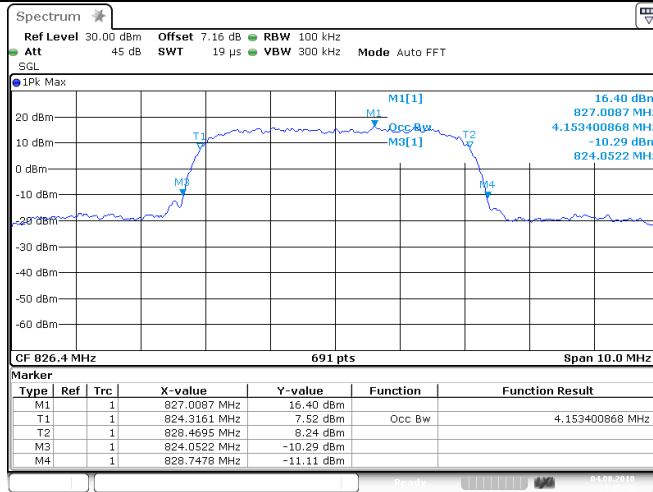
Middle channel



Highest channel

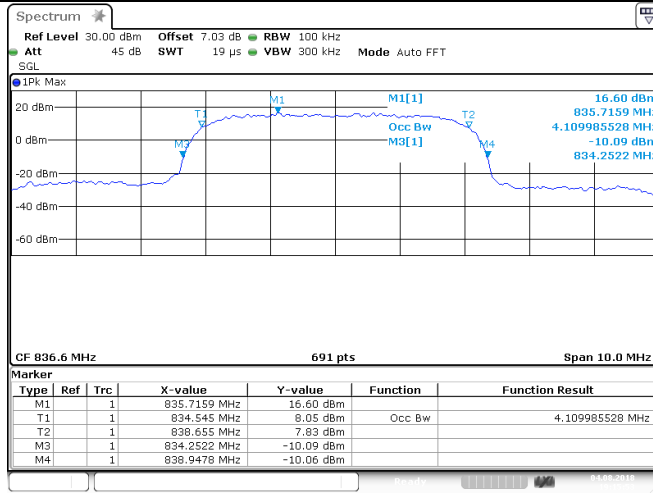
Highest channel

99% Occupancy bandwidth and -26dB bandwidth
WCDMA V



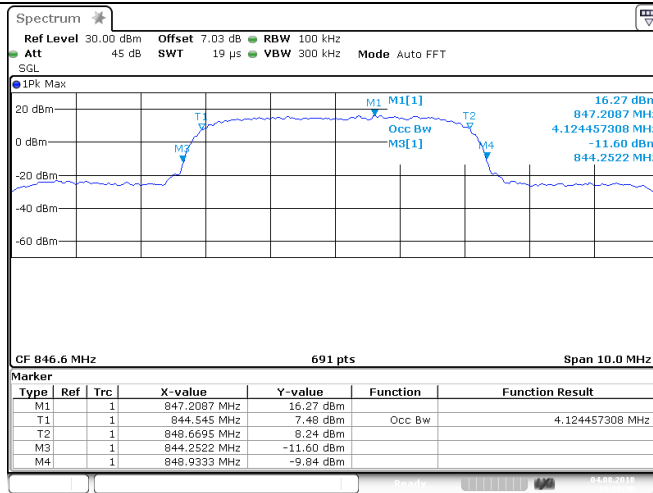
Date: 4.AUG.2018 19:15:16

Lowest channel



Date: 4.AUG.2018 19:15:53

Middle channel



Date: 4.AUG.2018 19:16:29

Highest channel

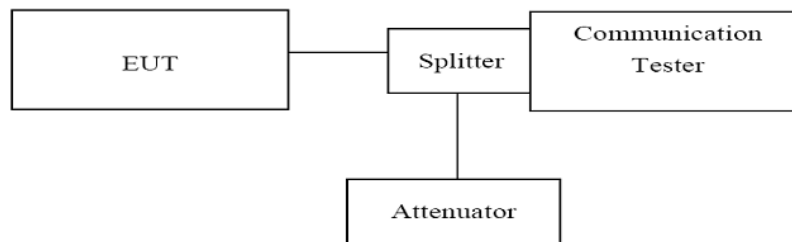
3.4. Out of band emission at antenna terminals

LIMIT

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

TEST CONFIGURATION



TEST PROCEDURE

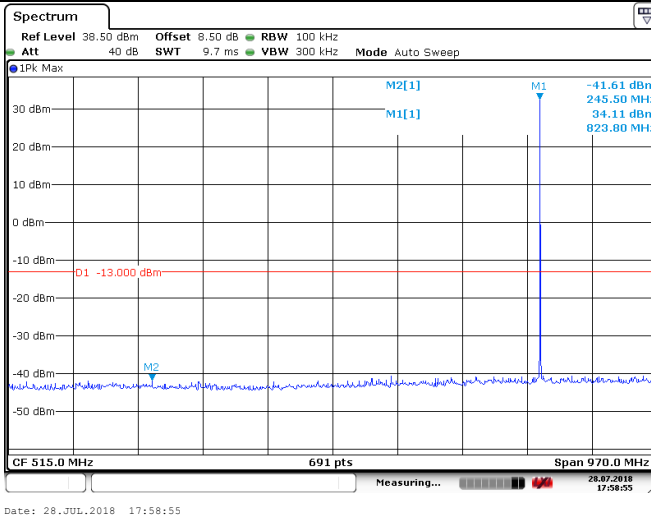
1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1MHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
3. For the out of band: Set the RBW = 1MHz VBW \geq 3 times RBW, Start=30MHz, Stop= 10th harmonic.

TEST RESULTS

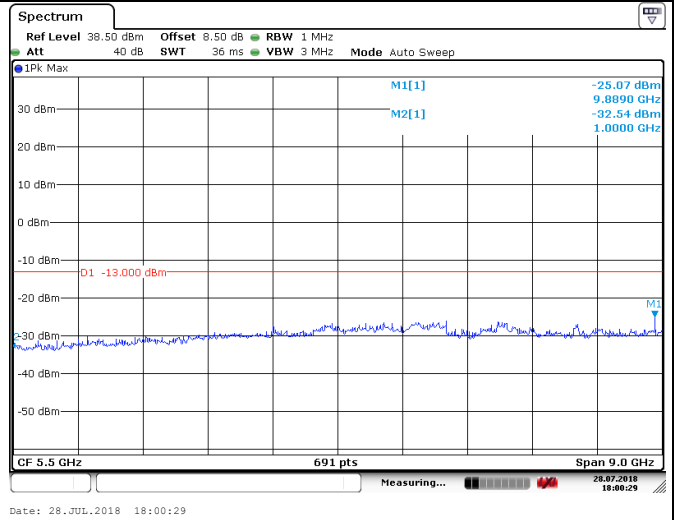
Remark: we test all modulation type and record worst case at Voice mode.

GSM 850

Lowest channel

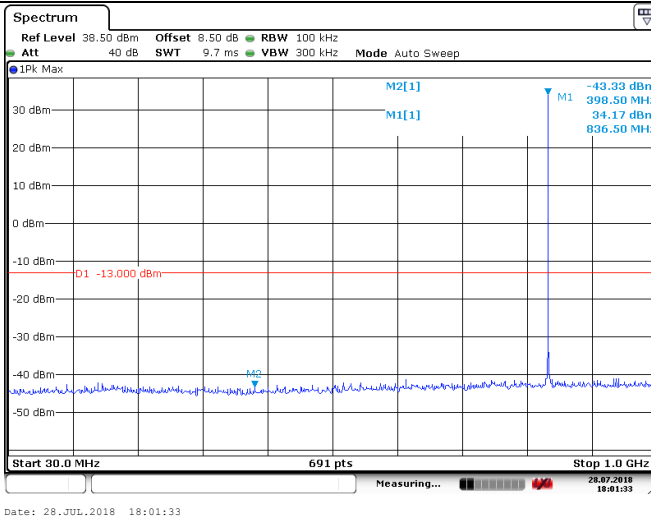


30MHz~1GHz

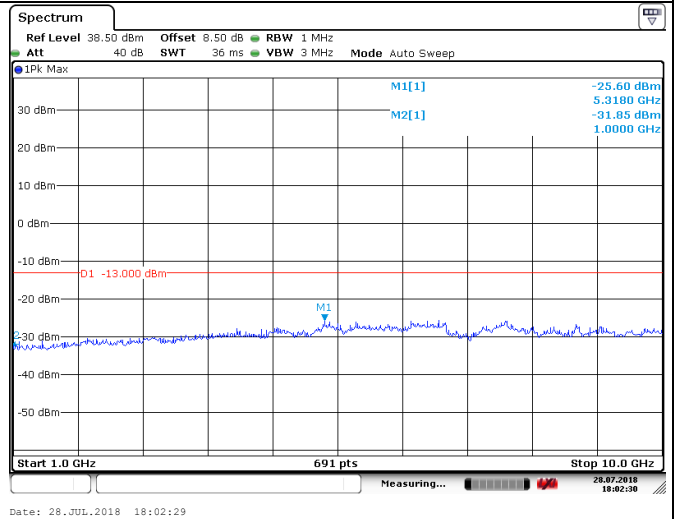


1GHz~10GHz

Middle channel

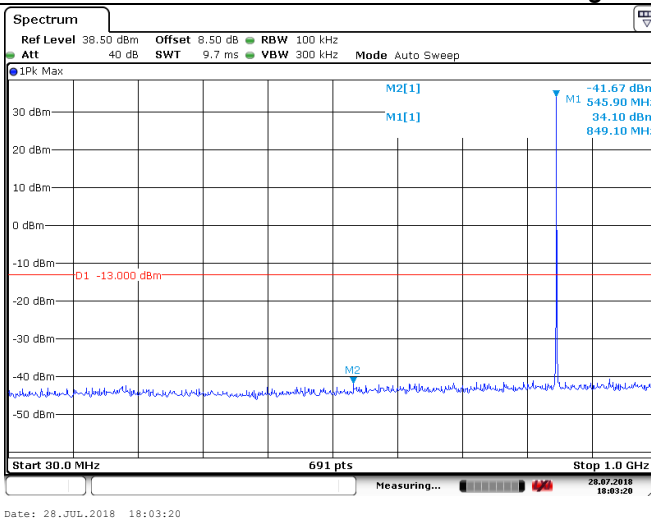


30MHz~1GHz

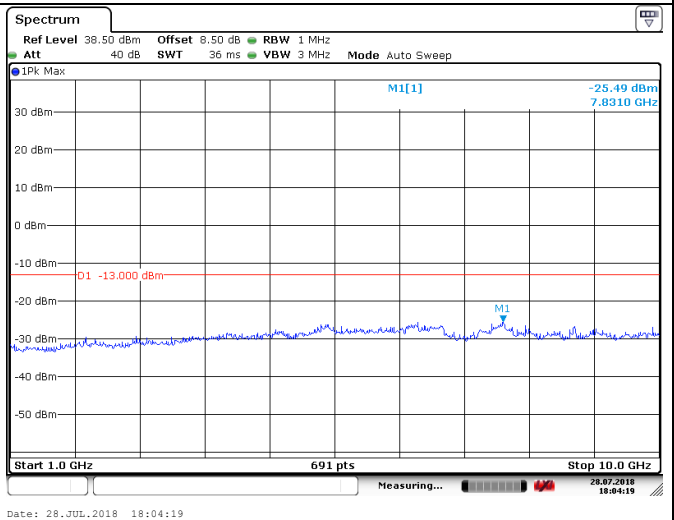


1GHz~10GHz

Highest channel



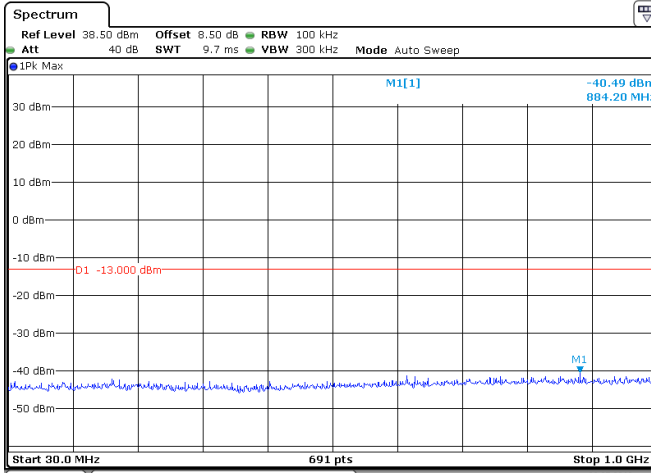
30MHz~1GHz



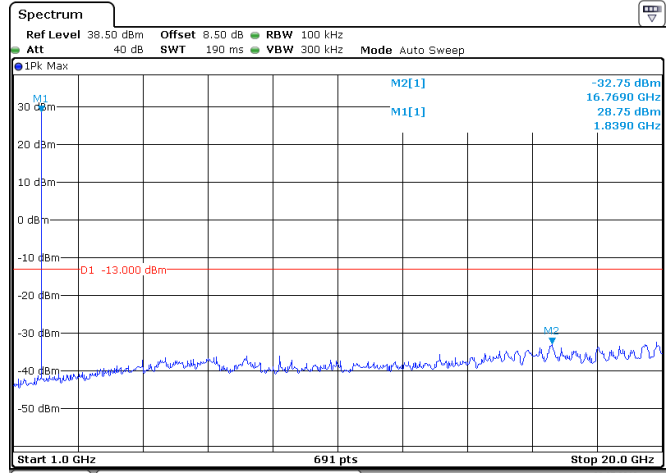
1GHz~10GHz

PCS 1900

Lowest channel

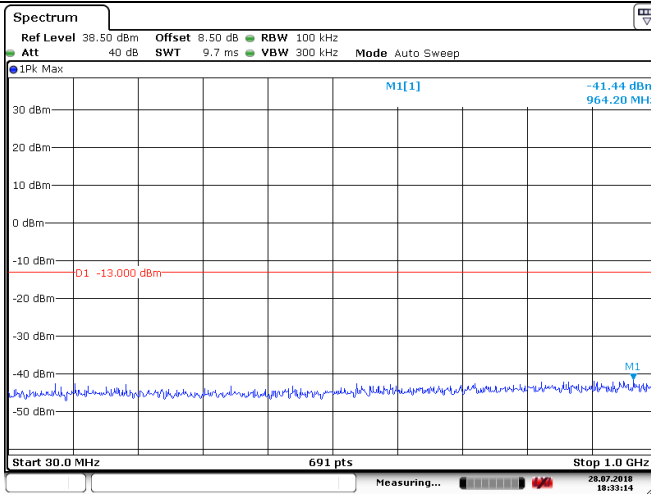


30MHz~1GHz

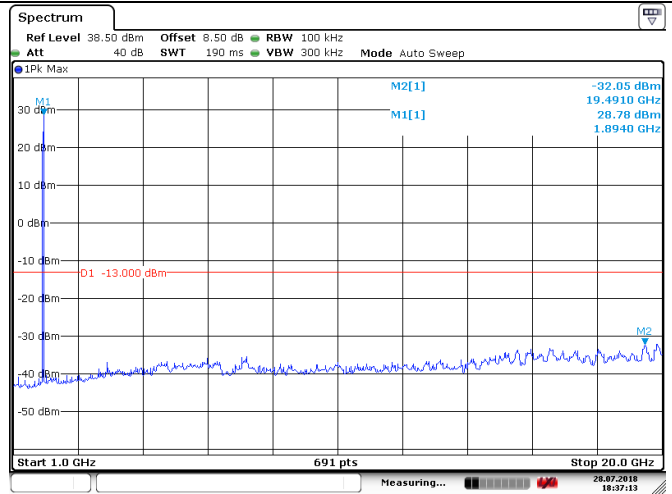


1GHz~20GHz

Middle channel

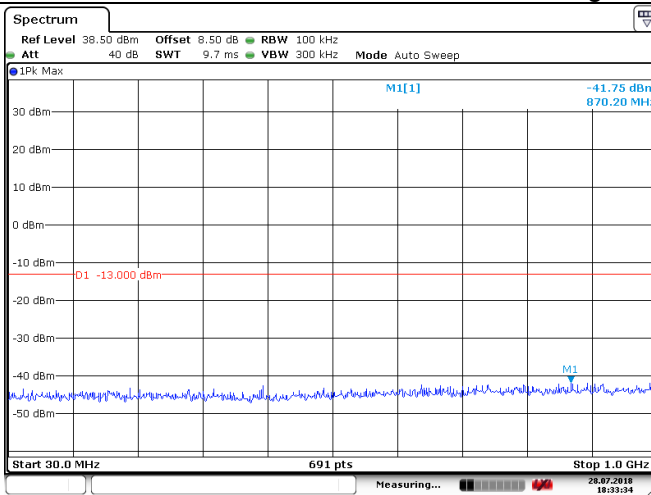


30MHz~1GHz

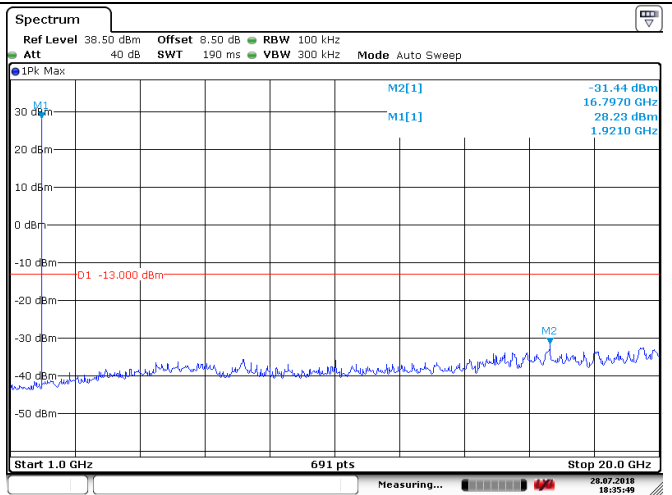


1GHz~20GHz

Highest channel



30MHz~1GHz



1GHz~20GHz

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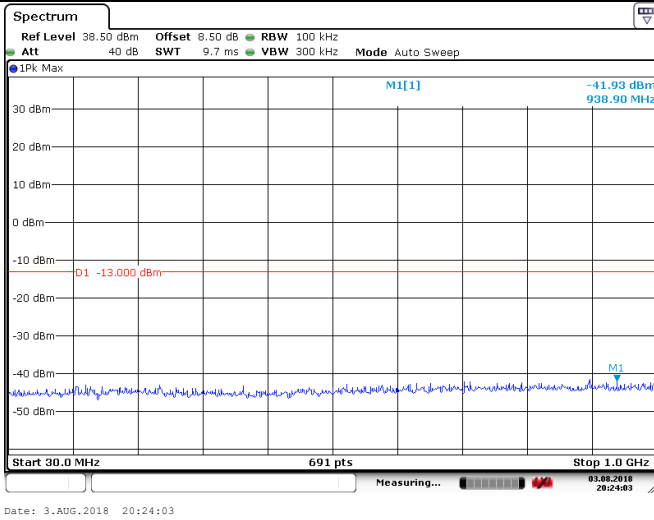
Fax: (86)755-27521011

Http://www.sz-ctc.org.cn

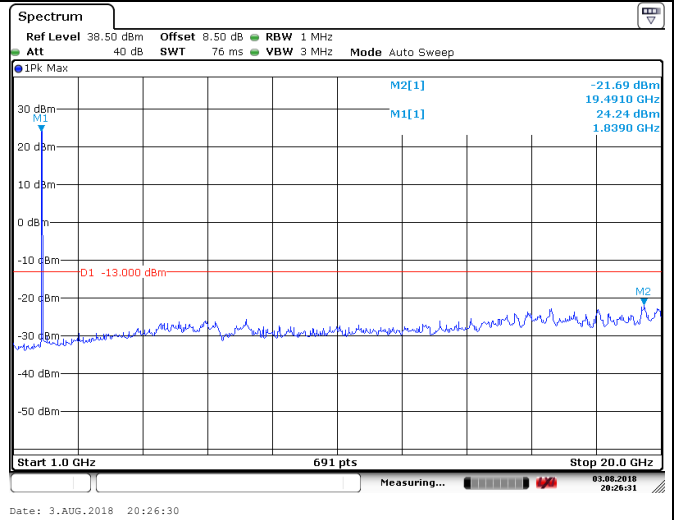


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WCDMA Band II Lowest channel

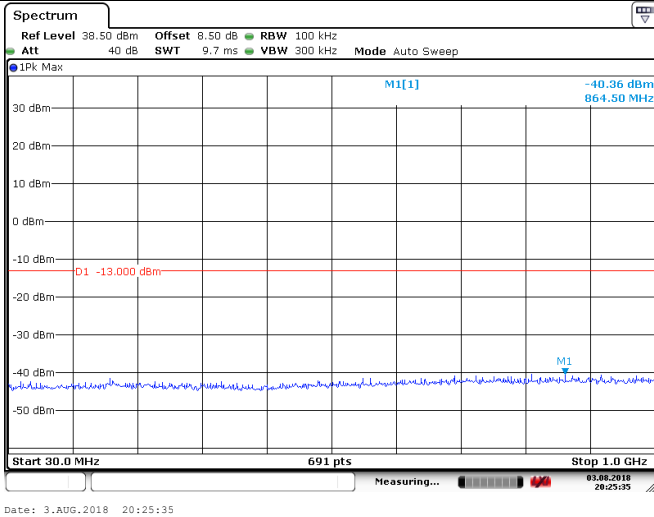


30MHz~1GHz

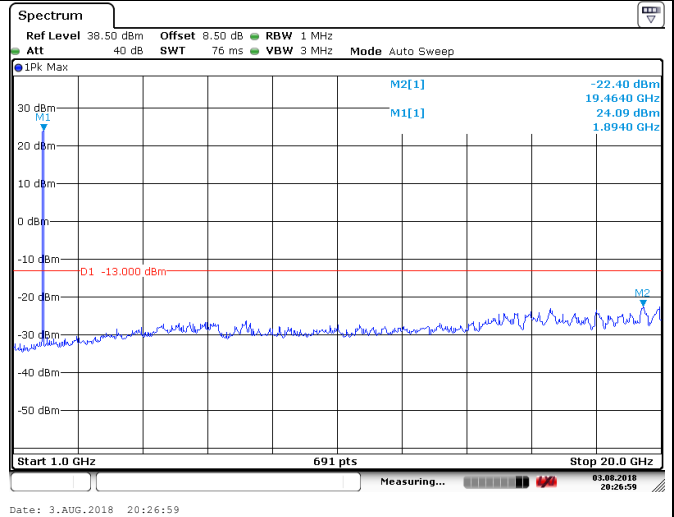


1GHz~20GHz

Middle channel

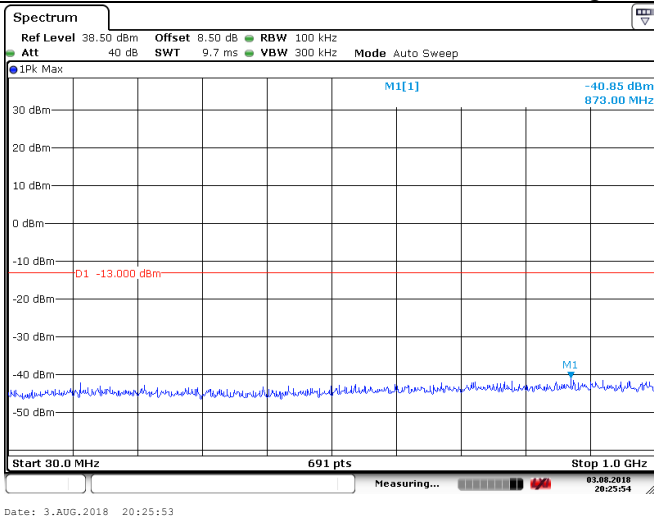


30MHz~1GHz

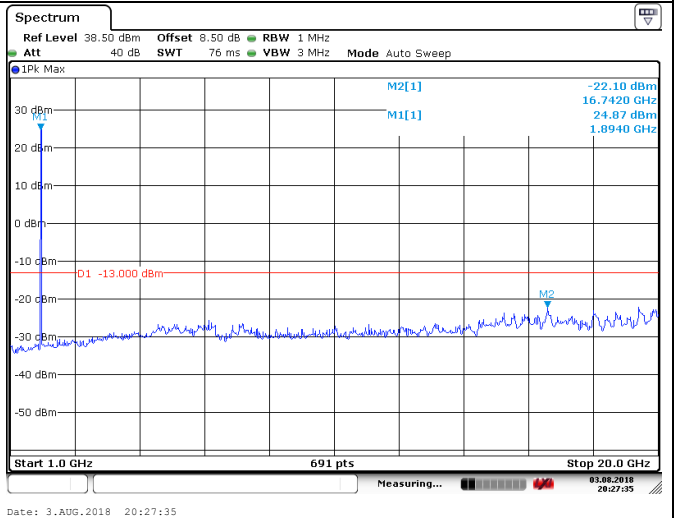


1GHz~20GHz

Highest channel

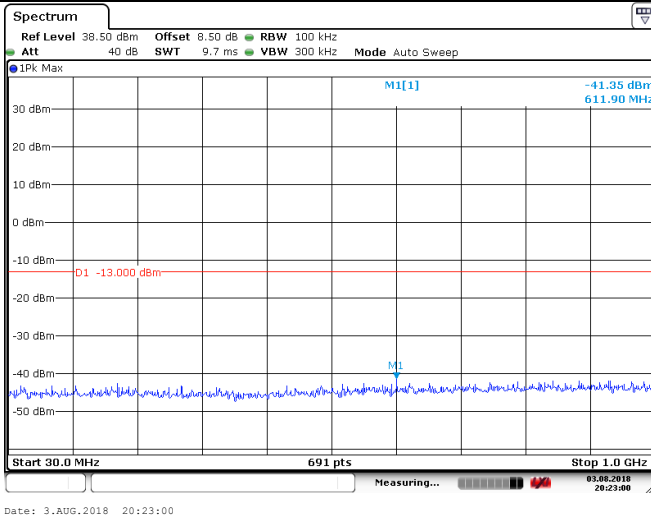


30MHz~1GHz

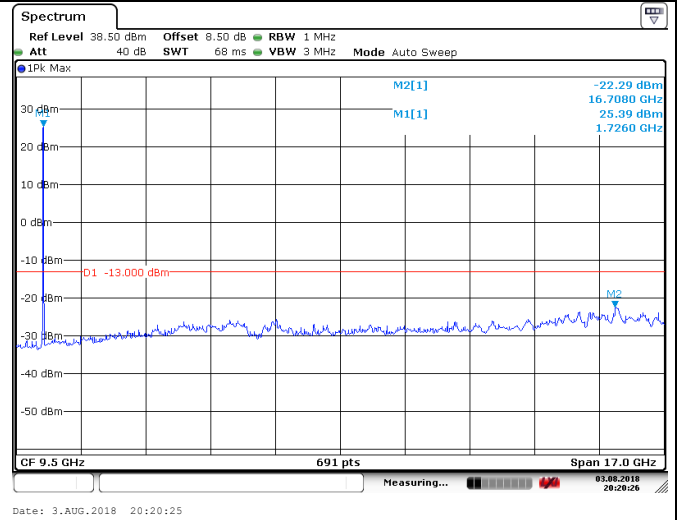


1GHz~20GHz

WCDMA Band IV Lowest channel

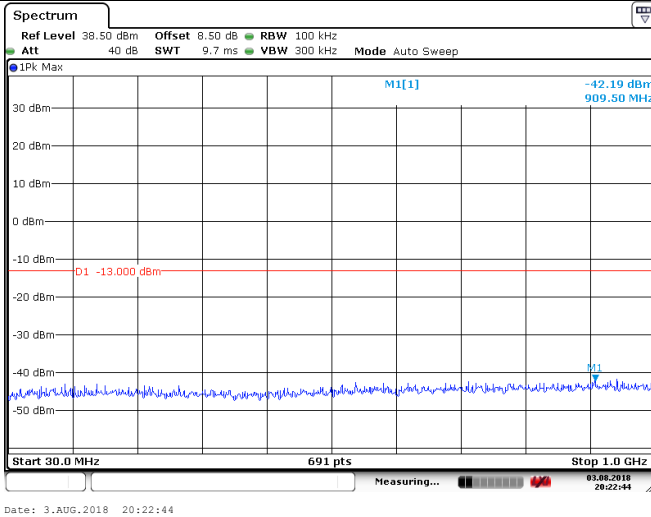


30MHz~1GHz

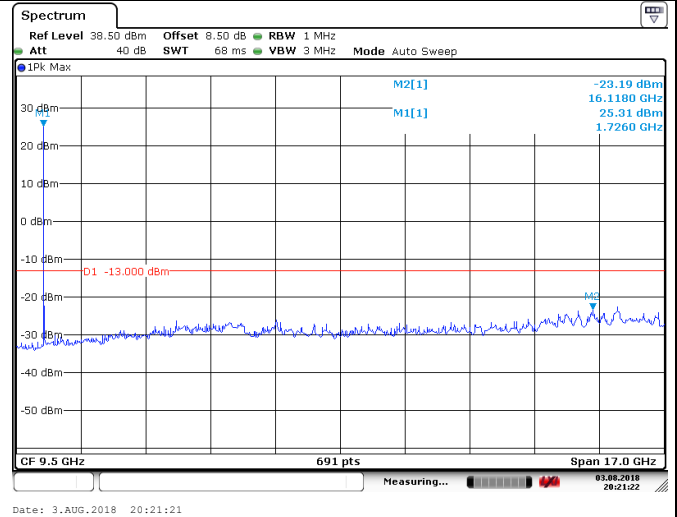


1GHz~17GHz

Middle channel

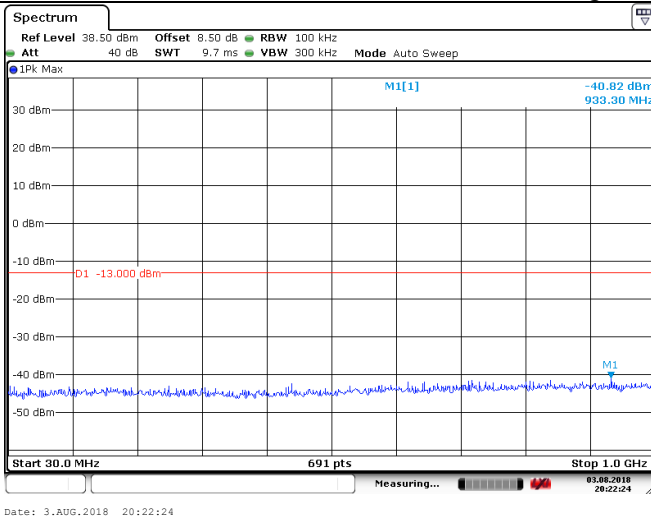


30MHz~1GHz

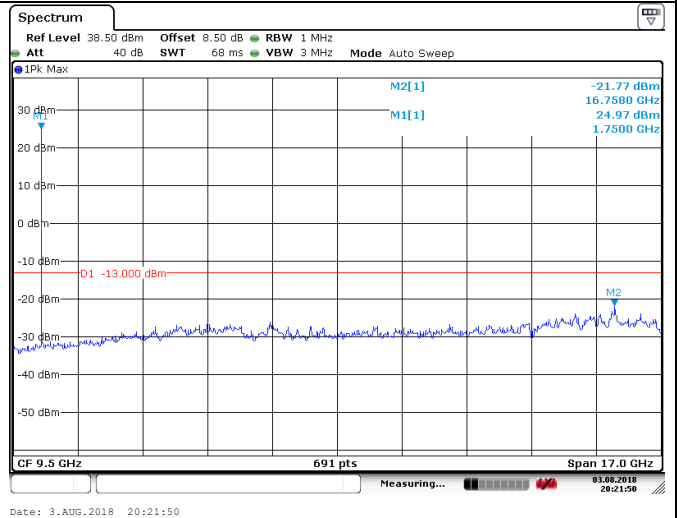


1GHz~17GHz

Highest channel

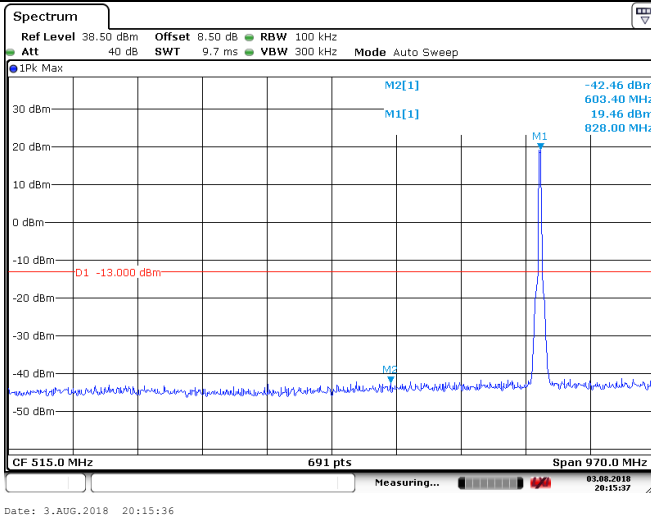


30MHz~1GHz

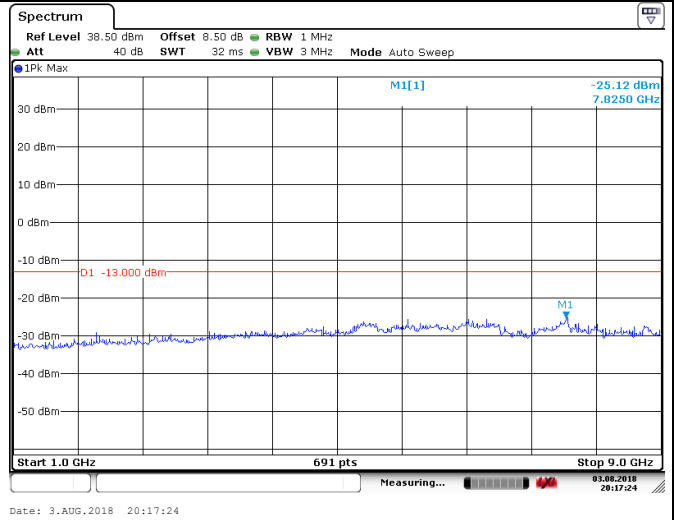


1GHz~17GHz

WCDMA Band V Lowest channel

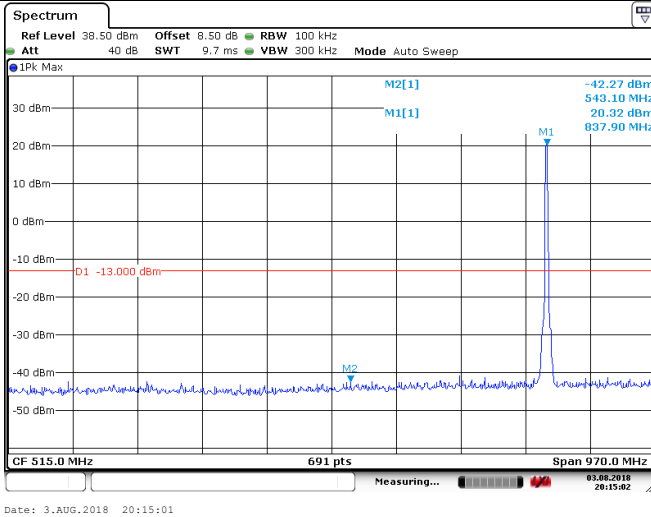


30MHz~1GHz

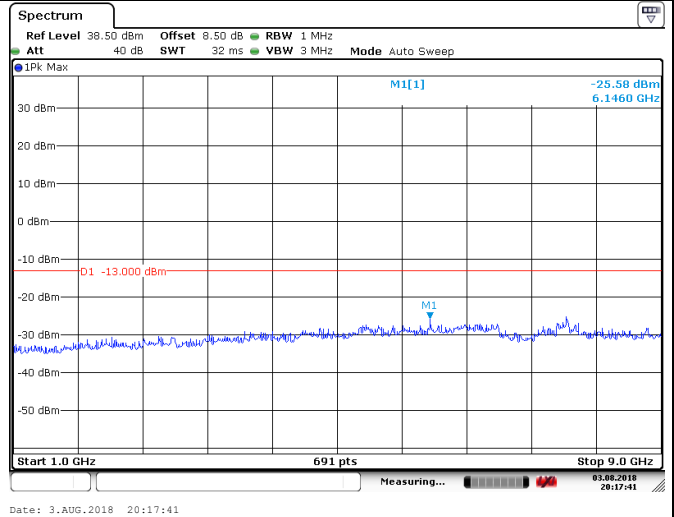


1GHz~9GHz

Middle channel

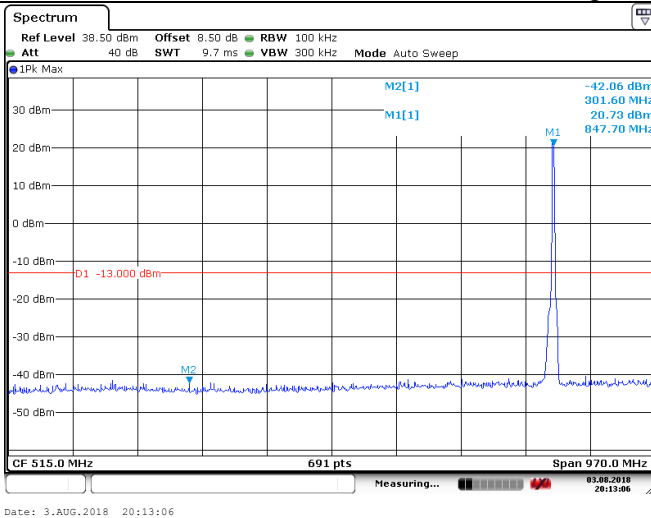


30MHz~1GHz

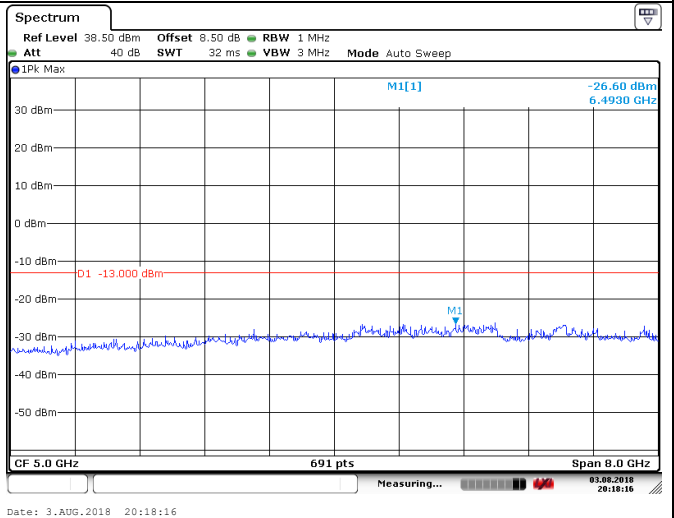


1GHz~9GHz

Highest channel



30MHz~1GHz



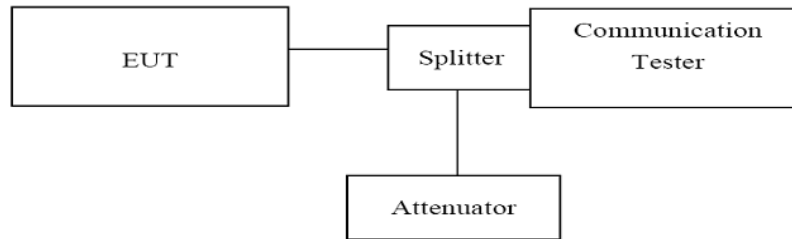
1GHz~9GHz

3.5. Receiver Spurious Emissions at Antenna Terminal

LIMIT

RSS-GEN7.1.3, Receiver-spurious emissions at any discrete frequency shall not exceed 2 nW in the band 30-1000 MHz, nor 5 nW above 1000 MHz.

TEST CONFIGURATION

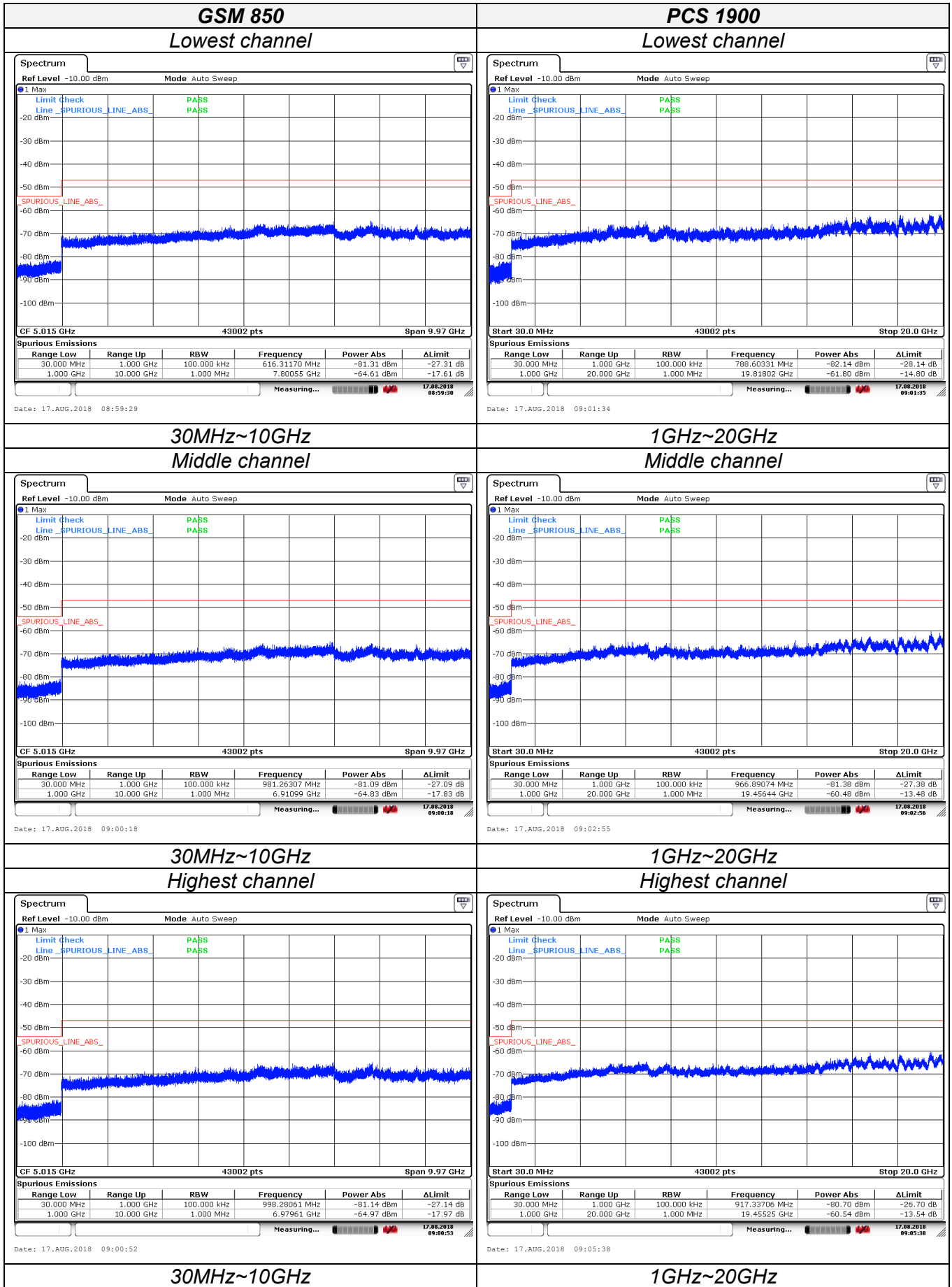


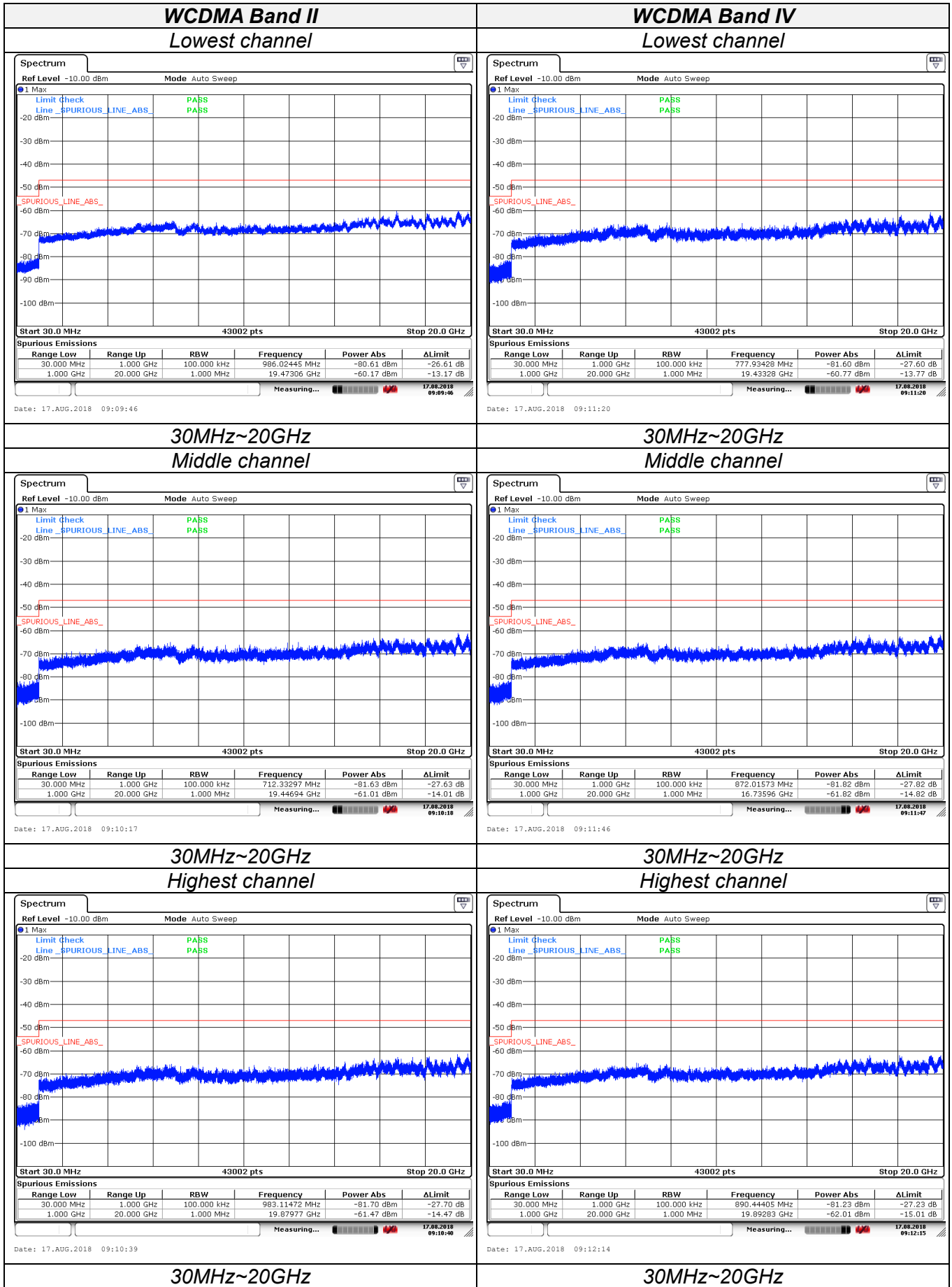
TEST PROCEDURE

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
3. Set the RBW= 100kHz, VBW =300kHz,below 1GHz
4. Set the RBW= 1MHz, VBW = 3MHz,above1GHz,
5. Start=30MHz, Stop= 10th harmonic.

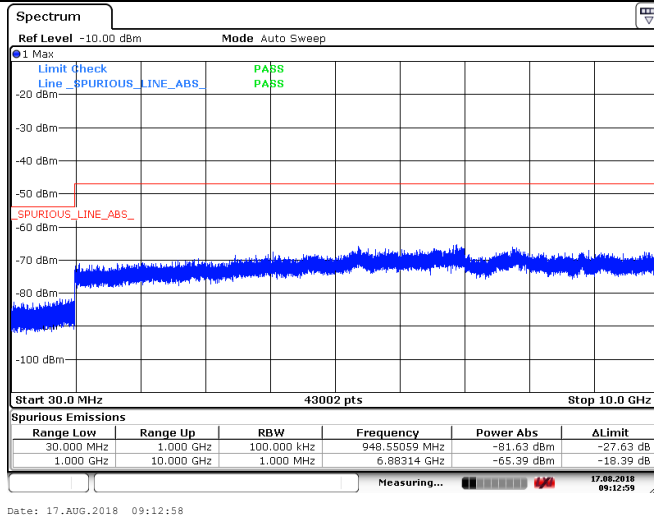
TEST RESULTS

Remark: we test all modulation type and record worst case at Voice mode.

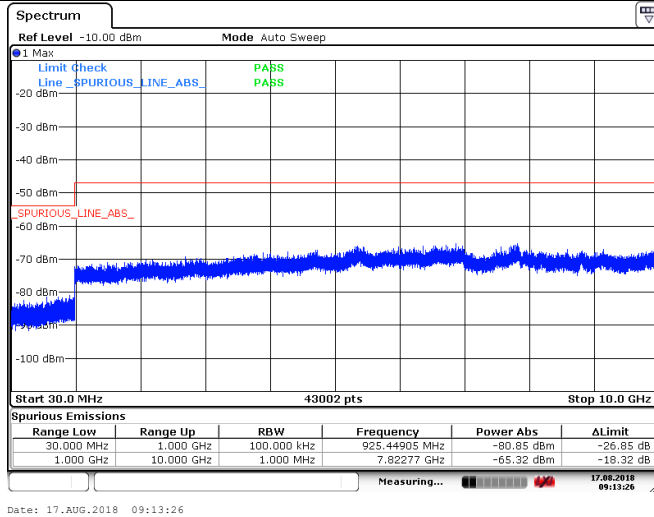




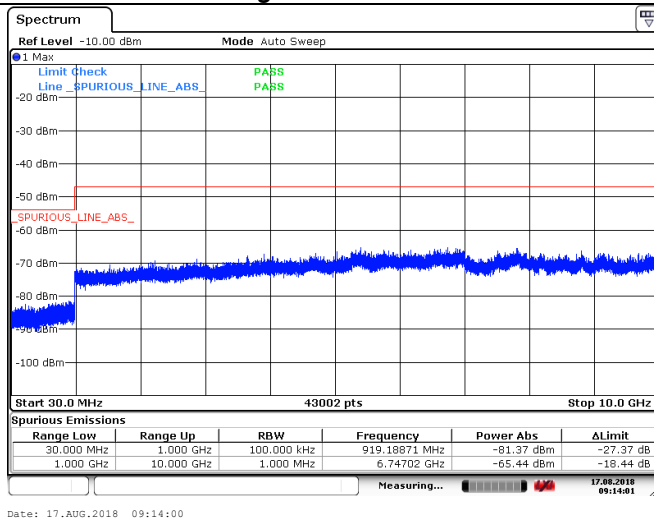
WCDMA Band V Lowest channel



30MHz~10GHz Middle channel



30MHz~10GHz Highest channel



30MHz~10GHz

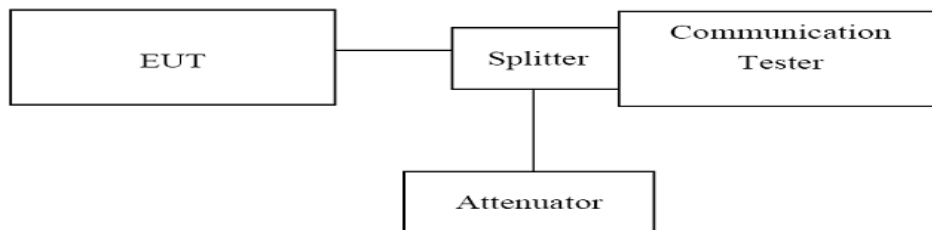
3.6. Band Edge compliance

LIMIT

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

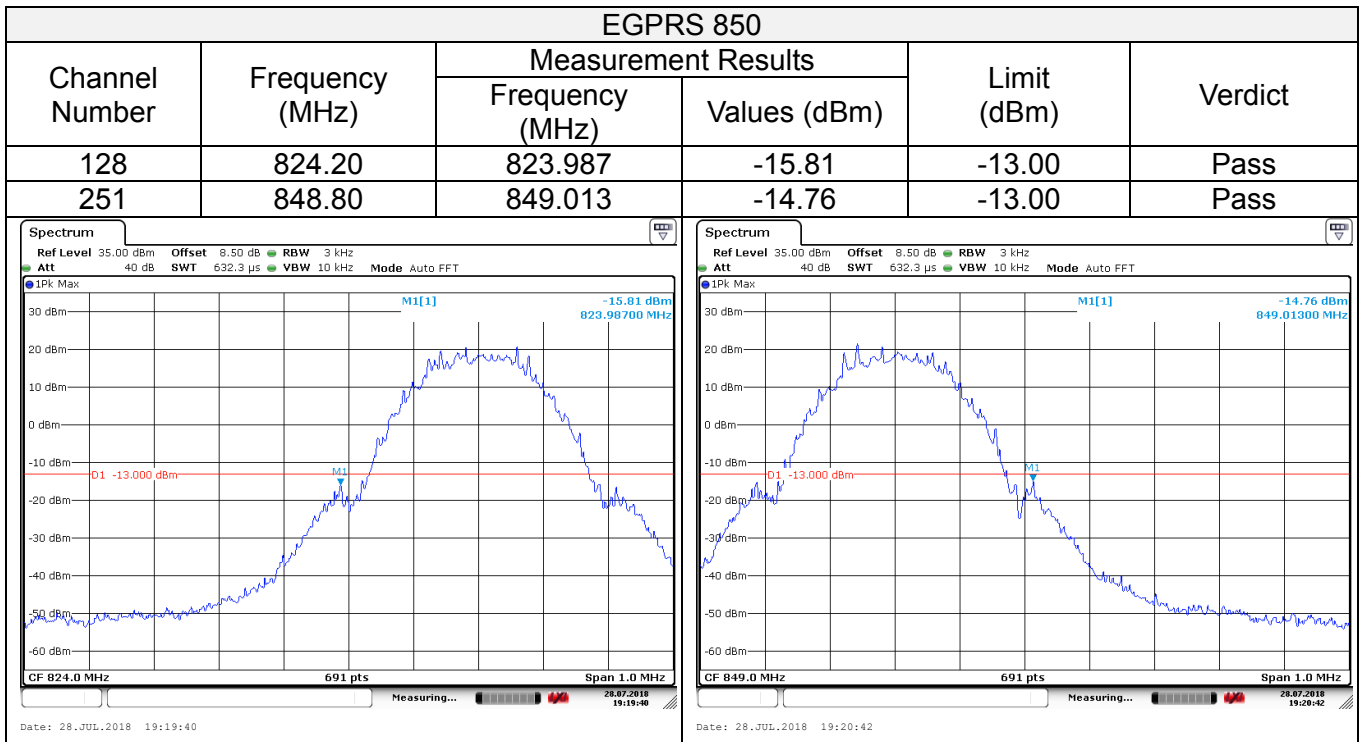
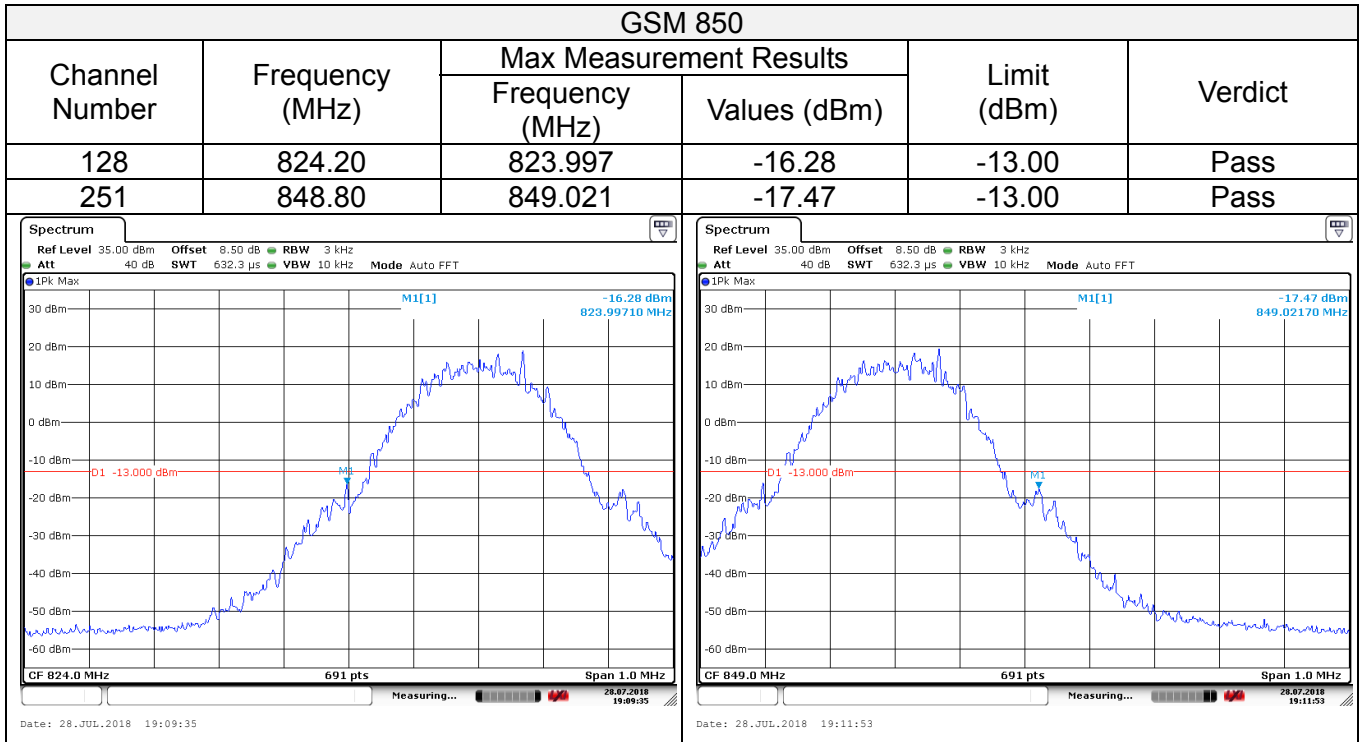
TEST CONFIGURATION

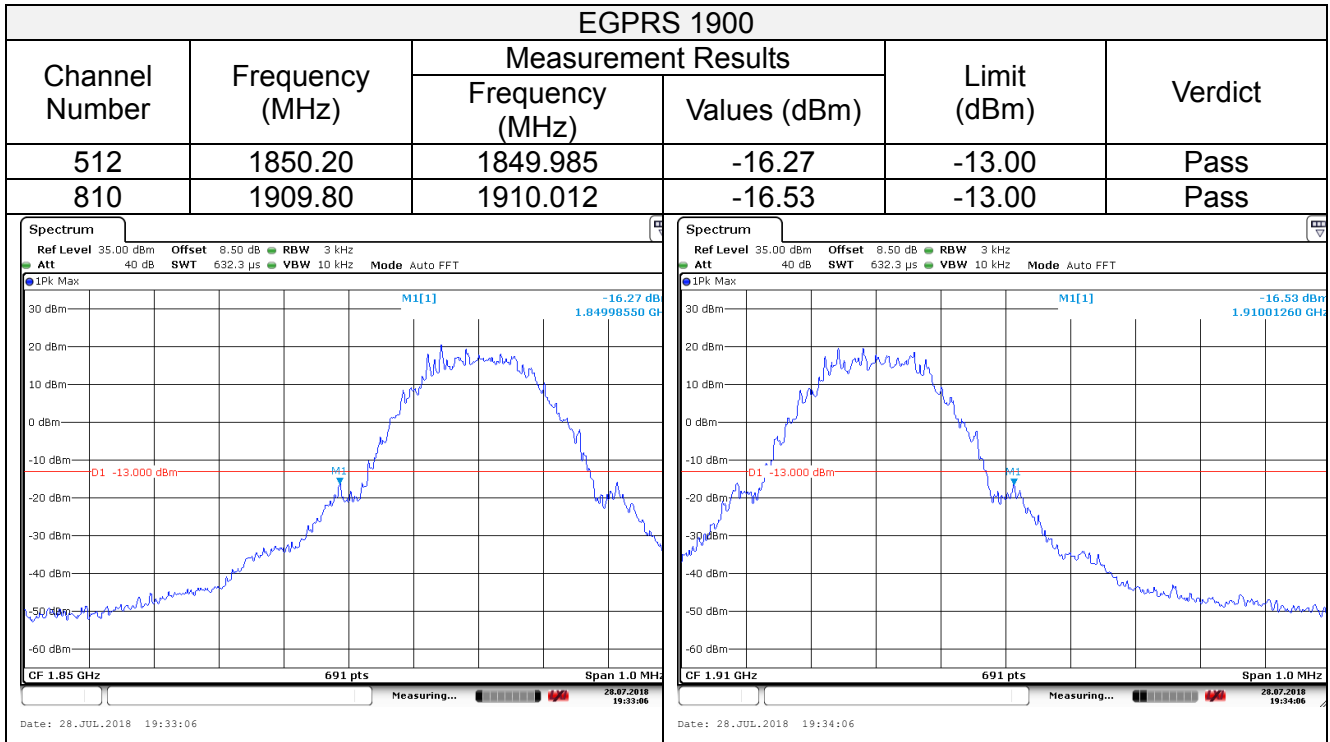
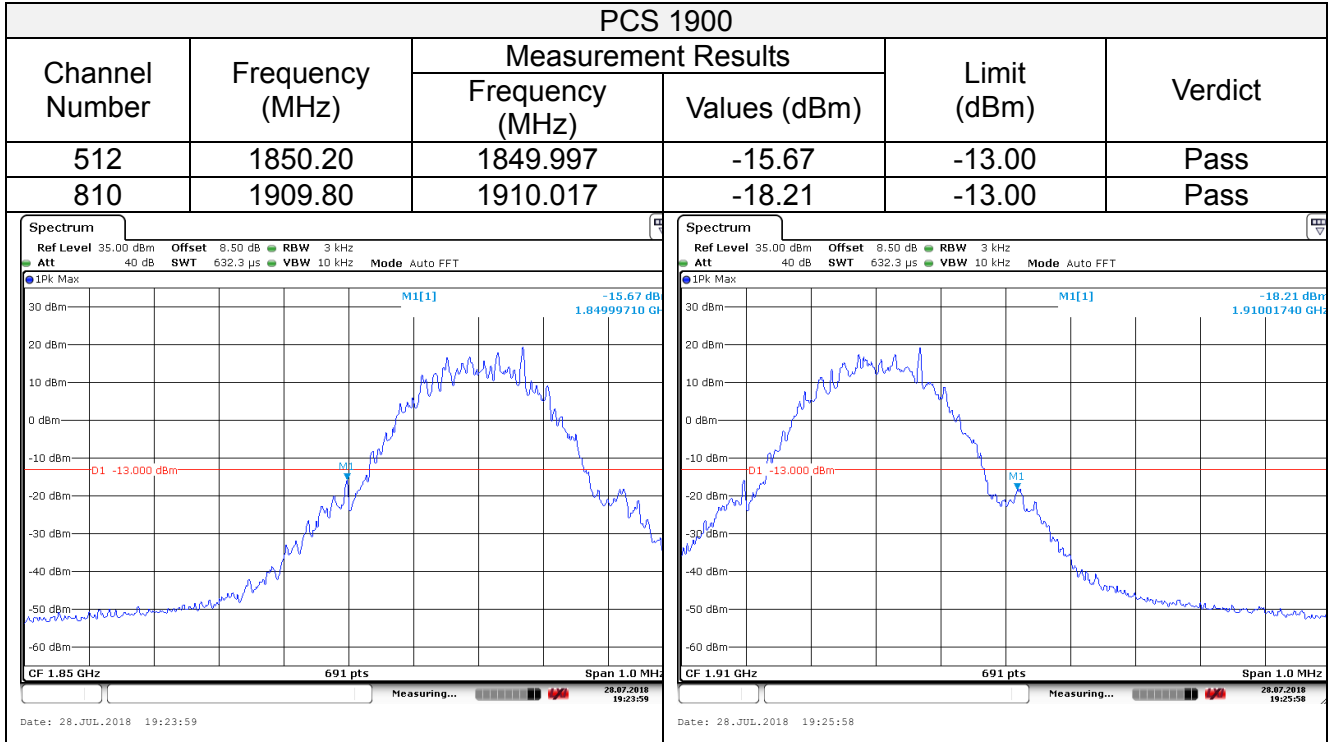


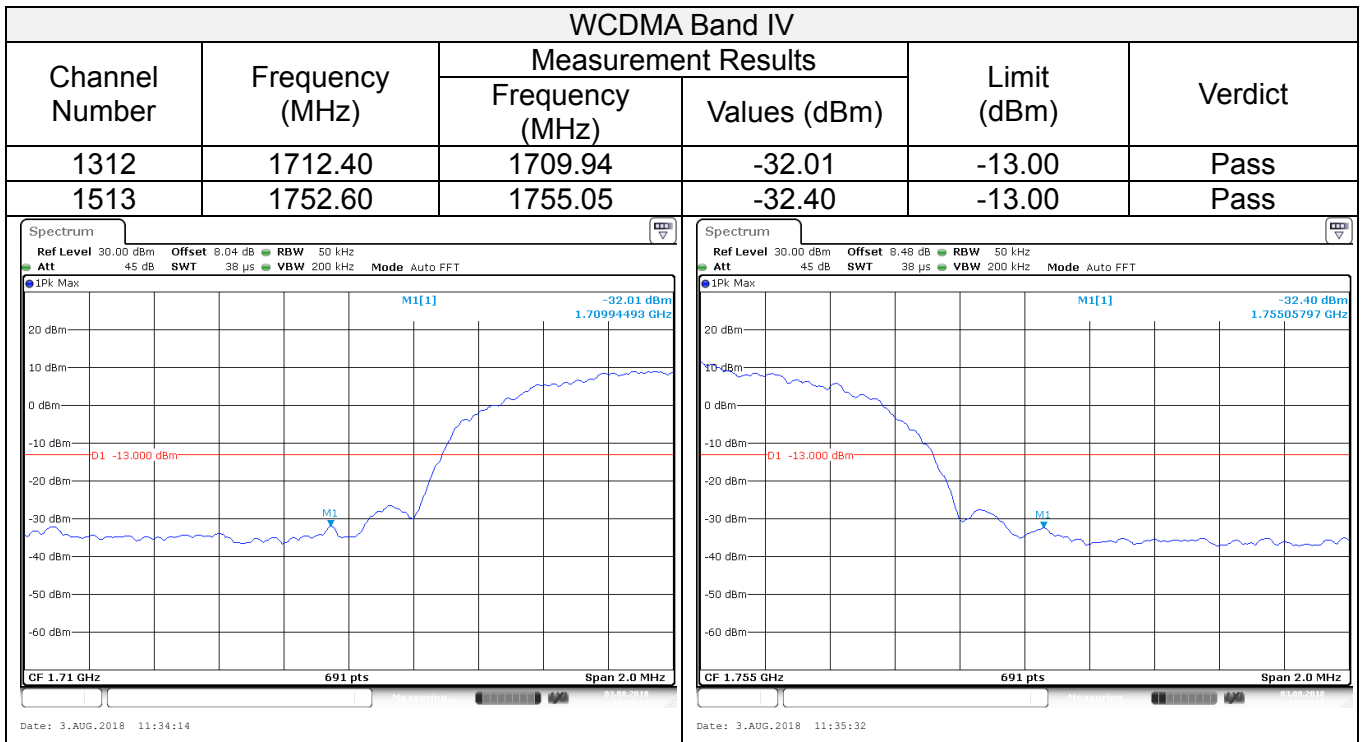
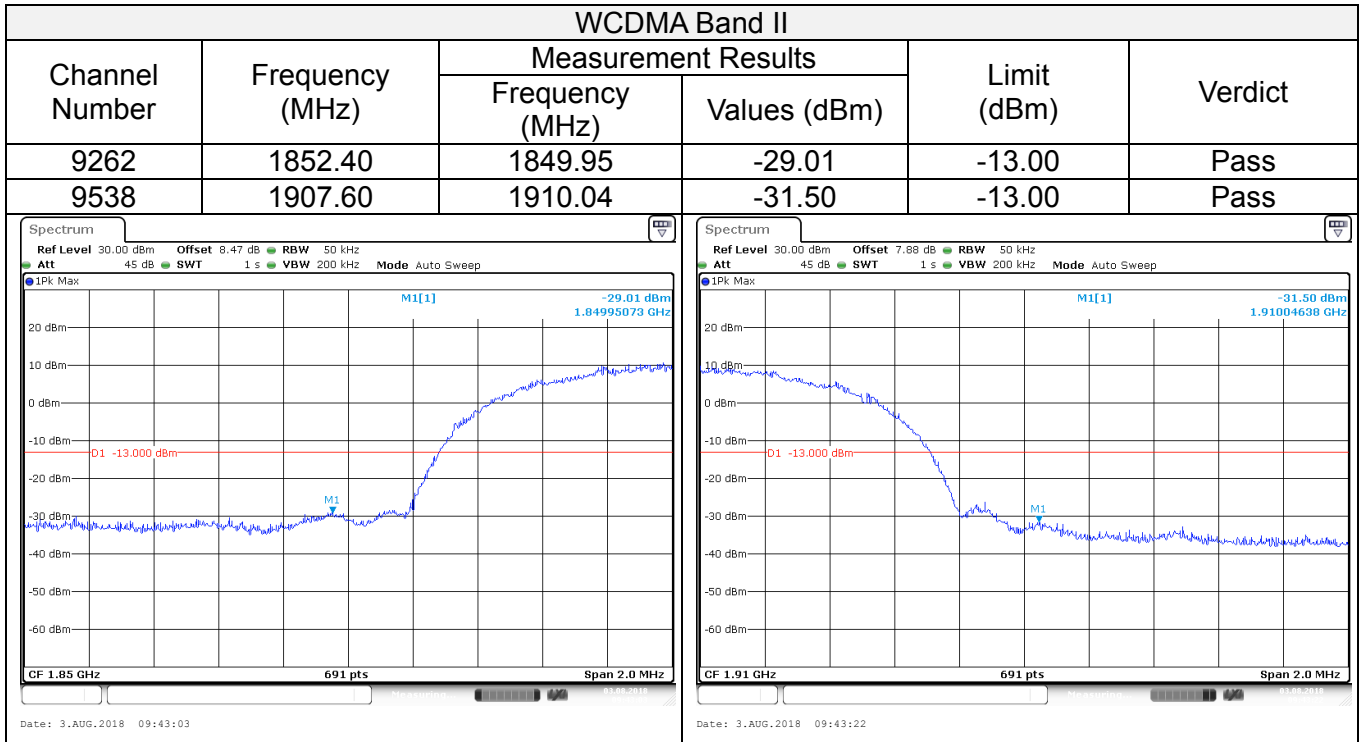
TEST PROCEDURE

6. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
7. Set the RBW=5 KHz, VBW = 50KHz, Span=1MHz Sweep time= Auto for 2G system measurement.
8. Set the RBW=50 KHz, VBW = 300KHz, Span=1MHz Sweep time= Auto for 3G system measurement.

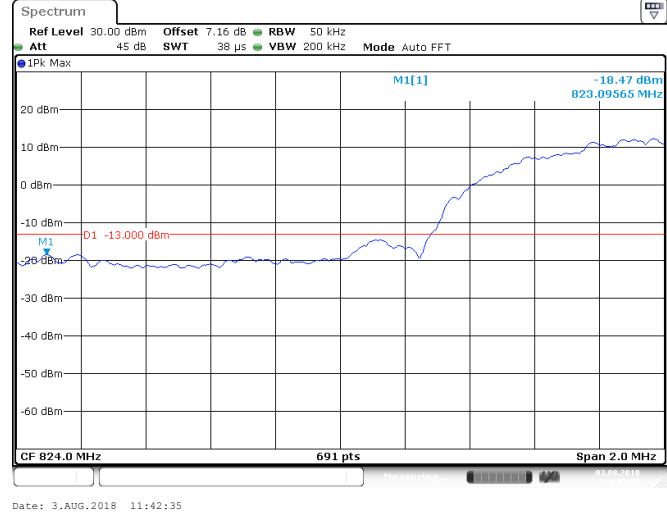
TEST RESULTS








WCDMA Band V					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
4132	826.40	823.09	-18.47	-13.00	Pass
4233	846.60	849.06	-26.69	-13.00	Pass





3.7. Radiated Power Measurement

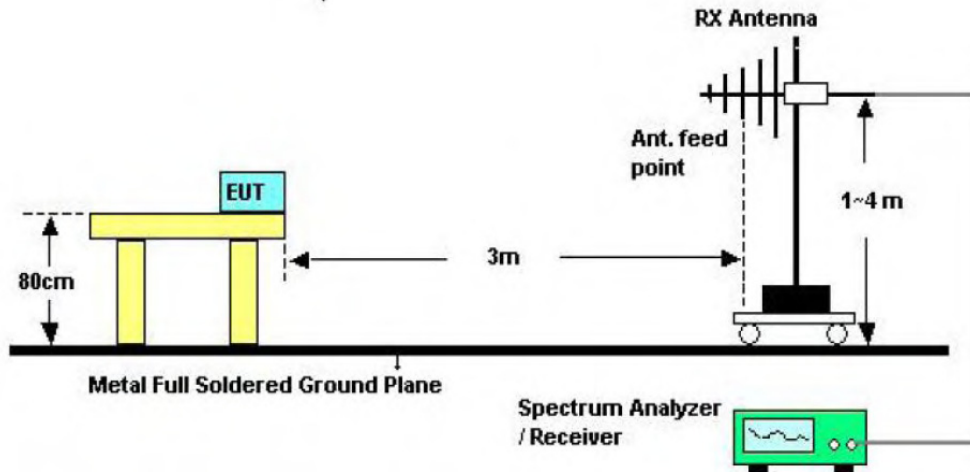
LIMIT

GSM850/WCDMA Band V: 7W ERP

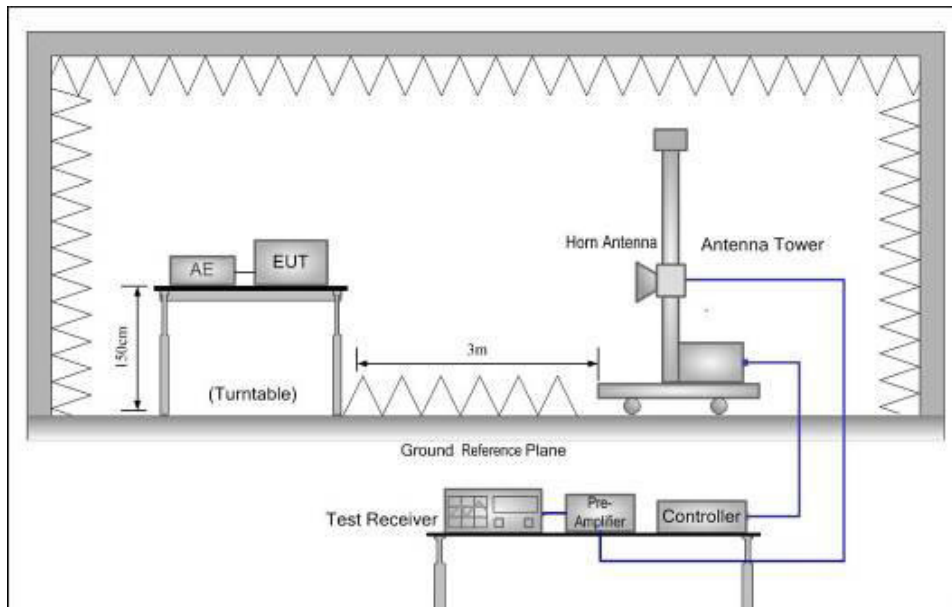
PCS1900/WCDMA Band II/WCDMA Band IV: 2W ERP

TEST CONFIGURATION

For the actual test configuration, please refer to the related Item – EUT Test Photos.



Below 1GHz



Above 1GHz

TEST PROCEDURE

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss (Pcl), the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
6. The measurement results are obtained as described below:
Power(EIRP)=PMea- PAg - Pcl + Ga
We used N5182A microwave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substitution test; The measurement results are amend as described below:
Power(EIRP)=PMea- Pcl + Ga
7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

TEST RESULTS

Remark:

1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.

Measurement Data (worst case) :

Mode	Channel	Antenna Pol.	ERP	Limit (dBm)	Result
GSM850 (GMSK)	128	V	31.36	38.45	Pass
		H	27.39		
	190	V	32.77		
		H	25.39		
	251	V	31.23		
		H	27.47		
GSM850 (GPRS)	128	V	30.84	38.45	Pass
		H	25.32		
	190	V	30.14		
		H	26.00		
	251	V	30.82		
		H	26.75		
GSM850 (EGPRS)	128	V	30.20	38.45	Pass
		H	25.19		
	190	V	30.11		
		H	26.56		
	251	V	30.08		
		H	25.58		

Mode	Channel	Antenna Pol.	EIRP	Limit (dBm)	Result
PCS1900 (GMSK)	512	V	29.04	33.00	Pass
		H	24.97		
	661	V	29.76		
		H	24.51		
	810	V	28.05		
		H	25.63		
PCS1900 (GPRS)	512	V	28.52	33.00	Pass
		H	25.38		
	661	V	28.94		
		H	24.32		
	810	V	28.30		
		H	24.15		
PCS1900 (EGPRS)	512	V	28.84	33.00	Pass
		H	24.20		
	661	V	28.36		
		H	25.03		
	810	V	28.15		
		H	25.20		

Mode	Channel	Antenna Pol.	EIRP	Limit (dBm)	Result
WCDMA Band II (QPSK)	9262	V	23.76	33.00	Pass
		H	20.98		
	9400	V	23.72		
		H	20.77		
	9538	V	23.96		
		H	20.67		

Mode	Channel	Antenna Pol.	EIRP	Limit (dBm)	Result
WCDMA Band IV (QPSK)	1312	V	23.93	33.00	Pass
		H	20.26		
	1413	V	23.25		
		H	20.45		
	1513	V	23.56		
		H	20.42		

Mode	Channel	Antenna Pol.	ERP	Limit (dBm)	Result
WCDMA Band V (QPSK)	4132	V	20.07	38.45	Pass
		H	17.39		
	4183	V	20.42		
		H	17.06		
	4233	V	20.14		
		H	17.19		

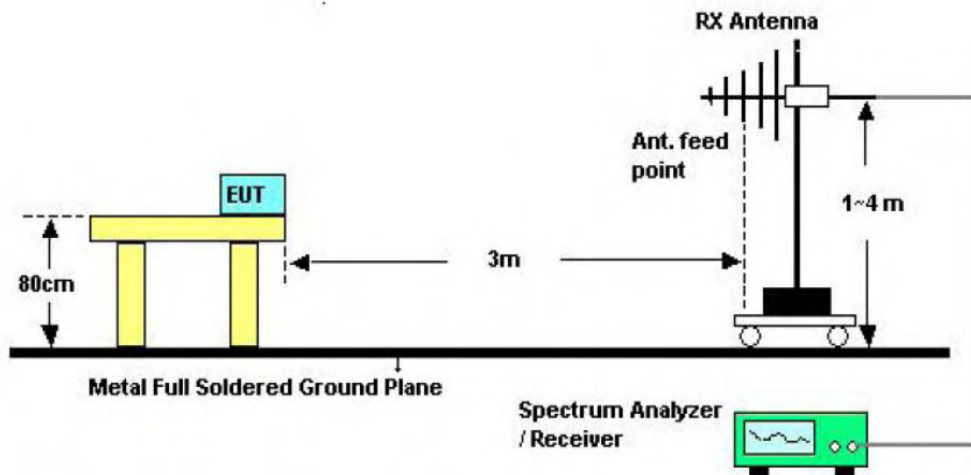
3.8. Radiated Spurious Emission

LIMIT

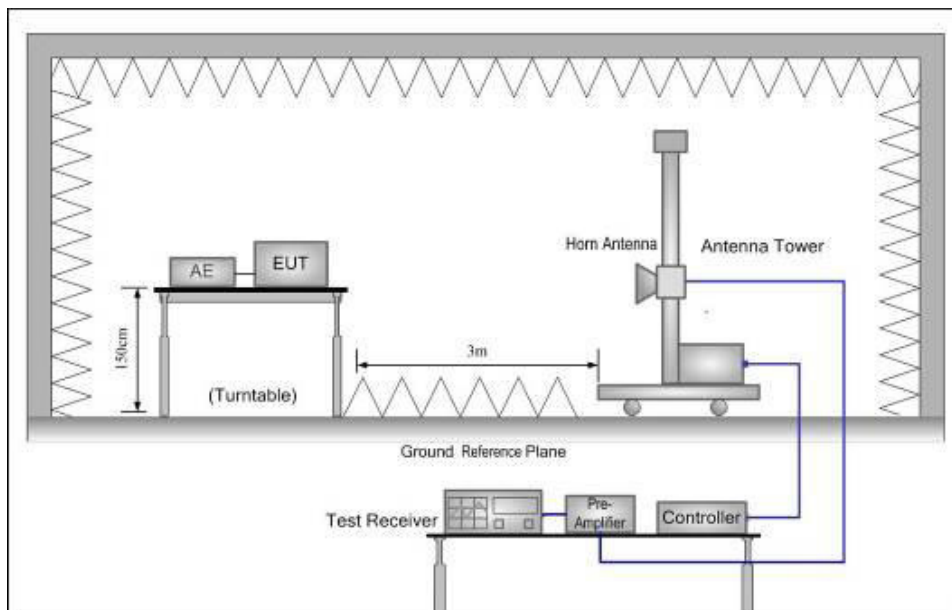
-13dBm

TEST CONFIGURATION

For the actual test configuration, please refer to the related Item – EUT Test Photos.



Below 1GHz



Above 1GHz

TEST PROCEDURE

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss (Pcl), the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAG) should be recorded after test.
6. The measurement results are obtained as described below:
Power(EIRP)=PMea- PAG - Pcl + Ga
We used SMF100A microwave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substitution test; The measurement results are amend as described below:
Power(EIRP)=PMea- Pcl + Ga
7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.
8. Test frequency range should extend to 10th harmonic of highest fundamental frequency.

TEST RESULTS

Remark:

1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "Z axis" position was the worst, and test data recorded in this report.
2. We test all modulation type and record worst case at Voice mode.
3. Above 18G test data reference to the test report No.: C180811Z01-RP2.

Measurement Data (worst case):

GSM850					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
128	1648.40	Vertical	-43.47	-13.00	Pass
	2472.60	Vertical	-48.07		
	1648.40	Horizontal	-47.88		
	2472.60	Horizontal	-53.53		
190	1673.20	Vertical	-43.67		
	2509.80	Vertical	-49.68		
	1673.20	Horizontal	-47.05		
	2509.80	Horizontal	-54.44		
251	1697.60	Vertical	-44.88		
	2546.40	Vertical	-46.30		
	1697.60	Horizontal	-44.42		
	2546.40	Horizontal	-47.40		

Remark :

- The emission levels of below 1 GHz are very lower than the limit above 10dB and not show in test report.

PCS1900					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
512	3700.40	Vertical	-46.48	-13.00	Pass
	5550.60	Vertical	-51.16		
	3700.40	Horizontal	-47.10		
	5550.60	Horizontal	-52.08		
661	3760.00	Vertical	-42.86		
	5640.00	Vertical	-51.58		
	3760.00	Horizontal	-44.91		
	5640.00	Horizontal	-53.91		
810	3819.60	Vertical	-42.55		
	5729.40	Vertical	-46.50		
	3819.60	Horizontal	-48.74		
	5729.40	Horizontal	-52.67		

Remark :

- The emission levels of below 1 GHz are very lower than the limit above 10dB and not show in test report.

WCDMA Band II					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
9262	3705.20	Vertical	-40.40	-13.00	Pass
	5557.80	Vertical	-50.42		
	3705.20	Horizontal	-47.96		
	5557.80	Horizontal	-52.99		
9400	3760.00	Vertical	-43.39		
	5640.00	Vertical	-53.34		
	3760.00	Horizontal	-43.43		
	5640.00	Horizontal	-52.69		
9538	3814.80	Vertical	-41.58		
	5722.20	Vertical	-52.12		
	3814.80	Horizontal	-42.09		
	5722.20	Horizontal	-48.24		

Remark :

- The emission levels of below 1 GHz are very lower than the limit above 10dB and not show in test report.

WCDMA Band IV					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
1312	3425.20	Vertical	-43.17	-13.00	Pass
	5137.80	Vertical	-55.74		
	3425.20	Horizontal	-48.70		
	5137.80	Horizontal	-53.65		
1413	3465.20	Vertical	-41.08		
	5197.80	Vertical	-55.07		
	3465.20	Horizontal	-49.61		
	5197.80	Horizontal	-50.32		
1513	3504.80	Vertical	-42.85		
	5257.20	Vertical	-55.29		
	3504.80	Horizontal	-44.46		
	5257.20	Horizontal	-53.58		

Remark :

- The emission levels of below 1 GHz are very lower than the limit above 10dB and not show in test report.

WCDMA Band V					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
4132	1653.20	Vertical	-41.69	-13.00	Pass
	2479.80	Vertical	-52.33		
	1653.20	Horizontal	-49.78		
	2479.80	Horizontal	-50.00		
4183	1672.80	Vertical	-44.10		
	2509.20	Vertical	-51.76		
	1672.80	Horizontal	-46.12		
	2509.20	Horizontal	-51.15		
4233	1692.80	Vertical	-38.94		
	2539.20	Vertical	-54.48		
	1692.80	Horizontal	-45.91		
	2539.20	Horizontal	-51.99		

Remark :

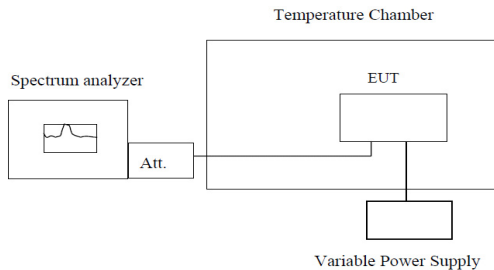
1. The emission levels of below 1 GHz are very lower than the limit above 10dB and not show in test report.

3.9. Frequency stability

LIMIT

Cellular Band: $\pm 2.5\text{ppm}$ PCS Band: Within the authorized frequency block

TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

TEST PROCEDURE

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.
7. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

TEST RESULTS

Remark: we test all modulation type and record worst case at Voice mode

1. Temperature measurement:

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	-142	-0.17	±2.5	Pass
	-20	121	0.15		
	-10	216	0.26		
	0	-204	-0.24		
	10	246	0.30		
	20	-265	-0.32		
	30	153	0.18		
	40	-231	-0.28		
	50	324	0.39		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	180	0.10	±2.5	Pass
	-20	-141	-0.08		
	-10	220	0.12		
	0	-148	-0.08		
	10	212	0.11		
	20	249	0.13		
	30	-164	-0.09		
	40	212	0.11		
	50	-346	-0.18		

Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	329	0.17	±2.5	Pass
	-20	-200	-0.11		
	-10	222	0.12		
	0	201	0.11		
	10	-244	-0.13		
	20	206	0.11		
	30	145	0.08		
	40	-216	-0.12		
	50	202	0.11		
Reference Frequency: WCDMA Band IV Middle channel=1413 channel=1732.6MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Voltage (V)	Temperature (°C)		
3.85	-30	-103	-0.06	±2.5	Pass
	-20	130	0.08		
	-10	205	0.12		
	0	224	0.13		
	10	-246	-0.14		
	20	254	0.15		
	30	179	0.10		
	40	-212	-0.12		
	50	-327	-0.19		
Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	-104	-0.12	±2.5	Pass
	-20	144	0.18		
	-10	191	0.22		
	0	-220	-0.26		
	10	203	0.24		
	20	296	0.35		
	30	-156	-0.19		
	40	225	0.27		
	50	-309	-0.37		

2. Voltage measurement:

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Temperature (°C)	Voltage (V)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.42	-254	-0.30	±2.5	Pass
	3.85	132	0.16		
	3.27	225	0.27		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Temperature (°C)	Voltage (V)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.42	243	0.13	±2.5	Pass
	3.85	216	0.12		
	3.27	195	0.10		
Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz					
Temperature (°C)	Voltage (V)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.42	141	0.07	±2.5	Pass
	3.85	-258	-0.14		
	3.27	153	0.08		
Reference Frequency: WCDMA Band IV Middle channel=1413 channel=1732.6MHz					
Temperature (°C)	Voltage (V)	Frequency error	Limit (ppm)	Limit (ppm)	Result
		Hz	ppm		
25	4.42	-224	-0.13	±2.5	Pass
	3.85	285	0.16		
	3.27	-171	-0.10		
Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Temperature (°C)	Voltage (V)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.42	293	0.35	±2.5	Pass
	3.85	281	0.34		
	3.27	-169	-0.20		

4. EUT TEST PHOTOS

Reference to the document No.: Test Photographs 2.

5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Reference to the document No.: External Photographs and Internal Photographs.

*****THE END*****