FCC PART 27

FCC PART 22H, PART 24E

TEST REPORT

For

BLU Products, Inc.

10814 NW 33rd St # 100 Doral, FL 33172, United States

FCC ID: YHLBLUGDM2LTE

Report Type:	Product Type:
Original Report	Mobile phone

Report Number:	RSZ171012006-00D
Report Date:	2017-10-26
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)

The *BLU Products, Inc.'s* product, model number: GRAND M2 LTE *(FCC ID: YHLBLUGDM2LTE)* or the "EUT" in this report was a *Mobile phone,* which was measured approximately: 15.01 cm (L) × 7.48 cm (W) × 0.96 cm (H), rated with input voltage: DC 3.8V battery or DC 5V from adapter.

Adapter Information:
Model: US-ZC-1000
Input: AC 100-240V, 50/60Hz, 0.4A
Output: DC 5V, 1.0 A

Notes: This series product models: GRAND M2 LTE and GRAND M2X are identical; they have the same or similar appearance, structure, PCB, Material and function to the testing product. Model GRAND M2 LTE was selected for fully testing, the detailed information can be referred to the attached declaration which was stated and guaranteed by the applicant.

*All measurement and test data in this report was gathered from production sample serial number: 1702236 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2017-10-12.

Objective

This test report is prepared on behalf of *BLU Products, Inc.* in accordance with Part 2-Subpart J, Part 22-Subpart H and Part 24-Subpart E and Subpart 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 DTS & DSS and Part 15B JBP submissions with FCC ID: YHLBLUGDM2LTE.

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		±1.5dB
Unwanted Emission, conducted		±1.5dB
Emissions, radiated	Below 1GHz	±4.70dB
	Above 1GHz	±4.80dB
Temperature		±1℃
Supply voltages		±0.4%

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.

Bay Area Compliance Laboratories Corp. (Shenzhen) has been accredited to ISO/IEC 17025 by CNAS(Lab code: L2408). And accredited to ISO/IEC 17025 by NVLAP(Lab code: 200707-0), the FCC Designation No. CN5001 under the KDB 974614 D01.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Bay Area Compliance Laboratories Corp. (Shenzhen) was 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.
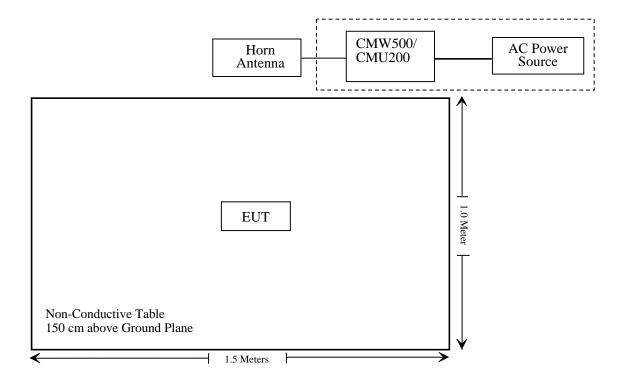
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-116218-UY
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	110605

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 (c) (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: RSZ171012006-20.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Sunol Sciences	Horn Antenna	DRH-118	A052604	2014-12-29	2017-12-28
Rohde & Schwarz	Signal ANALYZER	FSIQ26	8386001028	2017-04-24	2018-04-24
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-17	2017-12-16
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2017-02-14	2018-02-14
HP	Amplifier	HP8447E	1937A01046	2017-05-21	2017-11-19
Anritsu	Signal Generator	68369B	004114	2016-12-05	2017-12-05
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2016-12-07	2017-12-07
COM POWER	Dipole Antenna	AD-100	041000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2017-05-21	2017-11-19
Ducommun technologies	RF Cable	104PEA	218124002	2017-05-21	2017-11-19
Ducommun technologies	RF Cable	RG-214	1	2017-05-21	2017-11-19
Ducommun technologies	RF Cable	RG-214	2	2017-05-22	2017-11-22
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2014-12-29	2017-12-28
Ducommun technologies	Horn Antenna	ARH-4223-02	1007726-03	2014-12-29	2017-12-28
Ducommun technologies	Pre-amplifier	ALN-22093530-01	991373-01	2017-08-03	2018-08-03

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2016-12-05	2017-12-05
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2016-11-22	2017-11-22
Long Wei	DC Power Supply	TPR-6420D	398363	NCR	NCR
Aglient	ESG Vector Signal Generator	E4438C	MY42080875	2017-05-09	2018-05-09
Rohde & Schwarz	Wideband Radio Communication Tester	CMU200	106891	2016-10-18	2017-10-18
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2017-04-24	2018-04-24
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2017-08-17	2018-08-17
Ducommun technologies	RF Cable	RG-214	3	2017-05-22	2017-11-22
WEINSCHEL	10dB Attenuator	5324	AU 3842	2017-05-23	2017-11-22
WEINSCHEL	3dB Attenuator	N/A	N/A	2017-05-23	2017-11-22
N/A	Power Splitter	N/A	N/A	2017-05-21	2018-05-21

* 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: RSZ171012006-20.

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(c) (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(c),Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.
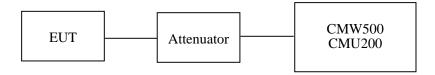
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

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 Hill He on 2017-10-17.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.16	38.45
	190	836.6	32.10	38.45
	251	848.8	31.95	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.02	31.26	29.31	28.25	38.45
	190	836.6	31.98	30.21	29.30	28.24	38.45
	251	848.8	31.86	30.09	29.20	28.13	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	24.42	23.56	21.74	20.65	38.45
	190	836.6	24.39	23.56	21.71	20.60	38.45
	251	848.8	24.43	23.49	21.65	20.58	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		21.78	22.05	21.96
		HSDPA	1	20.94	20.71	20.80
			2	20.89	20.65	20.70
			3	21.07	20.82	20.88
			4	20.83	20.62	20.71
		HSUPA	1	20.77	20.62	20.69
			2	20.70	20.50	20.62
			3	20.82	20.73	20.79
			4	20.64	20.54	20.59
			5	20.87	20.66	20.81

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.07	33
	661	1880.0	28.20	33
	810	1909.8	28.27	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.28	27.55	25.86	24.77	33
	661	1880.0	28.39	27.66	25.99	24.94	33
	810	1909.8	28.37	27.69	26.03	24.99	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	24.92	23.95	21.96	20.92	33
	661	1880.0	25.26	24.26	22.21	21.20	33
	810	1909.8	25.35	24.48	22.50	21.51	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		22.04	21.64	21.90
		HSDPA	1	20.37	20.45	20.76
			2	20.32	20.41	20.66
			3	20.42	20.52	20.83
			4	20.34	20.41	20.71
		HSUPA	1	20.58	20.55	20.49
			2	20.52	20.44	20.37
			3	20.70	20.60	20.55
			4	20.54	20.50	20.39
			5	20.69	20.64	20.59

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		22.37	22.44	22.40
		HSDPA	1	21.15	21.04	21.14
			2	21.08	21.00	21.10
			3	21.22	21.14	21.26
			4	21.11	21.00	21.03
		HSUPA	1	21.03	21.12	21.23
			2	20.92	21.06	21.16
			3	21.15	21.21	21.27
			4	20.99	21.01	21.19
			5	21.09	21.20	21.26

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.46	13
	Middle	0.37	13
	High	0.42	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.53	13
	Middle	2.41	13
	High	2.57	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	1.02	13
	Middle	0.86	13
	High	1.13	13
HSDPA (16QAM)	Low	1.08	13
	Middle	0.84	13
	High	1.19	13
HSUPA (BPSK)	Low	1.09	13
	Middle	0.81	13
	High	1.19	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.43	13
	Middle	0.31	13
	High	0.45	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.54	13
	Middle	2.42	13
	High	2.52	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	1.72	13
	Middle	1.64	13
	High	1.79	13
HSDPA (16QAM)	Low	1.78	13
	Middle	1.62	13
	High	1.73	13
HSUPA (BPSK)	Low	1.79	13
	Middle	1.66	13
	High	1.75	13

AWS Band

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (BPSK)	Low	1.78	13
	Middle	1.69	13
	High	1.85	13
HSDPA (16QAM)	Low	1.71	13
	Middle	1.62	13
	High	1.89	13
HSUPA (BPSK)	Low	1.75	13
	Middle	1.64	13
	High	1.87	13

Radiated Power

GSM Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	82.45	93	1.9	H	22.4	0.6	0.0	21.80	38.45	16.65
836.6	89.65	37	2.0	V	30.4	0.6	0.0	29.80	38.45	8.65
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	90.44	208	1.1	H	20.4	1.30	8.50	27.60	33	5.40
1880.00	86.60	298	1.2	V	16.3	1.30	8.50	23.50	33	9.50

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 (dB)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.6	78.78	172	1.0	H	18.7	0.6	0.0	18.10	38.45	20.35
836.6	85.52	206	1.4	V	26.3	0.6	0.0	25.70	38.45	12.75
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	87.43	104	1.4	H	17.4	1.3	8.5	24.6	33	8.4
1880.00	80.21	195	1.5	V	9.9	1.3	8.5	17.1	33	15.9

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E/27	
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	76.04	219	2.4	H	16.0	0.6	0.0	15.40	38.45	23.05
836.6	81.71	91	1.6	V	22.5	0.6	0.0	21.90	38.45	16.55
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	84.26	344	1.7	H	14.2	1.30	8.50	21.40	33	11.60
1880.00	80.59	245	1.1	V	10.3	1.30	8.50	17.50	33	15.50
EIRP for WCDMA Band IV (Part 27), Middle Channel										
1732.60	87.08	255	1.3	H	13.9	1.30	9.10	21.70	30	8.30
1732.60	82.16	73	2.2	V	9.6	1.30	9.10	17.40	30	12.60

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	21.87	22.11	21.82
		RB Size=1, RB Offset=2	21.75	22.03	21.71
		RB Size=1, RB Offset=5	21.94	22.18	21.88
		RB Size=3, RB Offset=0	21.14	21.52	21.24
		RB Size=3, RB Offset=1	21.11	21.45	21.19
		RB Size=3, RB Offset=2	21.25	21.63	21.31
		RB Size=6, RB Offset=0	20.68	21.07	20.75
	16QAM	RB Size=1, RB Offset=0	21.81	22.1	21.74
		RB Size=1, RB Offset=2	21.74	22.05	21.65
		RB Size=1, RB Offset=5	21.87	22.19	21.81
		RB Size=3, RB Offset=0	21.26	21.58	21.29
		RB Size=3, RB Offset=1	21.23	21.45	21.19
		RB Size=3, RB Offset=2	21.34	21.67	21.32
		RB Size=6, RB Offset=0	20.58	21.07	20.75
3.0	QPSK	RB Size=1, RB Offset=0	21.76	22.07	21.71
		RB Size=1, RB Offset=7	21.69	21.96	21.63
		RB Size=1, RB Offset=14	21.85	22.14	21.75
		RB Size=8, RB Offset=0	21.24	21.53	21.22
		RB Size=8, RB Offset=4	21.18	21.47	21.11
		RB Size=8, RB Offset=7	21.34	21.60	21.32
		RB Size=15, RB Offset=0	20.69	21.08	20.78
	16QAM	RB Size=1, RB Offset=0	21.71	22.06	21.82
		RB Size=1, RB Offset=7	21.60	21.97	21.73
		RB Size=1, RB Offset=14	21.81	22.14	21.91
		RB Size=8, RB Offset=0	21.34	21.64	21.28
		RB Size=8, RB Offset=4	21.29	21.55	21.23
		RB Size=8, RB Offset=7	21.38	21.70	21.31
		RB Size=15, RB Offset=0	20.75	21.06	20.65

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	21.79	22.16	21.94
		RB Size=1, RB Offset=12	21.73	22.13	21.85
		RB Size=1, RB Offset=24	21.84	22.27	22.00
		RB Size=12, RB Offset=0	21.38	21.69	21.46
		RB Size=12, RB Offset=6	21.27	21.60	21.42
		RB Size=12, RB Offset=11	21.46	21.79	21.54
		RB Size=25, RB Offset=0	20.78	21.10	20.92
	16QAM	RB Size=1, RB Offset=0	21.75	22.16	21.81
		RB Size=1, RB Offset=12	21.67	22.04	21.78
		RB Size=1, RB Offset=24	21.84	22.25	21.85
		RB Size=12, RB Offset=0	21.24	21.67	21.17
		RB Size=12, RB Offset=6	21.13	21.60	21.05
		RB Size=12, RB Offset=11	21.27	21.75	21.20
		RB Size=25, RB Offset=0	20.58	21.08	20.76
10.0	QPSK	RB Size=1, RB Offset=0	21.94	22.21	21.87
		RB Size=1, RB Offset=24	21.85	22.11	21.81
		RB Size=1, RB Offset=49	22.06	22.25	21.96
		RB Size=25, RB Offset=0	21.27	21.69	21.34
		RB Size=25, RB Offset=12	21.19	21.56	21.23
		RB Size=25, RB Offset=24	21.40	21.81	21.42
		RB Size=50, RB Offset=0	20.76	21.13	20.84
	16QAM	RB Size=1, RB Offset=0	21.98	22.2	21.83
		RB Size=1, RB Offset=24	21.92	22.12	21.71
		RB Size=1, RB Offset=49	22.03	22.27	21.95
		RB Size=25, RB Offset=0	21.22	21.64	21.38
		RB Size=25, RB Offset=12	21.09	21.53	21.28
		RB Size=25, RB Offset=24	21.33	21.76	21.50
		RB Size=50, RB Offset=0	20.65	21.15	20.75

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	22.03	22.3	22.15
		RB Size=1, RB Offset=37	21.94	22.18	22.10
		RB Size=1, RB Offset=74	22.10	22.36	22.25
		RB Size=36, RB Offset=0	21.28	21.72	21.31
		RB Size=36, RB Offset=18	21.25	21.60	21.23
		RB Size=36, RB Offset=37	21.38	21.79	21.38
		RB Size=75, RB Offset=0	21.02	21.25	21.06
	16QAM	RB Size=1, RB Offset=0	22.14	22.3	22.17
		RB Size=1, RB Offset=37	22.03	22.20	22.07
		RB Size=1, RB Offset=74	22.25	22.34	22.22
		RB Size=36, RB Offset=0	21.42	21.78	21.37
		RB Size=36, RB Offset=18	21.38	21.71	21.27
		RB Size=36, RB Offset=37	21.54	21.84	21.40
		RB Size=75, RB Offset=0	21.01	21.25	21.04
20.0	QPSK	RB Size=1, RB Offset=0	22.18	22.34	22.15
		RB Size=1, RB Offset=49	22.13	22.28	22.09
		RB Size=1, RB Offset=99	22.24	22.44	22.24
		RB Size=50, RB Offset=0	21.45	21.71	21.34
		RB Size=50, RB Offset=24	21.39	21.65	21.26
		RB Size=50, RB Offset=49	21.57	21.83	21.38
		RB Size=100, RB Offset=0	20.87	21.18	20.95
	16QAM	RB Size=1, RB Offset=0	22.01	22.26	22.05
		RB Size=1, RB Offset=49	21.92	22.13	21.94
		RB Size=1, RB Offset=99	22.05	22.35	22.13
		RB Size=50, RB Offset=0	21.47	21.69	21.38
		RB Size=50, RB Offset=24	21.36	21.64	21.29
		RB Size=50, RB Offset=49	21.53	21.76	21.44
		RB Size=100, RB Offset=0	20.85	21.12	20.74

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	2.58	13	Pass
16QAM (100%RB Size)	3.57	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	83.10	178	2.2	H	13.1	1.30	8.50	20.30	33
1880.00	86.75	330	2.1	V	16.5	1.30	8.50	23.70	33
3 MHz Bandwidth									
1880.00	83.23	234	2.0	H	13.2	1.30	8.50	20.40	33
1880.00	87.11	96	2.0	V	16.8	1.30	8.50	24.00	33
5 MHz Bandwidth									
1880.00	82.51	266	2.0	H	12.5	1.30	8.50	19.70	33
1880.00	86.95	192	1.2	V	16.7	1.30	8.50	23.90	33
10 MHz Bandwidth									
1880.00	82.83	286	2.0	H	12.8	1.30	8.50	20.00	33
1880.00	87.20	190	2.4	V	16.9	1.30	8.50	24.10	33
15 MHz Bandwidth									
1880.00	82.74	188	1.3	H	12.7	1.30	8.50	19.90	33
1880.00	87.62	78	1.0	V	17.4	1.30	8.50	24.60	33
20 MHz Bandwidth									
1880.00	82.65	161	2.0	H	12.6	1.30	8.50	19.80	33
1880.00	86.93	91	2.4	V	16.7	1.30	8.50	23.90	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	82.75	104	2.4	H	12.7	1.30	8.50	19.90	33
1880.00	87.14	213	1.3	V	16.9	1.30	8.50	24.10	33
3 MHz Bandwidth									
1880.00	82.49	276	1.6	H	12.4	1.30	8.50	19.60	33
1880.00	86.38	143	2.5	V	16.1	1.30	8.50	23.30	33
5 MHz Bandwidth									
1880.00	83.05	184	1.8	H	13.0	1.30	8.50	20.20	33
1880.00	87.11	129	1.2	V	16.8	1.30	8.50	24.00	33
10 MHz Bandwidth									
1880.00	82.99	140	1.8	H	12.9	1.30	8.50	20.10	33
1880.00	86.57	68	1.6	V	16.3	1.30	8.50	23.50	33
15 MHz Bandwidth									
1880.00	82.84	321	2.4	H	12.8	1.30	8.50	20.00	33
1880.00	87.03	336	1.1	V	16.8	1.30	8.50	24.00	33
20 MHz Bandwidth									
1880.00	83.41	287	1.8	H	13.4	1.30	8.50	20.60	33
1880.00	87.15	28	2.1	V	16.9	1.30	8.50	24.10	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	22.85	23.19	22.94
		RB Size=1, RB Offset=2	22.75	23.10	22.87
		RB Size=1, RB Offset=5	22.89	23.28	23.04
		RB Size=3, RB Offset=0	21.42	21.61	21.34
		RB Size=3, RB Offset=1	21.38	21.52	21.23
		RB Size=3, RB Offset=2	21.51	21.68	21.41
		RB Size=6, RB Offset=0	21.67	22.18	21.78
	16QAM	RB Size=1, RB Offset=0	22.79	23.19	22.97
		RB Size=1, RB Offset=2	22.71	23.11	22.85
		RB Size=1, RB Offset=5	22.86	23.27	23.01
		RB Size=3, RB Offset=0	21.47	21.69	21.38
		RB Size=3, RB Offset=1	21.37	21.57	21.29
		RB Size=3, RB Offset=2	21.51	21.82	21.43
		RB Size=6, RB Offset=0	21.84	22.18	21.76
3.0	QPSK	RB Size=1, RB Offset=0	22.75	23.08	22.82
		RB Size=1, RB Offset=7	22.70	23.00	22.71
		RB Size=1, RB Offset=14	22.80	23.17	22.87
		RB Size=8, RB Offset=0	21.42	21.64	21.32
		RB Size=8, RB Offset=4	21.38	21.56	21.25
		RB Size=8, RB Offset=7	21.55	21.68	21.42
		RB Size=15, RB Offset=0	21.75	22.16	21.85
	16QAM	RB Size=1, RB Offset=0	22.79	23.12	22.88
		RB Size=1, RB Offset=7	22.69	23.07	22.83
		RB Size=1, RB Offset=14	22.83	23.19	22.93
		RB Size=8, RB Offset=0	21.47	21.61	21.49
		RB Size=8, RB Offset=4	21.34	21.49	21.44
		RB Size=8, RB Offset=7	21.59	21.66	21.53
		RB Size=15, RB Offset=0	21.86	22.13	21.75

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	22.71	23.2	22.84
		RB Size=1, RB Offset=12	22.64	23.12	22.80
		RB Size=1, RB Offset=24	22.75	23.25	22.92
		RB Size=12, RB Offset=0	21.32	21.57	21.27
		RB Size=12, RB Offset=6	21.26	21.49	21.16
		RB Size=12, RB Offset=11	21.45	21.66	21.33
		RB Size=25, RB Offset=0	21.75	22.09	21.85
	16QAM	RB Size=1, RB Offset=0	22.78	23.2	22.72
		RB Size=1, RB Offset=12	22.71	23.09	22.69
		RB Size=1, RB Offset=24	22.83	23.25	22.83
		RB Size=12, RB Offset=0	21.37	21.68	21.24
		RB Size=12, RB Offset=6	21.31	21.64	21.14
		RB Size=12, RB Offset=11	21.48	21.79	21.33
		RB Size=25, RB Offset=0	21.85	22.08	21.74
10.0	QPSK	RB Size=1, RB Offset=0	22.72	23.24	22.78
		RB Size=1, RB Offset=24	22.60	23.20	22.67
		RB Size=1, RB Offset=49	22.80	23.32	22.81
		RB Size=25, RB Offset=0	21.32	21.64	21.27
		RB Size=25, RB Offset=12	21.25	21.60	21.21
		RB Size=25, RB Offset=24	21.41	21.72	21.37
		RB Size=50, RB Offset=0	21.84	22.15	21.72
	16QAM	RB Size=1, RB Offset=0	22.77	23.24	22.75
		RB Size=1, RB Offset=24	22.71	23.18	22.71
		RB Size=1, RB Offset=49	22.83	23.36	22.78
		RB Size=25, RB Offset=0	21.37	21.78	21.42
		RB Size=25, RB Offset=12	21.29	21.73	21.36
		RB Size=25, RB Offset=24	21.48	21.85	21.50
		RB Size=50, RB Offset=0	22.04	22.21	22.07

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	22.74	23.2	22.71
		RB Size=1, RB Offset=37	22.67	23.07	22.67
		RB Size=1, RB Offset=74	22.86	23.24	22.79
		RB Size=36, RB Offset=0	21.34	21.74	21.48
		RB Size=36, RB Offset=18	21.23	21.68	21.39
		RB Size=36, RB Offset=37	21.45	21.81	21.59
		RB Size=75, RB Offset=0	22.01	22.26	22.07
	16QAM	RB Size=1, RB Offset=0	22.85	23.29	22.84
		RB Size=1, RB Offset=37	22.74	23.22	22.74
		RB Size=1, RB Offset=74	22.95	23.35	22.90
		RB Size=36, RB Offset=0	21.38	21.79	21.42
		RB Size=36, RB Offset=18	21.34	21.76	21.31
		RB Size=36, RB Offset=37	21.46	21.91	21.53
		RB Size=75, RB Offset=0	22.05	22.27	22.01
20.0	QPSK	RB Size=1, RB Offset=0	22.94	23.37	22.89
		RB Size=1, RB Offset=49	22.85	23.27	22.81
		RB Size=1, RB Offset=99	23.00	23.44	22.93
		RB Size=50, RB Offset=0	21.31	21.74	21.47
		RB Size=50, RB Offset=24	21.20	21.64	21.42
		RB Size=50, RB Offset=49	21.37	21.84	21.59
		RB Size=100, RB Offset=0	22.04	22.20	22.07
	16QAM	RB Size=1, RB Offset=0	23.05	23.32	23.04
		RB Size=1, RB Offset=49	22.98	23.24	23.00
		RB Size=1, RB Offset=99	23.11	23.43	23.08
		RB Size=50, RB Offset=0	21.37	21.78	21.43
		RB Size=50, RB Offset=24	21.29	21.71	21.37
		RB Size=50, RB Offset=49	21.44	21.81	21.46
		RB Size=100, RB Offset=0	21.45	22.18	21.58

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	5.24	13	Pass
16QAM (100%RB Size)	4.99	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.45	128	2.1	H	14.3	1.30	9.10	22.10	30
1732.50	85.51	166	1.7	V	12.9	1.30	9.10	20.70	30
3 MHz Bandwidth									
1732.50	87.74	293	1.8	H	14.6	1.30	9.10	22.40	30
1732.50	85.67	252	1.4	V	13.1	1.30	9.10	20.90	30
5 MHz Bandwidth									
1732.50	86.30	22	1.0	H	13.1	1.30	9.10	20.90	30
1732.50	83.26	257	1.4	V	10.7	1.30	9.10	18.50	30
10 MHz Bandwidth									
1732.50	87.54	99	2.2	H	14.4	1.30	9.10	22.20	30
1732.50	85.12	6	1.0	V	12.6	1.30	9.10	20.40	30
15 MHz Bandwidth									
1732.50	87.60	328	1.3	H	14.4	1.30	9.10	22.20	30
1732.50	85.07	256	1.9	V	12.5	1.30	9.10	20.30	30
20 MHz Bandwidth									
1732.50	87.24	77	2.3	H	14.1	1.30	9.10	21.90	30
1732.50	85.10	160	2.4	V	12.5	1.30	9.10	20.30	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	87.66	340	1.5	H	14.5	1.30	9.10	22.30	30
1732.50	85.33	219	2.3	V	12.8	1.30	9.10	20.60	30
3 MHz Bandwidth									
1732.50	87.48	49	2.3	H	14.3	1.30	9.10	22.10	30
1732.50	85.19	66	2.2	V	12.6	1.30	9.10	20.40	30
5 MHz Bandwidth									
1732.50	87.77	332	2.2	H	14.6	1.30	9.10	22.40	30
1732.50	85.41	335	1.2	V	12.8	1.30	9.10	20.60	30
10 MHz Bandwidth									
1732.50	87.58	143	2.1	H	14.4	1.30	9.10	22.20	30
1732.50	84.98	156	1.2	V	12.4	1.30	9.10	20.20	30
15 MHz Bandwidth									
1732.50	87.28	203	1.8	H	14.1	1.30	9.10	21.90	30
1732.50	84.63	240	1.3	V	12.1	1.30	9.10	19.90	30
20 MHz Bandwidth									
1732.50	87.82	223	2.3	H	14.7	1.30	9.10	22.50	30
1732.50	85.02	172	1.7	V	12.5	1.30	9.10	20.30	30

LTE Band 5:

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	22.75	23.04	22.79
		RB Size=1, RB Offset=2	22.70	23.01	22.71
		RB Size=1, RB Offset=5	22.85	23.12	22.91
		RB Size=3, RB Offset=0	21.24	21.62	21.29
		RB Size=3, RB Offset=1	21.13	21.59	21.18
		RB Size=3, RB Offset=2	21.33	21.75	21.34
		RB Size=6, RB Offset=0	21.62	22.05	21.72
	16QAM	RB Size=1, RB Offset=0	22.78	23.03	22.75
		RB Size=1, RB Offset=2	22.67	22.91	22.71
		RB Size=1, RB Offset=5	22.91	23.15	22.88
		RB Size=3, RB Offset=0	21.28	21.67	21.22
		RB Size=3, RB Offset=1	21.23	21.61	21.18
		RB Size=3, RB Offset=2	21.32	21.72	21.31
		RB Size=6, RB Offset=0	21.85	22.06	21.78
3.0	QPSK	RB Size=1, RB Offset=0	22.72	23.03	22.79
		RB Size=1, RB Offset=7	22.65	22.94	22.68
		RB Size=1, RB Offset=14	22.79	23.11	22.85
		RB Size=8, RB Offset=0	21.22	21.63	21.25
		RB Size=8, RB Offset=4	21.12	21.58	21.14
		RB Size=8, RB Offset=7	21.30	21.69	21.36
		RB Size=15, RB Offset=0	21.56	22.13	21.58
	16QAM	RB Size=1, RB Offset=0	22.84	23.03	22.81
		RB Size=1, RB Offset=7	22.74	22.98	22.76
		RB Size=1, RB Offset=14	22.96	23.14	22.89
		RB Size=8, RB Offset=0	21.25	21.69	21.34
		RB Size=8, RB Offset=4	21.18	21.59	21.24
		RB Size=8, RB Offset=7	21.37	21.81	21.41
		RB Size=15, RB Offset=0	21.56	22.13	21.57

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	22.88	23.15	22.89
		RB Size=1, RB Offset=12	22.82	23.06	22.82
		RB Size=1, RB Offset=24	22.99	23.25	22.98
		RB Size=12, RB Offset=0	21.34	21.66	21.42
		RB Size=12, RB Offset=6	21.24	21.54	21.37
		RB Size=12, RB Offset=11	21.41	21.71	21.52
		RB Size=25, RB Offset=0	21.68	22.15	21.72
	16QAM	RB Size=1, RB Offset=0	22.94	23.15	22.97
		RB Size=1, RB Offset=12	22.86	23.02	22.86
		RB Size=1, RB Offset=24	23.07	23.27	23.00
		RB Size=12, RB Offset=0	21.39	21.69	21.37
		RB Size=12, RB Offset=6	21.32	21.65	21.25
		RB Size=12, RB Offset=11	21.51	21.72	21.44
		RB Size=25, RB Offset=0	21.87	22.12	21.64
10.0	QPSK	RB Size=1, RB Offset=0	22.96	23.14	22.95
		RB Size=1, RB Offset=24	22.83	23.04	22.89
		RB Size=1, RB Offset=49	23.07	23.23	23.00
		RB Size=25, RB Offset=0	21.24	21.57	21.17
		RB Size=25, RB Offset=12	21.13	21.50	21.13
		RB Size=25, RB Offset=24	21.32	21.60	21.29
		RB Size=50, RB Offset=0	21.85	22.16	21.75
	16QAM	RB Size=1, RB Offset=0	22.91	23.14	22.98
		RB Size=1, RB Offset=24	22.82	23.09	22.86
		RB Size=1, RB Offset=49	23.03	23.17	23.04
		RB Size=25, RB Offset=0	21.27	21.59	21.34
		RB Size=25, RB Offset=12	21.23	21.55	21.23
		RB Size=25, RB Offset=24	21.37	21.63	21.44
		RB Size=50, RB Offset=0	22.01	22.19	22.05

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	2.52	13	Pass
16QAM (100%RB Size)	1.81	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	77.83	218	1.7	H	17.8	0.6	0	17.20	38.45
836.5	81.34	269	2.2	V	22.1	0.6	0	21.50	38.45
3 MHz Bandwidth									
836.5	78.74	119	1.6	H	18.7	0.6	0.0	18.10	38.45
836.5	81.56	163	1.5	V	22.4	0.6	0.0	21.80	38.45
5 MHz Bandwidth									
836.5	77.81	171	2.1	H	17.8	0.6	0.0	17.20	38.45
836.5	80.52	202	1.9	V	21.3	0.6	0.0	20.70	38.45
10 MHz Bandwidth									
836.5	77.63	344	2.5	H	17.6	0.6	0.0	17.00	38.45
836.5	80.79	193	1.3	V	21.6	0.6	0.0	21.00	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
836.5	79.26	260	1.8	H	19.2	0.6	0.0	18.60	38.45
836.5	82.01	191	1.8	V	22.8	0.6	0.0	22.20	38.45
3 MHz Bandwidth									
836.5	79.37	180	2.4	H	19.3	0.6	0.0	18.70	38.45
836.5	81.63	138	1.2	V	22.4	0.6	0.0	21.80	38.45
5 MHz Bandwidth									
836.5	78.51	89	1.5	H	18.5	0.6	0.0	17.90	38.45
836.5	80.79	129	2.4	V	21.6	0.6	0.0	21.00	38.45
10 MHz Bandwidth									
836.5	78.13	337	2.3	H	18.1	0.6	0.0	17.50	38.45
836.5	80.03	154	1.4	V	20.8	0.6	0.0	20.20	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	21.23	21.51	21.32
		RB Size=1, RB Offset=12	21.12	21.46	21.21
		RB Size=1, RB Offset=24	21.30	21.56	21.41
		RB Size=12, RB Offset=0	20.74	21.04	20.65
		RB Size=12, RB Offset=6	20.68	20.99	20.53
		RB Size=12, RB Offset=11	20.84	21.14	20.77
		RB Size=25, RB Offset=0	20.38	20.47	20.36
	16QAM	RB Size=1, RB Offset=0	21.24	21.5	21.38
		RB Size=1, RB Offset=12	21.13	21.45	21.31
		RB Size=1, RB Offset=24	21.28	21.63	21.49
		RB Size=12, RB Offset=0	20.71	20.94	20.68
		RB Size=12, RB Offset=6	20.64	20.83	20.57
		RB Size=12, RB Offset=11	20.78	21.04	20.79
		RB Size=25, RB Offset=0	20.36	20.43	20.37
10	QPSK	RB Size=1, RB Offset=0	21.28	21.58	21.32
		RB Size=1, RB Offset=24	21.23	21.46	21.20
		RB Size=1, RB Offset=49	21.34	21.62	21.44
		RB Size=25, RB Offset=0	20.73	20.96	20.63
		RB Size=25, RB Offset=12	20.65	20.89	20.53
		RB Size=25, RB Offset=24	20.85	21.03	20.67
		RB Size=50, RB Offset=0	20.42	20.60	20.47
	16QAM	RB Size=1, RB Offset=0	21.23	21.57	21.35
		RB Size=1, RB Offset=24	21.14	21.49	21.24
		RB Size=1, RB Offset=49	21.32	21.63	21.39
		RB Size=25, RB Offset=0	20.78	21.03	20.69
		RB Size=25, RB Offset=12	20.70	20.95	20.62
		RB Size=25, RB Offset=24	20.89	21.13	20.81
		RB Size=50, RB Offset=0	20.39	20.49	20.37

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	21.27	21.63	21.39
		RB Size=1, RB Offset=37	21.15	21.54	21.31
		RB Size=1, RB Offset=74	21.33	21.70	21.46
		RB Size=36, RB Offset=0	20.72	21.08	20.65
		RB Size=36, RB Offset=18	20.64	20.97	20.61
		RB Size=36, RB Offset=37	20.75	21.11	20.72
		RB Size=75, RB Offset=0	20.43	20.54	20.41
	16QAM	RB Size=1, RB Offset=0	21.34	21.63	21.31
		RB Size=1, RB Offset=37	21.24	21.59	21.19
		RB Size=1, RB Offset=74	21.40	21.70	21.44
		RB Size=36, RB Offset=0	20.79	21.17	20.87
		RB Size=36, RB Offset=18	20.66	21.11	20.79
		RB Size=36, RB Offset=37	20.91	21.22	20.99
		RB Size=75, RB Offset=0	20.42	20.58	20.47
20	QPSK	RB Size=1, RB Offset=0	21.37	21.77	21.47
		RB Size=1, RB Offset=49	21.25	21.64	21.35
		RB Size=1, RB Offset=99	21.43	21.84	21.57
		RB Size=50, RB Offset=0	20.75	21.13	20.84
		RB Size=50, RB Offset=24	20.70	21.01	20.77
		RB Size=50, RB Offset=49	20.78	21.18	20.91
		RB Size=100, RB Offset=0	20.42	20.6	20.38
	16QAM	RB Size=1, RB Offset=0	21.34	21.77	21.42
		RB Size=1, RB Offset=49	21.23	21.68	21.34
		RB Size=1, RB Offset=99	21.46	21.82	21.46
		RB Size=50, RB Offset=0	20.79	21.11	20.83
		RB Size=50, RB Offset=24	20.68	21.00	20.77
		RB Size=50, RB Offset=49	20.84	21.23	20.89
		RB Size=100, RB Offset=0	20.37	20.51	20.41

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	4.98	13	Pass
16QAM (100%RB Size)	3.59	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 (dB)		
Middle Channel									
5 MHz Bandwidth									
2535.00	79.51	142	1.9	H	10.0	2.60	9.30	16.70	33
2535.00	82.85	293	1.6	V	14.0	2.60	9.30	20.70	33
10 MHz Bandwidth									
2535.00	79.10	281	2.1	H	9.6	2.60	9.30	16.30	33
2535.00	82.79	178	1.9	V	13.9	2.60	9.30	20.60	33
15 MHz Bandwidth									
2535.00	79.63	274	1.6	H	10.1	2.60	9.30	16.80	33
2535.00	82.98	130	2.0	V	14.1	2.60	9.30	20.80	33
20 MHz Bandwidth									
2535.00	79.81	46	1.1	H	10.3	2.60	9.30	17.00	33
2535.00	82.79	231	1.9	V	13.9	2.60	9.30	20.60	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 (dB)		
Middle Channel									
5 MHz Bandwidth									
2535.00	80.56	167	1.2	H	11.1	2.60	9.30	17.80	33
2535.00	83.10	44	2.5	V	14.2	2.60	9.30	20.90	33
10 MHz Bandwidth									
2535.00	79.86	207	1.2	H	10.4	2.60	9.30	17.10	33
2535.00	82.74	111	2.5	V	13.9	2.60	9.30	20.60	33
15 MHz Bandwidth									
2535.00	79.89	180	1.7	H	10.4	2.60	9.30	17.10	33
2535.00	82.75	33	1.5	V	13.9	2.60	9.30	20.60	33
20 MHz Bandwidth									
2535.00	80.04	106	2.5	H	10.6	2.60	9.30	17.30	33
2535.00	83.11	246	1.4	V	14.2	2.60	9.30	20.90	33

LTE Band 12:

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	23.15	23.39	23.04
		RB Size=1, RB Offset=2	23.10	23.33	22.94
		RB Size=1, RB Offset=5	23.27	23.43	23.09
		RB Size=3, RB Offset=0	22.57	22.87	22.52
		RB Size=3, RB Offset=1	22.50	22.76	22.40
		RB Size=3, RB Offset=2	22.69	22.93	22.61
		RB Size=6, RB Offset=0	22.15	22.41	22.17
	16QAM	RB Size=1, RB Offset=0	23.06	23.39	23.16
		RB Size=1, RB Offset=2	22.98	23.32	23.11
		RB Size=1, RB Offset=5	23.12	23.46	23.26
		RB Size=3, RB Offset=0	22.51	22.84	22.46
		RB Size=3, RB Offset=1	22.43	22.75	22.38
		RB Size=3, RB Offset=2	22.54	22.91	22.56
		RB Size=6, RB Offset=0	22.12	22.41	22.08
3	QPSK	RB Size=1, RB Offset=0	23.09	23.33	23.12
		RB Size=1, RB Offset=7	22.97	23.21	23.03
		RB Size=1, RB Offset=14	23.15	23.43	23.23
		RB Size=8, RB Offset=0	22.46	22.83	22.43
		RB Size=8, RB Offset=4	22.34	22.71	22.33
		RB Size=8, RB Offset=7	22.58	22.92	22.47
		RB Size=15, RB Offset=0	22.15	22.47	22.26
	16QAM	RB Size=1, RB Offset=0	23.05	23.33	23.17
		RB Size=1, RB Offset=7	22.93	23.24	23.13
		RB Size=1, RB Offset=14	23.15	23.41	23.30
		RB Size=8, RB Offset=0	22.42	22.85	22.49
		RB Size=8, RB Offset=4	22.30	22.77	22.42
		RB Size=8, RB Offset=7	22.55	22.92	22.56
		RB Size=15, RB Offset=0	22.15	22.47	22.18

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB Size=1, RB Offset=0	23.16	23.48	23.24
		RB Size=1, RB Offset=12	23.08	23.43	23.15
		RB Size=1, RB Offset=24	23.23	23.57	23.36
		RB Size=12, RB Offset=0	22.47	22.96	22.46
		RB Size=12, RB Offset=6	22.42	22.85	22.40
		RB Size=12, RB Offset=11	22.57	23.03	22.58
		RB Size=25, RB Offset=0	22.25	22.48	22.15
	16QAM	RB Size=1, RB Offset=0	23.14	23.46	23.28
		RB Size=1, RB Offset=12	23.03	23.36	23.17
		RB Size=1, RB Offset=24	23.18	23.55	23.33
		RB Size=12, RB Offset=0	22.63	22.94	22.67
		RB Size=12, RB Offset=6	22.53	22.90	22.56
		RB Size=12, RB Offset=11	22.73	23.03	22.73
		RB Size=25, RB Offset=0	22.26	22.48	22.18
10	QPSK	RB Size=1, RB Offset=0	23.27	23.45	23.23
		RB Size=1, RB Offset=24	23.22	23.38	23.19
		RB Size=1, RB Offset=49	23.31	23.49	23.29
		RB Size=25, RB Offset=0	22.67	23.05	22.69
		RB Size=25, RB Offset=12	22.55	22.97	22.61
		RB Size=25, RB Offset=24	22.73	23.12	22.79
		RB Size=50, RB Offset=0	22.15	22.55	22.26
	16QAM	RB Size=1, RB Offset=0	23.24	23.47	23.21
		RB Size=1, RB Offset=24	23.18	23.36	23.17
		RB Size=1, RB Offset=49	23.35	23.54	23.27
		RB Size=25, RB Offset=0	22.62	23.07	22.61
		RB Size=25, RB Offset=12	22.58	23.03	22.56
		RB Size=25, RB Offset=24	22.70	23.20	22.68
		RB Size=50, RB Offset=0	22.26	22.54	22.34

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	1.31	13	Pass
16QAM (100%RB Size)	1.02	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 (dB)		
Middle Channel									
1.4 MHz Bandwidth									
707.5	76.32	219	1.5	H	16.3	0.6	0.0	15.70	34.77
707.5	81.51	41	1.7	V	22.3	0.6	0.0	21.70	34.77
3 MHz Bandwidth									
707.5	75.58	238	1.7	H	15.5	0.6	0.0	14.90	34.77
707.5	81.67	345	2.1	V	22.5	0.6	0.0	21.90	34.77
5 MHz Bandwidth									
707.5	76.95	164	1.5	H	16.9	0.6	0.0	16.30	34.77
707.5	80.95	206	1.1	V	21.7	0.6	0.0	21.10	34.77
10 MHz Bandwidth									
707.5	75.97	18	2.4	H	15.9	0.6	0.0	15.30	34.77
707.5	80.79	99	1.6	V	21.6	0.6	0.0	21.00	34.77

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna Height (m)	Polar (H/V)	Substituted Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)	Absolute Level (dBm)	Limit (dBm)
Middle Channel									
1.4 MHz Bandwidth									
707.5	78.01	24	1.3	H	18.0	0.6	0.0	17.40	34.77
707.5	81.78	49	2.2	V	22.6	0.6	0.0	22.00	34.77
3 MHz Bandwidth									
707.5	77.11	343	1.9	H	17.1	0.6	0.0	16.50	34.77
707.5	80.91	84	1.3	V	21.7	0.6	0.0	21.10	34.77
5 MHz Bandwidth									
707.5	77.37	201	1.2	H	17.3	0.6	0.0	16.70	34.77
707.5	80.19	58	1.1	V	21.0	0.6	0.0	20.40	34.77
10 MHz Bandwidth									
707.5	76.55	286	1.1	H	16.5	0.6	0.0	15.90	34.77
707.5	79.83	229	1.8	V	20.6	0.6	0.0	20.00	34.77

LTE Band 17:

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	23.27	23.41	23.25
		RB Size=1, RB Offset=12	23.22	23.28	23.21
		RB Size=1, RB Offset=24	23.36	23.52	23.33
		RB Size=12, RB Offset=0	22.69	23.04	22.76
		RB Size=12, RB Offset=6	22.61	22.92	22.66
		RB Size=12, RB Offset=11	22.81	23.14	22.88
		RB Size=25, RB Offset=0	22.35	22.47	22.25
	16QAM	RB Size=1, RB Offset=0	23.17	23.41	23.19
		RB Size=1, RB Offset=12	23.09	23.35	23.10
		RB Size=1, RB Offset=24	23.21	23.48	23.24
		RB Size=12, RB Offset=0	22.63	23.01	22.64
		RB Size=12, RB Offset=6	22.55	22.96	22.58
		RB Size=12, RB Offset=11	22.67	23.05	22.77
		RB Size=25, RB Offset=0	22.15	22.46	22.25
10.0	QPSK	RB Size=1, RB Offset=0	23.12	23.43	23.15
		RB Size=1, RB Offset=24	23.02	23.39	23.04
		RB Size=1, RB Offset=49	23.21	23.48	23.23
		RB Size=25, RB Offset=0	23.12	23.43	23.15
		RB Size=25, RB Offset=12	23.02	23.39	23.08
		RB Size=25, RB Offset=24	23.23	23.56	23.27
		RB Size=50, RB Offset=0	22.26	22.50	22.15
	16QAM	RB Size=1, RB Offset=0	23.26	23.42	23.19
		RB Size=1, RB Offset=24	23.16	23.36	23.12
		RB Size=1, RB Offset=49	23.38	23.55	23.30
		RB Size=25, RB Offset=0	22.78	23.03	22.82
		RB Size=25, RB Offset=12	22.67	22.95	22.78
		RB Size=25, RB Offset=24	22.89	23.11	22.92
		RB Size=50, RB Offset=0	22.36	22.50	22.14

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	2.25	13	Pass
16QAM (100%RB Size)	1.62	13	Pass

ERP:

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 (dB)		
Middle Channel									
5 MHz Bandwidth									
710.00	75.1	88	1.5	H	15.1	0.6	0.0	14.5	34.77
710.00	82.01	198	1.3	V	22.8	0.6	0.0	22.2	34.77
10 MHz Bandwidth									
710.00	76.28	344	1.5	H	16.2	0.6	0.0	15.6	34.77
710.00	81.34	153	2.0	V	22.1	0.6	0.0	21.5	34.77

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 (dB)		
Middle Channel									
5 MHz Bandwidth									
710.00	75.13	216	1.6	H	15.1	0.6	0.0	14.5	34.77
710.00	81.21	69	1.9	V	22.0	0.6	0.0	21.4	34.77
10 MHz Bandwidth									
710.00	75.33	324	1.7	H	15.3	0.6	0.0	14.7	34.77
710.00	80.76	332	1.7	V	21.6	0.6	0.0	21.0	34.77

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
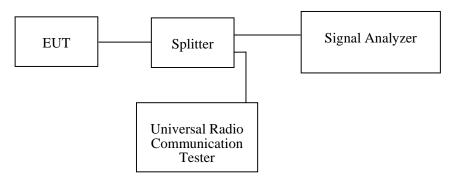
Applicable Standard

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.

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┌─────────┐      ┌──────────┐      ┌──────────────────┐
│   EUT   │──────│ Splitter │──────│  Signal Analyzer │
└─────────┘      └──────────┘      └──────────────────┘
                      │
               ┌──────────────┐
               │  Universal Radio │
               │  Communication   │
               │     Tester       │
               └──────────────┘
```

Test Data

Environmental Conditions

Temperature:	24~25 ℃
Relative Humidity:	48~50 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Hill He from 2017-10-16 to 2017-10-20.

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	243.1	318.4
EGPRS(8PSK)	836.6	254.7	321.3

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.197	4.863
HSUPA (BPSK)	836.6	4.197	4.863
HSDPA (16QAM)	836.6	4.211	4.877

PCS Band (Part 24E)
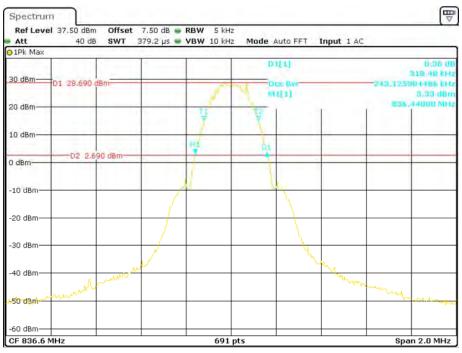
Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	243.1	318.4
EGPRS(8PSK)	1880.0	248.9	312.6

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.211	4.920
HSUPA (BPSK)	1880.0	4.197	4.863
HSDPA (16QAM)	1880.0	4.197	4.863

AWS Band (Part 27)
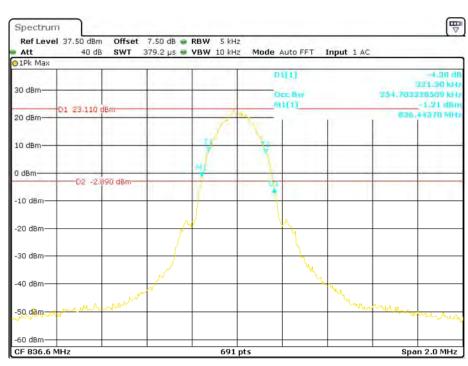
| Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.197	4.877
HSUPA (BPSK)	1880.0	4.197	4.863
HSDPA (16QAM)	1880.0	4.211	4.891

Cellular Band (Part 22H)
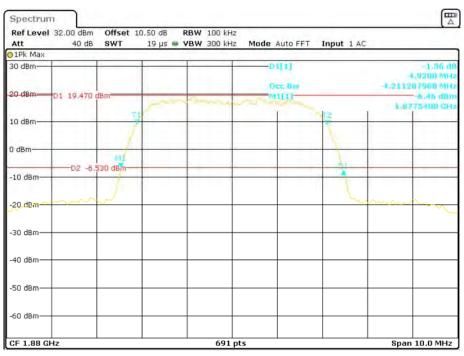### 26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode

Date: 20.OCT.2017 09:25:51
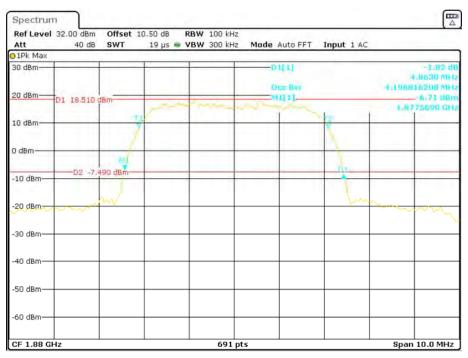
26 dB Emissions &99% Occupied Bandwidth for EDGE Mode
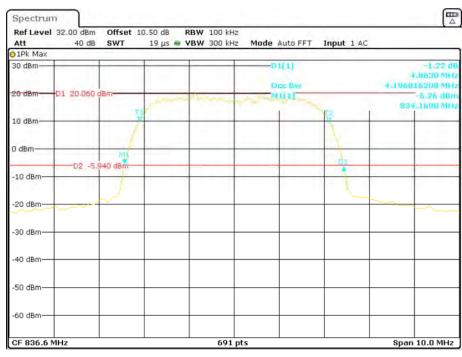
Date: 20.OCT.2017 10:44:44

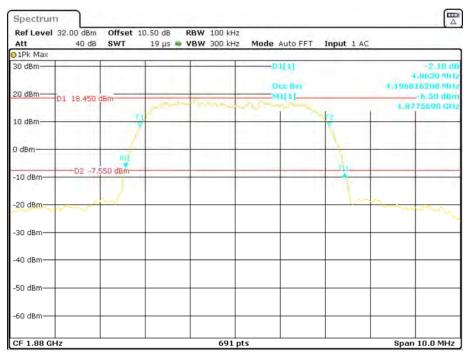## 26 dB Emissions &99% Occupied Bandwidth for RMC (BPSK) Mode
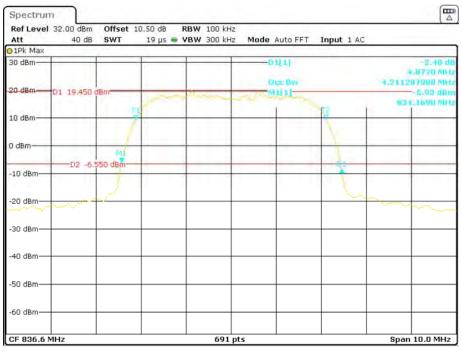
Date: 18.OCT.2017 09:26:13

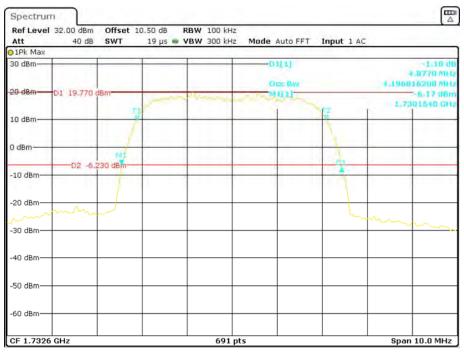## 26 dB Emissions &99% Occupied Bandwidth for HSUPA (BPSK) Mode

Date: 18.OCT.2017 10:22:21

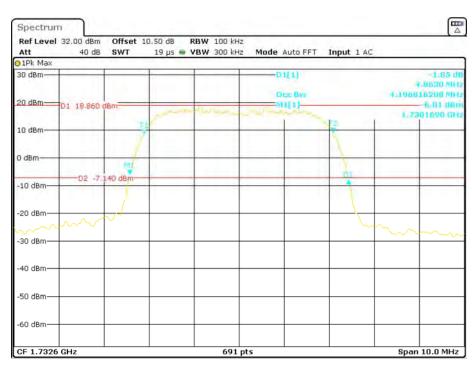### 26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode
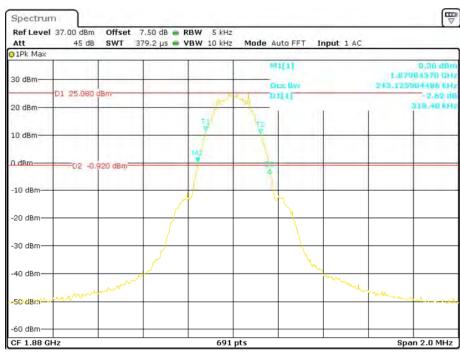
Date: 18.OCT.2017   09:43:32
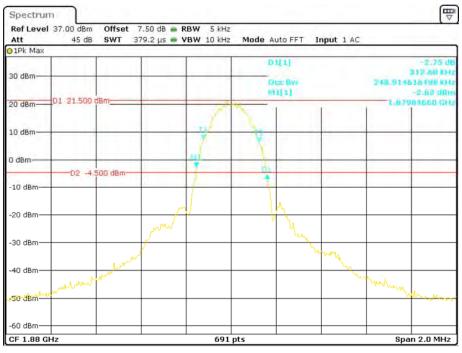
PCS Band (Part 24E)

26 dB Emissions &99% Occupied Bandwidth for GSM (GMSK) Mode

Date: 20.OCT.2017   13:50:08

26 dB Emissions &99% Occupied Bandwidth for EDGE Mode

Date: 20.OCT.2017 14:02:00

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

Date: 18.OCT.2017 09:31:27

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

Date: 18.OCT.2017 10:13:48

26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode

Date: 18.OCT.2017 09:50:53

AWS Band (Part 27)

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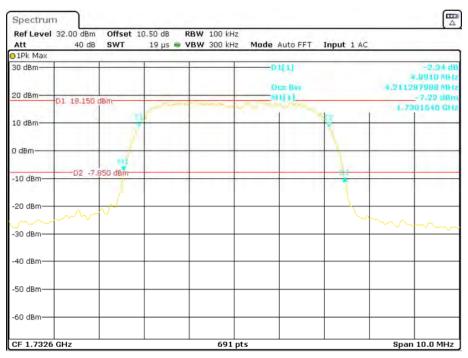

Date: 18.OCT.2017 09:32:59

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

Date: 18.OCT.2017 10:00:50

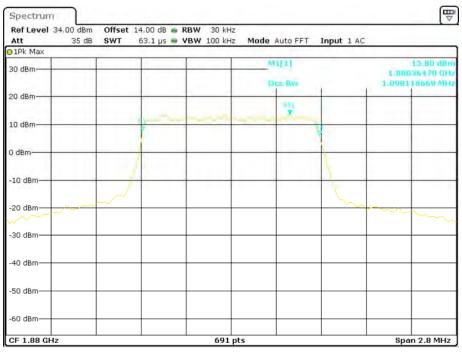**26 dB Emissions &99% Occupied Bandwidth for HSDPA (16QAM) Mode**

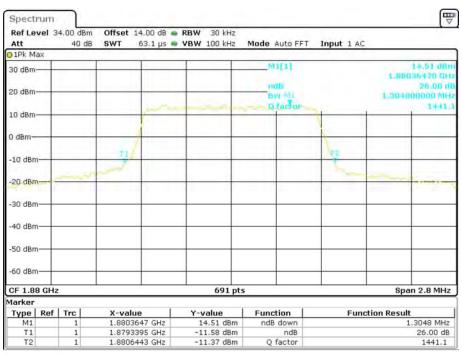Date: 18.OCT.2017 09:57:53

LTE Band 2: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.098	1.305
	16QAM	1.098	1.297
3.0	QPSK	2.692	2.918
	16QAM	2.692	2.909
5.0	QPSK	4.544	5.094
	16QAM	4.544	5.080
10.0	QPSK	8.973	9.870
	16QAM	8.973	9.870
15.0	QPSK	13.546	14.935
	16QAM	13.546	14.891
20.0	QPSK	17.945	19.508
	16QAM	17.945	19.324

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

Date: 16.OCT.2017 09:38:25

QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel

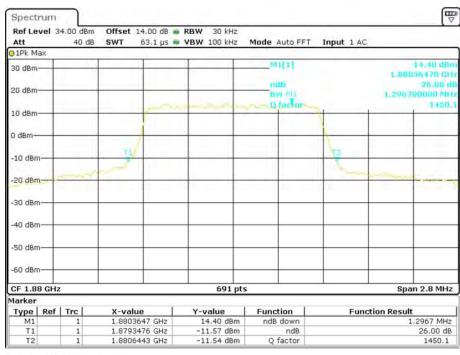| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.8803647 GHz	14.51 dBm	ndB down	1.3048 MHz
T1		1	1.8793395 GHz	-11.58 dBm	ndB	26.00 dB
T2		1	1.8806443 GHz	-11.37 dBm	Q factor	1441.1

Date: 16.OCT.2017 11:05:38

16-QAM (1.4 MHz) - 99% Occupied Bandwidth, Middle channel

Date: 16.OCT.2017 09:40:02
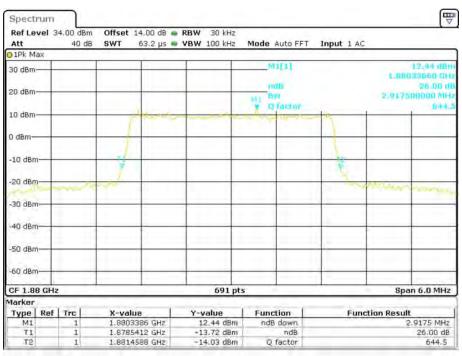
16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.8803647 GHz	14.40 dBm	ndB down	1.2967 MHz
T1		1	1.8793476 GHz	-11.57 dBm	ndB	26.00 dB
T2		1	1.8806443 GHz	-11.54 dBm	Q factor	1450.1

Date: 16.OCT.2017 11:06:57

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

Date: 16.OCT.2017　09:43:35
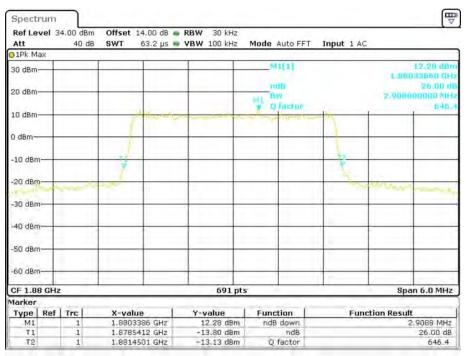
QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.8803386 GHz	12.44 dBm	ndB down	2.9175 MHz
T1		1	1.8785412 GHz	-13.72 dBm	ndB	26.00 dB
T2		1	1.8814588 GHz	-14.03 dBm	Q factor	644.5

Date: 16.OCT.2017　11:07:51

16-QAM (3.0 MHz) - 99% Occupied Bandwidth, Middle channel
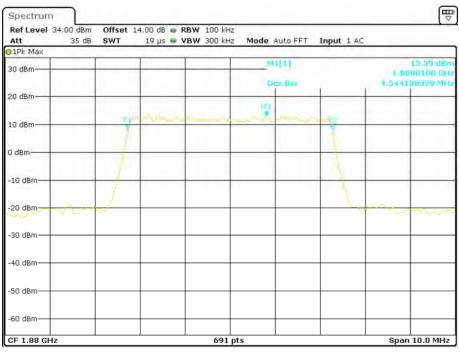
Date: 16.OCT.2017 09:43:01
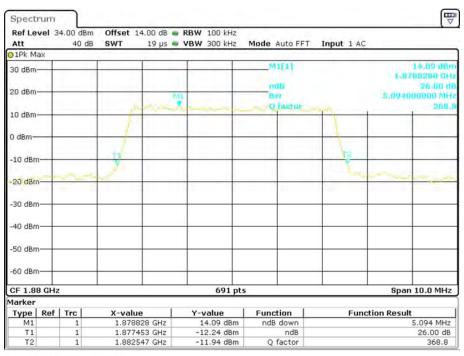
16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.8803386 GHz	12.28 dBm	ndB down	2.9088 MHz
T1		1	1.8785412 GHz	-13.80 dBm	ndB	26.00 dB
T2		1	1.8814501 GHz	-13.13 dBm	Q factor	646.4

Date: 16.OCT.2017 11:07:00

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

Date: 16.OCT.2017 09:48:20

QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.878828 GHz	14.09 dBm	ndB down	5.094 MHz
T1		1	1.877453 GHz	-12.24 dBm	ndB	26.00 dB
T2		1	1.882547 GHz	-11.94 dBm	Q factor	368.8

Date: 16.OCT.2017 11:12:06
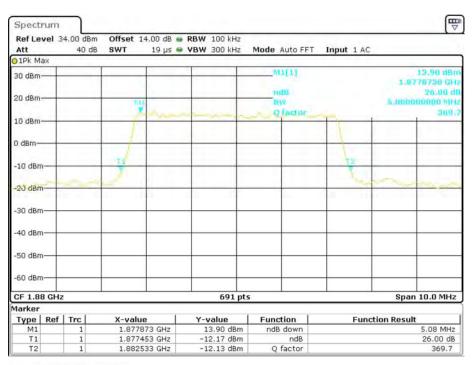
16-QAM (5.0 MHz) - 99% Occupied Bandwidth, Middle channel

Date: 16.OCT.2017 09:48:54

16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel

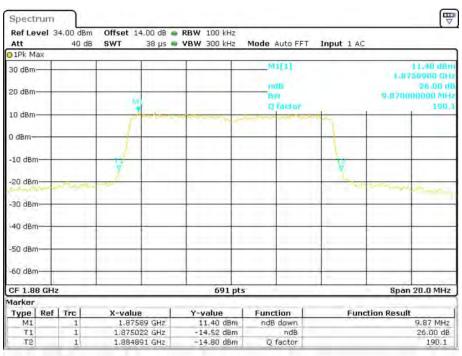| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.877873 GHz	13.90 dBm	ndB down	5.08 MHz
T1		1	1.877453 GHz	-12.17 dBm	ndB	26.00 dB
T2		1	1.882533 GHz	-12.13 dBm	Q factor	369.7

Date: 16.OCT.2017 11:12:38

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

Date: 16.OCT.2017 09:50:00

QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel

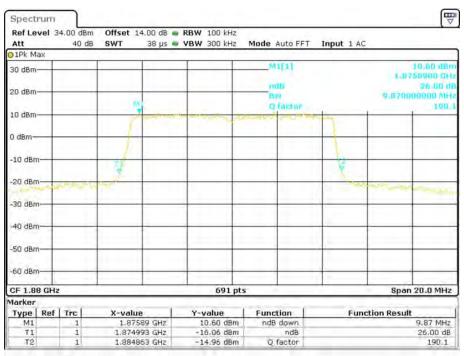| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.87589 GHz	11.40 dBm	ndB down	9.87 MHz
T1		1	1.875022 GHz	-14.52 dBm	ndB	26.00 dB
T2		1	1.884891 GHz	-14.80 dBm	Q factor	190.1

Date: 16.OCT.2017 11:13:40

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

16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.87589 GHz	10.60 dBm	ndB down	9.87 MHz
T1		1	1.874993 GHz	-16.06 dBm	ndB	26.00 dB
T2		1	1.884863 GHz	-14.96 dBm	Q factor	190.1

QPSK (15.0 MHz) - 99% Occupied Bandwidth, Middle channel
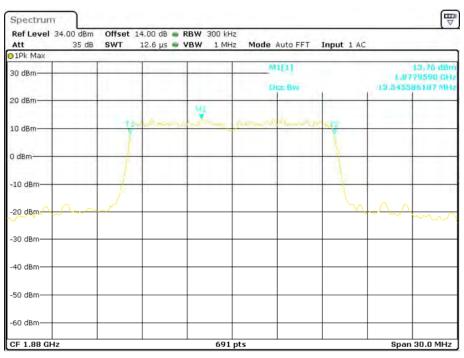
Date: 16.OCT.2017 09:51:04

QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.873922 GHz	13.30 dBm	ndB down	14.935 MHz
T1		1	1.872533 GHz	-12.67 dBm	ndB	26.00 dB
T2		1	1.887467 GHz	-12.37 dBm	Q factor	125.5

Date: 16.OCT.2017 11:14:18

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

Date: 16.OCT.2017   09:51:42
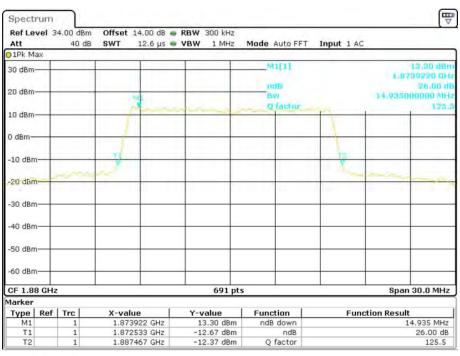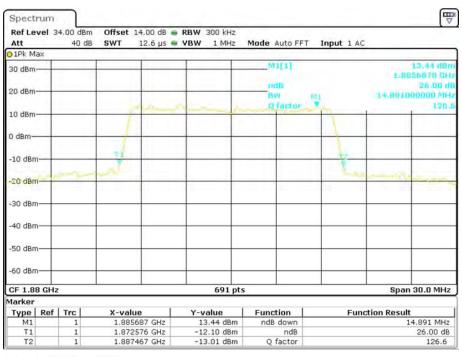
16-QAM (15.0 MHz) - 26 dB Bandwidth, Middle channel

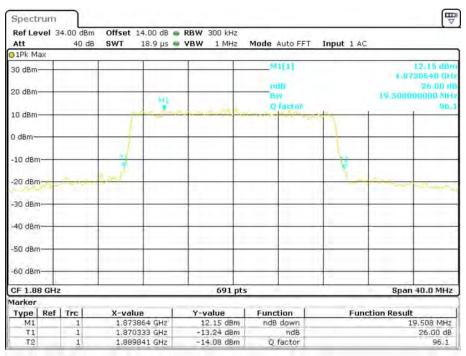| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.885687 GHz	13.44 dBm	ndB down	14.891 MHz
T1		1	1.872576 GHz	-12.10 dBm	ndB	26.00 dB
T2		1	1.887467 GHz	-13.01 dBm	Q factor	126.6

Date: 16.OCT.2017   11:14:42

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

Date: 16.OCT.2017 09:53:23
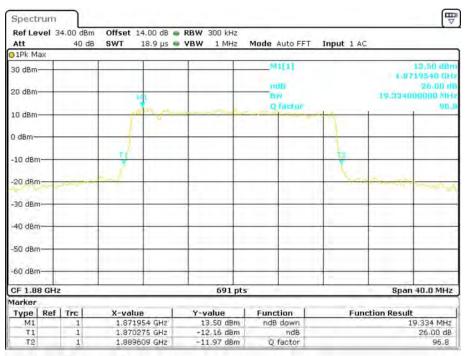
QPSK (20.0 MHz) - 26 dB Bandwidth, Middle channel

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.873864 GHz	12.15 dBm	ndB down	19.508 MHz
T1		1	1.870333 GHz	-13.24 dBm	ndB	26.00 dB
T2		1	1.889841 GHz	-14.08 dBm	Q factor	96.1

Date: 16.OCT.2017 11:18:49

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

Date: 16.OCT.2017 09:52:45

16-QAM (20.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.871954 GHz	13.50 dBm	ndB down	19.334 MHz
T1		1	1.870275 GHz	-12.16 dBm	ndB	26.00 dB
T2		1	1.889609 GHz	-11.97 dBm	Q factor	96.8

Date: 16.OCT.2017 11:18:15

LTE Band 4: (Middle Channel)
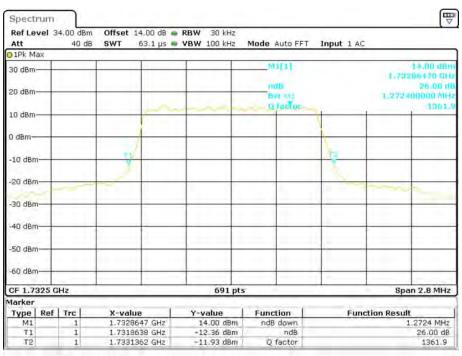
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.094	1.272
	16QAM	1.098	1.272
3.0	QPSK	2.683	2.918
	16QAM	2.692	2.909
5.0	QPSK	4.544	5.094
	16QAM	4.544	5.094
10.0	QPSK	8.973	9.783
	16QAM	8.973	9.696
15.0	QPSK	13.546	14.805
	16QAM	13.502	14.761
20.0	QPSK	17.945	19.334
	16QAM	17.945	19.334

QPSK (1.4 MHz) - 99% Occupied Bandwidth, Middle channel
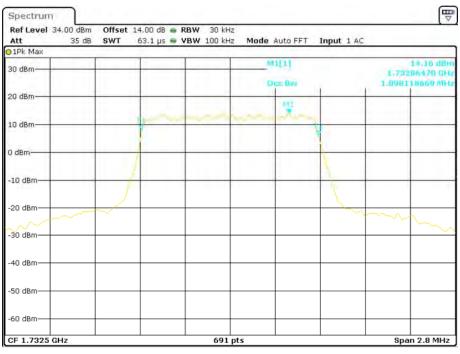
Date: 16.OCT.2017   09:55:03
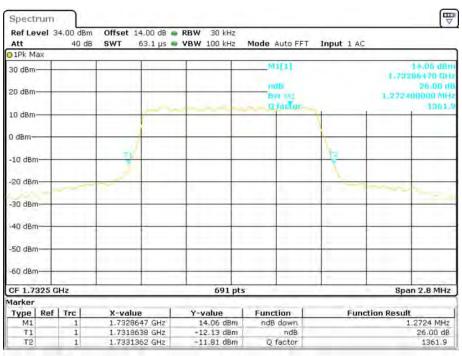
QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7328647 GHz	14.00 dBm	ndB down	1.2724 MHz
T1		1	1.7318639 GHz	-12.36 dBm	ndB	26.00 dB
T2		1	1.7331362 GHz	-11.93 dBm	Q factor	1361.9

Date: 16.OCT.2017 11:04:30

16-QAM (1.4 MHz) - 99% Occupied Bandwidth, Middle channel
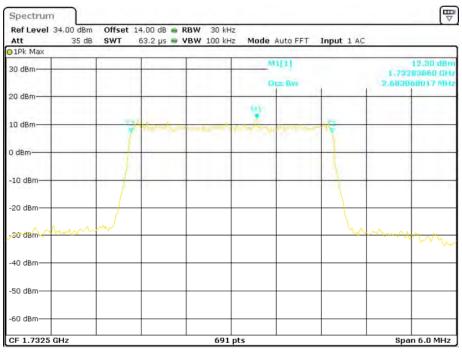
Date: 16.OCT.2017 09:55:44
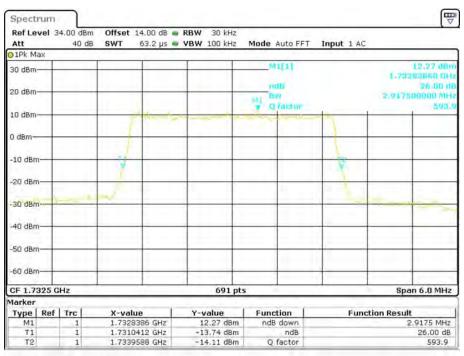
16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7328647 GHz	14.06 dBm	ndB down	1.2724 MHz
T1		1	1.7318639 GHz	-12.13 dBm	ndB	26.00 dB
T2		1	1.7331362 GHz	-11.81 dBm	Q factor	1361.9

Date: 16.OCT.2017 11:09:11

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

Date: 16.OCT.2017 09:57:24

QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel

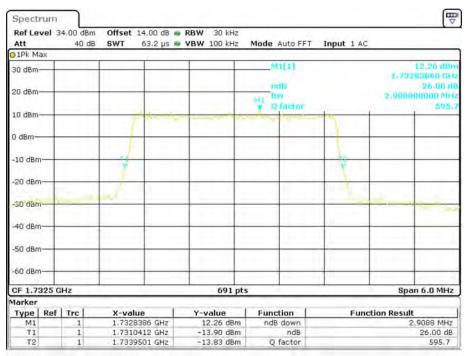| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7328386 GHz	12.27 dBm	ndB down	2.9175 MHz
T1		1	1.7310412 GHz	-13.74 dBm	ndB	26.00 dB
T2		1	1.7339588 GHz	-14.11 dBm	Q factor	593.9

Date: 16.OCT.2017 11:06:13

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

Date: 16.OCT.2017 09:56:48

16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.7328386 GHz	12.26 dBm	ndB down	2.9088 MHz
T1		1	1.7310412 GHz	-13.90 dBm	ndB	26.00 dB
T2		1	1.7339501 GHz	-13.83 dBm	Q factor	595.7

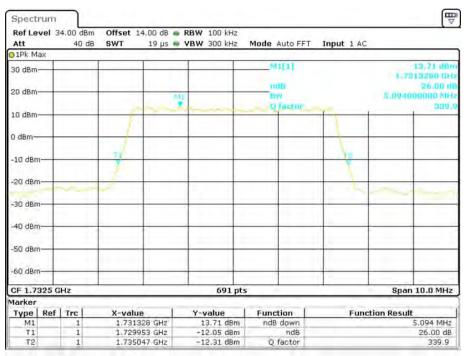Date: 16.OCT.2017 11:05:38

QPSK (5.0 MHz) - 99% Occupied Bandwidth, Middle channel
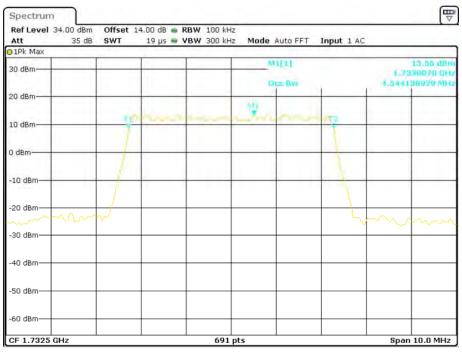
Date: 16.OCT.2017 10:01:15

QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.731328 GHz	13.71 dBm	ndB down	5.094 MHz
T1		1	1.729953 GHz	-12.05 dBm	ndB	26.00 dB
T2		1	1.735047 GHz	-12.31 dBm	Q factor	339.9

Date: 16.OCT.2017 11:38:38

16-QAM (5.0 MHz) - 99% Occupied Bandwidth, Middle channel
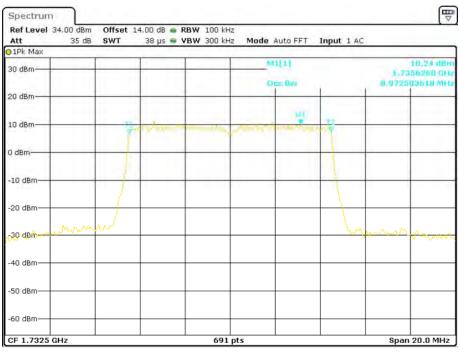
Date: 16.OCT.2017 10:01:45

16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel

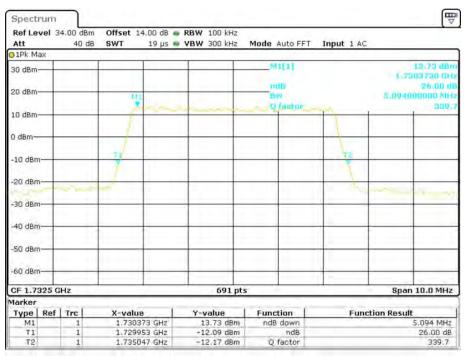| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.730373 GHz	13.73 dBm	ndB down	5.094 MHz
T1		1	1.729953 GHz	-12.09 dBm	ndB	26.00 dB
T2		1	1.735047 GHz	-12.17 dBm	Q factor	339.7

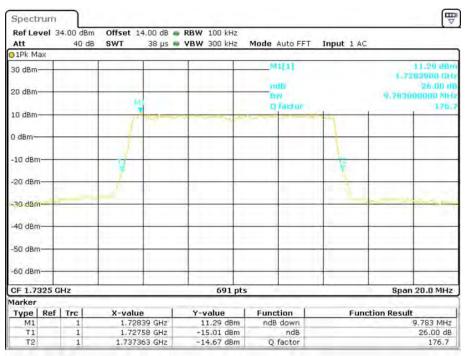Date: 16.OCT.2017 11:38:53

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

Date: 16.OCT.2017   10:02:53

QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel

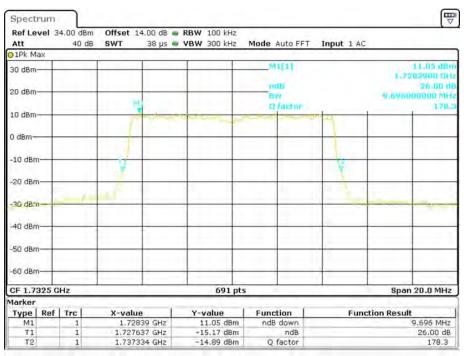| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.72839 GHz	11.29 dBm	ndB down	9.783 MHz
T1		1	1.72758 GHz	-15.01 dBm	ndB	26.00 dB
T2		1	1.737363 GHz	-14.67 dBm	Q factor	176.7

Date: 16.OCT.2017   11:31:55

16-QAM (10.0 MHz) - 99% Occupied Bandwidth, Middle channel
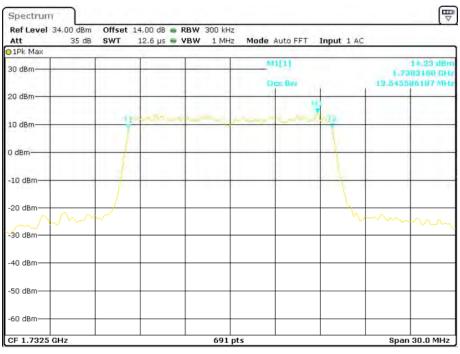
Date: 16.OCT.2017   10:02:25

16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel

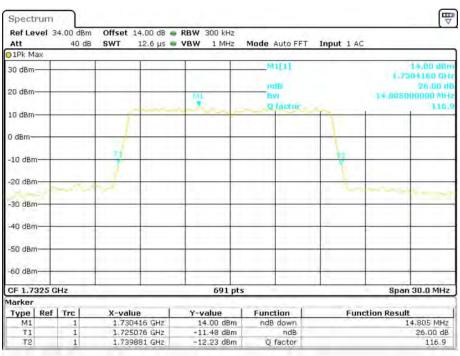| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.72839 GHz	11.05 dBm	ndB down	9.696 MHz
T1		1	1.727637 GHz	-15.17 dBm	ndB	26.00 dB
T2		1	1.737334 GHz	-14.89 dBm	Q factor	178.3

Date: 16.OCT.2017   11:31:19

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

Date: 16.OCT.2017 10:05:37

QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.730416 GHz	14.00 dBm	ndB down	14.805 MHz
T1		1	1.725076 GHz	-11.48 dBm	ndB	26.00 dB
T2		1	1.739881 GHz	-12.23 dBm	Q factor	116.9

Date: 16.OCT.2017 11:34:30

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

16-QAM (15.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.730416 GHz	14.30 dBm	ndB down	14.761 MHz
T1		1	1.725163 GHz	-12.18 dBm	ndB	26.00 dB
T2		1	1.739924 GHz	-11.97 dBm	Q factor	117.2

Date: 16.OCT.2017 11:34:59

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

Date: 16.OCT.2017 10:07:13

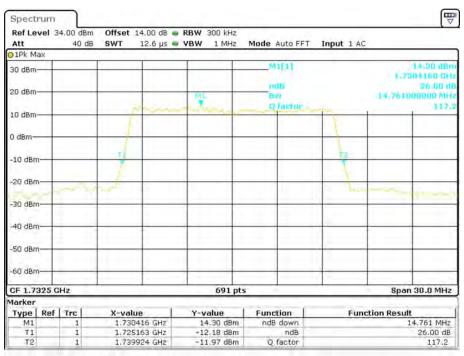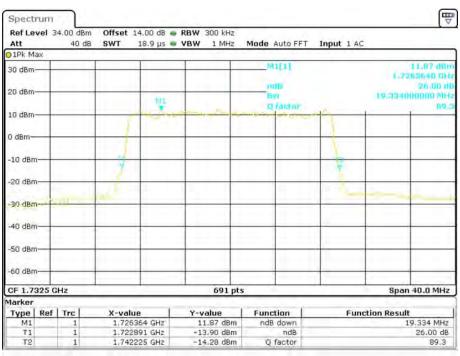## QPSK (20.0 MHz) - 26 dB Bandwidth, Middle channel

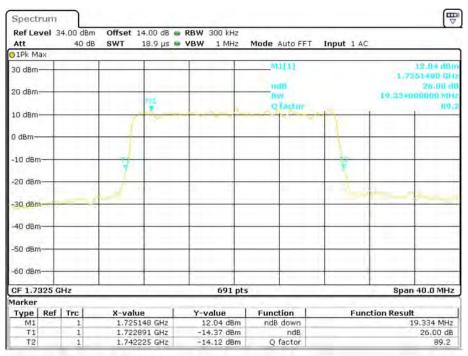| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.726364 GHz	11.87 dBm	ndB down	19.334 MHz
T1		1	1.722891 GHz	-13.90 dBm	ndB	26.00 dB
T2		1	1.742225 GHz	-14.28 dBm	Q factor	89.3

Date: 16.OCT.2017 11:36:18

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

Date: 16.OCT.2017 10:06:38

16-QAM (20.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.725148 GHz	12.04 dBm	ndB down	19.334 MHz
T1		1	1.722891 GHz	-14.37 dBm	ndB	26.00 dB
T2		1	1.742225 GHz	-14.12 dBm	Q factor	89.2

Date: 16.OCT.2017 11:35:37

LTE Band 5: (Middle Channel)

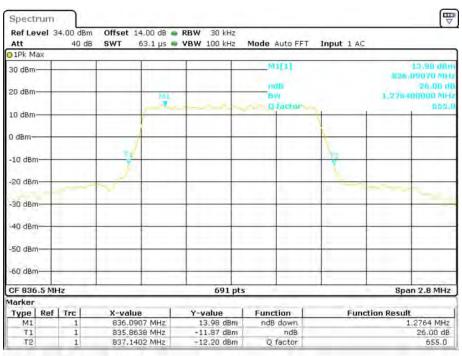| Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.094	1.276
	16QAM	1.098	1.268
3.0	QPSK	2.692	2.909
	16QAM	2.683	2.918
5.0	QPSK	4.544	5.080
	16QAM	4.544	5.080
10.0	QPSK	8.973	9.754
	16QAM	8.973	9.754

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

Date: 16.OCT.2017 10:09:08

QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	836.0907 MHz	13.98 dBm	ndB down	1.2764 MHz
T1		1	835.8638 MHz	-11.87 dBm	ndB	26.00 dB
T2		1	837.1402 MHz	-12.20 dBm	Q factor	655.0

Date: 16.OCT.2017 11:45:48

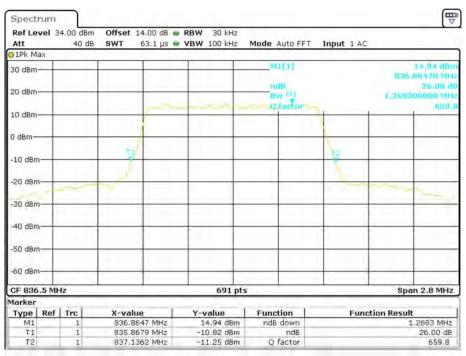**16-QAM (1.4 MHz) - 99% Occupied Bandwidth, Middle channel**
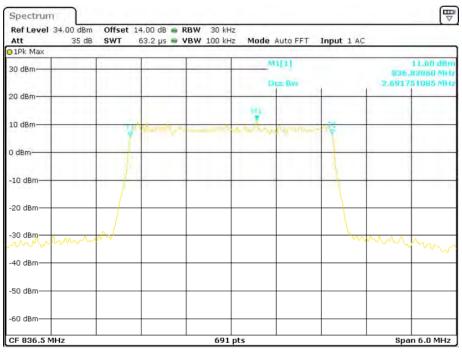
Date: 16.OCT.2017 10:09:55

16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel

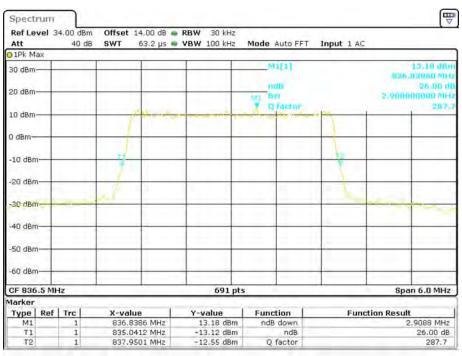| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	836.8647 MHz	14.94 dBm	ndB down	1.2683 MHz
T1		1	835.8679 MHz	-10.82 dBm	ndB	26.00 dB
T2		1	837.1362 MHz	-11.25 dBm	Q factor	659.8

Date: 16.OCT.2017 11:46:00

QPSK (3.0 MHz) - 99% Occupied Bandwidth, Middle channel
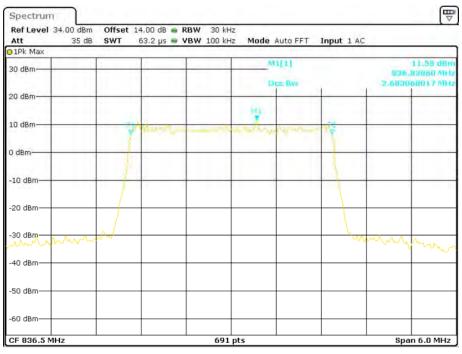
Date: 16.OCT.2017 10:18:59

QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel

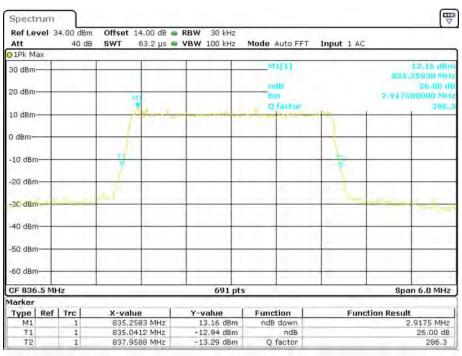| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	836.8386 MHz	13.18 dBm	ndB down	2.9088 MHz
T1		1	835.0412 MHz	-13.12 dBm	ndB	26.00 dB
T2		1	837.9501 MHz	-12.55 dBm	Q factor	287.7

Date: 16.OCT.2017 11:47:28

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

Date: 16.OCT.2017 10:18:26

16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel

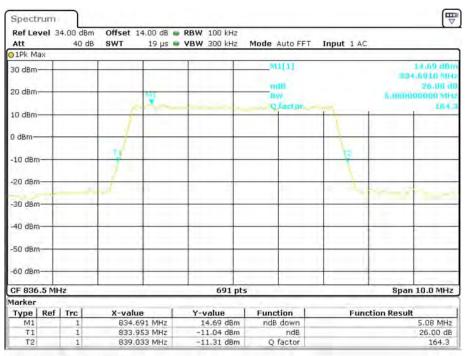| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	835.2583 MHz	13.16 dBm	ndB down	2.9175 MHz
T1		1	835.0412 MHz	-12.94 dBm	ndB	26.00 dB
T2		1	837.9588 MHz	-13.29 dBm	Q factor	286.3

Date: 16.OCT.2017 11:46:56

QPSK (5.0 MHz) - 99% Occupied Bandwidth, Middle channel
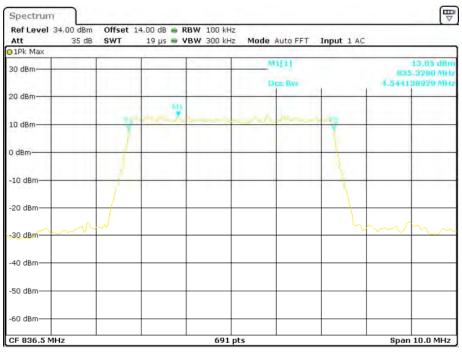
Date: 16.OCT.2017 10:19:45

QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	834.691 MHz	14.69 dBm	ndB down	5.08 MHz
T1		1	833.953 MHz	-11.04 dBm	ndB	26.00 dB
T2		1	839.033 MHz	-11.31 dBm	Q factor	164.3

Date: 16.OCT.2017 11:48:12

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

Date: 16.OCT.2017 10:20:18

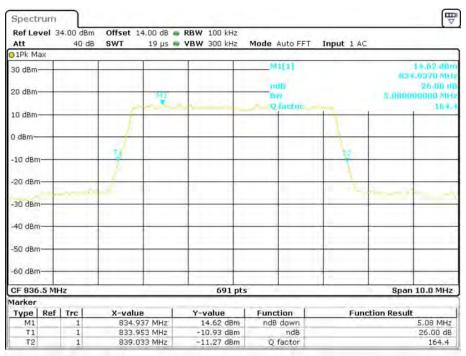**16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel**

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	834.937 MHz	14.62 dBm	ndB down	5.08 MHz
T1		1	833.953 MHz	-10.93 dBm	ndB	26.00 dB
T2		1	839.033 MHz	-11.27 dBm	Q factor	164.4

Date: 16.OCT.2017 11:48:36
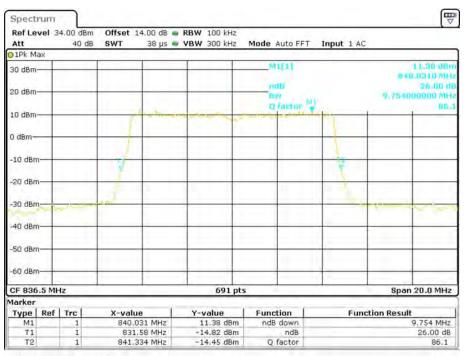
QPSK (10.0 MHz) - 99% Occupied Bandwidth, Middle channel

Date: 16.OCT.2017 10:22:01

QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel
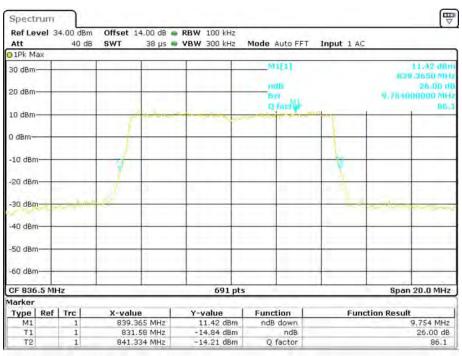
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	840.031 MHz	11.38 dBm	ndB down	9.754 MHz
T1		1	831.58 MHz	-14.82 dBm	ndB	26.00 dB
T2		1	841.334 MHz	-14.45 dBm	Q factor	86.1

Date: 16.OCT.2017 11:49:34

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

Date: 16.OCT.2017 10:21:00

16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	839.365 MHz	11.42 dBm	ndB down	9.754 MHz
T1		1	831.58 MHz	-14.84 dBm	ndB	26.00 dB
T2		1	841.334 MHz	-14.21 dBm	Q factor	86.1

Date: 16.OCT.2017 11:49:04

LTE Band 7: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.515	5.065
	16QAM	4.544	5.080
10.0	QPSK	8.973	9.725
	16QAM	8.973	9.783
15.0	QPSK	13.502	15.022
	16QAM	13.502	14.935
20.0	QPSK	17.945	19.276
	16QAM	17.945	19.334
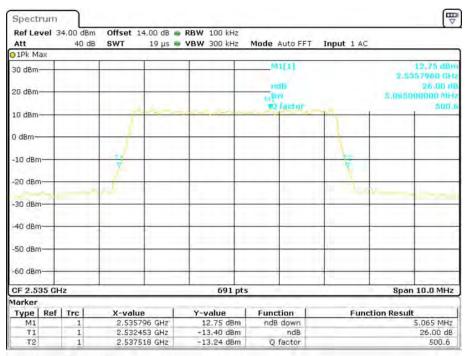
QPSK (5.0 MHz) - 99% Occupied Bandwidth, Middle channel

Date: 16.OCT.2017 10:28:33

QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel

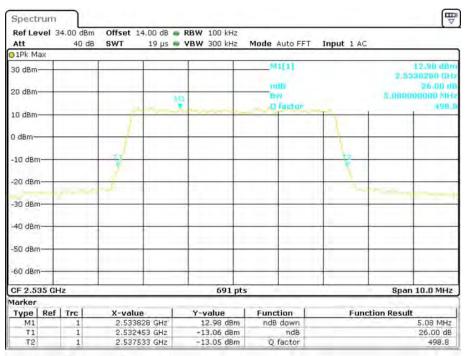| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.535796 GHz	12.75 dBm	ndB down	5.065 MHz
T1		1	2.532453 GHz	-13.40 dBm	ndB	26.00 dB
T2		1	2.537518 GHz	-13.24 dBm	Q factor	500.6

Date: 16.OCT.2017 11:51:51

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

Date: 16.OCT.2017   10:29:09

16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel

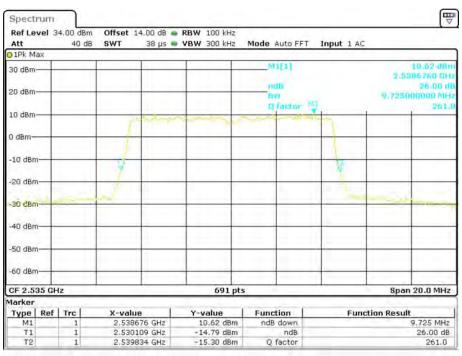| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.533828 GHz	12.98 dBm	ndB down	5.08 MHz
T1		1	2.532453 GHz	-13.06 dBm	ndB	26.00 dB
T2		1	2.537533 GHz	-13.05 dBm	Q factor	498.8

Date: 16.OCT.2017   11:53:33

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

Date: 16.OCT.2017 10:33:08

QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel

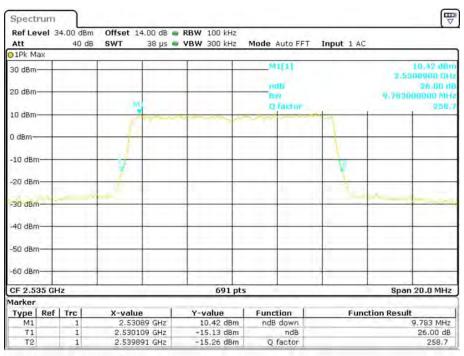| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.538676 GHz	10.62 dBm	ndB down	9.725 MHz
T1		1	2.530109 GHz	-14.79 dBm	ndB	26.00 dB
T2		1	2.539834 GHz	-15.30 dBm	Q factor	261.0

Date: 16.OCT.2017 13:78:48

16-QAM (10.0 MHz) - 99% Occupied Bandwidth, Middle channel
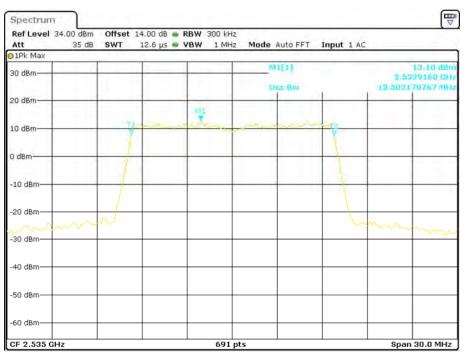
Date: 16.OCT.2017 10:32:34

16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.53089 GHz	10.42 dBm	ndB down	9.783 MHz
T1		1	2.530109 GHz	-15.13 dBm	ndB	26.00 dB
T2		1	2.539891 GHz	-15.26 dBm	Q factor	258.7

Date: 16.OCT.2017 13:78:03

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

Date: 16.OCT.2017 10:33:59
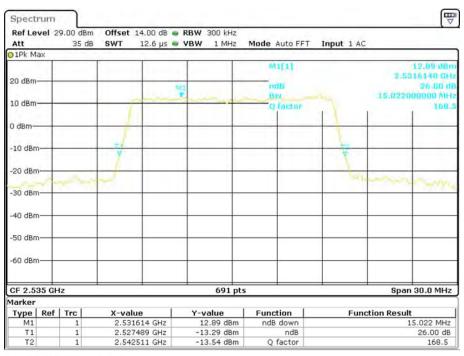
QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.531614 GHz	12.89 dBm	ndB down	15.022 MHz
T1		1	2.527489 GHz	-13.29 dBm	ndB	26.00 dB
T2		1	2.542511 GHz	-13.54 dBm	Q factor	168.5

Date: 19.OCT.2017 08:41:58

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

Spectrum							
Ref Level 34.00 dBm	Offset 14.00 dB	RBW 300 kHz					
Att 35 dB	SWT 12.6 μs	VBW 1 MHz	Mode Auto FFT	Input 1 AC			

● 1Pk Max

M1[1]   12.90 dBm
                             2.5329160 GHz
Occ Bw   13.502170767 MHz

30 dBm
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm

CF 2.535 GHz   691 pts   Span 30.0 MHz

Date: 16.OCT.2017 10:34:30

16-QAM (15.0 MHz) - 26 dB Bandwidth, Middle channel

Spectrum							
Ref Level 29.00 dBm	Offset 14.00 dB	RBW 300 kHz					
Att 35 dB	SWT 12.6 μs	VBW 1 MHz	Mode Auto FFT	Input 1 AC			

● 1Pk Max

M1[1]   14.13 dBm
                             2.5400180 GHz
ndB   26.00 dB
Bw   14.935000000 MHz
Q factor   170.1

20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm

CF 2.535 GHz   691 pts   Span 30.0 MHz

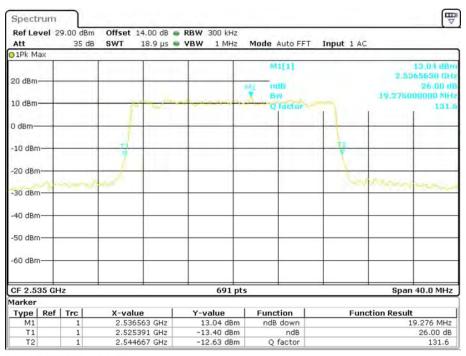| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.540818 GHz	14.13 dBm	ndB down	14.935 MHz
T1		1	2.527576 GHz	-12.24 dBm	ndB	26.00 dB
T2		1	2.542511 GHz	-11.49 dBm	Q factor	170.1
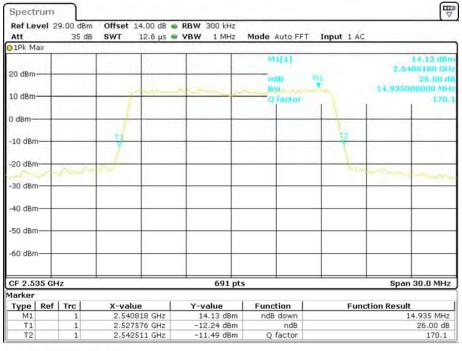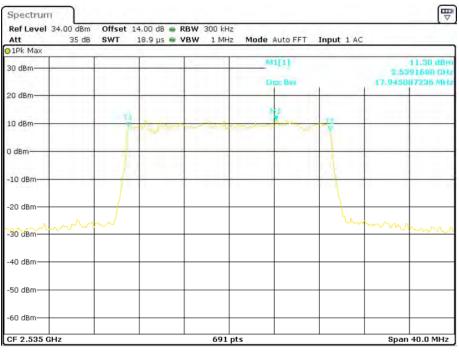
Date: 19.OCT.2017 08:40:57

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

Date: 16.OCT.2017 10:35:35

QPSK (20.0 MHz) - 26 dB Bandwidth, Middle channel

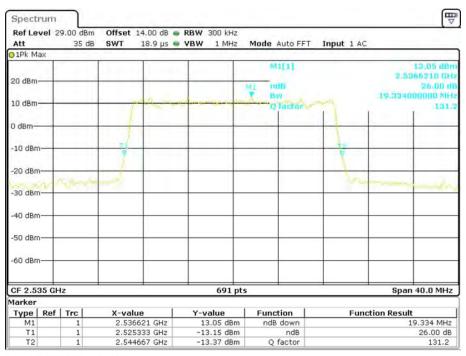| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.536563 GHz	13.04 dBm	ndB down	19.276 MHz
T1		1	2.525391 GHz	-13.40 dBm	ndB	26.00 dB
T2		1	2.544667 GHz	-12.63 dBm	Q factor	131.6

Date: 19.OCT.2017 08:42:36

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

Date: 16.OCT.2017 10:34:57

16-QAM (20.0 MHz) - 26 dB Bandwidth, Middle channel

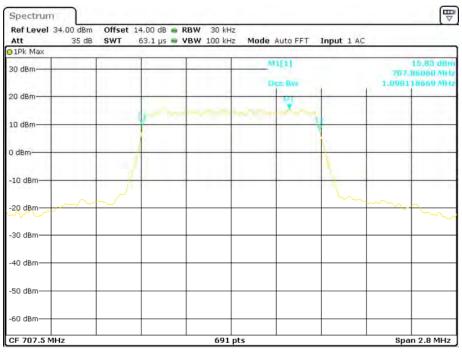| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.536621 GHz	13.05 dBm	ndB down	19.334 MHz
T1		1	2.525333 GHz	-13.15 dBm	ndB	26.00 dB
T2		1	2.544667 GHz	-13.37 dBm	Q factor	131.2

Date: 19.OCT.2017 08:43:08

BAND 12:

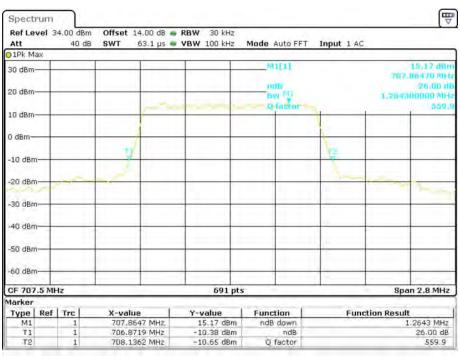| Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.098	1.264
	16QAM	1.098	1.268
3.0	QPSK	2.683	2.900
	16QAM	2.692	2.918
5.0	QPSK	4.530	5.080
	16QAM	4.544	5.080
10.0	QPSK	8.973	9.754
	16QAM	8.944	9.783

QPSK (1.4 MHz) - 99% Occupied Bandwidth, Middle channel
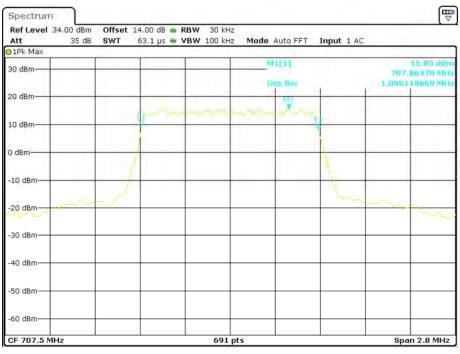
Date: 16.OCT.2017 10:46:10

QPSK (1.4 MHz) -26 dB Bandwidth, Middle channel

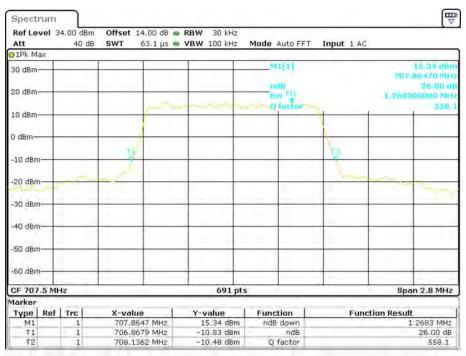| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	707.8647 MHz	15.17 dBm	ndB down	1.2643 MHz
T1		1	706.8719 MHz	-10.38 dBm	ndB	26.00 dB
T2		1	708.1362 MHz	-10.65 dBm	Q factor	559.9

Date: 16.OCT.2017 13:38:07

16-QAM (1.4 MHz) - 99% Occupied Bandwidth, Middle channel

Date: 16.OCT.2017 10:46:52
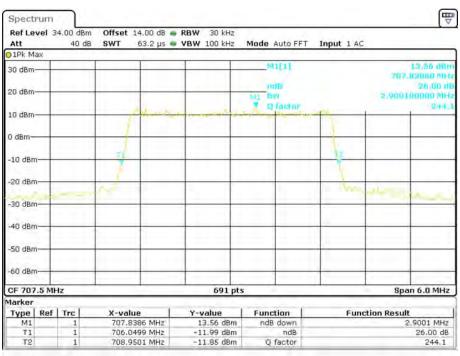
16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	707.8647 MHz	15.34 dBm	ndB down	1.2683 MHz
T1		1	706.8679 MHz	-10.83 dBm	ndB	26.00 dB
T2		1	708.1362 MHz	-10.48 dBm	Q factor	558.1

Date: 16.OCT.2017 13:31:38

QPSK (3.0 MHz) - 99% Occupied Bandwidth, Middle channel
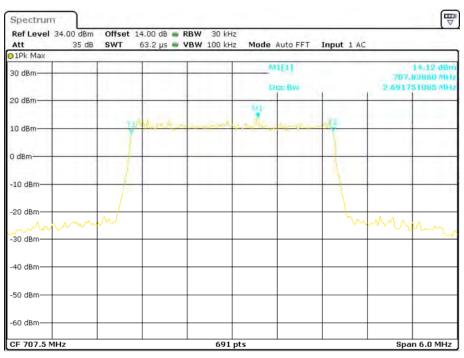
Date: 16.OCT.2017 10:48:57

QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	707.8386 MHz	13.56 dBm	ndB down	2.9001 MHz
T1		1	706.0499 MHz	-11.99 dBm	ndB	26.00 dB
T2		1	708.9501 MHz	-11.85 dBm	Q factor	244.1

Date: 16.OCT.2017 13:33:13

16-QAM (3.0 MHz) - 99% Occupied Bandwidth, Middle channel
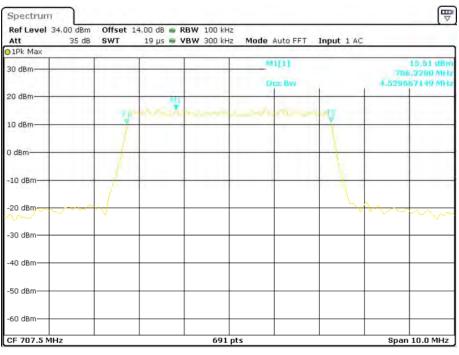
Date: 16.OCT.2017 10:48:24
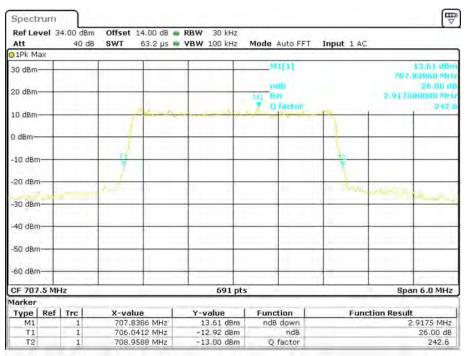
16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel

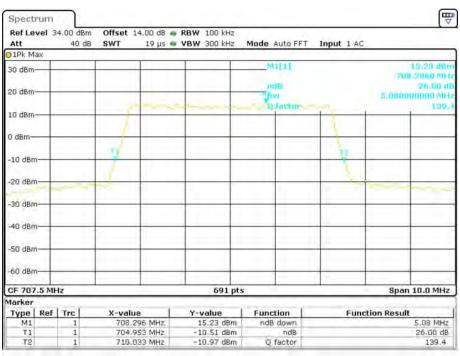| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	707.8386 MHz	13.61 dBm	ndB down	2.9175 MHz
T1		1	706.0412 MHz	-12.92 dBm	ndB	26.00 dB
T2		1	708.9588 MHz	-13.00 dBm	Q factor	242.6

Date: 16.OCT.2017 13:33:11

QPSK (5 MHz) - 99% Occupied Bandwidth, Middle channel
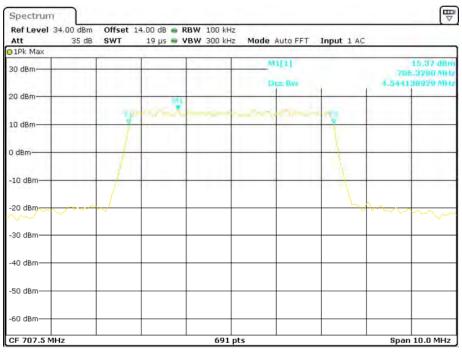
Date: 16.OCT.2017　10:49:31

QPSK (5 MHz) - 26 dB Bandwidth, Middle channel

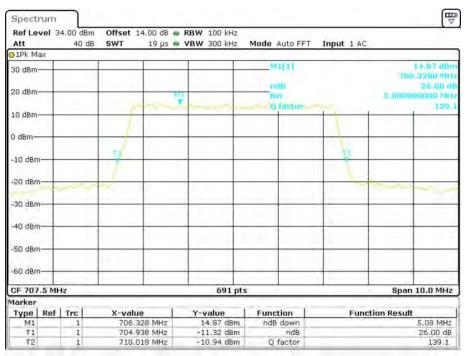| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	708.296 MHz	15.23 dBm	ndB down	5.08 MHz
T1		1	704.953 MHz	-10.51 dBm	ndB	26.00 dB
T2		1	710.033 MHz	-10.97 dBm	Q factor	139.4

Date: 16.OCT.2017　13:34:31

16-QAM (5 MHz) - 99% Occupied Bandwidth, Middle channel
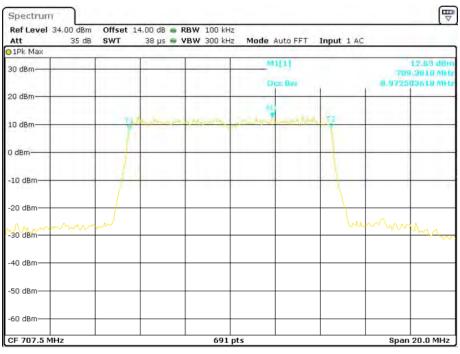
Date: 16.OCT.2017　10:50:01

16-QAM (5MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	706.328 MHz	14.87 dBm	ndB down	5.08 MHz
T1		1	704.938 MHz	-11.32 dBm	ndB	26.00 dB
T2		1	710.018 MHz	-10.94 dBm	Q factor	139.1

Date: 16.OCT.2017　13:34:51

QPSK (10 MHz) - 99% Occupied Bandwidth, Middle channel

Date: 16.OCT.2017 10:51:05
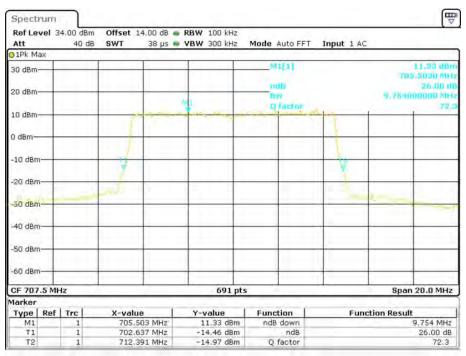
QPSK (10 MHz) - 26 dB Bandwidth, Middle channel

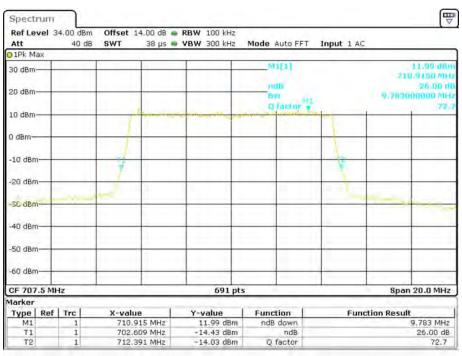| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	705.503 MHz	11.33 dBm	ndB down	9.754 MHz
T1		1	702.637 MHz	-14.46 dBm	ndB	26.00 dB
T2		1	712.391 MHz	-14.97 dBm	Q factor	72.3

Date: 16.OCT.2017 13:36:26

16-QAM (10MHz) - 99% Occupied Bandwidth, Middle channel

Date: 16.OCT.2017 10:50:29

16-QAM (10MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	710.915 MHz	11.99 dBm	ndB down	9.783 MHz
T1		1	702.609 MHz	-14.43 dBm	ndB	26.00 dB
T2		1	712.391 MHz	-14.03 dBm	Q factor	72.7

Date: 16.OCT.2017 13:35:36

LTE Band 17: (Middle Channel)

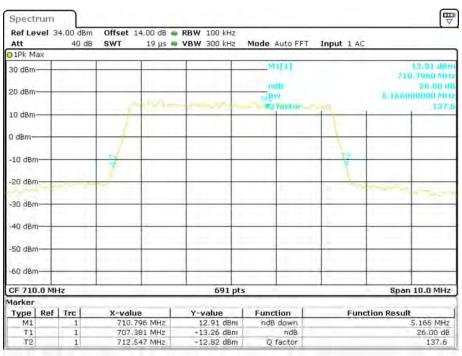| Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.544	5.166
	16QAM	4.530	5.065
10.0	QPSK	8.944	9.754
	16QAM	8.944	9.725

QPSK (5.0 MHz) - 99% Occupied Bandwidth, Middle channel
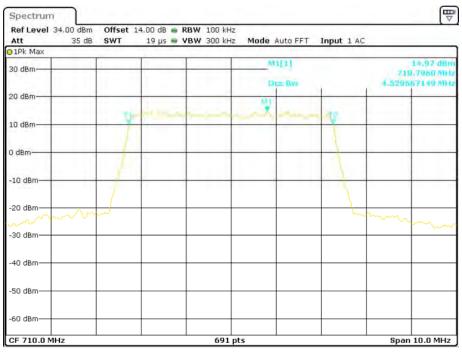
Date: 16.OCT.2017 10:54:56

QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel

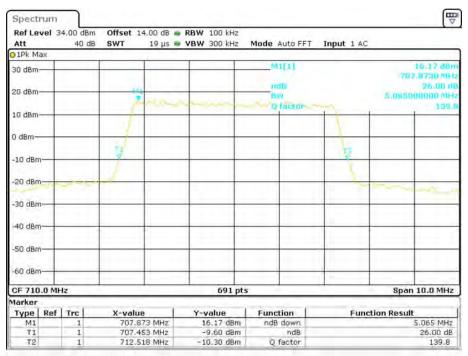| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	710.796 MHz	12.91 dBm	ndB down	5.166 MHz
T1		1	707.381 MHz	-13.26 dBm	ndB	26.00 dB
T2		1	712.547 MHz	-12.82 dBm	Q factor	137.6

Date: 16.OCT.2017 13:37:35

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

Date: 16.OCT.2017　10:55:34

16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel

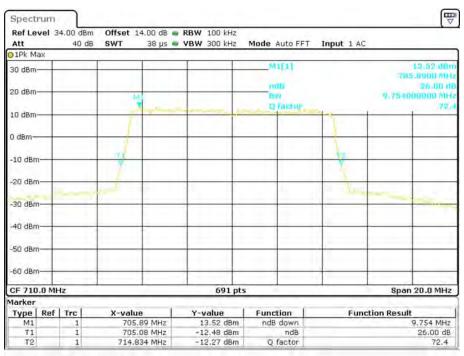| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	707.873 MHz	16.17 dBm	ndB down	5.065 MHz
T1		1	707.453 MHz	-9.60 dBm	ndB	26.00 dB
T2		1	712.518 MHz	-10.30 dBm	Q factor	139.8

Date: 16.OCT.2017　13:33:08

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

Date: 16.OCT.2017 10:56:33

QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel

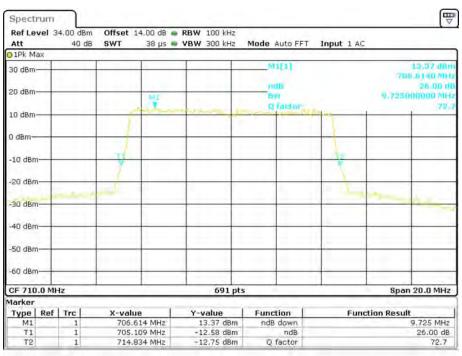| Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	705.89 MHz	13.52 dBm	ndB down	9.754 MHz
T1		1	705.08 MHz	-12.48 dBm	ndB	26.00 dB
T2		1	714.834 MHz	-12.27 dBm	Q factor	72.4

Date: 16.OCT.2017 13:39:38

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

Date: 16.OCT.2017 10:56:04

16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	706.614 MHz	13.37 dBm	ndB down	9.725 MHz
T1		1	705.109 MHz	-12.58 dBm	ndB	26.00 dB
T2		1	714.834 MHz	-12.75 dBm	Q factor	72.7

Date: 16.OCT.2017 13:38:39

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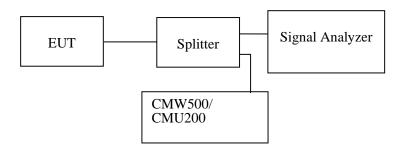
Applicable Standard

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:	21~24 ℃
Relative Humidity:	49~50 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by Hill He from 2017-10-16 to 2017-10-21.
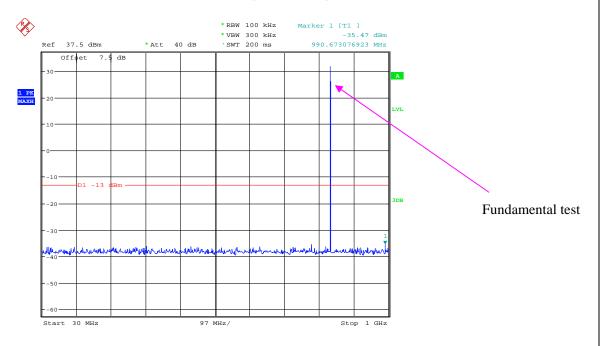
Test result: Compliance,

EUT operation mode: transmitting

Please refer to the following plots.

Cellular Band (Part 22H)
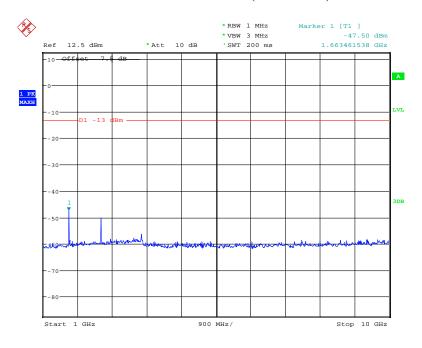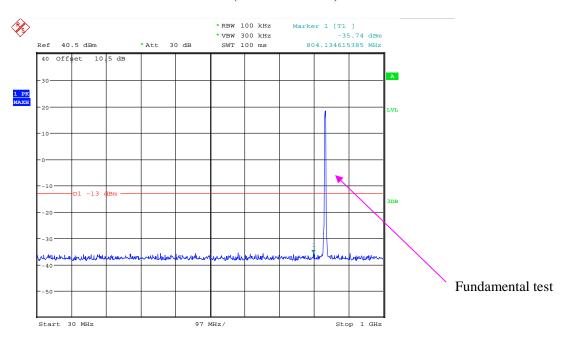
30 MHz – 1 GHz (GSM Mode)

```
                                    *RBW  100 kHz    Marker 1 [T1 ]
                                    *VBW  300 kHz              -35.47 dBm
         Ref  37.5 dBm    *Att  40 dB    'SWT 200 ms    990.673076923 MHz
            Offset   7.5 dB                                              A

           30

  1 PK      20
  MAXH                                                                   LVL

           10

            0

          -10  D1 -13 dBm                                               3DB

          -20                                                Fundamental test

          -30
                                                                        1
          -40

          -50

          -60
         Start  30 MHz              97 MHz/              Stop  1 GHz
```

Date: 21.OCT.2017 08:37:07

1 GHz – 10 GHz (GSM Mode)

```
                                    *RBW  1 MHz     Marker 1 [T1 ]
                                    *VBW  3 MHz               -47.50 dBm
         Ref  12.5 dBm    *Att  10 dB    'SWT 200 ms    1.663461538 GHz
          -10  Offset   7.5 dB                                          A

  1 PK      0
  MAXH                                                                   LVL

          -10  D1 -13 dBm

          -20

          -30

          -40

                                                                        3DB
          -50  1

          -60

          -70

          -80
         Start  1 GHz               900 MHz/             Stop  10 GHz
```
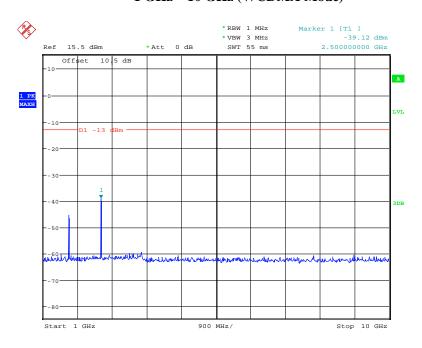
Date: 21.OCT.2017 08:40:42

30 MHz – 1 GHz (WCDMA Mode)

Fundamental test

Date: 19.OCT.2017 08:44:20
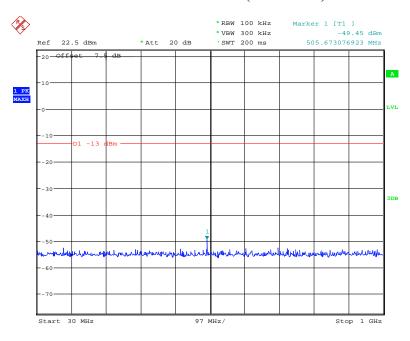
1 GHz – 10 GHz (WCDMA Mode)

Date: 19.OCT.2017 08:47:02
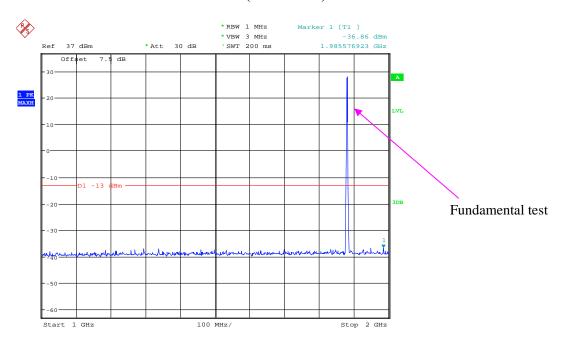
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)
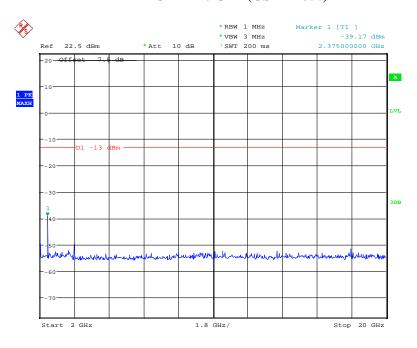
```
                                        *RBW 100 kHz    Marker 1 [T1 ]
                                        *VBW 300 kHz            -49.45 dBm
        Ref  22.5 dBm      *Att  20 dB  'SWT 200 ms     505.673076923 MHz
```



```
Date: 21.OCT.2017  08:44:12
```

1 GHz – 2 GHz (GSM Mode)

```
                                        *RBW 1 MHz     Marker 1 [T1 ]
                                        *VBW 3 MHz             -36.86 dBm
        Ref  37 dBm       *Att  30 dB   'SWT 200 ms    1.985576923 GHz
```


Fundamental test
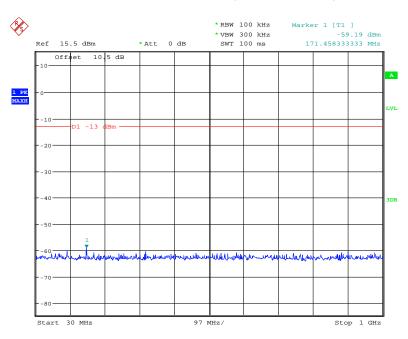
```
Date: 21.OCT.2017  08:42:55
```

2 GHz – 20 GHz (GSM Mode)

```
                                    * RBW  1 MHz      Marker 1 [T1 ]
                                    * VBW  3 MHz              -39.17 dBm
       Ref  22.5 dBm      * Att  10 dB    ' SWT 200 ms    2.375000000 GHz
   -20  Offset   7.5 dB
                                                                    A
   -10

1 PK   0                                                           LVL
MAXH
   -10  ─D1 -13 dBm──────────────────────────────────────────────

   -20

   -30                                                            3DB
      1
   -40

   -50

   -60

   -70

     Start  2 GHz            1.8 GHz/              Stop  20 GHz
```
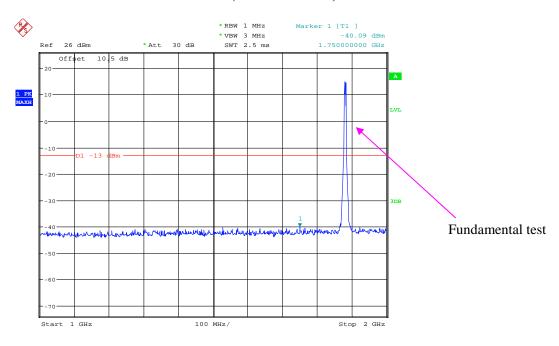
Date: 21.OCT.2017 08:43:20

30 MHz – 1 GHz (WCDMA Mode)

```
                                    * RBW 100 kHz     Marker 1 [T1 ]
                                    * VBW 300 kHz             -59.19 dBm
       Ref  15.5 dBm      * Att   0 dB     SWT 100 ms   171.458333333 MHz
     -10  Offset   10.5 dB
                                                                    A
1 PK   0                                                           LVL
MAXH
   -10  ─D1 -13 dBm──────────────────────────────────────────────

   -20

   -30

   -40                                                            3DB

   -50
         1
   -60

   -70

   -80

     Start  30 MHz           97 MHz/               Stop  1 GHz
```
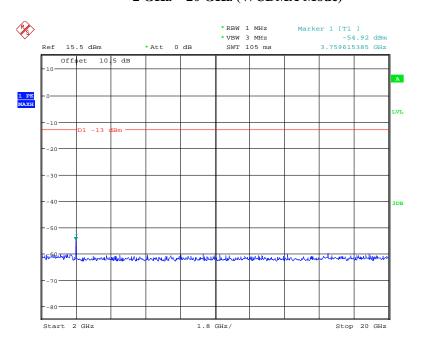
Date: 19.OCT.2017 08:49:29

1 GHz – 2 GHz (WCDMA Mode)

Fundamental test

Date: 19.OCT.2017 08:47:56
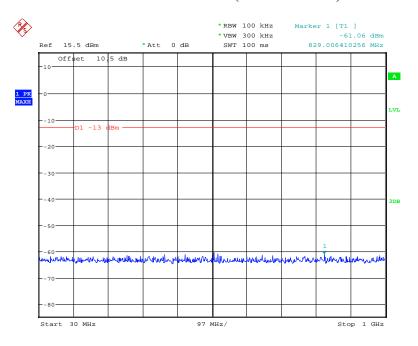
2 GHz – 20 GHz (WCDMA Mode)

Date: 19.OCT.2017 08:48:32
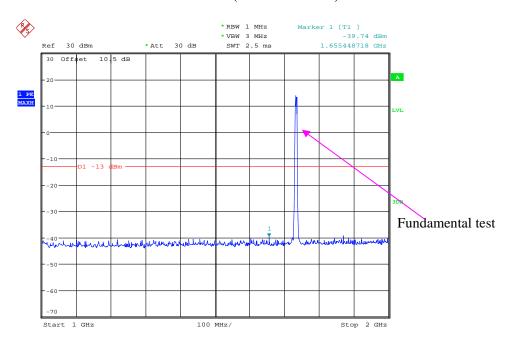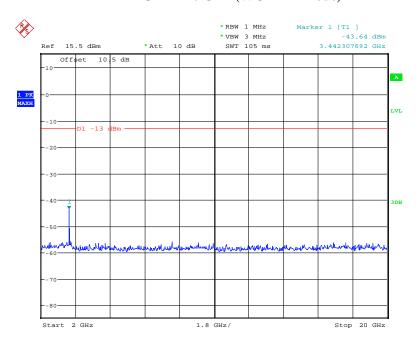
AWS Band (Part 27)

30 MHz – 1 GHz (WCDMA Mode)

```
                                        *RBW 100 kHz    Marker 1 [T1 ]
                                        *VBW 300 kHz           -61.06 dBm
        Ref  15.5 dBm      *Att  0 dB    SWT 100 ms      829.006410256 MHz
           Offset  10.5 dB                                                    A
      -10
   1 PK
   MAXH  -0                                                                   LVL
      -10
           D1 -13 dBm
      -20
      -30
      -40                                                                     3DB
      -50
      -60                                        1
      -70
      -80
        Start  30 MHz              97 MHz/              Stop 1 GHz
```

Date: 19.OCT.2017 08:50:14

1 GHz – 2 GHz (WCDMA Mode)

```
                                        *RBW 1 MHz     Marker 1 [T1 ]
                                        *VBW 3 MHz            -39.74 dBm
        Ref  30 dBm       *Att  30 dB    SWT 2.5 ms      1.655448718 GHz
        30 Offset  10.5 dB                                                    A
      -20
   1 PK
   MAXH  -10                                                                  LVL
      -0
      -10
           D1 -13 dBm
      -20
      -30                                                                     3DB
      -40                              1                    Fundamental test
      -50
      -60
      -70
        Start  1 GHz               100 MHz/             Stop 2 GHz
```

Date: 19.OCT.2017 08:50:48

2 GHz – 20 GHz (WCDMA Mode)

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz              -43.64 dBm
        Ref  15.5 dBm    *Att  10 dB    SWT 105 ms      3.442307692 GHz
           Offset  10.5 dB                                           A
  1 PK
  MAXH
                                                                    LVL

           D1 -13 dBm

                                                                    3DB
       1
```

Start 2 GHz   1.8 GHz/   Stop 20 GHz
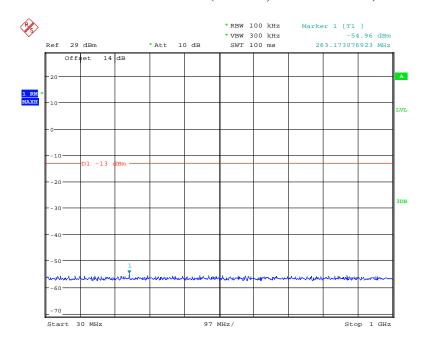
Date: 19.OCT.2017 08:51:25
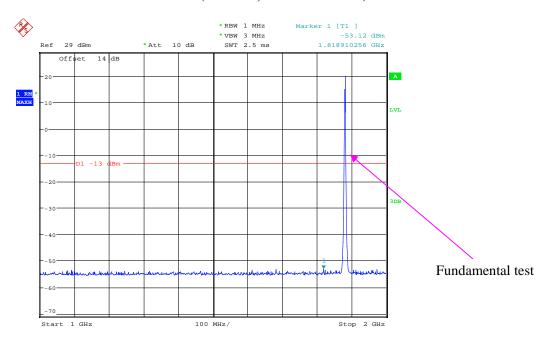
LTE Band 2:

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

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz            -54.96 dBm
        Ref  29 dBm      *Att  10 dB    SWT 100 ms      263.173076923 MHz
           Offset  14 dB                                             A
  1 RM *
  MAXH
                                                                    LVL

           D1 -13 dBm
                                                                    3DB

                   1
```

Start 30 MHz   97 MHz/   Stop 1 GHz
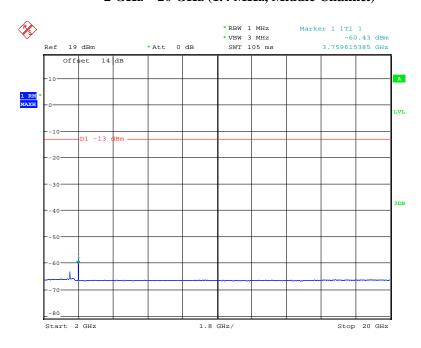
Date: 17.OCT.2017 08:43:09

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

Fundamental test
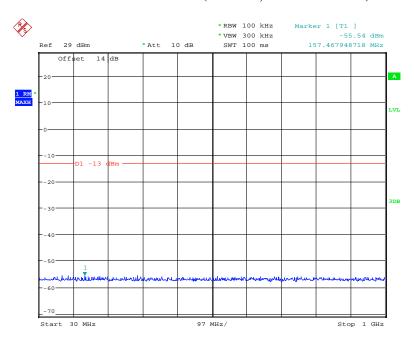
Date: 17.OCT.2017 08:47:04

2 GHz – 20 GHz (1.4 MHz, Middle Channel)
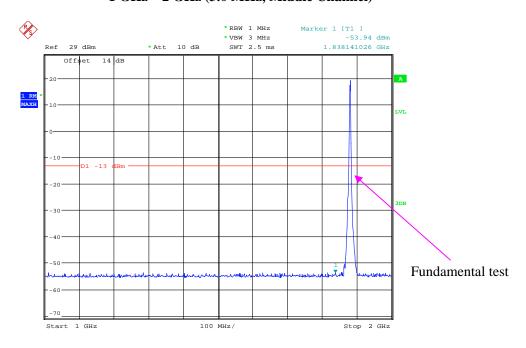
Date: 17.OCT.2017 08:51:51

30 MHz - 1 GHz (3.0 MHz, Middle Channel)
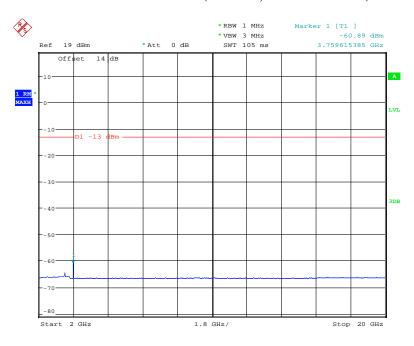
Date: 17.OCT.2017 08:45:05
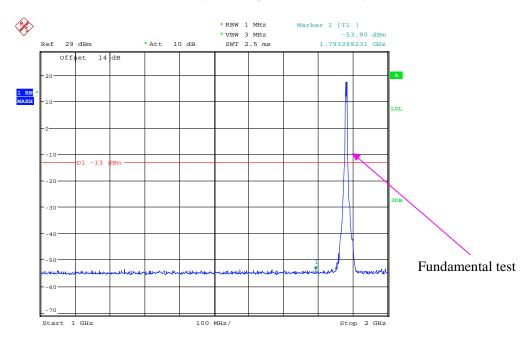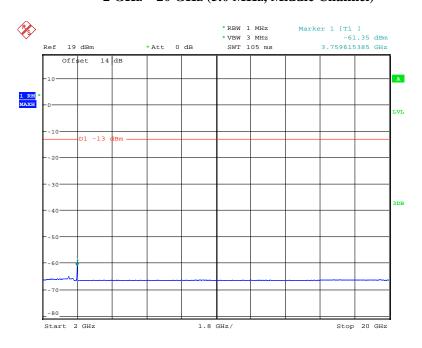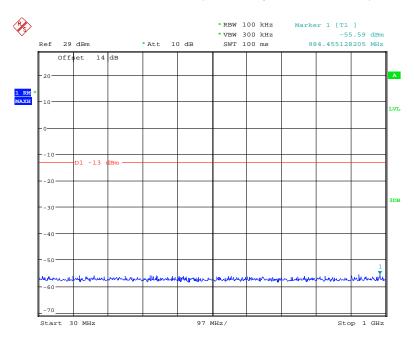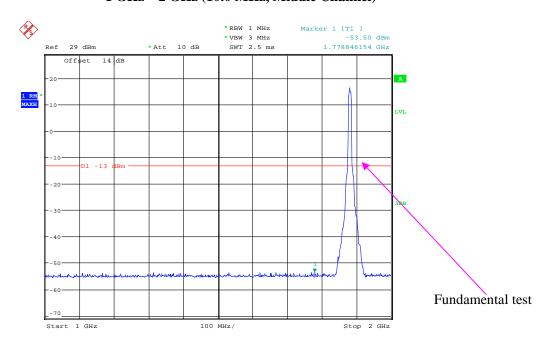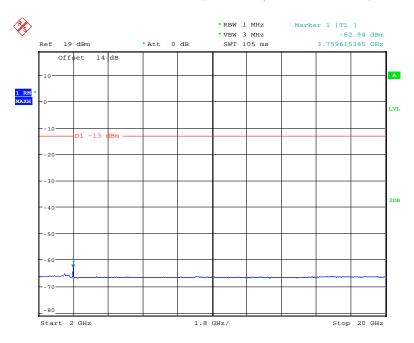
1 GHz – 2 GHz (3.0 MHz, Middle Channel)
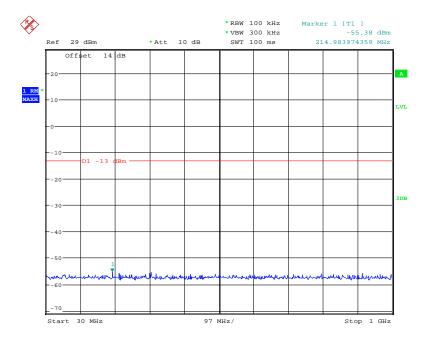

Fundamental test
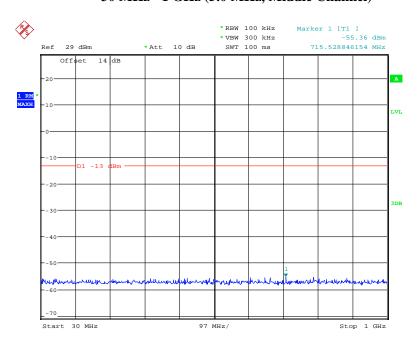
Date: 17.OCT.2017 08:47:35

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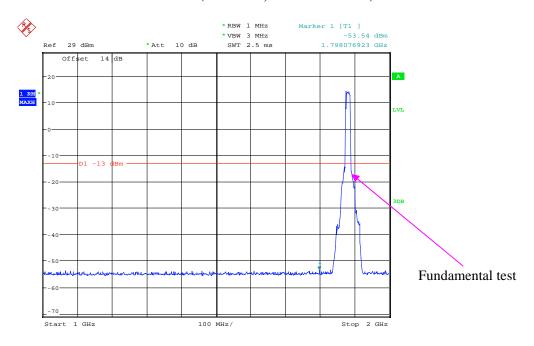

Date: 17.OCT.2017 08:52:15

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

Date: 17.OCT.2017 08:45:24

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

Fundamental test

Date: 17.OCT.2017 08:48:25

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

Date: 17.OCT.2017 08:51:20
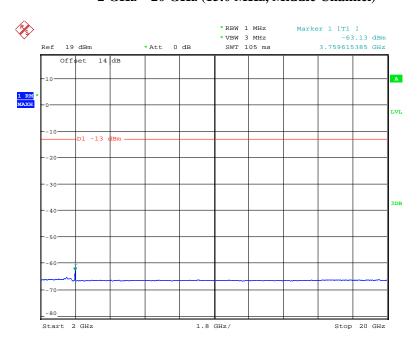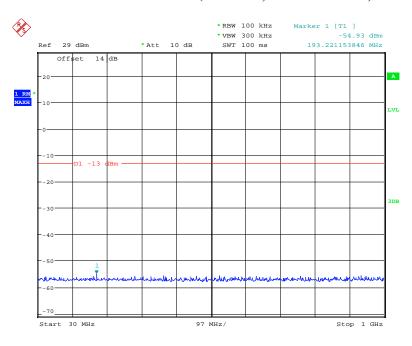
30 MHz - 1 GHz (10.0 MHz, Middle Channel)

```
                                        * RBW 100 kHz    Marker 1 [T1 ]
                                        * VBW 300 kHz              -55.59 dBm
        Ref  29 dBm           * Att 10 dB   SWT 100 ms    984.455128205 MHz
          Offset  14 dB
```

Date: 17.OCT.2017 08:45:40

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

```
                                        * RBW 1 MHz      Marker 1 [T1 ]
                                        * VBW 3 MHz                -53.50 dBm
        Ref  29 dBm           * Att 10 dB   SWT 2.5 ms     1.778846154 GHz
          Offset  14 dB
```

Fundamental test

Date: 17.OCT.2017 08:48:52

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

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz              -62.94 dBm
        Ref  19 dBm    *Att  0 dB    SWT 105 ms      3.759615385 GHz
```



```
Date: 17.OCT.2017  08:52:46
```

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

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz            -55.38 dBm
        Ref  29 dBm    *Att  10 dB   SWT 100 ms      214.983974359 MHz
```



```
Date: 17.OCT.2017  08:45:55
```

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

Fundamental test

Date: 17.OCT.2017 08:49:20

2 GHz – 20 GHz (15.0 MHz, Middle Channel)
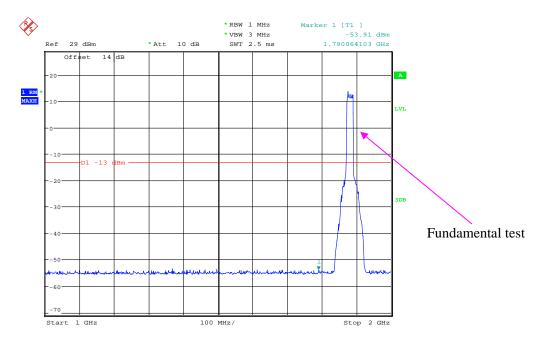
Date: 17.OCT.2017 08:53:02
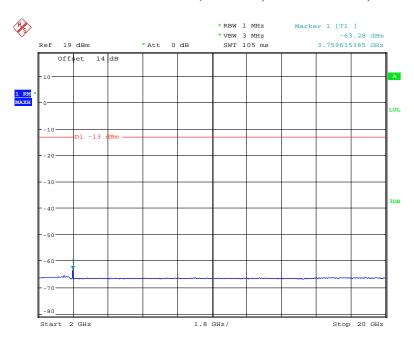
30 MHz - 1 GHz (20.0 MHz, Middle Channel)

```
                              * RBW 100 kHz    Marker 1 [T1 ]
                              * VBW 300 kHz              -54.93 dBm
     Ref  29 dBm      * Att  10 dB    SWT 100 ms    193.221153846 MHz
        Offset  14 dB
```

Date: 17.OCT.2017 08:46:14

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

```
                              * RBW 1 MHz      Marker 1 [T1 ]
                              * VBW 3 MHz               -53.91 dBm
     Ref  29 dBm      * Att  10 dB    SWT 2.5 ms    1.790064103 GHz
        Offset  14 dB
```

Fundamental test

Date: 17.OCT.2017 08:49:40

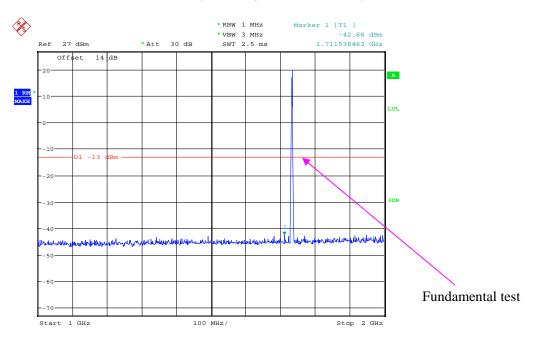**2 GHz –20 GHz (20.0 MHz, Middle Channel)**
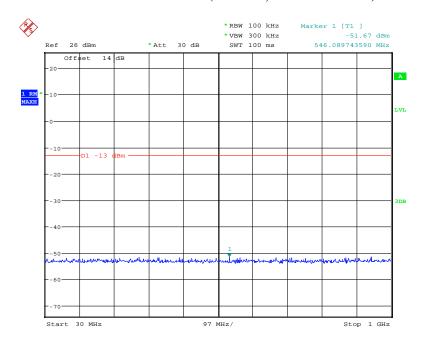
Date: 17.OCT.2017 08:53:17

LTE Band 4:
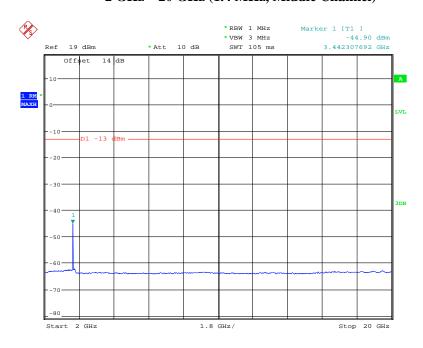
30 MHz - 1 GHz (1.4 MHz, Middle Channel)

Date: 17.OCT.2017 09:00:47

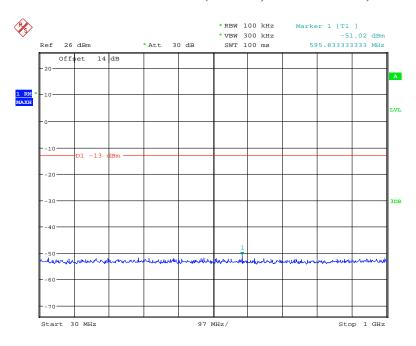**1 GHz – 2 GHz (1.4 MHz, Middle Channel)**

Fundamental test

Date: 17.OCT.2017 09:29:35

2 GHz – 20 GHz (1.4 MHz, Middle Channel)
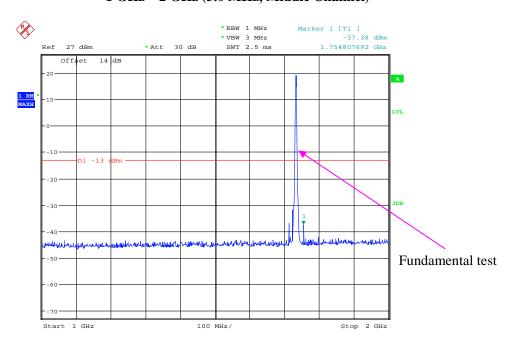
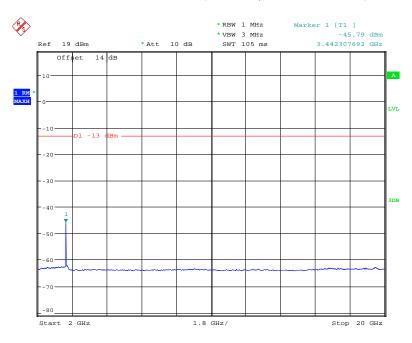Date: 17.OCT.2017 08:54:31

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

```
                                    * RBW 100 kHz    Marker 1 [T1 ]
                                    * VBW 300 kHz              -51.02 dBm
     Ref   26 dBm      * Att  30 dB   SWT 100 ms      595.833333333 MHz
        Offset  14 dB
```

Date: 17.OCT.2017 09:01:12

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

```
                                    * RBW 1 MHz      Marker 1 [T1 ]
                                    * VBW 3 MHz                -37.38 dBm
     Ref   27 dBm      * Att  30 dB   SWT 2.5 ms       1.754807692 GHz
        Offset  14 dB
```

Fundamental test

Date: 17.OCT.2017 09:30:12

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

```
                                    * RBW  1 MHz      Marker 1 [T1 ]
                                    * VBW  3 MHz                -45.79 dBm
        Ref  19 dBm     * Att  10 dB  SWT 105 ms        3.442307692 GHz
            Offset  14 dB                                                 [A]
     -10

 1 RM *
 MAXH  -0                                                                LVL

     --10
          D1 -13 dBm

     --20

     --30
                                                                        3DB
     --40

          1
     --50

     --60

     --70

     --80
        Start 2 GHz              1.8 GHz/              Stop 20 GHz
```
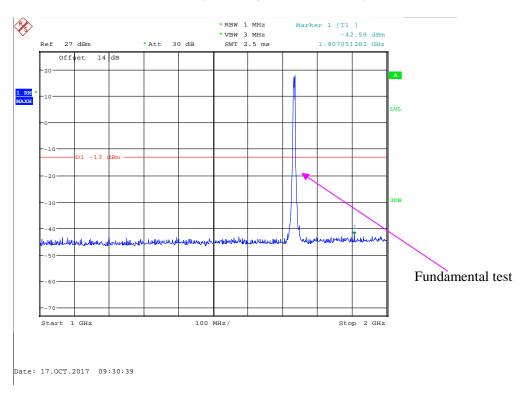
Date: 17.OCT.2017 08:55:00

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

```
                                    * RBW  100 kHz     Marker 1 [T1 ]
                                    * VBW  300 kHz              -51.61 dBm
        Ref  26 dBm     * Att  30 dB  SWT 100 ms       368.878205128 MHz
            Offset  14 dB                                                 [A]
     -20

 1 RM *
 MAXH  -10                                                               LVL

     --0

     --10
          D1 -13 dBm

     --20

     --30
                                                                        3DB

     --40

          1
     --50

     --60

     --70
        Start 30 MHz             97 MHz/               Stop 1 GHz
```

Date: 17.OCT.2017 09:01:27

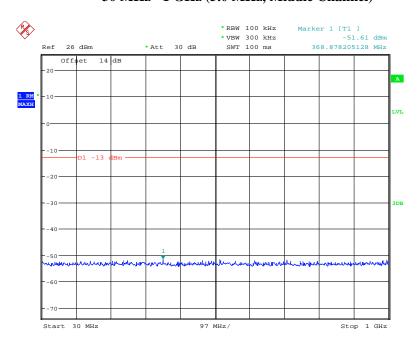## 1 GHz – 2 GHz (5.0 MHz, Middle Channel)

Fundamental test

Date: 17.OCT.2017 09:30:39

2 GHz – 20 GHz (5.0 MHz, Middle Channel)
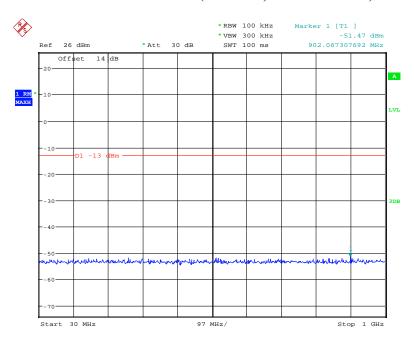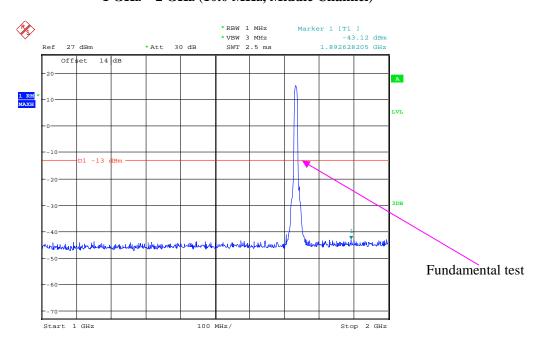
Date: 17.OCT.2017 08:55:15
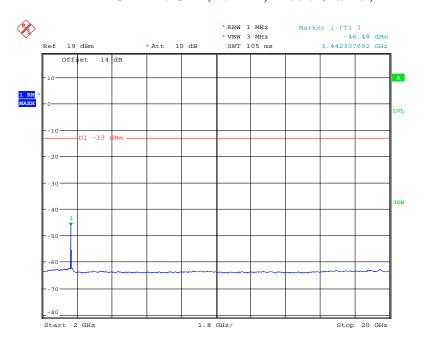
30 MHz - 1 GHz (10.0 MHz, Middle Channel)

```
                                    *RBW  100 kHz    Marker 1 [T1 ]
                                    *VBW  300 kHz              -51.47 dBm
              Ref   26 dBm    *Att   30 dB    SWT  100 ms    902.067307692 MHz
                 Offset  14 dB
                 20                                                          A
              1 RM * -10
              MAXH                                                          LVL
                 0
                -10
                 D1 -13 dBm
                -20
                -30                                                         3DB
                -40
                -50
                -60
                -70
              Start  30 MHz          97 MHz/              Stop  1 GHz
```
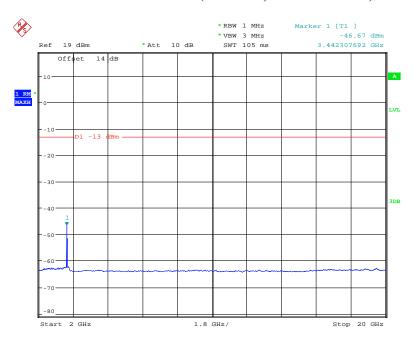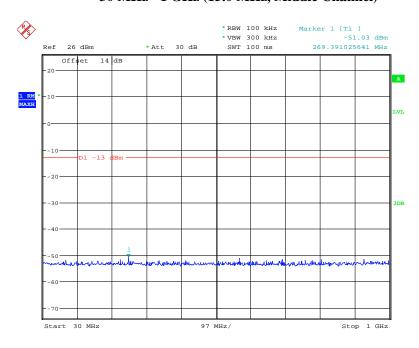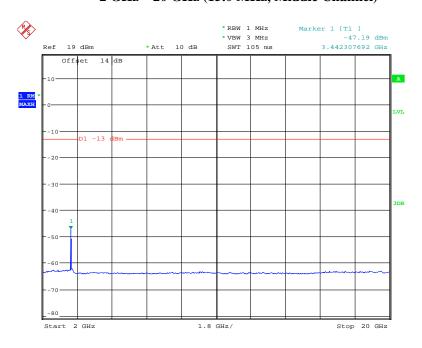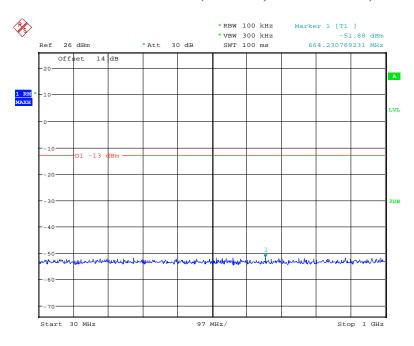
Date: 17.OCT.2017 09:01:41

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

```
                                    *RBW  1 MHz      Marker 1 [T1 ]
                                    *VBW  3 MHz                -43.12 dBm
              Ref   27 dBm    *Att   30 dB    SWT  2.5 ms    1.892628205 GHz
                 Offset  14 dB
                 20                                                          A
              1 RM * -10
              MAXH                                                          LVL
                 0
                -10
                 D1 -13 dBm
                -20
                -30                                                         3DB
                -40
                -50
                -60
                -70
              Start  1 GHz          100 MHz/              Stop  2 GHz
```

Fundamental test

Date: 17.OCT.2017 09:30:56

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

```
                                    * RBW  1 MHz      Marker 1 [T1 ]
                                    * VBW  3 MHz                -46.67 dBm
        Ref   19 dBm    * Att  10 dB   SWT 105 ms       3.442307692 GHz
```
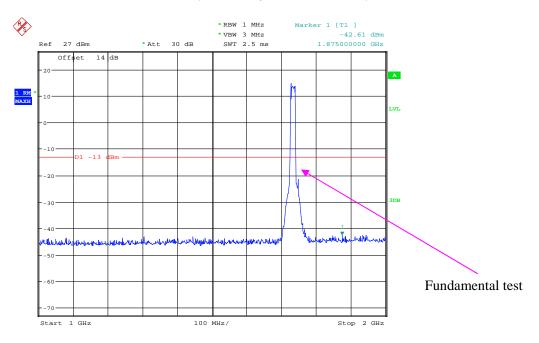

Date: 17.OCT.2017 08:55:29

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

```
                                    * RBW 100 kHz     Marker 1 [T1 ]
                                    * VBW 300 kHz               -51.03 dBm
        Ref   26 dBm    * Att  30 dB   SWT 100 ms      269.391025641 MHz
```


Date: 17.OCT.2017 09:01:56

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

Fundamental test

Date: 17.OCT.2017   09:31:19

2 GHz – 20 GHz (15.0 MHz, Middle Channel)
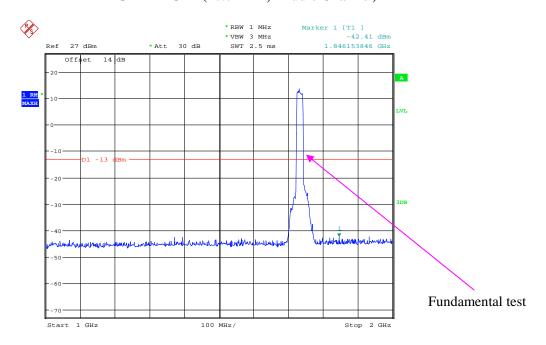
Date: 17.OCT.2017   08:55:44

30 MHz - 1 GHz (20.0 MHz, Middle Channel)
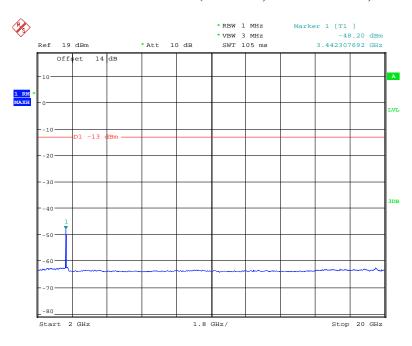
Date: 17.OCT.2017 09:02:10

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

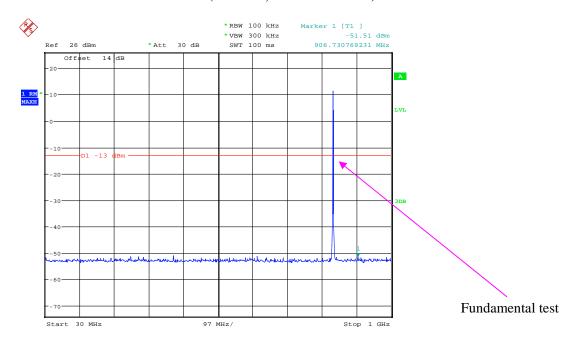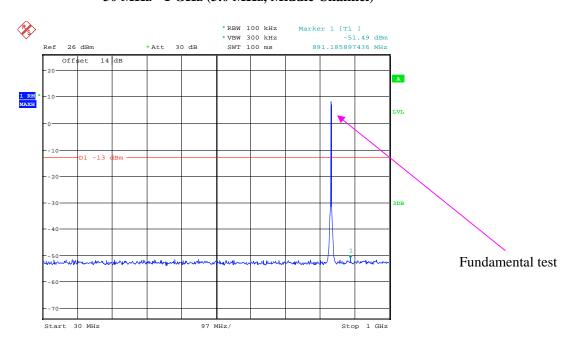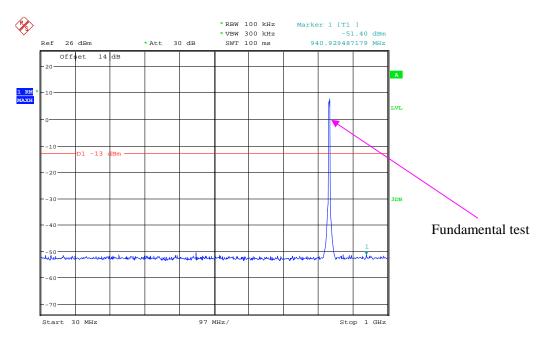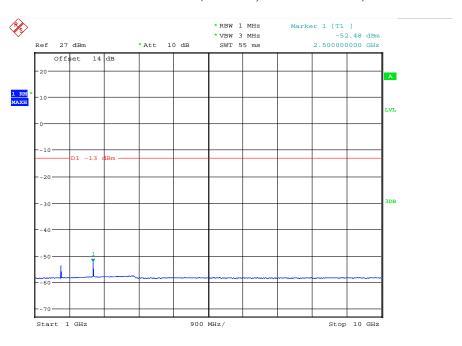Fundamental test

Date: 17.OCT.2017 09:31:43

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

```
                                    *RBW 1 MHz      Marker 1 [T1 ]
                                    *VBW 3 MHz              -48.20 dBm
        Ref  19 dBm      *Att  10 dB   SWT 105 ms    3.442307692 GHz
           Offset  14 dB
```

Date: 17.OCT.2017 08:55:59
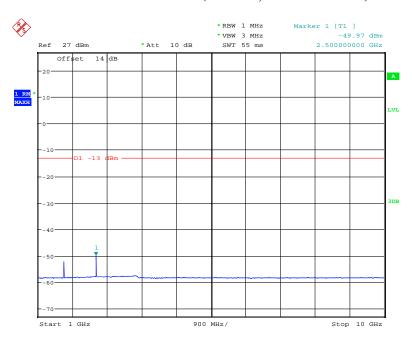
LTE Band 5:

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

```
                                    *RBW 100 kHz    Marker 1 [T1 ]
                                    *VBW 300 kHz            -51.51 dBm
        Ref  26 dBm      *Att  30 dB   SWT 100 ms    906.730769231 MHz
           Offset  14 dB
```

Fundamental test

Date: 17.OCT.2017 09:03:26

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

```
                                    * RBW 1 MHz      Marker 1 [T1 ]
                                    * VBW 3 MHz                -49.97 dBm
       Ref   27 dBm      * Att  10 dB   SWT 55 ms      2.500000000 GHz
          Offset   14 dB
```
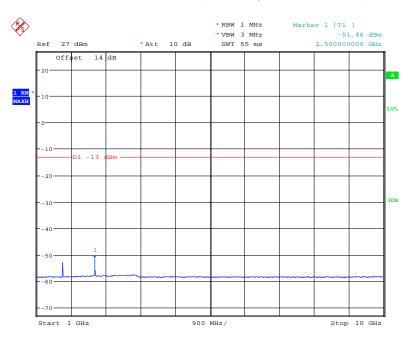
Date: 17.OCT.2017 09:24:43

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

```
                                    * RBW 100 kHz     Marker 1 [T1 ]
                                    * VBW 300 kHz               -51.49 dBm
       Ref   26 dBm      * Att  30 dB   SWT 100 ms     891.185897436 MHz
          Offset   14 dB
```

Fundamental test

Date: 17.OCT.2017 09:03:55

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

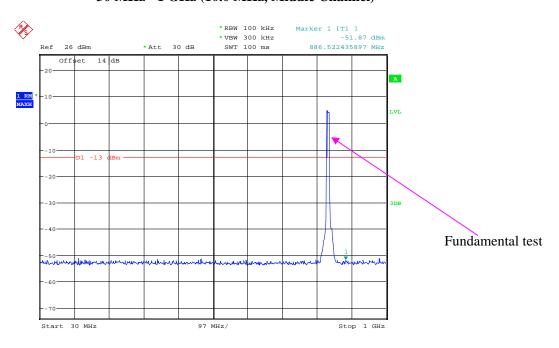Date: 17.OCT.2017 09:25:00

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

Fundamental test

Date: 17.OCT.2017 09:04:25

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

```
                                    * RBW 1 MHz      Marker 1 [T1 ]
                                    * VBW 3 MHz             -52.48 dBm
        Ref  27 dBm      * Att  10 dB    SWT 55 ms     2.500000000 GHz
          Offset  14 dB
        -20                                                              A
        -10
1 RM *
MAXH     -0                                                             LVL

        -10
        D1 -13 dBm
        -20
        -30                                                             3DB
        -40
        -50
              1
        -60
        -70
        Start  1 GHz            900 MHz/              Stop  10 GHz
```
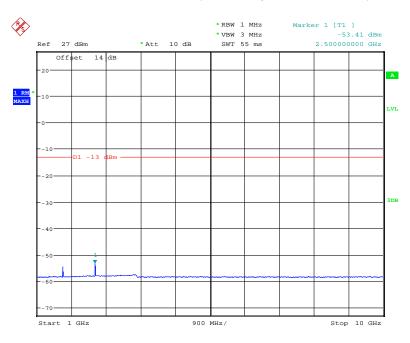
Date: 17.OCT.2017 09:25:20

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

```
                                    * RBW 100 kHz     Marker 1 [T1 ]
                                    * VBW 300 kHz           -51.87 dBm
        Ref  26 dBm      * Att  30 dB    SWT 100 ms   886.522435897 MHz
          Offset  14 dB
        -20                                                              A
        -10
1 RM *
MAXH     -0                                                             LVL

        -10
        D1 -13 dBm
        -20
        -30                                                             3DB
        -40
        -50                                          1
        -60
        -70
        Start  30 MHz           97 MHz/              Stop  1 GHz
```

Fundamental test
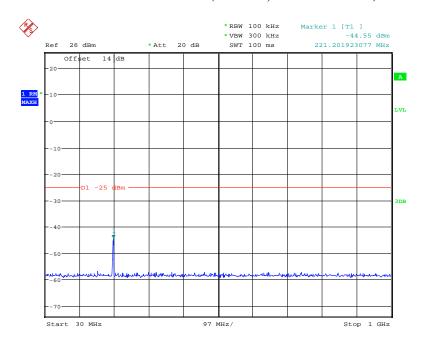
Date: 17.OCT.2017 09:04:45

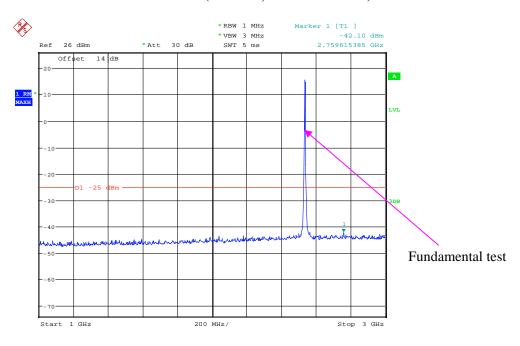**1 GHz – 10 GHz (10.0 MHz, Middle Channel)**

Date: 17.OCT.2017 09:25:34

LTE Band 7:
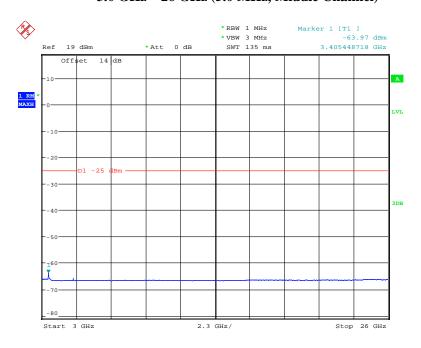
30 MHz – 1 GHz (5.0 MHz, Middle Channel)

Date: 17.OCT.2017 09:08:50

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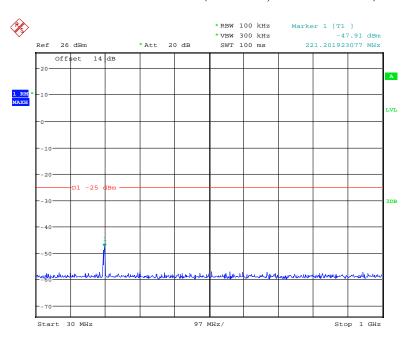

Fundamental test

Date: 17.OCT.2017 09:11:04

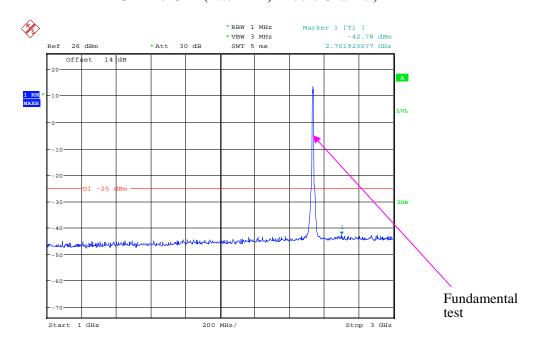## 3.0 GHz – 26 GHz (5.0 MHz, Middle Channel)

Date: 17.OCT.2017 09:12:45

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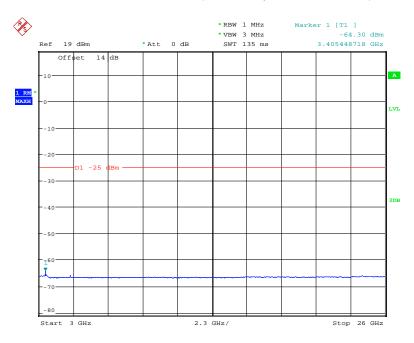

Date: 17.OCT.2017 09:09:25

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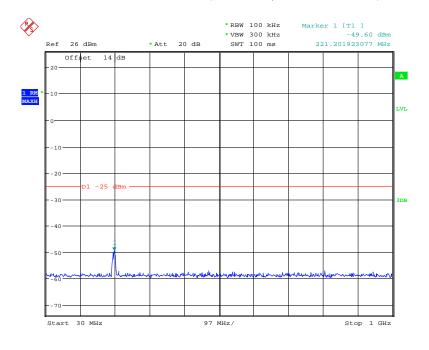

Fundamental test

Date: 17.OCT.2017 09:11:20

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

Date: 17.OCT.2017 09:13:08

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

Date: 17.OCT.2017 09:09:43