BACL
Bay Area Compliance Labs Corp.

FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

INFINIX MOBILITY LIMITED

ROOM 604 6/F SOUTH TOWER WORLD FINANCE CTR HARBOUR CITY 17 CANTON ROAD TST KL, Hong Kong

FCC ID: 2AIZN-X5516B

Report Type:	Product Type:
Original Report	Mobile phone

Report Number:	RSZ190123004-00D
Report Date:	2019-02-28
Reviewed By:	Rocky Kang *Rocky Kang* RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Mobile phone
Model	X5516B
Frequency Range	Cellular: 824-849 MHz PCS: 1850-1910 MHz WCDMA B2/LTE B2: 1850-1910 MHz WCDMA B5/LTE B5: 824-849 MHz WCDMA B4/LTE B4: 1710- 1755 MHz LTE B7: 2500-2570 MHz
Transmit Power	GSM 850 : 32.7 dBm PCS 1900: 29.1 dBm WCDMA Band 2: 22.6 dBm; WCDMA Band 4: 22.6 dBm WCDMA Band 5: 22.6 dBm LTE Band 2: 23.1 dBm; LTE Band 4: 23.1 dBm LTE Band 5: 23.3 dBm; LTE Band 7: 23.9 dBm
Modulation Technique	2G: GMSK,8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G: FPC Antennas
Voltage Range	Powered: DC 3.85V by internal rechargeable Li-ion polymer battery Recharged: DC 5.0V by adapter
Date of Test	2019/01/24~2019/01/25
Sample serial number	190123004
Received date	2019/01/23
Sample/EUT Status	Good condition
Adapter information	Model: CU-52JT Input: AC 100-240V, 50/60Hz, 200mA Output: DC 5.0V, 1.2A

Objective

This test report is prepared on behalf of *INFINIX MOBILITY LIMITED* in accordance with Part 2-Subpart J, Part 22-Subpart H and Part 24-Subpart E and Part 27 of the Federal Communication Commissions rules.

The objective is to determine the compliance of the EUT with FCC rules for output power, modulation characteristic, occupied bandwidth, and spurious emission at antenna terminal, spurious radiated emission, frequency stability and band edge.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS&DTS, and Part 15B JBP submissions with FCC ID: 2AIZN-X5516B.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2-Subpart J as well as the following parts:

Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services
Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA/EIA 603-D.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF output power, conducted		±0.5dB
Unwanted Emission, conducted		±1.5dB
Radiated Emissions	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±3℃
Supply voltages		±0.4%

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing according to TIA/EIA-603-D.

The final qualification test was performed with the EUT operating at normal mode.
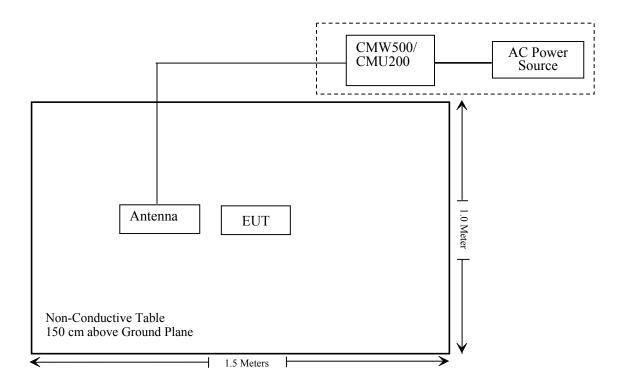
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh

Block Diagram of Test Setup

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (d) (h)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a); §27.53 (h)(m)	Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235; §27.54;	Frequency stability	Compliance

Note: * Please refer to SAR report released by BACL, report number: RSZ190123004-20

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017-12-22	2020-12-21
Rohde & Schwarz	Signal Analyzer	FSEM	845987/005	2018-06-23	2019-06-23
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
COM-POWER	Pre-amplifier	PA-122	181919	2018-11-12	2019-11-12
Sonoma Instrument	Amplifier	310N	186238	2018-11-12	2019-11-12
Anritsu	Signal Generator	68369B	004114	2018-12-24	2019-12-24
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2019-01-11	2020-01-11
COM-POWER	Dipole Antenna	AD-100	41000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2018-09-01	2021-08-31
UTiFLEX MICRO-C0AX	RF Cable	UFA147A-2362-100100	MFR64639 231029-003	2018-07-11	2021-07-10
Ducommun Technologies	RF Cable	104PEA	218124002	2018-11-12	2019-11-12
Ducommun Technologies	RF Cable	RG-214	1	2018-11-19	2019-05-21
Ducommun Technologies	RF Cable	RG-214	2	2018-11-12	2019-11-12
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2017-12-29	2020-12-28
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-03	2017-12-29	2020-12-28
Heatsink Required	Amplifier	QLW-18405536-J0	15964001002	2018-11-12	2019-11-12

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSU26	200120	2018-12-24	2019-12-24
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2018-12-21	2019-12-21
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2018-12-14	2019-12-14
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2018-06-23	2019-06-23
Ducommun Technologies	RF Cable	RG-214	3	Each Time	
WEINSCHEL	3dB Attenuator	6231	666	Each Time	
Unknown	Power Splitter	1620	129	Each Time	

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ190123004-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E & 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 22.913 (a) & § 24.232 (c); §27.50 (d) (h) - RF OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.
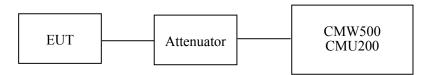
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

According to §27.50(h), the maximum EIRP must not exceed 2Watts (33dBm) for 2500-2570MHz.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the CMW500/CMU200 through sufficient attenuation.

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┌──────────┐        ┌──────────┐        ┌──────────┐
│          │        │          │        │ CMW500   │
│   EUT    │────────│Attenuator│────────│ CMU200   │
│          │        │          │        │          │
└──────────┘        └──────────┘        └──────────┘
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Radiated method:

TIA 603-D section 2.2.17

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2019-01-25.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.56	38.45
	190	836.6	32.43	38.45
	251	848.8	32.12	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	31.28	30.35	28.53	27.51	38.45
	190	836.6	31.42	30.60	28.77	27.52	38.45
	251	848.8	31.52	30.80	28.92	27.58	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	27.20	25.36	23.43	22.41	38.45
	190	836.6	27.72	25.69	23.73	22.78	38.45
	251	848.8	27.81	25.79	23.86	22.83	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	RMC12.2k		22.51	22.42	22.25
		HSDPA	1	21.56	21.33	21.15
			2	21.73	21.93	21.34
			3	21.82	22.08	21.43
			4	21.74	21.96	21.35
		HSUPA	1	21.56	21.25	21.13
			2	21.72	21.92	21.26
			3	21.86	22.08	21.43
			4	21.66	21.92	21.27
			5	21.84	22.08	21.42

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.62	33
	661	1880.0	28.81	33
	810	1909.8	28.95	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.37	27.60	26.06	25.01	33
	661	1880.0	28.56	27.83	26.22	25.31	33
	810	1909.8	28.51	27.89	26.45	25.39	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	24.49	23.58	21.59	20.64	33
	661	1880.0	24.69	23.80	21.95	20.95	33
	810	1909.8	25.30	24.25	22.52	21.52	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		22.26	22.42	22.28
		HSDPA	1	21.15	21.43	21.14
			2	20.38	20.33	20.37
			3	20.48	20.38	20.56
			4	20.36	20.35	20.34
		HSUPA	1	21.22	21.45	21.32
			2	20.34	20.39	20.34
			3	20.54	20.31	20.44
			4	20.31	20.36	20.34
			5	20.43	20.42	20.48

AWS Band (Part 27)

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band IV)	Normal	RMC12.2k		22.21	22.32	22.23
		HSDPA	1	21.53	21.63	21.54
			2	21.41	21.33	21.33
			3	21.40	21.38	21.52
			4	21.33	21.35	21.37
		HSUPA	1	20.40	20.45	20.37
			2	20.34	20.33	20.34
			3	20.54	20.32	20.47
			4	20.31	20.39	20.32
			5	20.43	20.42	20.42

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.20	13
	Middle	1.25	13
	High	1.30	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.05	13
	Middle	1.09	13
	High	1.24	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.59	13
	Middle	3.61	13
	High	3.82	13
HSDPA (16QAM)	Low	3.89	13
	Middle	3.62	13
	High	3.83	13
HSUPA (BPSK)	Low	3.64	13
	Middle	3.62	13
	High	3.64	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.03	13
	Middle	1.22	13
	High	1.21	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.16	13
	Middle	1.09	13
	High	1.23	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.63	13
	Middle	3.63	13
	High	3.87	13
HSDPA (16QAM)	Low	3.84	13
	Middle	3.66	13
	High	3.65	13
HSUPA (BPSK)	Low	3.82	13
	Middle	3.63	13
	High	3.86	13

Radiated Power
GSM Mode:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	86.23	100	2.2	H	26.9	1.90	0.0	25.00	38.45	13.45
836.6	91.08	279	2.0	V	31.1	1.90	0.0	29.20	38.45	9.25
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	88.81	21	2.4	H	18.8	1.30	9.40	26.90	33	6.10
1880.00	82.71	220	1.4	V	12.4	1.30	9.40	20.50	33	12.50

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	82.04	62	1.8	H	19.6	1.9	0.0	20.10	38.45	18.35
836.6	86.17	164	2.4	V	25.7	1.9	0.0	26.20	38.45	12.25
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	83.65	120	1.2	H	13.6	1.30	9.40	21.70	33	11.30
1880.00	78.42	211	2.0	V	8.2	1.30	9.40	16.30	33	16.70

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	76.86	165	2.4	H	17.5	1.90	0.0	15.60	38.35	22.75
836.6	82.15	85	1.6	V	22.2	1.90	0.0	20.30	38.35	18.05
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	81.36	99	1.4	H	11.3	1.30	9.40	19.40	33	13.60
1880.00	76.72	268	1.7	V	6.5	1.30	9.40	14.60	33	18.40
EIRP for WCDMA Band IV (Part 27), Middle Channel										
1732.60	85.80	60	1.8	H	12.6	1.30	8.90	20.20	30	9.80
1732.60	80.74	98	1.3	V	8.2	1.30	8.90	15.80	30	14.20

Note:
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

LTE Band 2:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.66	22.60	22.58
		RB Size=1, RB Offset=2	22.63	22.62	22.70
		RB Size=1, RB Offset=5	22.34	22.73	22.62
		RB Size=3, RB Offset=0	22.43	22.36	22.31
		RB Size=3, RB Offset=1	22.27	22.45	22.32
		RB Size=3, RB Offset=2	22.27	22.25	22.15
		RB Size=6, RB Offset=0	22.24	22.21	22.13
	16QAM	RB Size=1, RB Offset=0	22.27	22.31	22.16
		RB Size=1, RB Offset=2	22.04	22.18	21.94
		RB Size=1, RB Offset=5	22.04	21.91	23.00
		RB Size=3, RB Offset=0	21.80	21.71	22.78
		RB Size=3, RB Offset=1	21.80	21.86	21.99
		RB Size=3, RB Offset=2	21.87	21.82	21.69
		RB Size=6, RB Offset=0	21.80	21.80	21.88
3.0	QPSK	RB Size=1, RB Offset=0	22.85	22.70	22.94
		RB Size=1, RB Offset=7	22.73	22.80	22.79
		RB Size=1, RB Offset=14	22.55	22.57	22.81
		RB Size=8, RB Offset=0	21.94	21.94	21.82
		RB Size=8, RB Offset=4	21.90	21.78	21.69
		RB Size=8, RB Offset=7	21.58	21.56	21.66
		RB Size=15, RB Offset=0	21.90	21.86	21.76
	16QAM	RB Size=1, RB Offset=0	22.05	22.08	22.03
		RB Size=1, RB Offset=7	22.12	21.95	22.01
		RB Size=1, RB Offset=14	22.16	21.76	21.91
		RB Size=8, RB Offset=0	20.97	20.81	20.99
		RB Size=8, RB Offset=4	20.72	20.80	20.92
		RB Size=8, RB Offset=7	20.47	20.57	20.78
		RB Size=15, RB Offset=0	20.67	20.81	20.75

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.83	22.76	22.86
		RB Size=1, RB Offset=12	22.77	22.84	22.58
		RB Size=1, RB Offset=24	22.47	22.92	22.36
		RB Size=12, RB Offset=0	21.76	21.84	22.01
		RB Size=12, RB Offset=6	21.96	21.67	21.73
		RB Size=12, RB Offset=11	21.84	21.51	21.69
		RB Size=25, RB Offset=0	21.74	21.77	21.79
	16QAM	RB Size=1, RB Offset=0	22.11	21.70	21.73
		RB Size=1, RB Offset=12	21.82	21.50	21.69
		RB Size=1, RB Offset=24	21.79	21.39	21.55
		RB Size=12, RB Offset=0	20.88	20.78	20.91
		RB Size=12, RB Offset=6	20.77	20.58	20.72
		RB Size=12, RB Offset=11	20.69	20.59	20.59
		RB Size=25, RB Offset=0	20.79	20.64	20.81
10.0	QPSK	RB Size=1, RB Offset=0	22.89	22.78	22.74
		RB Size=1, RB Offset=24	22.78	22.81	22.58
		RB Size=1, RB Offset=49	22.65	22.74	22.63
		RB Size=25, RB Offset=0	21.74	21.73	21.63
		RB Size=25, RB Offset=12	21.95	21.74	21.70
		RB Size=25, RB Offset=24	21.85	21.62	21.51
		RB Size=50, RB Offset=0	21.64	21.55	21.68
	16QAM	RB Size=1, RB Offset=0	21.61	21.61	21.68
		RB Size=1, RB Offset=24	21.61	21.60	21.54
		RB Size=1, RB Offset=49	21.33	21.54	21.82
		RB Size=25, RB Offset=0	22.70	20.66	20.79
		RB Size=25, RB Offset=12	22.45	20.40	20.60
		RB Size=25, RB Offset=24	22.53	20.26	20.30
		RB Size=50, RB Offset=0	20.53	20.57	20.51

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.09	22.15	22.31
		RB Size=1, RB Offset=37	21.95	21.96	22.22
		RB Size=1, RB Offset=74	22.03	22.03	22.33
		RB Size=36, RB Offset=0	22.08	21.93	22.06
		RB Size=36, RB Offset=18	22.06	21.94	21.94
		RB Size=36, RB Offset=37	22.09	21.76	21.58
		RB Size=75, RB Offset=0	21.97	21.99	22.06
	16QAM	RB Size=1, RB Offset=0	21.81	21.79	21.73
		RB Size=1, RB Offset=37	21.86	21.94	21.61
		RB Size=1, RB Offset=74	21.94	21.80	21.44
		RB Size=36, RB Offset=0	21.75	21.98	22.15
		RB Size=36, RB Offset=18	21.85	21.71	21.95
		RB Size=36, RB Offset=37	21.50	21.62	21.94
		RB Size=75, RB Offset=0	21.18	21.07	21.12
20.0	QPSK	RB Size=1, RB Offset=0	22.96	22.79	23.02
		RB Size=1, RB Offset=49	22.95	22.94	22.84
		RB Size=1, RB Offset=99	22.94	22.82	22.67
		RB Size=50, RB Offset=0	21.83	21.85	22.05
		RB Size=50, RB Offset=24	21.88	21.80	22.00
		RB Size=50, RB Offset=49	21.62	21.69	21.70
		RB Size=100, RB Offset=0	21.93	21.71	21.84
	16QAM	RB Size=1, RB Offset=0	22.01	22.09	22.17
		RB Size=1, RB Offset=49	22.04	21.87	21.88
		RB Size=1, RB Offset=99	21.97	21.84	21.96
		RB Size=50, RB Offset=0	20.82	20.98	20.99
		RB Size=50, RB Offset=24	20.75	20.89	21.04
		RB Size=50, RB Offset=49	20.52	20.70	20.84
		RB Size=100, RB Offset=0	20.92	20.72	20.98

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	6.38	13	Pass
QPSK (100RB Size)	6.47	13	Pass
16QAM (1RB Size)	6.38	13	Pass
16QAM (100RB Size)	6.47	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	80.37	123	1.7	H	10.3	1.30	9.40	18.40	33
1880.00	74.54	177	2.1	V	4.3	1.30	9.40	12.40	33
3 MHz Bandwidth									
1880.00	80.36	265	2.1	H	10.3	1.30	9.40	18.40	33
1880.00	74.25	245	2.3	V	4.0	1.30	9.40	12.10	33
5 MHz Bandwidth									
1880.00	80.26	71	2.2	H	10.2	1.30	9.40	18.30	33
1880.00	74.13	10	2.3	V	3.9	1.30	9.40	12.00	33
10 MHz Bandwidth									
1880.00	80.42	312	2.0	H	10.4	1.30	9.40	18.50	33
1880.00	74.33	273	2.2	V	4.1	1.30	9.40	12.20	33
15 MHz Bandwidth									
1880.00	80.42	198	1.6	H	10.4	1.30	9.40	18.50	33
1880.00	74.15	212	1.2	V	3.9	1.30	9.40	12.00	33
20 MHz Bandwidth									
1880.00	80.26	3	2.3	H	10.2	1.30	9.40	18.30	33
1880.00	74.17	203	2.0	V	3.9	1.30	9.40	12.00	33

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	81.57	123	1.7	H	11.5	1.3	9.4	19.6	33
1880.00	75.66	177	2.1	V	5.4	1.3	9.4	13.5	33
3 MHz Bandwidth									
1880.00	81.72	265	2.1	H	11.7	1.3	9.4	19.8	33
1880.00	76.04	245	2.3	V	5.8	1.3	9.4	13.9	33
5 MHz Bandwidth									
1880.00	81.99	71	2.2	H	11.9	1.3	9.4	20	33
1880.00	76.11	10	2.3	V	5.9	1.3	9.4	14	33
10 MHz Bandwidth									
1880.00	82.16	312	2.0	H	12.1	1.3	9.4	20.2	33
1880.00	76.31	273	2.2	V	6.1	1.3	9.4	14.2	33
15 MHz Bandwidth									
1880.00	82.39	198	1.6	H	12.3	1.3	9.4	20.4	33
1880.00	76.55	212	1.2	V	6.3	1.3	9.4	14.4	33
20 MHz Bandwidth									
1880.00	82.27	3	2.3	H	12.2	1.3	9.4	20.3	33
1880.00	76.28	203	2.0	V	6.0	1.3	9.4	14.1	33

LTE Band 4:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.40	22.36	22.63
		RB Size=1, RB Offset=2	22.42	22.26	22.61
		RB Size=1, RB Offset=5	22.57	22.03	22.67
		RB Size=3, RB Offset=0	22.73	22.68	22.73
		RB Size=3, RB Offset=1	22.50	22.57	22.61
		RB Size=3, RB Offset=2	22.39	22.65	22.38
		RB Size=6, RB Offset=0	21.44	21.46	21.36
	16QAM	RB Size=1, RB Offset=0	21.89	21.98	22.01
		RB Size=1, RB Offset=2	21.82	21.93	21.78
		RB Size=1, RB Offset=5	21.75	21.90	21.91
		RB Size=3, RB Offset=0	22.84	21.85	21.67
		RB Size=3, RB Offset=1	22.93	21.75	21.92
		RB Size=3, RB Offset=2	22.66	21.80	21.68
		RB Size=6, RB Offset=0	20.71	20.58	20.73
3.0	QPSK	RB Size=1, RB Offset=0	22.52	22.40	22.56
		RB Size=1, RB Offset=7	22.28	22.48	22.32
		RB Size=1, RB Offset=14	22.25	22.14	22.22
		RB Size=8, RB Offset=0	21.58	21.63	21.66
		RB Size=8, RB Offset=4	21.43	21.42	21.65
		RB Size=8, RB Offset=7	21.47	21.30	21.60
		RB Size=15, RB Offset=0	21.57	21.51	21.81
	16QAM	RB Size=1, RB Offset=0	21.73	21.59	21.67
		RB Size=1, RB Offset=7	21.61	21.70	21.44
		RB Size=1, RB Offset=14	21.65	21.38	21.27
		RB Size=8, RB Offset=0	20.68	20.70	20.78
		RB Size=8, RB Offset=4	20.61	20.48	20.79
		RB Size=8, RB Offset=7	20.61	20.72	20.63
		RB Size=15, RB Offset=0	20.87	20.83	20.76

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.71	22.63	22.85
		RB Size=1, RB Offset=12	22.64	22.50	22.62
		RB Size=1, RB Offset=24	22.50	22.51	22.59
		RB Size=12, RB Offset=0	21.82	21.60	21.59
		RB Size=12, RB Offset=6	21.69	21.69	21.71
		RB Size=12, RB Offset=11	21.53	21.73	21.54
		RB Size=25, RB Offset=0	21.68	21.71	21.69
	16QAM	RB Size=1, RB Offset=0	21.94	22.01	21.89
		RB Size=1, RB Offset=12	21.79	21.67	21.63
		RB Size=1, RB Offset=24	21.77	21.80	21.64
		RB Size=12, RB Offset=0	20.96	20.98	21.07
		RB Size=12, RB Offset=6	20.79	20.95	20.81
		RB Size=12, RB Offset=11	20.74	20.68	20.85
		RB Size=25, RB Offset=0	20.87	20.66	20.67
10.0	QPSK	RB Size=1, RB Offset=0	22.60	22.75	22.79
		RB Size=1, RB Offset=24	22.75	22.53	22.73
		RB Size=1, RB Offset=49	22.45	22.71	22.65
		RB Size=25, RB Offset=0	21.73	21.65	21.74
		RB Size=25, RB Offset=12	21.70	21.93	21.66
		RB Size=25, RB Offset=24	21.58	21.45	21.76
		RB Size=50, RB Offset=0	21.78	21.71	21.74
	16QAM	RB Size=1, RB Offset=0	22.26	22.27	22.22
		RB Size=1, RB Offset=24	22.12	21.98	22.24
		RB Size=1, RB Offset=49	22.13	22.23	22.01
		RB Size=25, RB Offset=0	20.77	20.76	20.79
		RB Size=25, RB Offset=12	20.61	20.62	20.85
		RB Size=25, RB Offset=24	20.53	20.72	20.72
		RB Size=50, RB Offset=0	20.96	20.84	20.87

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.64	22.61	22.65
		RB Size=1, RB Offset=37	22.68	22.30	22.44
		RB Size=1, RB Offset=74	22.50	22.50	22.42
		RB Size=36, RB Offset=0	22.02	21.93	21.75
		RB Size=36, RB Offset=18	21.85	21.72	21.79
		RB Size=36, RB Offset=37	21.95	21.76	21.76
		RB Size=75, RB Offset=0	21.69	21.58	21.64
	16QAM	RB Size=1, RB Offset=0	21.81	21.55	21.54
		RB Size=1, RB Offset=37	21.56	21.55	21.63
		RB Size=1, RB Offset=74	21.45	21.44	21.65
		RB Size=36, RB Offset=0	20.84	20.75	20.59
		RB Size=36, RB Offset=18	20.68	20.49	20.70
		RB Size=36, RB Offset=37	20.40	20.52	20.55
		RB Size=75, RB Offset=0	20.75	20.85	20.68
20.0	QPSK	RB Size=1, RB Offset=0	22.78	22.36	22.55
		RB Size=1, RB Offset=49	22.73	22.24	22.39
		RB Size=1, RB Offset=99	22.73	22.36	22.18
		RB Size=50, RB Offset=0	21.95	21.99	21.85
		RB Size=50, RB Offset=24	21.87	21.90	21.99
		RB Size=50, RB Offset=49	21.72	21.84	21.79
		RB Size=100, RB Offset=0	21.86	21.43	21.60
	16QAM	RB Size=1, RB Offset=0	22.41	22.18	22.29
		RB Size=1, RB Offset=49	22.17	22.18	22.37
		RB Size=1, RB Offset=99	22.08	22.20	22.28
		RB Size=50, RB Offset=0	21.00	21.02	20.98
		RB Size=50, RB Offset=24	21.01	20.92	21.02
		RB Size=50, RB Offset=49	20.96	21.14	21.10
		RB Size=100, RB Offset=0	20.86	20.78	20.88

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	7.53	13	Pass
QPSK (100RB Size)	7.55	13	Pass
16QAM (1RB Size)	6.65	13	Pass
16QAM (100RB Size)	6.71	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna Height (m)	Rx Antenna Polar (H/V)	Substituted Level (dBm)	Substituted Cable Loss (dB)	Substituted Antenna Gain (dBi)	Absolute Level (dBm)	Limit (dBm)
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.26	347	2.4	H	14.1	1.30	8.90	21.70	30
1732.50	77.21	140	1.1	V	4.6	1.30	8.90	12.20	30
3 MHz Bandwidth									
1732.50	86.94	197	2.2	H	13.8	1.30	8.90	21.40	30
1732.50	76.89	303	2.3	V	4.3	1.30	8.90	11.90	30
5 MHz Bandwidth									
1732.50	87.13	325	1.7	H	14.0	1.30	8.90	21.60	30
1732.50	77.08	264	1.3	V	4.5	1.30	8.90	12.10	30
10 MHz Bandwidth									
1732.50	87.24	273	1.5	H	14.1	1.30	8.90	21.70	30
1732.50	77.19	28	2.0	V	4.6	1.30	8.90	12.20	30
15 MHz Bandwidth									
1732.50	87.26	293	2.3	H	14.1	1.30	8.90	21.70	30
1732.50	77.22	173	2.2	V	4.7	1.30	8.90	12.30	30
20 MHz Bandwidth									
1732.50	87.18	95	1.8	H	14.0	1.30	8.90	21.60	30
1732.50	77.13	117	1.9	V	4.6	1.30	8.90	12.20	30

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.07	347	2.4	H	13.9	1.3	8.9	21.5	30
1732.50	77.11	140	1.1	V	4.5	1.3	8.9	12.1	30
3 MHz Bandwidth									
1732.50	86.95	197	2.2	H	13.8	1.3	8.9	21.4	30
1732.50	77.08	303	2.3	V	4.5	1.3	8.9	12.1	30
5 MHz Bandwidth									
1732.50	87.23	325	1.7	H	14.1	1.3	8.9	21.7	30
1732.50	77.28	264	1.3	V	4.7	1.3	8.9	12.3	30
10 MHz Bandwidth									
1732.50	87.35	273	1.5	H	14.2	1.3	8.9	21.8	30
1732.50	77.46	28	2.0	V	4.8	1.3	8.9	12.4	30
15 MHz Bandwidth									
1732.50	87.11	293	2.3	H	14.0	1.3	8.9	21.6	30
1732.50	77.21	173	2.2	V	4.6	1.3	8.9	12.2	30
20 MHz Bandwidth									
1732.50	87.36	95	1.8	H	14.2	1.3	8.9	21.8	30
1732.50	77.49	117	1.9	V	4.9	1.3	8.9	12.5	30

LTE Band 5:

<center>Maximum Output Power</center>

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.91	23.13	22.92
		RB Size=1, RB Offset=2	23.07	23.00	22.99
		RB Size=1, RB Offset=5	22.97	23.01	22.98
		RB Size=3, RB Offset=0	23.02	23.05	23.15
		RB Size=3, RB Offset=1	22.86	22.92	22.98
		RB Size=3, RB Offset=2	22.81	22.73	23.02
		RB Size=6, RB Offset=0	21.92	22.07	22.00
	16QAM	RB Size=1, RB Offset=0	22.02	21.96	21.87
		RB Size=1, RB Offset=2	21.92	21.88	21.86
		RB Size=1, RB Offset=5	21.91	21.61	21.77
		RB Size=3, RB Offset=0	22.08	22.16	22.32
		RB Size=3, RB Offset=1	22.12	22.27	22.25
		RB Size=3, RB Offset=2	21.85	22.14	22.07
		RB Size=6, RB Offset=0	20.88	21.11	21.02
3.0	QPSK	RB Size=1, RB Offset=0	23.09	22.97	23.01
		RB Size=1, RB Offset=7	22.74	23.12	23.00
		RB Size=1, RB Offset=14	22.56	22.82	22.66
		RB Size=8, RB Offset=0	22.09	21.99	22.01
		RB Size=8, RB Offset=4	22.02	21.95	22.04
		RB Size=8, RB Offset=7	22.12	21.90	21.80
		RB Size=15, RB Offset=0	22.03	22.09	22.05
	16QAM	RB Size=1, RB Offset=0	22.59	22.58	22.54
		RB Size=1, RB Offset=7	22.40	22.35	22.54
		RB Size=1, RB Offset=14	22.21	22.21	22.45
		RB Size=8, RB Offset=0	21.10	21.20	21.12
		RB Size=8, RB Offset=4	21.03	21.14	21.13
		RB Size=8, RB Offset=7	21.18	21.12	21.29
		RB Size=15, RB Offset=0	21.15	21.01	21.15

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.14	22.06	22.01
		RB Size=1, RB Offset=12	22.02	21.86	21.79
		RB Size=1, RB Offset=24	21.88	21.86	21.88
		RB Size=12, RB Offset=0	21.30	21.16	21.15
		RB Size=12, RB Offset=6	20.95	21.24	21.02
		RB Size=12, RB Offset=11	20.86	21.07	21.05
		RB Size=25, RB Offset=0	22.12	22.12	22.04
	16QAM	RB Size=1, RB Offset=0	21.94	21.96	22.05
		RB Size=1, RB Offset=12	21.86	21.79	21.95
		RB Size=1, RB Offset=24	22.06	21.56	22.06
		RB Size=12, RB Offset=0	21.29	21.08	21.32
		RB Size=12, RB Offset=6	20.91	21.12	21.07
		RB Size=12, RB Offset=11	20.89	21.04	20.84
		RB Size=25, RB Offset=0	21.09	21.04	21.08
10.0	QPSK	RB Size=1, RB Offset=0	23.03	23.03	23.19
		RB Size=1, RB Offset=24	23.00	22.96	22.97
		RB Size=1, RB Offset=49	23.05	22.99	22.88
		RB Size=25, RB Offset=0	22.09	21.96	21.97
		RB Size=25, RB Offset=12	22.08	22.03	22.05
		RB Size=25, RB Offset=24	21.74	21.96	21.86
		RB Size=50, RB Offset=0	22.12	22.01	22.13
	16QAM	RB Size=1, RB Offset=0	22.65	22.58	22.62
		RB Size=1, RB Offset=24	22.56	22.46	22.59
		RB Size=1, RB Offset=49	22.40	22.40	22.22
		RB Size=25, RB Offset=0	21.02	21.12	21.18
		RB Size=25, RB Offset=12	21.03	21.12	21.11
		RB Size=25, RB Offset=24	20.92	21.40	20.92
		RB Size=50, RB Offset=0	21.09	21.12	21.06

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK(1RB Size)	7.49	13	Pass
QPSK(50RB Size)	7.51	13	Pass
16QAM (1RB Size)	6.30	13	Pass
16QAM (50RB Size)	6.37	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	78.02	73	1.2	H	18.6	1.90	0.0	16.70	38.45
836.5	82.24	219	1.1	V	22.2	1.90	0.0	20.30	38.45
3 MHz Bandwidth									
836.5	78.26	187	1.1	H	18.9	1.90	0.0	17.00	38.45
836.5	82.54	119	1.9	V	22.5	1.90	0.0	20.60	38.45
5 MHz Bandwidth									
836.5	78.52	244	1.5	H	19.1	1.90	0.0	17.20	38.45
836.5	82.71	247	2.2	V	22.7	1.90	0.0	20.80	38.45
10 MHz Bandwidth									
836.5	78.35	153	1.8	H	19.0	1.90	0.0	17.10	38.45
836.5	82.63	291	1.6	V	22.6	1.90	0.0	20.70	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	78.14	73	1.2	H	18.7	1.9	0	16.8	38.45
836.5	82.39	219	1.1	V	22.4	1.9	0	20.5	38.45
3 MHz Bandwidth									
836.5	78.36	187	1.1	H	18.9	1.9	0	17	38.45
836.5	82.69	119	1.9	V	22.7	1.9	0	20.8	38.45
5 MHz Bandwidth									
836.5	78.66	244	1.5	H	19.2	1.9	0	17.3	38.45
836.5	82.88	247	2.2	V	22.8	1.9	0	20.9	38.45
10 MHz Bandwidth									
836.5	78.71	153	1.8	H	19.3	1.9	0	17.4	38.45
836.5	82.97	291	1.6	V	22.9	1.9	0	21	38.45

LTE Band 7:

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	23.17	22.86	22.59
		RB Size=1, RB Offset=12	22.78	22.40	22.30
		RB Size=1, RB Offset=24	23.37	23.04	22.93
		RB Size=12, RB Offset=0	22.11	21.55	21.27
		RB Size=12, RB Offset=6	21.93	21.65	21.51
		RB Size=12, RB Offset=11	22.11	21.60	21.47
		RB Size=25, RB Offset=0	21.94	21.59	22.20
	16QAM	RB Size=1, RB Offset=0	22.64	21.95	22.13
		RB Size=1, RB Offset=12	22.47	21.78	22.17
		RB Size=1, RB Offset=24	22.58	21.91	22.35
		RB Size=12, RB Offset=0	21.80	21.00	21.29
		RB Size=12, RB Offset=6	21.65	21.05	21.30
		RB Size=12, RB Offset=11	21.67	20.98	21.47
		RB Size=25, RB Offset=0	21.00	20.72	20.58
10	QPSK	RB Size=1, RB Offset=0	22.64	22.38	22.86
		RB Size=1, RB Offset=24	22.82	22.34	22.70
		RB Size=1, RB Offset=49	22.51	22.27	22.78
		RB Size=25, RB Offset=0	21.85	21.75	21.98
		RB Size=25, RB Offset=12	21.83	21.75	21.96
		RB Size=25, RB Offset=24	21.90	21.75	22.02
		RB Size=50, RB Offset=0	22.11	21.45	21.58
	16QAM	RB Size=1, RB Offset=0	21.78	22.11	21.87
		RB Size=1, RB Offset=24	21.64	22.25	22.03
		RB Size=1, RB Offset=49	21.84	22.18	22.06
		RB Size=25, RB Offset=0	21.10	21.28	21.24
		RB Size=25, RB Offset=12	21.29	21.18	21.07
		RB Size=25, RB Offset=24	21.10	21.35	21.30
		RB Size=50, RB Offset=0	21.12	20.47	20.63

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	22.70	22.67	23.89
		RB Size=1, RB Offset=37	22.54	22.69	23.61
		RB Size=1, RB Offset=74	22.72	22.66	23.76
		RB Size=36, RB Offset=0	21.99	21.94	23.00
		RB Size=36, RB Offset=18	21.94	21.68	23.16
		RB Size=36, RB Offset=37	22.03	21.89	23.00
		RB Size=75, RB Offset=0	22.02	21.37	22.25
	16QAM	RB Size=1, RB Offset=0	21.94	21.88	22.68
		RB Size=1, RB Offset=37	21.91	21.51	22.75
		RB Size=1, RB Offset=74	22.08	21.60	22.87
		RB Size=36, RB Offset=0	21.22	21.05	21.95
		RB Size=36, RB Offset=18	21.23	21.06	21.79
		RB Size=36, RB Offset=37	21.18	21.08	21.80
		RB Size=75, RB Offset=0	20.67	20.45	21.46
20	QPSK	RB Size=1, RB Offset=0	22.74	23.03	23.55
		RB Size=1, RB Offset=49	22.68	22.95	23.32
		RB Size=1, RB Offset=99	22.97	23.08	23.67
		RB Size=50, RB Offset=0	21.97	22.19	22.67
		RB Size=50, RB Offset=24	22.15	22.14	22.78
		RB Size=50, RB Offset=49	21.97	22.15	22.91
		RB Size=100, RB Offset=0	22.27	21.72	22.42
	16QAM	RB Size=1, RB Offset=0	22.06	22.29	22.87
		RB Size=1, RB Offset=49	21.93	22.29	22.68
		RB Size=1, RB Offset=99	22.08	22.23	22.97
		RB Size=50, RB Offset=0	21.22	21.42	22.11
		RB Size=50, RB Offset=24	21.45	21.47	22.05
		RB Size=50, RB Offset=49	21.24	21.47	22.04
		RB Size=100, RB Offset=0	21.23	20.63	21.47

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	7.79	13	Pass
QPSK (100RB Size)	7.85	13	Pass
16QAM (1RB Size)	7.03	13	Pass
16QAM (100RB Size)	7.09	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	80.69	92	1.9	H	11.2	2.60	10.20	18.80	33
2535.00	74.16	94	1.5	V	5.3	2.60	10.20	12.90	33
10 MHz Bandwidth									
2535.00	80.03	340	1.4	H	10.5	2.60	10.20	18.10	33
2535.00	73.89	160	1.2	V	5.0	2.60	10.20	12.60	33
15 MHz Bandwidth									
2535.00	80.91	209	2.1	H	11.4	2.60	10.20	19.00	33
2535.00	73.59	85	2.1	V	4.7	2.60	10.20	12.30	33
20 MHz Bandwidth									
2535.00	80.51	341	1.7	H	11.0	2.60	10.20	18.60	33
2535.00	73.98	113	1.6	V	5.1	2.60	10.20	12.70	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	79.09	150	2.2	H	9.6	2.60	10.20	17.20	33
2535.00	73.00	325	1.7	V	4.1	2.60	10.20	11.70	33
10 MHz Bandwidth									
2535.00	79.05	78	2.1	H	9.6	2.60	10.20	17.20	33
2535.00	72.56	221	2.1	V	3.7	2.60	10.20	11.30	33
15 MHz Bandwidth									
2535.00	78.86	3	1.7	H	9.4	2.60	10.20	17.00	33
2535.00	72.56	331	1.2	V	3.7	2.60	10.20	11.30	33
20 MHz Bandwidth									
2535.00	78.87	81	2.2	H	9.4	2.60	10.20	17.00	33
2535.00	72.62	167	1.3	V	3.7	2.60	10.20	11.30	33

Note:
All above data were tested with no amplifier
Absolute Level = Substituted Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53 - OCCUPIED BANDWIDTH
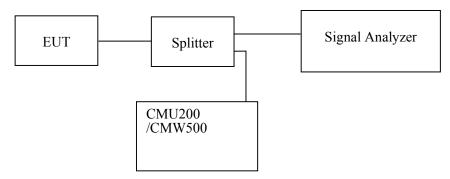
Applicable Standard

FCC 47 §2.1049, §22.917, §22.905, §24.238 and §27.53.

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2019-01-24 and 2019-01-25.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables and plots.

Cellular Band (Part 22H)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	245.2	312.5
EGPRS(8PSK)	836.6	251.6	317.3

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.183	4.712
HSUPA (BPSK)	836.6	4.199	4.776
HSDPA (16QAM)	836.6	4.199	4.776

PCS Band (Part 24E)
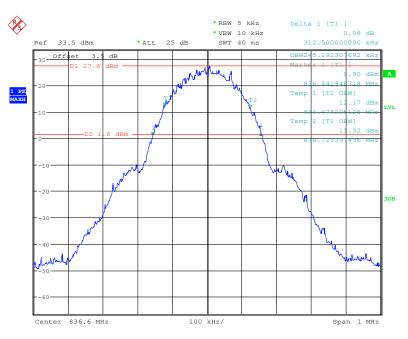
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	243.6	315.7
EGPRS(8PSK)	1880.0	248.4	322.1

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.183	4.728
HSUPA (BPSK)	1880.0	4.215	5.032
HSDPA (16QAM)	1880.0	4.199	4.776

AWS Band (Part27)
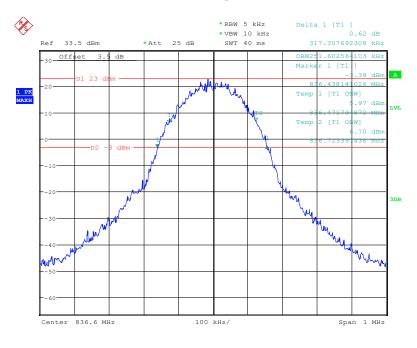
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1732.6	4.167	4.712
HSUPA (BPSK)	1732.6	4.231	5.160
HSDPA (16QAM)	1732.6	4.183	4.728

Cellular Band (Part 22H)
26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode
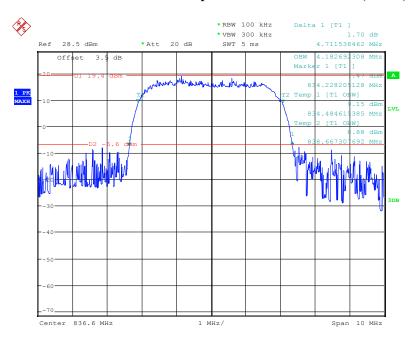
Date: 25.JAN.2019 08:19:13

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode
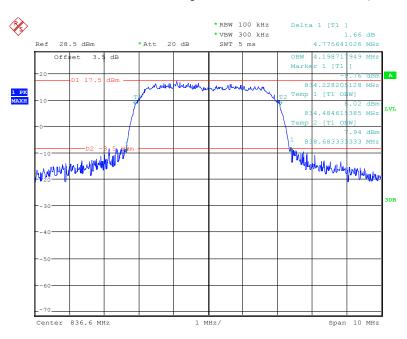
Date: 25.JAN.2019 08:54:52

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode
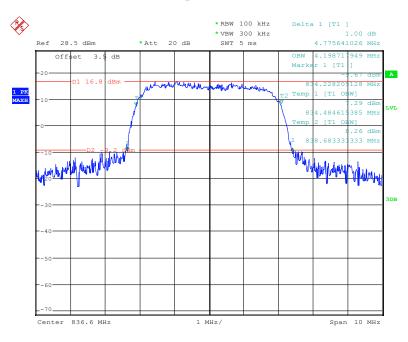
Date: 25.JAN.2019 13:27:48

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode

Date: 25.JAN.2019 13:19:23

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode
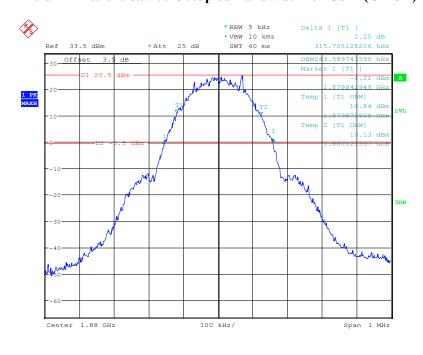
Date: 25.JAN.2019 13:21:03
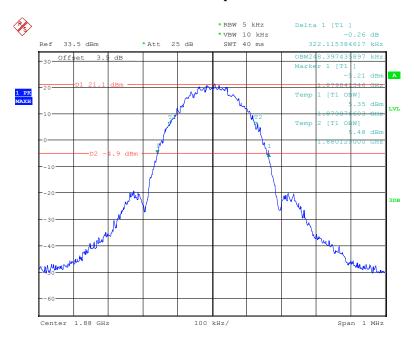
PCS Band (Part 24E)
26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode
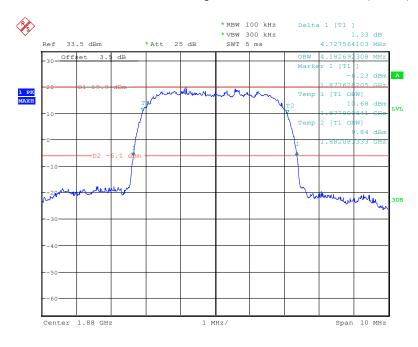
Date: 25.JAN.2019 09:31:41

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode
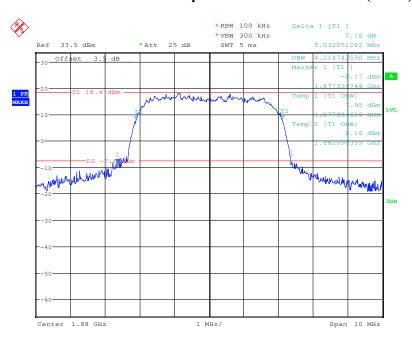
Date: 25.JAN.2019 09:51:04

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode
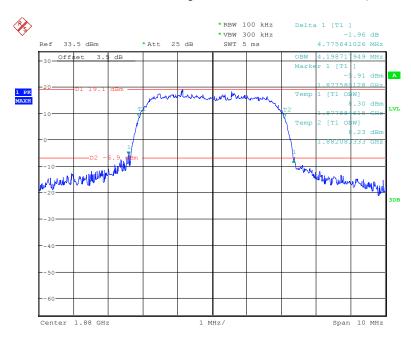
Date: 25.JAN.2019 12:11:16

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode
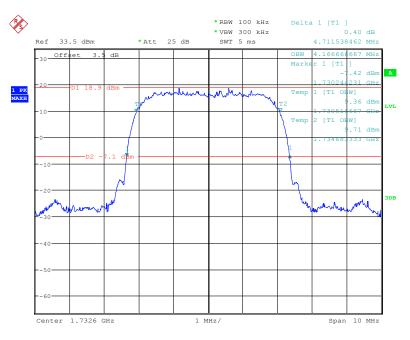
Date: 25.JAN.2019 12:48:09

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode
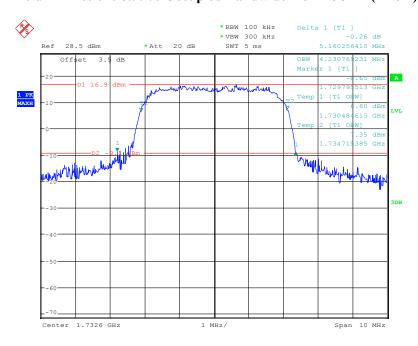
Date: 25.JAN.2019 12:39:16

AWS Band (Part 27)

26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode
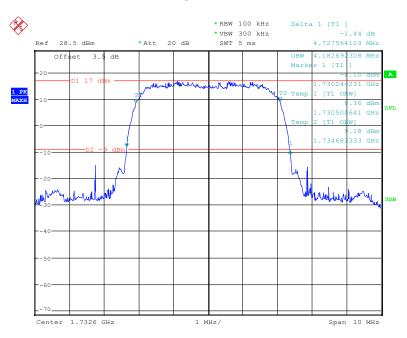
Date: 25.JAN.2019 12:55:28

26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode

Date: 25.JAN.2019 13:11:27

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode
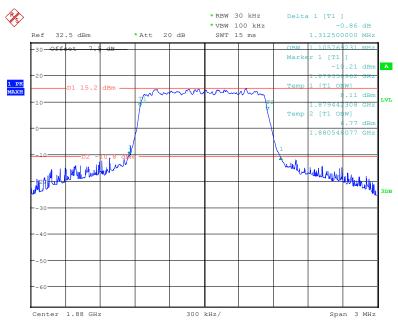
Date: 25.JAN.2019 13:09:20

LTE Band 2: (Middle Channel)

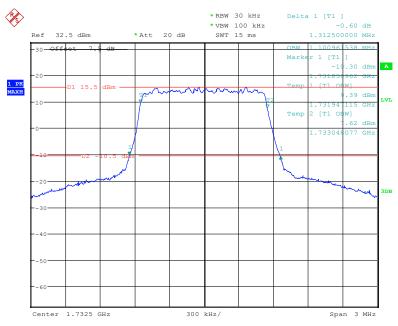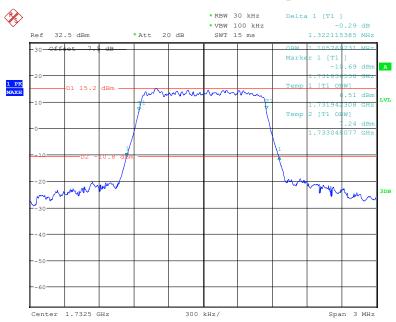| Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.106	1.313
	16QAM	1.106	1.313
3.0	QPSK	2.692	2.885
	16QAM	2.692	2.962
5.0	QPSK	4.519	4.952
	16QAM	4.519	4.968
10.0	QPSK	8.974	9.679
	16QAM	8.974	9.615
15.0	QPSK	13.462	14.615
	16QAM	13.462	14.567
20.0	QPSK	17.885	19.038
	16QAM	17.885	19.103
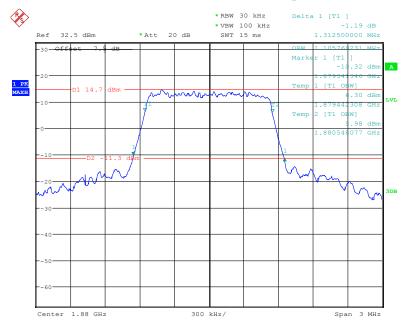
QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
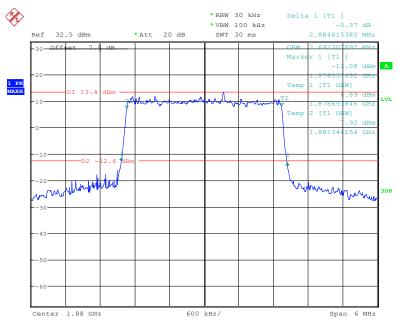
Date: 24.JAN.2019 18:31:29

16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
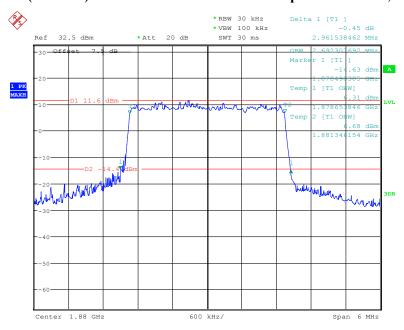
Date: 24.JAN.2019 18:32:59

QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
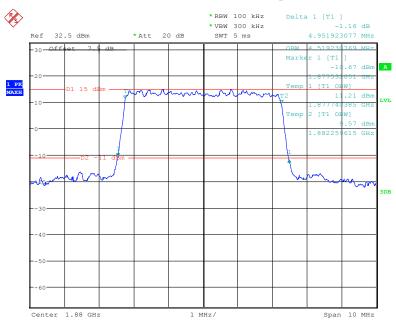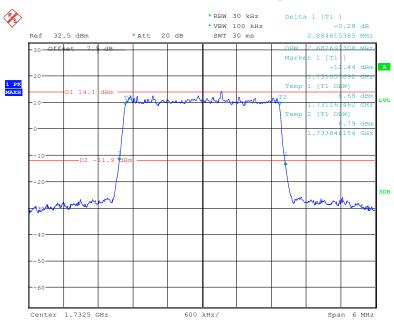

Date: 24.JAN.2019 18:36:16

16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
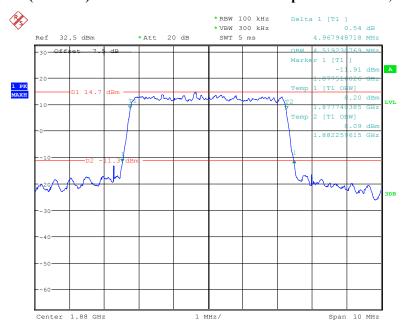
Date: 24.JAN.2019 18:38:29

QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
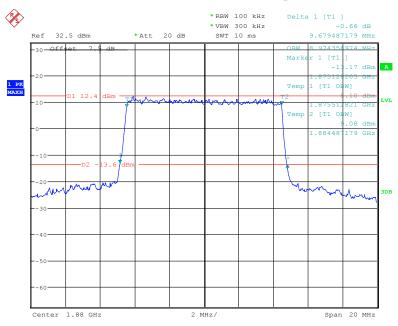
Date: 24.JAN.2019 18:40:29

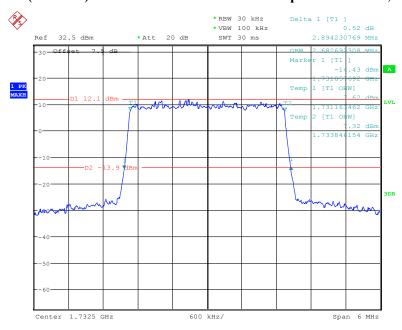## 16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
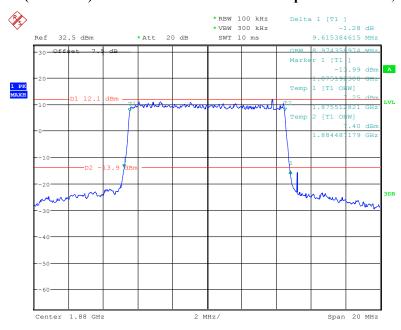
Date: 24.JAN.2019 18:42:12

QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
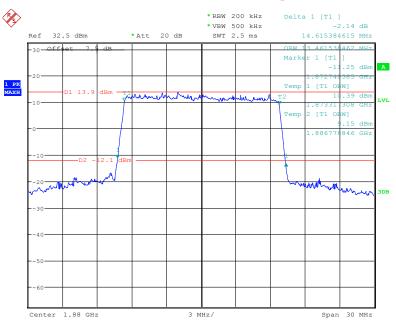
Date: 24.JAN.2019 18:47:26

16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
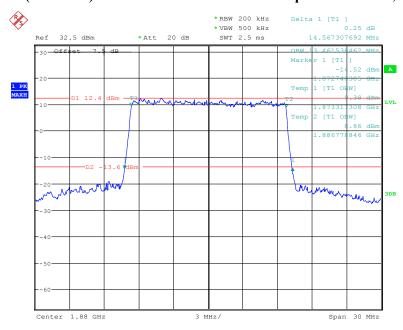
Date: 24.JAN.2019 18:44:36

QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
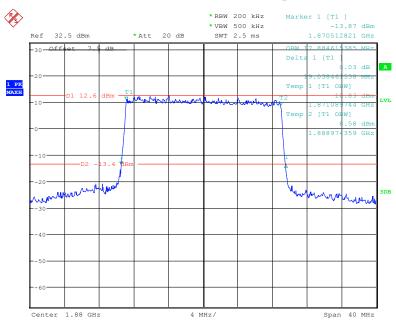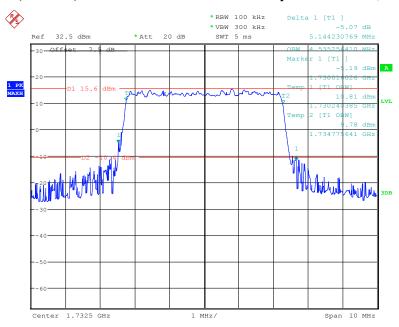

Date: 24.JAN.2019 18:50:13

16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
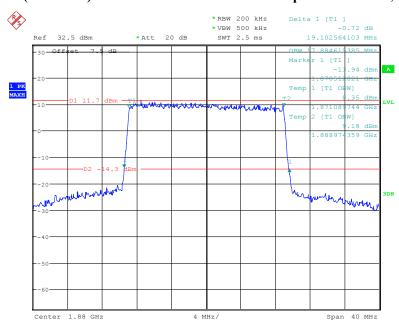
Date: 24.JAN.2019 18:51:39

QPSK (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 18:54:22

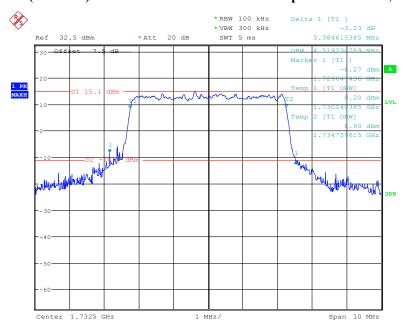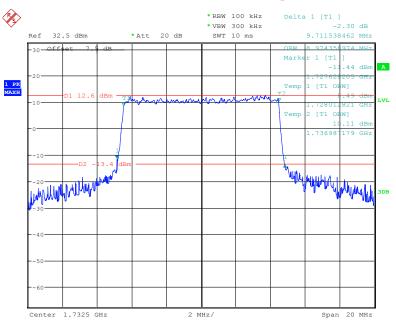## 16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 18:56:02

LTE Band 4: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.101	1.313
	16QAM	1.106	1.322
3.0	QPSK	2.683	2.885
	16QAM	2.683	2.894
5.0	QPSK	4.535	5.144
	16QAM	4.519	5.385
10.0	QPSK	8.974	9.712
	16QAM	8.942	9.551
15.0	QPSK	13.510	14.760
	16QAM	13.462	14.856
20.0	QPSK	17.949	19.038
	16QAM	17.949	19.103

QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 18:59:42

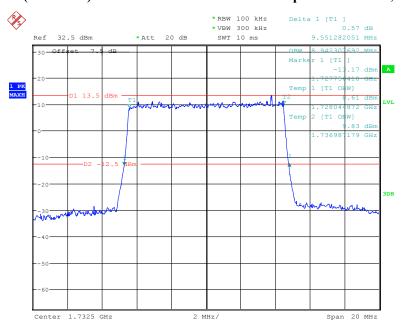## 16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 18:58:08

QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
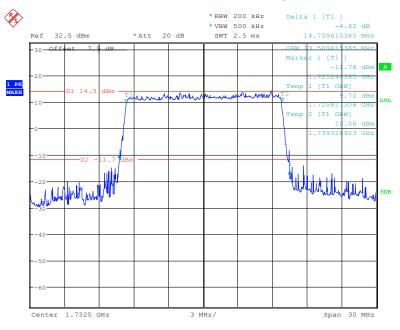

Date: 24.JAN.2019 19:03:00

16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:01:27

QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:10:32

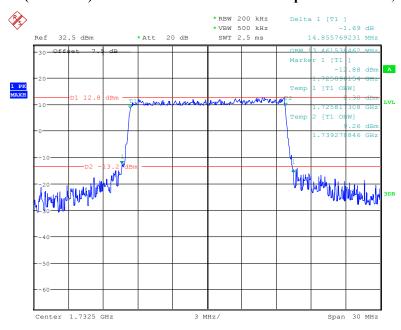## 16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:08:54

QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

```
                                          *RBW 100 kHz      Delta 1 [T1 ]
                                          *VBW 300 kHz                -2.30 dB
      Ref  32.5 dBm          *Att  20 dB   SWT 10 ms        9.711538462 MHz
   -30  Offset   7.5 dB                                 OBW  8.974358974 MHz
                                                        Marker 1 [T1 ]
   -20                                                           -11.44 dBm      A
                                                                 1.727626205 GHz
 1 PK                                                   Temp 1 [T1 OBW]
 MAXH    D1 12.6 dBm   T1                                         8.49 dBm        LVL
   -10                                                   1.728012821 GHz
                                                        Temp 2 [T1 OBW]
     0                                                            10.11 dBm
                                                         1.736987179 GHz
   -10
         D2 -13.4 dBm
   -20
                                                                                 3DB
   -30

   -40

   -50

   -60

      Center  1.7325 GHz              2 MHz/              Span  20 MHz
```

Date: 24.JAN.2019 19:12:50

16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

```
                                          *RBW 100 kHz      Delta 1 [T1 ]
                                          *VBW 300 kHz                 0.57 dB
      Ref  32.5 dBm          *Att  20 dB   SWT 10 ms        9.551282051 MHz
   -30  Offset   7.5 dB                                 OBW  8.942307692 MHz
                                                        Marker 1 [T1 ]
   -20                                                           -13.17 dBm      A
                                                                 1.727756410 GHz
 1 PK                                                   Temp 1 [T1 OBW]
 MAXH    D1 13.5 dBm   T1                                         8.61 dBm        LVL
   -10                                                   1.728044872 GHz
                                                        Temp 2 [T1 OBW]
     0                                                            9.83 dBm
                                                         1.736987179 GHz
   -10
         D2 -12.5 dBm
   -20
                                                                                 3DB
   -30

   -40

   -50

   -60

      Center  1.7325 GHz              2 MHz/              Span  20 MHz
```

Date: 24.JAN.2019 19:14:26

QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
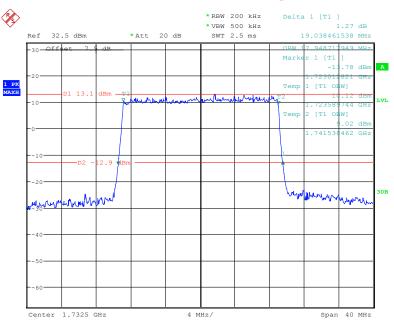

Date: 24.JAN.2019 19:17:51

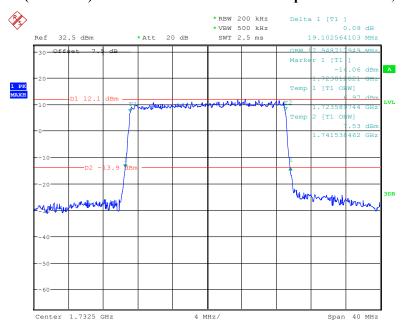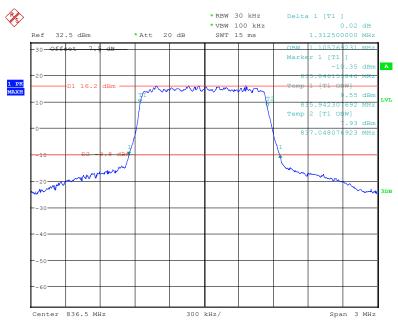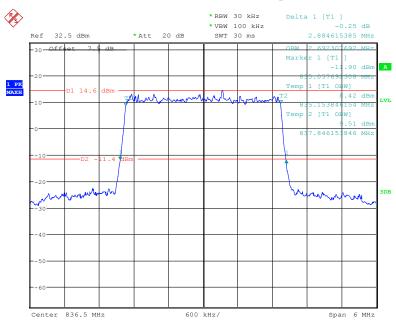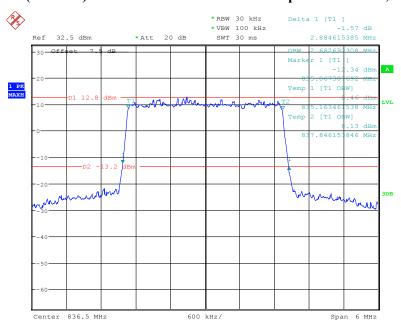## 16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:15:54

QPSK (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
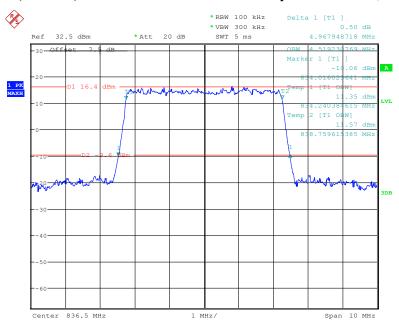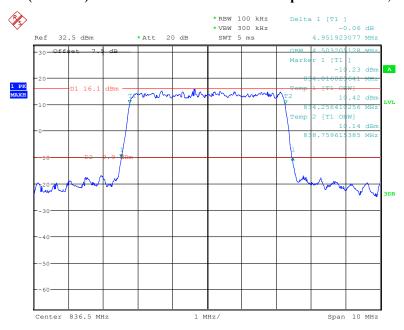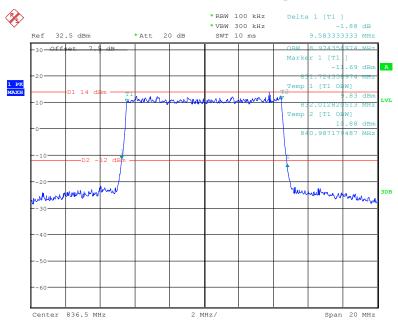
Date: 24.JAN.2019 19:20:27

16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
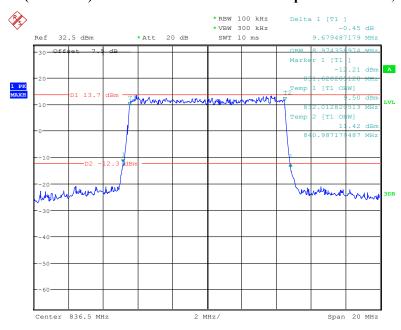
Date: 24.JAN.2019 19:19:02

LTE Band 5: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.106	1.313
	16QAM	1.106	1.322
3.0	QPSK	2.692	2.885
	16QAM	2.683	2.885
5.0	QPSK	4.519	4.968
	16QAM	4.503	4.952
10.0	QPSK	8.974	9.583
	16QAM	8.974	9.679
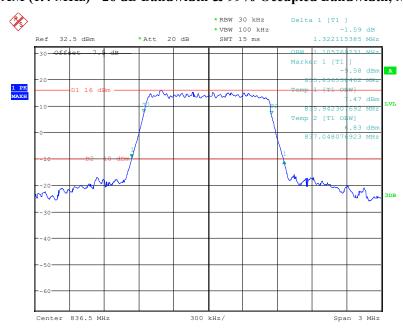
QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:22:24

### 16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:24:19

QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:25:47

16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:27:26

QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:30:07

16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:32:42
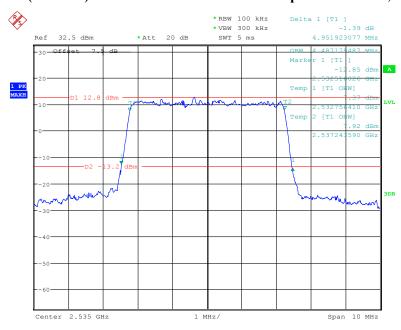
QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:34:44

16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
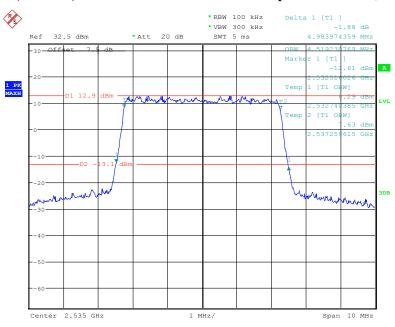
Date: 24.JAN.2019 19:36:18

LTE Band 7: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.519	4.984
	16QAM	4.487	4.952
10.0	QPSK	8.974	9.647
	16QAM	8.974	9.615
15.0	QPSK	13.510	14.856
	16QAM	13.510	14.519
20.0	QPSK	17.885	19.103
	16QAM	17.885	19.167

QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
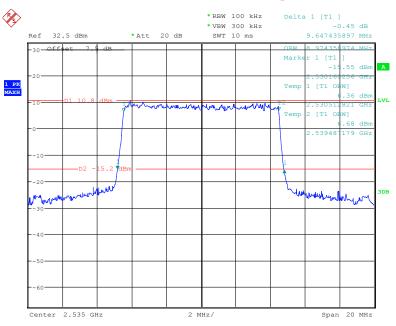

Date: 24.JAN.2019 19:42:20

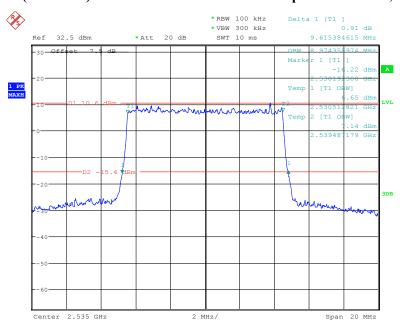## 16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:40:53

QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
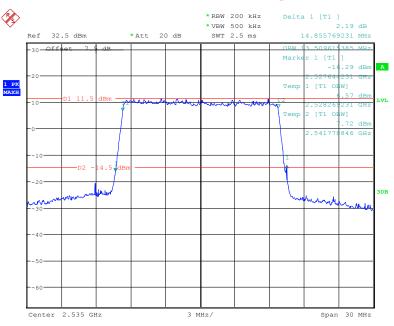
Date: 24.JAN.2019 19:43:48

16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
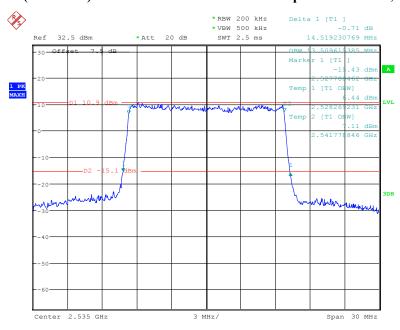
Date: 24.JAN.2019 19:46:16

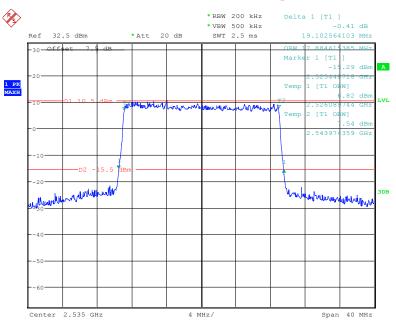## QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:49:27

16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel
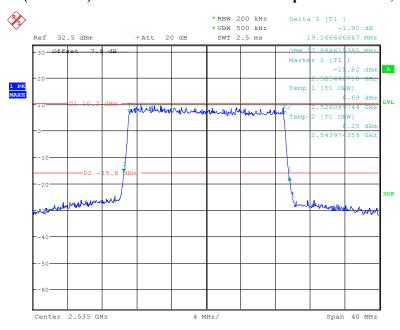

Date: 24.JAN.2019 19:51:16

QPSK (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:53:08

16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 24.JAN.2019 19:54:44

FCC §2.1051, §22.917(a) & §24.238(a); §27.53 (h) (m) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS
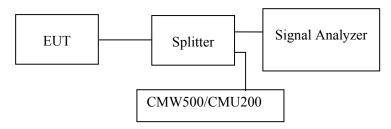
Applicable Standard

FCC §2.1051, §22.917(a) and §24.238(a) and §27.53(h) (m).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

```
┌─────────┐       ┌──────────┐       ┌──────────────────┐
│   EUT   │───────│ Splitter │───────│  Signal Analyzer │
└─────────┘       └──────────┘       └──────────────────┘
                       │
                  ┌──────────────────┐
                  │  CMW500/CMU200   │
                  └──────────────────┘
```

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2019-01-24 and 2019-01-25.
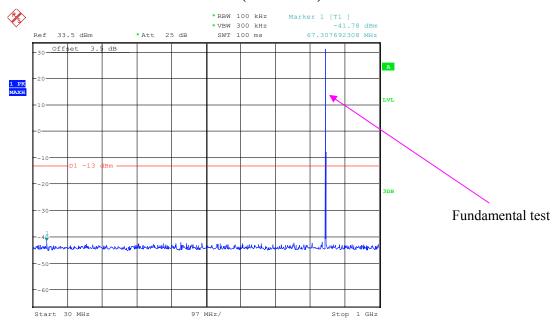
Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.
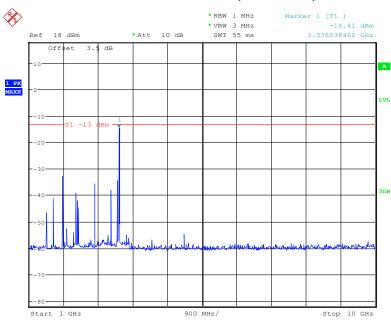
Cellular Band (Part 22H)

30 MHz – 1 GHz (GSM Mode)

```
                                    * RBW 100 kHz    Marker 1 [T1 ]
                                    * VBW 300 kHz              -41.78 dBm
        Ref  33.5 dBm    * Att  25 dB    SWT 100 ms     67.307692308 MHz
```

Fundamental test
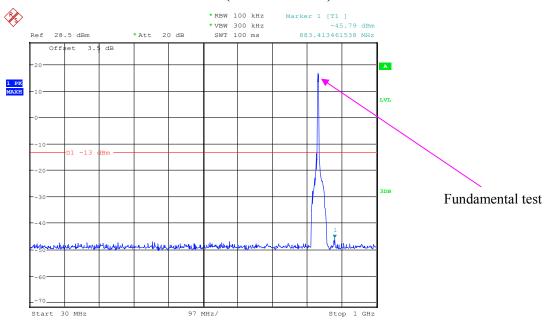
```
Date: 25.JAN.2019  08:30:44
```

1 GHz – 10 GHz (GSM Mode)

```
                                    * RBW 1 MHz      Marker 1 [T1 ]
                                    * VBW 3 MHz               -14.41 dBm
        Ref  18 dBm     * Att  10 dB    SWT 55 ms      3.336538462 GHz
```
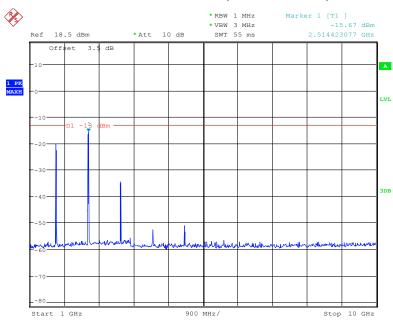
```
Date: 25.JAN.2019  09:07:52
```

30 MHz – 1 GHz (WCDMA Mode)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz              -45.79 dBm
        Ref  28.5 dBm    *Att  20 dB  SWT 100 ms     883.413461538 MHz
           Offset   3.5 dB
```

Fundamental test

Date: 25.JAN.2019 13:29:55

1 GHz – 10 GHz (WCDMA Mode)

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz              -15.67 dBm
        Ref  18.5 dBm    *Att  10 dB  SWT  55 ms      2.514423077 GHz
           Offset   3.5 dB
```

Date: 25.JAN.2019 13:30:56

PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)

```
                              *RBW 100 kHz     Marker 1 [T1 ]
                              *VBW 300 kHz              -25.10 dBm
     Ref  18 dBm    *Att  10 dB   SWT 100 ms     505.673076923 MHz
```
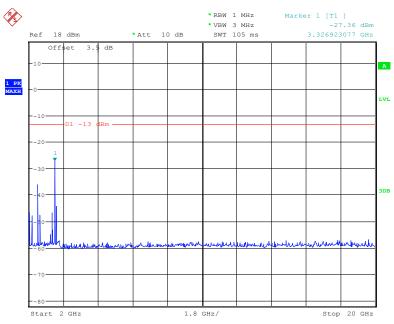
Date: 25.JAN.2019 09:27:48

1 GHz – 2 GHz (GSM Mode)

```
                              *RBW 1 MHz       Marker 1 [T1 ]
                              *VBW 3 MHz               -42.03 dBm
     Ref  33.5 dBm   *Att  25 dB   SWT 2.5 ms     1.761217949 GHz
```

Fundamental test
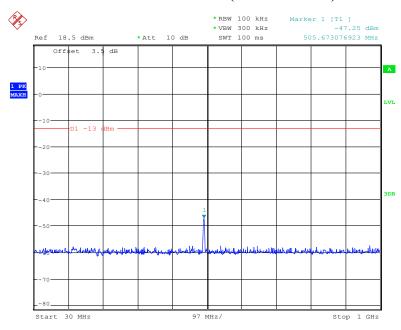
Date: 25.JAN.2019 09:14:08

2 GHz – 20 GHz (GSM Mode)

```
                                    *RBW  1 MHz      Marker 1 [T1 ]
                                    *VBW  3 MHz                 -27.36 dBm
     Ref   18 dBm      *Att  10 dB   SWT 105 ms        3.326923077 GHz
        Offset  3.5 dB
```
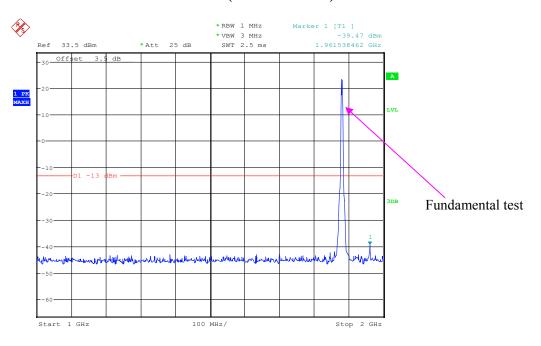
Date: 25.JAN.2019 09:27:10

30 MHz – 1 GHz (WCDMA Mode)

```
                                    *RBW 100 kHz      Marker 1 [T1 ]
                                    *VBW 300 kHz                -47.25 dBm
     Ref  18.5 dBm     *Att  10 dB   SWT 100 ms       505.673076923 MHz
        Offset  3.5 dB
```

Date: 25.JAN.2019 12:18:52

1 GHz – 2 GHz (WCDMA Mode)

```
                                    *RBW  1 MHz      Marker 1 [T1 ]
                                    *VBW  3 MHz              -39.47 dBm
      Ref  33.5 dBm      *Att  25 dB   SWT 2.5 ms      1.961538462 GHz
        Offset  3.5 dB
```

Fundamental test
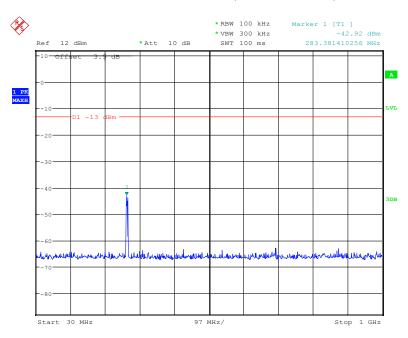
```
Date: 25.JAN.2019  12:14:24
```

2 GHz – 20 GHz (WCDMA Mode)

```
                                    *RBW  1 MHz      Marker 1 [T1 ]
                                    *VBW  3 MHz              -45.62 dBm
      Ref  18.5 dBm      *Att  10 dB   SWT 105 ms      3.298076923 GHz
        Offset  3.5 dB
```

```
Date: 25.JAN.2019  12:18:10
```

AWS Band (Part 27)

30 MHz – 1 GHz (WCDMA Mode)
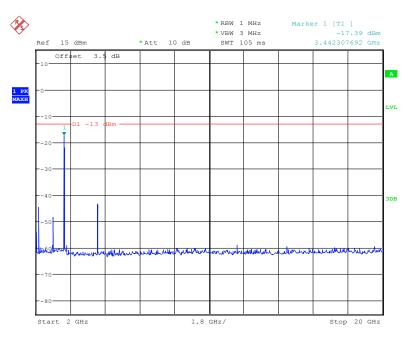
Date: 25.JAN.2019 13:01:15

1 GHz – 2 GHz (WCDMA Mode)

Fundamental test

Date: 25.JAN.2019 12:59:13
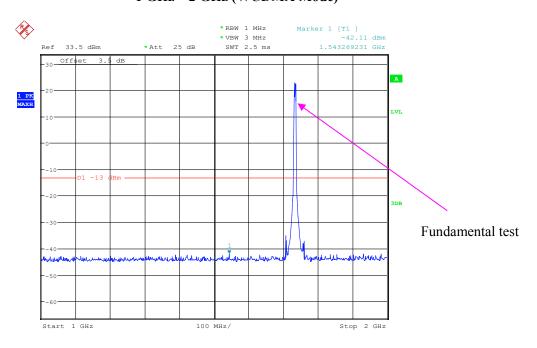
2 GHz – 20 GHz (WCDMA Mode)

```
                                    *RBW  1 MHz      Marker 1 [T1 ]
                                    *VBW  3 MHz                -17.39 dBm
         Ref  15 dBm      *Att  10 dB     SWT 105 ms      3.442307692 GHz
```
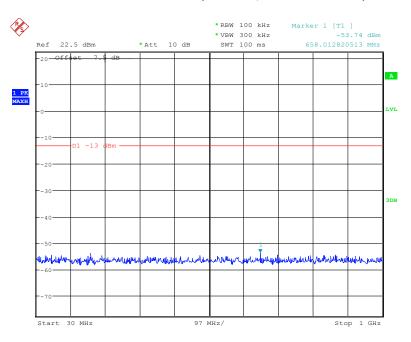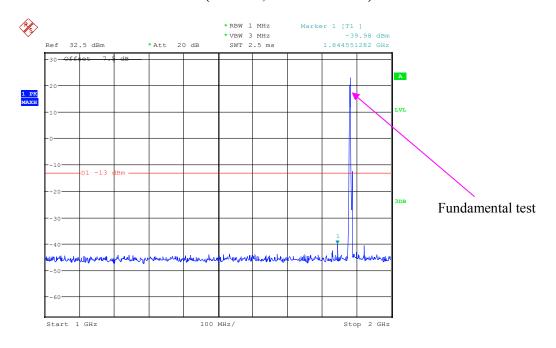


```
Date: 25.JAN.2019  13:02:05
```

LTE Band 2:

30 MHz - 1 GHz (1.4 MHz, Middle Channel)
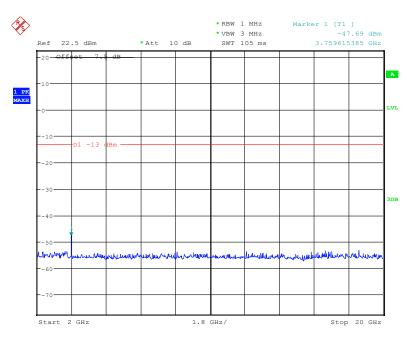
Date: 24.JAN.2019 20:42:50
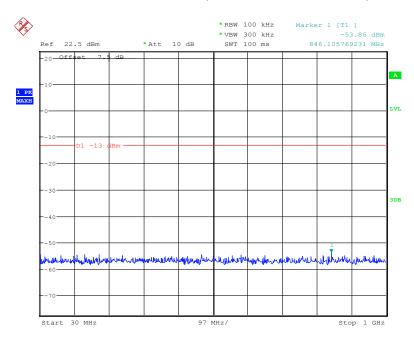
1 GHz – 2 GHz (1.4 MHz, Middle Channel)

Fundamental test

Date: 24.JAN.2019 20:39:46

2 GHz – 20 GHz (1.4 MHz, Middle Channel)

```
                                    *RBW 1 MHz        Marker 1 [T1 ]
                                    *VBW 3 MHz              -47.69 dBm
        Ref  22.5 dBm      *Att  10 dB    SWT 105 ms      3.759615385 GHz
       -20  Offset   7.5 dB                                              A

1 PK    -10
MAXH
         -0                                                             LVL

        --10
             D1 -13 dBm

        --20

        --30
                                                                        3DB
        --40

        --50

        --60

        --70

        Start  2 GHz              1.8 GHz/                Stop  20 GHz
```
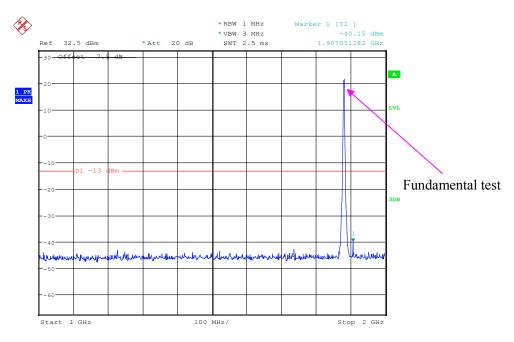
Date: 24.JAN.2019 20:31:15

30 MHz - 1 GHz (3.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz      Marker 1 [T1 ]
                                    *VBW 300 kHz            -53.86 dBm
        Ref  22.5 dBm      *Att  10 dB    SWT 100 ms      846.105769231 MHz
       -20  Offset   7.5 dB                                              A

1 PK    -10
MAXH
         -0                                                             LVL

        --10
             D1 -13 dBm

        --20

        --30
                                                                        3DB
        --40

        --50

        --60

        --70

        Start  30 MHz              97 MHz/                Stop  1 GHz
```

Date: 24.JAN.2019 20:43:16

1 GHz – 2 GHz (3.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz        Marker 1 [T1 ]
                                    *VBW 3 MHz              -40.15 dBm
        Ref  32.5 dBm      *Att  20 dB    SWT 2.5 ms      1.907051282 GHz
     -30  Offset  7.5 dB
                                                                          A
1 PK
MAXH  -20
                                                                         LVL
    -10

     0

    -10   D1 -13 dBm
                                                                         3DB
    -20

    -30

    -40                                             1

    -50

    -60

        Start  1 GHz           100 MHz/              Stop  2 GHz
```

Fundamental test
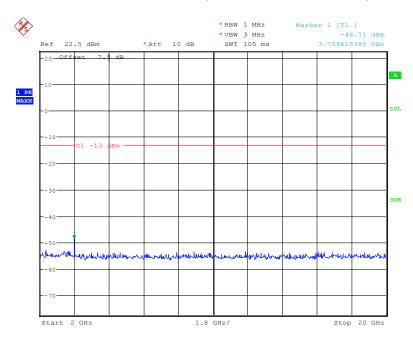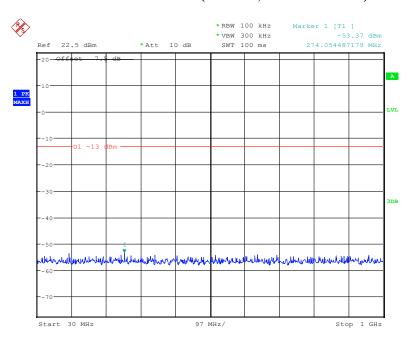
Date: 24.JAN.2019 20:39:20

2 GHz – 20 GHz (3.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz        Marker 1 [T1 ]
                                    *VBW 3 MHz              -48.71 dBm
        Ref  22.5 dBm      *Att  10 dB    SWT 105 ms      3.759615385 GHz
     -20  Offset  7.5 dB
                                                                          A
1 PK
MAXH  -10
                                                                         LVL
     0

    -10   D1 -13 dBm

    -20

    -30
                                                                         3DB
    -40

    -50

    -60

    -70

        Start  2 GHz           1.8 GHz/              Stop  20 GHz
```

Date: 24.JAN.2019 20:31:49

30 MHz - 1 GHz (5.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz          -53.37 dBm
         Ref  22.5 dBm     *Att  10 dB    SWT 100 ms   274.054487179 MHz
```
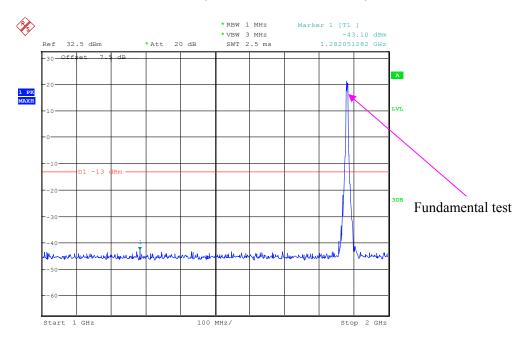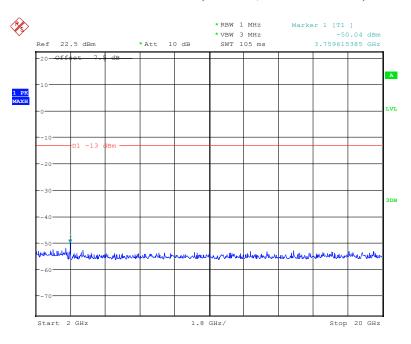
```
Date: 24.JAN.2019  20:43:30
```

1 GHz – 2 GHz (5.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz     Marker 1 [T1 ]
                                    *VBW 3 MHz           -43.10 dBm
         Ref  32.5 dBm     *Att  20 dB    SWT 2.5 ms   1.282051282 GHz
```

Fundamental test

```
Date: 24.JAN.2019  20:35:16
```

2 GHz – 20 GHz (5.0 MHz, Middle Channel)

	*RBW 1 MHz	Marker 1 [T1]
	*VBW 3 MHz	−50.04 dBm
Ref 22.5 dBm *Att 10 dB	SWT 105 ms	3.759615385 GHz

Offset 7.5 dB

D1 −13 dBm

1 PK MAXH

A
LVL
3DB

Start 2 GHz   1.8 GHz/   Stop 20 GHz
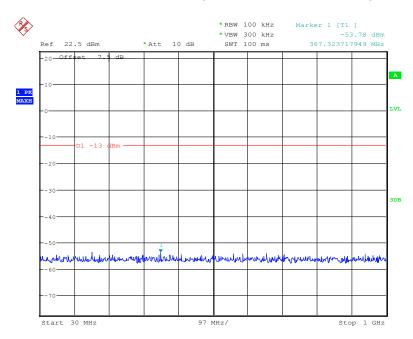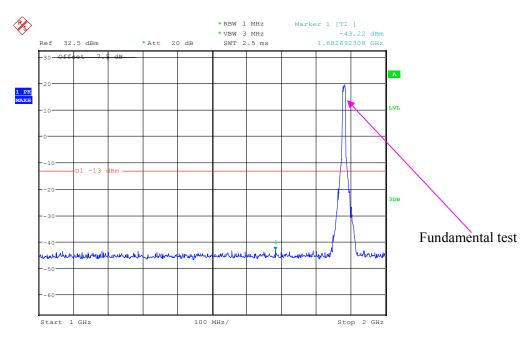
Date: 24.JAN.2019 20:32:03

30 MHz - 1 GHz (10.0 MHz, Middle Channel)

	*RBW 100 kHz	Marker 1 [T1]
	*VBW 300 kHz	−53.78 dBm
Ref 22.5 dBm *Att 10 dB	SWT 100 ms	367.323717949 MHz

Offset 7.5 dB

D1 −13 dBm

1 PK MAXH

A
LVL
3DB

Start 30 MHz   97 MHz/   Stop 1 GHz

Date: 24.JAN.2019 20:43:43

1 GHz – 2 GHz (10.0 MHz, Middle Channel)

Fundamental test
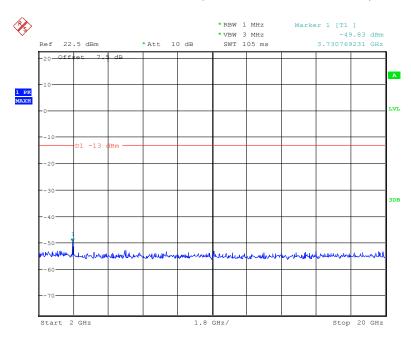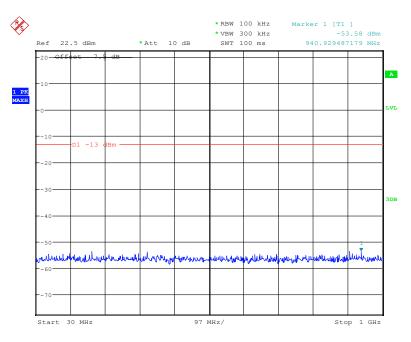
Date: 24.JAN.2019 20:34:47

2 GHz – 20 GHz (10.0 MHz, Middle Channel)

Date: 24.JAN.2019 20:32:16

30 MHz - 1 GHz (15.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz            -53.58 dBm
         Ref  22.5 dBm    *Att 10 dB   SWT 100 ms    940.929487179 MHz
```
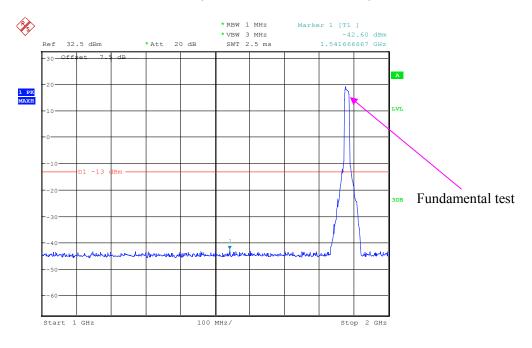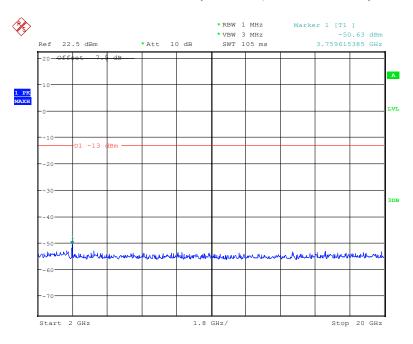
Date: 24.JAN.2019 20:43:57

1 GHz – 2 GHz (15.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz     Marker 1 [T1 ]
                                    *VBW 3 MHz             -42.60 dBm
         Ref  32.5 dBm    *Att 20 dB   SWT 2.5 ms    1.541666667 GHz
```

Fundamental test

Date: 24.JAN.2019 20:34:22

2 GHz – 20 GHz (15.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz        Marker 1 [T1 ]
                                    *VBW 3 MHz                -50.63 dBm
        Ref   22.5 dBm    *Att  10 dB   SWT 105 ms      3.759615385 GHz
```



```
        Start  2 GHz              1.8 GHz/              Stop  20 GHz
```
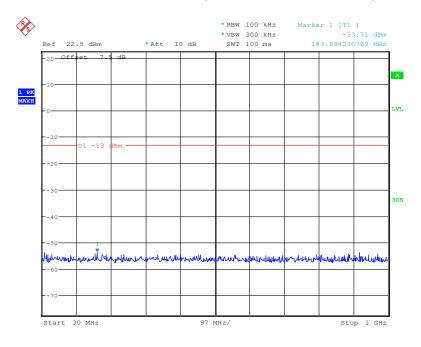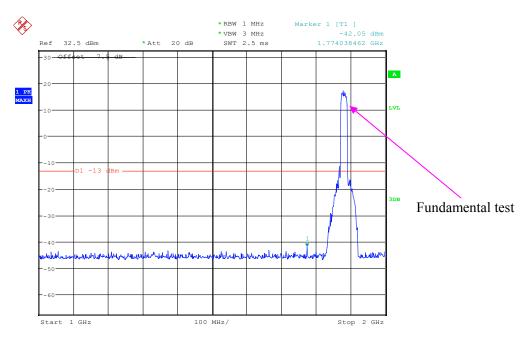
Date: 24.JAN.2019 20:32:29

30 MHz - 1 GHz (20.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz      Marker 1 [T1 ]
                                    *VBW 300 kHz               -53.71 dBm
        Ref   22.5 dBm    *Att  10 dB   SWT 100 ms      183.894230769 MHz
```



```
        Start  30 MHz             97 MHz/               Stop  1 GHz
```

Date: 24.JAN.2019 20:44:13

1 GHz – 2 GHz (20.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz        Marker 1 [T1 ]
                                    *VBW 3 MHz              -42.05 dBm
     Ref  32.5 dBm      *Att  20 dB  SWT 2.5 ms       1.774038462 GHz
```

Fundamental test
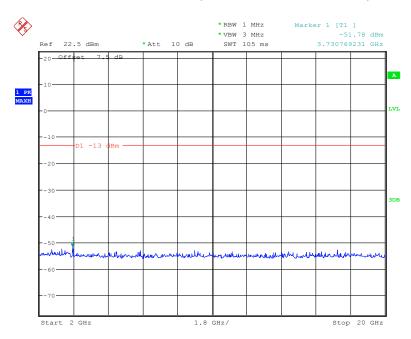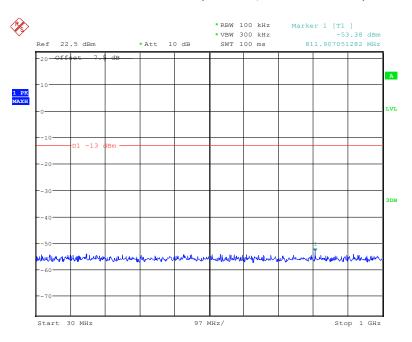
Date: 24.JAN.2019 20:33:24

2 GHz –20 GHz (20.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz        Marker 1 [T1 ]
                                    *VBW 3 MHz              -51.78 dBm
     Ref  22.5 dBm      *Att  10 dB  SWT 105 ms       3.730769231 GHz
```

Date: 24.JAN.2019 20:32:44
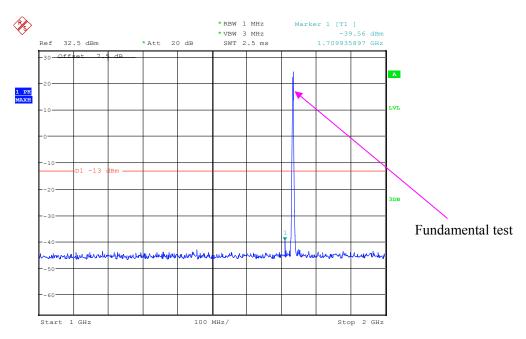
LTE Band 4:

30 MHz - 1 GHz (1.4 MHz, Middle Channel)

```
                                    *RBW 100 kHz      Marker 1 [T1 ]
                                    *VBW 300 kHz            -53.38 dBm
        Ref  22.5 dBm      *Att  10 dB    SWT 100 ms   811.907051282 MHz
```
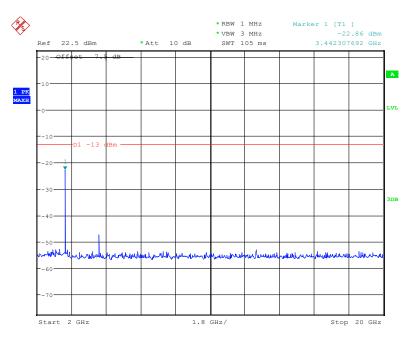
Date: 24.JAN.2019 20:22:54

1 GHz – 2 GHz (1.4 MHz, Middle Channel)

```
                                    *RBW 1 MHz        Marker 1 [T1 ]
                                    *VBW 3 MHz              -39.56 dBm
        Ref  32.5 dBm      *Att  20 dB    SWT 2.5 ms   1.709935897 GHz
```

Fundamental test

Date: 24.JAN.2019 20:28:24

2 GHz – 20 GHz (1.4 MHz, Middle Channel)

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz                -22.86 dBm
        Ref  22.5 dBm    *Att  10 dB   SWT 105 ms       3.442307692 GHz
    -20  Offset  7.5 dB                                              A

    -10

     0                                                             LVL

    -10
         D1 -13 dBm
    -20  1

    -30

    -40                                                            3DB

    -50

    -60

    -70

       Start 2 GHz          1.8 GHz/            Stop 20 GHz
```
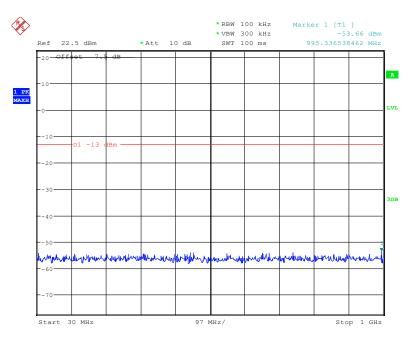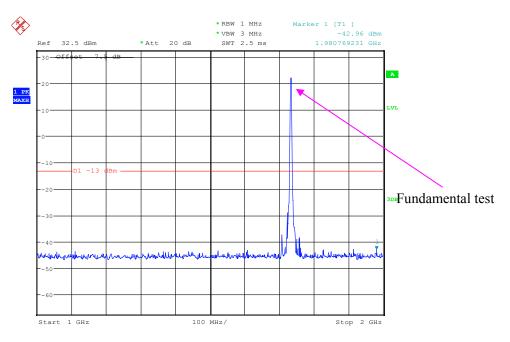
Date: 24.JAN.2019 20:28:43

30 MHz - 1 GHz (3.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz               -53.66 dBm
        Ref  22.5 dBm    *Att  10 dB   SWT 100 ms      995.336538462 MHz
    -20  Offset  7.5 dB                                              A

    -10

     0                                                             LVL

    -10
         D1 -13 dBm
    -20

    -30                                                            3DB

    -40

    -50

    -60

    -70

       Start 30 MHz          97 MHz/             Stop 1 GHz
```

Date: 24.JAN.2019 20:23:16

1 GHz – 2 GHz (3.0 MHz, Middle Channel)

Fundamental test
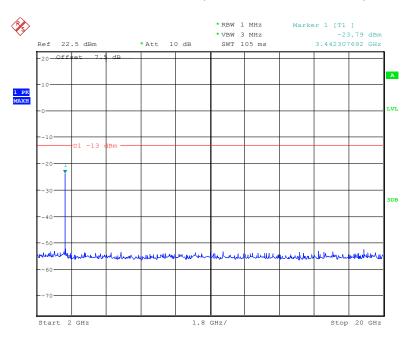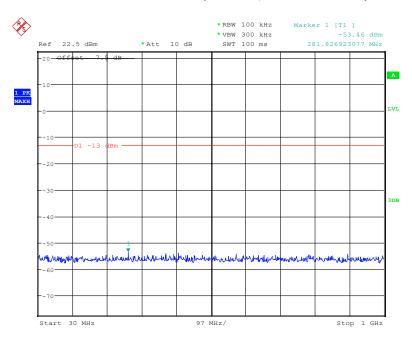
Date: 24.JAN.2019 20:27:08

2 GHz – 20 GHz (3.0 MHz, Middle Channel)

Date: 24.JAN.2019 20:28:56

30 MHz - 1 GHz (5.0 MHz, Middle Channel)

```
                              *RBW 100 kHz    Marker 1 [T1 ]
                              *VBW 300 kHz            -53.46 dBm
    Ref  22.5 dBm    *Att  10 dB    SWT 100 ms    281.826923077 MHz
  -20  Offset  7.5 dB                                              A

  --10

  --0                                                             LVL

  --10
      D1 -13 dBm

  --20

  --30                                                            3DB

  --40

  --50
                         1
  --60

  --70

    Start 30 MHz              97 MHz/              Stop  1 GHz
```
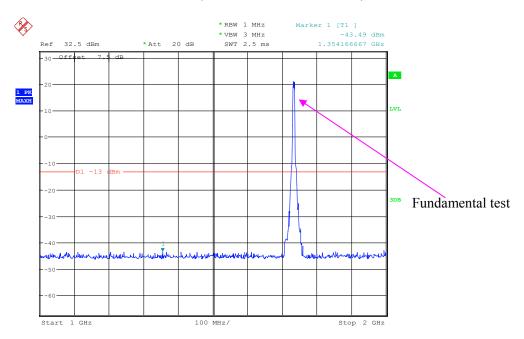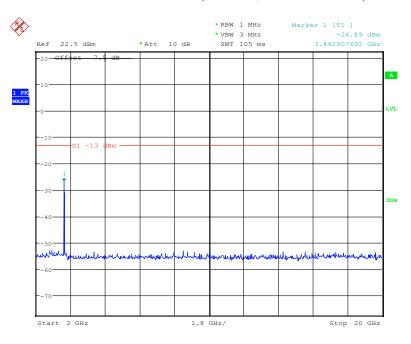
Date: 24.JAN.2019 20:23:32

1 GHz – 2 GHz (5.0 MHz, Middle Channel)

```
                              *RBW 1 MHz      Marker 1 [T1 ]
                              *VBW 3 MHz             -43.49 dBm
    Ref  32.5 dBm    *Att  20 dB    SWT 2.5 ms    1.354166667 GHz
  -30  Offset  7.5 dB                                              A

  --20

  --10                                                            LVL

  --0

  --10
      D1 -13 dBm

  --20                                                            3DB        Fundamental test

  --30

  --40
                         1
  --50

  --60

    Start 1 GHz              100 MHz/              Stop  2 GHz
```

Date: 24.JAN.2019 20:26:48

2 GHz – 20 GHz (5.0 MHz, Middle Channel)
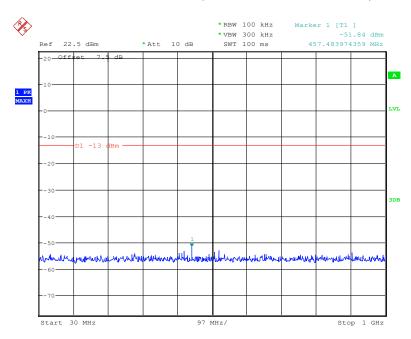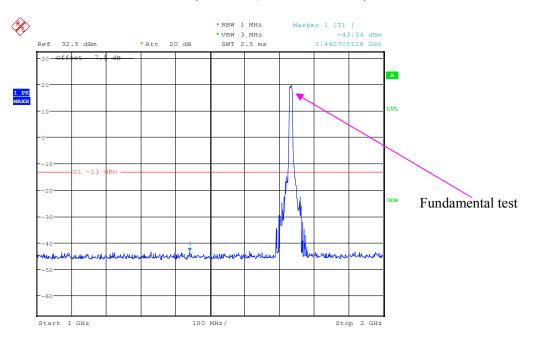
Date: 24.JAN.2019 20:29:09

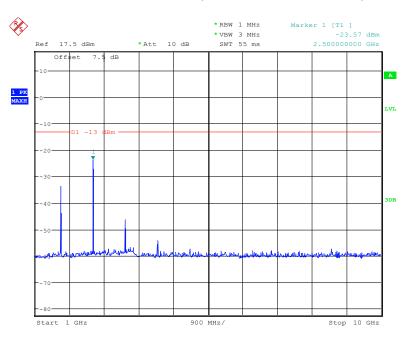## 30 MHz - 1 GHz (10.0 MHz, Middle Channel)

Date: 24.JAN.2019 20:23:47

1 GHz – 2 GHz (10.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz              -43.34 dBm
         Ref  32.5 dBm      *Att  20 dB    SWT 2.5 ms    1.440705128 GHz
```
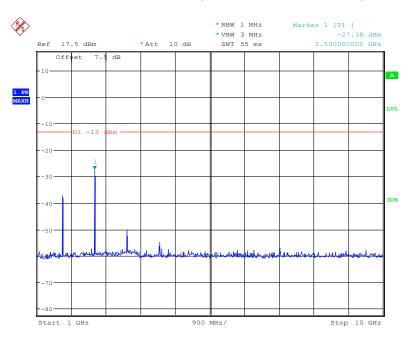
Fundamental test
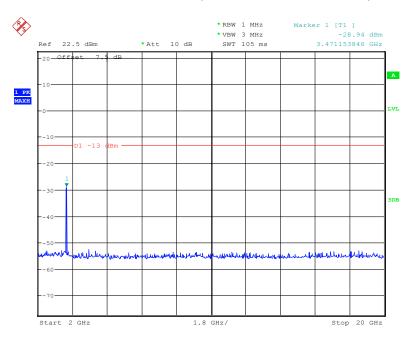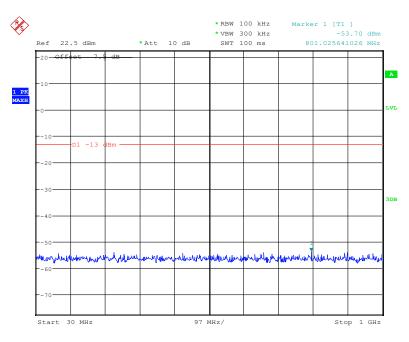
```
Date: 24.JAN.2019  20:25:36
```

2 GHz – 20 GHz (10.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz              -28.94 dBm
         Ref  22.5 dBm      *Att  10 dB    SWT 105 ms    3.471153846 GHz
```

```
Date: 24.JAN.2019  20:29:21
```

30 MHz - 1 GHz (15.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz           -53.70 dBm
        Ref  22.5 dBm    *Att  10 dB   SWT 100 ms     801.025641026 MHz
   -20  Offset  7.5 dB                                              A
1 PK
MAXH  -10                                                          LVL
      -0
      -10
         D1 -13 dBm
      -20
      -30                                                          3DB
      -40
      -50                                              1
      -60
      -70
      Start 30 MHz            97 MHz/            Stop  1 GHz
```
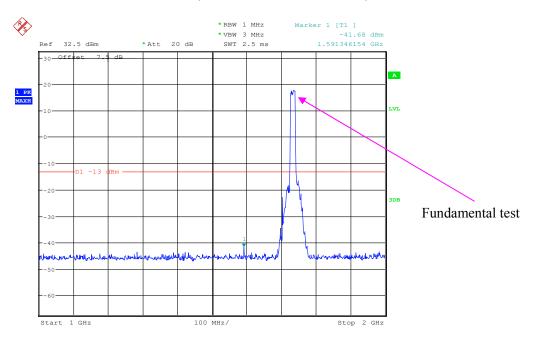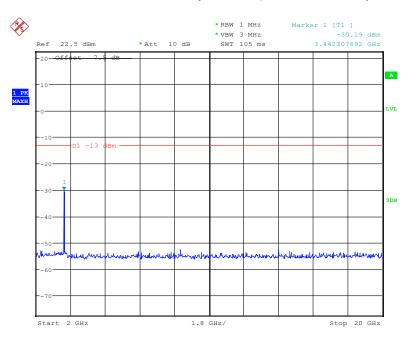
Date: 24.JAN.2019 20:24:00

1 GHz – 2 GHz (15.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz    Marker 1 [T1 ]
                                    *VBW 3 MHz           -41.68 dBm
        Ref  32.5 dBm    *Att  20 dB   SWT 2.5 ms     1.591346154 GHz
   -30  Offset  7.5 dB                                              A
1 PK
MAXH  -20                                                          LVL
      -10
      -0
      -10
         D1 -13 dBm
      -20
      -30                                                          3DB
      -40         1
      -50
      -60
      Start  1 GHz           100 MHz/           Stop  2 GHz
```

Fundamental test

Date: 24.JAN.2019 20:25:08

2 GHz – 20 GHz (15.0 MHz, Middle Channel)
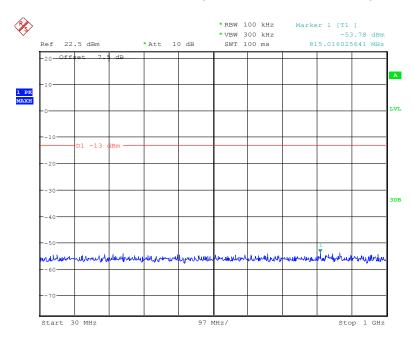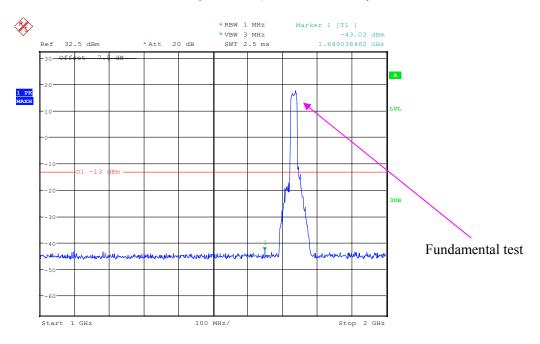
Date: 24.JAN.2019 20:29:36

30 MHz - 1 GHz (20.0 MHz, Middle Channel)

Date: 24.JAN.2019 20:24:14

1 GHz – 2 GHz (20.0 MHz, Middle Channel)

Fundamental test
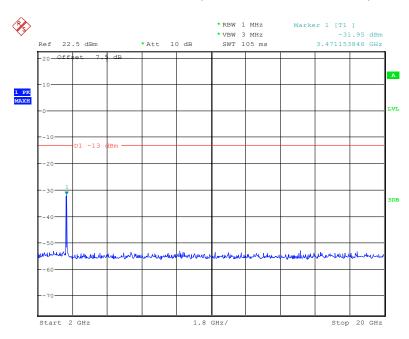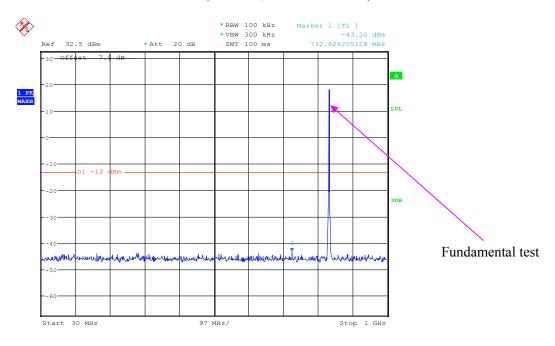
Date: 24.JAN.2019 20:24:51

2 GHz – 20 GHz (20.0 MHz, Middle Channel)

Date: 24.JAN.2019 20:29:49
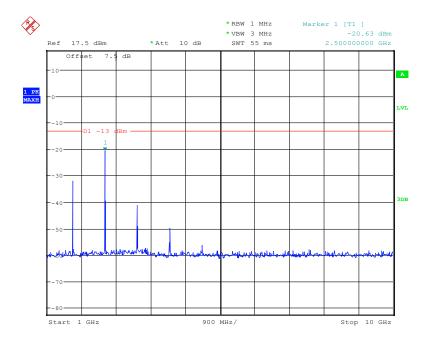
LTE Band 5:

30 MHz - 1 GHz (1.4 MHz, Middle Channel)

Fundamental test
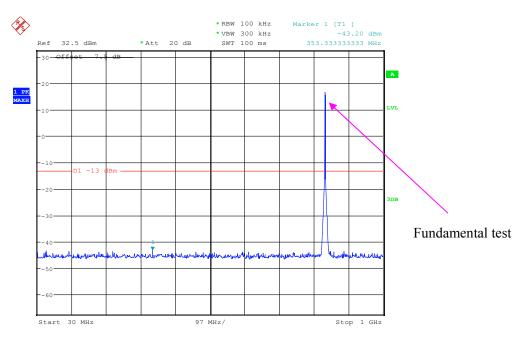
Date: 24.JAN.2019 20:19:29

1 GHz – 10 GHz (1.4 MHz, Middle Channel)

Date: 24.JAN.2019 20:18:49

30 MHz - 1 GHz (3.0 MHz, Middle Channel)

```
                                    * RBW 100 kHz    Marker 1 [T1 ]
                                    * VBW 300 kHz             -43.20 dBm
      Ref  32.5 dBm      * Att  20 dB    SWT 100 ms    353.333333333 MHz
```

Fundamental test
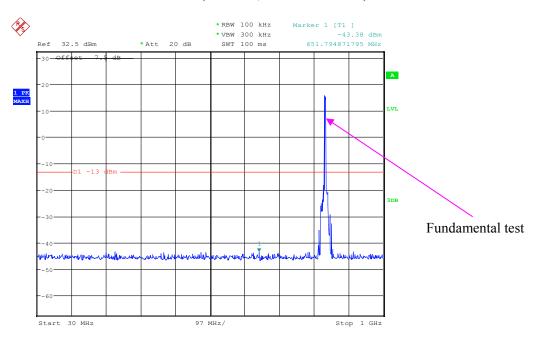
```
Date: 24.JAN.2019  20:20:03
```

1 GHz – 10 GHz (3.0 MHz, Middle Channel)

```
                                    * RBW 1 MHz     Marker 1 [T1 ]
                                    * VBW 3 MHz              -23.57 dBm
      Ref  17.5 dBm      * Att  10 dB    SWT 55 ms    2.500000000 GHz
```

```
Date: 24.JAN.2019  20:18:35
```

30 MHz - 1 GHz (5.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz              -43.38 dBm
         Ref  32.5 dBm    *Att  20 dB    SWT 100 ms      651.794871795 MHz
      -30  Offset  7.5 dB                                              A
 1 PK
 MAXH    -20                                                           LVL
         -10
          0
         -10
         D1 -13 dBm                                                   3DB
         -20
         -30
         -40                                               Fundamental test
         -50
         -60
         Start  30 MHz           97 MHz/              Stop  1 GHz
```
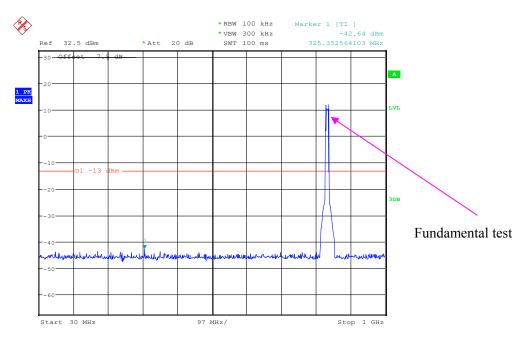
Date: 24.JAN.2019 20:20:43

1 GHz – 10 GHz (5.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz                -27.38 dBm
         Ref  17.5 dBm    *Att  10 dB    SWT 55 ms       2.500000000 GHz
          Offset  7.5 dB                                              A
 1 PK
 MAXH     10
          0                                                          LVL
         -10
         D1 -13 dBm
         -20
         -30          1
         -40
         -50                                                         3DB
         -70
         -80
         Start  1 GHz            900 MHz/             Stop  10 GHz
```

Date: 24.JAN.2019 20:18:22

30 MHz - 1 GHz (10.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz          -42.64 dBm
        Ref  32.5 dBm    *Att  20 dB    SWT 100 ms    325.352564103 MHz
```

Fundamental test
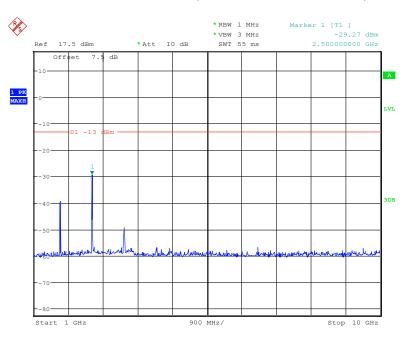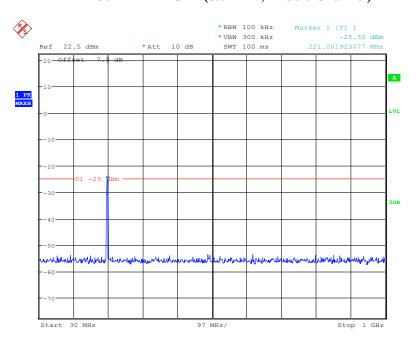
Date: 24.JAN.2019 20:21:25

1 GHz – 10 GHz (10.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz            -29.27 dBm
        Ref  17.5 dBm    *Att  10 dB    SWT 55 ms     2.500000000 GHz
```

Date: 24.JAN.2019 20:18:08
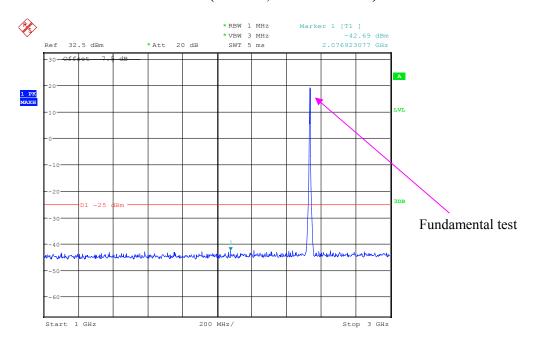
LTE Band 7:

30 MHz – 1 GHz (5.0 MHz, Middle Channel)
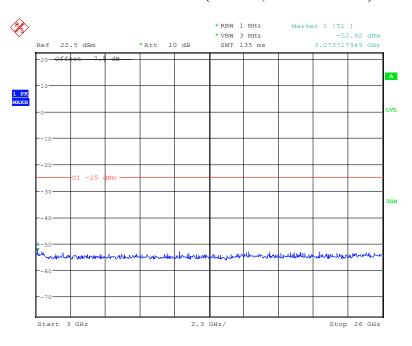
Date: 24.JAN.2019 20:08:08

1 GHz – 3.0 GHz (5.0 MHz, Middle Channel)

Fundamental test

Date: 24.JAN.2019 20:09:01
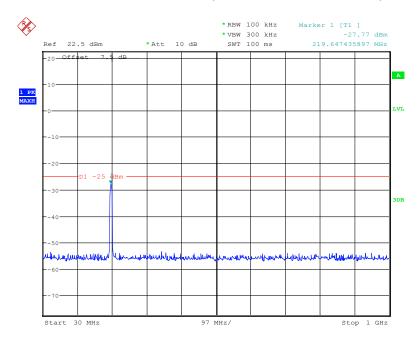
3.0 GHz – 26 GHz (5.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz                -52.92 dBm
        Ref  22.5 dBm    *Att  10 dB   SWT 135 ms    3.073717949 GHz
   -20  Offset  7.5 dB                                              A

   -10

 1 PK
 MAXH   -0                                                        LVL

   -10

   -20
        D1 -25 dBm
   -30                                                            3DB

   -40

   -50

   -60

   -70

        Start  3 GHz            2.3 GHz/            Stop  26 GHz
```
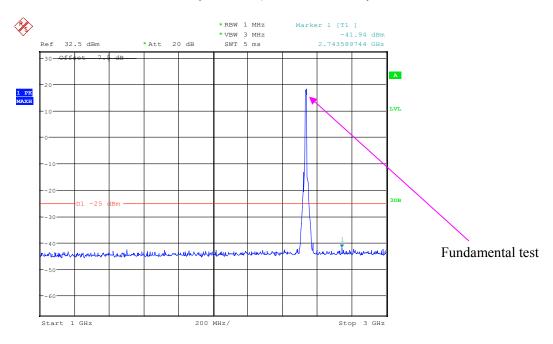
Date: 24.JAN.2019 20:13:26

30 MHz – 1.0 GHz (10.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz             -27.77 dBm
        Ref  22.5 dBm    *Att  10 dB   SWT 100 ms  219.647435897 MHz
   -20  Offset  7.5 dB                                              A

   -10

 1 PK
 MAXH   -0                                                        LVL

   -10

   -20
        D1 -25 dBm
   -30                                                            3DB

   -40

   -50

   -60

   -70

        Start  30 MHz           97 MHz/             Stop  1 GHz
```

Date: 24.JAN.2019 20:07:19
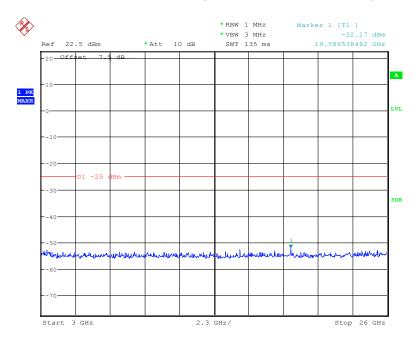
1 GHz – 3 GHz (10.0 MHz, Middle Channel)

Fundamental test
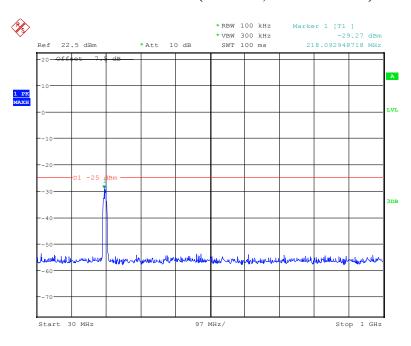
Date: 24.JAN.2019 20:10:05

3 GHz – 26 GHz (10.0 MHz, Middle Channel)

Date: 24.JAN.2019 20:13:05

30 MHz – 1 GHz (15.0 MHz, Middle Channel)

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz            -29.27 dBm
        Ref  22.5 dBm    *Att  10 dB   SWT 100 ms    218.092948718 MHz
     -20  Offset  7.5 dB
                                                              A

  1 PK  -10
  MAXH
                                                              LVL
      0


     -10


     -20
         D1 -25 dBm
     -30                                                      3DB

     -40


     -50

     -60

     -70

        Start  30 MHz            97 MHz/              Stop  1 GHz
```
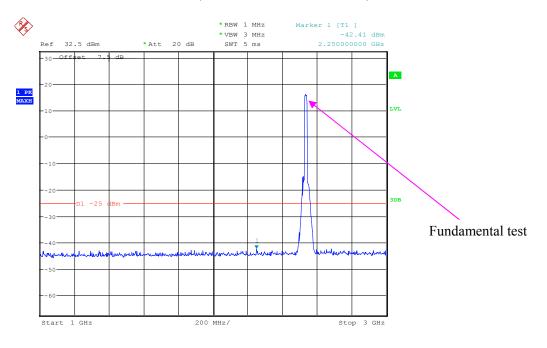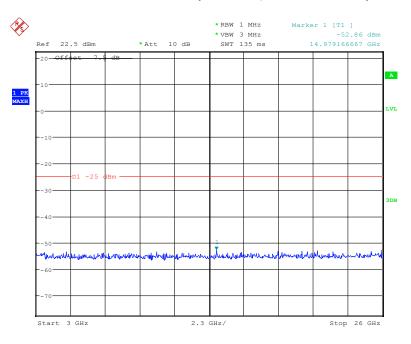
Date: 24.JAN.2019 20:06:58

1 GHz – 3 GHz (15.0 MHz, Middle Channel)

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz             -42.41 dBm
        Ref  32.5 dBm    *Att  20 dB   SWT 5 ms      2.250000000 GHz
     -30  Offset  7.5 dB
                                                              A

  1 PK  -20
  MAXH
                                                              LVL
     -10


      0


     -10


     -20
         D1 -25 dBm
     -30                                                      3DB

     -40
                              1

     -50

     -60

        Start  1 GHz            200 MHz/             Stop  3 GHz
```

Fundamental test

Date: 24.JAN.2019 20:11:07
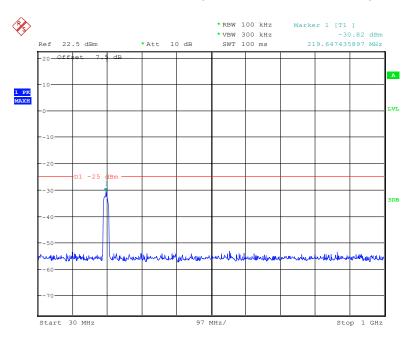
3 GHz – 26 GHz (15.0 MHz, Middle Channel)
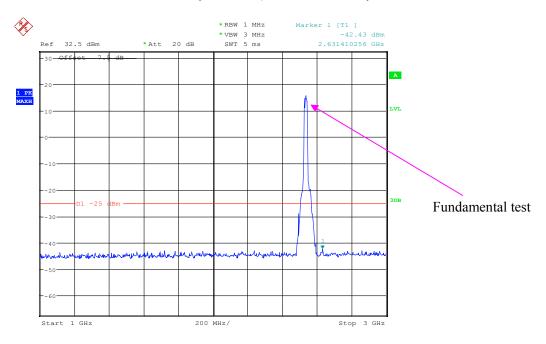
Date: 24.JAN.2019 20:12:47

30 MHz – 1 GHz (20.0 MHz, Middle Channel)

Date: 24.JAN.2019 20:06:25

1 GHz – 3 GHz (20.0 MHz, Middle Channel)

```
                                    *RBW  1 MHz        Marker 1 [T1 ]
                                    *VBW  3 MHz              -42.43 dBm
        Ref  32.5 dBm    *Att  20 dB   SWT 5 ms          2.631410256 GHz
    -30  Offset  7.5 dB                                              A
    -20
1 PK
MAXH -10                                                            LVL
     0
    -10
    -20
    D1 -25 dBm                                                      3DB
    -30
    -40                                                      1
    -50
    -60
        Start  1 GHz            200 MHz/              Stop  3 GHz
```

Fundamental test
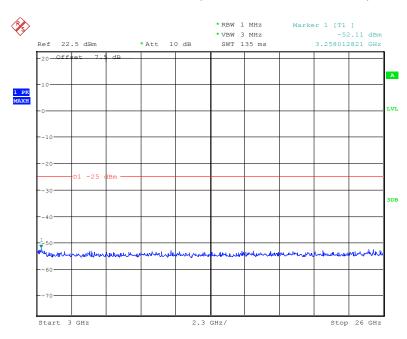
Date: 24.JAN.2019 20:11:34

3 GHz – 26 GHz (20.0 MHz, Middle Channel)

```
                                    *RBW  1 MHz        Marker 1 [T1 ]
                                    *VBW  3 MHz              -52.11 dBm
        Ref  22.5 dBm    *Att  10 dB   SWT 135 ms        3.258012821 GHz
    -20  Offset  7.5 dB                                              A
    -10
1 PK
MAXH  0                                                             LVL
    -10
    -20
    D1 -25 dBm
    -30                                                             3DB
    -40
    -50  1
    -60
    -70
        Start  3 GHz            2.3 GHz/              Stop  26 GHz
```

Date: 24.JAN.2019 20:12:09

FCC § 2.1053; § 22.917 (a);§ 24.238 (a); §27.53 (h)(m) SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 2.1053, §22.917(a) and § 24.238(a) and § 27.53(h)(m)

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the receiving antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2019-01-25.

EUT operation mode: Transmitting

Pre-scan with Low, Middle and High channel, the worst case as below:

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
263.18	31.75	137	2.0	H	-65.3	0.32	0	-65.62	-13	52.62
263.18	30.98	164	1.5	V	-66.0	0.32	0	-66.32	-13	53.32
1673.20	47.74	140	1.8	H	-59.3	1.30	8.90	-51.70	-13	38.70
1673.20	49.91	55	1.2	V	-56.6	1.30	8.90	-49.00	-13	36.00
2509.80	57.49	77	1.4	H	-46.0	2.60	10.20	-38.40	-13	25.40
2509.80	57.75	321	1.8	V	-45.2	2.60	10.20	-37.60	-13	24.60
3346.40	64.50	81	1.0	H	-35.8	1.50	11.70	-25.60	-13	12.60
3346.40	63.47	154	1.2	V	-36.9	1.50	11.70	-26.70	-13	13.70
WCDMA Mode, Middle channel										
263.18	32.05	3	1.9	H	-65.0	0.32	0	-65.32	-13	52.32
263.18	31.47	326	2.1	V	-65.5	0.32	0	-65.82	-13	52.82
1673.20	64.80	118	1.5	H	-42.3	1.30	8.90	-34.70	-13	21.70
1673.20	64.32	20	2.4	V	-42.2	1.30	8.90	-34.60	-13	21.60
2509.80	66.08	180	2.4	H	-37.4	2.60	10.20	-29.80	-13	16.80
2509.80	64.77	49	1.8	V	-38.1	2.60	10.20	-30.50	-13	17.50
3346.40	55.37	351	2.4	H	-45.0	1.50	11.70	-34.80	-13	21.80
3346.40	56.08	155	1.4	V	-44.3	1.50	11.70	-34.10	-13	21.10

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
263.18	32.18	188	2.3	H	-64.8	0.32	0	-65.12	-13	52.12
263.18	31.47	336	1.6	V	-65.5	0.32	0	-65.82	-13	52.82
3760.00	45.88	193	1.5	H	-55.3	1.50	11.80	-45.00	-13	32.00
3760.00	46.14	46	1.2	V	-54.6	1.50	11.80	-44.30	-13	31.30
WCDMA Mode Band II, Middle channel										
263.18	32.00	150	1.1	H	-65.0	0.32	0	-65.32	-13	52.32
263.18	31.26	171	1.1	V	-65.7	0.32	0	-66.02	-13	53.02
3760.00	44.13	28	2.1	H	-57.1	1.50	11.80	-46.80	-13	33.80
3760.00	44.32	239	2.3	V	-56.4	1.50	11.80	-46.10	-13	33.10

30 MHz ~ 20 GHz:

AWS Band (Part 27)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 27	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		Limit (dBm)	Margin (dB)
WCDMA Mode Band IV, Middle channel										
263.18	32.45	42	1.6	H	-64.6	0.32	0	-64.92	-13	51.92
263.18	31.18	180	1.6	V	-65.8	0.32	0	-66.12	-13	53.12
3465.20	65.35	303	2.3	H	-35.0	1.50	12.00	-24.50	-13	11.50
3465.20	64.46	7	2.2	V	-36.7	1.50	12.00	-26.20	-13	13.20

LTE Band: *(Pre-scan with all the bandwidth, and worse case as below)*

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
(MHz)	Reading (dBµV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)			
Band 2										
Test frequency range:30 MHz ~ 20 GHz										
263.18	32.67	72	1.1	H	-64.3	0.32	0	-64.62	-13	51.62
263.18	31.53	285	1.0	V	-65.5	0.32	0	-65.82	-13	52.82
3760.00	44.53	68	1.6	H	-56.7	1.50	11.80	-46.40	-13	33.40
3760.00	44.21	25	1.2	V	-56.5	1.50	11.80	-46.20	-13	33.20
Band 4										
Test frequency range:30 MHz ~ 18 GHz										
263.18	32.81	155	2.4	H	-64.2	0.32	0	-64.52	-13	51.52
263.18	31.74	132	1.4	V	-65.3	0.32	0	-65.62	-13	52.62
3465.00	55.09	357	2.1	H	-45.3	1.50	12.00	-34.80	-13	21.80
3465.00	53.60	102	1.6	V	-47.5	1.50	12.00	-37.00	-13	24.00
Band 5										
Test frequency range:30 MHz ~ 10 GHz										
263.18	32.16	188	1.8	H	-64.8	0.32	0	-65.12	-13	52.12
263.18	31.47	9	2.4	V	-65.5	0.32	0	-65.82	-13	52.82
1673.00	54.15	190	1.7	H	-52.9	1.30	8.90	-45.30	-13	32.30
1673.00	54.06	32	2.4	V	-52.4	1.30	8.90	-44.80	-13	31.80
2509.50	54.61	290	1.3	H	-48.9	2.60	10.20	-41.30	-13	28.30
2509.50	56.27	147	1.8	V	-46.6	2.60	10.20	-39.00	-13	26.00
3346.00	45.23	67	2.5	H	-55.1	1.50	11.70	-44.90	-13	31.90
3346.00	44.55	348	2.2	V	-55.8	1.50	11.70	-45.60	-13	32.60
Band 7										
Test frequency range:30 MHz ~ 26 GHz										
223.18	52.36	228	1.5	H	-44.6	0.32	0	-44.92	-25	19.92
223.18	51.02	110	2.4	V	-46.0	0.32	0	-46.32	-25	21.32
5070.00	44.32	354	2.2	H	-53.5	1.60	12.10	-43.00	-25	18.00
5070.00	44.06	103	1.6	V	-53.8	1.60	12.10	-43.30	-25	18.30

Note:
1) Absolute Level = Substituted Level - Cable loss + Antenna Gain
2) Margin = Limit- Absolute Level

FCC § 22.917 (a);§ 24.238 (a); §27.53 (h)(m) - BAND EDGES

Applicable Standard

According to § 22.917(a), the power of any emissions 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.
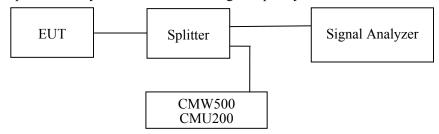
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC §27.53 (h)(m), 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.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency

```
┌──────────┐      ┌──────────┐      ┌──────────────────┐
│   EUT    │──────│ Splitter │──────│  Signal Analyzer │
└──────────┘      └────┬─────┘      └──────────────────┘
                       │
                  ┌────┴─────┐
                  │  CMW500  │
                  │  CMU200  │
                  └──────────┘
```

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2019-01-24 and 2019-01-25.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following plots.

Cellular Band, Left Band Edge for GSM (GMSK) Mode

```
                              *RBW  5 kHz      Marker 1 [T1 ]
                              *VBW  10 kHz              -14.81 dBm
        Ref  33.5 dBm         *Att  25 dB   SWT 80 ms   823.996794872 MHz
           Offset  3.5 dB
         -30                                                          A
1 RM  *                                                              LVL
MAXH
          10
          0
         -10
D1 -13 dBm
         -20                                                         3DB
         -30
         -40
         -50
         -60
       Center  824 MHz            200 kHz/              Span  2 MHz
```
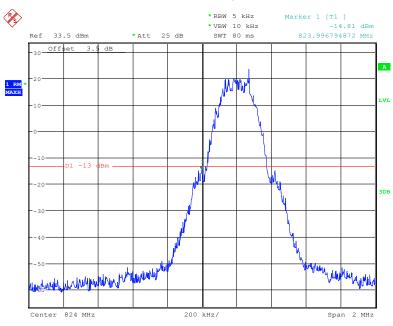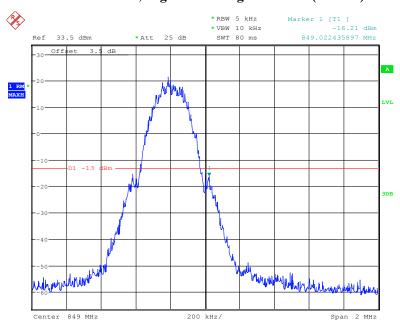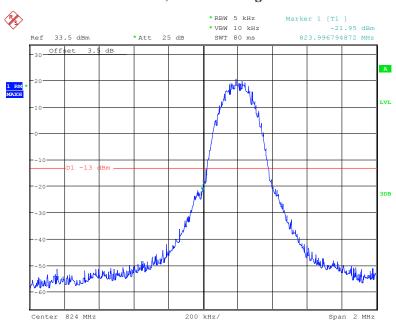
Date: 25.JAN.2019 08:27:14

Cellular Band, Right Band Edge for GSM (GMSK) Mode

```
                              *RBW  5 kHz      Marker 1 [T1 ]
                              *VBW  10 kHz              -16.21 dBm
        Ref  33.5 dBm         *Att  25 dB   SWT 80 ms   849.022435897 MHz
           Offset  3.5 dB
         -30                                                          A
1 RM  *                                                              LVL
MAXH
          10
          0
         -10
D1 -13 dBm                               1
         -20                                                         3DB
         -30
         -40
         -50
         -60
       Center  849 MHz            200 kHz/              Span  2 MHz
```
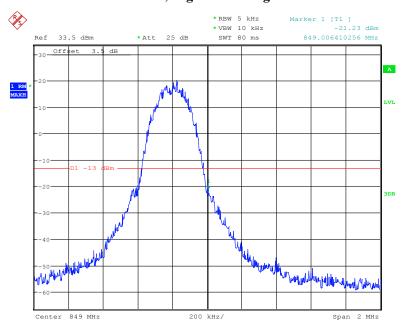
Date: 25.JAN.2019 08:28:16

Cellular Band, Left Band Edge for EDGE Mode
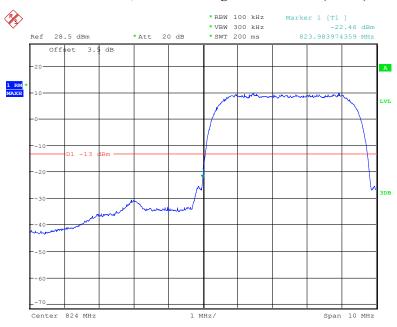
Date: 25.JAN.2019 08:50:51

Cellular Band, Right Band Edge for EDGE Mode
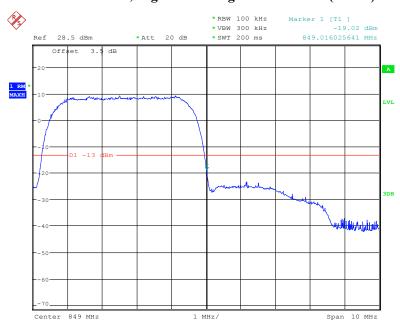
Date: 25.JAN.2019 08:51:36

Cellular Band, Left Band Edge for WCDMA (BPSK) Mode

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz            -22.46 dBm
        Ref  28.5 dBm    *Att  20 dB  *SWT 200 ms    823.983974359 MHz
           Offset  3.5 dB
```
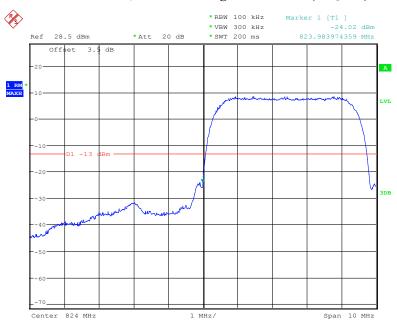
Date: 25.JAN.2019 13:24:29

Cellular Band, Right Band Edge for WCDMA (BPSK) Mode

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz            -19.02 dBm
        Ref  28.5 dBm    *Att  20 dB  *SWT 200 ms    849.016025641 MHz
           Offset  3.5 dB
```
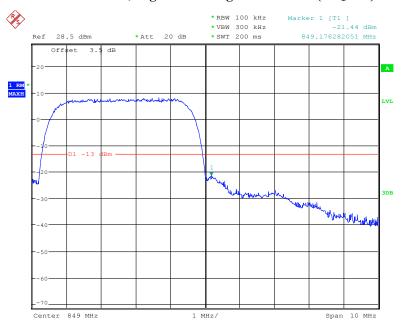
Date: 25.JAN.2019 13:23:54

Cellular Band, Left Band Edge for HSDPA (16QAM) Mode

```
                                    *RBW 100 kHz      Marker 1 [T1 ]
                                    *VBW 300 kHz               -24.02 dBm
    Ref  28.5 dBm      *Att  20 dB  *SWT 200 ms       823.983974359 MHz
         Offset  3.5 dB
```
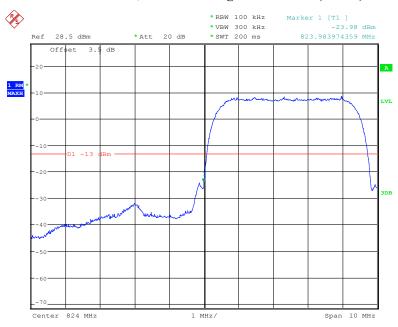
Date: 25.JAN.2019 13:22:05

Cellular Band, Right Band Edge for HSDPA (16QAM) Mode

```
                                    *RBW 100 kHz      Marker 1 [T1 ]
                                    *VBW 300 kHz               -21.44 dBm
    Ref  28.5 dBm      *Att  20 dB  *SWT 200 ms       849.176282051 MHz
         Offset  3.5 dB
```
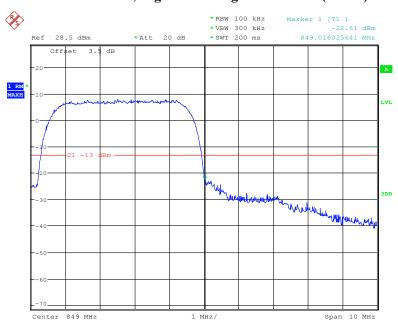
Date: 25.JAN.2019 13:22:49

Cellular Band, Left Band Edge for HSUPA (BPSK) Mode
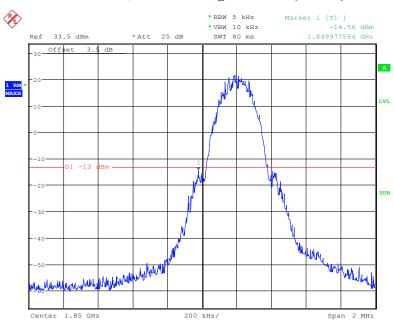
Date: 25.JAN.2019 13:16:41

Cellular Band, Right Band Edge for HSUPA (BPSK) Mode
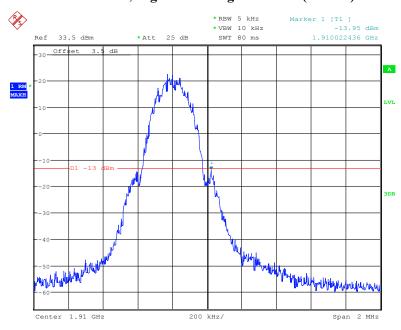
Date: 25.JAN.2019 13:15:53

PCS Band, Left Band Edge for GSM (GMSK) Mode
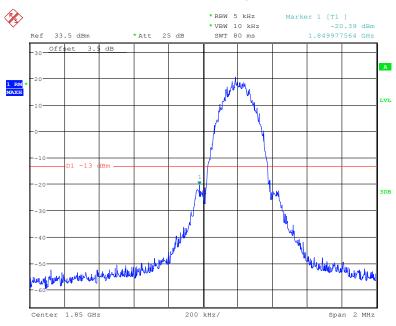
Date: 25.JAN.2019 09:39:39

PCS Band, Right Band Edge for GSM (GMSK) Mode
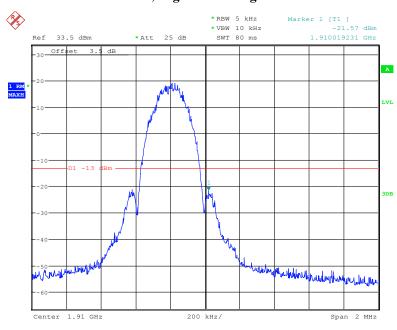
Date: 25.JAN.2019 09:38:39

PCS Band, Left Band Edge for EDGE Mode
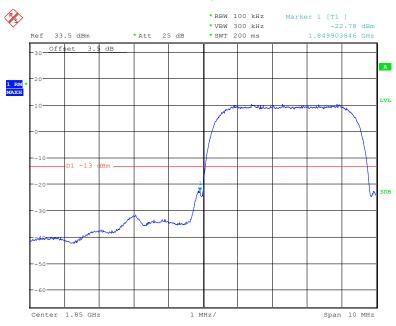
Date: 25.JAN.2019 09:47:37

PCS Band, Right Band Edge for EDGE Mode
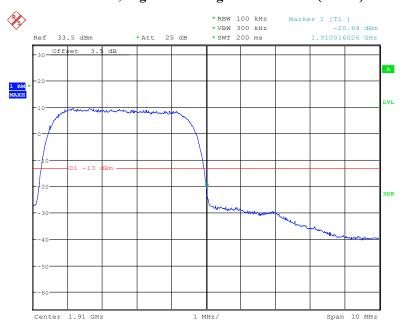
Date: 25.JAN.2019 09:46:41

PCS Band, Left Band Edge for WCDMA (BPSK) Mode
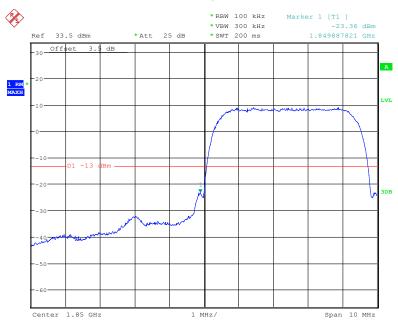
Date: 25.JAN.2019 10:52:32

PCS Band, Right Band Edge for WCDMA (BPSK) Mode
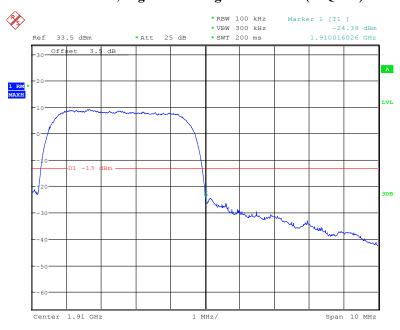
Date: 25.JAN.2019 10:51:59

PCS Band, Left Band Edge for HSDPA (16QAM) Mode

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz              -23.36 dBm
     Ref  33.5 dBm      *Att  25 dB  *SWT 200 ms        1.849887821 GHz
```

Date: 25.JAN.2019 12:21:00

PCS Band, Right Band Edge for HSDPA (16QAM) Mode

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz              -24.39 dBm
     Ref  33.5 dBm      *Att  25 dB  *SWT 200 ms        1.910016026 GHz
```
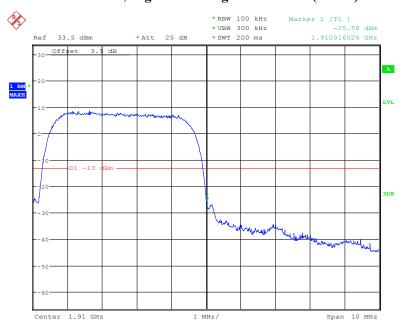
Date: 25.JAN.2019 12:31:27

PCS Band, Left Band Edge for HSUPA (BPSK) Mode
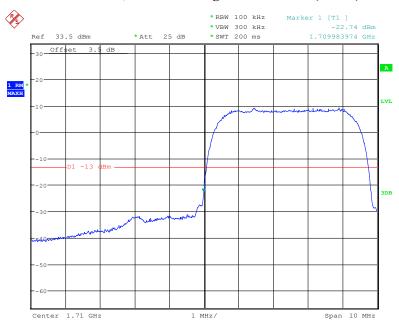
Date: 25.JAN.2019 12:49:29

PCS Band, Right Band Edge for HSUPA (BPSK) Mode
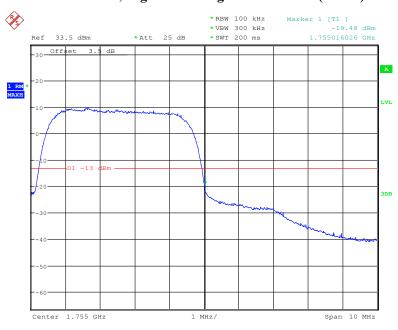
Date: 25.JAN.2019 12:50:11

AWS Band, Left Band Edge for WCDMA (BPSK) Mode
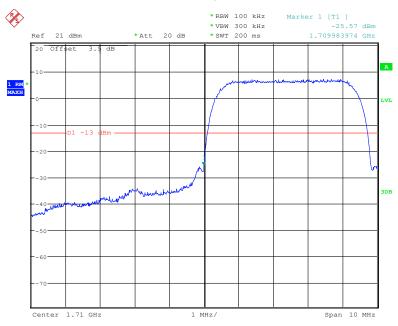
Date: 25.JAN.2019 12:53:41

AWS Band, Right Band Edge for WCDMA (BPSK) Mode
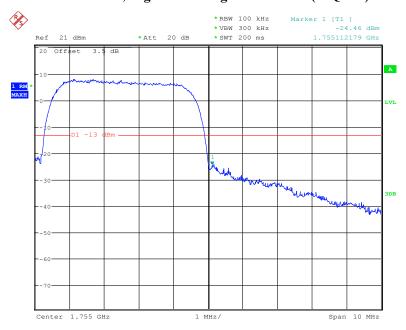
Date: 25.JAN.2019 12:52:54

AWS Band, Left Band Edge for HSDPA (16QAM) Mode

```
                              *RBW 100 kHz    Marker 1 [T1 ]
                              *VBW 300 kHz              -25.57 dBm
Ref  21 dBm        *Att  20 dB   *SWT 200 ms    1.709983974 GHz
```
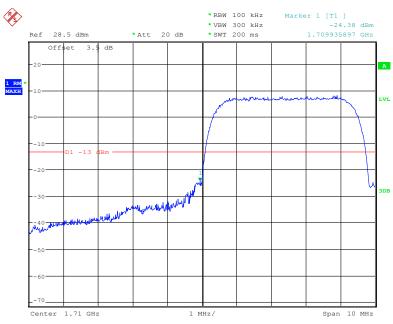


```
Date: 25.JAN.2019  13:06:18
```

AWS Band, Right Band Edge for HSDPA (16QAM) Mode

```
                              *RBW 100 kHz    Marker 1 [T1 ]
                              *VBW 300 kHz              -24.46 dBm
Ref  21 dBm        *Att  20 dB   *SWT 200 ms    1.755112179 GHz
```
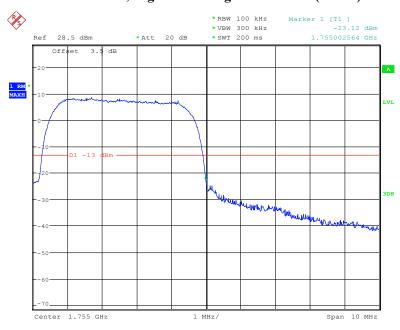


```
Date: 25.JAN.2019  13:07:11
```

AWS Band, Left Band Edge for HSUPA (BPSK) Mode

Date: 25.JAN.2019 13:12:46

AWS Band, Right Band Edge for HSUPA (BPSK) Mode
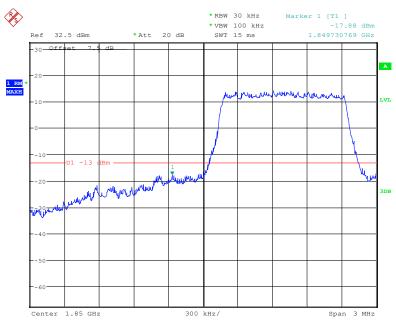
Date: 25.JAN.2019 13:14:19

Band 2:

QPSK (1.4 MHz, FULL RB) - Left Band Edge


```
                                    *RBW  30 kHz      Marker 1 [T1 ]
                                    *VBW  100 kHz              -17.88 dBm
      Ref   32.5 dBm      *Att  20 dB   SWT  15 ms     1.849730769 GHz
```
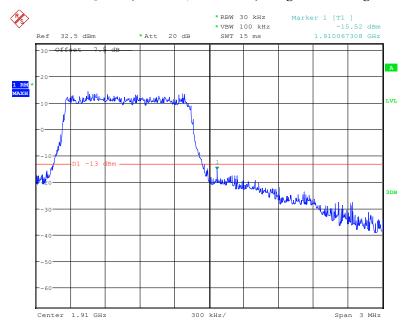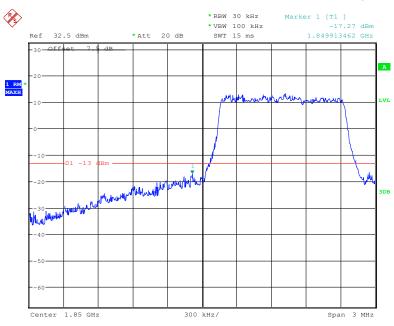
Date: 24.JAN.2019 20:57:28

QPSK (1.4 MHz, FULL RB) - Right Band Edge


```
                                    *RBW  30 kHz      Marker 1 [T1 ]
                                    *VBW  100 kHz              -15.52 dBm
      Ref   32.5 dBm      *Att  20 dB   SWT  15 ms     1.910067308 GHz
```
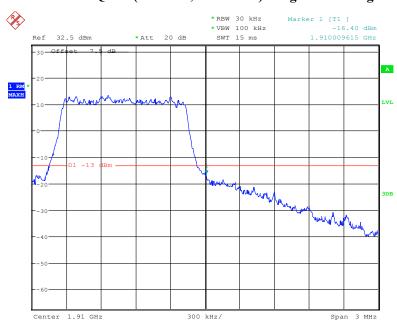
Date: 24.JAN.2019 20:59:05

16-QAM (1.4 MHz, FULL RB) - Left Band Edge

```
                                    *RBW  30 kHz       Marker 1 [T1 ]
                                    *VBW  100 kHz                    -17.27 dBm
        Ref   32.5 dBm    *Att  20 dB    SWT  15 ms             1.849913462 GHz
```
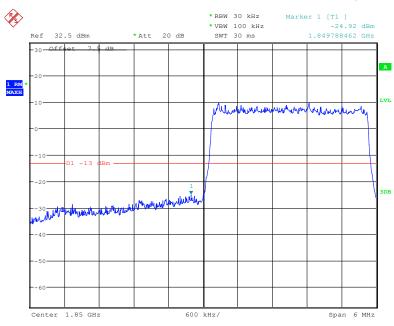


```
Date: 24.JAN.2019  20:49:47
```

16-QAM (1.4 MHz, FULL RB) - Right Band Edge

```
                                    *RBW  30 kHz       Marker 1 [T1 ]
                                    *VBW  100 kHz                    -16.40 dBm
        Ref   32.5 dBm    *Att  20 dB    SWT  15 ms             1.910009615 GHz
```
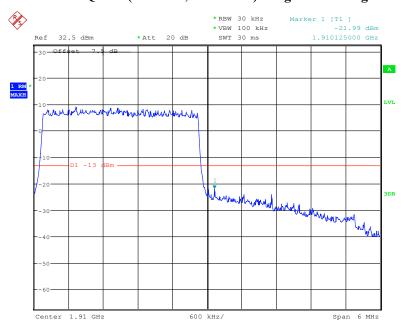


```
Date: 24.JAN.2019  21:00:20
```

QPSK (3.0 MHz, FULL RB) - Left Band Edge
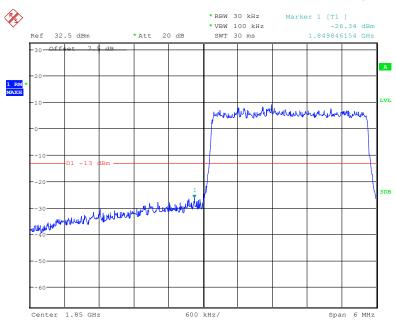
Date: 24.JAN.2019 21:03:51

## QPSK (3.0 MHz, FULL RB) - Right Band Edge
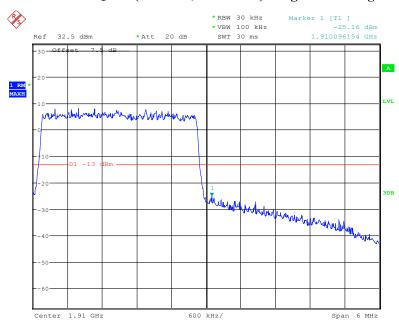
Date: 24.JAN.2019 21:03:07

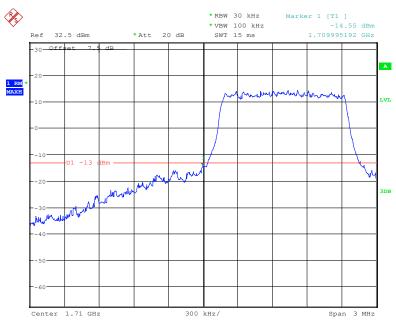## 16-QAM (3.0 MHz, FULL RB) - Left Band Edge
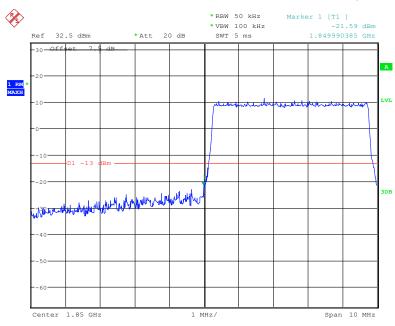
Date: 24.JAN.2019 21:04:32

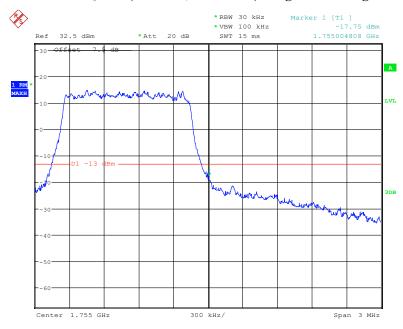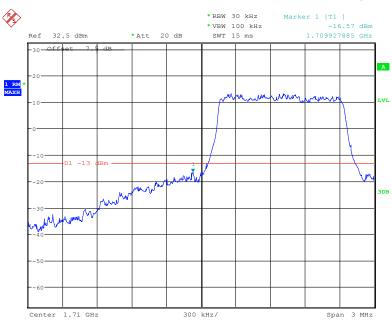## 16-QAM (3.0 MHz, FULL RB) - Right Band Edge
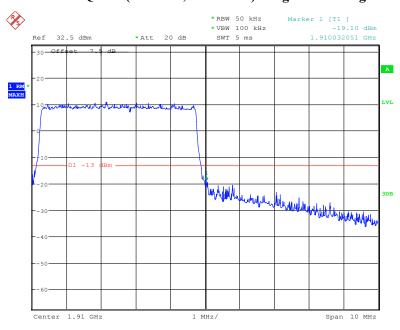
Date: 24.JAN.2019 21:01:49

QPSK (5.0 MHz, FULL RB) - Left Band Edge

		*RBW 50 kHz	Marker 1 [T1]
		*VBW 100 kHz	-21.59 dBm
Ref 32.5 dBm	*Att 20 dB	SWT 5 ms	1.849990385 GHz
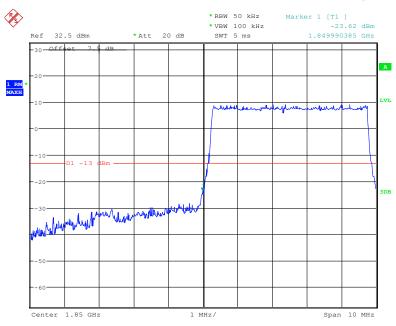
Date: 24.JAN.2019 21:05:34

QPSK (5.0 MHz, FULL RB) - Right Band Edge

|		*RBW 50 kHz	Marker 1 [T1]
		*VBW 100 kHz	-19.10 dBm
Ref 32.5 dBm	*Att 20 dB	SWT 5 ms	1.910032051 GHz
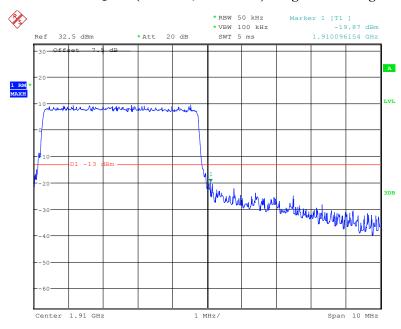
Date: 24.JAN.2019 21:09:51

16-QAM (5.0 MHz, FULL RB) - Left Band Edge
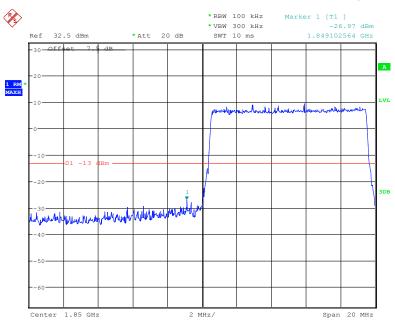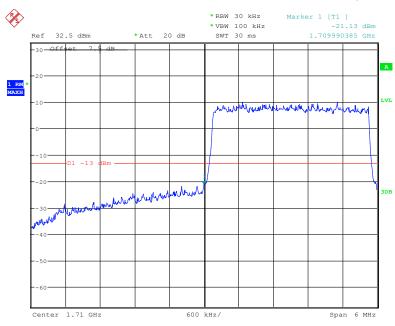

Date: 24.JAN.2019 21:07:09
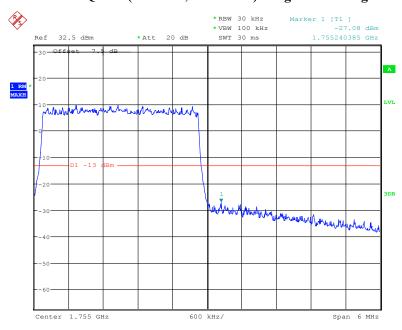
16-QAM (5.0 MHz, FULL RB) - Right Band Edge
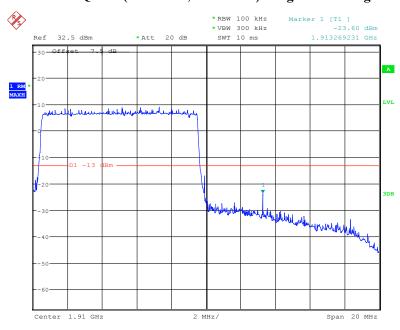
Date: 24.JAN.2019 21:08:08
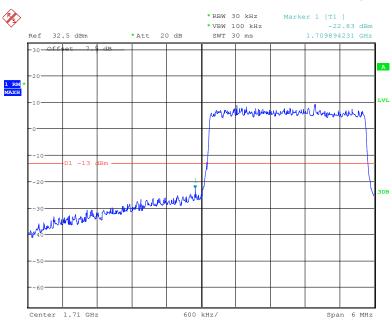
QPSK (10.0 MHz, FULL RB) - Left Band Edge

	*RBW 100 kHz	Marker 1 [T1]	
	*VBW 300 kHz	−26.97 dBm	
Ref 32.5 dBm	*Att 20 dB	SWT 10 ms	1.849102564 GHz

Offset 7.5 dB

D1 −13 dBm

Center 1.85 GHz   2 MHz/   Span 20 MHz
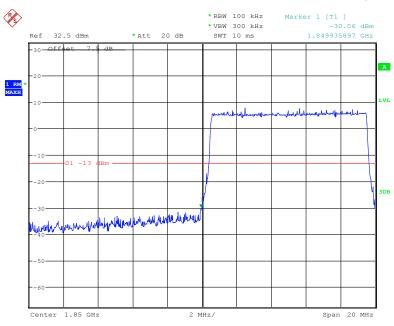
Date: 24.JAN.2019 21:28:42

QPSK (10.0 MHz, FULL RB) - Right Band Edge

	*RBW 100 kHz	Marker 1 [T1]	
	*VBW 300 kHz	−23.60 dBm	
Ref 32.5 dBm	*Att 20 dB	SWT 10 ms	1.913269231 GHz

Offset 7.5 dB

D1 −13 dBm

Center 1.91 GHz   2 MHz/   Span 20 MHz
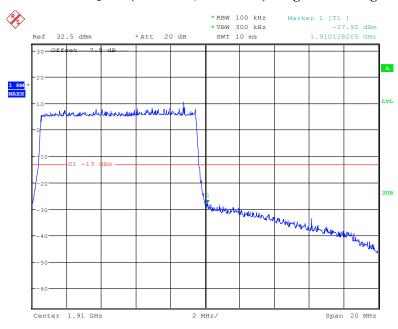
Date: 24.JAN.2019 21:27:32

16-QAM (10.0 MHz, FULL RB) - Left Band Edge

*RBW 100 kHz   Marker 1 [T1]
*VBW 300 kHz   -30.06 dBm
Ref 32.5 dBm   *Att 20 dB   SWT 10 ms   1.849935897 GHz

Offset 7.5 dB

1 RM *
MAXH

D1 -13 dBm

Center 1.85 GHz   2 MHz/   Span 20 MHz
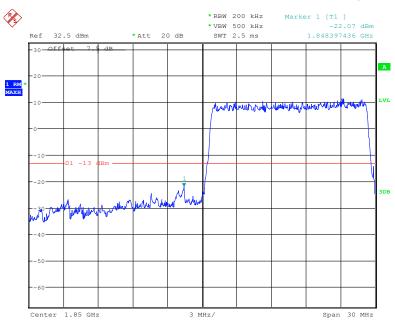
Date: 24.JAN.2019 21:29:09

16-QAM (10.0 MHz, FULL RB) - Right Band Edge

*RBW 100 kHz   Marker 1 [T1]
*VBW 300 kHz   -27.92 dBm
Ref 32.5 dBm   *Att 20 dB   SWT 10 ms   1.910128205 GHz

Offset 7.5 dB

1 RM *
MAXH

D1 -13 dBm

Center 1.91 GHz   2 MHz/   Span 20 MHz
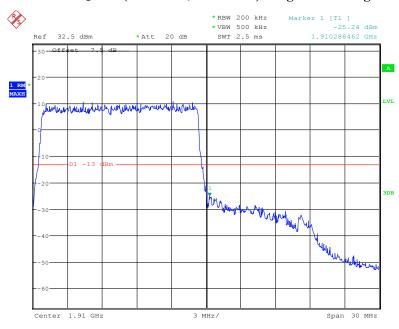
Date: 24.JAN.2019 21:26:50

QPSK (15.0 MHz, FULL RB) - Left Band Edge
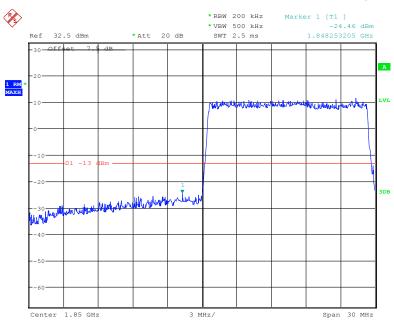
Date: 24.JAN.2019 21:32:04
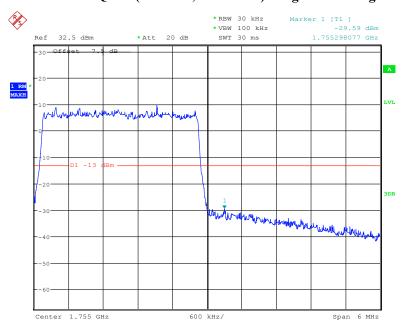
QPSK (15.0 MHz, FULL RB) - Right Band Edge
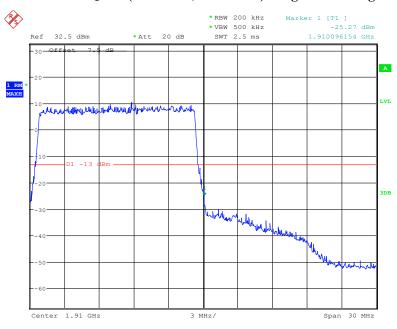
Date: 24.JAN.2019 21:34:32

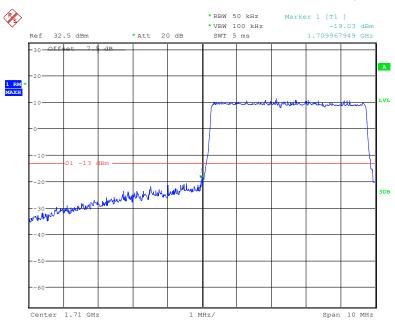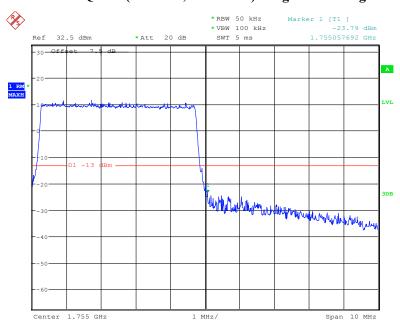## 16-QAM (15.0 MHz, FULL RB) - Left Band Edge
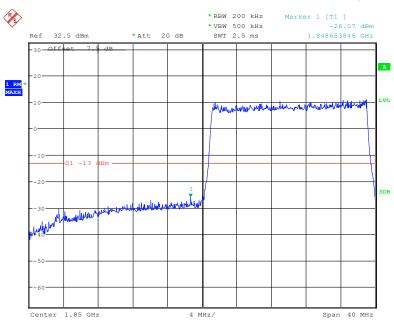
Date: 24.JAN.2019 21:31:24

16-QAM (15.0 MHz, FULL RB) - Right Band Edge
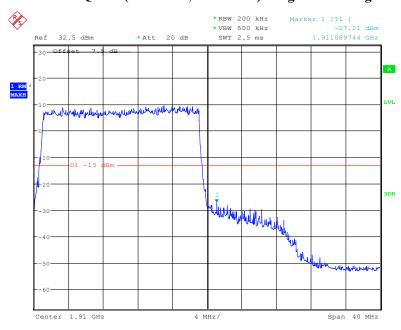
Date: 24.JAN.2019 21:35:22

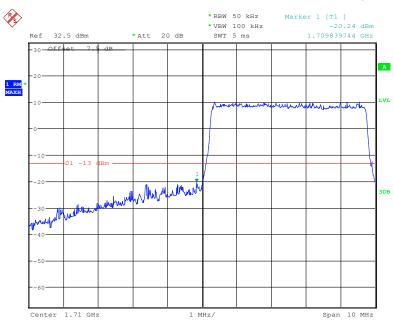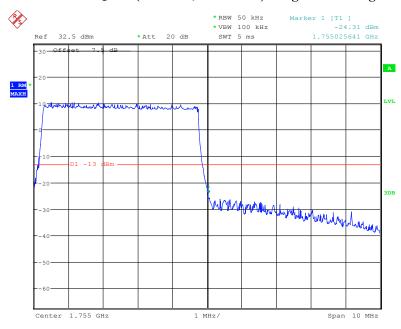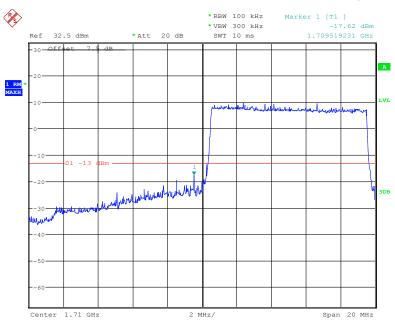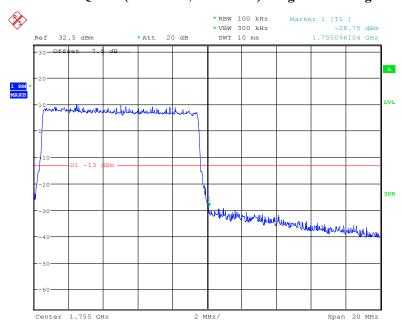## QPSK (20.0 MHz, FULL RB) - Left Band Edge
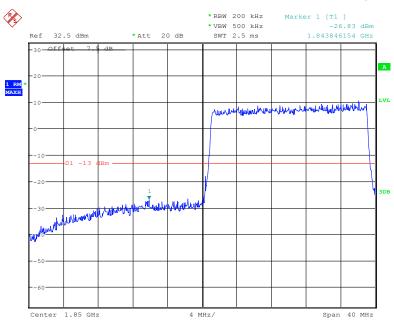
Date: 24.JAN.2019 21:43:29

QPSK (20.0 MHz, FULL RB) - Right Band Edge
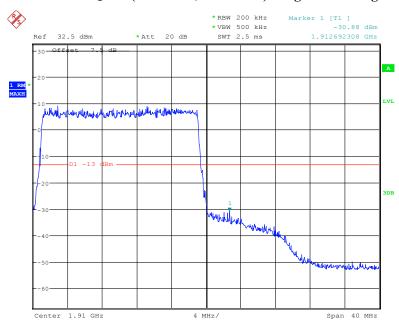
Date: 24.JAN.2019 21:44:15

16-QAM (20.0 MHz, FULL RB) - Left Band Edge

```
                                    *RBW 200 kHz      Marker 1 [T1 ]
                                    *VBW 500 kHz              -26.83 dBm
        Ref  32.5 dBm      *Att  20 dB   SWT 2.5 ms    1.843846154 GHz
```



```
Center  1.85 GHz              4 MHz/              Span 40 MHz
```

Date: 24.JAN.2019 21:37:54

16-QAM (20.0 MHz, FULL RB) - Right Band Edge

```
                                    *RBW 200 kHz      Marker 1 [T1 ]
                                    *VBW 500 kHz              -30.88 dBm
        Ref  32.5 dBm      *Att  20 dB   SWT 2.5 ms    1.912692308 GHz
```



```
Center  1.91 GHz              4 MHz/              Span 40 MHz
```

Date: 24.JAN.2019 21:45:06

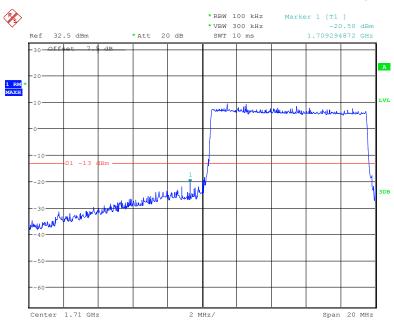**Band 4:**

QPSK (1.4 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 21:49:15

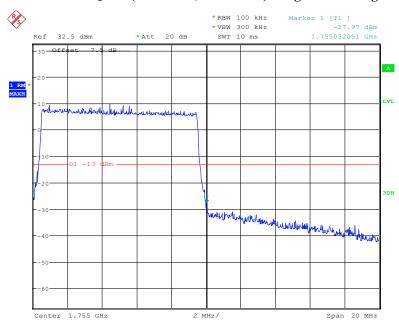## QPSK (1.4 MHz, FULL RB) - Right Band Edge
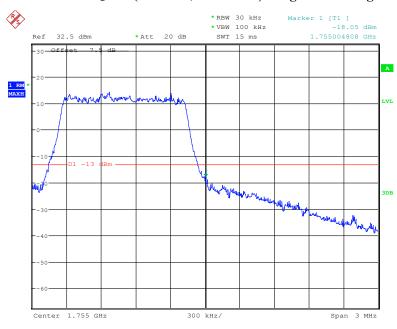
Date: 24.JAN.2019 21:55:07
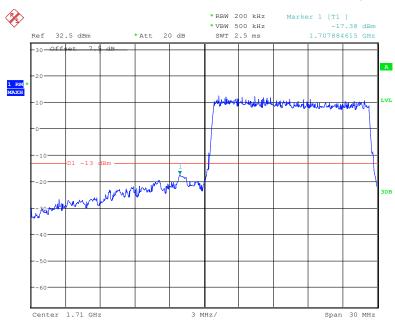
16-QAM (1.4 MHz, FULL RB) - Left Band Edge

```
                                    *RBW 30 kHz      Marker 1 [T1 ]
                                    *VBW 100 kHz              -16.57 dBm
         Ref  32.5 dBm    *Att  20 dB    SWT 15 ms         1.709927885 GHz
```

Date: 24.JAN.2019 21:51:11

16-QAM (1.4 MHz, FULL RB) - Right Band Edge

```
                                    *RBW 30 kHz      Marker 1 [T1 ]
                                    *VBW 100 kHz              -18.05 dBm
         Ref  32.5 dBm    *Att  20 dB    SWT 15 ms         1.755004808 GHz
```

Date: 24.JAN.2019 21:52:01

QPSK (3.0 MHz, FULL RB) - Left Band Edge

```
                                    *RBW  30 kHz      Marker 1 [T1 ]
                                    *VBW  100 kHz            -21.13 dBm
        Ref   32.5 dBm      *Att  20 dB    SWT  30 ms      1.709990385 GHz
```

Date: 24.JAN.2019 21:59:05

QPSK (3.0 MHz, FULL RB) - Right Band Edge

```
                                    *RBW  30 kHz      Marker 1 [T1 ]
                                    *VBW  100 kHz            -27.08 dBm
        Ref   32.5 dBm      *Att  20 dB    SWT  30 ms      1.755240385 GHz
```

Date: 24.JAN.2019 22:01:36

16-QAM (3.0 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 21:56:12
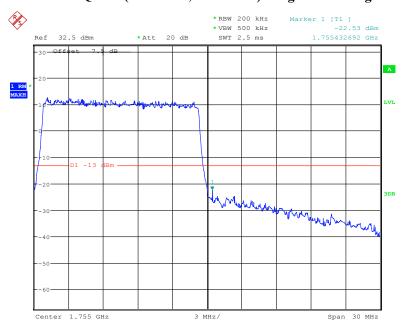
16-QAM (3.0 MHz, FULL RB) - Right Band Edge

Date: 24.JAN.2019 22:02:09

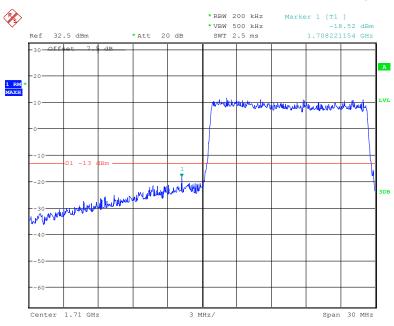## QPSK (5.0 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 22:07:56
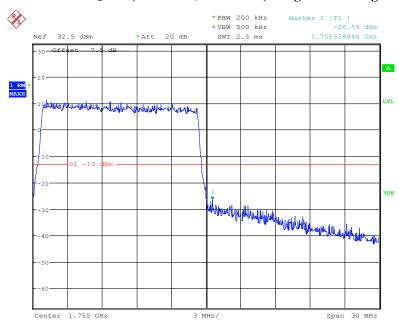
QPSK (5.0 MHz, FULL RB) - Right Band Edge

Date: 24.JAN.2019 22:03:33
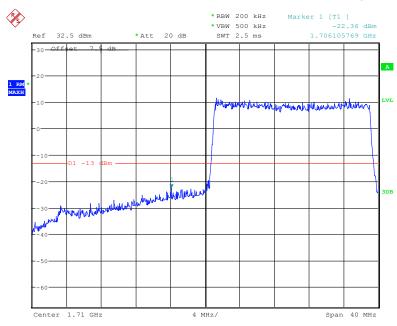
16-QAM (5.0 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 22:06:13

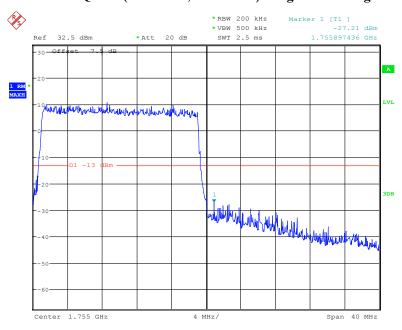## 16-QAM (5.0 MHz, FULL RB) - Right Band Edge

Date: 24.JAN.2019 22:04:44
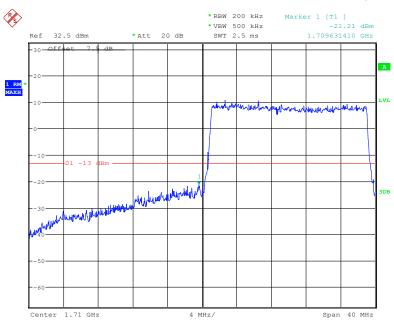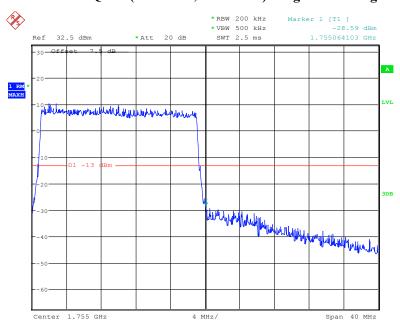
QPSK (10.0 MHz, FULL RB) - Left Band Edge

```
                                    *RBW  100 kHz      Marker 1 [T1 ]
                                    *VBW  300 kHz              -17.62 dBm
        Ref  32.5 dBm    *Att  20 dB  SWT  10 ms       1.709519231 GHz
```

Date: 24.JAN.2019 22:10:18

QPSK (10.0 MHz, FULL RB) - Right Band Edge

```
                                    *RBW  100 kHz      Marker 1 [T1 ]
                                    *VBW  300 kHz              -28.75 dBm
        Ref  32.5 dBm    *Att  20 dB  SWT  10 ms       1.755096154 GHz
```

Date: 24.JAN.2019 22:10:54

16-QAM (10.0 MHz, FULL RB) - Left Band Edge

```
                          *RBW 100 kHz     Marker 1 [T1 ]
                          *VBW 300 kHz           -20.50 dBm
       Ref  32.5 dBm      *Att  20 dB   SWT 10 ms      1.709294872 GHz
   -30  Offset  7.5 dB                                              A

   -20                                                             LVL
1 RM *
MAXH
   -10

    0

  -10
     D1 -13 dBm
  -20                              1
                                   ▽
  -30                                                              3DB

  -40

  -50

  -60

      Center  1.71 GHz           2 MHz/            Span  20 MHz
```

Date: 24.JAN.2019 22:09:35

16-QAM (10.0 MHz, FULL RB) - Right Band Edge

```
                          *RBW 100 kHz     Marker 1 [T1 ]
                          *VBW 300 kHz           -27.97 dBm
       Ref  32.5 dBm      *Att  20 dB   SWT 10 ms      1.755032051 GHz
   -30  Offset  7.5 dB                                              A

   -20                                                             LVL
1 RM *
MAXH
   -10

    0

  -10
     D1 -13 dBm
  -20
                                                                  3DB
  -30

  -40

  -50

  -60

      Center  1.755 GHz          2 MHz/            Span  20 MHz
```

Date: 24.JAN.2019 22:11:53

QPSK (15.0 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 22:15:55

QPSK (15.0 MHz, FULL RB) - Right Band Edge

Date: 24.JAN.2019 22:15:13

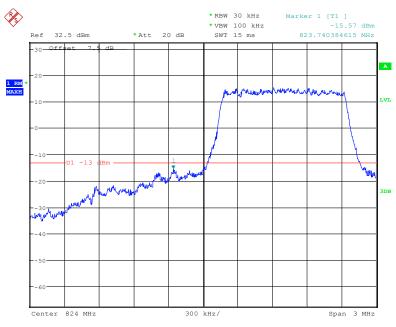## 16-QAM (15.0 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 22:16:57

16-QAM (15.0 MHz, FULL RB) - Right Band Edge

Date: 24.JAN.2019 22:12:56
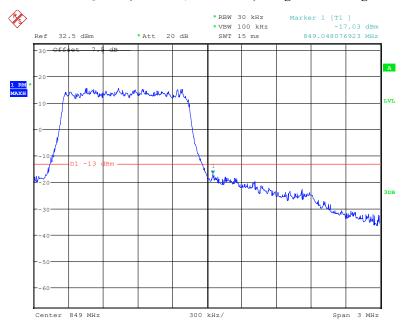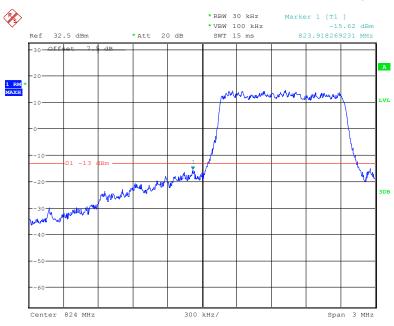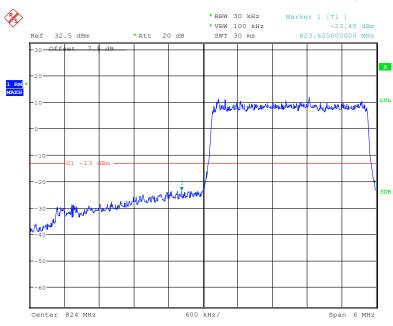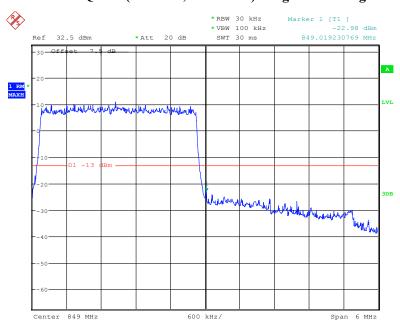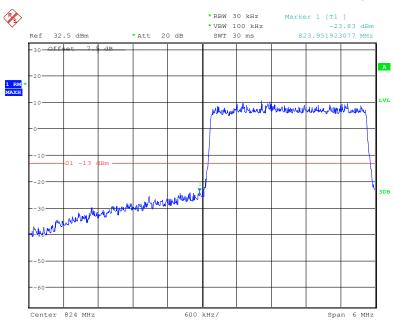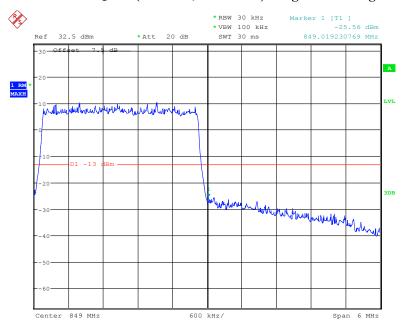
QPSK (20.0 MHz, FULL RB) - Left Band Edge

```
                              *RBW 200 kHz    Marker 1 [T1 ]
                              *VBW 500 kHz              -22.36 dBm
      Ref  32.5 dBm    *Att  20 dB    SWT 2.5 ms      1.706105769 GHz
```

Date: 24.JAN.2019 22:19:40

QPSK (20.0 MHz, FULL RB) - Right Band Edge

```
                              *RBW 200 kHz    Marker 1 [T1 ]
                              *VBW 500 kHz              -27.21 dBm
      Ref  32.5 dBm    *Att  20 dB    SWT 2.5 ms      1.755897436 GHz
```

Date: 24.JAN.2019 22:20:36

16-QAM (20.0 MHz, FULL RB) - Left Band Edge

```
                                          *RBW 200 kHz    Marker 1 [T1 ]
                                          *VBW 500 kHz         -21.21 dBm
        Ref  32.5 dBm      *Att  20 dB    SWT 2.5 ms      1.709631410 GHz
```



```
Date: 24.JAN.2019  22:18:33
```

16-QAM (20.0 MHz, FULL RB) - Right Band Edge

```
                                          *RBW 200 kHz    Marker 1 [T1 ]
                                          *VBW 500 kHz         -28.59 dBm
        Ref  32.5 dBm      *Att  20 dB    SWT 2.5 ms      1.755064103 GHz
```



```
Date: 24.JAN.2019  22:21:05
```

Band 5:

QPSK (1.4 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 22:23:39

QPSK (1.4 MHz, FULL RB) - Right Band Edge
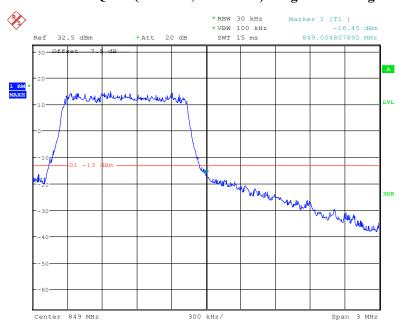
Date: 24.JAN.2019 22:26:45

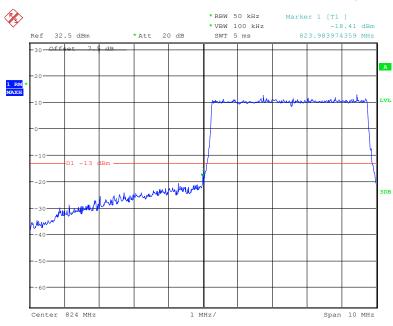## 16-QAM (1.4 MHz, FULL RB) - Left Band Edge

```
                                    *RBW 30 kHz        Marker 1 [T1 ]
                                    *VBW 100 kHz              -15.62 dBm
      Ref  32.5 dBm       *Att  20 dB   SWT 15 ms      823.918269231 MHz
```

Date: 24.JAN.2019 22:24:54

16-QAM (1.4 MHz, FULL RB) - Right Band Edge

```
                                    *RBW 30 kHz        Marker 1 [T1 ]
                                    *VBW 100 kHz              -16.45 dBm
      Ref  32.5 dBm       *Att  20 dB   SWT 15 ms      849.004807692 MHz
```

Date: 24.JAN.2019 22:25:43

QPSK (3.0 MHz, FULL RB) - Left Band Edge

```
                                    *RBW  30 kHz        Marker 1 [T1 ]
                                    *VBW  100 kHz              -23.45 dBm
        Ref   32.5 dBm   *Att  20 dB   SWT  30 ms        823.625000000 MHz
```



```
Date: 24.JAN.2019  22:30:38
```

QPSK (3.0 MHz, FULL RB) - Right Band Edge

```
                                    *RBW  30 kHz        Marker 1 [T1 ]
                                    *VBW  100 kHz              -22.98 dBm
        Ref   32.5 dBm   *Att  20 dB   SWT  30 ms        849.019230769 MHz
```



```
Date: 24.JAN.2019  22:29:19
```

16-QAM (3.0 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 22:31:40

16-QAM (3.0 MHz, FULL RB) - Right Band Edge
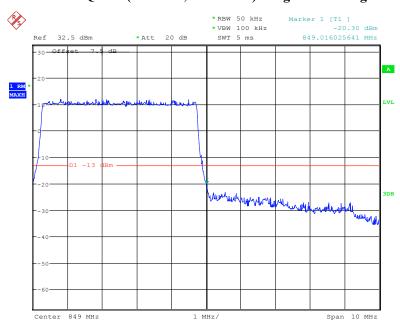
Date: 24.JAN.2019 22:28:29

QPSK (5.0 MHz, FULL RB) - Left Band Edge
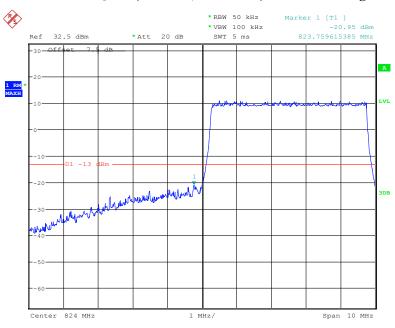
Date: 24.JAN.2019 22:32:41

QPSK (5.0 MHz, FULL RB) - Right Band Edge
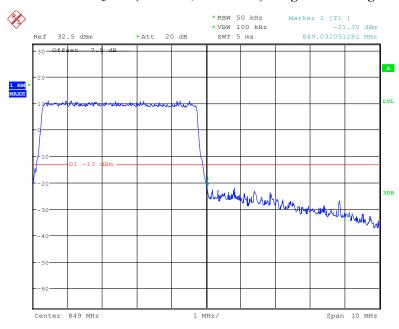
Date: 24.JAN.2019 22:35:06

16-QAM (5.0 MHz, FULL RB) - Left Band Edge
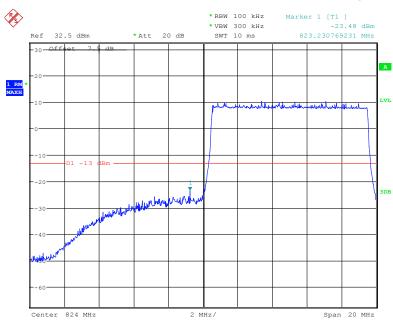
Date: 24.JAN.2019 22:33:25
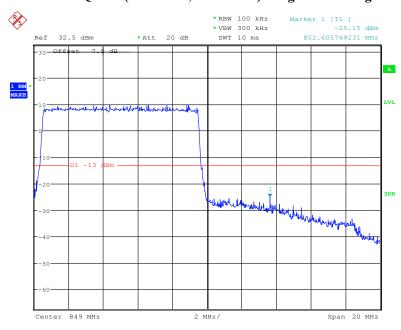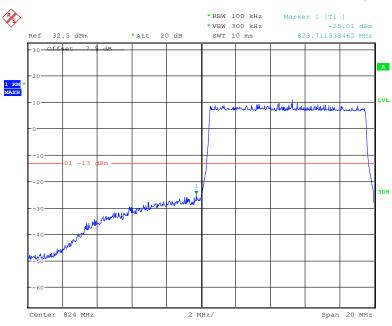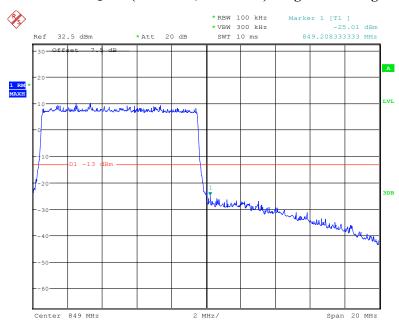
16-QAM (5.0 MHz, FULL RB) - Right Band Edge

Date: 24.JAN.2019 22:34:30

QPSK (10.0 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 22:39:24

QPSK (10.0 MHz, FULL RB) - Right Band Edge

Date: 24.JAN.2019 22:38:22

16-QAM (10.0 MHz, FULL RB) - Left Band Edge
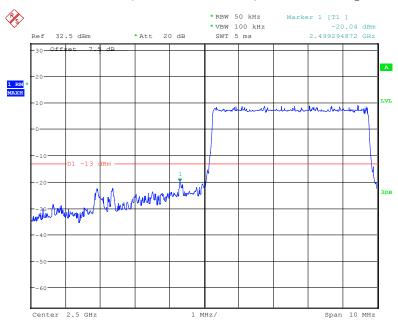

Date: 24.JAN.2019 22:40:48

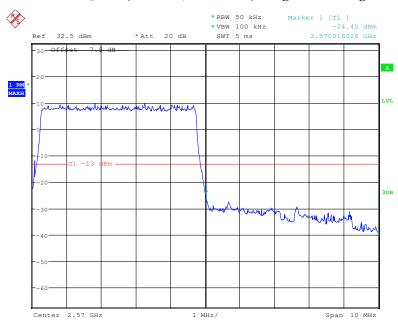## 16-QAM (10.0 MHz, FULL RB) - Right Band Edge
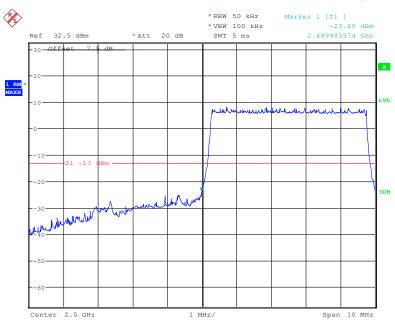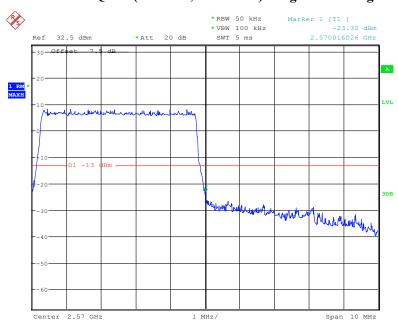

Date: 24.JAN.2019 22:37:26

Band 7:

QPSK (5.0 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 22:42:12

QPSK (5.0 MHz, FULL RB) - Right Band Edge

Date: 24.JAN.2019 22:46:18
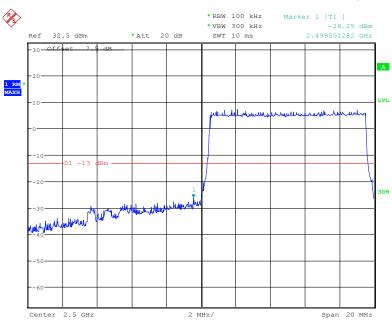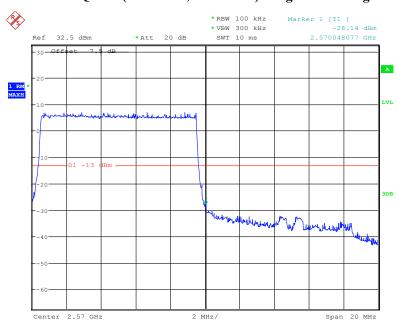
16-QAM (5.0 MHz, FULL RB) - Left Band Edge

```
                                    *RBW 50 kHz      Marker 1 [T1 ]
                                    *VBW 100 kHz              -23.60 dBm
      Ref  32.5 dBm       *Att  20 dB   SWT 5 ms     2.499983974 GHz
```

Date: 24.JAN.2019 22:43:36

16-QAM (5.0 MHz, FULL RB) - Right Band Edge

```
                                    *RBW 50 kHz      Marker 1 [T1 ]
                                    *VBW 100 kHz              -23.32 dBm
      Ref  32.5 dBm       *Att  20 dB   SWT 5 ms     2.570016026 GHz
```

Date: 24.JAN.2019 22:44:38

QPSK (10.0 MHz, FULL RB) - Left Band Edge

```
                                    *RBW  100 kHz      Marker 1 [T1 ]
                                    *VBW  300 kHz                -26.25 dBm
        Ref  32.5 dBm      *Att  20 dB    SWT 10 ms        2.499551282 GHz
```

Date: 24.JAN.2019 22:49:32

QPSK (10.0 MHz, FULL RB) - Right Band Edge

```
                                    *RBW  100 kHz      Marker 1 [T1 ]
                                    *VBW  300 kHz                -28.14 dBm
        Ref  32.5 dBm      *Att  20 dB    SWT 10 ms        2.570048077 GHz
```

Date: 24.JAN.2019 22:48:44

16-QAM (10.0 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 22:50:02

16-QAM (10.0 MHz, FULL RB) - Right Band Edge

Date: 24.JAN.2019 22:47:34

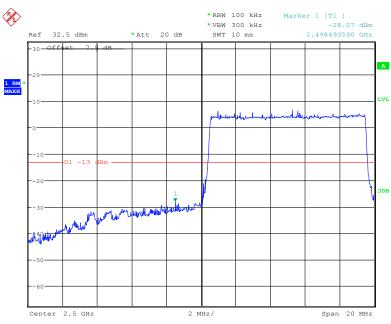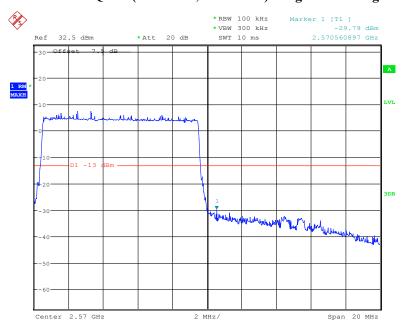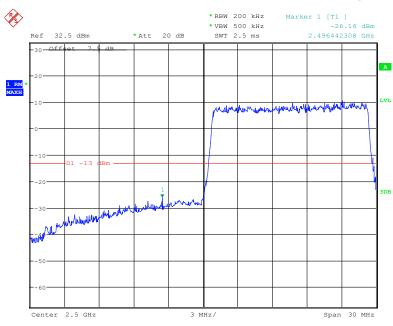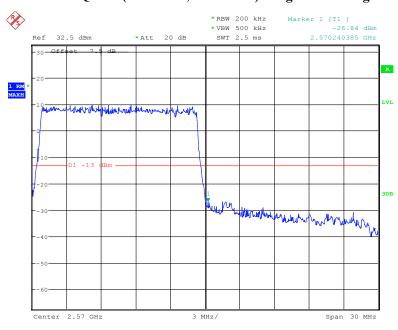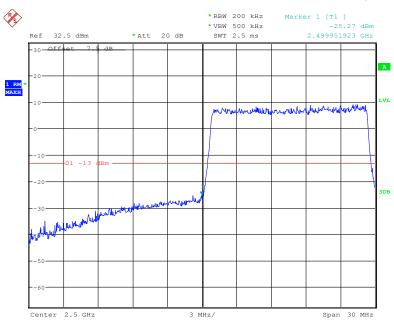## QPSK (15.0 MHz, FULL RB) - Left Band Edge

```
                                    *RBW 200 kHz     Marker 1 [T1 ]
                                    *VBW 500 kHz              -26.16 dBm
        Ref   32.5 dBm     *Att  20 dB   SWT 2.5 ms      2.496442308 GHz
```

Date: 24.JAN.2019 22:52:24

QPSK (15.0 MHz, FULL RB) - Right Band Edge

```
                                    *RBW 200 kHz     Marker 1 [T1 ]
                                    *VBW 500 kHz              -26.84 dBm
        Ref   32.5 dBm     *Att  20 dB   SWT 2.5 ms      2.570240385 GHz
```
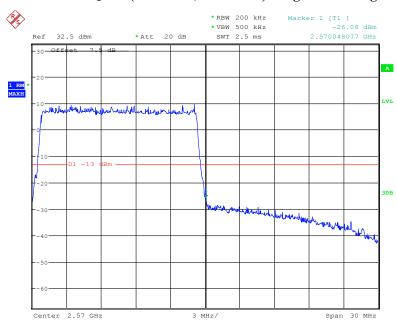
Date: 24.JAN.2019 22:53:18

16-QAM (15.0 MHz, FULL RB) - Left Band Edge

```
* RBW 200 kHz      Marker 1 [T1 ]
* VBW 500 kHz            -25.27 dBm
Ref  32.5 dBm      * Att  20 dB    SWT 2.5 ms         2.499951923 GHz
```



```
Center 2.5 GHz              3 MHz/              Span 30 MHz
```
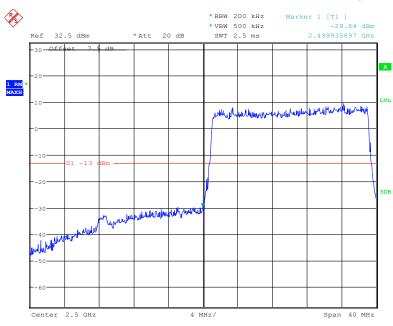
Date: 24.JAN.2019 22:51:46

16-QAM (15.0 MHz, FULL RB) - Right Band Edge

```
* RBW 200 kHz      Marker 1 [T1 ]
* VBW 500 kHz            -26.06 dBm
Ref  32.5 dBm      * Att  20 dB    SWT 2.5 ms         2.570048077 GHz
```



```
Center 2.57 GHz             3 MHz/              Span 30 MHz
```

Date: 24.JAN.2019 22:54:28

QPSK (20.0 MHz, FULL RB) - Left Band Edge

```
                              *RBW 200 kHz      Marker 1 [T1 ]
                              *VBW 500 kHz              -29.64 dBm
     Ref  32.5 dBm    *Att  20 dB   SWT 2.5 ms     2.499935897 GHz
```

Date: 24.JAN.2019 22:56:36

QPSK (20.0 MHz, FULL RB) - Right Band Edge

```
                              *RBW 200 kHz      Marker 1 [T1 ]
                              *VBW 500 kHz              -30.62 dBm
     Ref  32.5 dBm    *Att  20 dB   SWT 2.5 ms     2.570641026 GHz
```

Date: 24.JAN.2019 22:56:00

16-QAM (20.0 MHz, FULL RB) - Left Band Edge

Date: 24.JAN.2019 22:57:43
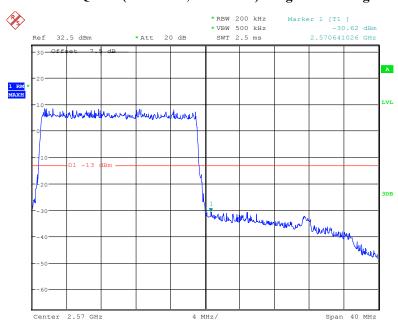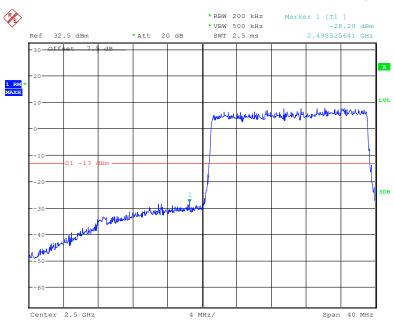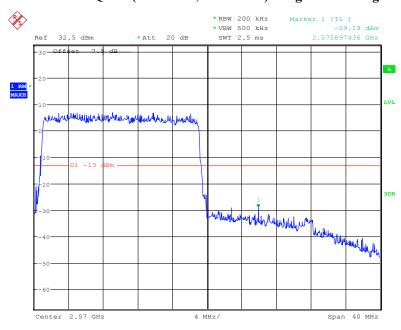
16-QAM (20.0 MHz, FULL RB) - Right Band Edge

Date: 24.JAN.2019 22:55:17

FCC § 2.1055; § 22.355; § 24.235; §27.54 - FREQUENCY STABILITY

Applicable Standard

FCC § 2.1055, §22.355, §24.235 and & §27.54.

According to FCC §2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

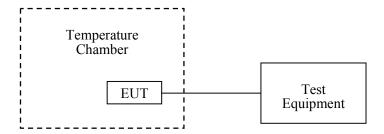| Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile > 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2019-01-25.

EUT operation mode: Transmitting

Test Result: Compliance. Please refer to the following tables.

Cellular Band (Part 22H)

GSM Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30		2	0.0024	2.5
-20		1	0.0012	2.5
-10		3	0.0036	2.5
0		1	0.0012	2.5
10	3.85	-2	-0.0024	2.5
20		2	0.0024	2.5
30		2	0.0024	2.5
40		1	0.0012	2.5
50		0	0.0000	2.5
20	V min.= 3.6	-1	-0.0012	2.5
	V max.= 4.35	3	0.0036	2.5

EDGE Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30		6	0.0072	2.5
-20		5	0.0060	2.5
-10		4	0.0048	2.5
0		4	0.0048	2.5
10	3.85	3	0.0036	2.5
20		5	0.0060	2.5
30		4	0.0048	2.5
40		5	0.0060	2.5
50		3	0.0036	2.5
20	V min.= 3.6	6	0.0072	2.5
	V max.= 4.35	4	0.0048	2.5

WCDMA Mode

Middle Channel, f_o =836.6MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.85	-8	-0.0096	2.5
-20		-9	-0.0108	2.5
-10		-10	-0.0120	2.5
0		-9	-0.0108	2.5
10		-8	-0.0096	2.5
20		-9	-0.0108	2.5
30		-9	-0.0108	2.5
40		-7	-0.0084	2.5
50		-8	-0.0096	2.5
20	V min.= 3.6	-7	-0.0084	2.5
	V max.= 4.35	-8	-0.0096	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.85	29	0.0154	pass
-20		25	0.0133	pass
-10		28	0.0149	pass
0		26	0.0138	pass
10		27	0.0144	pass
20		28	0.0149	pass
30		28	0.0149	pass
40		29	0.0154	pass
50		27	0.0144	pass
20	V min.= 3.6	26	0.0138	pass
	V max.= 4.35	28	0.0149	pass

EDGE Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.85	27	0.0144	pass
-20		26	0.0138	pass
-10		27	0.0144	pass
0		29	0.0154	pass
10		25	0.0133	pass
20		28	0.0149	pass
30		26	0.0138	pass
40		27	0.0144	pass
50		25	0.0133	pass
20	V min.= 3.6	26	0.0138	pass
	V max.= 4.35	27	0.0144	pass

WCDMA Mode

Middle Channel, f_o =1880.0 MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.85	-13	-0.0069	pass
-20		-12	-0.0064	pass
-10		-11	-0.0059	pass
0		-14	-0.0074	pass
10		-13	-0.0069	pass
20		-14	-0.0074	pass
30		-10	-0.0053	pass
40		-11	-0.0059	pass
50		-12	-0.0064	pass
20	V min.= 3.6	-13	-0.0069	pass
	V max.= 4.35	-10	-0.0053	pass

AWS Band (Part 27)

WCDMA Mode

Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.85	1710.0412	1754.8753	1710.0000	1755.0000
-20		1710.0554	1754.8080	1710.0000	1755.0000
-10		1710.0462	1754.7575	1710.0000	1755.0000
0		1710.0135	1754.7532	1710.0000	1755.0000
10		1710.9845	1754.6890	1710.0000	1755.0000
20		1710.9839	1754.0160	1710.0000	1755.0000
30		1710.0862	1754.8386	1710.0000	1755.0000
40		1710.0846	1754.7870	1710.0000	1755.0000
50		1710.0364	1754.7608	1710.0000	1755.0000
20	V min.= 3.6	1710.9913	1754.7250	1710.0000	1755.0000
	V max.= 4.35	1710.9754	1754.6812	1710.0000	1755.0000

LTE:
QPSK:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	**Voltage Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.85	-14	-0.0074	pass
-20		-15	-0.0080	pass
-10		-12	-0.0064	pass
0		-10	-0.0053	pass
10		-8	-0.0043	pass
20		-7	-0.0037	pass
30		-5	-0.0027	pass
40		-3	-0.0016	pass
50		-2	-0.0011	pass
20	V min.= 3.6	3	0.0016	pass
	V max.= 4.35	4	0.0021	pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	**Power Supplied (V_{DC})**	**F_L (MHz)**	**F_H (MHz)**	**F_L Limit (MHz)**	**F_H Limit (MHz)**
-30	3.85	1710.4283	1754.5508	1710	1755
-20		1710.2239	1754.8091	1710	1755
-10		1710.1619	1754.0946	1710	1755
0		1710.1013	1754.2444	1710	1755
10		1710.7814	1754.5399	1710	1755
20		1710.2290	1754.1379	1710	1755
30		1710.3131	1754.6892	1710	1755
40		1710.4963	1754.5075	1710	1755
50		1710.5052	1754.8710	1710	1755
20	V min.= 3.6	1710.9263	1754.1857	1710	1755
	V max.= 4.35	1710.1197	1754.2390	1710	1755

Band 5:

10.0 MHz Middle Channel, f_o =836.5 MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.85	-18	-0.0215	2.5
-20		-14	-0.0167	2.5
-10		-11	-0.0132	2.5
0		-9	-0.0108	2.5
10		-8	-0.0096	2.5
20		-5	-0.0060	2.5
30		-2	-0.0024	2.5
40		-4	-0.0048	2.5
50		-1	-0.0012	2.5
20	V min.= 3.6	4	0.0048	2.5
	V max.= 4.35	6	0.0072	2.5

Band 7:

10 MHz Bandwidth					
Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.85	2500.1259	2569.3883	2500	2570
-20		2500.0470	2569.5153	2500	2570
-10		2500.3178	2569.1574	2500	2570
0		2500.3427	2569.1857	2500	2570
10		2500.2667	2569.1891	2500	2570
20		2500.1126	2569.5318	2500	2570
30		2500.3168	2569.2985	2500	2570
40		2500.4074	2569.6392	2500	2570
50		2500.5500	2569.5658	2500	2570
20	V min.= 3.6	2500.5425	2569.5352	2500	2570
	V max.= 4.35	2500.5309	2569.5453	2500	2570

16QAM:

Band 2:

10.0 MHz Middle Channel, f_o =1880MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30		-13	-0.0069	pass
-20		-11	-0.0059	pass
-10		-8	-0.0043	pass
0		-5	-0.0027	pass
10	3.85	-4	-0.0021	pass
20		-9	-0.0048	pass
30		-6	-0.0032	pass
40		-3	-0.0016	pass
50		-1	-0.0005	pass
20	V min.= 3.6	4	0.0021	pass
	V max.= 4.35	7	0.0037	pass

Band 4:

10 MHz Bandwidth					
Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30		1710.8836	1754.2775	1710	1755
-20		1710.1912	1754.1508	1710	1755
-10		1710.8623	1754.5581	1710	1755
0		1710.4389	1754.9940	1710	1755
10	3.85	1710.2817	1754.5593	1710	1755
20		1710.2716	1754.5987	1710	1755
30		1710.7459	1754.1345	1710	1755
40		1710.3211	1754.8977	1710	1755
50		1710.7643	1754.3778	1710	1755
20	V min.= 3.6	1710.7209	1754.4362	1710	1755
	V max.= 4.35	1710.6996	1754.4335	1710	1755

Band 5:

10.0 MHz Middle Channel, f_o =836.5 MHz				
Temperature (℃)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.85	-17	-0.0203	2.5
-20		-16	-0.0191	2.5
-10		-12	-0.0143	2.5
0		-8	-0.0096	2.5
10		-5	-0.0060	2.5
20		-4	-0.0048	2.5
30		-2	-0.0024	2.5
40		-1	-0.0012	2.5
50		2	0.0024	2.5
20	V min.= 3.6	5	0.0060	2.5
	V max.= 4.35	8	0.0096	2.5

Band 7:

10 MHz Bandwidth					
Temperature (℃)	Power Supplied (V_{DC})	F_L (MHz)	F_H (MHz)	F_L Limit (MHz)	F_H Limit (MHz)
-30	3.85	2500.4654	2569.5212	2500	2570
-20		2500.4725	2569.4989	2500	2570
-10		2500.4800	2569.4851	2500	2570
0		2500.4587	2569.4850	2500	2570
10		2500.4758	2569.5045	2500	2570
20		2500.4676	2569.5388	2500	2570
30		2500.4695	2569.5093	2500	2570
40		2500.4619	2569.4905	2500	2570
50		2500.4694	2569.5007	2500	2570
20	V min.= 3.6	2500.4893	2569.5054	2500	2570
	V max.= 4.35	2500.4580	2569.4997	2500	2570

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