CTC Laboratories, Inc.

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TEST REPORT

Report No. ·····:	**CTC20211136E13**
FCC ID·····:	**2AC88-GLMR21A02**
Applicant·····:	**HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED**
Address·····:	Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, Hong Kong
Manufacturer·····:	HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED
Address·····:	Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, Hong Kong
Product Name·····:	**4G LTE Wireless Router**
Trade Mark·····:	GlocalMe
Model/Type reference·····:	GLMR21A02
Listed Model(s) ·····:	N/A
Standard·····:	**FCC CFR47 PART 22H, 24E, 27L AND 90S**
Date of receipt of test sample.:	Jul. 01, 2021
Date of testing……..:	Jul. 02, 2021 ~ Jul. 28, 2021
Date of issue……....:	Jul. 29, 2021
Result……:	**PASS**

Compiled by: (Printed name+signature)	Terry Su	
Supervised by: (Printed name+signature)	Miller Ma	
Approved by: (Printed name+signature)	Walter Chen	

Testing Laboratory Name…:	**CTC Laboratories, Inc.**
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 ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
FCC Rules Part 22: PRIVATE LAND MOBILE RADIO SERVICES.
FCC Rules Part 24: PUBLIC MOBILE SERVICES
FCC Rules Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
FCC Rules Part 90S: Regulations Governing Licensing and Use of Frequencies in the 806-824, 851-869, 896-901, and 935-940 MHz Bands
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	Jul. 29, 2021	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	Alicia Liu
Peak-to-Average Ratio	Part 24.232 Part 27.50	RSS-132(5.4) RSS-133(6.4)	Pass	Alicia Liu
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	Alicia Liu
Band Edge	Part 2.1051 Part 22.917 Part 24.238 Part 27.53	RSS-132(5.5) RSS-133(6.5)	Pass	Alicia Liu
Conducted Spurious Emissions	Part 2.1051 Part 22.917 Part 24.238 Part 27.53	RSS-132(5.5) RSS-133(6.5)	Pass	Alicia Liu
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	Alicia Liu
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	Alicia Liu
ERP and EIRP	Part 22.913(a) Part 24.232(b) Part 27.50	RSS-132(5.4) RSS-133(6.4)	Pass	Alicia Liu
Radiated Spurious Emissions	Part 2.1053 Part 22.917 Part 24.238 Part 27.53	RSS-132(5.5) RSS-133(6.5)	Pass	Alicia Liu

Note: The measurement uncertainty is not included in the test result.
The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, Part 22, Part 24, Part 27, and Part 90, FCC KDB 971168 D01 v03r01/ D02 v02r01, KDB 412172 D01 v01r01, ANSI C63.26:2015, IC RSS-132,RSS-133 and RSS-139.

1.4. Test Facility

Address of the report laboratory

CTC Laboratories, Inc.

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

Laboratory accreditation

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

CNAS-Lab Code: L5365

CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation. Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025:2017 General Requirements) t he Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in th e identified field of testing.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. 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 inour fi les. Registration 951311, Aug 26, 2017.

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 TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. 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 CTC Laboratories, Inc. 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)

Note: (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:	20°C-25°C
Relative Humidity:	50 %-55 %
Air Pressure:	101kPa

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
Manufacturer:	HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED
Address:	Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, Hong Kong
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:	4G LTE Wireless Router
Trade Mark:	GlocalMe
Model/Type reference:	GLMR21A02
Listed Model(s):	N/A
Power supply:	12Vdc/2A from AC/DC Adapter
Adapter model:	KA2401A-1202000US Input: 100-240V~ 50/60Hz 0.65A Max Output: 12Vdc/2A
Hardware version:	R4P-MAIN-VA
Software version:	UCLKO_202107261814
GSM	
Operation Band:	GPRS/EGPRS850: UL: 824MHz~849MHz, DL: 869MHz~894MHz GPRS/EGPRS1900: UL: 1850MHz~1910, DL: 1930MHz~1990MHz
Supported Type:	GPRS/EGPRS
Modulation Type:	GMSK for GPRS, 8PSK for EGPRS
Antenna Type:	FPC Antenna
Antenna Gain:	Main Antenna: GPRS/EDGE850:1.75dBi Max GPRS/EDGE1900: 2.23dBi Max
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:	FPC Antenna
Antenna Gain:	Main Antenna: WCDMA II: 2.23dBi Max WCDMA IV: 2.90dBi Max WCDMA V: 1.75dBi Max

2.3. Description of Test Modes and Test Frequency

The EUT has been tested under typical operating condition. The CMW500 used to control the EUT staying in continuous transmitting and receiving mode for testing.

Test Frequency:

GPRS/EDGE850		GPRS/EDGE1900	
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	Dec. 27, 2020
2	High pass filter	Compliance Direction systems	BSU-6	34202	Dec. 27, 2020
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec. 27, 2020
4	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4181	Dec. 27, 2020
5	Spectrum Analyzer	HP	8563E	02052	Dec. 27, 2020
6	Horn Antenna	Schwarzbeck	BBHA 9120D	648	Dec. 27, 2020
7	Horn Antenna	Schwarzbeck	BBHA 9120D	649	Dec. 27, 2020
8	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Dec. 27, 2020
9	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25842	Dec. 27, 2020
10	Pre-Amplifier	HP	8447D	1937A03050	Dec. 27, 2020
11	Pre-Amplifier	EMCI	EMC051835	980075	Dec. 27, 2020
12	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 27, 2020
13	Signal Generator	Agilent	N5182A	1019356	Dec. 27, 2020
14	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec. 27, 2020
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	Dec. 27, 2020
19	Cable Above 1GHz	Hubersuhner	SUCOFLEX102	DA1580	Dec. 27, 2020

Output Power(Conducted) & Occupied Bandwidth & Emission Bandwidth & Band Edge Compliance & Conducted Spurious Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec. 27, 2020
2	Spectrum Analyzer	Rohde & Schwarz	FSU	100105	Dec. 27, 2020
3	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2021
4	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 27, 2020
5	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	Dec. 27, 2020
6	RF Connection Cable	Chengdu E-Microwave	---	---	Dec. 27, 2020
7	Attenuator	Chengdu E-Microwave	EMCAXX-10RNZ-3	---	Dec. 27, 2020

Frequency Stability					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec. 27, 2020
2	Spectrum Analyzer	Rohde & Schwarz	FSU	100105	Dec. 27, 2020

3	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2021
4	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 27, 2020
5	Climate Chamber	ESPEC	EL-10KA	05107008	Dec. 27, 2020

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

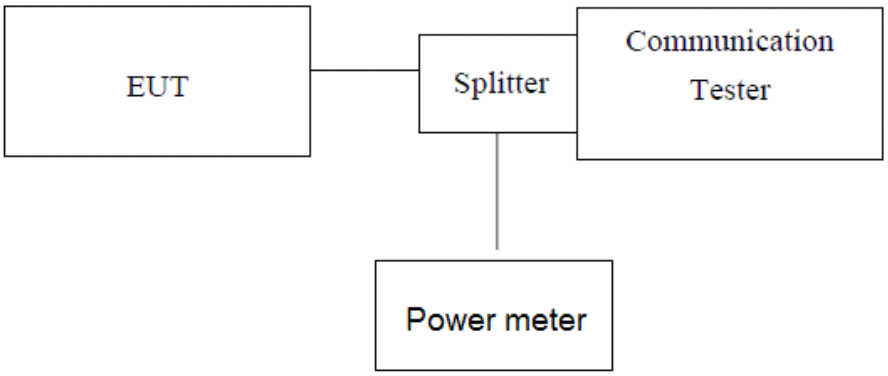
3.1. Conducted Output Power

LIMIT

FCC: §2.1046, §22.913, §24.232, §27.50 and §90.635

IC: RSS132§5.4; RSS133§6.4 and RSS139§6.5.

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
GPRS (GMSK)	1TXslot	36.72	36.60	36.56
	2TXslots	35.17	35.26	35.38
	3TXslots	33.22	33.02	33.15
	4TXslots	30.77	31.04	31.21
EGPRS (8PSK)	1TXslot	30.64	30.47	30.51
	2TXslots	30.43	30.41	30.43
	3TXslots	28.69	28.65	28.69
	4TXslots	26.53	26.55	26.57

GSM1900		Conducted Power (dBm)		
		CH512	CH661	CH810
		1850.2MHz	1880.0MHz	1909.8MHz
GPRS (GMSK)	1TXslot	32.73	32.69	32.55
	2TXslots	32.00	31.64	31.90
	3TXslots	30.82	30.47	30.57
	4TXslots	28.99	29.29	28.83
EGPRS (8PSK)	1TXslot	29.45	28.98	28.76
	2TXslots	27.93	27.49	27.27
	3TXslots	26.01	25.59	25.33
	4TXslots	23.81	23.37	23.10

WCDMA Band II		Conducted Power (dBm)		
		CH9262	CH9400	CH9538
		1852.40	1880.00	1907.60
RMC 12.2K		24.39	24.60	24.43
HSDPA	Subtest-1	24.48	24.71	24.56
	Subtest-2	24.31	24.56	24.37
	Subtest-3	24.40	24.60	24.50
	Subtest-4	24.30	24.55	24.43
HSUPA	Subtest-1	23.16	23.40	23.32
	Subtest-2	22.55	22.40	22.29
	Subtest-3	22.30	22.54	22.51
	Subtest-4	22.76	22.94	22.26
	Subtest-5	23.54	23.73	23.64

WCDMA Band IV		Conducted Power (dBm)		
		CH1312	CH1413	CH1513
		1712.40	1732.60	1752.60
RMC 12.2K		23.83	23.88	24.01
HSDPA	Subtest-1	24.12	24.09	24.27
	Subtest-2	24.05	24.14	24.06
	Subtest-3	23.64	23.64	23.77
	Subtest-4	23.66	23.65	23.76
HSUPA	Subtest-1	23.62	23.71	23.77
	Subtest-2	22.44	22.62	22.71
	Subtest-3	22.08	22.91	22.89
	Subtest-4	22.92	23.34	23.29
	Subtest-5	24.19	24.09	24.15

WCDMA Band V		Conducted Power (dBm)		
		CH4132	CH4182	CH4233
		826.40	836.40	846.60
RMC 12.2K		24.00	23.95	23.96
HSDPA	Subtest-1	24.19	24.18	24.25
	Subtest-2	22.43	24.15	24.12
	Subtest-3	23.71	23.67	23.65
	Subtest-4	23.70	23.72	23.62
HSUPA	Subtest-1	23.69	23.57	23.66
	Subtest-2	22.90	22.46	22.39
	Subtest-3	22.73	22.59	22.15
	Subtest-4	23.30	23.11	22.93
	Subtest-5	23.95	23.93	23.90

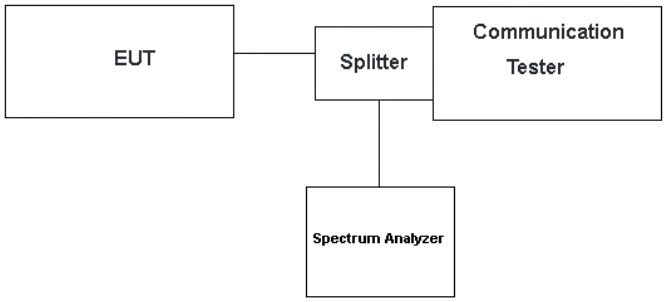
3.2. Peak-to-Average Ratio

LIMIT

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

TEST CONFIGURATION

- For Peak-to-Average Ratio



TEST PROCEDURE

- For Peak-to-Average Ratio

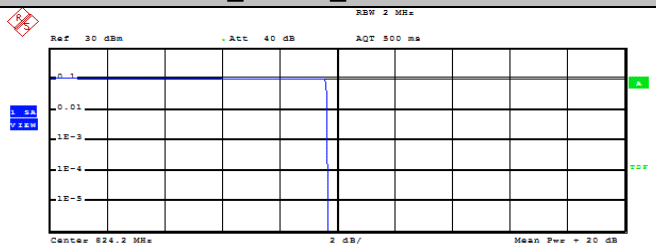
1. The testing follows FCC KDB 971168 v02r02 Section 5.7.1.
2. The EUT was connected to spectrum and communication tester via a splitter
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyser.
4. The highest RF powers were measured and recorded the maximum PAPR level 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 GPRS	128	824.20	9.68	13	PASS
	190	836.60	9.68	13	
	251	848.80	9.65	13	
GSM 850 EGPRS	128	824.20	12.37	13	
	190	836.60	12.28	13	
	251	848.80	8.4	13	
PCS 1900 GPRS	512	1850.20	9.68	13	
	661	1880.00	9.65	13	
	810	1909.80	9.58	13	
PCS 1900 EGPRS	512	1850.20	11.99	13	
	661	1880.00	12.05	13	
	810	1909.80	12.05	13	

EUT Mode	Channel	Frequency (MHz)	Peak-to-Average Ratio(dB)	Limit (dB)	Result
WCDMA Band II WCDMA	9262	1852.40	3.48	13	PASS
	9400	1880.00	3.39	13	
	9538	1907.60	3.48	13	
WCDMA Band II HSDPA	9262	1852.40	3.39	13	
	9400	1880.00	3.42	13	
	9538	1907.60	3.45	13	
WCDMA Band II HSUPA	9262	1852.40	3.42	13	
	9400	1880.00	3.42	13	
	9538	1907.60	3.45	13	
WCDMA Band IV WCDMA	1312	1712.40	8.43	13	
	1413	1732.60	3.71	13	
	1513	1752.60	3.62	13	
WCDMA Band IV HSDPA	1312	1712.40	3.42	13	
	1413	1732.60	3.77	13	
	1513	1752.60	3.65	13	
WCDMA Band IV HSUPA	1312	1712.40	3.45	13	
	1413	1732.60	3.45	13	
	1513	1752.60	3.45	13	
WCDMA Band V WCDMA	4132	826.40	3.57	13	
	4183	836.60	3.51	13	
	4233	846.60	3.54	13	
WCDMA Band V HSDPA	4132	826.40	3.54	13	
	4183	836.60	3.48	13	
	4233	846.60	3.54	13	
WCDMA Band V HSUPA	4132	826.40	3.45	13	
	4183	836.60	3.45	13	
	4233	846.60	3.45	13	

GSM 850_ GPRS_ Lowest channel



Complementary Cumulative Distribution Function (1000000 samples)

	Trace 1
Mean	25.35 dBm
Peak	35.00 dBm
Crest	9.65 dB
10% @	9.58 dB
1% @	9.68 dB
.1% @	9.68 dB

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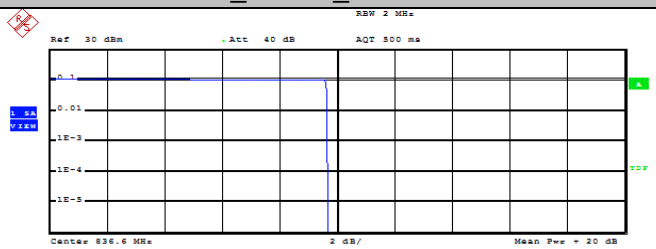
GSM 850_ GPRS_ Middle channel



Complementary Cumulative Distribution Function (1000000 samples)

	Trace 1
Mean	25.35 dBm
Peak	35.00 dBm
Crest	9.65 dB
10% @	9.58 dB
1% @	9.68 dB
.1% @	9.68 dB

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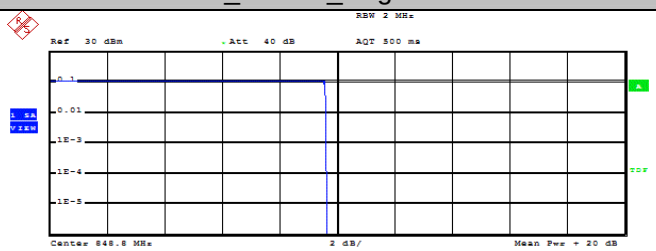
GSM 850_ GPRS_ Highest channel



Complementary Cumulative Distribution Function (1000000 samples)

	Trace 1
Mean	25.39 dBm
Peak	35.00 dBm
Crest	9.61 dB
10% @	9.55 dB
1% @	9.62 dB
.1% @	9.65 dB

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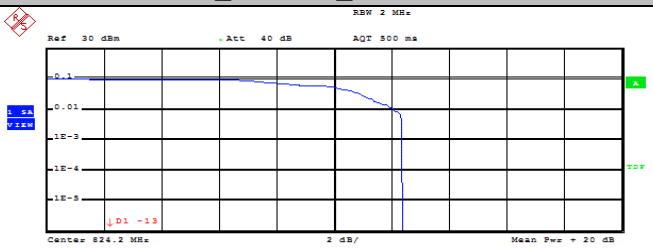
GSM 850_ EGPRS_ Lowest channel

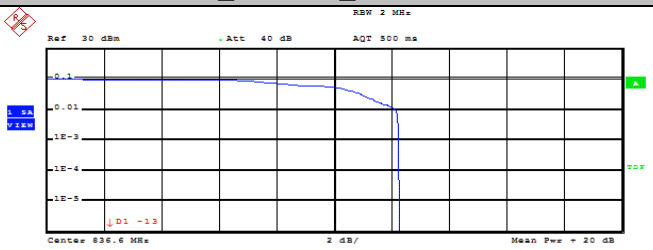


Complementary Cumulative Distribution Function (1000000 samples)

	Trace 1
Mean	22.63 dBm
Peak	35.00 dBm
Crest	12.37 dB
10% @	2.82 dB
1% @	12.05 dB
.1% @	12.37 dB

Date: 19.JUL.2021 12:49:36

GSM 850_ EGPRS_ Middle channel

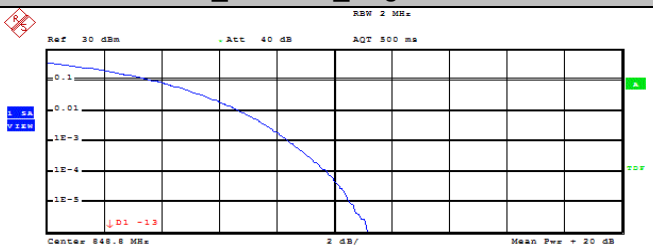


Complementary Cumulative Distribution Function (1000000 samples)

	Trace 1
Mean	22.76 dBm
Peak	35.00 dBm
Crest	12.24 dB
10% @	2.66 dB
1% @	12.12 dB
.1% @	12.28 dB

Date: 19.JUL.2021 12:49:46

GSM 850_ EGPRS_ Highest channel

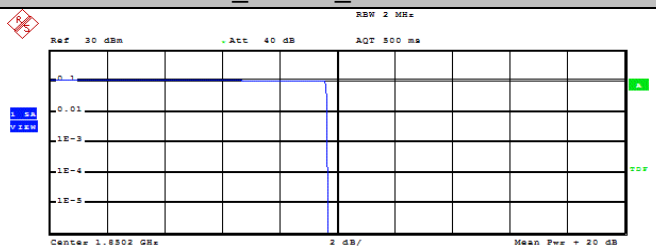


Complementary Cumulative Distribution Function (1000000 samples)

	Trace 1
Mean	-30.51 dBm
Peak	-19.18 dBm
Crest	11.33 dB
10% @	3.65 dB
1% @	6.67 dB
.1% @	8.40 dB

Date: 19.JUL.2021 13:06:19

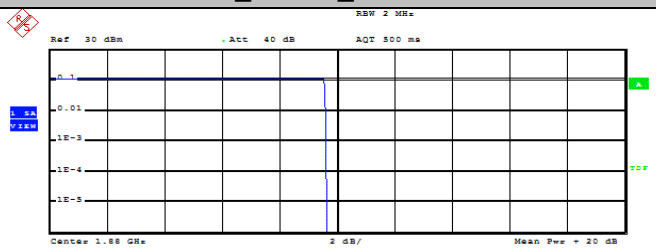
PCS 1900_ GPRS_ Lowest channel



	Trace 1
Mean	25.35 dBm
Peak	35.00 dBm
Crest	9.65 dB
10% @	9.58 dB
1% @	9.68 dB
.1% @	9.68 dB

Date: 19.JUL.2021 10:56:18

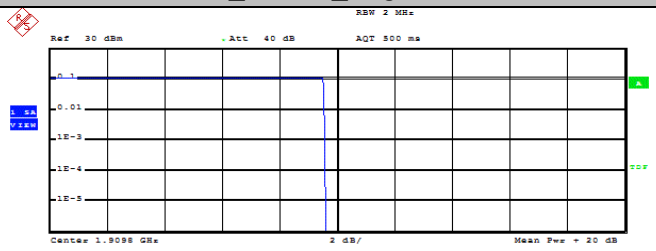
PCS 1900_ GPRS_ Middle channel



	Trace 1
Mean	25.40 dBm
Peak	35.00 dBm
Crest	9.60 dB
10% @	9.55 dB
1% @	9.62 dB
.1% @	9.65 dB

Date: 19.JUL.2021 10:56:28

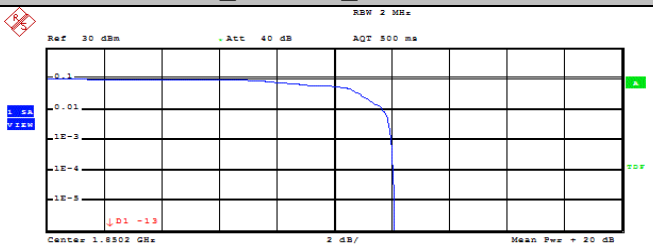
PCS 1900_ GPRS_ Highest channel



	Trace 1
Mean	25.43 dBm
Peak	35.00 dBm
Crest	9.57 dB
10% @	9.52 dB
1% @	9.58 dB
.1% @	9.58 dB

Date: 19.JUL.2021 10:56:38

PCS 1900_ EGPRS_ Lowest channel

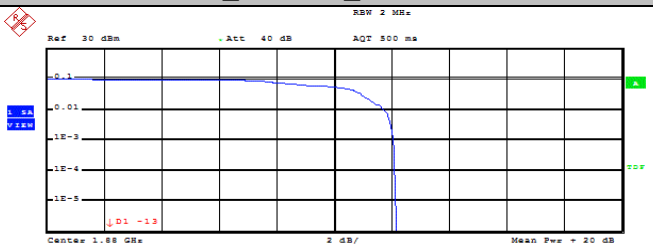


Complementary Cumulative Distribution Function (1000000 samples)

	Trace 1
Mean	22.77 dBm
Peak	34.86 dBm
Crest	12.09 dB
10% @	2.88 dB
1% @	11.67 dB
.1% @	11.99 dB

Date: 19.JUL.2021 11:10:07

PCS 1900_ EGPRS_ Middle channel

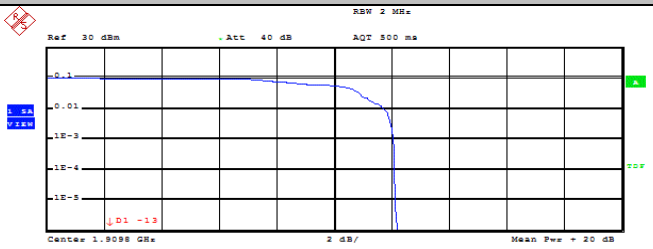


Complementary Cumulative Distribution Function (1000000 samples)

	Trace 1
Mean	22.50 dBm
Peak	34.65 dBm
Crest	12.15 dB
10% @	2.98 dB
1% @	11.73 dB
.1% @	12.05 dB

Date: 19.JUL.2021 11:10:17

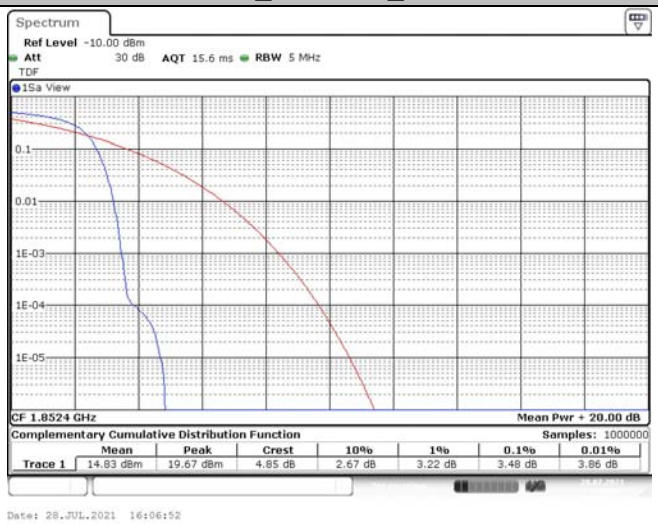
PCS 1900_ EGPRS_ Highest channel

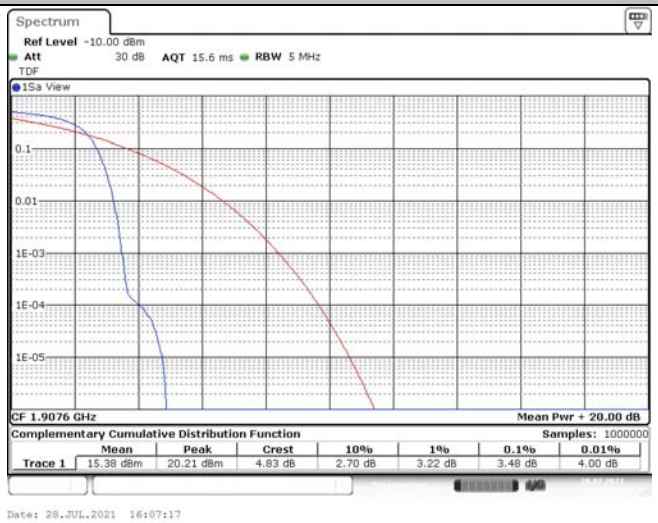


Complementary Cumulative Distribution Function (1000000 samples)

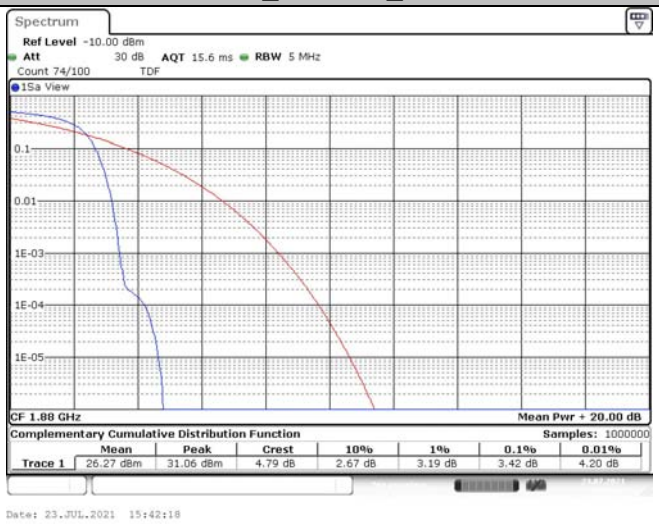
	Trace 1
Mean	22.46 dBm
Peak	34.65 dBm
Crest	12.19 dB
10% @	3.14 dB
1% @	11.70 dB
.1% @	12.05 dB

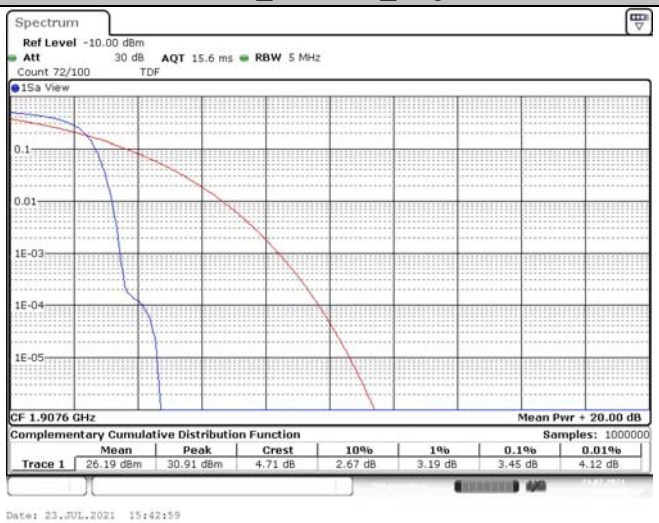
Date: 19.JUL.2021 11:10:29

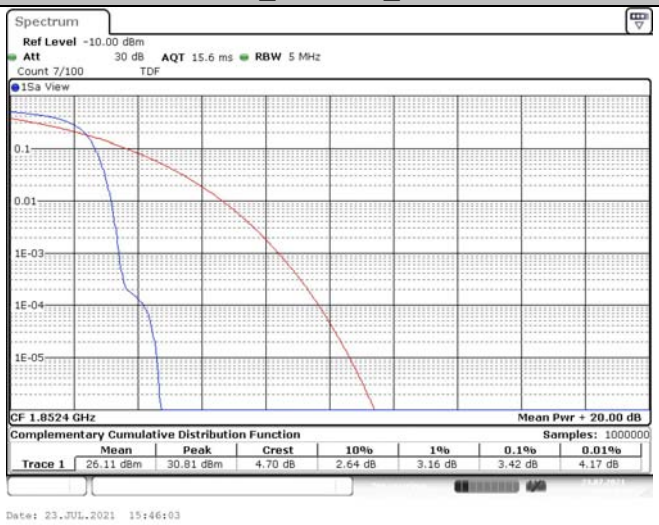
WCDMA Band II_ WCDMA_ Lowest channel

WCDMA Band II_ WCDMA_ Middle channel

WCDMA Band II_ WCDMA_ Highest channel


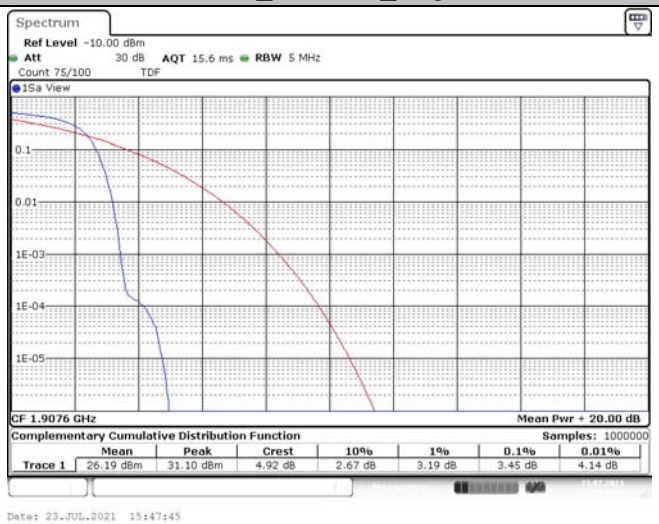
WCDMA Band II_ HSDPA _ Lowest channel

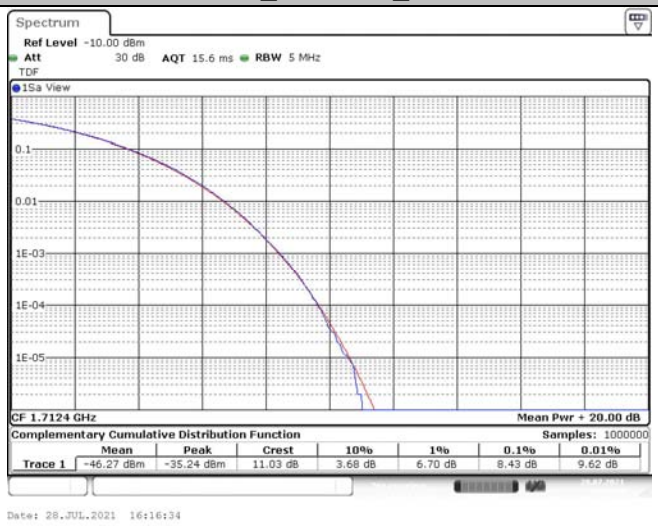
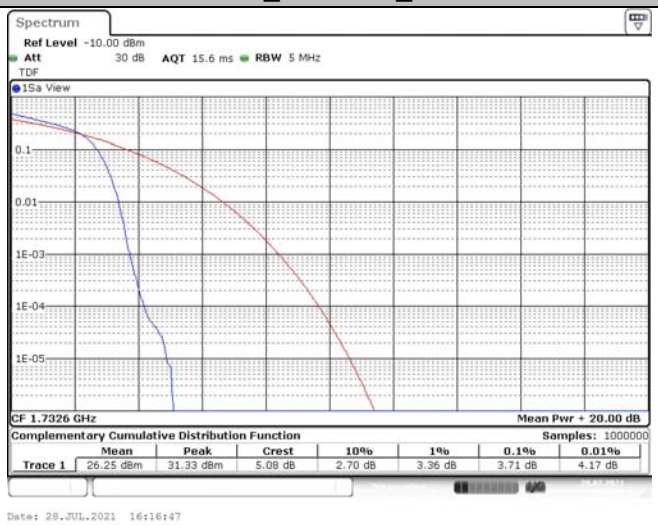
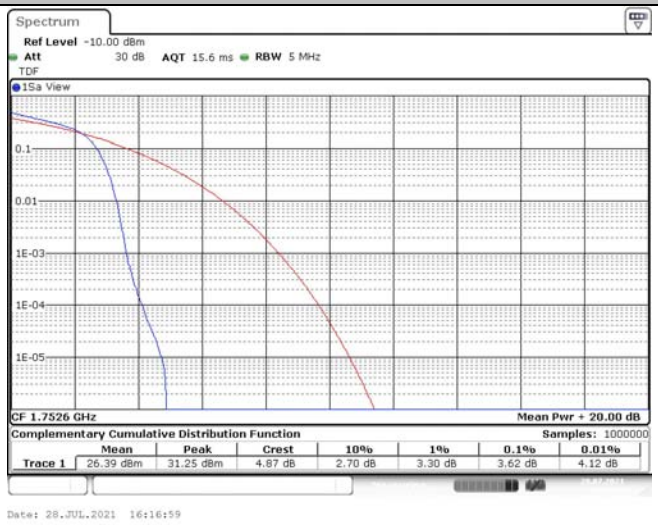

WCDMA Band II_ HSDPA _ Middle channel


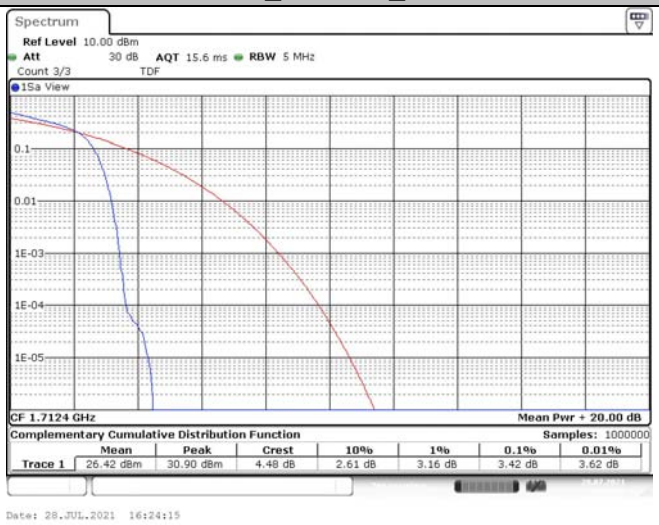
WCDMA Band II_ HSDPA _ Highest channel


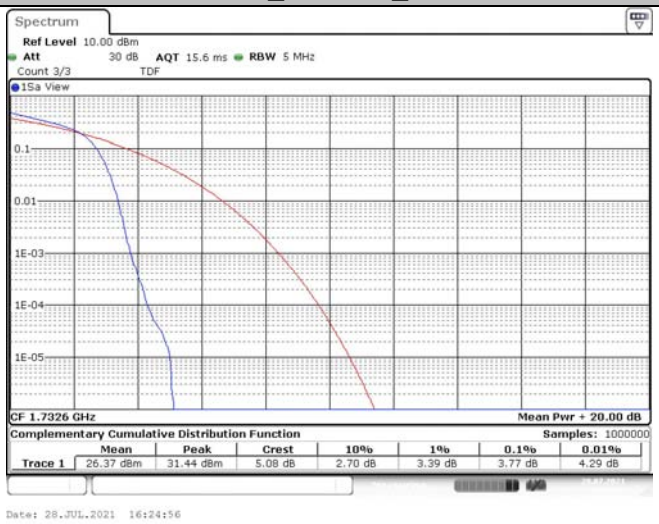
WCDMA Band II_ HSUPA _ Lowest channel


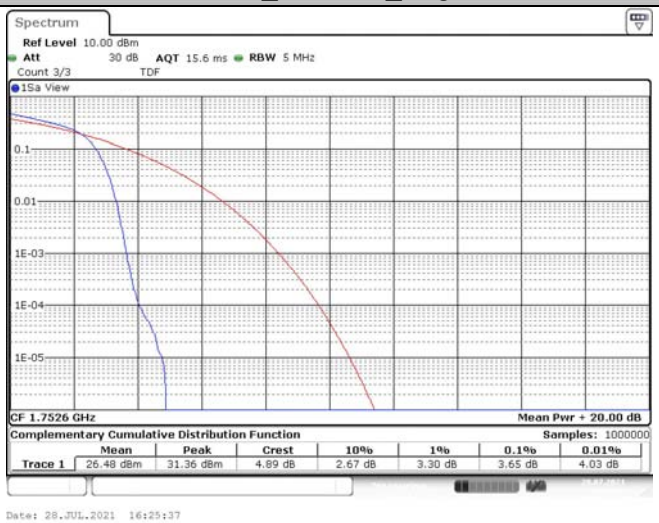
WCDMA Band II_ HSUPA _ Middle channel

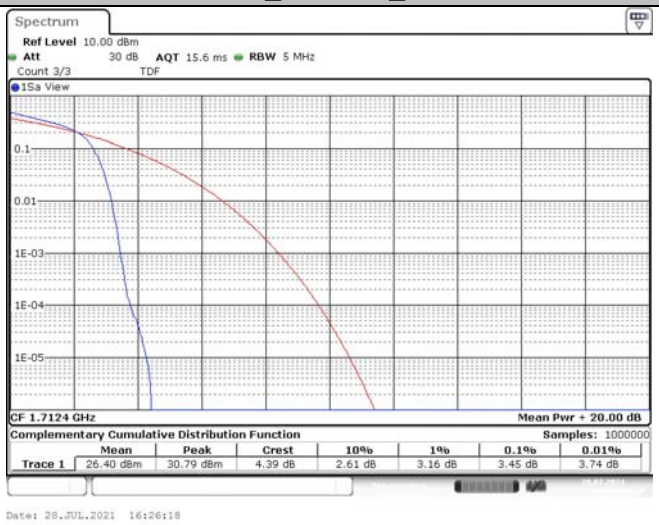

WCDMA Band II_ HSUPA _ Highest channel


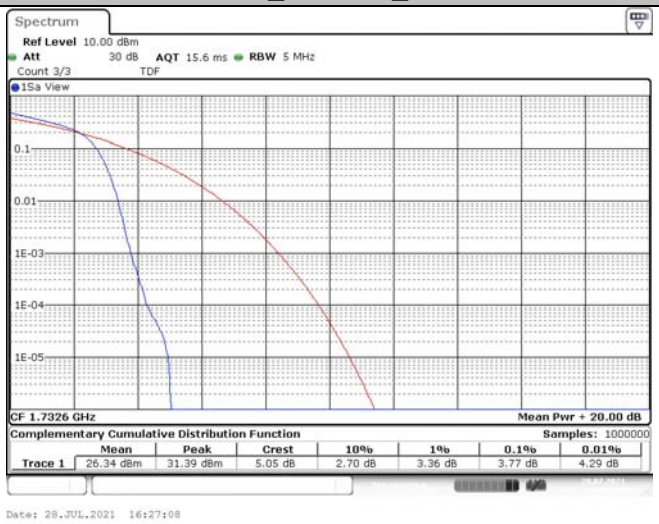
WCDMA Band IV_ WCDMA_ Lowest channel

WCDMA Band IV_ WCDMA_ Middle channel

WCDMA Band IV_ WCDMA_ Highest channel


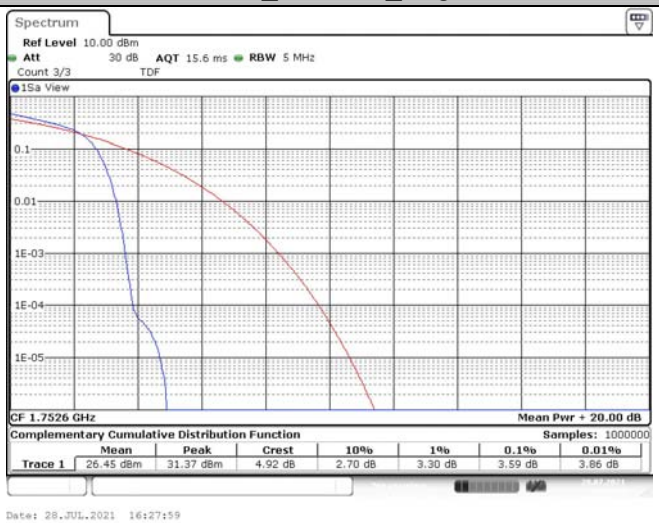
WCDMA Band IV_ HSDPA _ Lowest channel


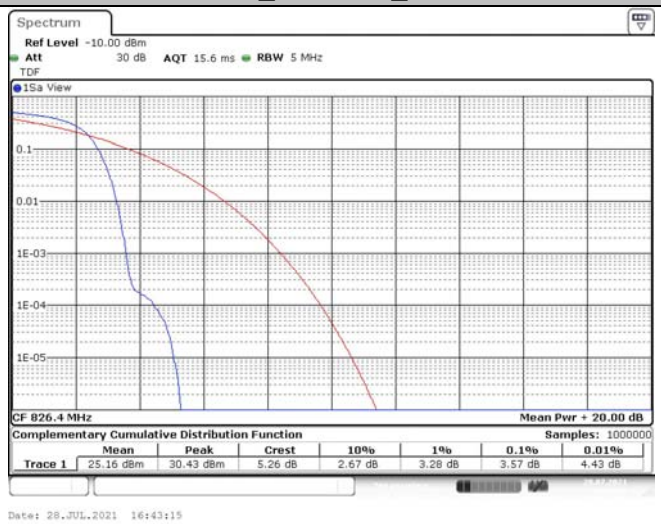
WCDMA Band IV_ HSDPA _ Middle channel


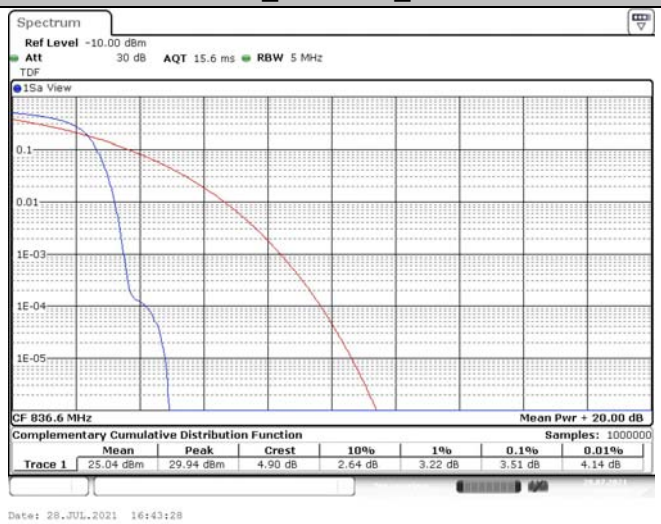
WCDMA Band IV_ HSDPA _ Highest channel


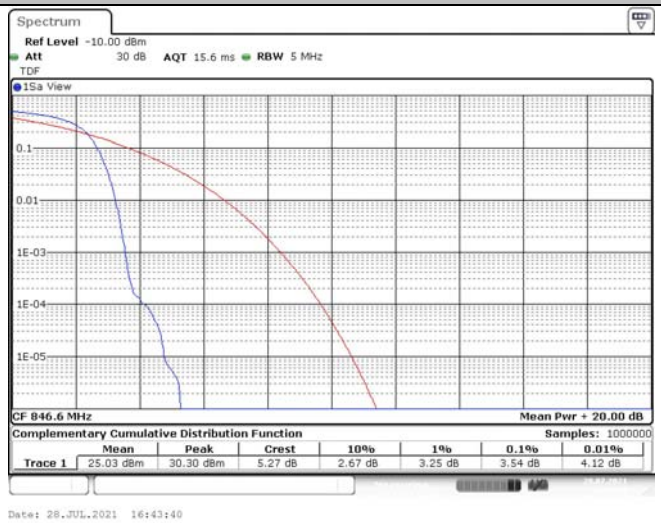
WCDMA Band IV_ HSUPA _ Lowest channel


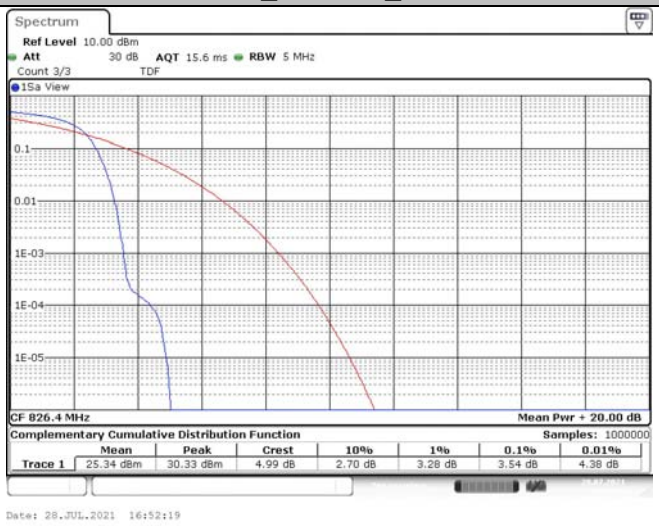
WCDMA Band IV_ HSUPA _ Middle channel


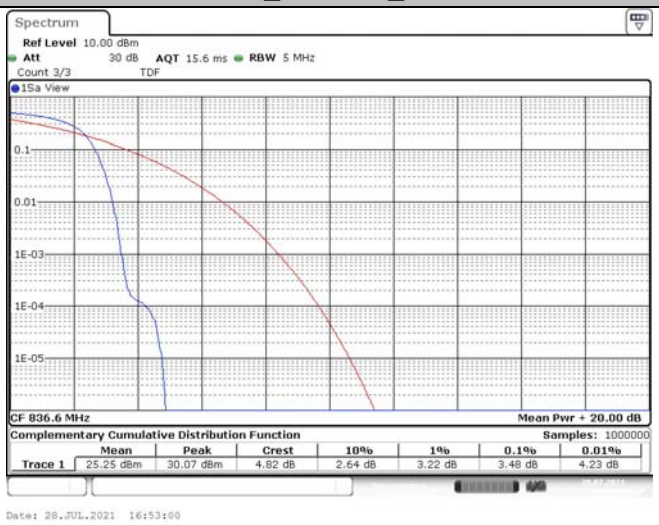
WCDMA Band IV_ HSUPA _ Highest channel


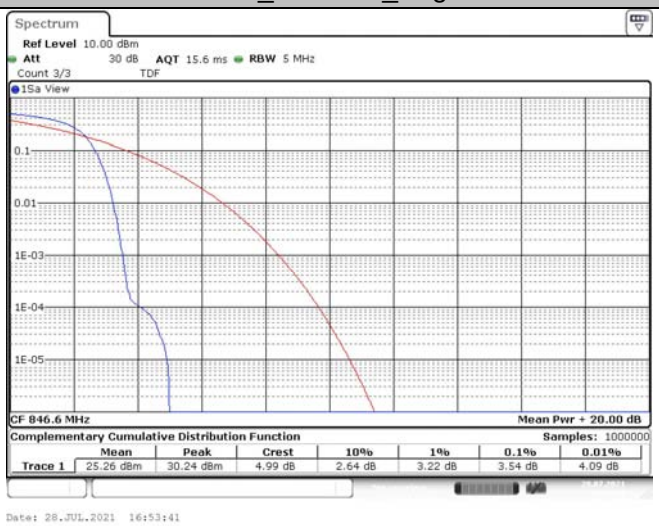
WCDMA Band V_ WCDMA_ Lowest channel


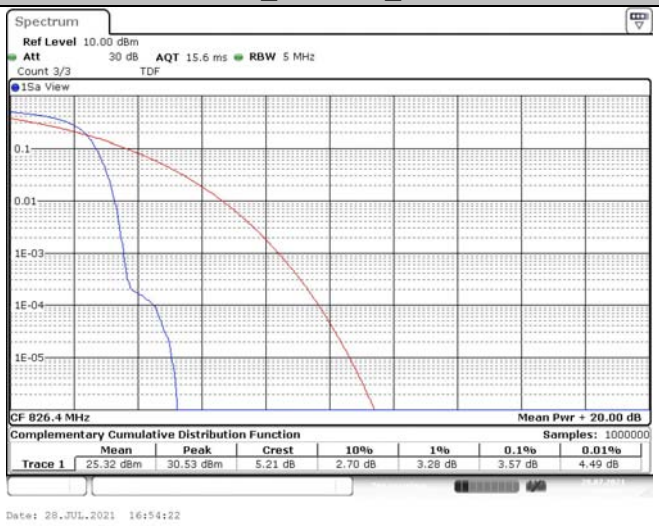
WCDMA Band V_ WCDMA_ Middle channel


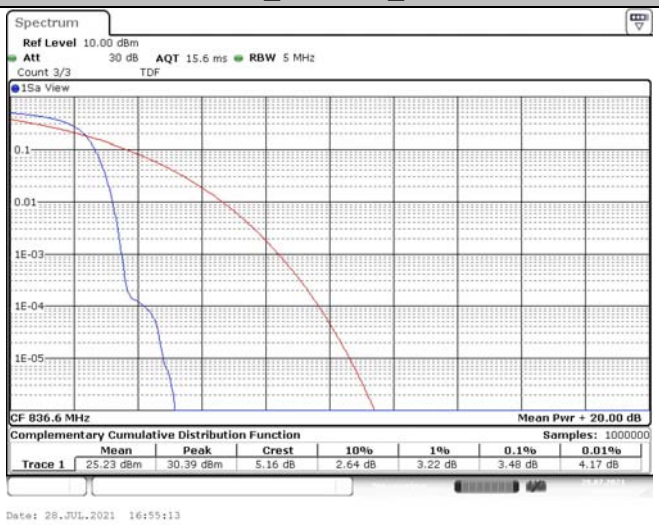
WCDMA Band V_ WCDMA_ Highest channel


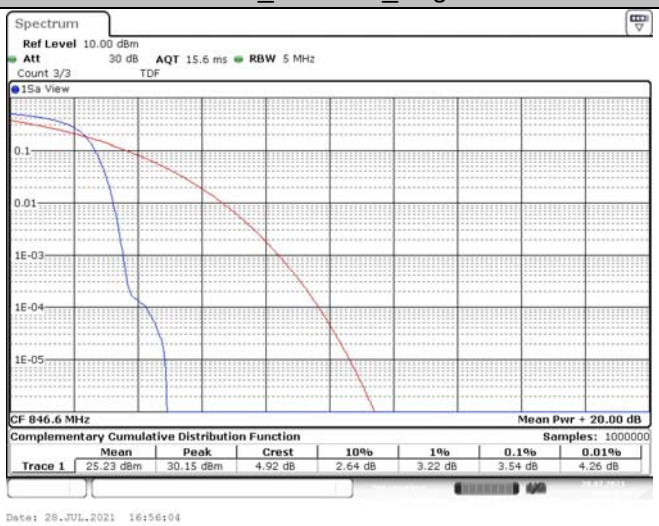
WCDMA Band V_ HSDPA _ Lowest channel


WCDMA Band V_ HSDPA _ Middle channel


WCDMA Band V_ HSDPA _ Highest channel


WCDMA Band V_ HSUPA _ Lowest channel


WCDMA Band V_ HSUPA _ Middle channel


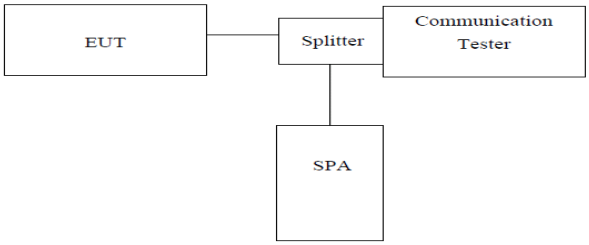
WCDMA Band V_ HSUPA _ Highest channel


3.3. Occupy Bandwidth

LIMIT

For reporting purposes only.

TEST CONFIGURATION



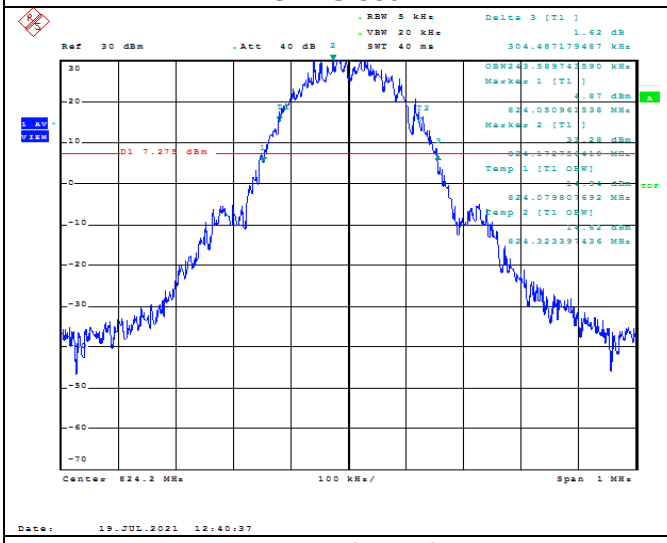
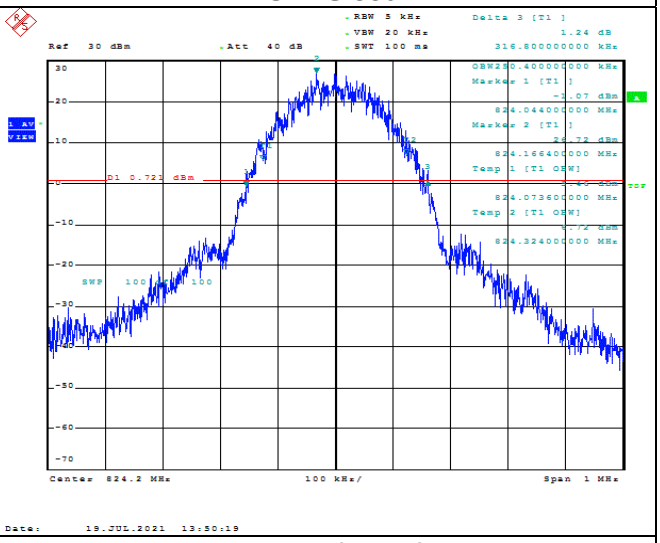
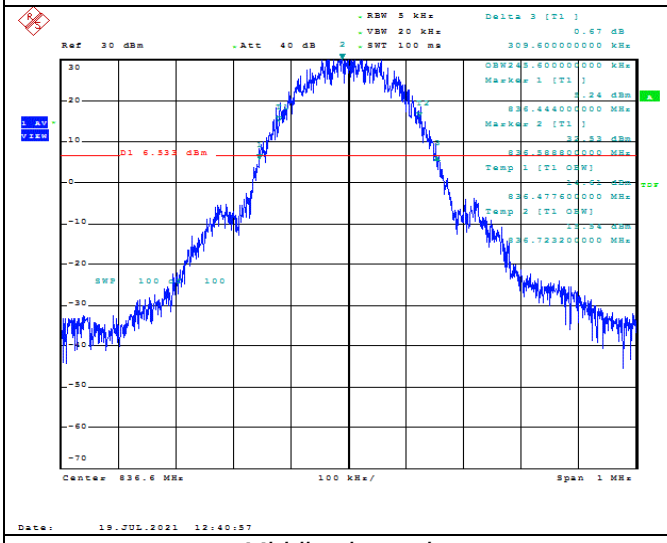
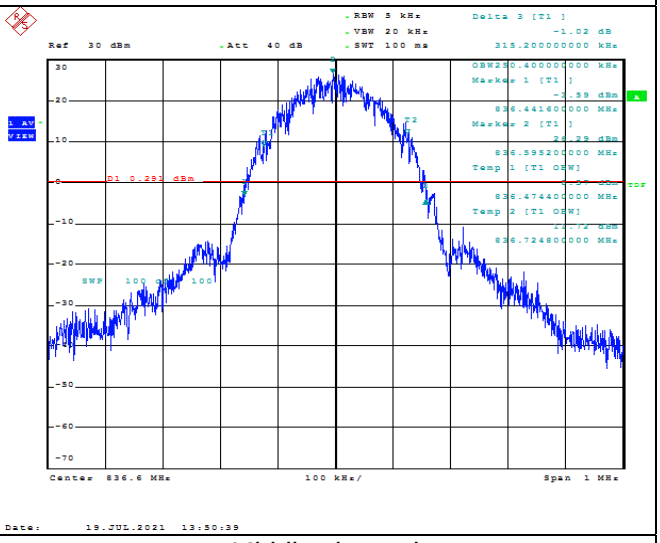
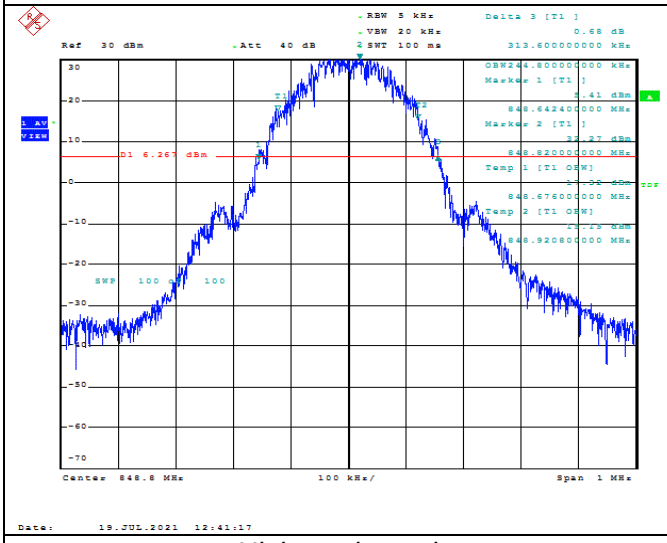
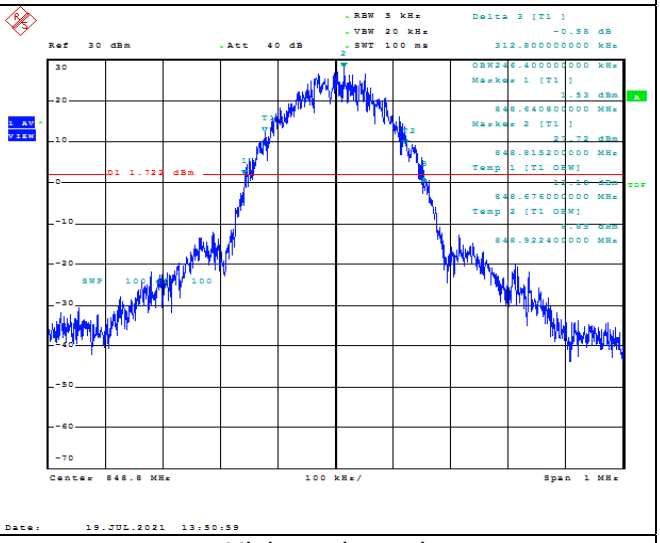
Note: Measurement setup for testing on Antenna connector

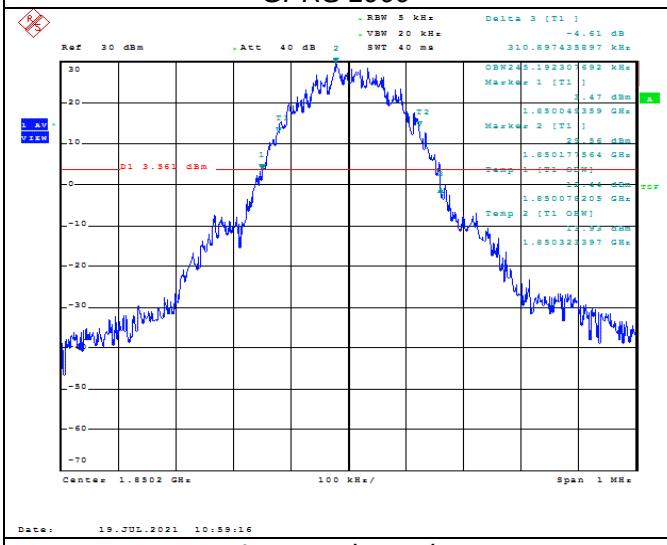
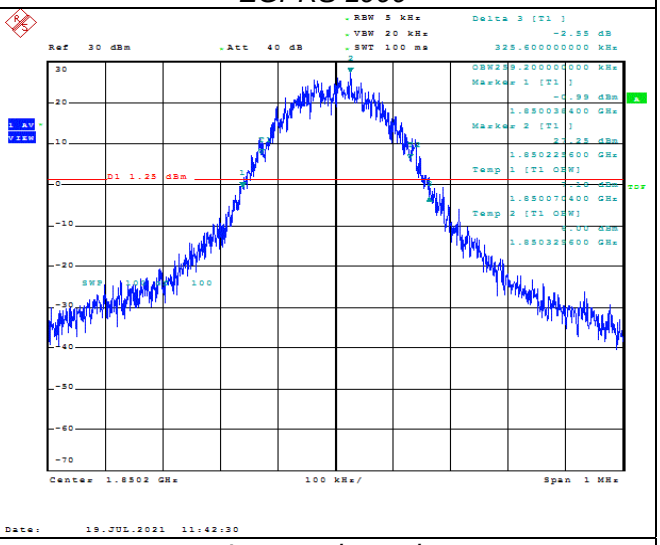
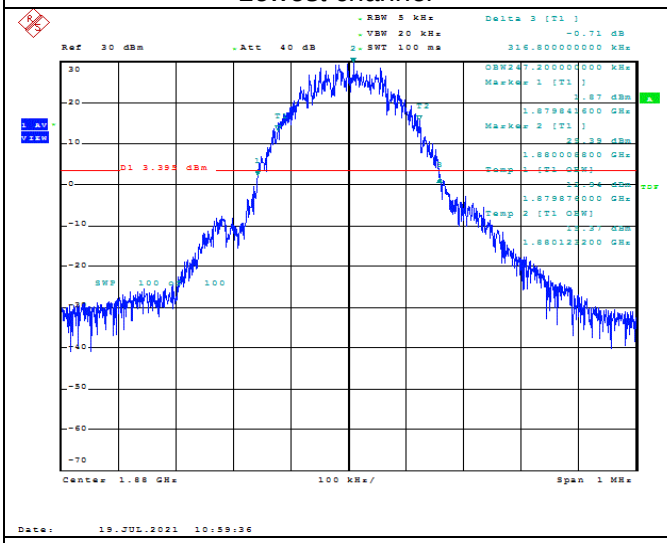
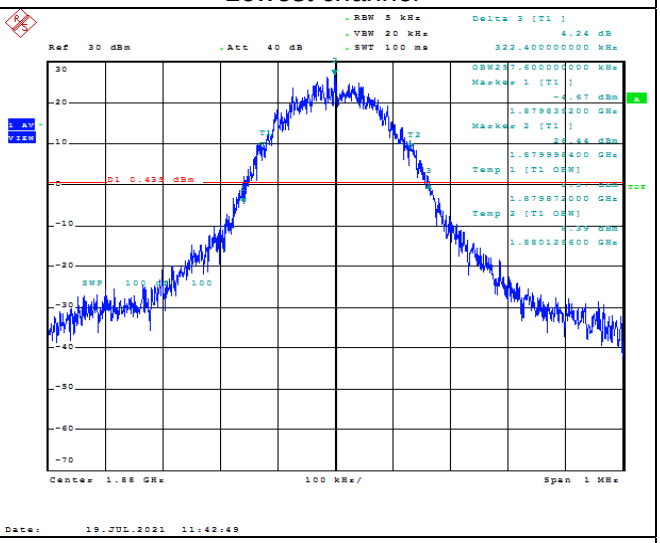
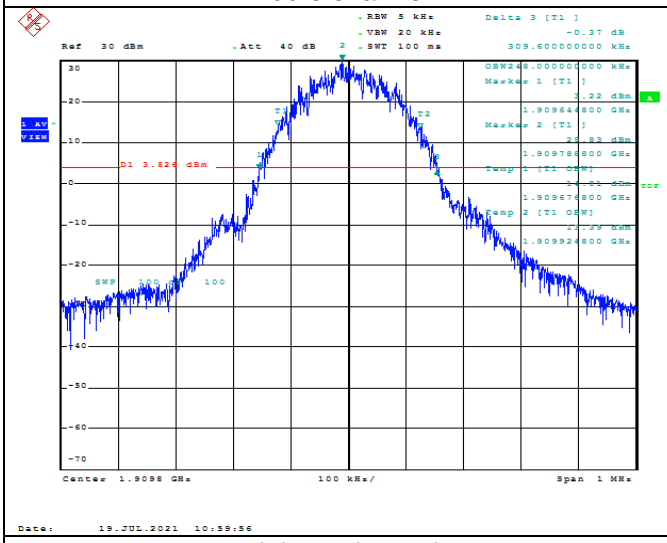
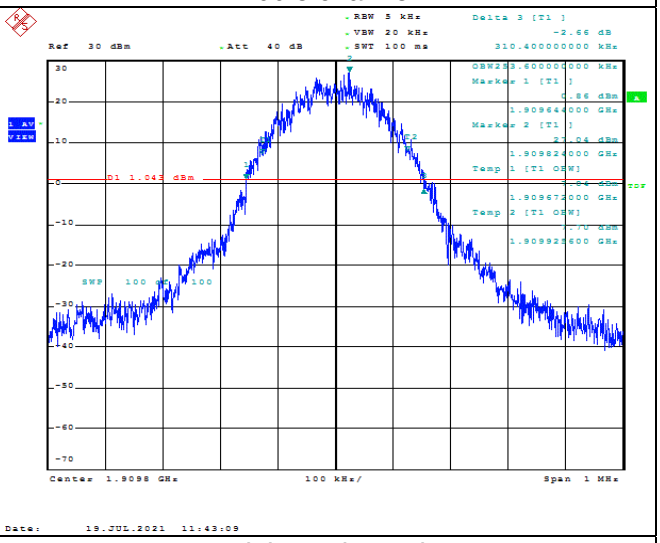
TEST PROCEDURE

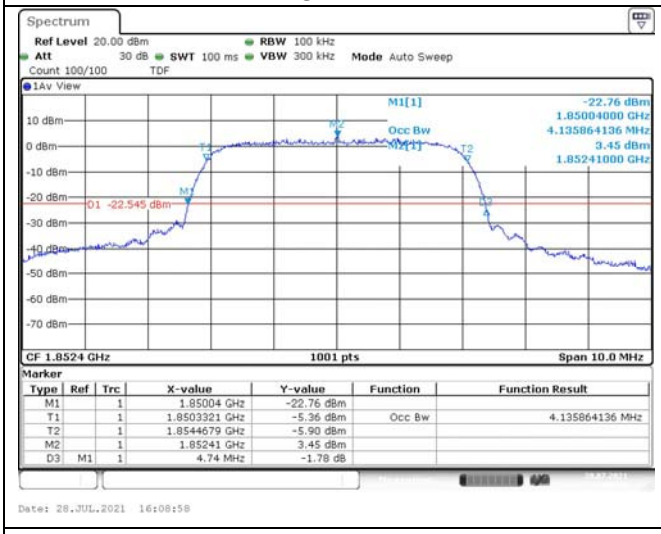
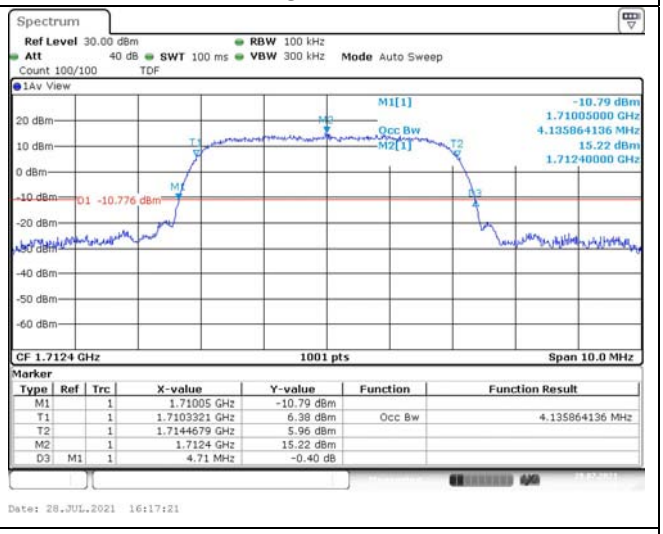
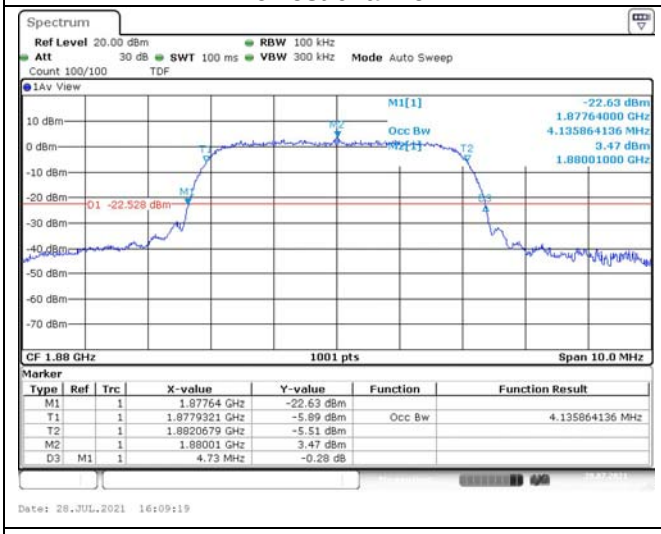
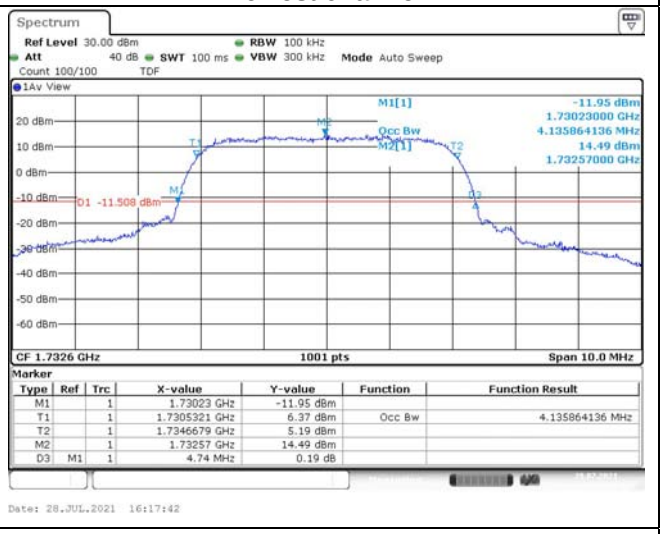
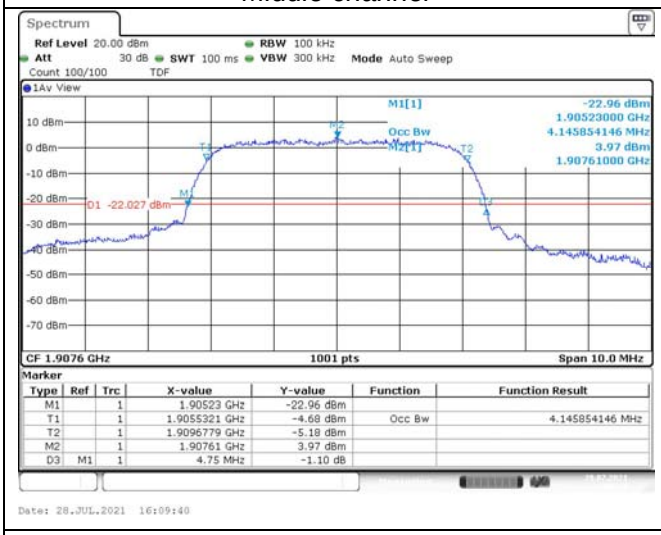
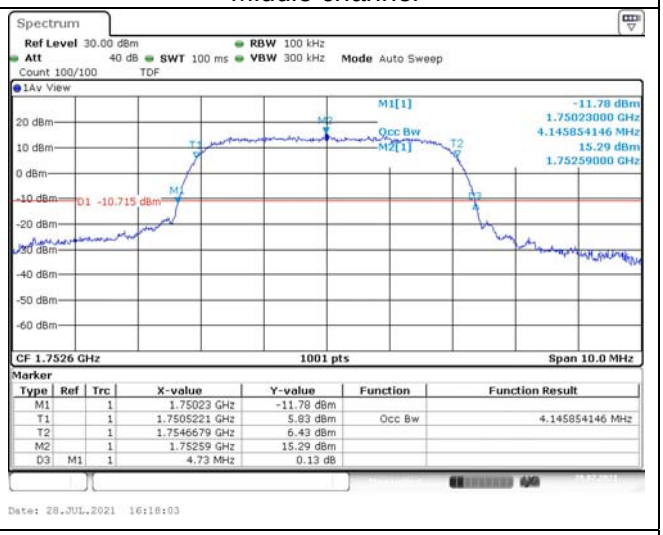
1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBW was set to about 1% of emission BW, VBW≥3 times RBW.
3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display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

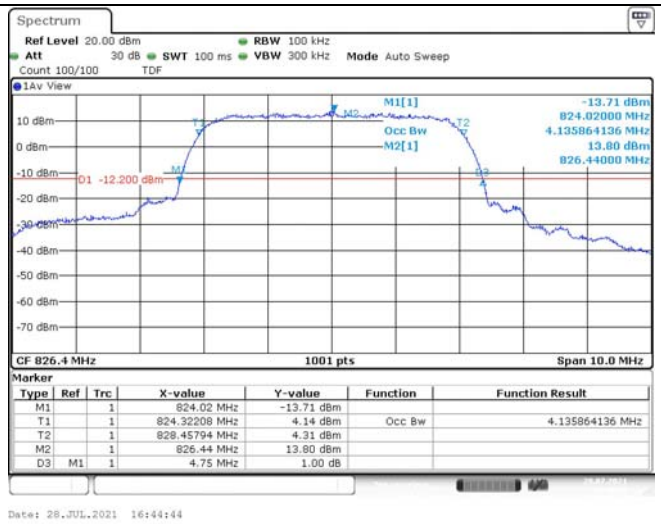
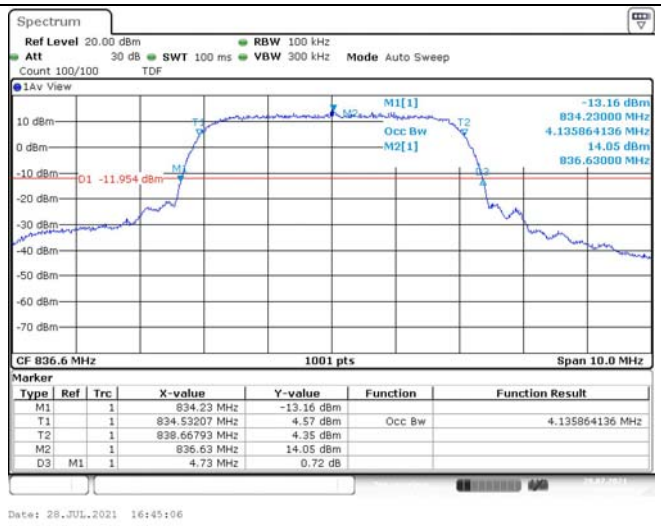
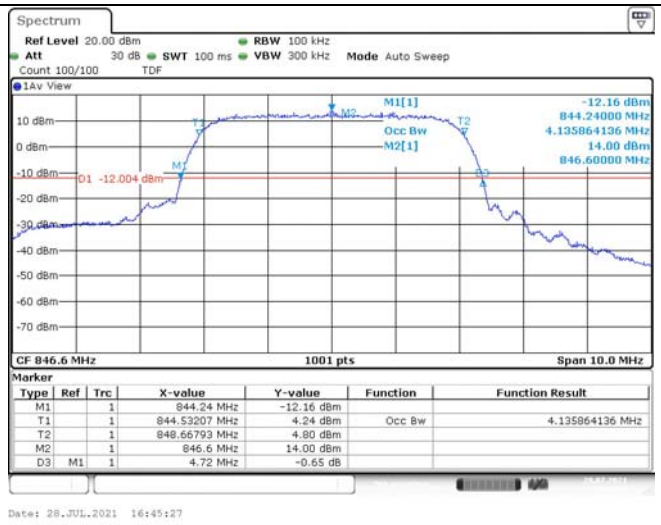
TEST RESULTS

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (MHz)	-26dB bandwidth (MHz)
GSM 850 (GPRS)	128	824.20	0.244	0.304
	190	836.60	0.246	0.310
	251	848.80	0.245	0.314
EGPRS850 (8PSK,1Slot)	128	824.20	0.250	0.317
	190	836.60	0.250	0.315
	251	848.80	0.246	0.313
PCS1900 (GPRS)	512	1850.20	0.245	0.311
	661	1880.00	0.247	0.317
	810	1909.80	0.248	0.310
EGPRS1900 (8PSK,1Slot)	512	1850.20	0.259	0.326
	661	1880.00	0.258	0.322
	810	1909.80	0.254	0.310
WCDMA Band II (QPSK)	9262	1852.40	4.136	4.740
	9400	1880.00	4.136	4.730
	9538	1907.60	4.146	4.750
WCDMA Band IV (QPSK)	1312	1712.40	4.136	4.710
	1413	1732.60	4.136	4.740
	1513	1752.60	4.146	4.730
WCDMA Band V (QPSK)	4132	826.40	4.136	4.750
	4183	836.60	4.136	4.730
	4233	846.60	4.136	4.720

99% Occupy bandwidth and -26dB bandwidth	
GPRS 850	*EGPRS 850*
	
Lowest channel	*Lowest channel*
	
Middle channel	*Middle channel*
	
Highest channel	*Highest channel*

99% Occupy bandwidth and -26dB bandwidth	
GPRS 1900	*EGPRS 1900*
	
Lowest channel	*Lowest channel*
	
Middle channel	*Middle channel*
	
Highest channel	*Highest channel*

99% Occupy bandwidth and -26dB bandwidth	
WCDMA II	*WCDMA IV*
	
Lowest channel	*Lowest channel*
	
Middle channel	*Middle channel*
	
Highest channel	*Highest channel*

99% Occupy bandwidth and -26dB bandwidth
WCDMA V

Lowest channel

Middle channel

Highest channel

3.4. Out Of Band Emissions

LIMIT

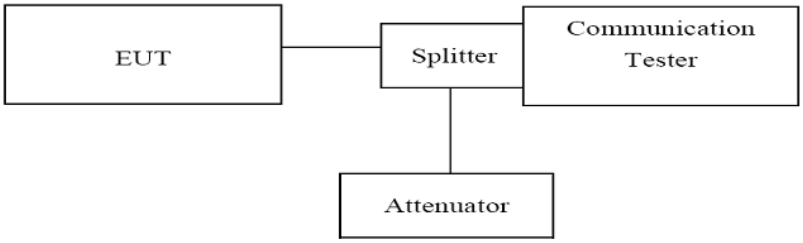
FCC: §22.917, §24.238, §27.53 (h), §90.691

The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

RSS132§5.5, RSS133§6.5, RSS139§6.6

The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

TEST CONFIGURATION



TEST PROCEDURE

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. Sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

TEST RESULTS

Band	Channel	Frequency Range(MHz)	Max. Freq. (MHz)	Result (dBm)	Limit (dBm)	Verdict
GPRS850	128	0.009~0.15MHz	0.01	-42.09	-33	PASS
GPRS850	128	0.15~30MHz	0.63	-47.27	-13	PASS
GPRS850	128	30~1000MHz	982.22	-38.55	-13	PASS
GPRS850	128	1000~3000MHz	1697.8	-22.54	-13	PASS
GPRS850	128	3000~10000MHz	5176.07	-20.42	-13	PASS
GPRS850	190	0.009~0.15MHz	0.01	-41.8	-33	PASS
GPRS850	190	0.15~30MHz	0.66	-47.51	-13	PASS
GPRS850	190	30~1000MHz	713.91	-38.29	-13	PASS
GPRS850	190	1000~3000MHz	1697.47	-22.51	-13	PASS
GPRS850	190	3000~10000MHz	5182.37	-22.34	-13	PASS
GPRS850	251	0.009~0.15MHz	0.01	-42.03	-33	PASS
GPRS850	251	0.15~30MHz	0.67	-47.16	-13	PASS
GPRS850	251	30~1000MHz	647.34	-38.98	-13	PASS
GPRS850	251	1000~3000MHz	1697.47	-22.51	-13	PASS
GPRS850	251	3000~10000MHz	5195.2	-54.14	-13	PASS
EGPRS850	128	0.009~0.15MHz	0.02	-44.17	-33	PASS
EGPRS850	128	0.15~30MHz	0.63	-47.23	-13	PASS

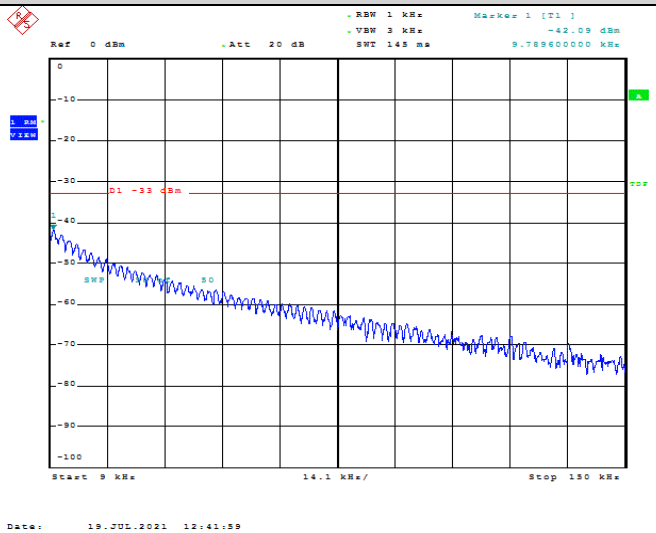
EGPRS850	128	30~1000MHz	965.24	-38.87	-13	PASS
EGPRS850	128	1000~3000MHz	2474.2	-27.94	-13	PASS
EGPRS850	128	3000~10000MHz	5214.57	-25.76	-13	PASS
EGPRS850	190	0.009~0.15MHz	0.03	-68.86	-33	PASS
EGPRS850	190	0.15~30MHz	0.61	-46.81	-13	PASS
EGPRS850	190	30~1000MHz	999.16	-38.99	-13	PASS
EGPRS850	190	1000~3000MHz	2473.4	-37.53	-13	PASS
EGPRS850	190	3000~10000MHz	5213.87	-25.19	-13	PASS
EGPRS850	251	0.009~0.15MHz	0.05	-44.42	-33	PASS
EGPRS850	251	0.15~30MHz	0.67	-46.74	-13	PASS
EGPRS850	251	30~1000MHz	990.24	-39.12	-13	PASS
EGPRS850	251	1000~3000MHz	1697.73	-31.45	-13	PASS
EGPRS850	251	3000~10000MHz	3395.03	-35.87	-13	PASS
GPRS1900	512	0.009~0.15MHz	0.01	-48.49	-43	PASS
GPRS1900	512	0.15~30MHz	0.67	-47.12	-23	PASS
GPRS1900	512	30~1000MHz	710.36	-37.77	-13	PASS
GPRS1900	512	1000~3000MHz	2469.6	-29.15	-13	PASS
GPRS1900	512	3000~10000MHz	3819.7	-36.81	-13	PASS
GPRS1900	512	10000~18000MHz	11458.93	-42.88	-13	PASS
GPRS1900	661	0.009~0.15MHz	0.01	-47.43	-43	PASS
GPRS1900	661	0.15~30MHz	0.6	-46.93	-23	PASS
GPRS1900	661	30~1000MHz	882.89	-37.61	-13	PASS
GPRS1900	661	1000~3000MHz	2466.27	-37.26	-13	PASS
GPRS1900	661	3000~10000MHz	9964.3	-55.42	-13	PASS
GPRS1900	661	10000~18000MHz	17929.33	-50.57	-13	PASS
GPRS1900	810	0.009~0.15MHz	0.01	-47.69	-43	PASS
GPRS1900	810	0.15~30MHz	12.35	-47.8	-23	PASS
GPRS1900	810	30~1000MHz	710.55	-38.53	-13	PASS
GPRS1900	810	1000~3000MHz	2471.47	-31.81	-13	PASS
GPRS1900	810	3000~10000MHz	3819.93	-38	-13	PASS
GPRS1900	810	10000~18000MHz	11458.67	-43.48	-13	PASS
EGPRS1900	512	0.009~0.15MHz	0.03	-47.18	-43	PASS
EGPRS1900	512	0.15~30MHz	0.64	-47.38	-23	PASS
EGPRS1900	512	30~1000MHz	967.02	-39.04	-13	PASS
EGPRS1900	512	1000~3000MHz	2461.8	-35.34	-13	PASS
EGPRS1900	512	3000~10000MHz	5212.93	-22.72	-13	PASS
EGPRS1900	512	10000~18000MHz	17985.6	-50.39	-13	PASS
EGPRS1900	661	0.009~0.15MHz	0.04	-46.59	-43	PASS
EGPRS1900	661	0.15~30MHz	0.61	-46.59	-23	PASS
EGPRS1900	661	30~1000MHz	748.45	-38.46	-13	PASS
EGPRS1900	661	1000~3000MHz	2466.33	-38.57	-13	PASS
EGPRS1900	661	3000~10000MHz	5236.27	-52.62	-13	PASS
EGPRS1900	661	10000~18000MHz	17921.33	-50.42	-13	PASS
EGPRS1900	810	0.009~0.15MHz	0.02	-47	-43	PASS

EGPRS1900	810	0.15~30MHz	0.61	-47.06	-23	PASS
EGPRS1900	810	30~1000MHz	671.66	-35.58	-13	PASS
EGPRS1900	810	1000~3000MHz	2461.73	-36.24	-13	PASS
EGPRS1900	810	3000~10000MHz	5217.13	-19.56	-13	PASS
EGPRS1900	810	10000~18000MHz	17998.13	-50.43	-13	PASS

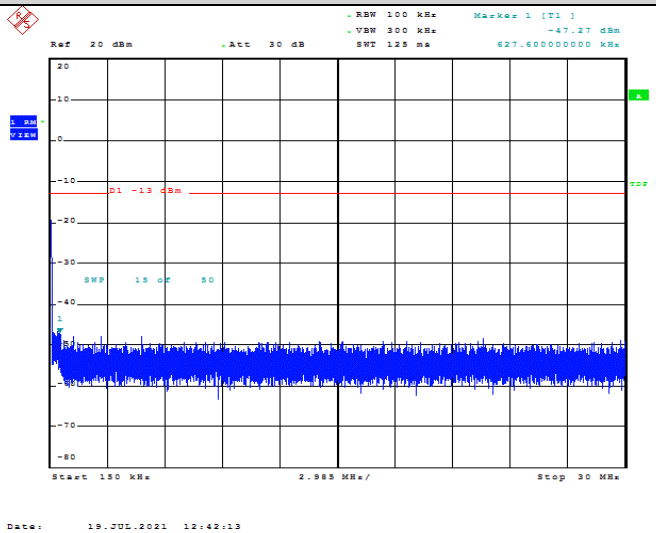
Band	Channel	Frequency Range (Mhz)	Frequency (dBm)	Result (dBm)	Limit (dBm)	Verdict
Band2	9262	0.15~30MHz	0.62	-47.87	-23	PASS
Band2	9262	30~1000MHz	924.37	-38.07	-13	PASS
Band2	9262	1000~3000MHz	2473.27	-35.45	-13	PASS
Band2	9262	3000~10000MHz	5222.27	-18.02	-13	PASS
Band2	9262	10000~20000MHz	19341.67	-47.17	-13	PASS
Band2	9262	0.009~0.15MHz	0.01	-69.4	-43	PASS
Band2	9400	0.009~0.15MHz	0.01	-66.93	-43	PASS
Band2	9400	0.15~30MHz	0.68	-46.68	-23	PASS
Band2	9400	30~1000MHz	731.96	-38.76	-13	PASS
Band2	9400	1000~3000MHz	2464.27	-27.58	-13	PASS
Band2	9400	3000~10000MHz	5223.43	-20.69	-13	PASS
Band2	9400	10000~20000MHz	19432	-46.96	-13	PASS
Band2	9538	0.009~0.15MHz	0.02	-69.21	-43	PASS
Band2	9538	10000~20000MHz	19422.67	-46.85	-13	PASS
Band2	9538	3000~10000MHz	5222.5	-19.54	-13	PASS
Band2	9538	1000~3000MHz	2639.4	-43.48	-13	PASS
Band2	9538	0.15~30MHz	17.9	-47.92	-23	PASS
Band2	9538	30~1000MHz	874.84	-38.64	-13	PASS
Band4	1312	0.009~0.15MHz	0.01	-53.39	-43	PASS
Band4	1312	0.15~30MHz	0.95	-48.62	-23	PASS
Band4	1312	30~1000MHz	934.77	-39.24	-13	PASS
Band4	1312	1000~3000MHz	2470.87	-34.27	-13	PASS
Band4	1312	3000~10000MHz	5217.64	-22.87	-13	PASS
Band4	1312	10000~20000MHz	19452.85	-36.1	-13	PASS
Band4	1413	30~1000MHz	924.23	-39.14	-13	PASS
Band4	1413	0.009~0.15MHz	0.01	-53.99	-43	PASS
Band4	1413	1000~3000MHz	2469.47	-36.54	-13	PASS
Band4	1413	3000~10000MHz	3466.77	-26.84	-13	PASS
Band4	1413	10000~20000MHz	19474.85	-36.03	-13	PASS
Band4	1413	0.15~30MHz	0.96	-47.27	-23	PASS
Band4	1513	0.009~0.15MHz	0.01	-54.63	-43	PASS
Band4	1513	0.15~30MHz	0.96	-47.56	-23	PASS
Band4	1513	30~1000MHz	961.02	-39.97	-13	PASS
Band4	1513	1000~3000MHz	2477.33	-42.55	-13	PASS
Band4	1513	3000~10000MHz	3503.4	-28.05	-13	PASS
Band4	1513	10000~20000MHz	19441.85	-36.13	-13	PASS
Band5	4132	1000~3000MHz	2471.12	-36.32	-13	PASS

Band5	4132	3000~10000MHz	5218.34	-24.36	-13	PASS
Band5	4132	10000~18000MHz	11847.27	-32.3	-13	PASS
Band5	4132	0.15~30MHz	0.87	-55.05	-13	PASS
Band5	4132	0.009~0.15MHz	0.02	-61.63	-33	PASS
Band5	4132	30~1000MHz	964.08	-38.27	-13	PASS
Band5	4183	1000~3000MHz	2981.3	-43.09	-13	PASS
Band5	4183	3000~10000MHz	7821.79	-46.12	-13	PASS
Band5	4183	30~1000MHz	519.95	-38.02	-13	PASS
Band5	4183	0.15~30MHz	0.63	-54.46	-13	PASS
Band5	4183	0.009~0.15MHz	0.06	-62.06	-33	PASS
Band5	4183	10000~18000MHz	11856.87	-32.54	-13	PASS
Band5	4233	10000~18000MHz	11865.14	-32.37	-13	PASS
Band5	4233	0.009~0.15MHz	0.02	-62.49	-33	PASS
Band5	4233	0.15~30MHz	0.75	-54.79	-13	PASS
Band5	4233	30~1000MHz	981.12	-40.12	-13	PASS
Band5	4233	1000~3000MHz	2465.65	-42.44	-13	PASS
Band5	4233	3000~10000MHz	7833.46	-46.05	-13	PASS

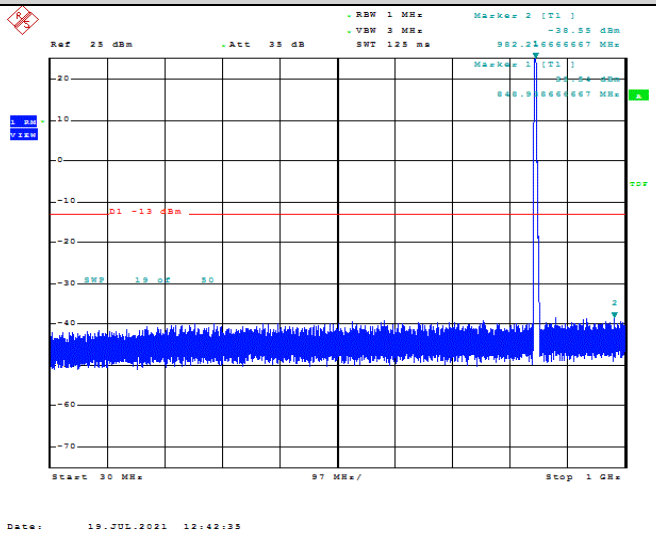
GPRS850-128-0.009~0.15MHz



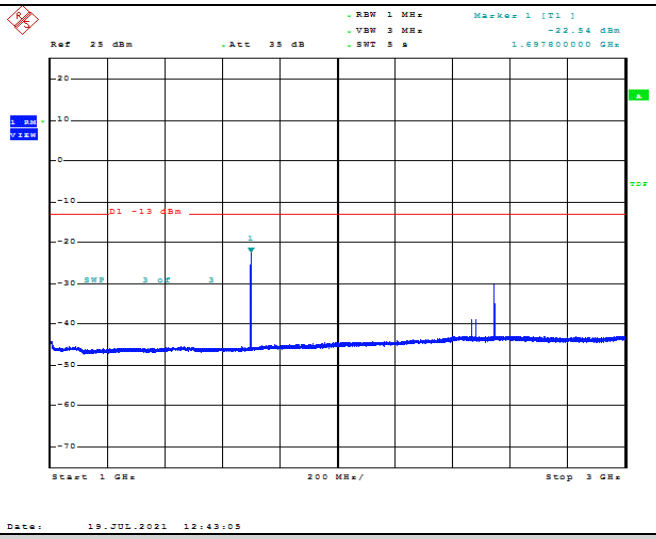
GPRS850-128-0.15~30MHz



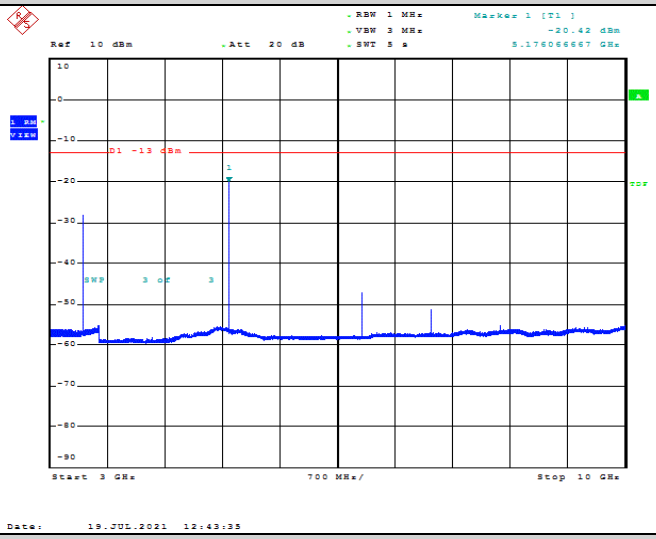
GPRS850-128-30~1000MHz



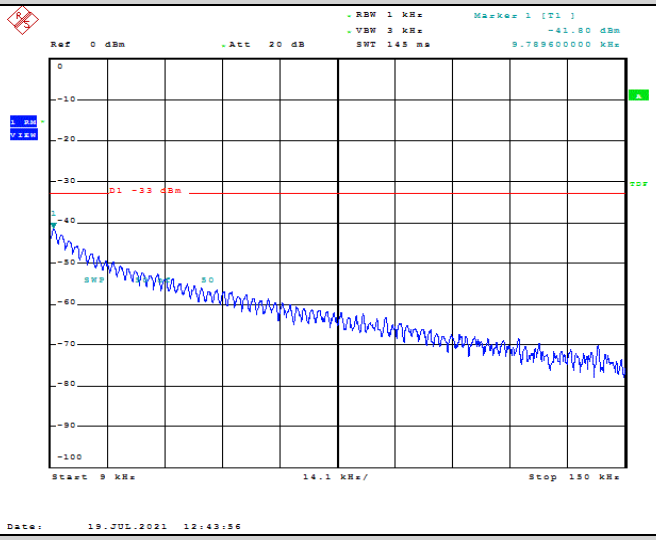
GPRS850-128-1000~3000MHz



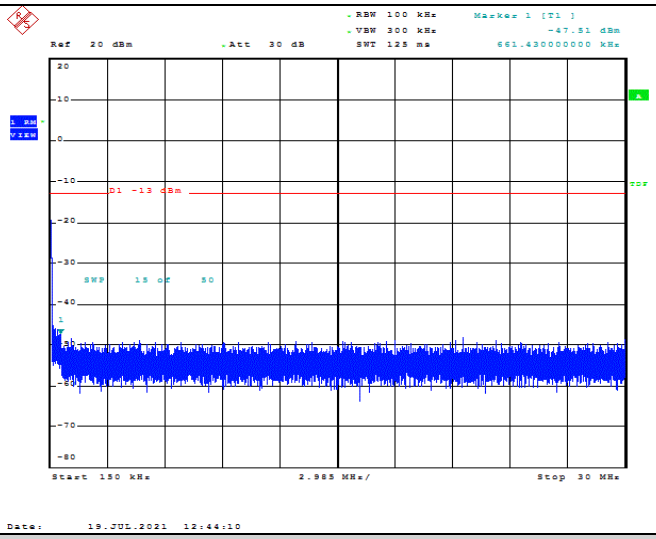
GPRS850-128-3000~10000MHz



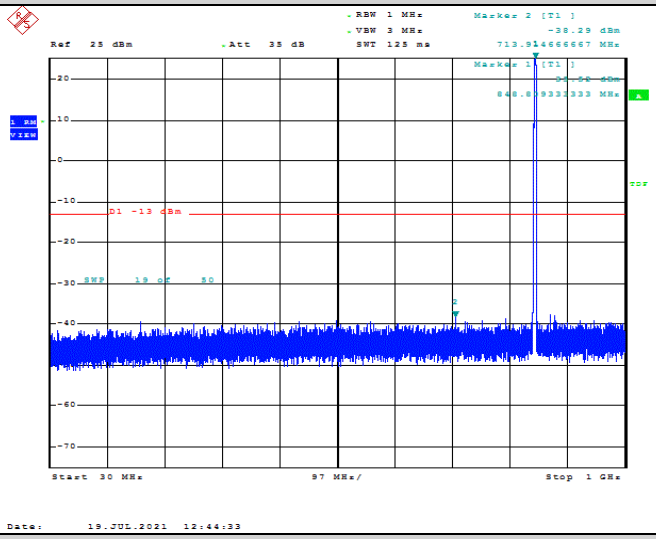
GPRS850-190-0.009~0.15MHz



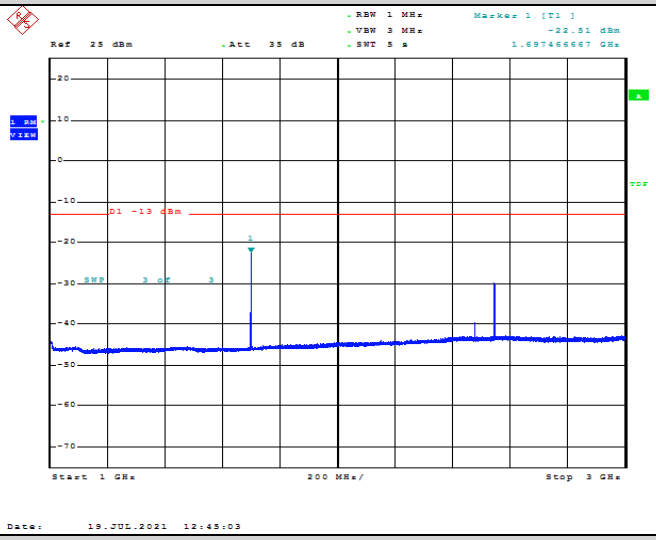
GPRS850-190-0.15~30MHz



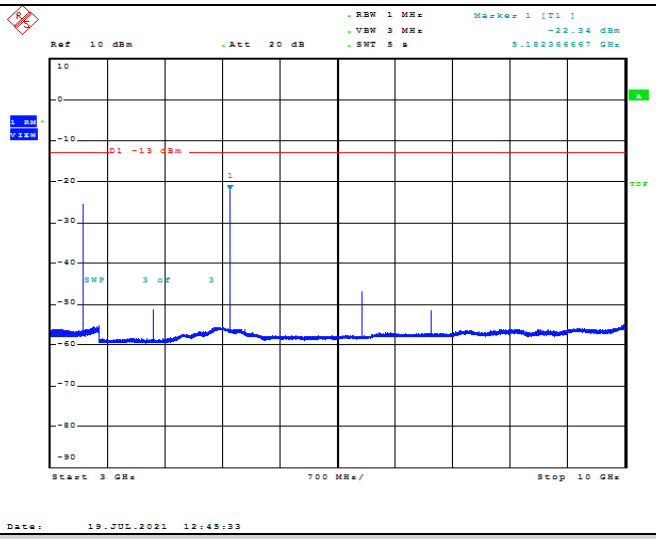
GPRS850-190-30~1000MHz



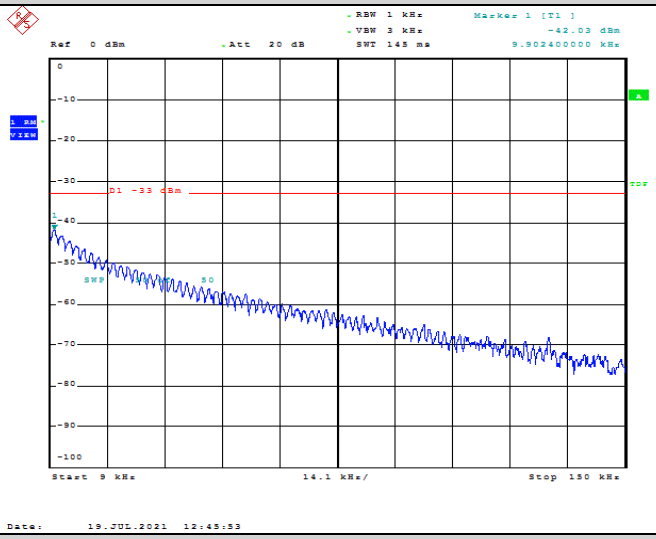
GPRS850-190-1000~3000MHz



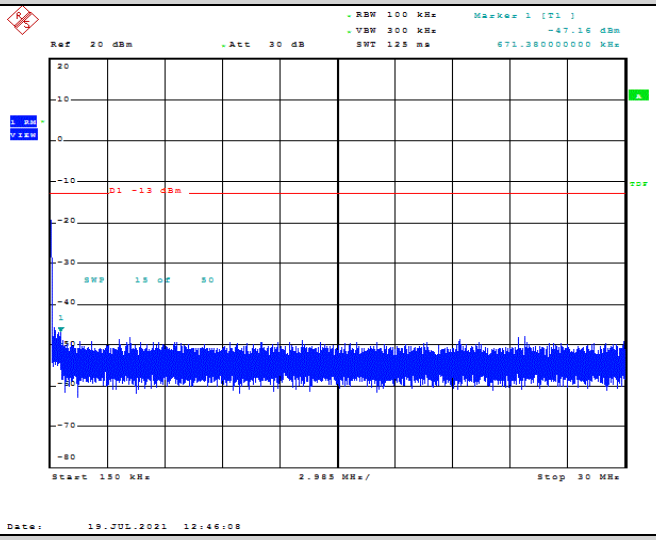
GPRS850-190-3000~10000MHz



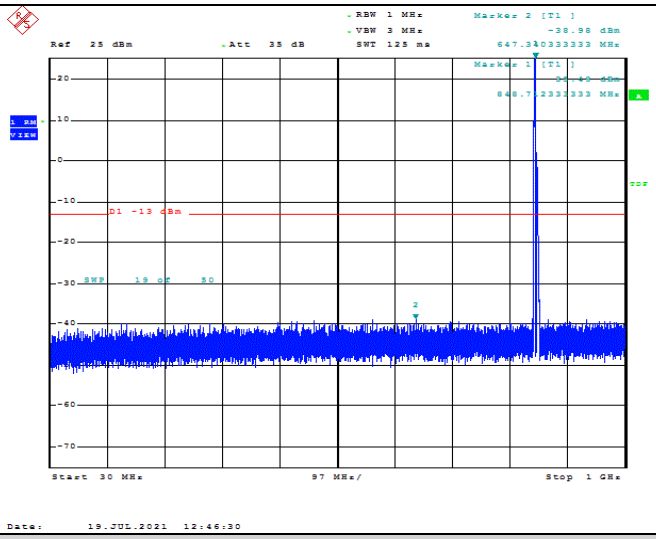
GPRS850-251-0.009~0.15MHz



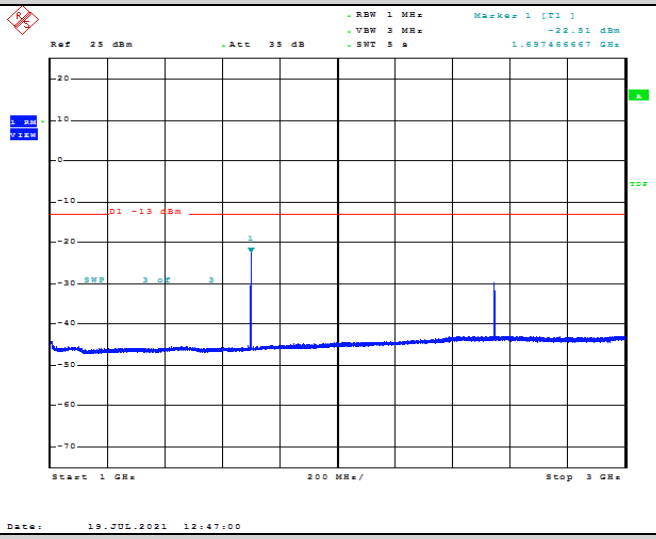
GPRS850-251-0.15~30MHz



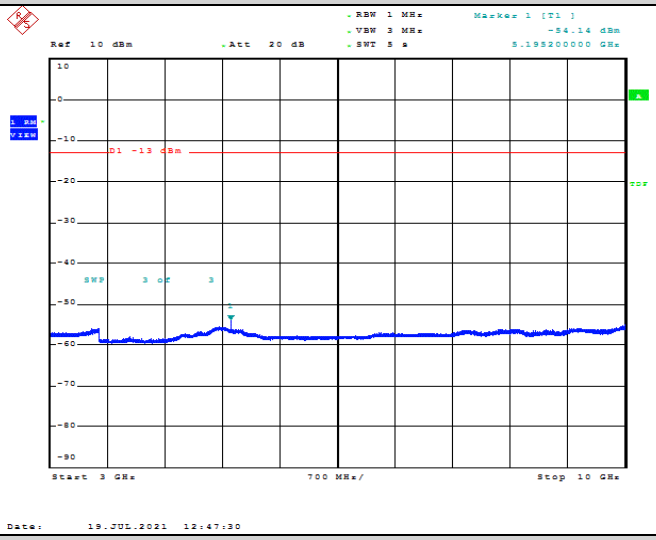
GPRS850-251-30~1000MHz



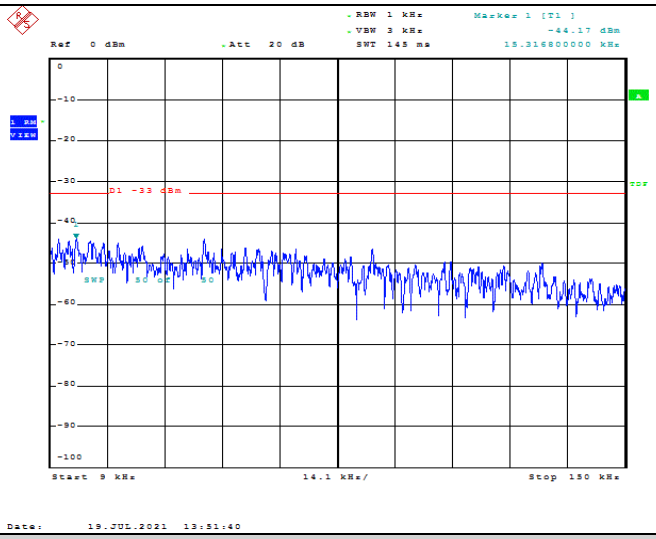
GPRS850-251-1000~3000MHz



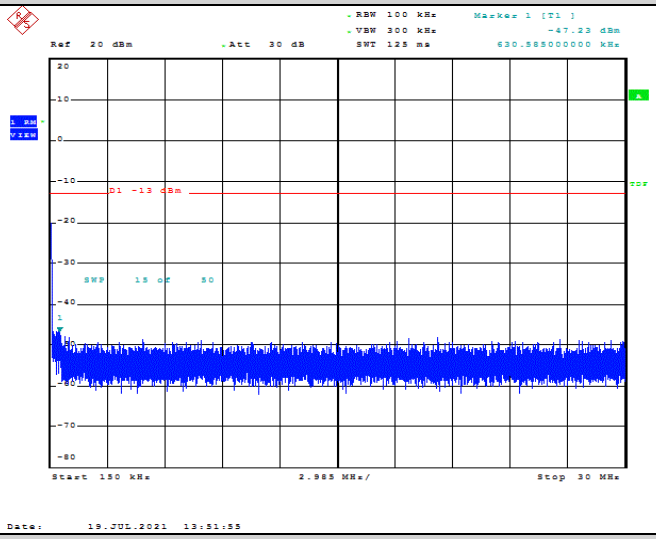
GPRS850-251-3000~10000MHz



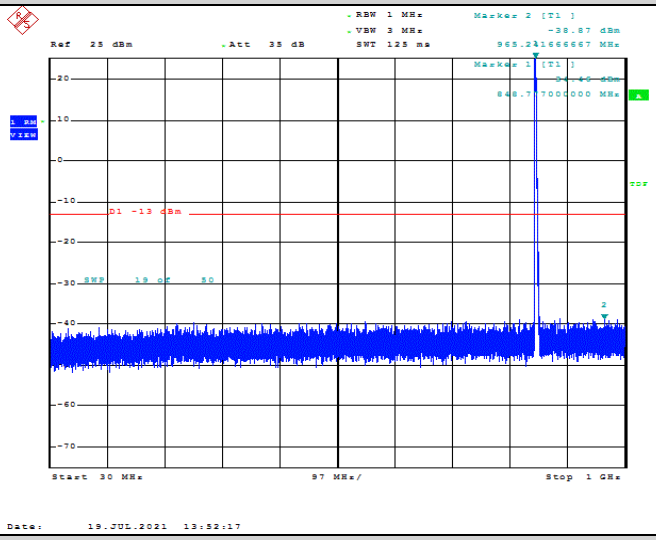
EGPRS850-128-0.009~0.15MHz



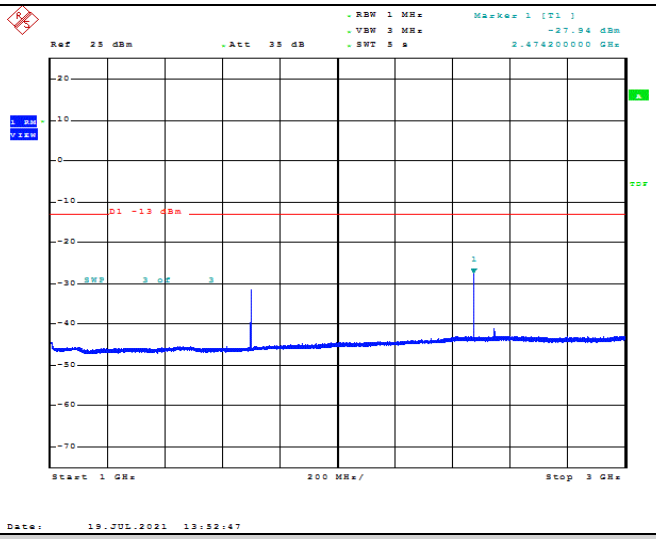
EGPRS850-128-0.15~30MHz



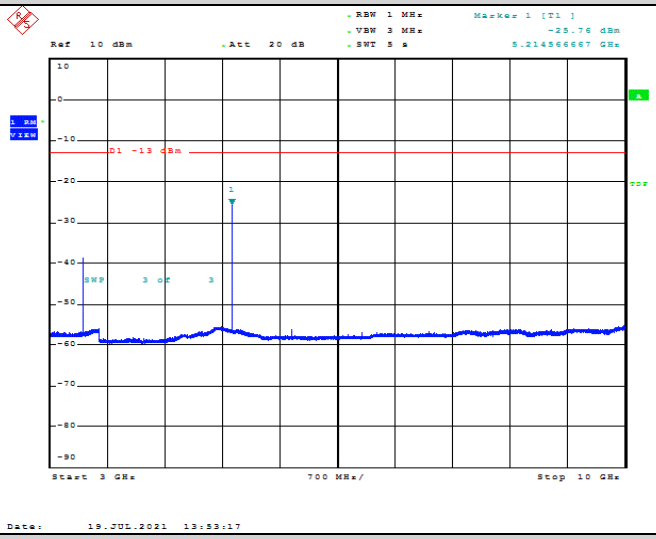
EGPRS850-128-30~1000MHz



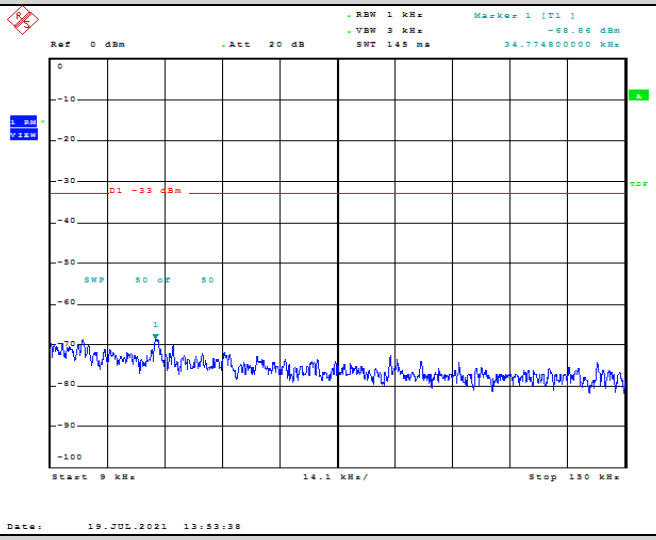
EGPRS850-128-1000~3000MHz



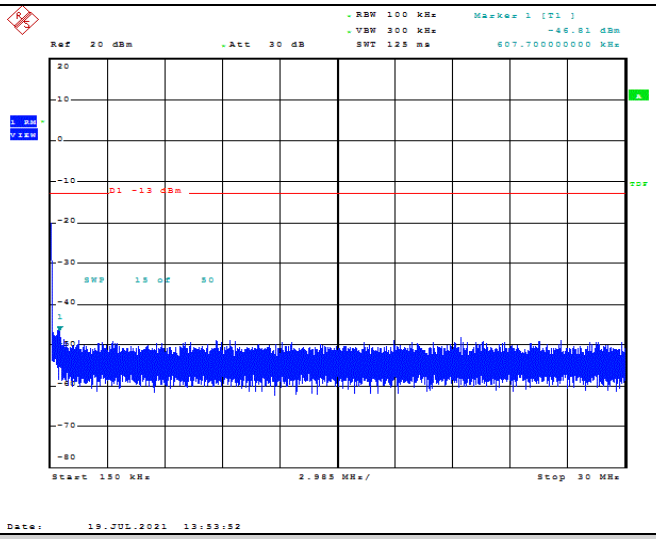
EGPRS850-128-3000~10000MHz



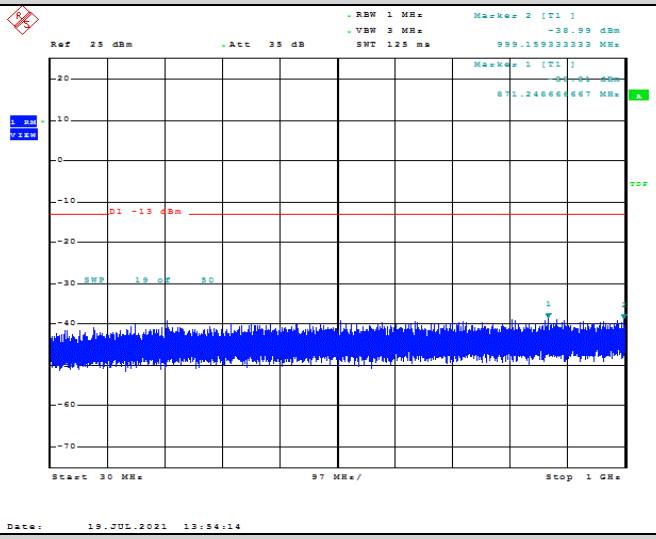
EGPRS850-190-0.009~0.15MHz



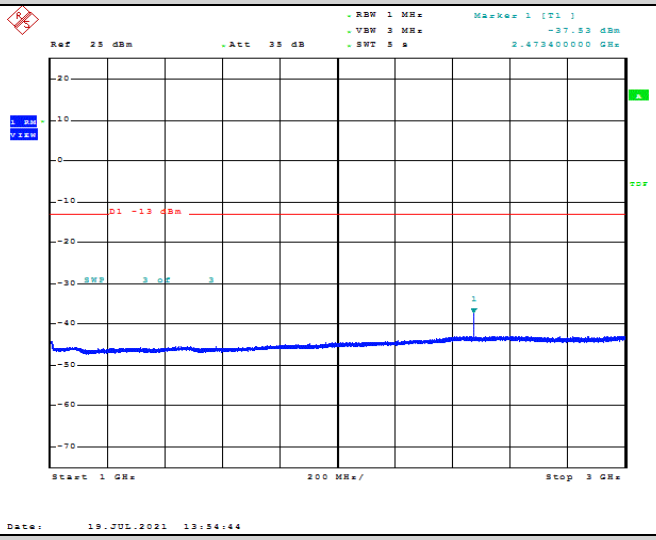
EGPRS850-190-0.15~30MHz



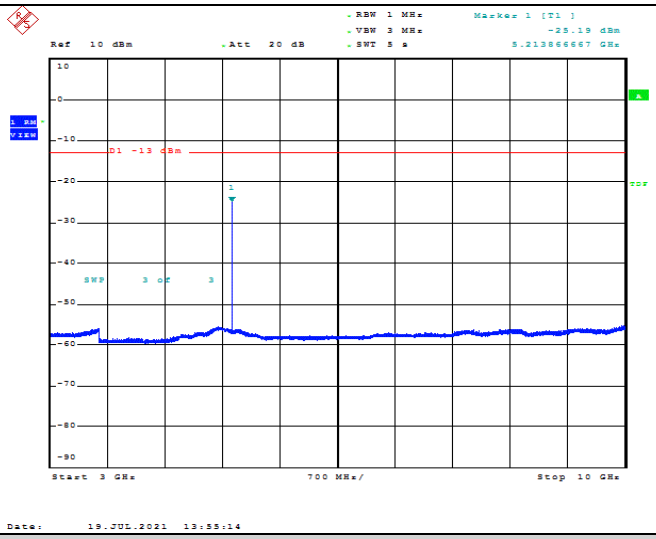
EGPRS850-190-30~1000MHz



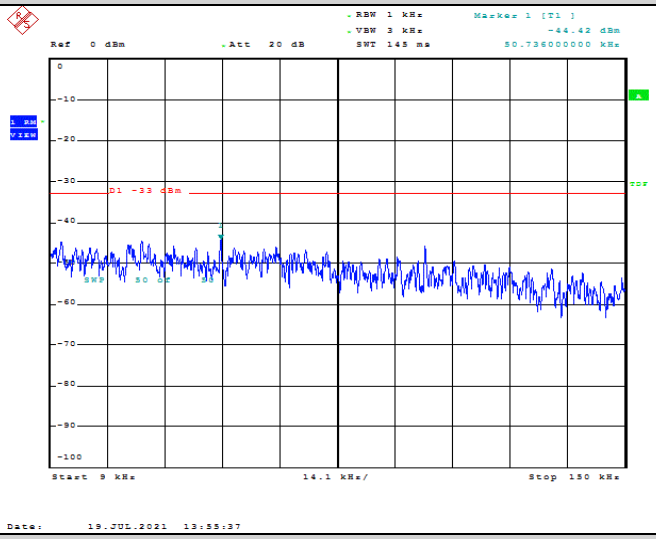
EGPRS850-190-1000~3000MHz



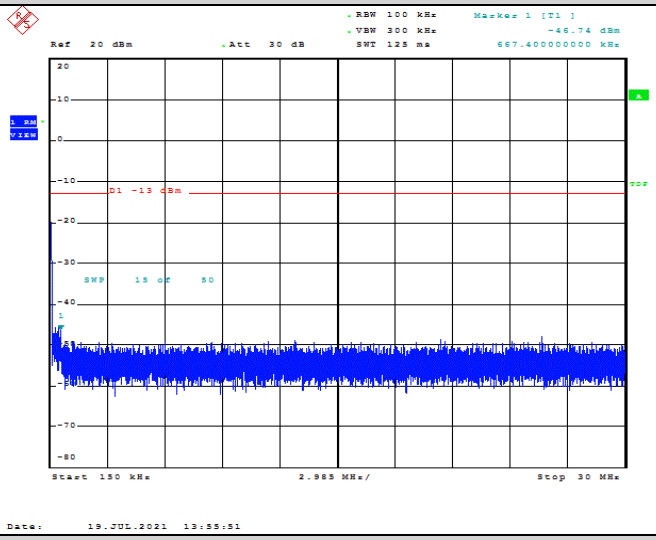
EGPRS850-190-3000~10000MHz



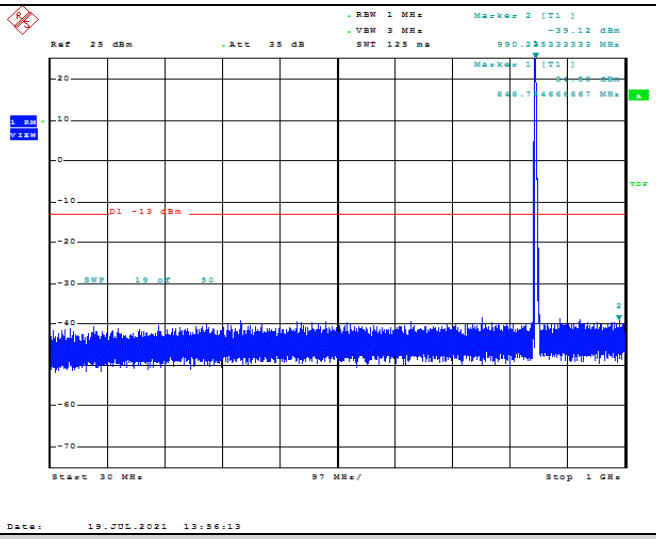
EGPRS850-251-0.009~0.15MHz



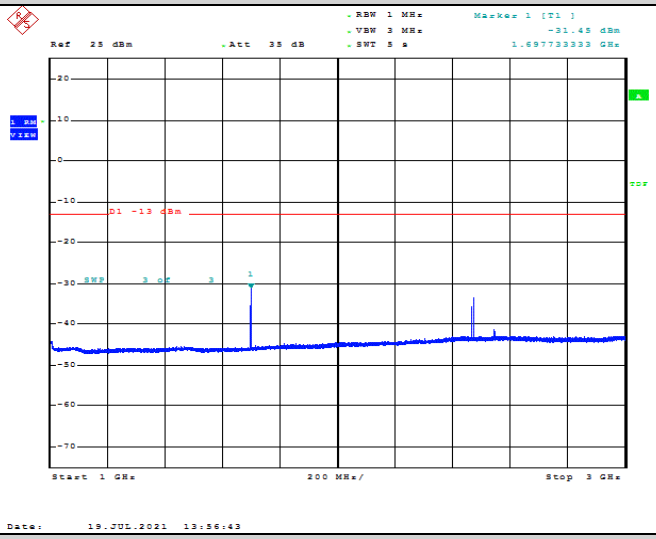
EGPRS850-251-0.15~30MHz



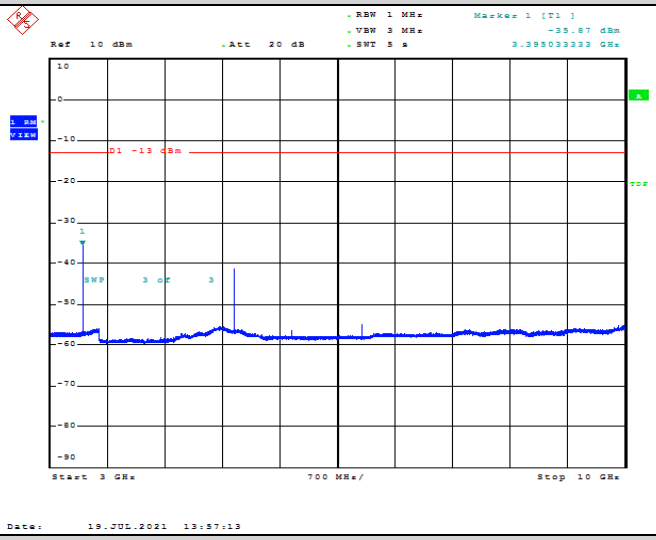
EGPRS850-251-30~1000MHz



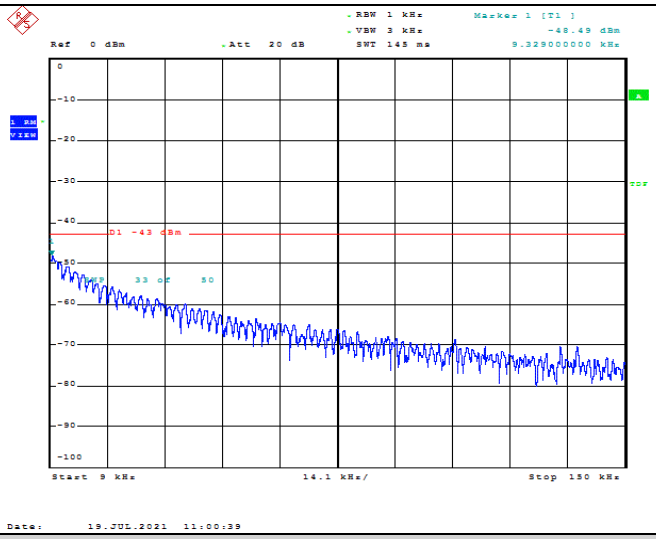
EGPRS850-251-1000~3000MHz



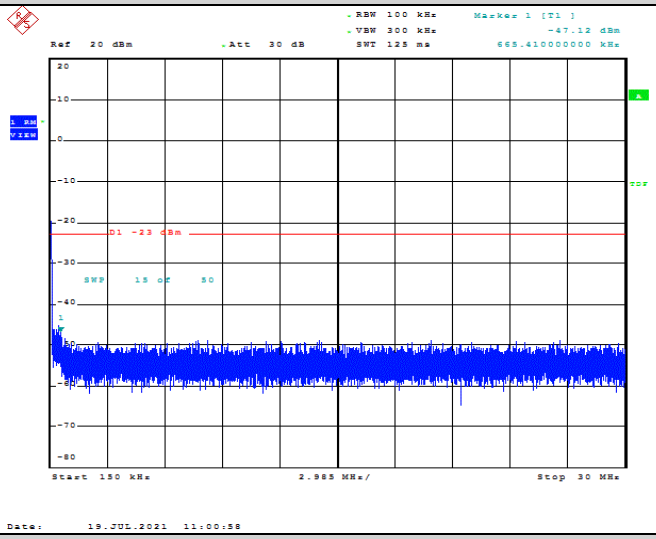
EGPRS850-251-3000~10000MHz



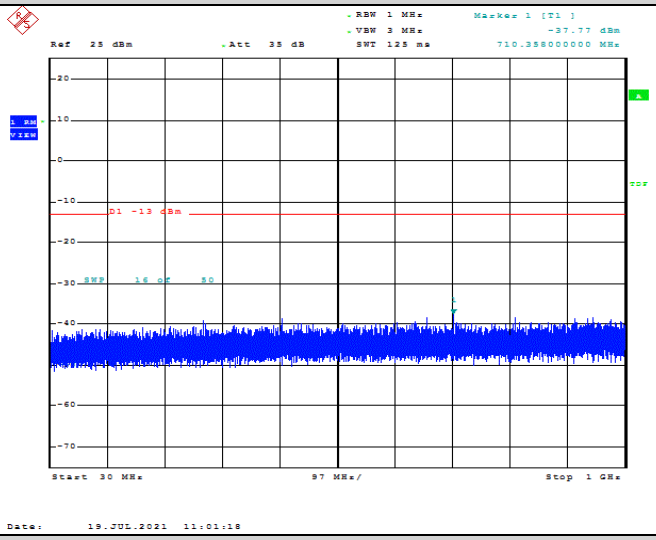
GPRS1900-512-0.009~0.15MHz



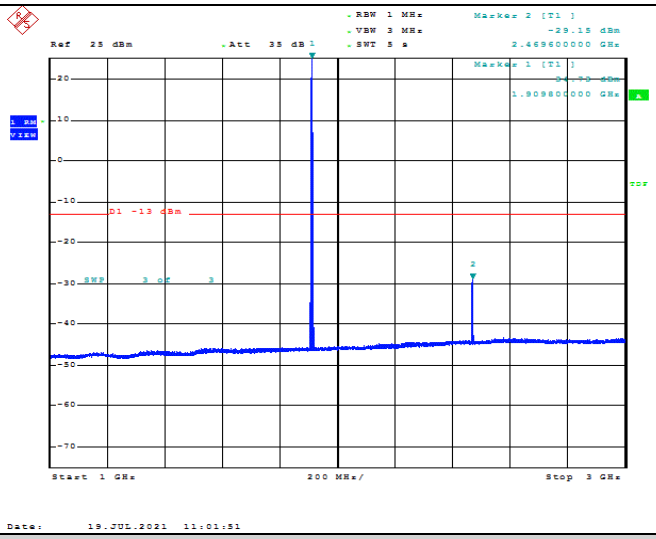
GPRS1900-512-0.15~30MHz



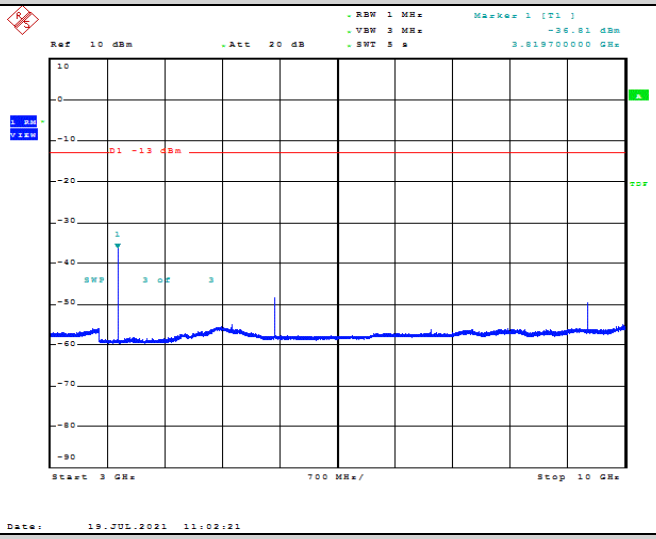
GPRS1900-512-30~1000MHz



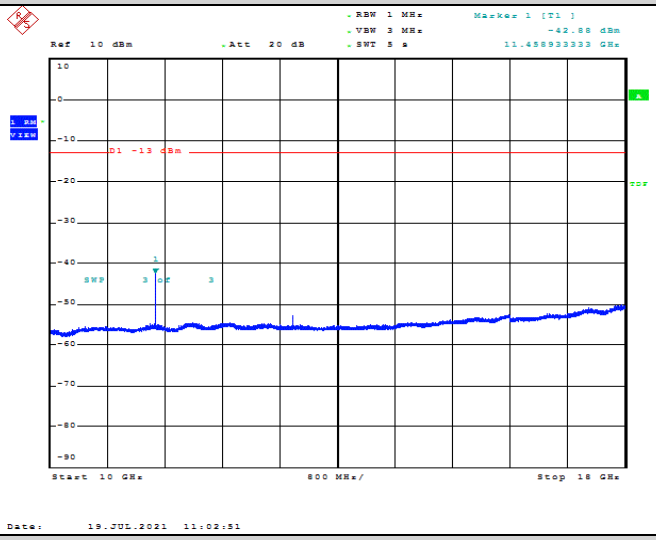
GPRS1900-512-1000~3000MHz



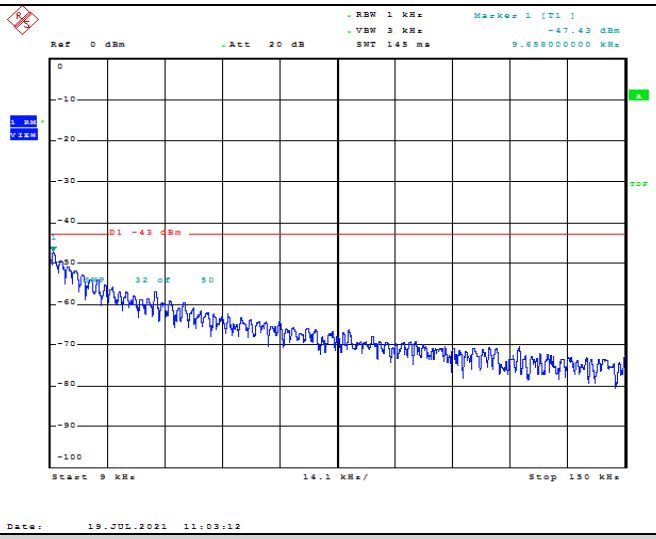
GPRS1900-512-3000~10000MHz



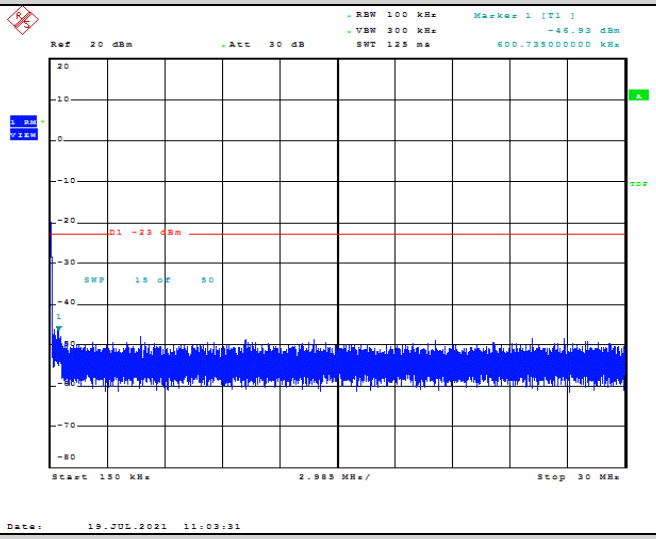
GPRS1900-512-10000~18000MHz



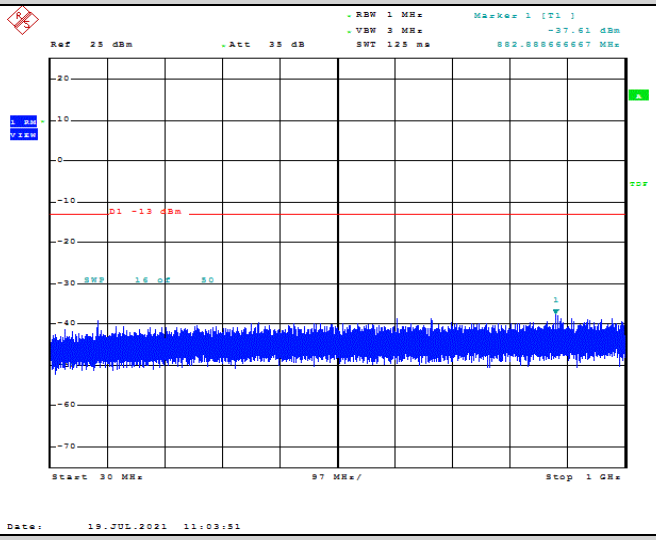
GPRS1900-661-0.009~0.15MHz



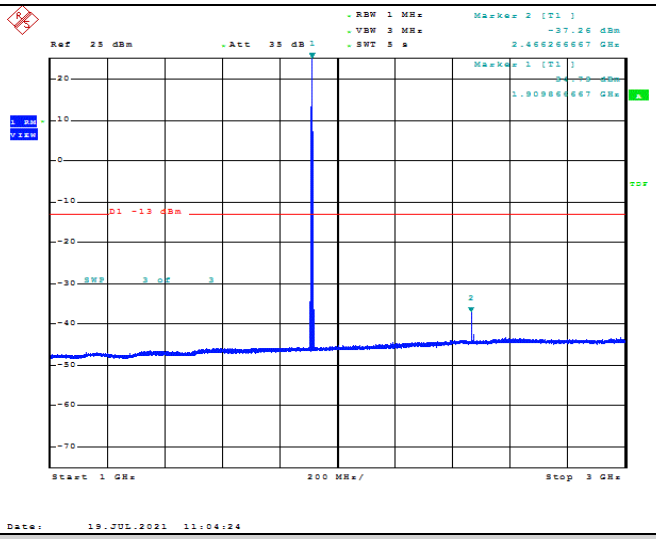
GPRS1900-661-0.15~30MHz



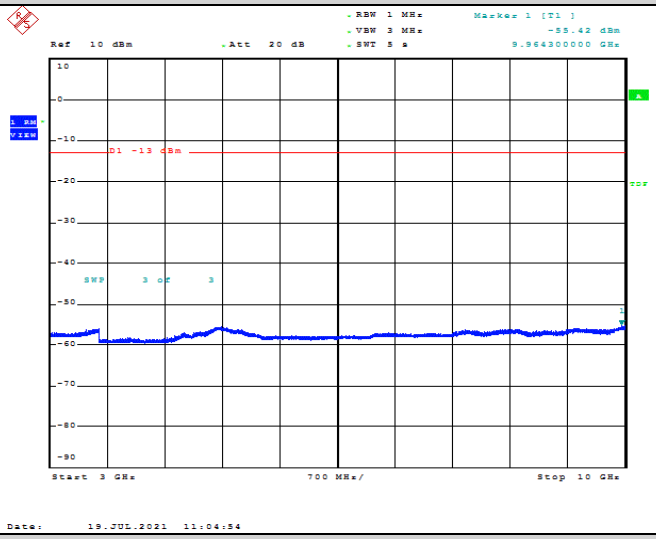
GPRS1900-661-30~1000MHz



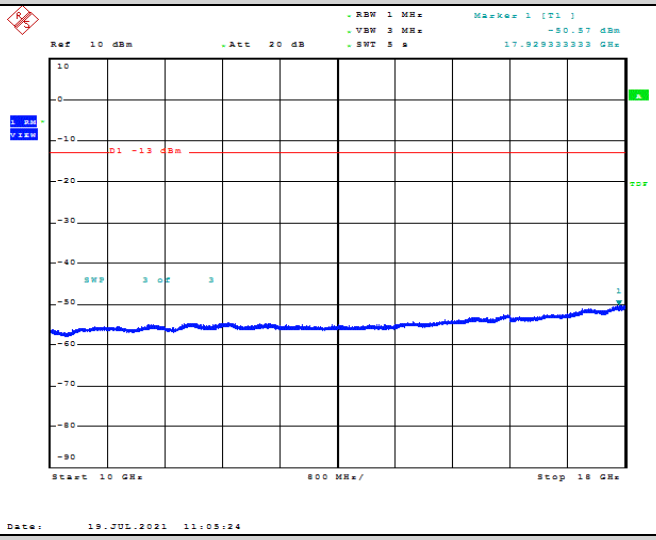
GPRS1900-661-1000~3000MHz



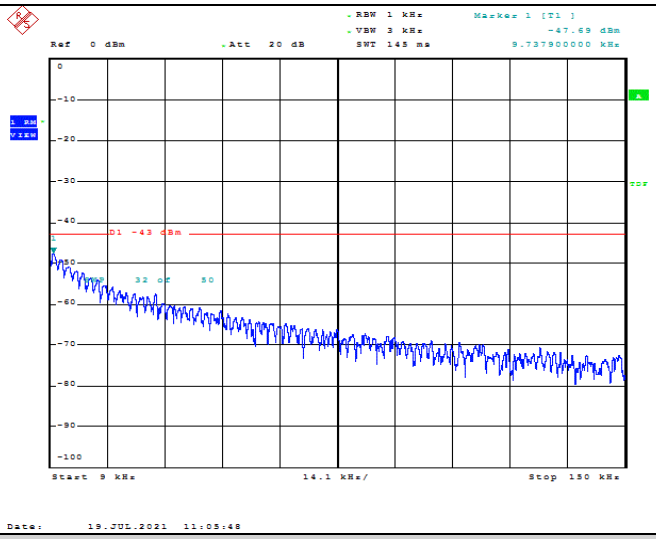
GPRS1900-661-3000~10000MHz



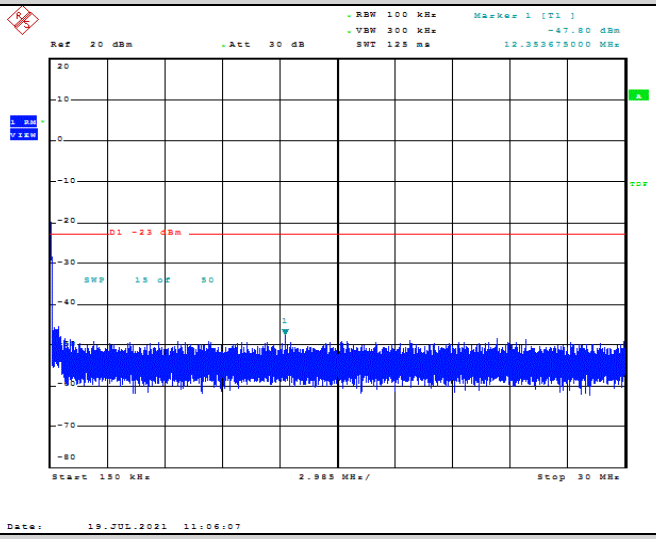
GPRS1900-661-10000~18000MHz



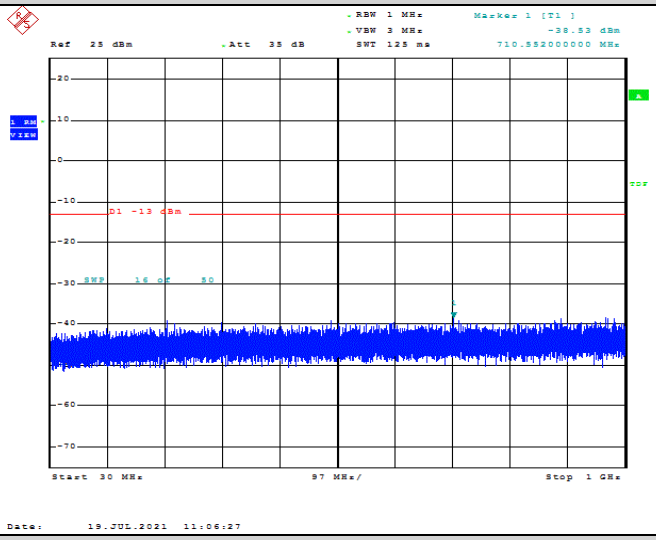
GPRS1900-810-0.009~0.15MHz



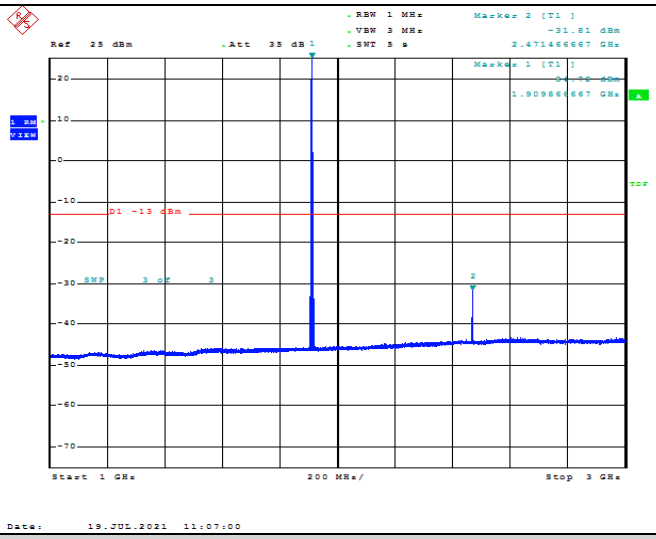
GPRS1900-810-0.15~30MHz



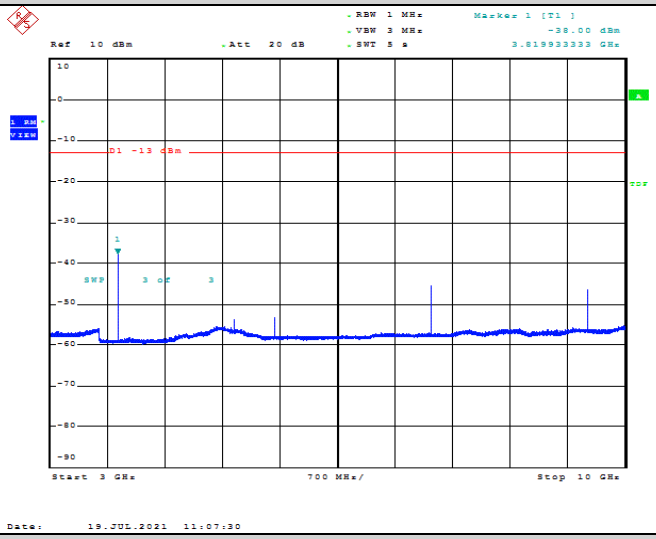
GPRS1900-810-30~1000MHz



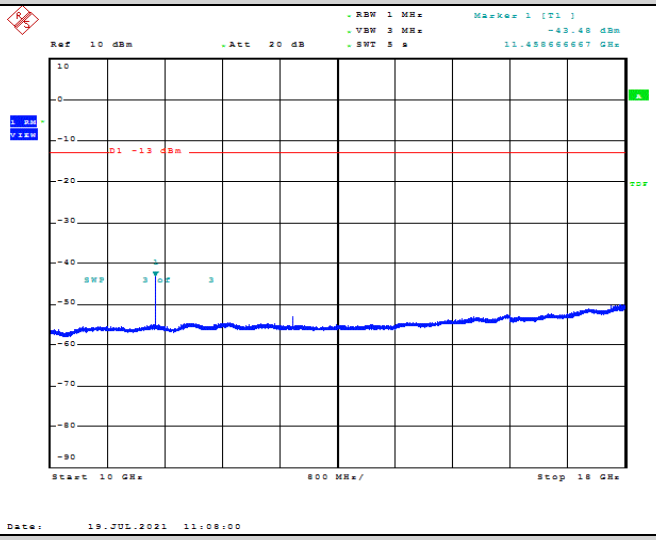
GPRS1900-810-1000~3000MHz



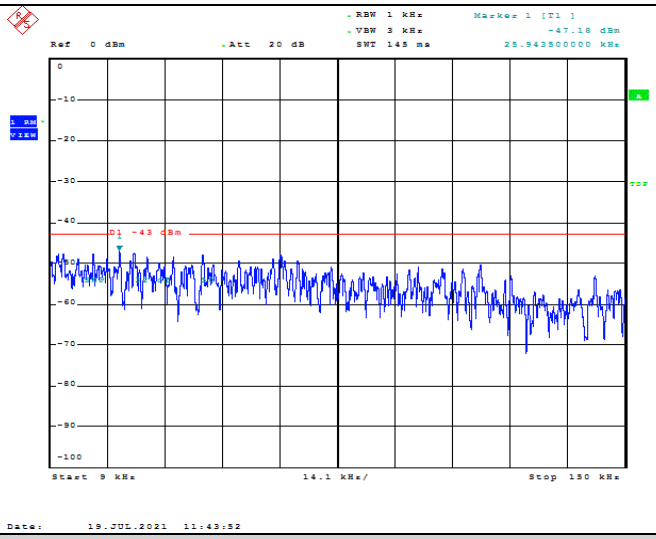
GPRS1900-810-3000~10000MHz



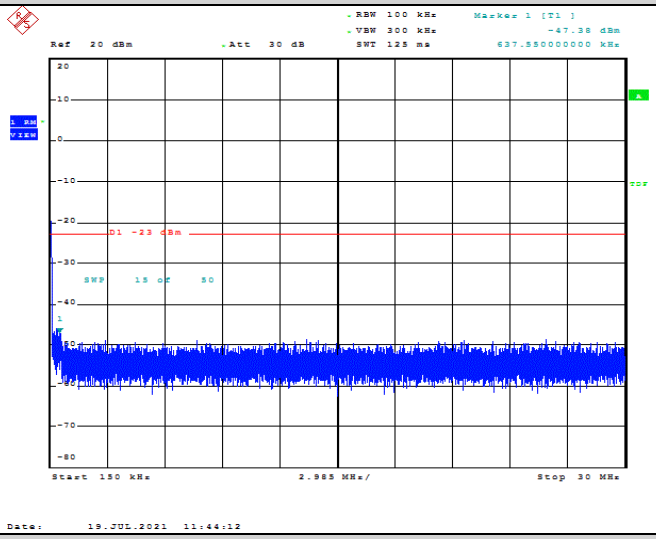
GPRS1900-810-10000~18000MHz



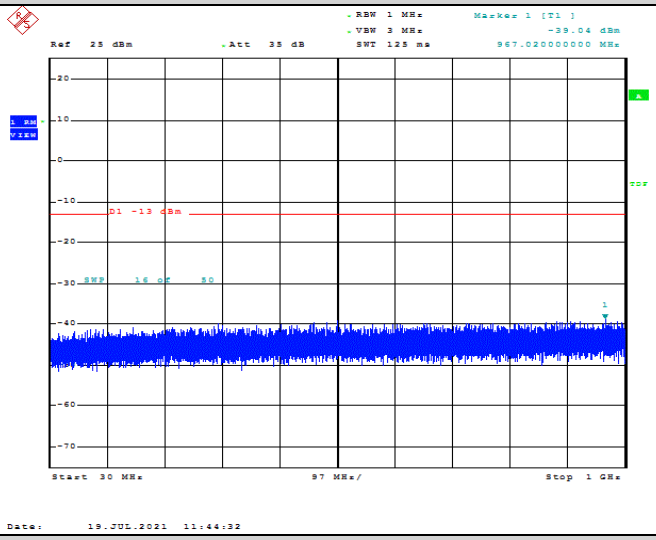
EGPRS1900-512-0.009~0.15MHz



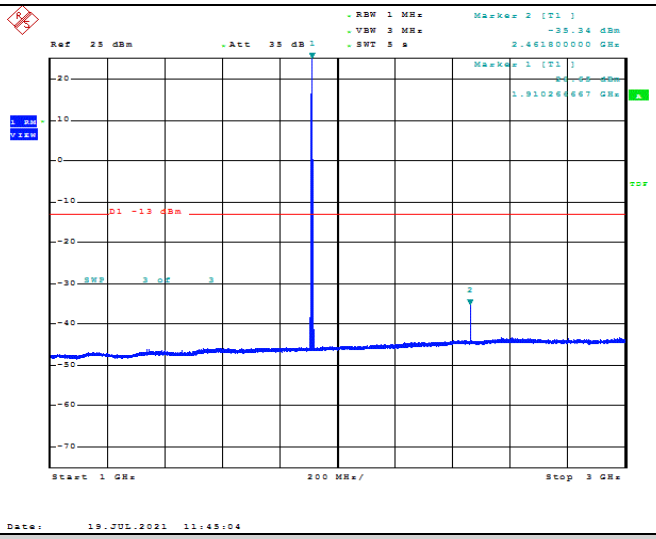
EGPRS1900-512-0.15~30MHz



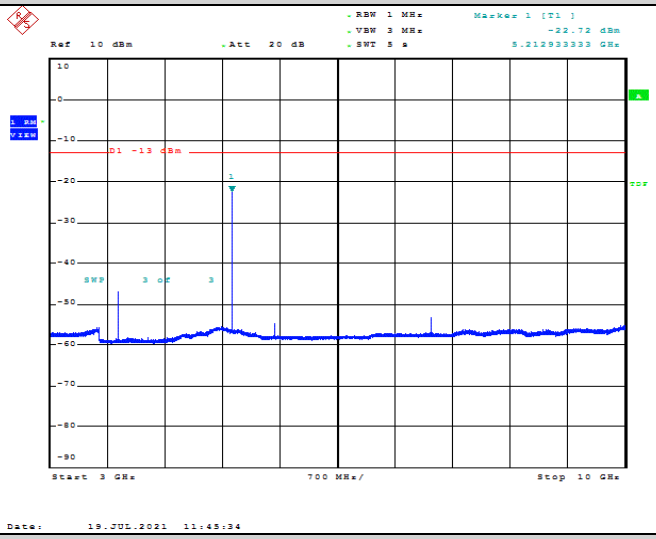
EGPRS1900-512-30~1000MHz



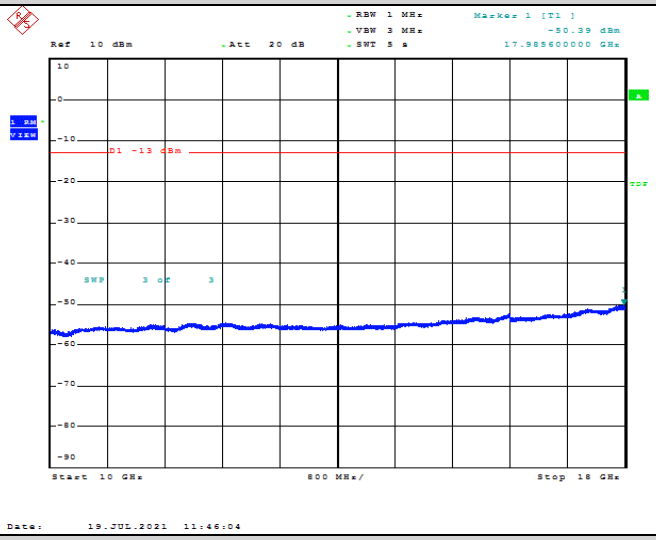
EGPRS1900-512-1000~3000MHz



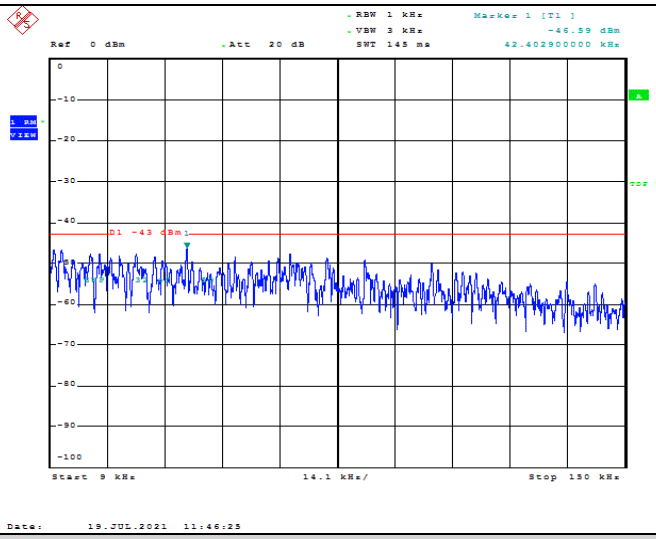
EGPRS1900-512-3000~10000MHz



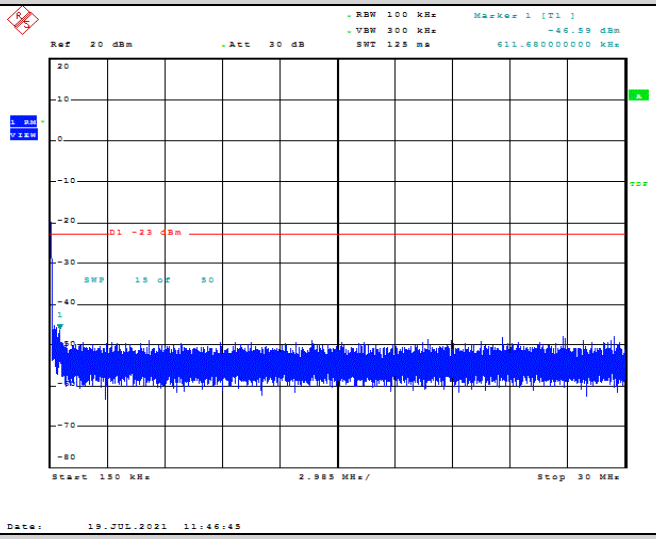
EGPRS1900-512-10000~18000MHz



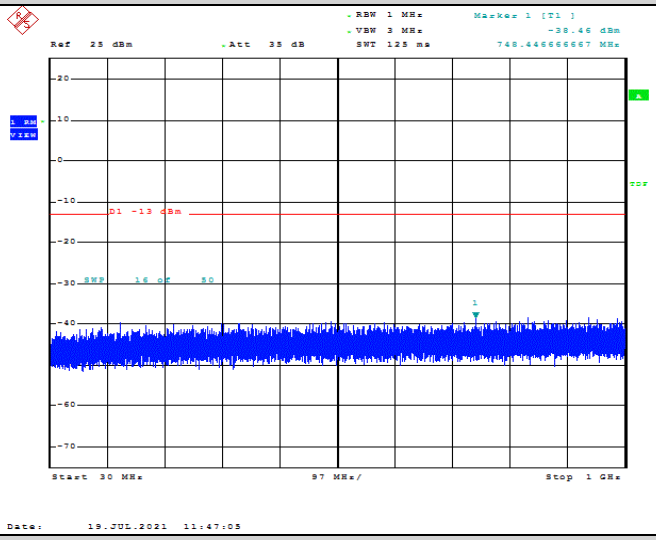
EGPRS1900-661-0.009~0.15MHz



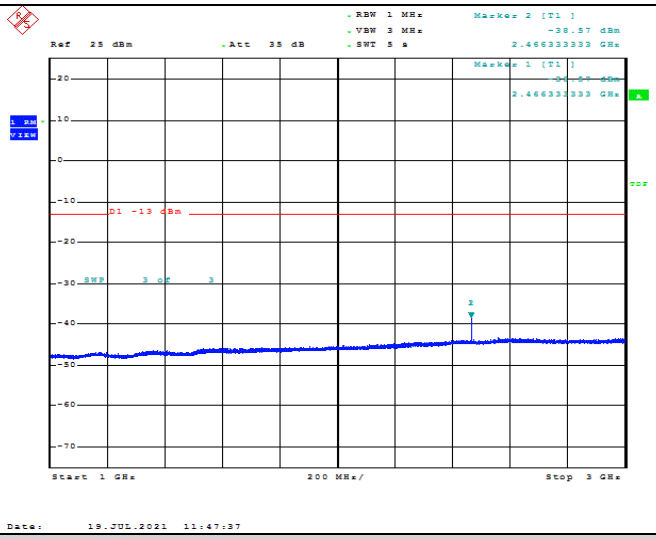
EGPRS1900-661-0.15~30MHz



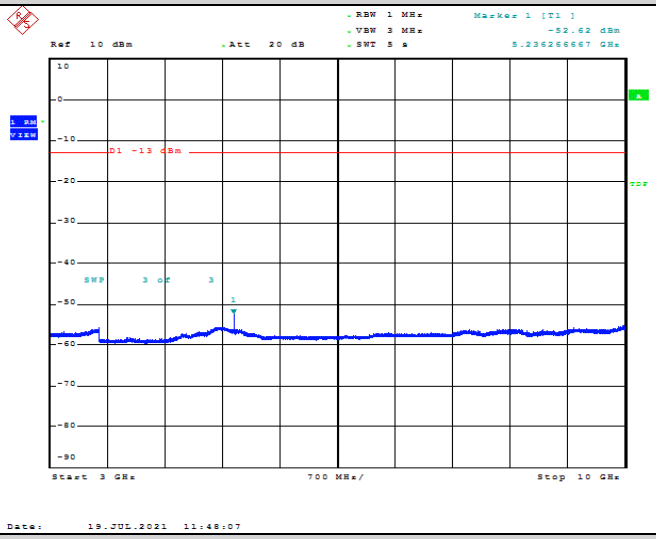
EGPRS1900-661-30~1000MHz



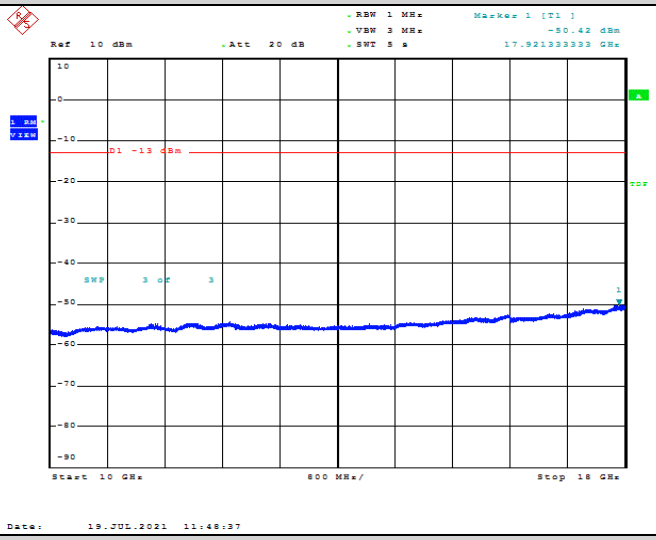
EGPRS1900-661-1000~3000MHz



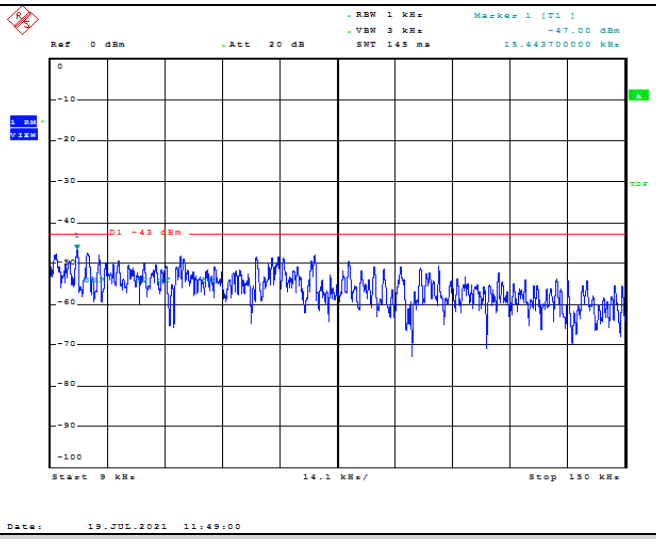
EGPRS1900-661-3000~10000MHz



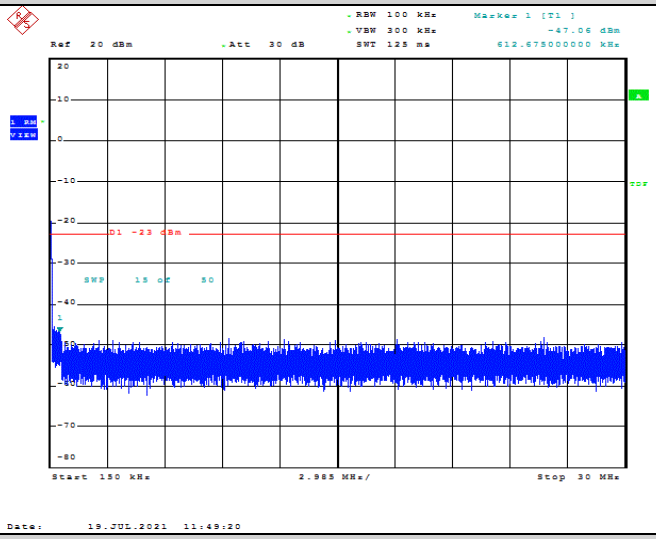
EGPRS1900-661-10000~18000MHz



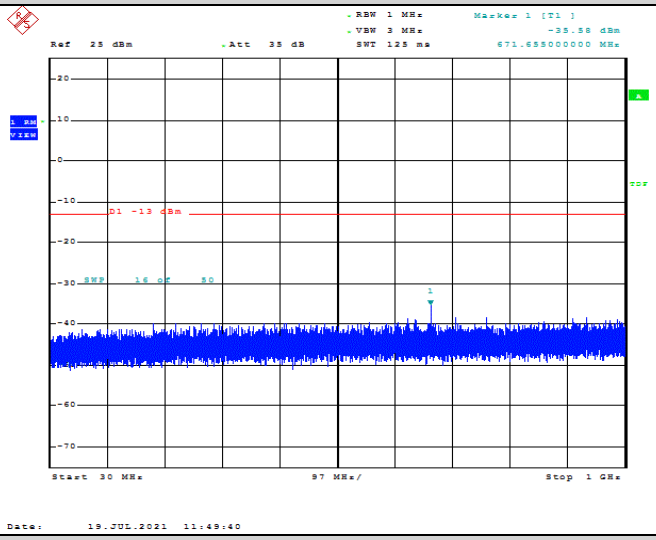
EGPRS1900-810-0.009~0.15MHz



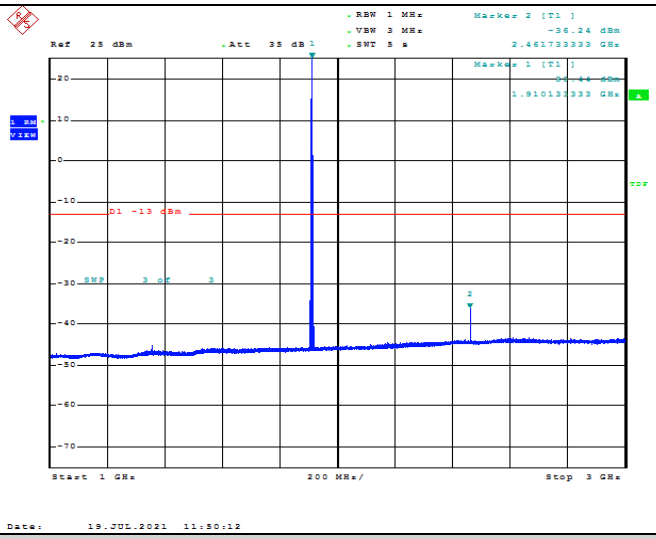
EGPRS1900-810-0.15~30MHz



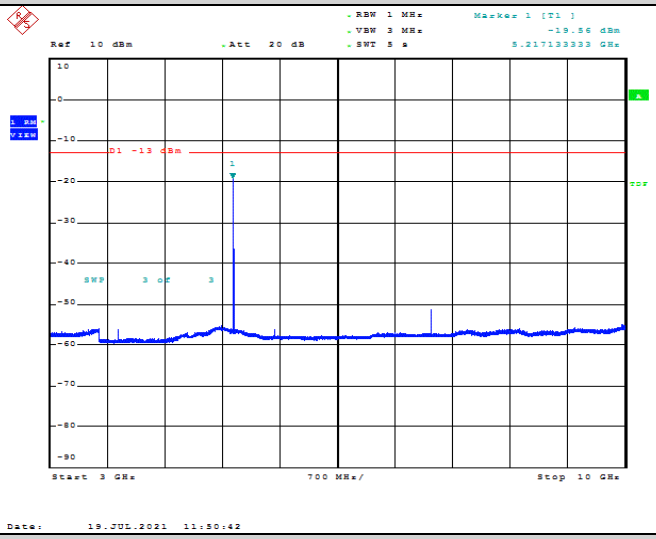
EGPRS1900-810-30~1000MHz



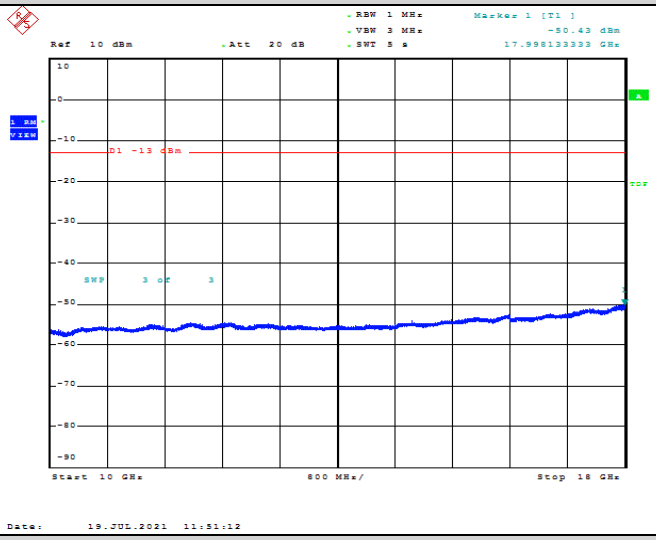
EGPRS1900-810-1000~3000MHz



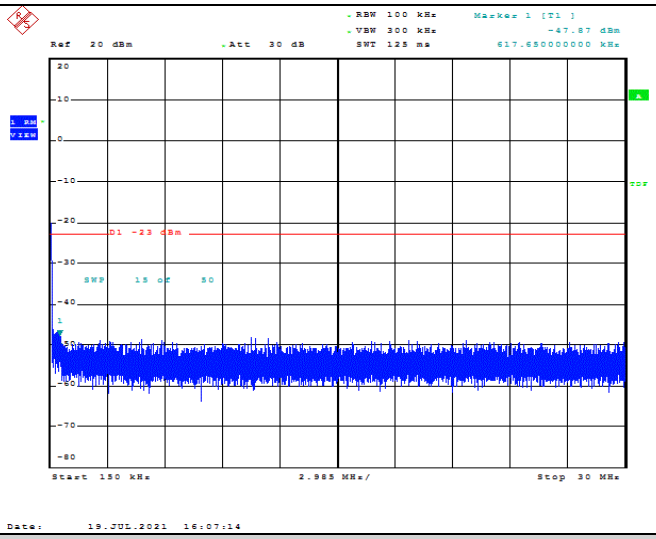
EGPRS1900-810-3000~10000MHz



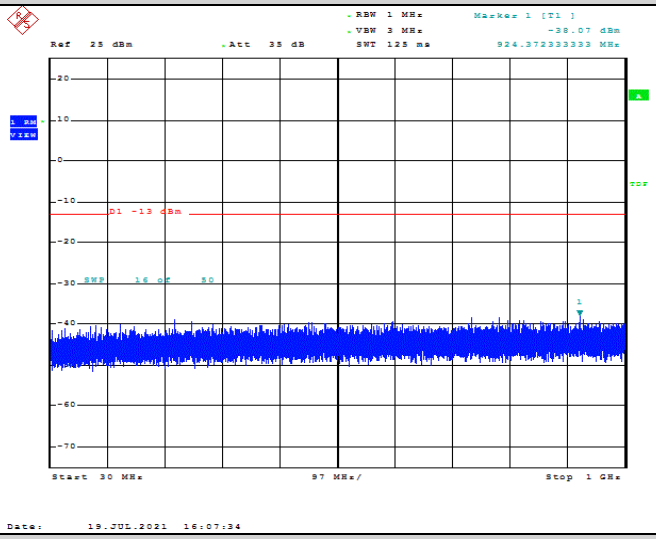
EGPRS1900-810-10000~18000MHz



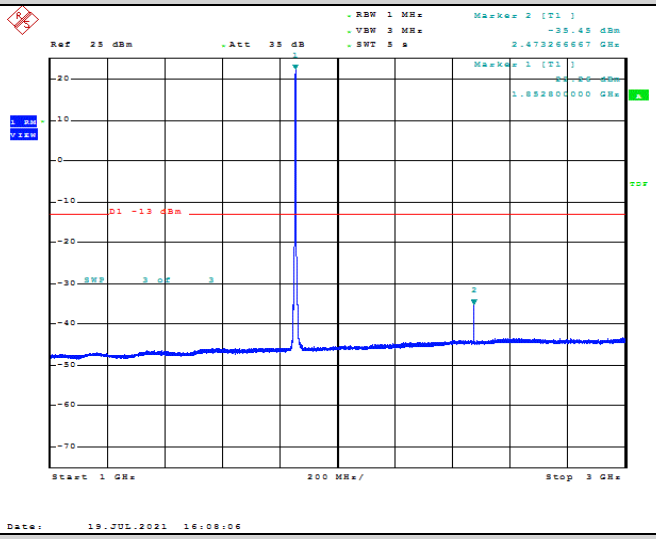
Band2-9262-0.15~30MHz



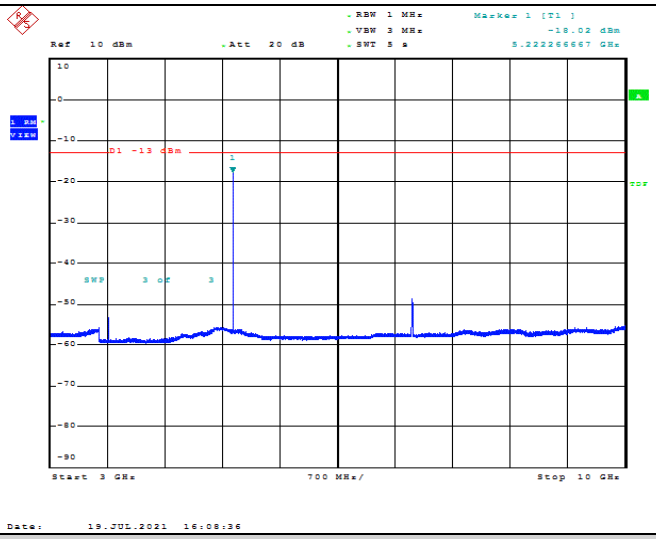
Band2-9262-30~1000MHz



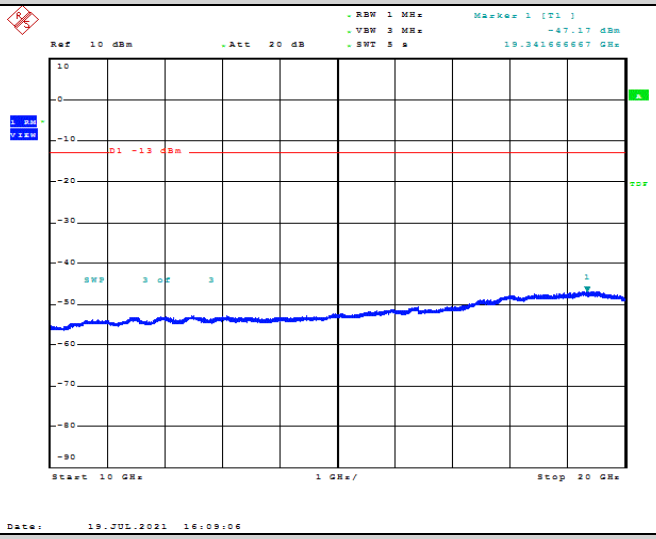
Band2-9262-1000~3000MHz



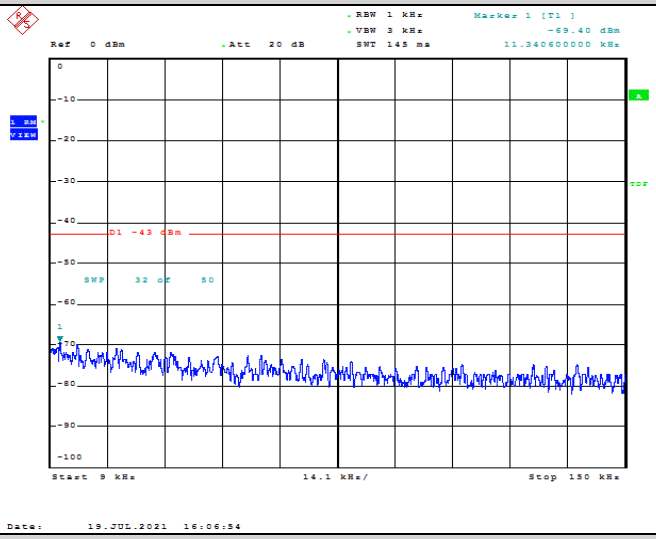
Band2-9262-3000~10000MHz



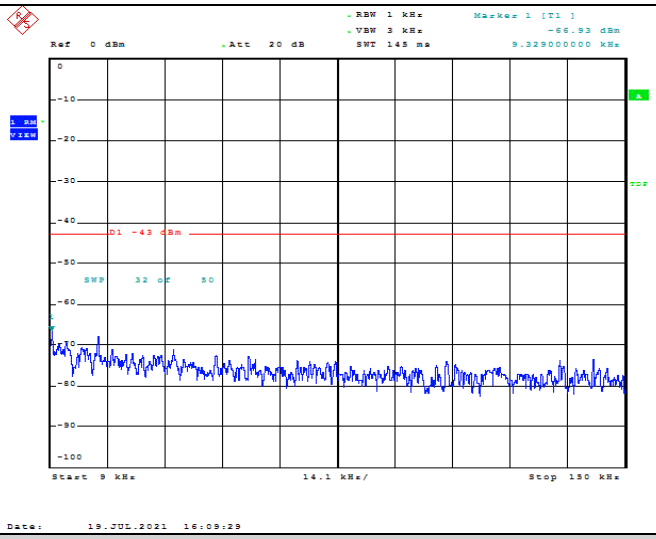
Band2-9262-10000~20000MHz



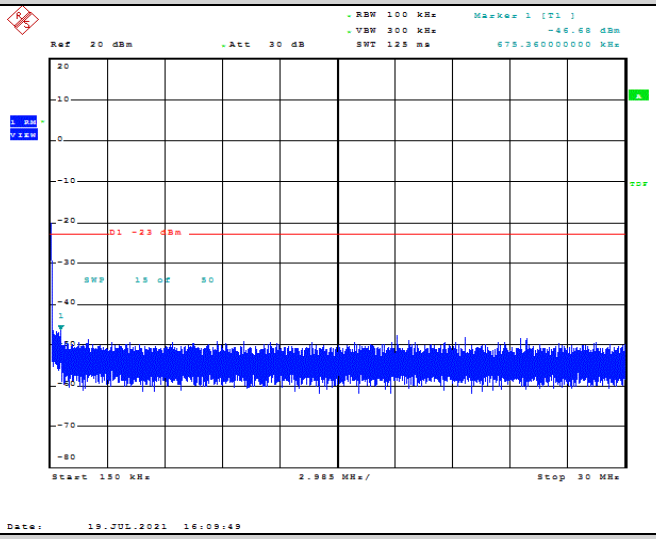
Band2-9262-0.009~0.15MHz



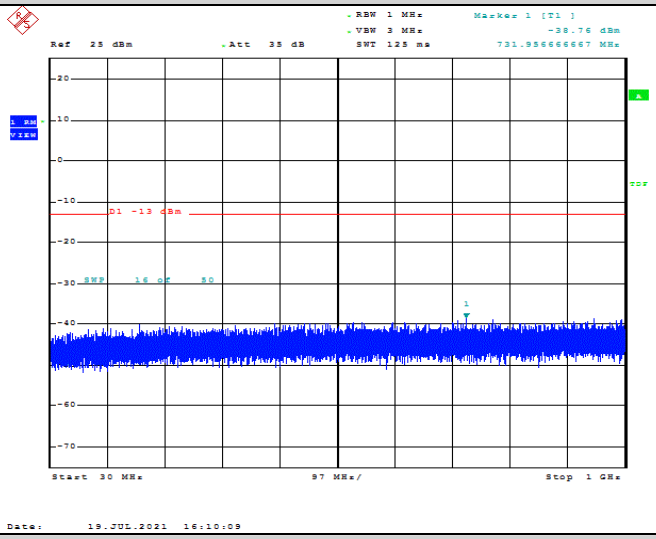
Band2-9400-0.009~0.15MHz



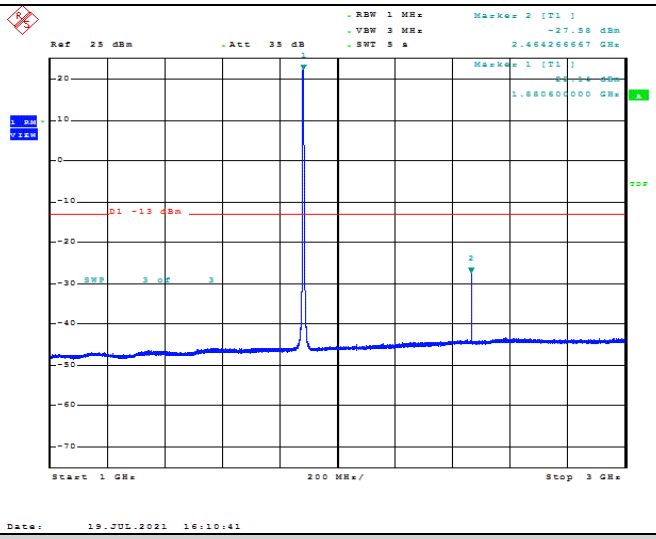
Band2-9400-0.15~30MHz



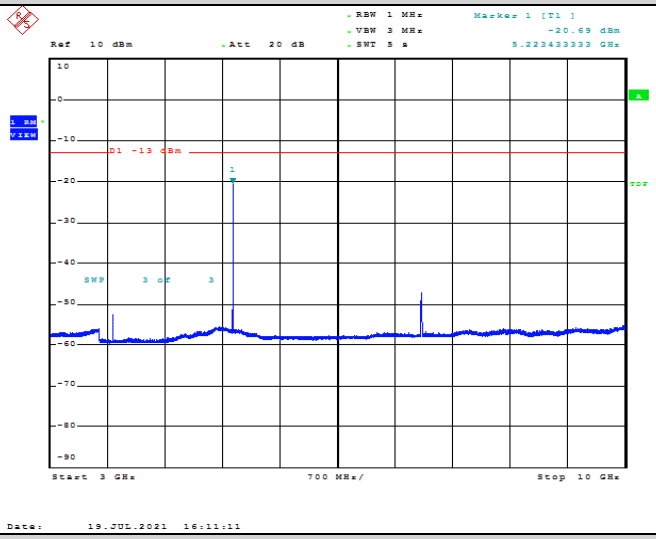
Band2-9400-30~1000MHz



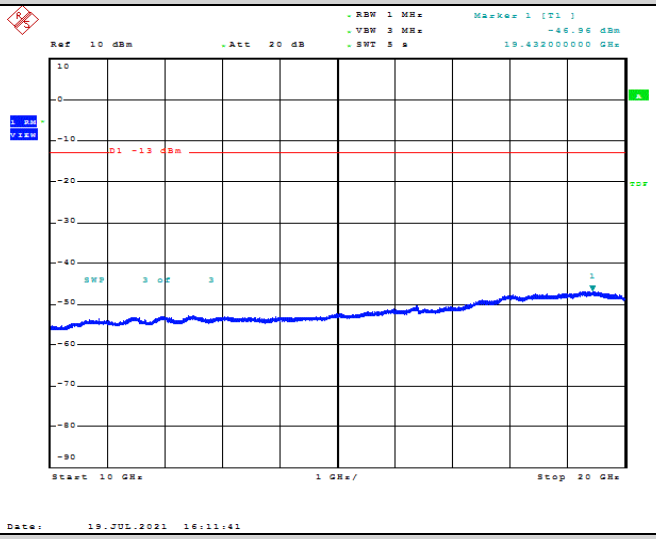
Band2-9400-1000~3000MHz



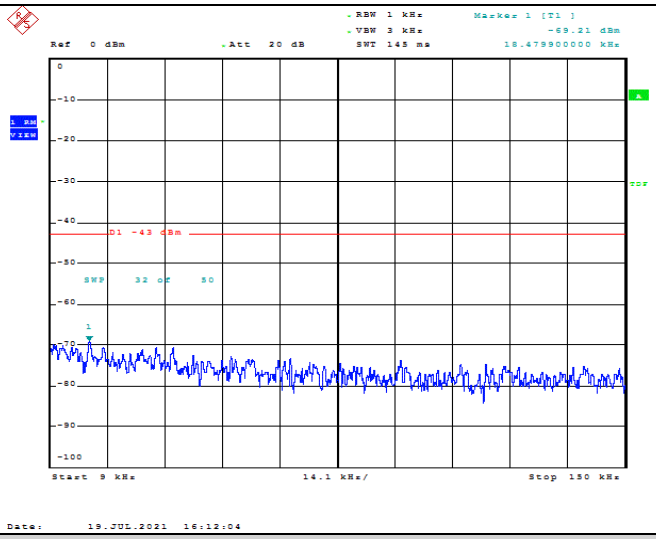
Band2-9400-3000~10000MHz



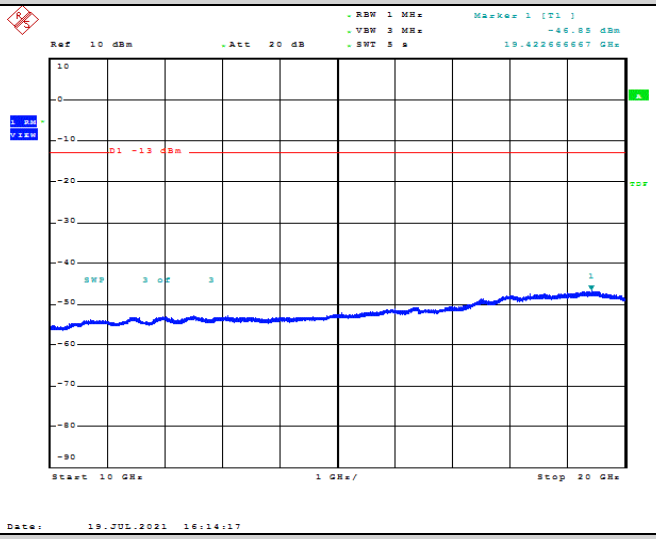
Band2-9400-10000~20000MHz



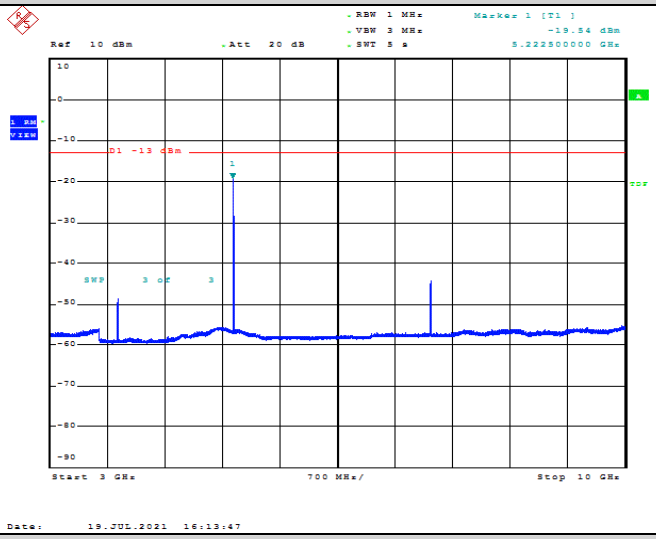
Band2-9538-0.009~0.15MHz



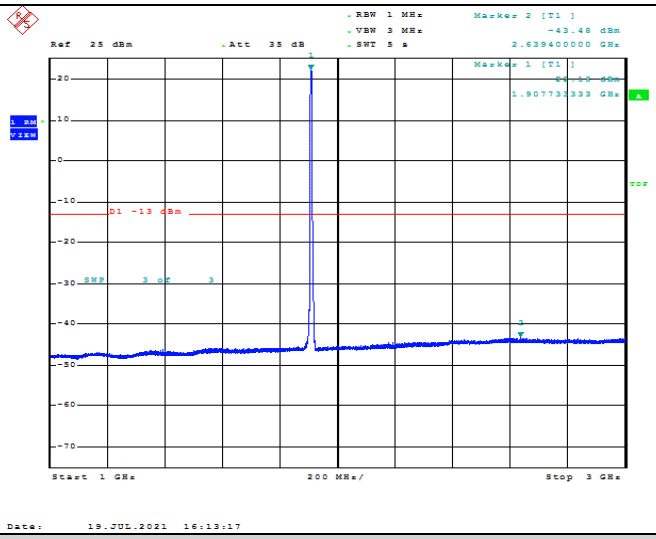
Band2-9538-10000~20000MHz



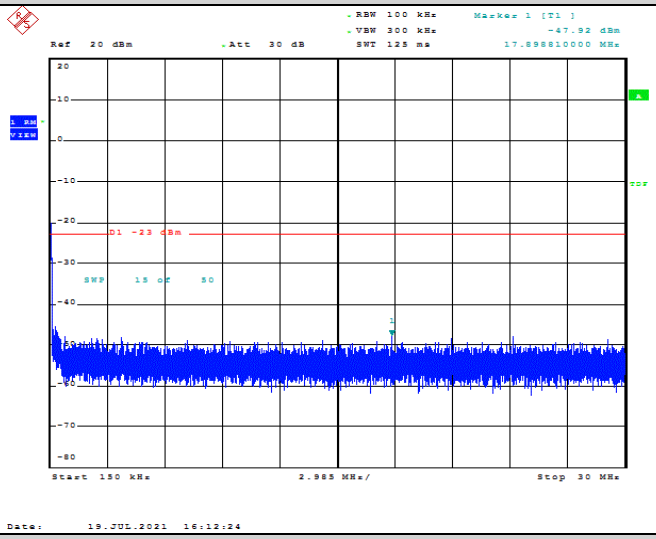
Band2-9538-3000~10000MHz



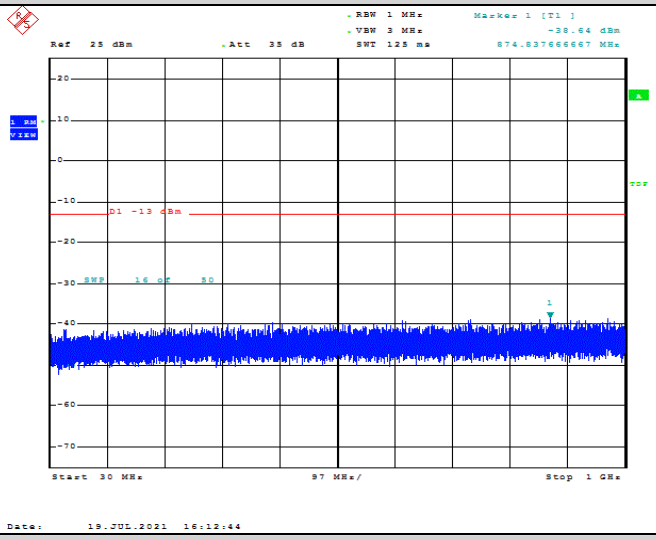
Band2-9538-1000~3000MHz



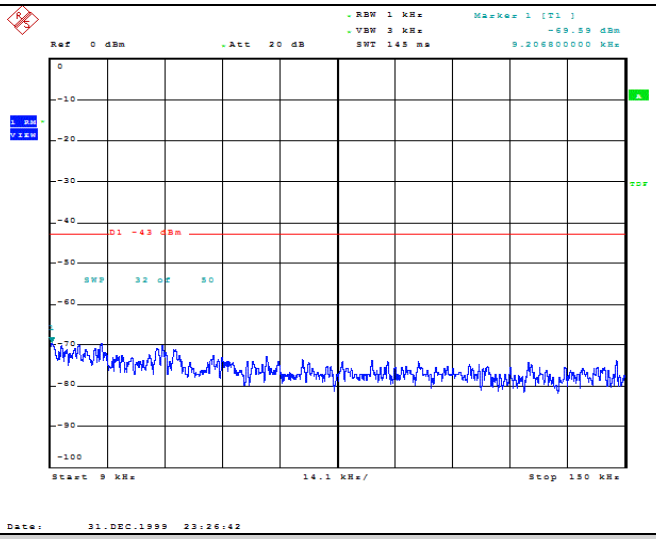
Band2-9538-0.15~30MHz



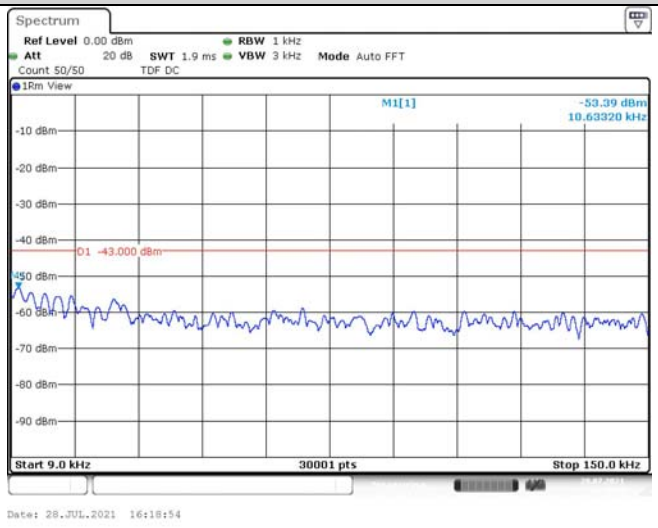
Band2-9538-30~1000MHz



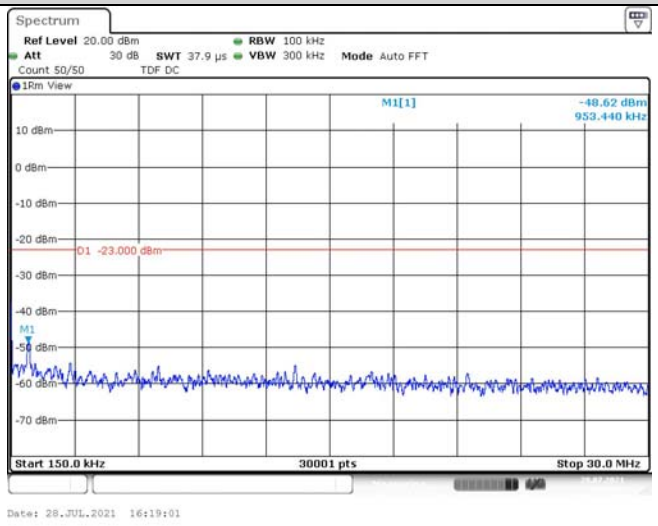
Band4-1312-0.009~0.15MHz



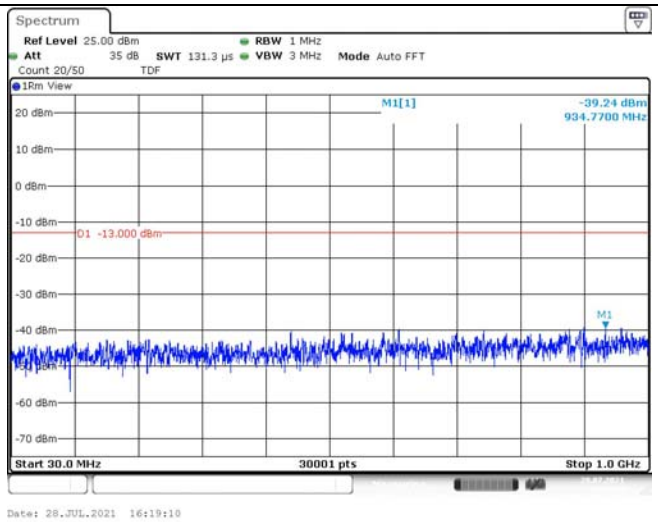
Band4-1312-0.009~0.15MHz



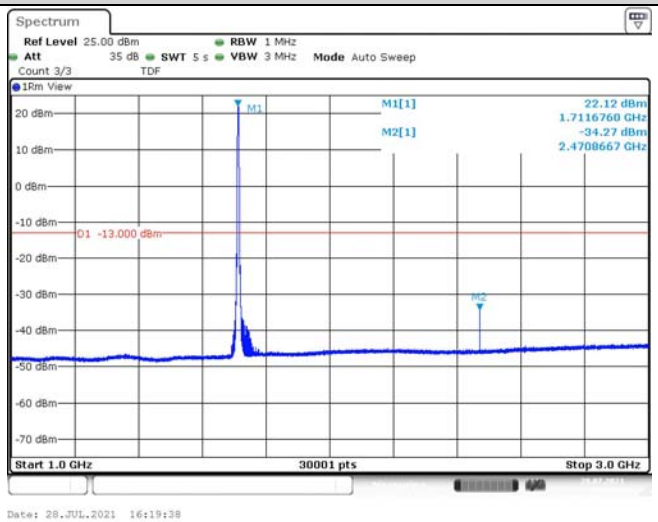
Band4-1312-0.15~30MHz



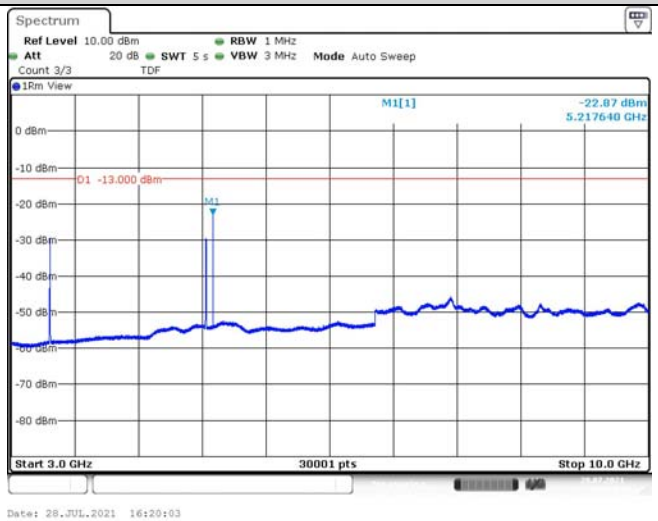
Band4-1312-30~1000MHz



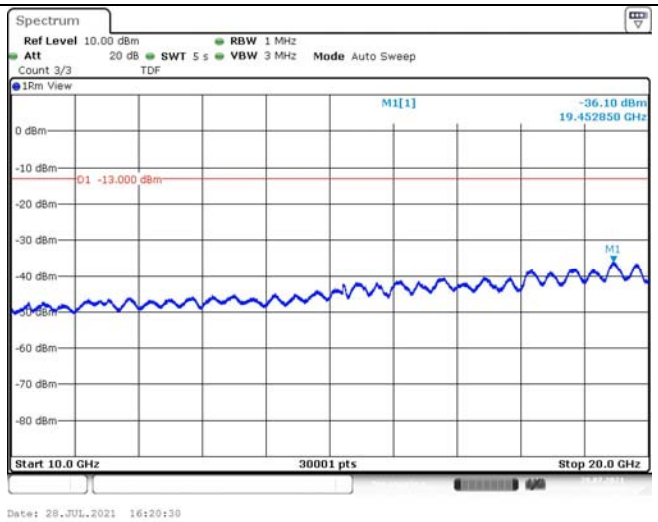
Band4-1312-1000~3000MHz



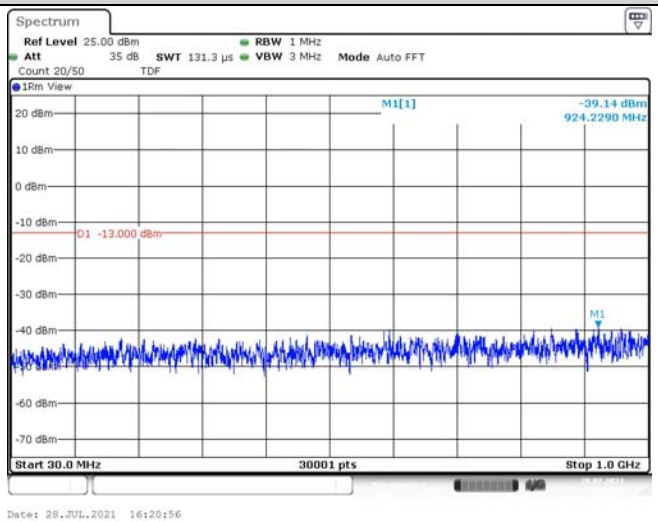
Band4-1312-3000~10000MHz



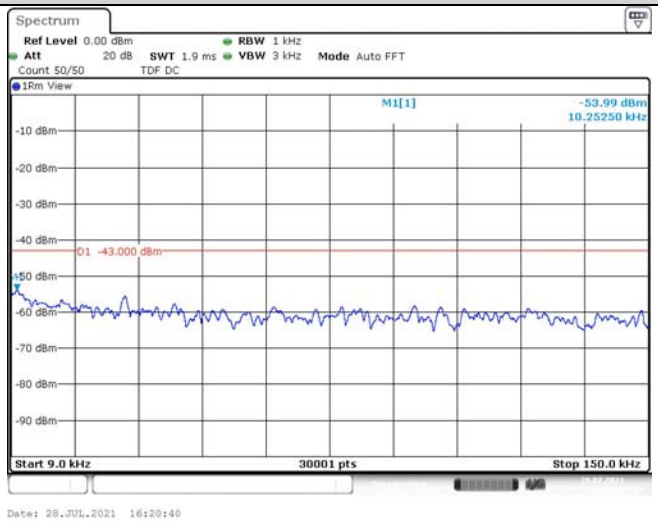
Band4-1312-10000~20000MHz



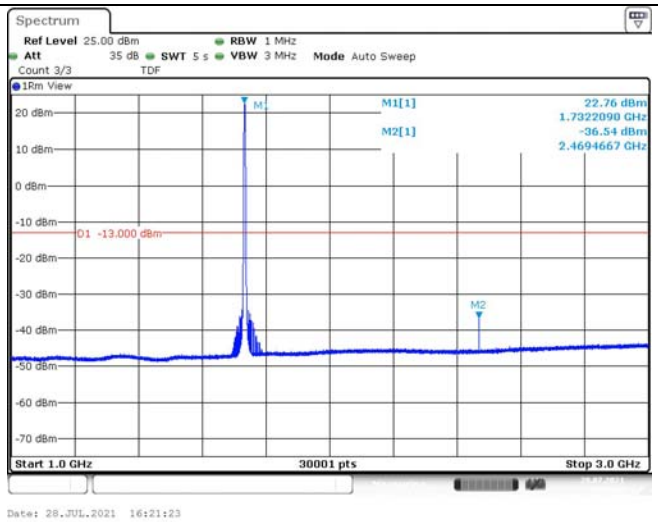
Band4-1413-30~1000MHz



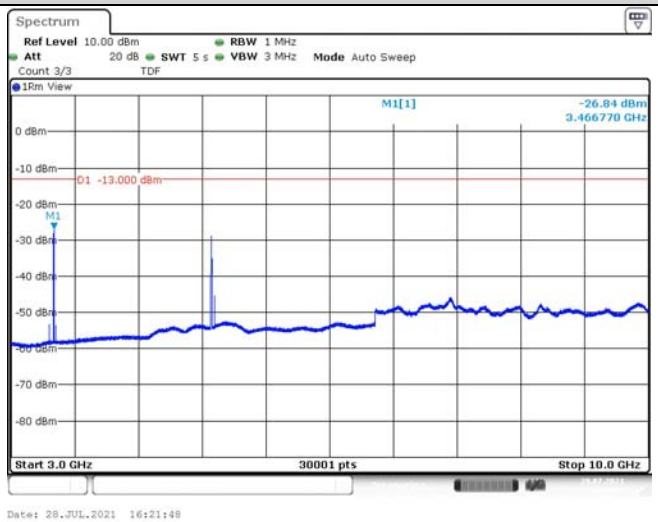
Band4-1413-0.009~0.15MHz



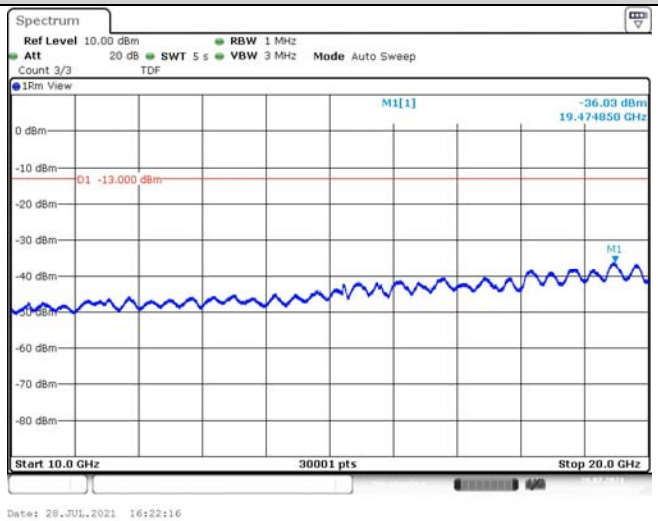
Band4-1413-1000~3000MHz



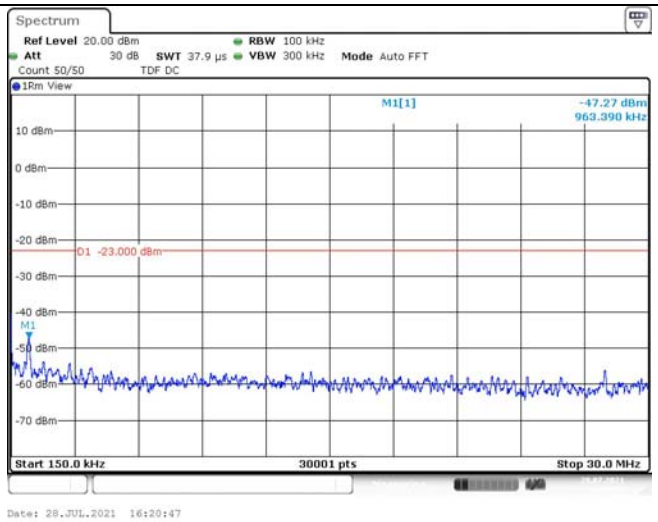
Band4-1413-3000~10000MHz



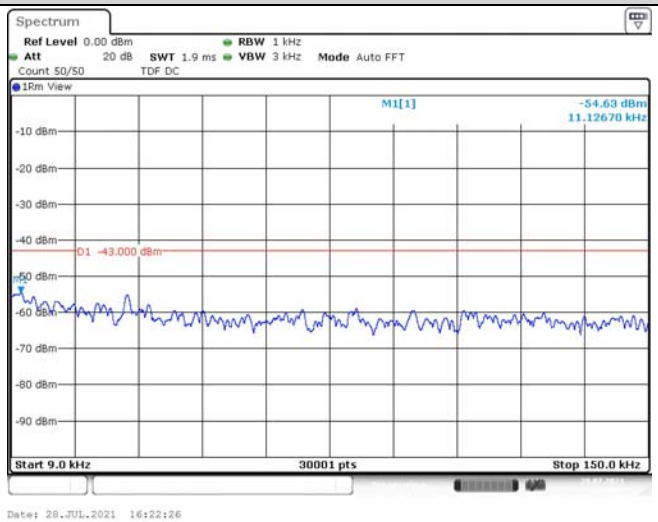
Band4-1413-10000~20000MHz



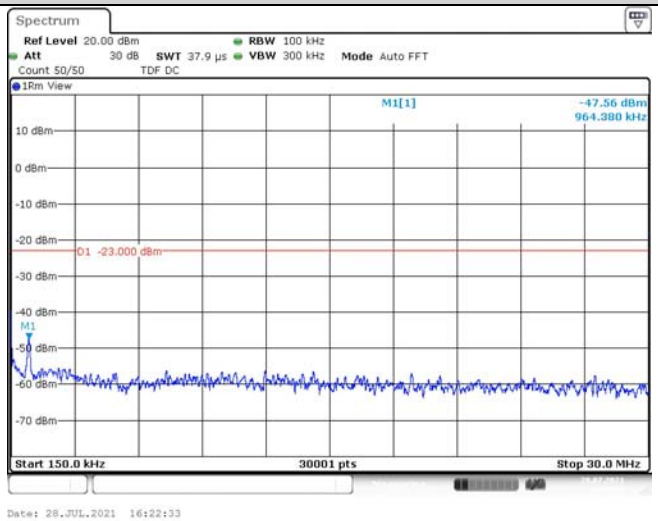
Band4-1413-0.15~30MHz



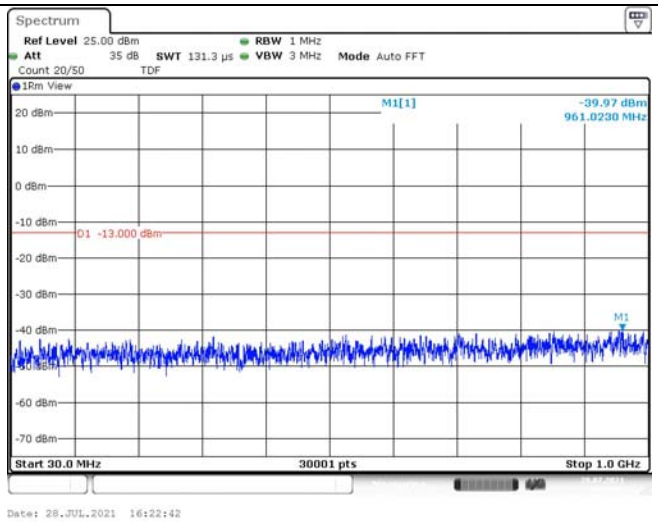
Band4-1513-0.009~0.15MHz



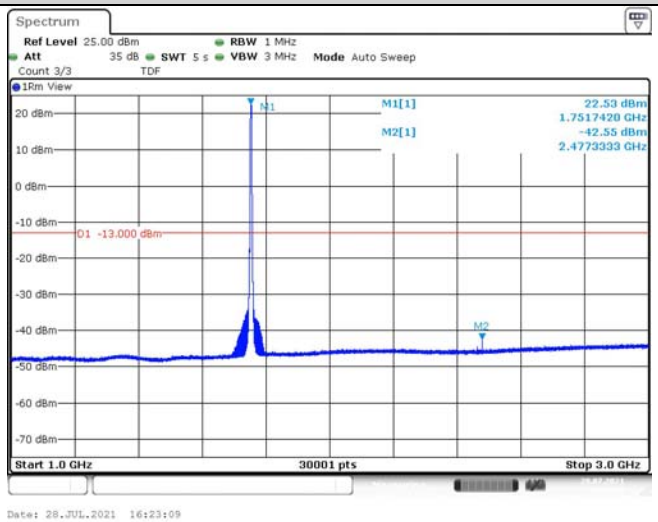
Band4-1513-0.15~30MHz



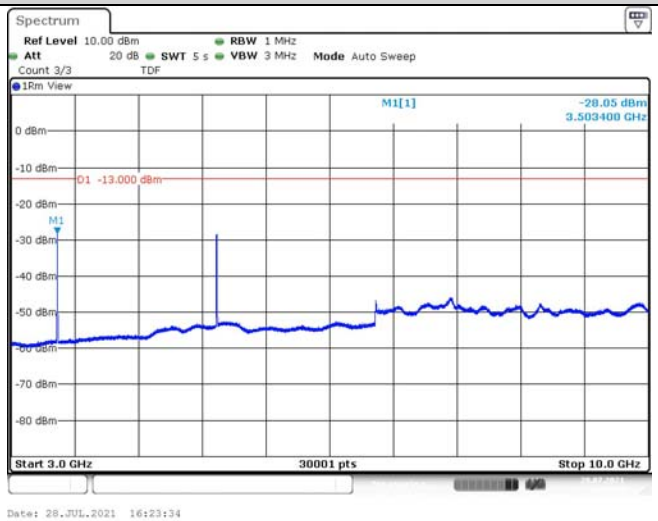
Band4-1513-30~1000MHz



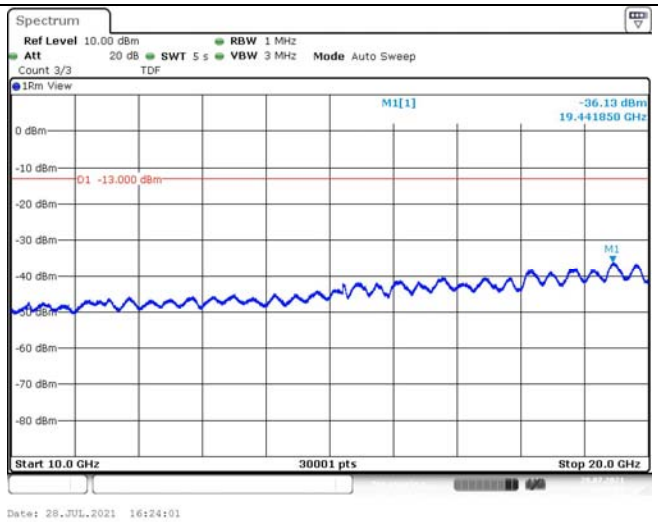
Band4-1513-1000~3000MHz



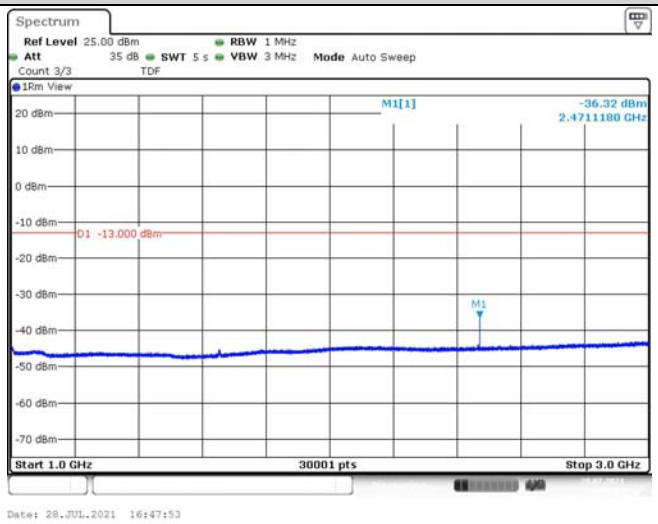
Band4-1513-3000~10000MHz



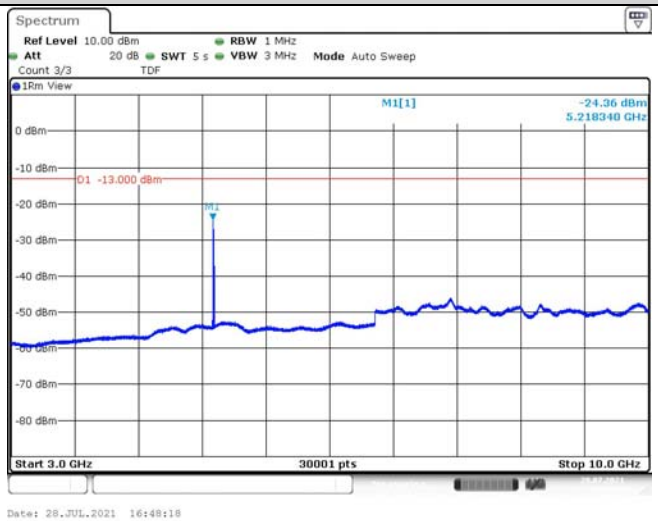
Band4-1513-10000~20000MHz



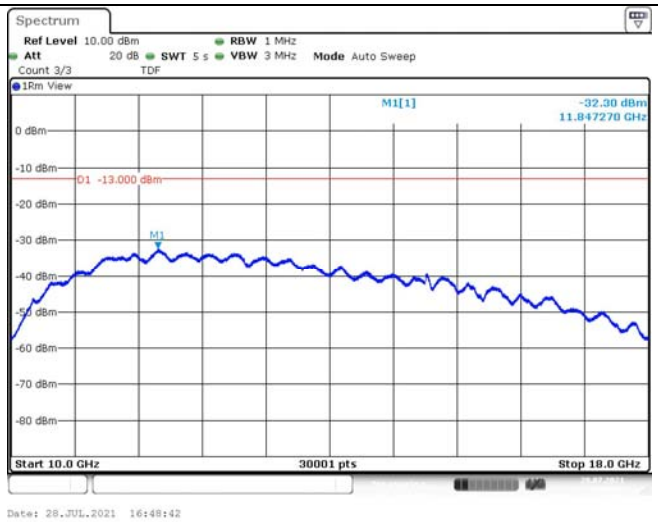
Band5-4132-1000~3000MHz



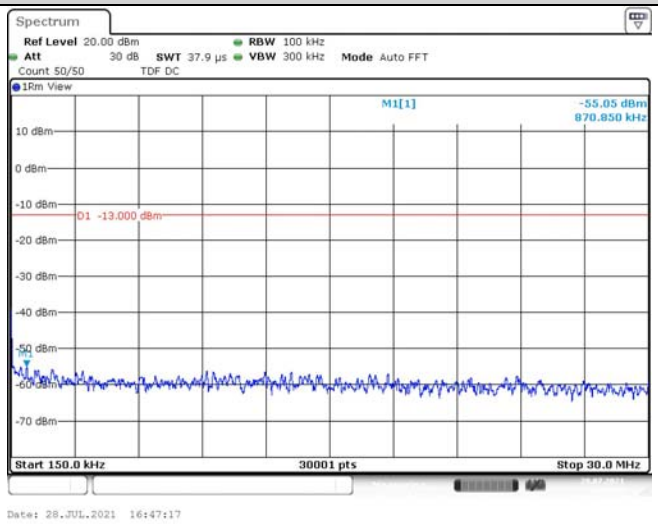
Band5-4132-3000~10000MHz



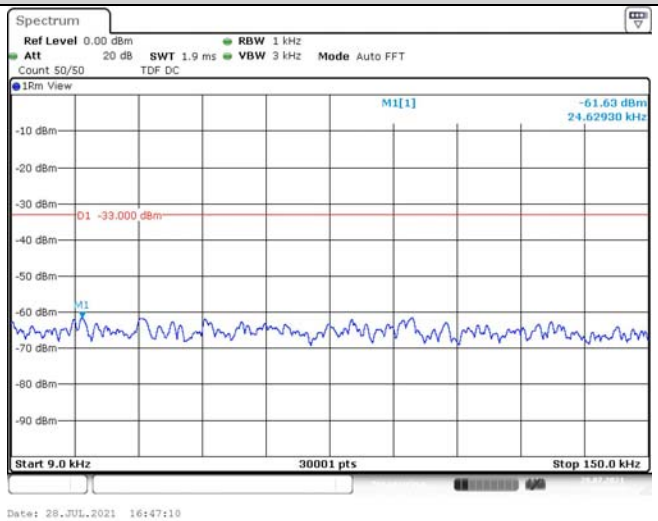
Band5-4132-10000~18000MHz



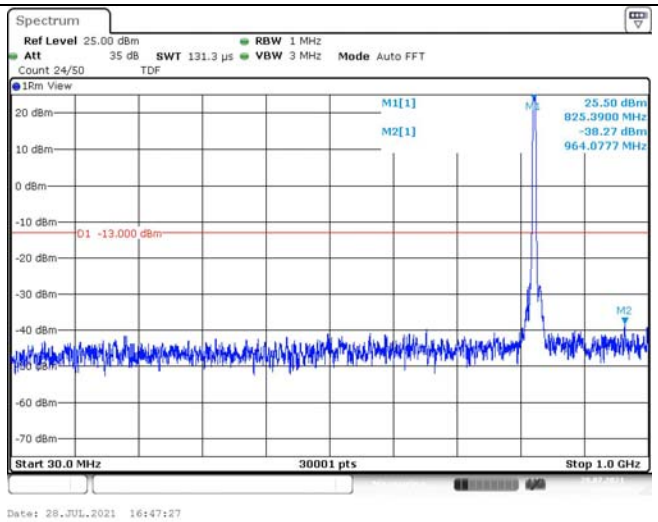
Band5-4132-0.15~30MHz



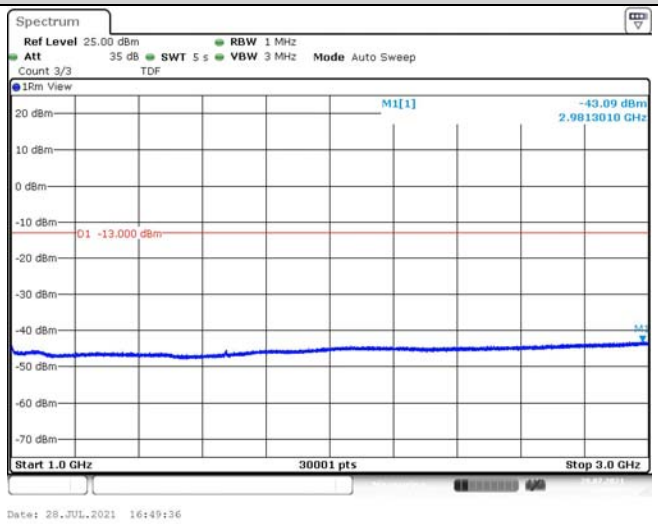
Band5-4132-0.009~0.15MHz



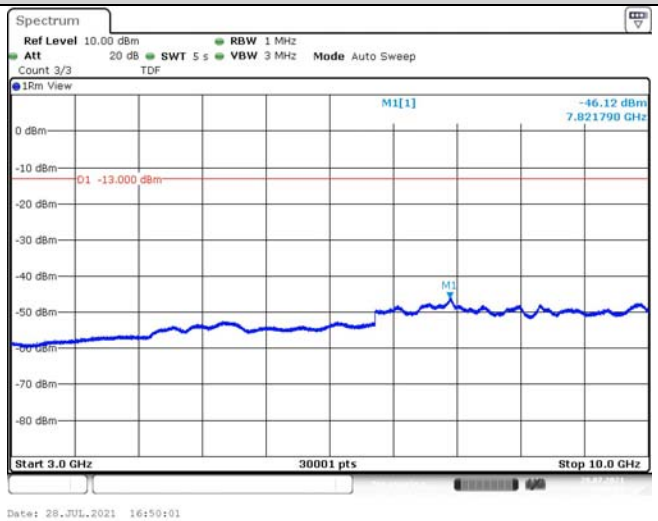
Band5-4132-30~1000MHz



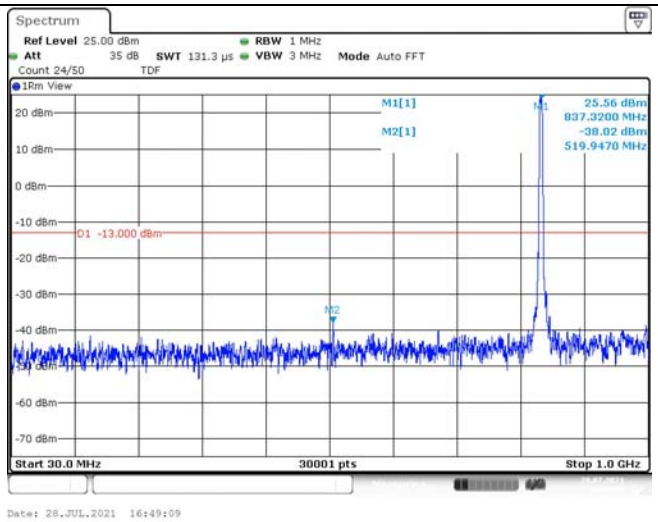
Band5-4183-1000~3000MHz



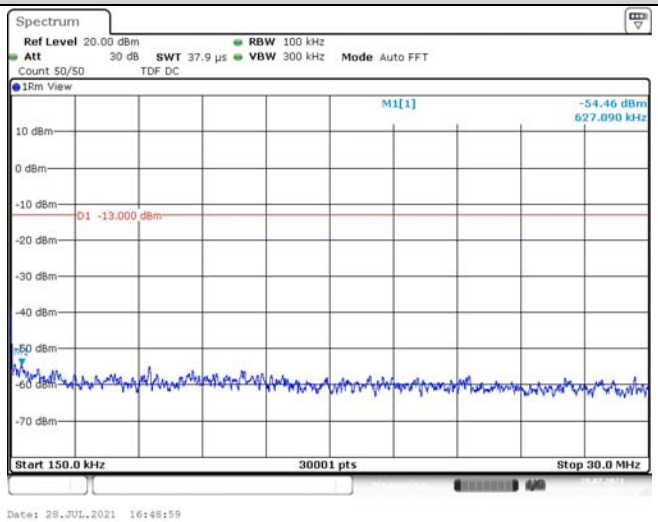
Band5-4183-3000~10000MHz



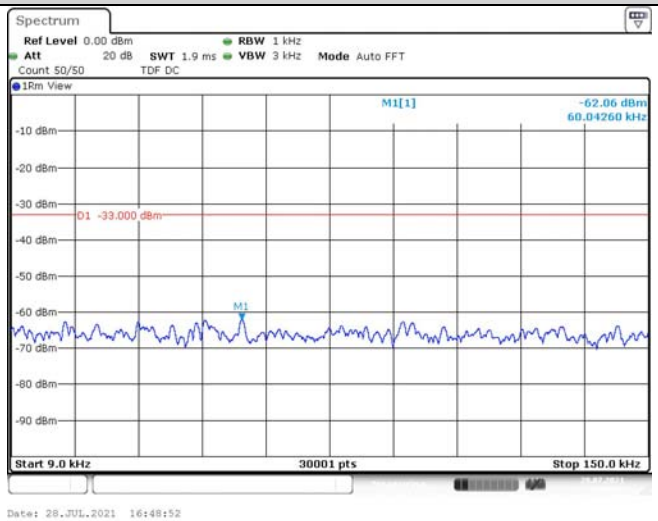
Band5-4183-30~1000MHz



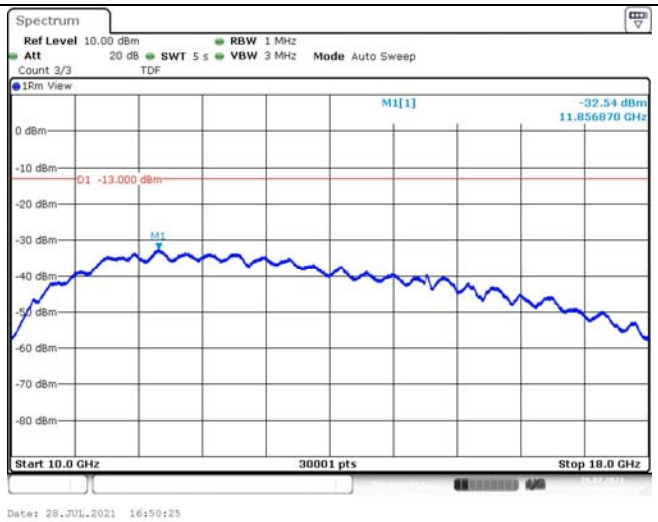
Band5-4183-0.15~30MHz



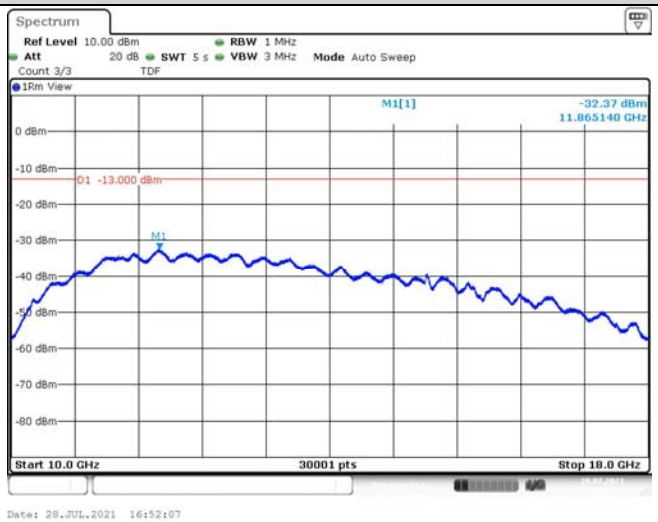
Band5-4183-0.009~0.15MHz



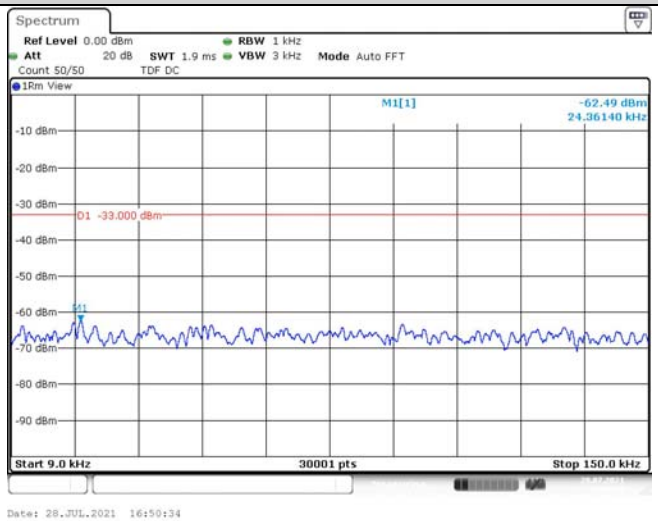
Band5-4183-10000~18000MHz



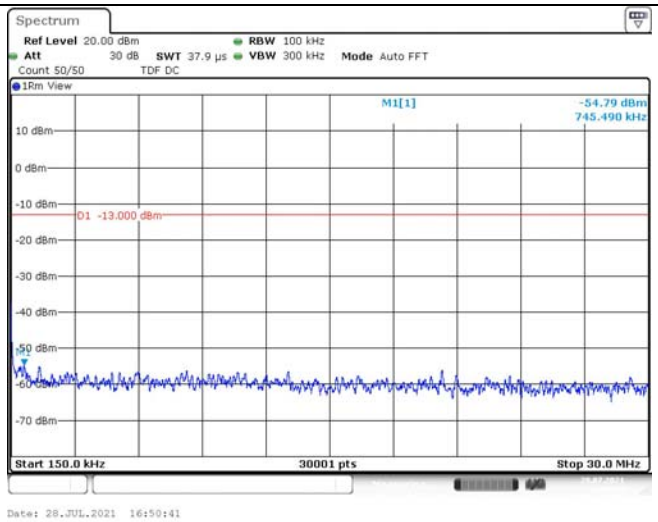
Band5-4233-10000~18000MHz



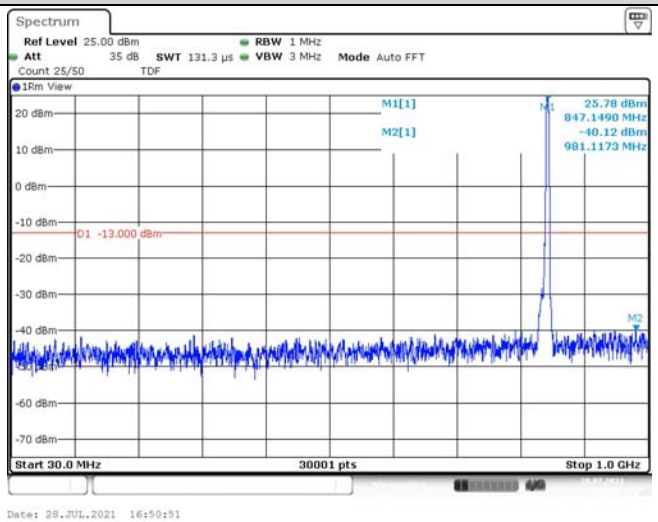
Band5-4233-0.009~0.15MHz



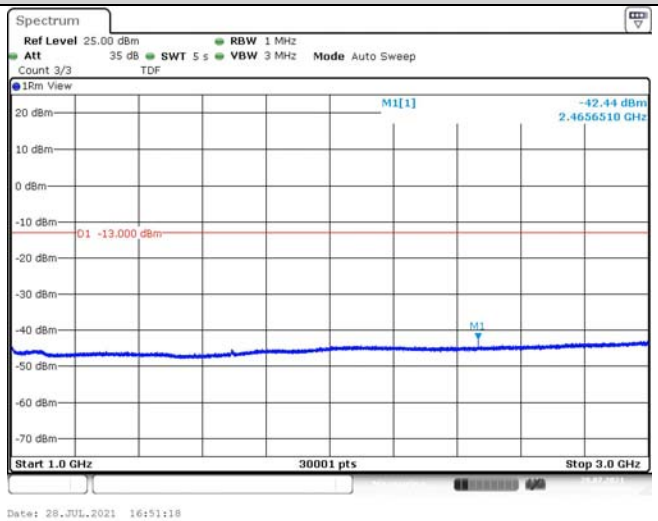
Band5-4233-0.15~30MHz



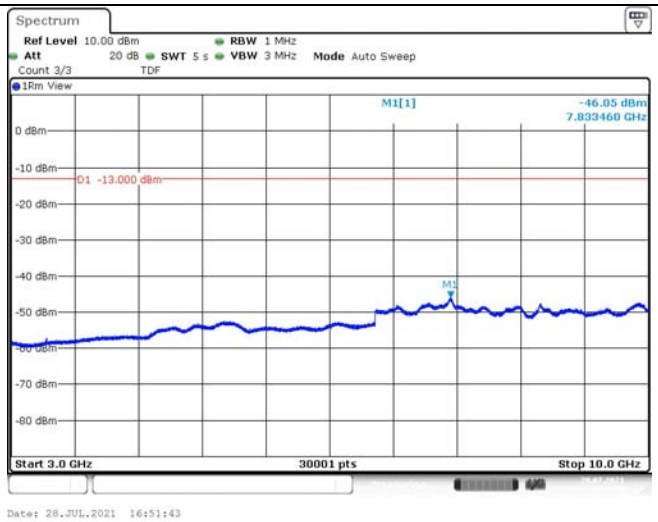
Band5-4233-30~1000MHz



Band5-4233-1000~3000MHz



Band5-4233-3000~10000MHz


Spectrum
Ref Level 10.00 dBm
RBW 1 MHz
Att 20 dB SWT 5 s VBW 3 MHz Mode Auto Sweep
Count 3/3 TDF
1Rm View
M1[1] -46.05 dBm
7.833460 GHz
D1 -13.000 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
Start 3.0 GHz
30001 pts
Stop 10.0 GHz
Date: 28.JUL.2021 16:51:43

3.5. Band Edge compliance

LIMIT

FCC: §22.917, §24.238, §27.53 (h)

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.

FCC: §90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

RSS132§5.5

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1,the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least43 +10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS133§6.5

Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment’s operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).

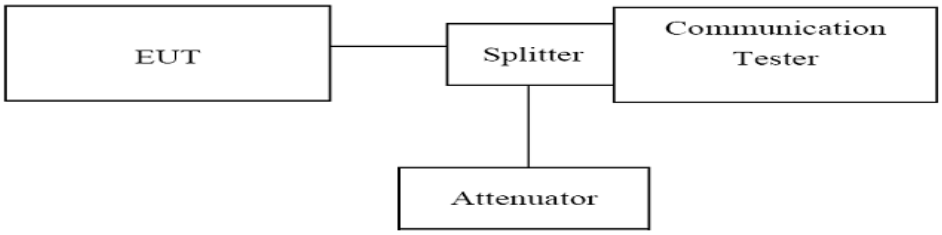
(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

RSS139§6.6

(i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment’s smallest operating frequency block,Footnote2 which can contain the equipment’s occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least43 + 10 log10 p (watts) dB.

(ii) After the first 1.0 MHz outside the equipment’s smallest operating frequency block, which can contain the equipment’s occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

TEST CONFIGURATION



TEST PROCEDURE

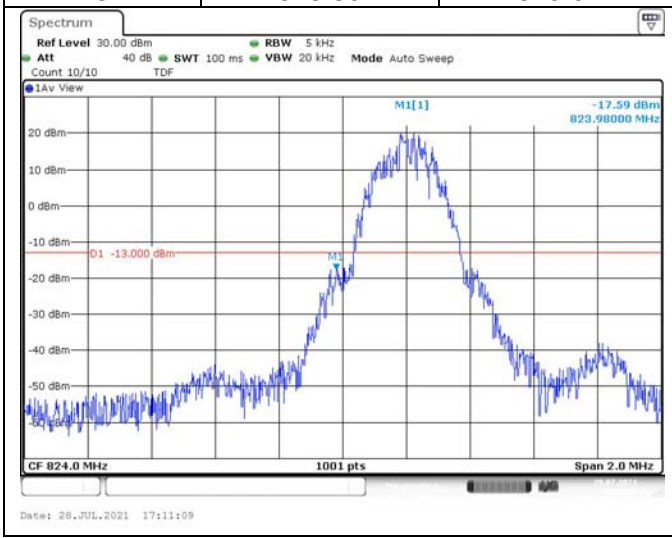
The transmitter output was connected to a R&S CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

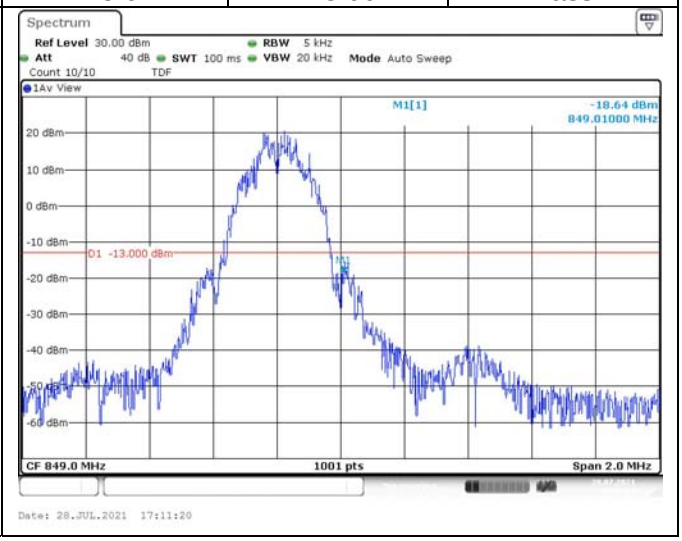
For each band edge measurement:

- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

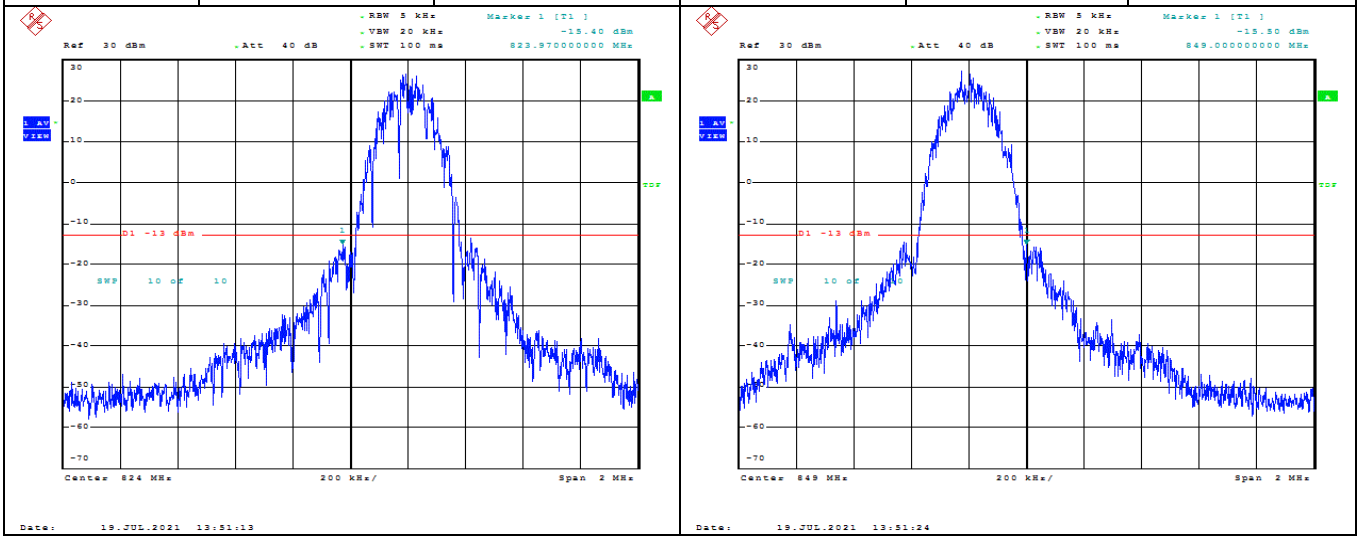
TEST RESULTS

GPRS 850					
Channel Number	Frequency (MHz)	Max Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
128	824.20	823.98	-17.59	-13.00	Pass
251	848.80	849.01	-18.64	-13.00	Pass

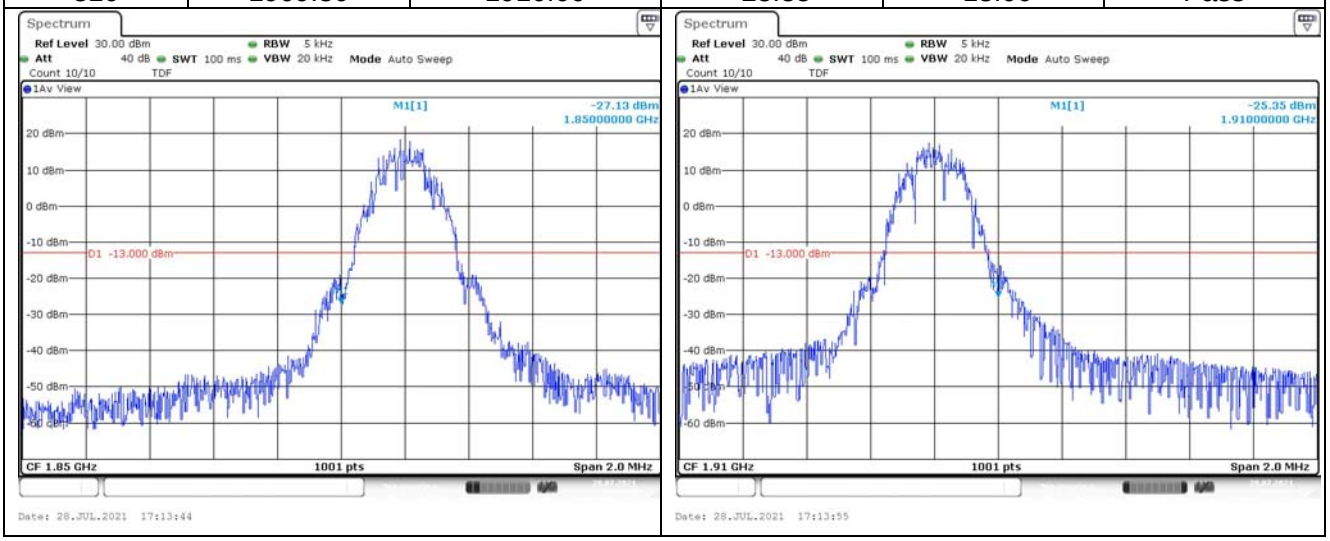




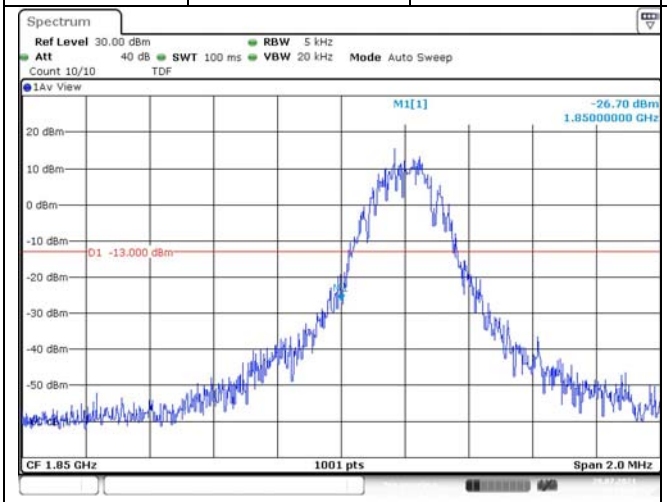
EGPRS 850					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
128	824.20	823.97	-15.40	-13.00	Pass
251	848.80	849.00	-15.50	-13.00	Pass

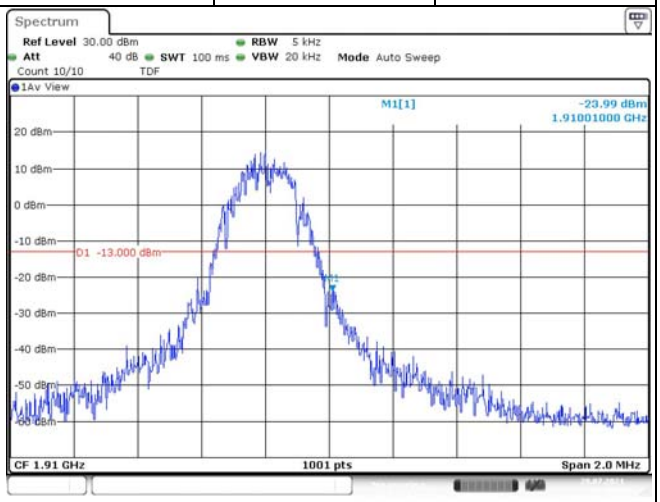


GPRS 1900					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
512	1850.20	1850.00	-27.13	-13.00	Pass
810	1909.80	1910.00	-25.35	-13.00	Pass

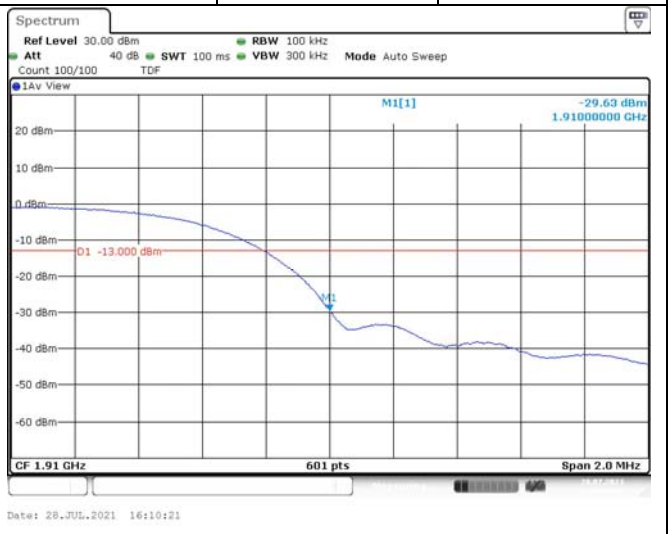


EGPRS 1900					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
512	1850.20	1850.00	-26.70	-13.00	Pass
810	1909.80	1910.00	-23.99	-13.00	Pass

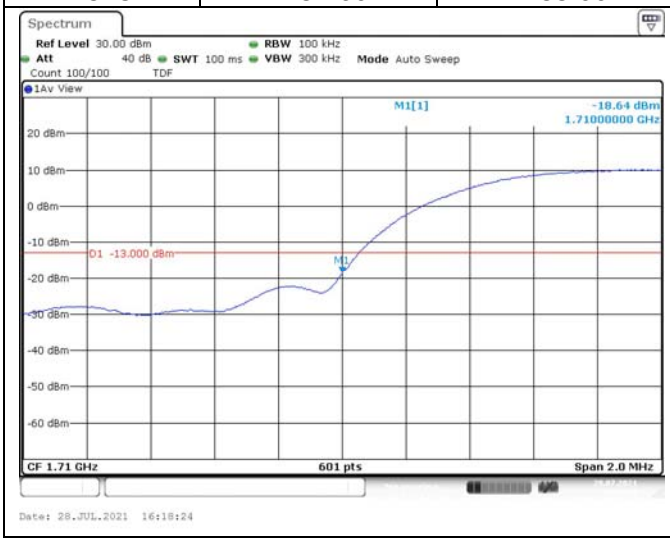




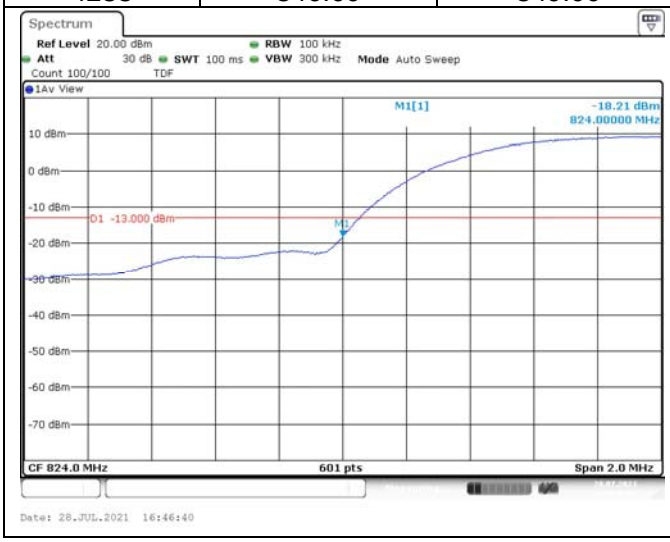
WCDMA Band II					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
9262	1852.40	1850.00	-29.76	-13.00	Pass
9538	1907.60	1910.00	-29.63	-13.00	Pass



WCDMA Band IV					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
1312	1712.40	1710.00	-18.64	-13.00	Pass
1513	1752.60	1755.00	-18.65	-13.00	Pass



WCDMA Band V					
Channel Number	Frequency (MHz)	Measurement Results		Limit (dBm)	Verdict
		Frequency (MHz)	Values (dBm)		
4132	826.40	824.00	-18.21	-13.00	Pass
4233	846.60	849.00	-19.74	-13.00	Pass



3.6. Radiated Power Measurement

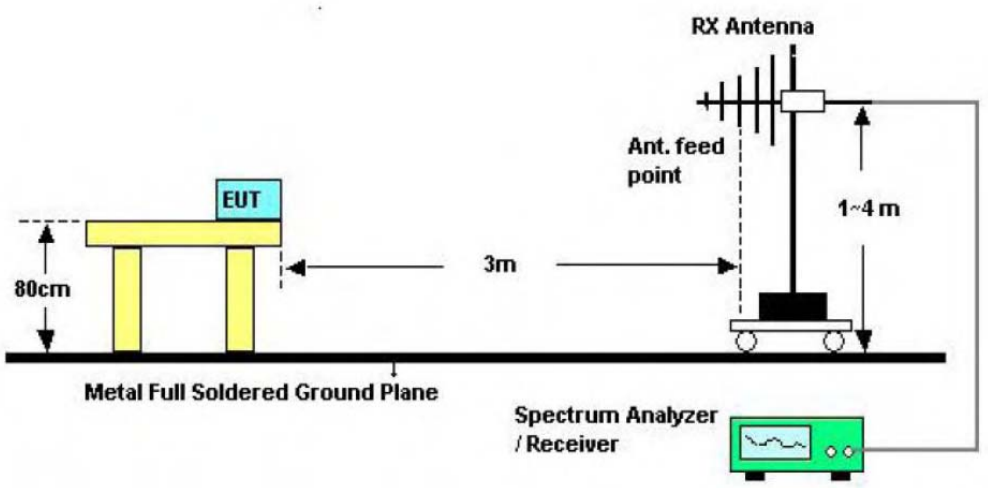
LIMIT

FCC: §2.1046, §22.913, §24.232, §27.50 and §90.635

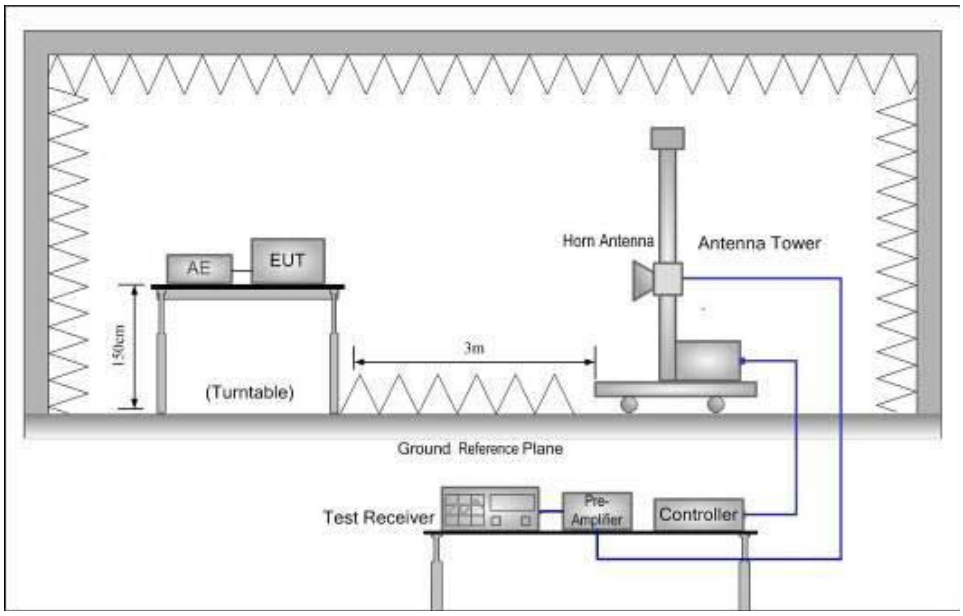
IC: RSS132§5.4; RSS133§6.4 and RSS139§6.5.

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 “X axis” position was the worst, and test data recorded in this report.

Measurement Data (worst case) :

Mode	Channel	Antenna Pol.	ERP	Limit (dBm)	Result
GPRS850	128	V	31.39	38.45	Pass
		H	27.68		
	190	V	31.46		
		H	27.38		
	251	V	33.15		
		H	27.07		
EGPRS850	128	V	33.46	38.45	Pass
		H	27.63		
	190	V	31.54		
		H	26.41		
	251	V	31.68		
		H	25.85		

Mode	Channel	Antenna Pol.	ERIP	Limit (dBm)	Result
GPRS1900	512	V	29.84	33.00	Pass
		H	24.98		
	661	V	28.13		
		H	25.49		
	810	V	29.32		
		H	24.89		
EGPRS1900	512	V	29.01	33.00	Pass
		H	25.51		
	661	V	28.68		
		H	25.60		
	810	V	29.83		
		H	24.17		

Mode	Channel	Antenna Pol.	EIRP	Limit (dBm)	Result
WCDMA Band II (QPSK)	9262	V	27.28	33.00	Pass
		H	23.92		
	9400	V	27.67		
		H	24.57		
	9538	V	27.21		
		H	24.00		

Mode	Channel	Antenna Pol.	EIRP	Limit (dBm)	Result
WCDMA Band IV (QPSK)	1312	V	27.89	33.00	Pass
		H	24.13		
	1413	V	27.49		
		H	23.02		
	1513	V	26.51		
		H	23.95		

Mode	Channel	Antenna Pol.	ERP	Limit (dBm)	Result
WCDMA Band V (QPSK)	4132	V	27.02	38.45	Pass
		H	23.76		
	4183	V	26.98		
		H	23.22		
	4233	V	27.58		
		H	23.94		

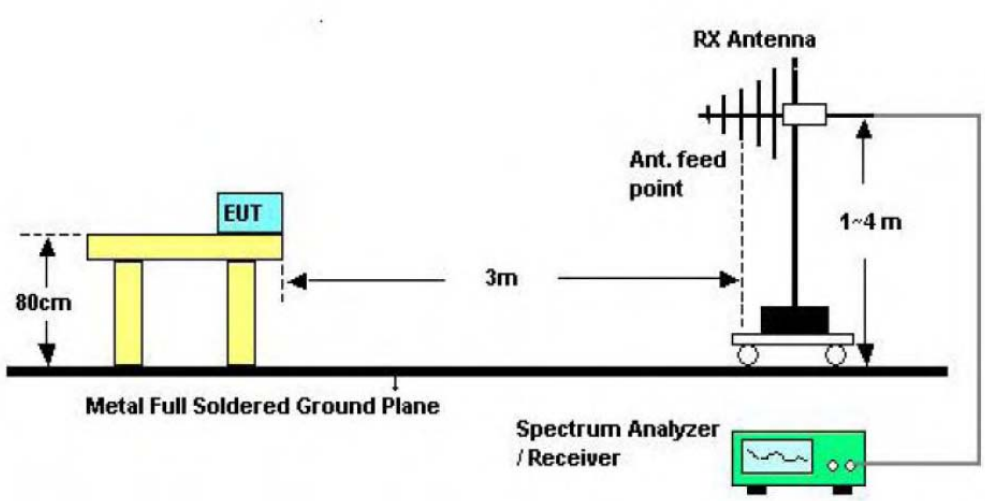
3.7. Radiated Spurious Emission

LIMIT

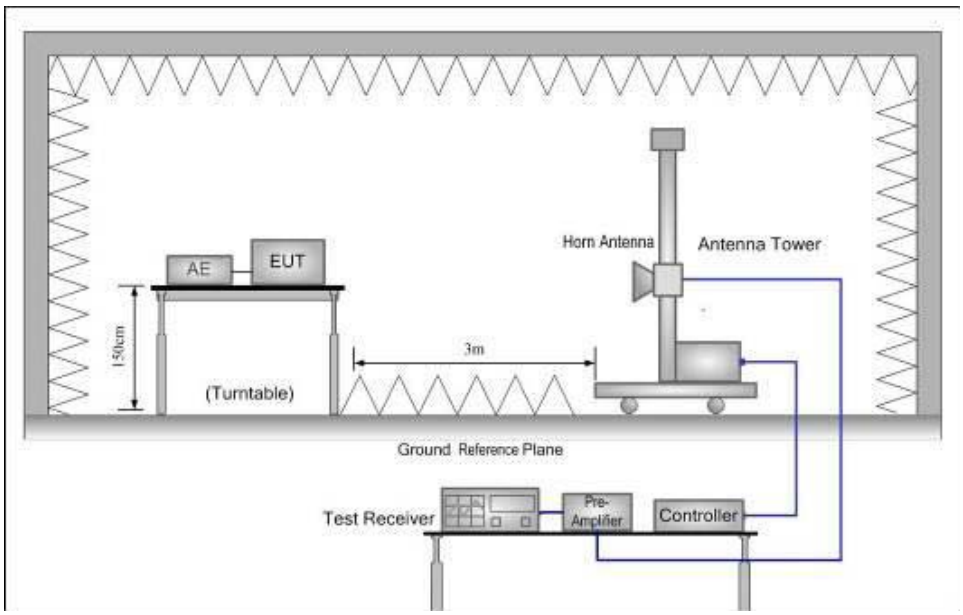
FCC: §22.917(a), §24.238(a), §27.53 (h), §90.691
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.
RSS132§5.5
Mobile and base station equipment shall comply with the limits in (i) and (ii) below.
(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts).
(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least43 +10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.
RSS133§6.5
Equipment shall comply with the limits in (i) and (ii) below.
(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).
(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.
RSS139§6.6
(i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block,Footnote2 which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least43 + 10log10 p (watts) dB.
(ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

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 (2.15dBi) 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.

GPRS 850					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
128	1648.8	Vertical	-36.98	-13.00	Pass
	2473.2	Vertical	-48.90		
	1648.8	Horizontal	-45.96		
	2473.2	Horizontal	-52.76		
190	1673.2	Vertical	-44.17		
	2509.8	Vertical	-46.01		
	1673.2	Horizontal	-42.58		
	2509.8	Horizontal	-51.14		
251	1697.6	Vertical	-34.39		
	2546.4	Vertical	-40.73		
	1697.6	Horizontal	-41.06		
	2546.4	Horizontal	-45.87		

EGPRS 850					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
128	1648.8	Vertical	-40.55	-13.00	Pass
	2473.2	Vertical	-49.62		
	1648.8	Horizontal	-45.61		
	2473.2	Horizontal	-50.26		
190	1673.2	Vertical	-42.50		
	2509.8	Vertical	-47.45		
	1673.2	Horizontal	-44.07		
	2509.8	Horizontal	-51.61		
251	1697.6	Vertical	-33.72		
	2546.4	Vertical	-44.34		
	1697.6	Horizontal	-40.93		
	2546.4	Horizontal	-45.67		

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

GPRS 1900					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
512	3700.4	Vertical	-46.72	-13.00	Pass
	5550.6	Vertical	-52.05		
	3700.4	Horizontal	-48.06		
	5550.6	Horizontal	-53.27		
661	3760	Vertical	-42.58		
	5640	Vertical	-54.54		
	3760	Horizontal	-48.87		
	5640	Horizontal	-52.91		
810	3819.6	Vertical	-35.41		
	5729.4	Vertical	-43.81		
	3819.6	Horizontal	-47.34		
	5729.4	Horizontal	-50.56		

EGPRS 1900					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
512	3700.4	Vertical	-45.76	-13.00	Pass
	5550.6	Vertical	-52.32		
	3700.4	Horizontal	-52.02		
	5550.6	Horizontal	-53.20		
661	3760	Vertical	-43.67		
	5640	Vertical	-50.96		
	3760	Horizontal	-45.15		
	5640	Horizontal	-56.50		
810	3819.6	Vertical	-38.67		
	5729.4	Vertical	-45.28		
	3819.6	Horizontal	-48.11		
	5729.4	Horizontal	-50.16		

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

WCDMA Band II					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
9262	3705.20	Vertical	-44.14	-13.00	Pass
	5557.80	Vertical	-53.77		
	3705.20	Horizontal	-51.59		
	5557.80	Horizontal	-50.87		
9400	3760.00	Vertical	-41.84		
	5640.00	Vertical	-54.80		
	3760.00	Horizontal	-40.58		
	5640.00	Horizontal	-50.18		
9538	3814.80	Vertical	-40.41		
	5722.20	Vertical	-52.16		
	3814.80	Horizontal	-41.64		
	5722.20	Horizontal	-47.18		

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

WCDMA Band IV					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
1312	3425.20	Vertical	-41.40	-13.00	Pass
	5137.80	Vertical	-56.15		
	3425.20	Horizontal	-48.02		
	5137.80	Horizontal	-51.92		
1413	3465.20	Vertical	-50.28		
	5197.80	Vertical	-55.68		
	3465.20	Horizontal	-51.54		
	5197.80	Horizontal	-52.35		
1513	3504.80	Vertical	-53.80		
	5257.20	Vertical	-55.34		
	3504.80	Horizontal	-50.95		
	5257.20	Horizontal	-51.66		

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

WCDMA Band V					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
4132	1653.20	Vertical	-41.78	-13.00	Pass
	2479.80	Vertical	-50.74		
	1653.20	Horizontal	-48.55		
	2479.80	Horizontal	-53.67		
4183	1672.80	Vertical	-44.43		
	2509.20	Vertical	-55.00		
	1672.80	Horizontal	-46.79		
	2509.20	Horizontal	-54.39		
4233	1692.80	Vertical	-42.04		
	2539.20	Vertical	-54.64		
	1692.80	Horizontal	-44.22		
	2539.20	Horizontal	-51.07		

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

3.8. Frequency stability

LIMIT

FCC §22.355, §90.213

The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

FCC §24.235 & §27.54

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

RSS132§5.3

The carrier frequency shall not depart from the reference frequency in excess of ±2.5 SRSP for mobile stations and±1.5 ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the occupied bandwidth stays within each of the sub-bands (see Section 5.1) when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS133§6.3

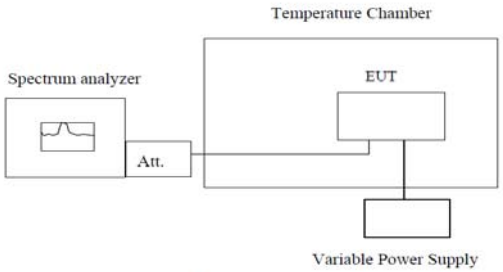
The carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and±1.0 ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS139§6.4

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

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℃ operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to 0℃. After the temperature stabilized for

approximately 30 minutes recorded the frequency.

6. Repeat step measure with 10℃ increased per stage until the highest temperature of +45℃ reached.
7. Reduce the input voltage to specified extreme voltage variation (+/- 10%) and endpoint, record the maximum frequency change.

TEST RESULTS

Voltage								
Band	Channel	PCL	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
GPRS850	128	3	VL	NT	21.95	0.026632	±2.5	PASS
GPRS850	128	3	VN	NT	19.86	0.024096	±2.5	PASS
GPRS850	128	3	VH	NT	20.28	0.024606	±2.5	PASS
GPRS850	190	3	VL	NT	17.76	0.021229	±2.5	PASS
GPRS850	190	3	VN	NT	10.56	0.012623	±2.5	PASS
GPRS850	190	3	VH	NT	18.08	0.021611	±2.5	PASS
GPRS850	251	3	VL	NT	19.18	0.022597	±2.5	PASS
GPRS850	251	3	VN	NT	14.82	0.017460	±2.5	PASS
GPRS850	251	3	VH	NT	18.95	0.022326	±2.5	PASS
EGPRS850	128	8	VL	NT	5.55	0.006734	±2.5	PASS
EGPRS850	128	8	VN	NT	2.58	0.003130	±2.5	PASS
EGPRS850	128	8	VH	NT	6.65	0.008068	±2.5	PASS
EGPRS850	190	8	VL	NT	12.01	0.014356	±2.5	PASS
EGPRS850	190	8	VN	NT	4.00	0.004781	±2.5	PASS
EGPRS850	190	8	VH	NT	10.82	0.012933	±2.5	PASS
EGPRS850	251	8	VL	NT	13.62	0.016046	±2.5	PASS
EGPRS850	251	8	VN	NT	5.88	0.006927	±2.5	PASS
EGPRS850	251	8	VH	NT	11.62	0.013690	±2.5	PASS
GPRS1900	512	0	VL	NT	7.23	0.003908	±2.5	PASS
GPRS1900	512	0	VN	NT	8.33	0.004502	±2.5	PASS
GPRS1900	512	0	VH	NT	11.33	0.006124	±2.5	PASS
GPRS1900	661	0	VL	NT	-13.14	-0.006989	±2.5	PASS
GPRS1900	661	0	VN	NT	-19.34	-0.010287	±2.5	PASS
GPRS1900	661	0	VH	NT	-7.17	-0.003814	±2.5	PASS
GPRS1900	810	0	VL	NT	-20.15	-0.010551	±2.5	PASS
GPRS1900	810	0	VN	NT	-19.69	-0.010310	±2.5	PASS
GPRS1900	810	0	VH	NT	-17.60	-0.009216	±2.5	PASS
EGPRS1900	512	2	VL	NT	13.82	0.007469	±2.5	PASS
EGPRS1900	512	2	VN	NT	15.72	0.008496	±2.5	PASS
EGPRS1900	512	2	VH	NT	9.52	0.005145	±2.5	PASS
EGPRS1900	661	2	VL	NT	18.92	0.010064	±2.5	PASS
EGPRS1900	661	2	VN	NT	1.32	0.000702	±2.5	PASS
EGPRS1900	661	2	VH	NT	18.11	0.009633	±2.5	PASS
EGPRS1900	810	2	VL	NT	11.17	0.005849	±2.5	PASS
EGPRS1900	810	2	VN	NT	-4.13	-0.002163	±2.5	PASS

EGPRS1900	810	2	VH	NT	4.58	0.002398	±2.5	PASS

Temperature								
Band	Channel	PCL	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
GPRS850	128	3	NV	0	18.85	0.022871	±2.5	PASS
GPRS850	128	3	NV	10	21.63	0.026244	±2.5	PASS
GPRS850	128	3	NV	20	18.79	0.022798	±2.5	PASS
GPRS850	128	3	NV	30	18.18	0.022058	±2.5	PASS
GPRS850	128	3	NV	40	13.37	0.016222	±2.5	PASS
GPRS850	128	3	NV	45	15.11	0.018333	±2.5	PASS
GPRS850	190	3	NV	0	16.47	0.019687	±2.5	PASS
GPRS850	190	3	NV	10	16.72	0.019986	±2.5	PASS
GPRS850	190	3	NV	20	19.50	0.023309	±2.5	PASS
GPRS850	190	3	NV	30	16.43	0.019639	±2.5	PASS
GPRS850	190	3	NV	40	15.30	0.018288	±2.5	PASS
GPRS850	190	3	NV	45	14.43	0.017248	±2.5	PASS
GPRS850	251	3	NV	0	14.24	0.016777	±2.5	PASS
GPRS850	251	3	NV	10	18.31	0.021572	±2.5	PASS
GPRS850	251	3	NV	20	19.15	0.022561	±2.5	PASS
GPRS850	251	3	NV	30	16.18	0.019062	±2.5	PASS
GPRS850	251	3	NV	40	13.33	0.015705	±2.5	PASS
GPRS850	251	3	NV	45	14.69	0.017307	±2.5	PASS
EGPRS850	128	8	NV	0	10.85	0.013164	±2.5	PASS
EGPRS850	128	8	NV	10	9.36	0.011356	±2.5	PASS
EGPRS850	128	8	NV	20	9.62	0.011672	±2.5	PASS
EGPRS850	128	8	NV	30	10.46	0.012691	±2.5	PASS
EGPRS850	128	8	NV	40	14.30	0.017350	±2.5	PASS
EGPRS850	128	8	NV	45	14.75	0.017896	±2.5	PASS
EGPRS850	190	8	NV	0	11.66	0.013937	±2.5	PASS
EGPRS850	190	8	NV	10	9.98	0.011929	±2.5	PASS
EGPRS850	190	8	NV	20	11.49	0.013734	±2.5	PASS
EGPRS850	190	8	NV	30	11.11	0.013280	±2.5	PASS
EGPRS850	190	8	NV	40	12.69	0.015169	±2.5	PASS
EGPRS850	190	8	NV	45	16.11	0.019257	±2.5	PASS
EGPRS850	251	8	NV	0	15.17	0.017872	±2.5	PASS
EGPRS850	251	8	NV	10	12.27	0.014456	±2.5	PASS
EGPRS850	251	8	NV	20	9.40	0.011074	±2.5	PASS
EGPRS850	251	8	NV	30	10.59	0.012476	±2.5	PASS
EGPRS850	251	8	NV	40	10.27	0.012099	±2.5	PASS
EGPRS850	251	8	NV	45	14.72	0.017342	±2.5	PASS
GPRS1900	512	0	NV	0	4.97	0.002686	±2.5	PASS
GPRS1900	512	0	NV	10	3.58	0.001935	±2.5	PASS
GPRS1900	512	0	NV	20	8.39	0.004535	±2.5	PASS

GPRS1900	512	0	NV	30	9.27	0.005010	±2.5	PASS
GPRS1900	512	0	NV	40	7.52	0.004064	±2.5	PASS
GPRS1900	512	0	NV	45	4.78	0.002584	±2.5	PASS
GPRS1900	661	0	NV	0	-10.49	-0.005580	±2.5	PASS
GPRS1900	661	0	NV	10	-12.53	-0.006665	±2.5	PASS
GPRS1900	661	0	NV	20	-8.88	-0.004723	±2.5	PASS
GPRS1900	661	0	NV	30	-0.32	-0.000170	±2.5	PASS
GPRS1900	661	0	NV	40	-6.94	-0.003691	±2.5	PASS
GPRS1900	661	0	NV	45	-8.75	-0.004654	±2.5	PASS
GPRS1900	810	0	NV	0	-22.37	-0.011713	±2.5	PASS
GPRS1900	810	0	NV	10	-21.79	-0.011410	±2.5	PASS
GPRS1900	810	0	NV	20	-18.69	-0.009786	±2.5	PASS
GPRS1900	810	0	NV	30	-9.52	-0.004985	±2.5	PASS
GPRS1900	810	0	NV	40	-16.82	-0.008807	±2.5	PASS
GPRS1900	810	0	NV	45	-16.21	-0.008488	±2.5	PASS
EGPRS1900	512	2	NV	0	14.82	0.008010	±2.5	PASS
EGPRS1900	512	2	NV	10	14.79	0.007994	±2.5	PASS
EGPRS1900	512	2	NV	20	8.04	0.004345	±2.5	PASS
EGPRS1900	512	2	NV	30	5.00	0.002702	±2.5	PASS
EGPRS1900	512	2	NV	40	8.59	0.004643	±2.5	PASS
EGPRS1900	512	2	NV	45	8.56	0.004627	±2.5	PASS
EGPRS1900	661	2	NV	0	14.72	0.007830	±2.5	PASS
EGPRS1900	661	2	NV	10	16.18	0.008606	±2.5	PASS
EGPRS1900	661	2	NV	20	16.89	0.008984	±2.5	PASS
EGPRS1900	661	2	NV	30	12.14	0.006457	±2.5	PASS
EGPRS1900	661	2	NV	40	8.52	0.004532	±2.5	PASS
EGPRS1900	661	2	NV	45	10.65	0.005665	±2.5	PASS
EGPRS1900	810	2	NV	0	9.04	0.004733	±2.5	PASS
EGPRS1900	810	2	NV	10	8.07	0.004226	±2.5	PASS
EGPRS1900	810	2	NV	20	8.49	0.004445	±2.5	PASS
EGPRS1900	810	2	NV	30	6.55	0.003430	±2.5	PASS
EGPRS1900	810	2	NV	40	5.71	0.002990	±2.5	PASS
EGPRS1900	810	2	NV	45	5.00	0.002618	±2.5	PASS

Voltage							
Band	Channel	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band2	9262	VL	NT	3.75	0.002024	±2.5	PASS
Band2	9262	VN	NT	4.35	0.002348	±2.5	PASS
Band2	9262	VH	NT	4.08	0.002203	±2.5	PASS
Band2	9400	VL	NT	0.94	0.000500	±2.5	PASS
Band2	9400	VN	NT	0.29	0.000154	±2.5	PASS
Band2	9400	VH	NT	0.79	0.000420	±2.5	PASS
Band2	9538	VL	NT	-5.46	-0.002862	±2.5	PASS
Band2	9538	VN	NT	-5.07	-0.002658	±2.5	PASS

Band2	9538	VH	NT	-4.68	-0.002453	±2.5	PASS
Band4	1312	VL	NT	12.77	0.007457	±2.5	PASS
Band4	1312	VN	NT	12.41	0.007247	±2.5	PASS
Band4	1312	VH	NT	14.00	0.008176	±2.5	PASS
Band4	1413	VL	NT	-0.72	-0.000416	±2.5	PASS
Band4	1413	VN	NT	-0.31	-0.000179	±2.5	PASS
Band4	1413	VH	NT	-0.61	-0.000352	±2.5	PASS
Band4	1513	VL	NT	-19.10	-0.010898	±2.5	PASS
Band4	1513	VN	NT	-18.65	-0.010641	±2.5	PASS
Band4	1513	VH	NT	-17.92	-0.010225	±2.5	PASS
Band5	4132	VL	NT	3.33	0.004030	±2.5	PASS
Band5	4132	VN	NT	2.97	0.003594	±2.5	PASS
Band5	4132	VH	NT	3.70	0.004477	±2.5	PASS
Band5	4183	VL	NT	-0.34	-0.000406	±2.5	PASS
Band5	4183	VN	NT	-0.27	-0.000323	±2.5	PASS
Band5	4183	VH	NT	-1.10	-0.001315	±2.5	PASS
Band5	4233	VL	NT	-3.64	-0.004300	±2.5	PASS
Band5	4233	VN	NT	-2.97	-0.003508	±2.5	PASS
Band5	4233	VH	NT	-3.07	-0.003626	±2.5	PASS

Temperature							
Band	Channel	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band2	9262	NV	0	4.79	0.002586	±2.5	PASS
Band2	9262	NV	10	4.97	0.002683	±2.5	PASS
Band2	9262	NV	20	4.52	0.002440	±2.5	PASS
Band2	9262	NV	30	5.83	0.003147	±2.5	PASS
Band2	9262	NV	40	6.46	0.003487	±2.5	PASS
Band2	9262	NV	45	5.87	0.003169	±2.5	PASS
Band2	9400	NV	0	0.12	0.000064	±2.5	PASS
Band2	9400	NV	10	0.61	0.000324	±2.5	PASS
Band2	9400	NV	20	0.49	0.000261	±2.5	PASS
Band2	9400	NV	30	0.44	0.000234	±2.5	PASS
Band2	9400	NV	40	-0.12	-0.000064	±2.5	PASS
Band2	9400	NV	45	-0.51	-0.000271	±2.5	PASS
Band2	9538	NV	0	-4.63	-0.002427	±2.5	PASS
Band2	9538	NV	10	-4.68	-0.002453	±2.5	PASS
Band2	9538	NV	20	-5.11	-0.002679	±2.5	PASS
Band2	9538	NV	30	-4.42	-0.002317	±2.5	PASS
Band2	9538	NV	40	-4.89	-0.002563	±2.5	PASS
Band2	9538	NV	45	-5.01	-0.002626	±2.5	PASS
Band4	1312	NV	0	16.92	0.009881	±2.5	PASS
Band4	1312	NV	10	16.56	0.009671	±2.5	PASS
Band4	1312	NV	20	17.51	0.010225	±2.5	PASS
Band4	1312	NV	30	16.64	0.009717	±2.5	PASS

Band4	1312	NV	40	17.31	0.010109	±2.5	PASS
Band4	1312	NV	45	17.52	0.010231	±2.5	PASS
Band4	1413	NV	0	1.32	0.000762	±2.5	PASS
Band4	1413	NV	10	0.55	0.000317	±2.5	PASS
Band4	1413	NV	20	-1.04	-0.000600	±2.5	PASS
Band4	1413	NV	30	0.64	0.000369	±2.5	PASS
Band4	1413	NV	40	-1.78	-0.001027	±2.5	PASS
Band4	1413	NV	45	0.31	0.000179	±2.5	PASS
Band4	1513	NV	0	-21.86	-0.012473	±2.5	PASS
Band4	1513	NV	10	-20.63	-0.011771	±2.5	PASS
Band4	1513	NV	20	-21.29	-0.012148	±2.5	PASS
Band4	1513	NV	30	-20.54	-0.011720	±2.5	PASS
Band4	1513	NV	40	-22.18	-0.012655	±2.5	PASS
Band4	1513	NV	45	-21.22	-0.012108	±2.5	PASS
Band5	4132	NV	0	3.04	0.003679	±2.5	PASS
Band5	4132	NV	10	2.24	0.002711	±2.5	PASS
Band5	4132	NV	20	4.10	0.004961	±2.5	PASS
Band5	4132	NV	30	3.71	0.004489	±2.5	PASS
Band5	4132	NV	40	3.45	0.004175	±2.5	PASS
Band5	4132	NV	45	4.31	0.005215	±2.5	PASS
Band5	4183	NV	0	-0.18	-0.000215	±2.5	PASS
Band5	4183	NV	10	-0.16	-0.000191	±2.5	PASS
Band5	4183	NV	20	-0.17	-0.000203	±2.5	PASS
Band5	4183	NV	30	1.41	0.001685	±2.5	PASS
Band5	4183	NV	40	1.10	0.001315	±2.5	PASS
Band5	4183	NV	45	-0.59	-0.000705	±2.5	PASS
Band5	4233	NV	0	-2.28	-0.002693	±2.5	PASS
Band5	4233	NV	10	-4.18	-0.004937	±2.5	PASS
Band5	4233	NV	20	-2.83	-0.003343	±2.5	PASS
Band5	4233	NV	30	-2.98	-0.003520	±2.5	PASS
Band5	4233	NV	40	-2.05	-0.002421	±2.5	PASS
Band5	4233	NV	45	-3.99	-0.004713	±2.5	PASS

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