FCC RF Test Report

APPLICANT	:	ZTE CORPORATION
EQUIPMENT	:	LTE UFI MODEM
BRAND NAME	:	ZTE
MODEL NAME	:	MF90
FCC ID	:	SRQMF90
STANDARD	:	47 CFR Part 2, 27(M)
CLASSIFICATION	:	PCS Licensed Transmitter (PCB)

The product was received on Apr. 09, 2014 and testing was completed on May 15, 2014. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and the testing has shown the tested sample to be in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
2627

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

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APPENDIX A. SETUP PHOTOGRAPHS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG440903B	Rev. 01	Initial issue of report	May 23, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	Reporting Only	PASS	-
3.2	§24.232(c) §27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 7)	EIRP < 2Watt	PASS	-
3.3	§2.1049 §27.53(l)(6)	99% Occupied Bandwidth and 26dB Bandwidth	Reporting Only	PASS	-
3.4	§2.1051 §27.53(l)(4)	Conducted Band Edge Measurement(Band 7)	< 5.5MHz: -13 dBm ≥5.5MHz: -25 dBm	PASS	-
3.5	§2.1051 §27.53(l)(4)	Conducted Spurious Emission (Band 7)	< 55+10log10(P[Watts])	PASS	-
3.6	§2.1053 §27.53(l)(4)	Radiated Spurious Emission (Band 7)	< $55+10\log_{10}$(P[Watts])	PASS	Under limit 24.84 dB at 5074.000 MHz
3.7	§2.1055 §27.54	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	

1 General Description

1.1 Applicant

ZTE CORPORATION
ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.2 Manufacturer

ZTE CORPORATION
ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	LTE UFI MODEM
Brand Name	ZTE
Model Name	MF90
FCC ID	SRQMF90
EUT supports Radios application	GPRS/EGPRS/WCDMA/HSPA/HSPA+/DC-HSDPA/LTE/ WLAN 2.4GHz 802. 11b/g/n HT20/HT40/ WLAN 5GHz 802. 11a/n HT20/HT40
HW Version	xq5B
SW Version	EN_ZTE_MF90LATINV1.0.0B05
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx Frequency	LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz
Rx Frequency	LTE Band 7 : 2622.5MHz ~ 2687.5 MHz
Bandwidth	LTE Band 7 : 5MHz/ 10MHz / 15MHz / 20MHz
Maximum Output Power to Antenna	LTE Band 7 : 22.12 dBm
Antenna Type	PIFA Antenna
Type of Modulation	QPSK / 16QAM

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Maximum EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	BW	Maximum EIRP	Frequency Tolerance (ppm)	Emission Designator
Part 27M	LTE Band 7	QPSK	5MHz	0.31 W	0.005	4M50G7D
Part 27M	LTE Band 7	16QAM	5MHz	0.25 W	0.005	4M49D7W
Part 27M	LTE Band 7	QPSK	10MHz	0.30 W	0.004	9M09G7D
Part 27M	LTE Band 7	16QAM	10MHz	0.24 W	0.005	9M01D7W
Part 27M	LTE Band 7	QPSK	15MHz	0.29 W	0.004	13M5G7D
Part 27M	LTE Band 7	16QAM	15MHz	0.23 W	0.004	13M5D7W
Part 27M	LTE Band 7	QPSK	20MHz	0.27 W	0.005	18M4G7D
Part 27M	LTE Band 7	16QAM	20MHz	0.21 W	0.005	18M4D7W

1.7 Testing Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	**Sporton Site No.**			**FCC Registration No.**
	TH01-KS	03CH01-KS	OTA01-KS	149928

Note: The test site complies with ANSI C63.4 2003 requirement

1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2, 27(M)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

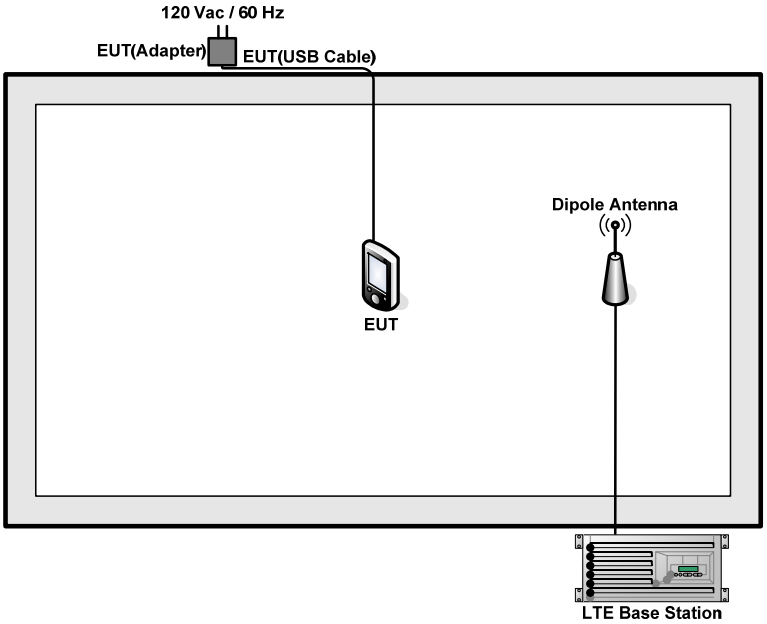
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission. (Y plane)

Test Items	Band	Bandwidth (MHz)				Modulation		RB #			Test Channel		
		5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	7	v	v	v	v	v	v	v	v	v	v	v	v
26dB and 99% Bandwidth	7	v	v	v	v	v	v			v		v	
Conducted Band Edge	7	v	v	v	v	v	v	v		v	v		v
Conducted Spurious Emission	7	v	v	v	v	v	v	v			v	v	v
Frequency Stability	7	v	v	v	v	v	v			v		v	
E.I.R.P.	7	v	v	v	v	v	v	v			v	v	v
Radiated Spurious Emission	7	v	v	v	v	v		v				v	
Note	1. The mark "v" means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. **3.** The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.												

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF cable loss + attenuator factor.
Following shows an offset computation example with cable loss 6 dB and 10 dB attenuator.

Offset (dB) = RF cable loss (dB) + attenuator factor (dB).
= 6 + 10 = 16 (dB)

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A LTE base station was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

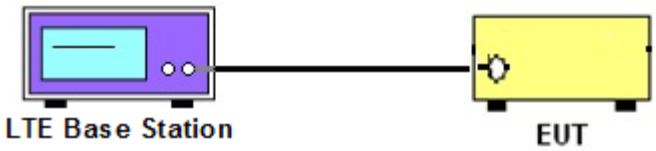
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

<LTE Band 7 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				**20850**	**21100**	**21350**
Frequency (MHz)				**2510**	**2535**	**2560**
20	QPSK	1	0	21.91	21.62	21.90
20	QPSK	1	49	21.93	21.87	21.91
20	QPSK	1	99	22.05	**22.12**	22.01
20	QPSK	50	0	20.78	20.80	20.78
20	QPSK	50	24	20.82	20.83	20.80
20	QPSK	50	49	20.85	20.88	20.84
20	QPSK	100	0	20.78	20.87	20.70
20	16QAM	1	0	20.44	20.98	20.87
20	16QAM	1	49	20.55	20.95	20.77
20	16QAM	1	99	21.18	21.00	20.92
20	16QAM	50	0	19.83	19.84	19.94
20	16QAM	50	24	19.87	19.89	19.79
20	16QAM	50	49	19.96	19.98	19.67
20	16QAM	100	0	19.85	19.93	19.82
Channel				**20825**	**21100**	**21375**
Frequency (MHz)				**2507.5**	**2535**	**2562.5**
15	QPSK	1	0	21.89	21.65	21.90
15	QPSK	1	37	21.99	21.99	21.88
15	QPSK	1	74	22.01	22.00	21.92
15	QPSK	36	0	20.84	20.87	20.73
15	QPSK	36	18	20.79	21.00	20.71
15	QPSK	36	37	20.84	20.89	20.78
15	QPSK	75	0	20.90	20.89	20.71
15	16QAM	1	0	20.80	20.75	20.52
15	16QAM	1	37	20.56	20.81	20.65
15	16QAM	1	74	20.95	20.82	20.70
15	16QAM	36	0	19.82	19.75	19.66
15	16QAM	36	18	19.90	19.95	19.69
15	16QAM	36	37	19.77	20.00	19.84
15	16QAM	75	0	19.92	20.00	19.85

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				**20800**	**21100**	**21400**
Frequency (MHz)				**2505**	**2535**	**2565**
10	QPSK	1	0	21.84	21.71	21.74
10	QPSK	1	24	21.90	21.87	21.89
10	QPSK	1	49	21.96	22.10	21.99
10	QPSK	25	0	20.88	20.97	20.78
10	QPSK	25	12	20.85	20.90	20.83
10	QPSK	25	24	20.80	20.97	20.77
10	QPSK	50	0	20.79	20.84	20.72
10	16QAM	1	0	20.68	20.73	20.95
10	16QAM	1	24	20.82	21.08	21.00
10	16QAM	1	49	20.83	21.30	21.07
10	16QAM	25	0	20.00	20.09	19.92
10	16QAM	25	12	19.95	20.10	19.85
10	16QAM	25	24	19.84	19.85	19.68
10	16QAM	50	0	19.89	19.90	19.70
Channel				**20775**	**21100**	**21425**
Frequency (MHz)				**2502.5**	**2535**	**2567.5**
5	QPSK	1	0	21.89	21.75	21.78
5	QPSK	1	12	21.81	21.88	21.84
5	QPSK	1	24	21.93	21.96	21.95
5	QPSK	12	0	20.92	20.97	20.81
5	QPSK	12	6	20.98	21.05	20.74
5	QPSK	12	11	20.99	21.06	20.71
5	QPSK	25	0	20.90	20.99	20.67
5	16QAM	1	0	21.04	20.87	20.73
5	16QAM	1	12	20.46	20.78	20.71
5	16QAM	1	24	21.18	20.96	20.91
5	16QAM	12	0	19.85	19.99	19.94
5	16QAM	12	6	20.08	19.88	19.84
5	16QAM	12	11	19.94	20.01	19.80
5	16QAM	25	0	19.90	20.00	19.60

Note: Maximum average power for LTE.

3.2 Equivalent Isotropic Radiated Power Measurement

3.2.1 Description of the EIRP Measurement

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r01. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 7.

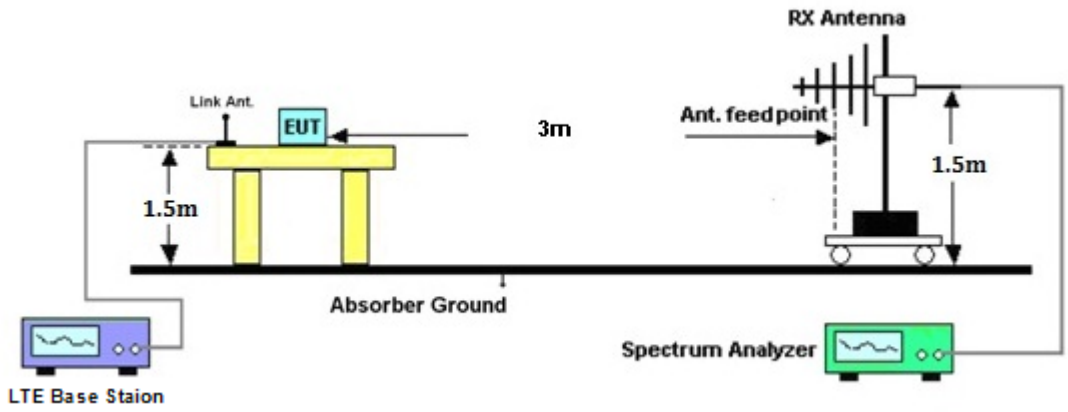
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer which used a channel power option across EUT's signal bandwidth per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs
    Ps (dBm)：Input power to substitution antenna.
    Gs (dBi or dBd)：Substitution antenna Gain.
    Et = Rt + AF
    Es = Rs + AF
    AF (dB/m)：Receive antenna factor
    Rt：The highest received signal in spectrum analyzer for EUT.
    Rs：The highest received signal in spectrum analyzer for substitution antenna.

3.2.4 Test Setup



3.2.5 Test Result of EIRP

LTE Band 7 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
7	5	QPSK	1	24	2502.5	24.94	0.31	H
7	5	QPSK	1	24	2535	23.53	0.23	H
7	5	QPSK	1	24	2567.5	21.17	0.13	H
7	5	QPSK	1	24	2502.5	24.49	0.28	V
7	5	QPSK	1	24	2535	23.58	0.23	V
7	5	QPSK	1	24	2567.5	21.16	0.13	V
7	5	16QAM	1	24	2502.5	24.03	0.25	H
7	5	16QAM	1	24	2535	22.52	0.18	H
7	5	16QAM	1	24	2567.5	20.05	0.10	H
7	5	16QAM	1	24	2502.5	23.58	0.23	V
7	5	16QAM	1	24	2535	22.49	0.18	V
7	5	16QAM	1	24	2567.5	20.13	0.10	V
7	10	QPSK	1	49	2505	24.78	0.30	H
7	10	QPSK	1	49	2535	23.36	0.22	H
7	10	QPSK	1	49	2565	21.17	0.13	H
7	10	QPSK	1	49	2505	24.23	0.26	V
7	10	QPSK	1	49	2535	23.38	0.22	V
7	10	QPSK	1	49	2565	21.17	0.13	V
7	10	16QAM	1	49	2505	23.78	0.24	H
7	10	16QAM	1	49	2535	22.56	0.18	H
7	10	16QAM	1	49	2565	20.09	0.10	H
7	10	16QAM	1	49	2505	23.24	0.21	V
7	10	16QAM	1	49	2535	22.47	0.18	V
7	10	16QAM	1	49	2565	20.09	0.10	V

LTE Band 7 Radiated Power EIRP								
LTE Band	Channel BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	EIRP (W)	H/V
			RB Size	RB Offset				
7	15	QPSK	1	74	2507.5	24.62	0.29	H
7	15	QPSK	1	74	2535	23.35	0.22	H
7	15	QPSK	1	74	2562.5	21.12	0.13	H
7	15	QPSK	1	74	2507.5	24.07	0.26	V
7	15	QPSK	1	74	2535	23.30	0.21	V
7	15	QPSK	1	74	2562.5	21.07	0.13	V
7	15	16QAM	1	74	2507.5	23.65	0.23	H
7	15	16QAM	1	74	2535	22.29	0.17	H
7	15	16QAM	1	74	2562.5	20.18	0.10	H
7	15	16QAM	1	74	2507.5	23.02	0.20	V
7	15	16QAM	1	74	2535	22.33	0.17	V
7	15	16QAM	1	74	2562.5	20.05	0.10	V
7	20	QPSK	1	99	2510	24.25	0.27	H
7	20	QPSK	1	99	2535	23.46	0.22	H
7	20	QPSK	1	99	2560	21.12	0.13	H
7	20	QPSK	1	99	2510	23.74	0.24	V
7	20	QPSK	1	99	2535	23.21	0.21	V
7	20	QPSK	1	99	2560	21.08	0.13	V
7	20	16QAM	1	99	2510	23.27	0.21	H
7	20	16QAM	1	99	2535	22.46	0.18	H
7	20	16QAM	1	99	2560	20.15	0.10	H
7	20	16QAM	1	99	2510	22.80	0.19	V
7	20	16QAM	1	99	2535	22.32	0.17	V
7	20	16QAM	1	99	2560	20.16	0.10	V

3.3 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.3.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

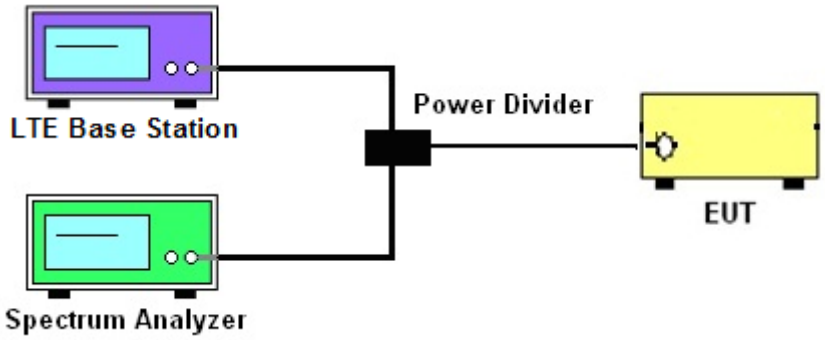
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The 26dB and 99% occupied bandwidth (BW) of the middle channel for the highest RF power with full RB sizes were measured.

3.3.4 Test Setup



3.3.5 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

Modes	LTE Band 7			
BW / Mod.	**5MHz / QPSK**	**5MHz / 16QAM**	**10MHz / QPSK**	**10MHz / 16QAM**
99% OBW (MHz)	4.496	4.486	9.091	9.011
26dB BW (MHz)	5.175	5.085	10.030	9.970
BW / Mod.	**15MHz / QPSK**	**15MHz / 16QAM**	**20MHz / QPSK**	**20MHz / 16QAM**
99% OBW (MHz)	13.457	13.457	18.382	18.422
26dB BW (MHz)	14.895	14.745	20.659	20.819

Note:

The maximum RB configurations of the 99% Occupied Bandwidth and 26dB Bandwidth summary as below:

BW5MHz RB setting：RB Size 25, RB offset 0

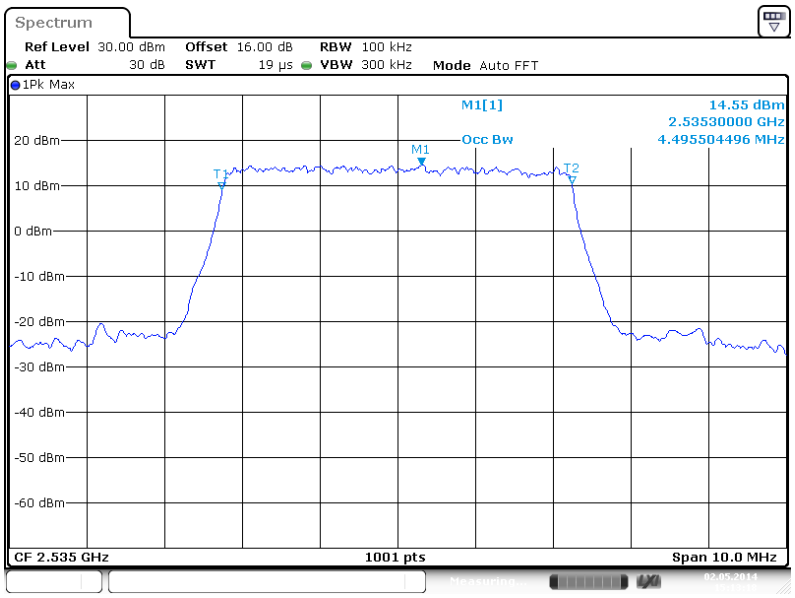
BW10MHz RB setting：RB Size 50, RB offset 0

BW15MHz RB setting：RB Size 75, RB offset 0

BW20MHz RB setting：RB Size 100, RB offset 0

Band :	LTE Band 7	BW / Mod. :	5MHz / QPSK

99% Occupied Bandwidth Plot on Channel 21100



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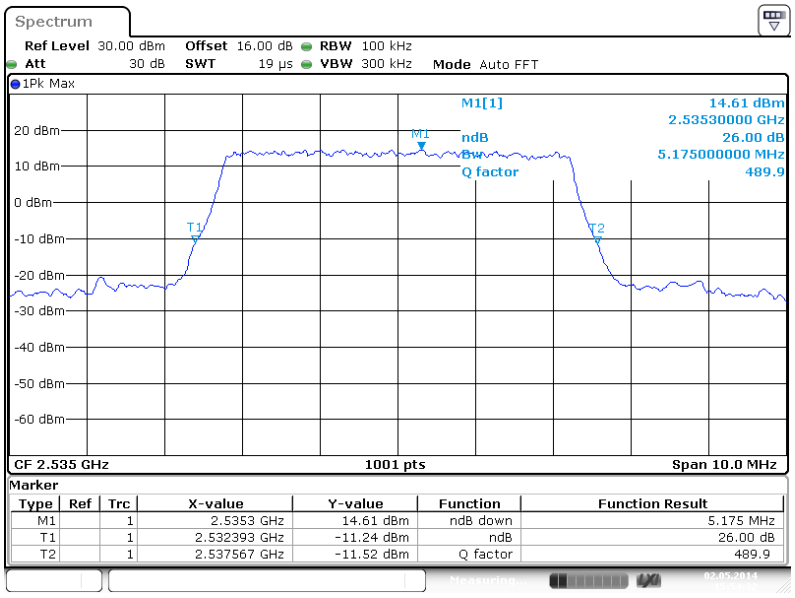
26dB Bandwidth Plot on Channel 21100



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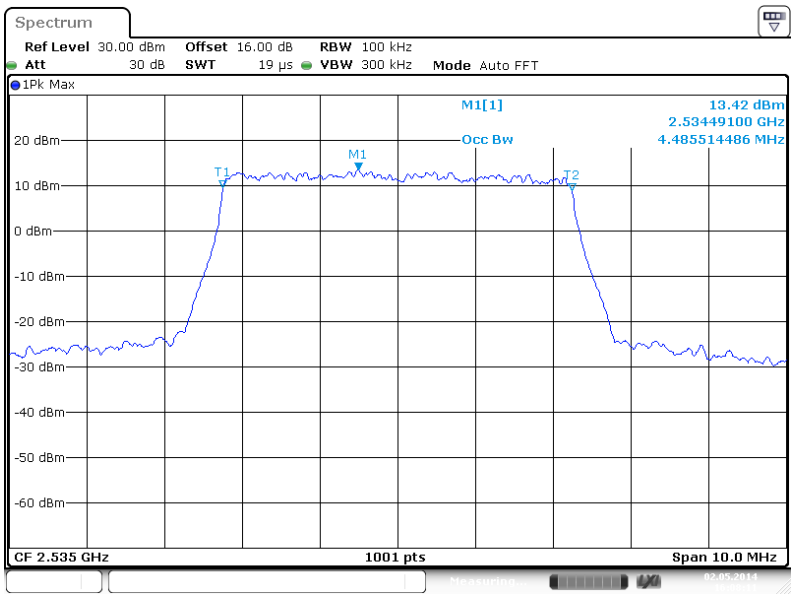
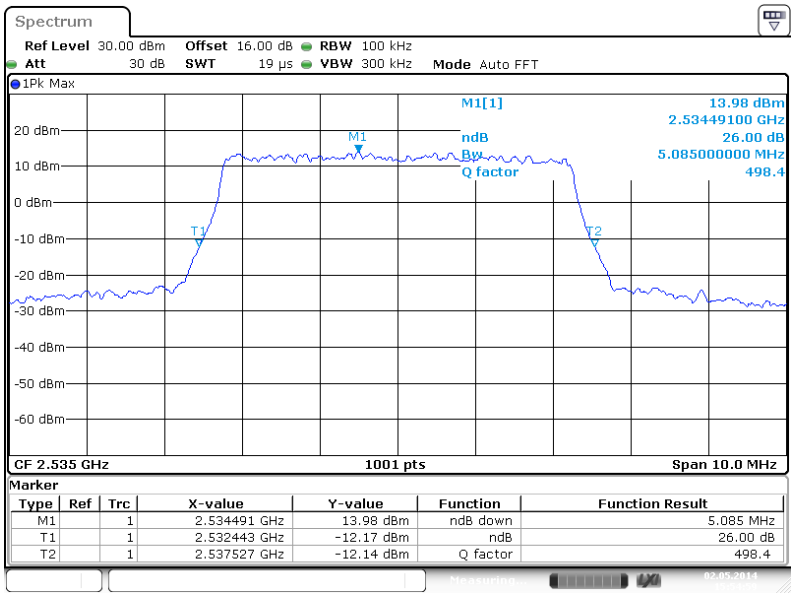
Band :	LTE Band 7	BW / Mod. :	5MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 21100



Date:2 MAY 2014 16:08:11

26dB Bandwidth Plot on Channel 21100



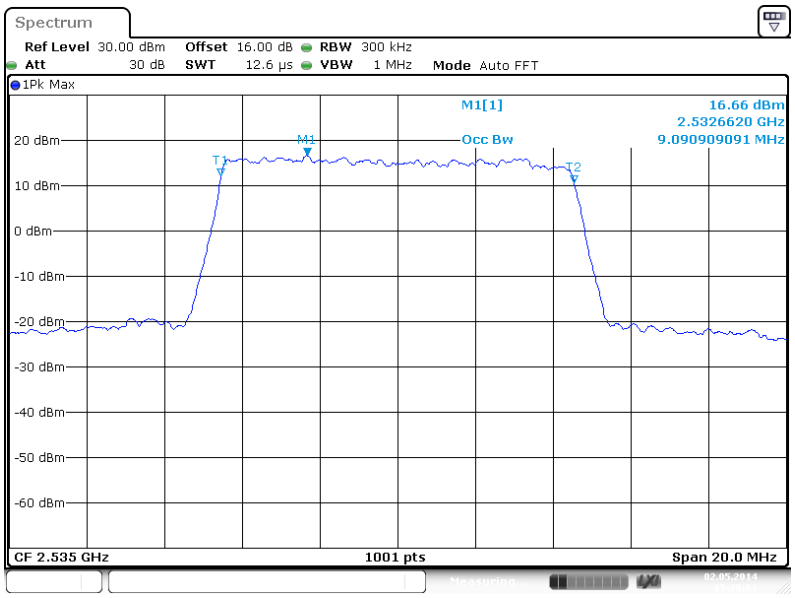
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.534491 GHz	13.98 dBm	ndB down	5.085 MHz
T1		1	2.532443 GHz	-12.17 dBm	ndB	26.00 dB
T2		1	2.537527 GHz	-12.14 dBm	Q factor	498.4

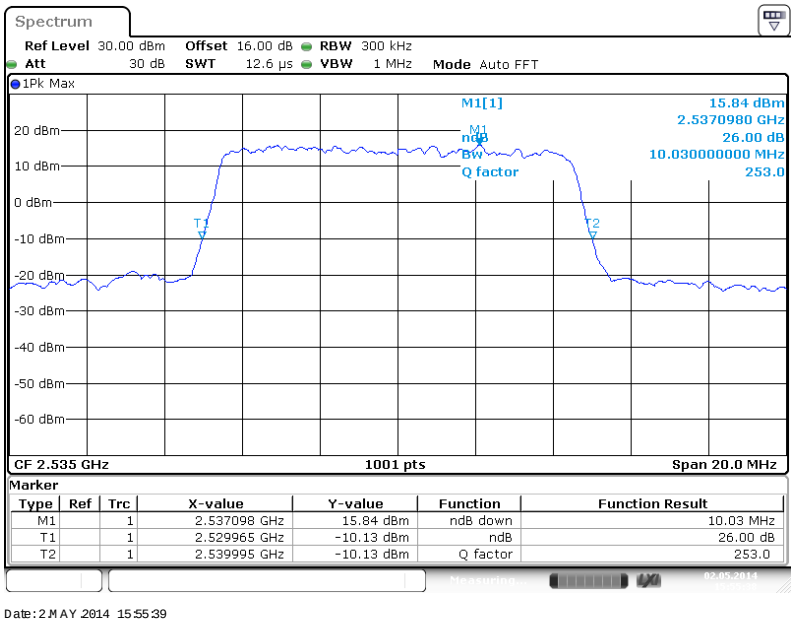
Date:2 MAY 2014 15:54:59

Band :	LTE Band 7	BW / Mod. :	10MHz / QPSK

99% Occupied Bandwidth Plot on Channel 21100

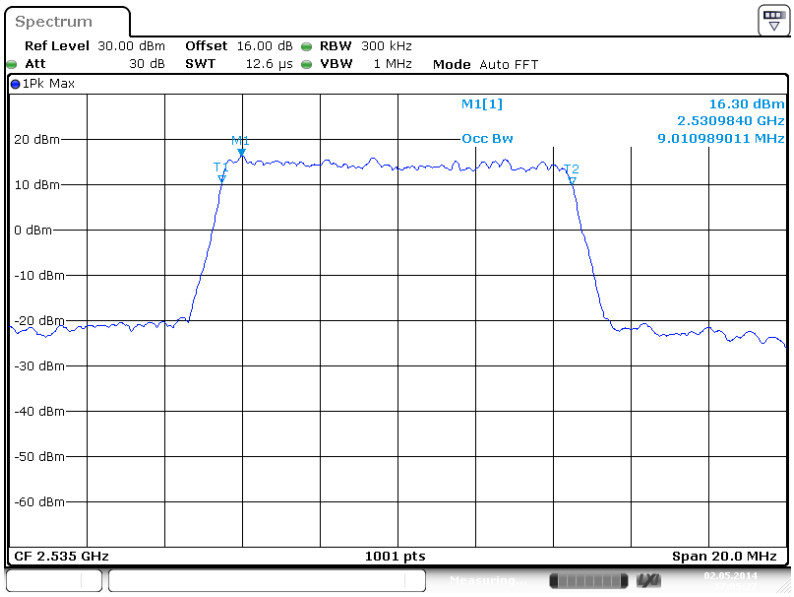


26dB Bandwidth Plot on Channel 21100



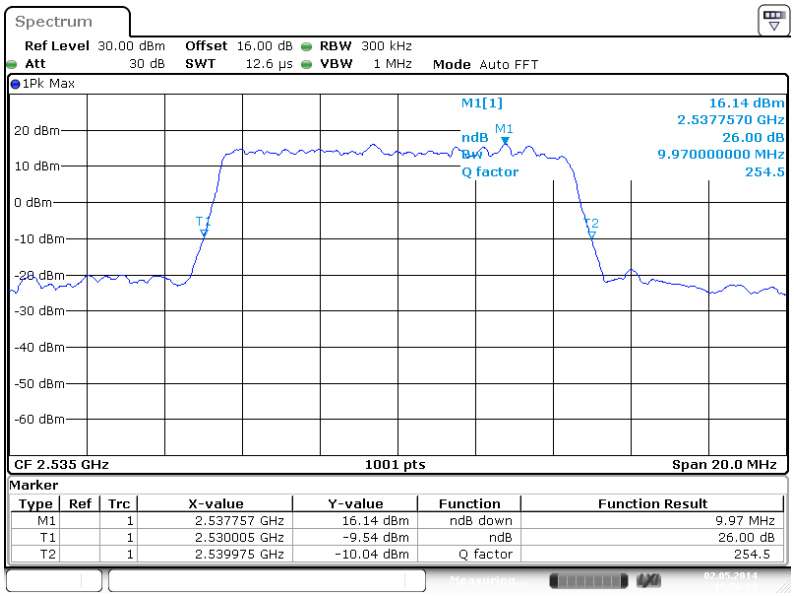
Band :	LTE Band 7	BW / Mod. :	10MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 21100



Date: 2 MAY 2014 17:05:27

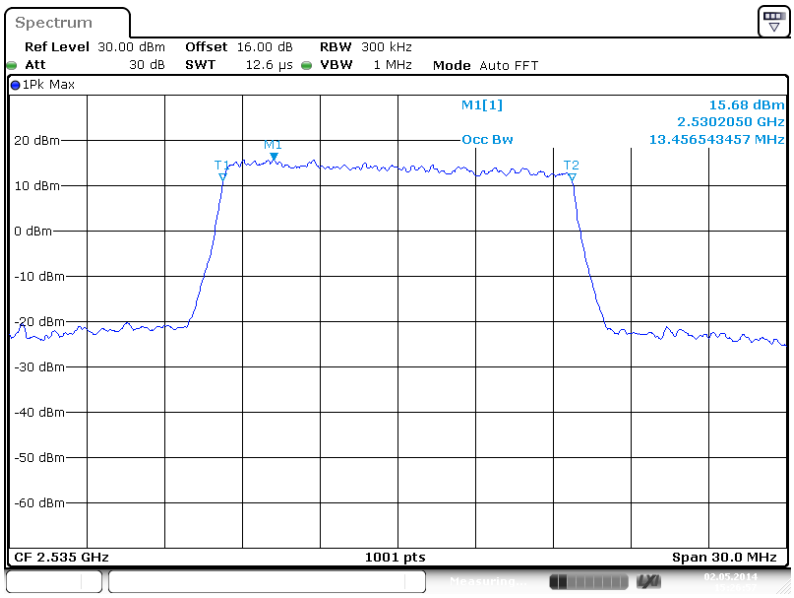
26dB Bandwidth Plot on Channel 21100



Date: 2 MAY 2014 15:56:04

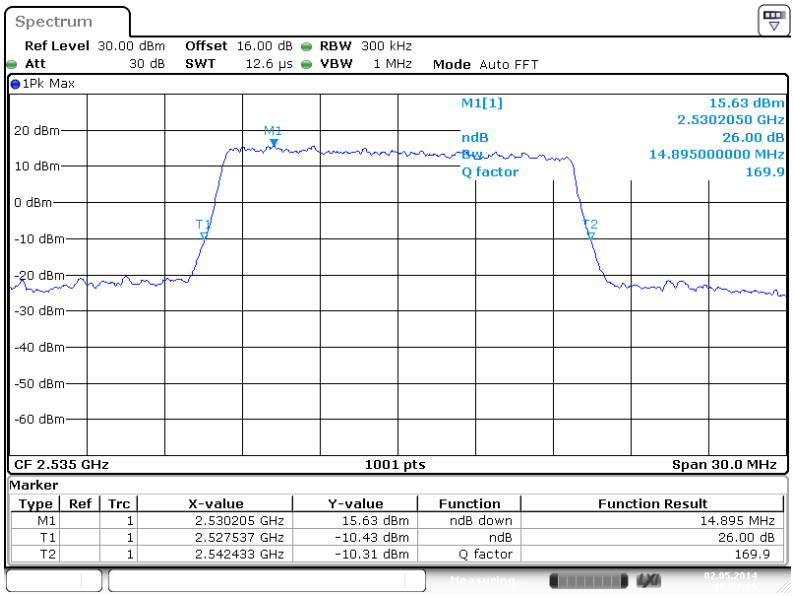
Band :	LTE Band 7	BW / Mod. :	15MHz / QPSK

99% Occupied Bandwidth Plot on Channel 21100



Date:2 MAY 2014 15:26:57

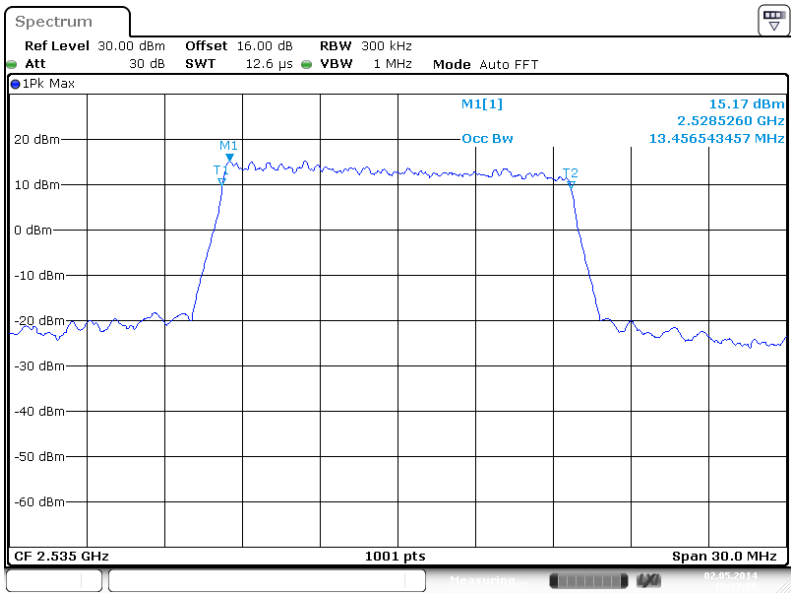
26dB Bandwidth Plot on Channel 21100



Date:2 MAY 2014 15:57:25

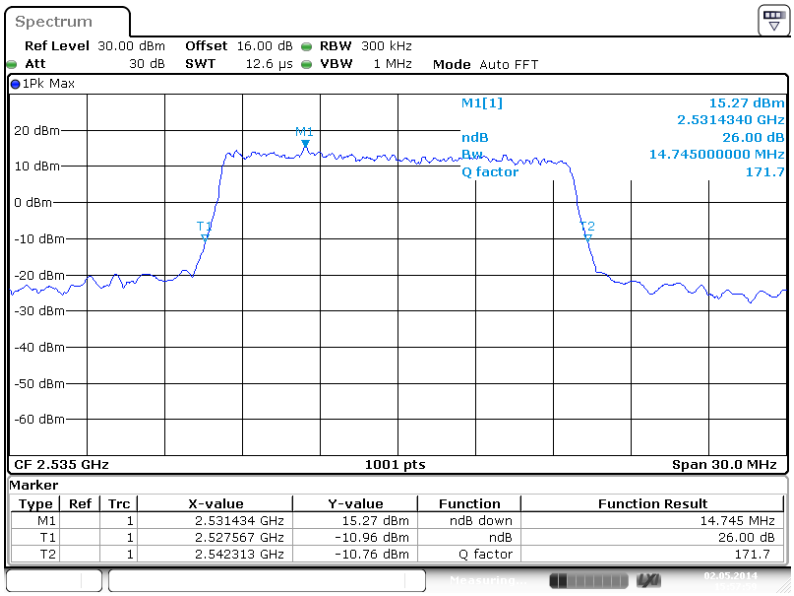
Band :	LTE Band 7	BW / Mod. :	15MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 21100



Date: 2 MAY 2014 15:37:58

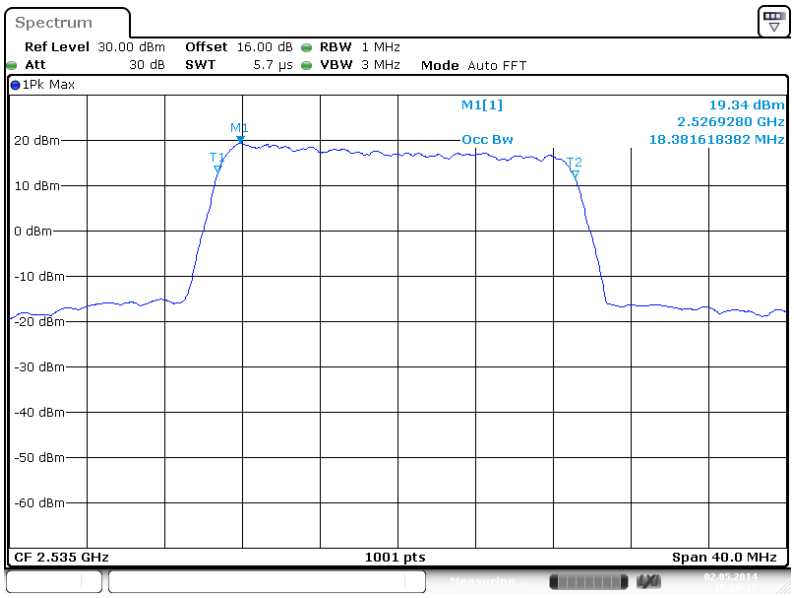
26dB Bandwidth Plot on Channel 21100



Date: 2 MAY 2014 15:57:59

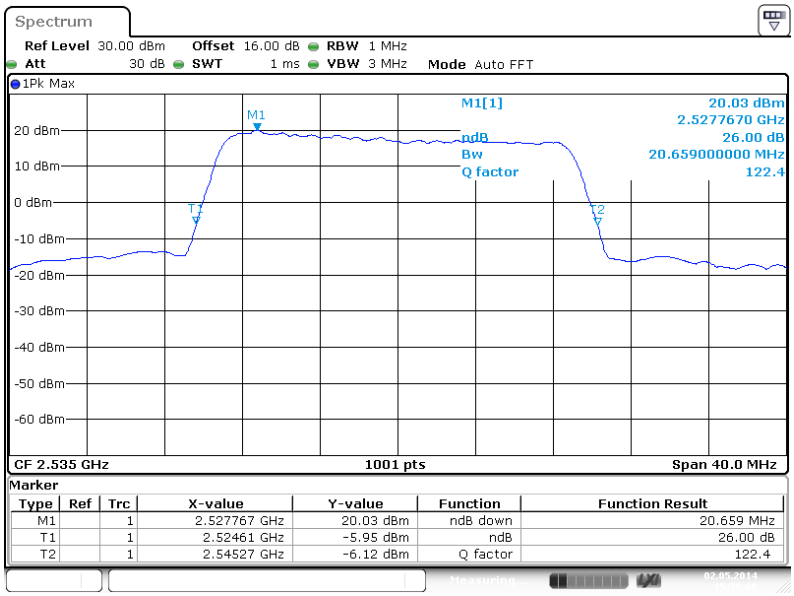
Band :	LTE Band 7	BW / Mod. :	20MHz / QPSK

99% Occupied Bandwidth Plot on Channel 21100



Date:2 MAY 2014 15:29:18

26dB Bandwidth Plot on Channel 21100



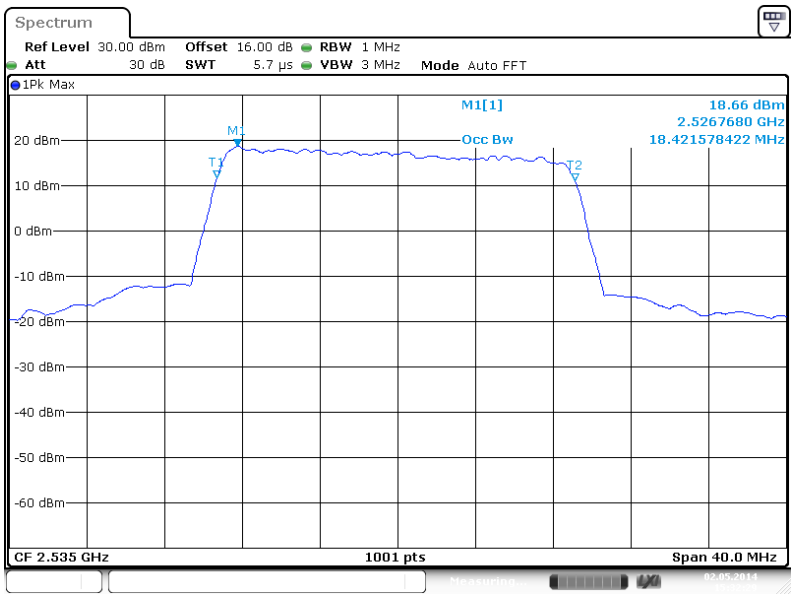
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.527767 GHz	20.03 dBm	ndB down	20.659 MHz
T1		1	2.52461 GHz	-5.95 dBm	ndB	26.00 dB
T2		1	2.54527 GHz	-6.12 dBm	Q factor	122.4

Date:2 MAY 2014 15:59:08

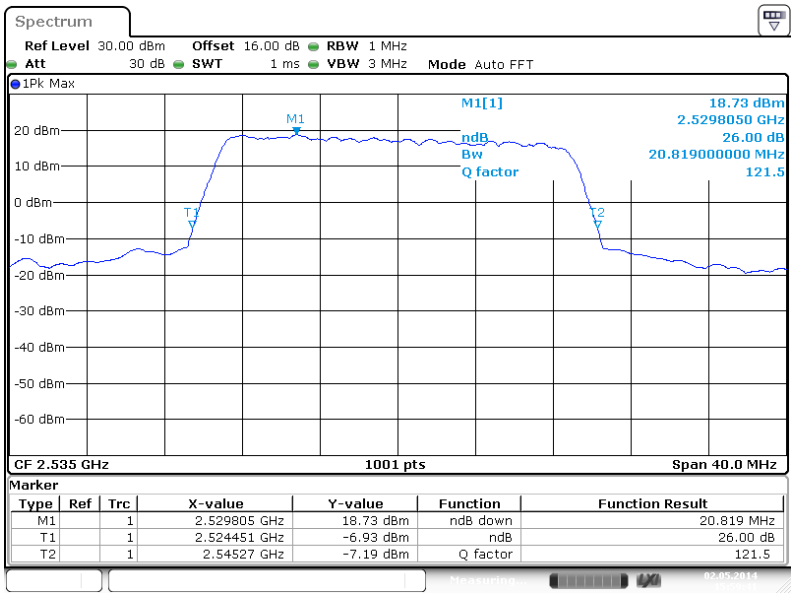
Band :	LTE Band 7	BW / Mod. :	20MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 21100



Date:2 MAY 2014 15:32:29

26dB Bandwidth Plot on Channel 21100



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.529805 GHz	18.73 dBm	ndB down	20.819 MHz
T1		1	2.524451 GHz	-6.93 dBm	ndB	26.00 dB
T2		1	2.54527 GHz	-7.19 dBm	Q factor	121.5

Date:2 MAY 2014 15:59:40

3.4 Conducted Band Edge Measurement

3.4.1 Description of Conducted Band Edge Measurement

27.53 (l) (4) for Band 7

The emissions be operated in the 2496-2690 MHz band, the attenuation factor of transmitter Power (P) shall be not less than 55 + 10 log (P) dB at the channel edge

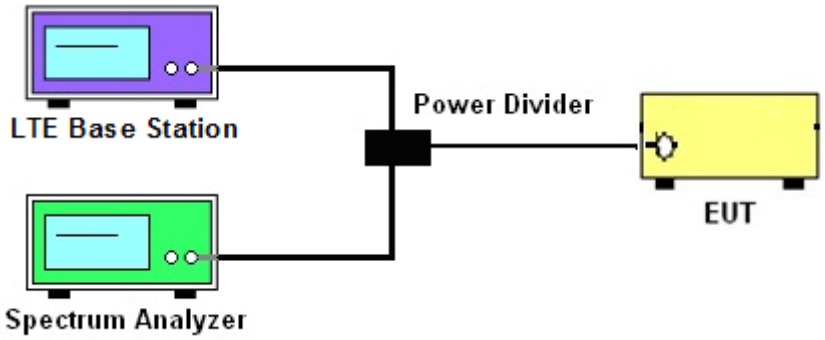
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with RMS detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5. The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [55 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)
   = -25dBm.

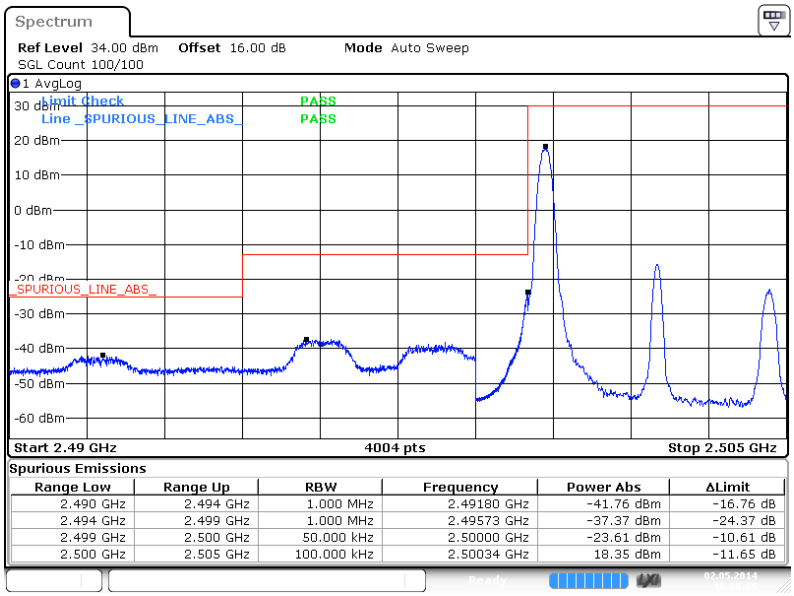
3.4.4 Test Setup



3.4.5 Test Result (Plots) of Conducted Band Edge

Band :	LTE Band 7	Band Width :	5MHz / QPSK

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

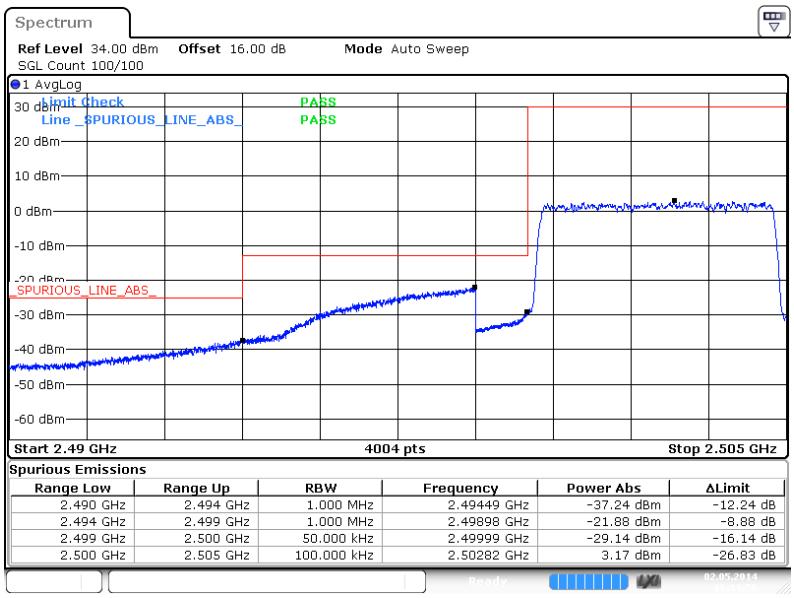


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49180 GHz	-41.76 dBm	-16.76 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49573 GHz	-37.37 dBm	-24.37 dB
2.499 GHz	2.500 GHz	50.000 kHz	2.50000 GHz	-23.61 dBm	-10.61 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50034 GHz	18.35 dBm	-11.65 dB

Date: 2 MAY 2014 16:39:05

Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0

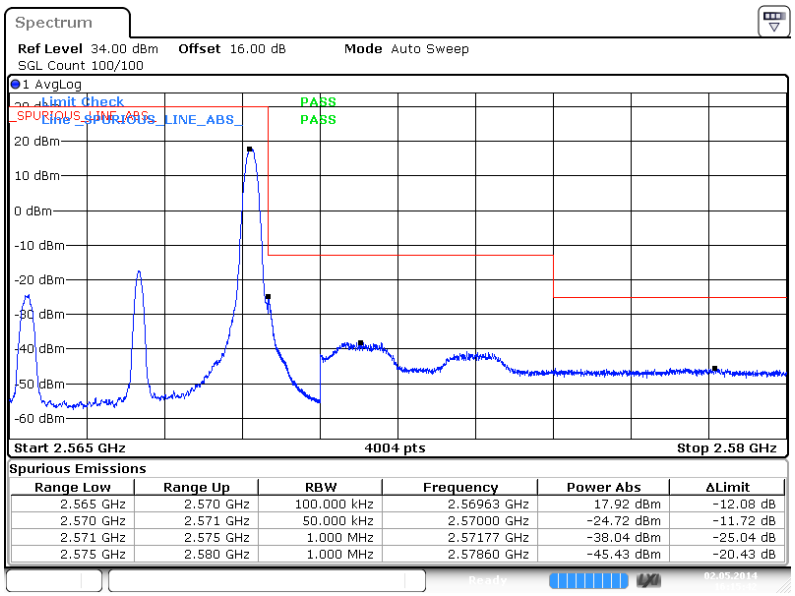


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49449 GHz	-37.24 dBm	-12.24 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49898 GHz	-21.88 dBm	-8.88 dB
2.499 GHz	2.500 GHz	50.000 kHz	2.49999 GHz	-29.14 dBm	-16.14 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50282 GHz	3.17 dBm	-26.83 dB

Date: 2 MAY 2014 16:13:57

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24

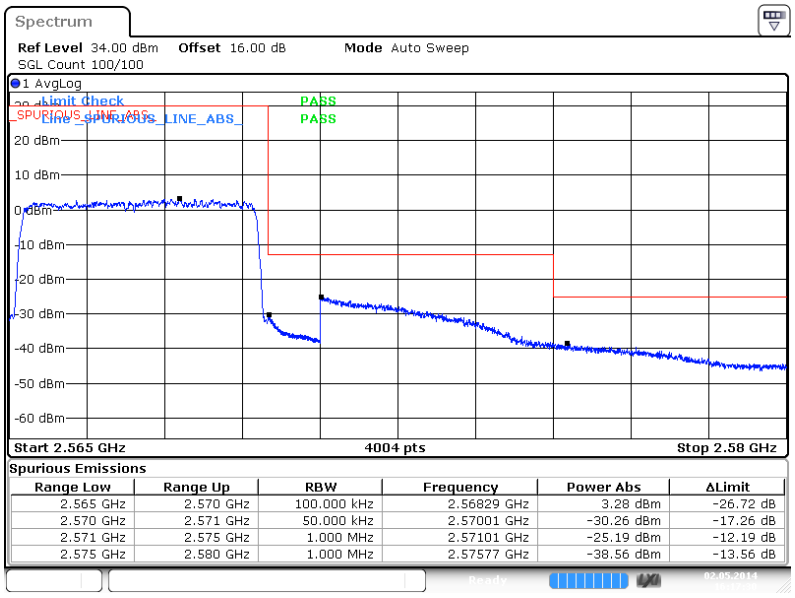


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.565 GHz	2.570 GHz	100.000 kHz	2.56963 GHz	17.92 dBm	-12.08 dB
2.570 GHz	2.571 GHz	50.000 kHz	2.57000 GHz	-24.72 dBm	-11.72 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57177 GHz	-38.04 dBm	-25.04 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57860 GHz	-45.43 dBm	-20.43 dB

Date: 2 MAY 2014 16:15:42

Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0



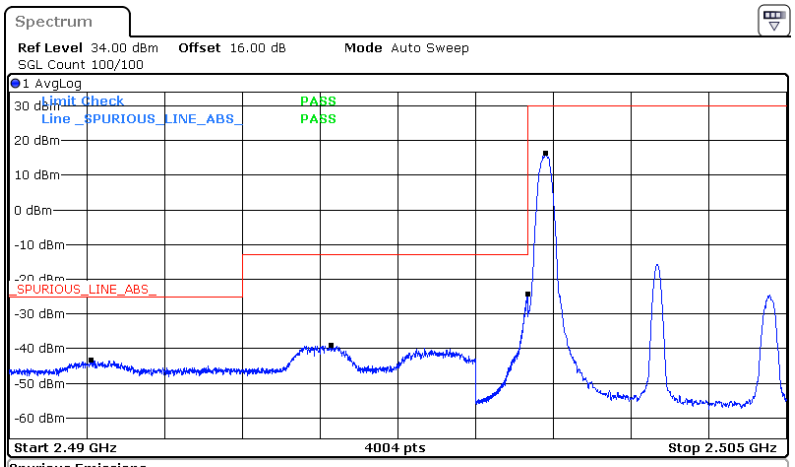
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.565 GHz	2.570 GHz	100.000 kHz	2.56829 GHz	3.28 dBm	-26.72 dB
2.570 GHz	2.571 GHz	50.000 kHz	2.57001 GHz	-30.26 dBm	-17.26 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57101 GHz	-25.19 dBm	-12.19 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57577 GHz	-38.56 dBm	-13.56 dB

Date: 2 MAY 2014 16:17:31

Band :	LTE Band 7	Band Width :	5MHz / 16QAM

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0

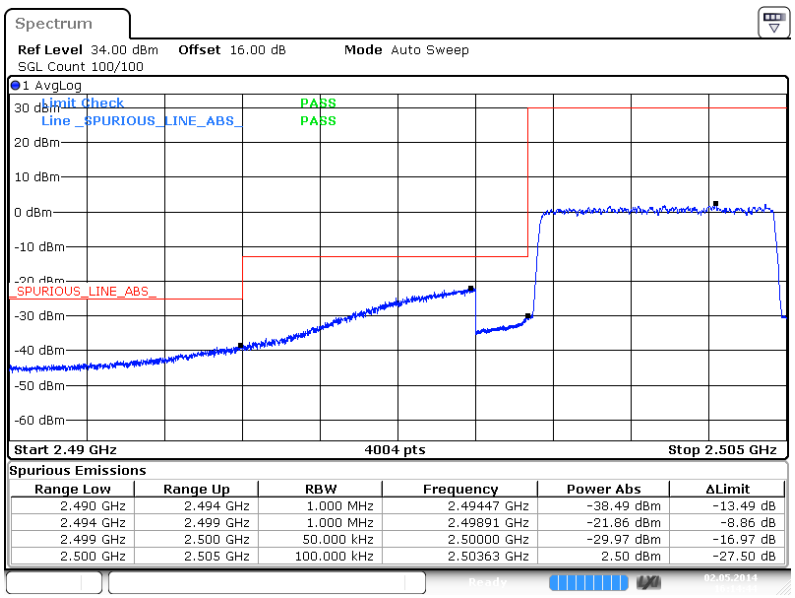


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49158 GHz	-43.28 dBm	-18.28 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49620 GHz	-39.03 dBm	-26.03 dB
2.499 GHz	2.500 GHz	50.000 kHz	2.50000 GHz	-24.12 dBm	-11.12 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50034 GHz	16.45 dBm	-13.55 dB

Date: 2 MAY 2014 16:09:45

Lower Band Edge Plot for 16QAM-RB Size 25, RB Offset 0

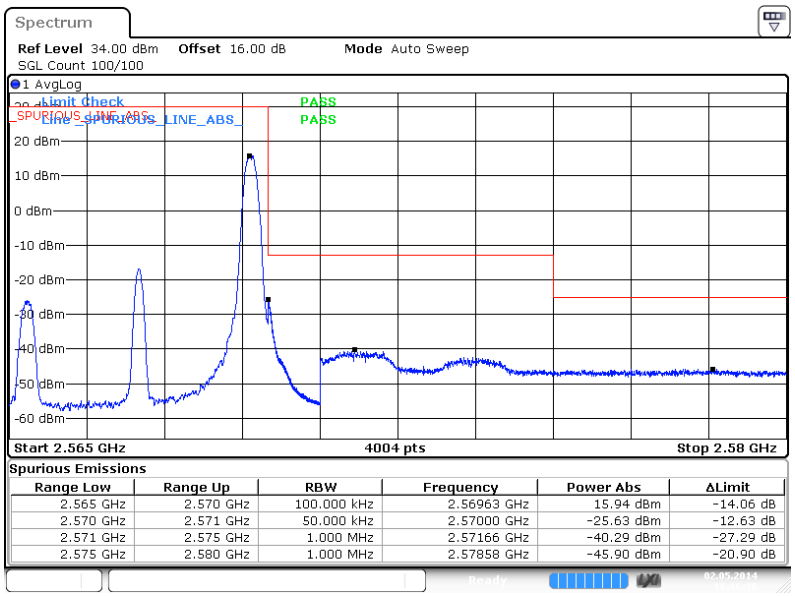


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49447 GHz	-38.49 dBm	-13.49 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49891 GHz	-21.86 dBm	-8.86 dB
2.499 GHz	2.500 GHz	50.000 kHz	2.50000 GHz	-29.97 dBm	-16.97 dB
2.500 GHz	2.505 GHz	100.000 kHz	2.50363 GHz	2.50 dBm	-27.50 dB

Date: 2 MAY 2014 16:14:44

Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24

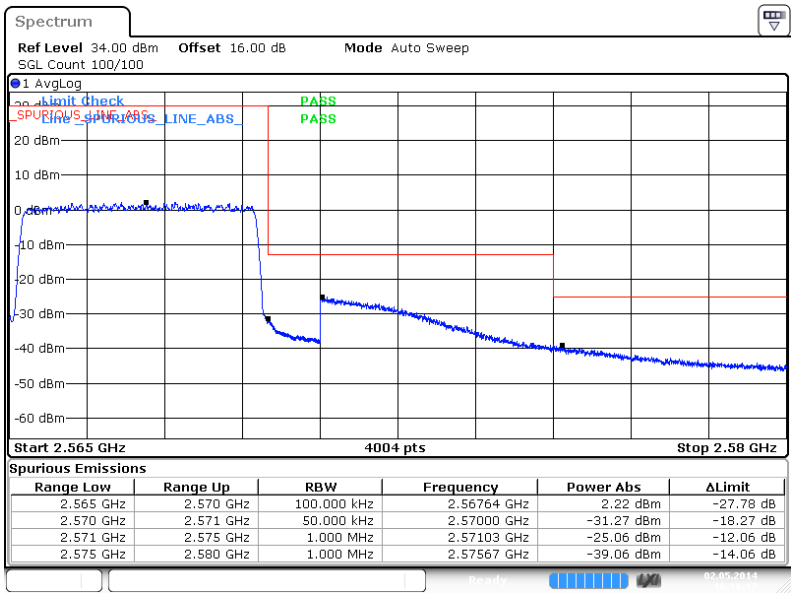


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.565 GHz	2.570 GHz	100.000 kHz	2.56963 GHz	15.94 dBm	-14.06 dB
2.570 GHz	2.571 GHz	50.000 kHz	2.57000 GHz	-25.63 dBm	-12.63 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57166 GHz	-40.29 dBm	-27.29 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57858 GHz	-45.90 dBm	-20.90 dB

Date:2 MAY 2014 16:16:37

Higher Band Edge Plot for 16QAM-RB Size 25, RB Offset 0



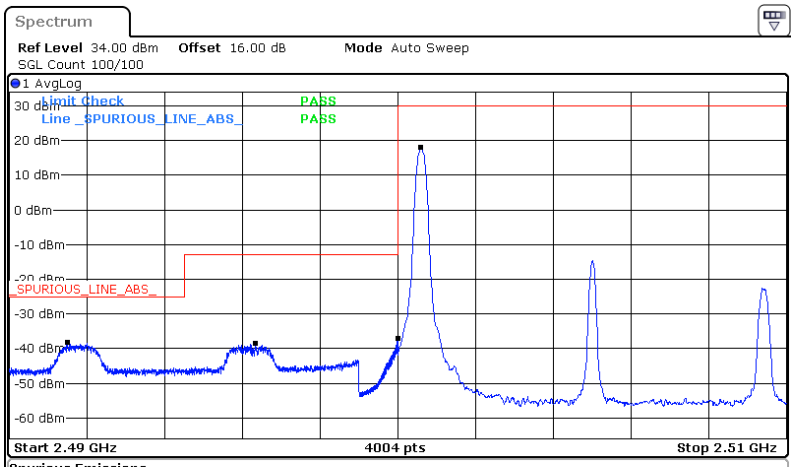
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.565 GHz	2.570 GHz	100.000 kHz	2.56764 GHz	2.22 dBm	-27.78 dB
2.570 GHz	2.571 GHz	50.000 kHz	2.57000 GHz	-31.27 dBm	-18.27 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57103 GHz	-25.06 dBm	-12.06 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57567 GHz	-39.06 dBm	-14.06 dB

Date:2 MAY 2014 16:18:17

Band :	LTE Band 7	Band Width :	10MHz / QPSK

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

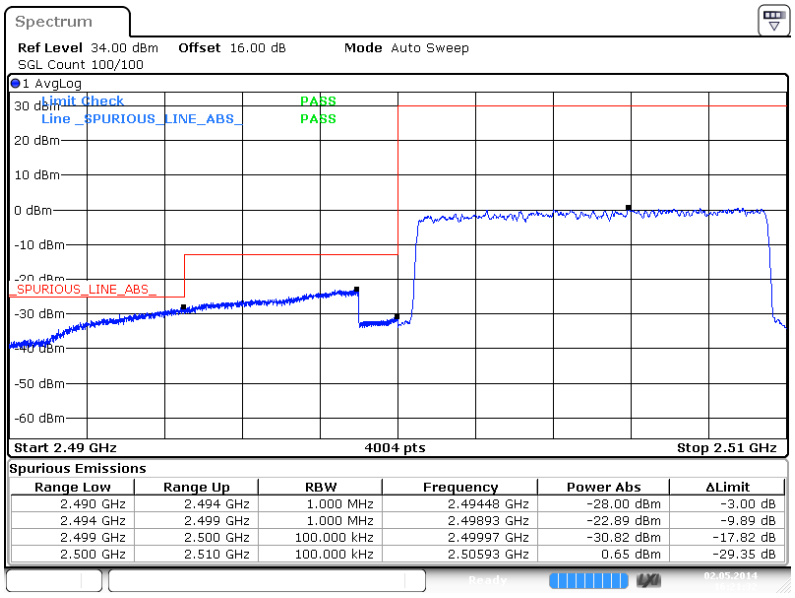


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49150 GHz	-38.24 dBm	-13.24 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49633 GHz	-38.44 dBm	-25.44 dB
2.499 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-37.01 dBm	-24.01 dB
2.500 GHz	2.510 GHz	100.000 kHz	2.50058 GHz	18.19 dBm	-11.81 dB

Date:2 MAY 2014 16:19:40

Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0

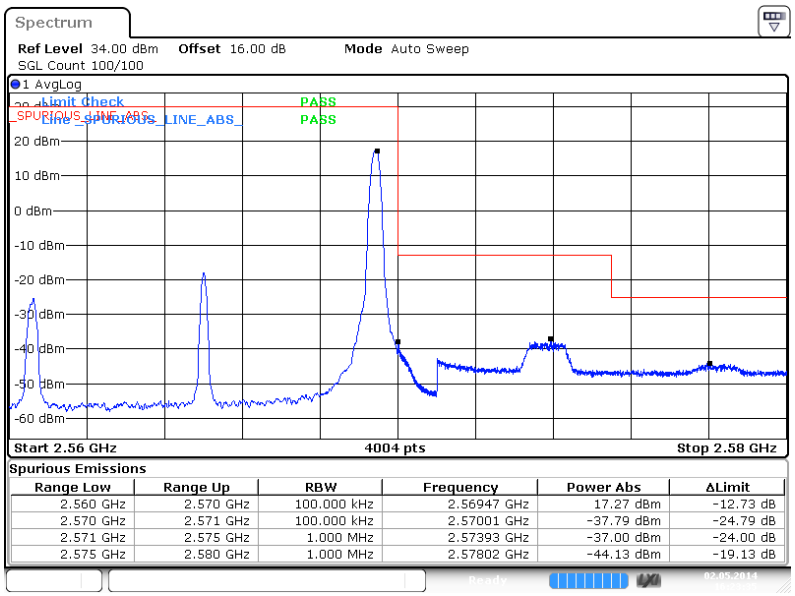


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49448 GHz	-28.00 dBm	-3.00 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49893 GHz	-22.89 dBm	-9.89 dB
2.499 GHz	2.500 GHz	100.000 kHz	2.49997 GHz	-30.82 dBm	-17.82 dB
2.500 GHz	2.510 GHz	100.000 kHz	2.50593 GHz	0.65 dBm	-29.35 dB

Date:2 MAY 2014 16:21:32

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49

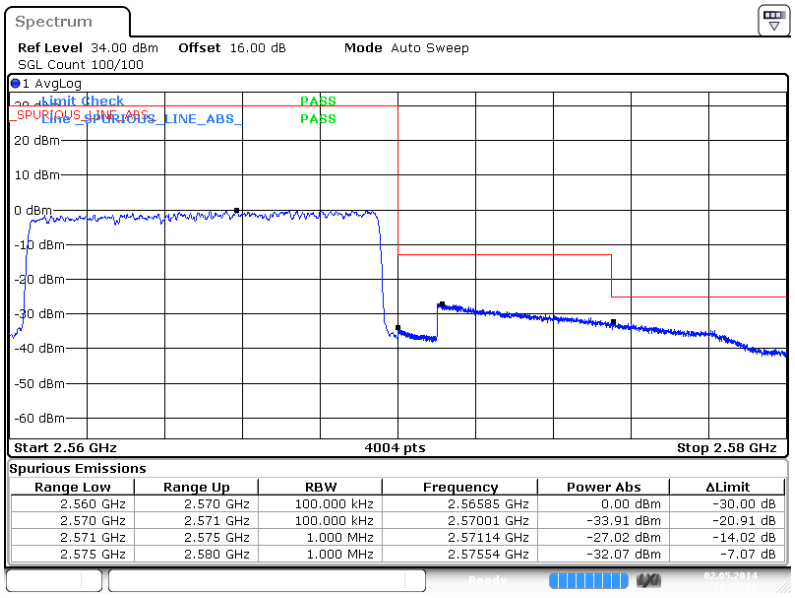


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56947 GHz	17.27 dBm	-12.73 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57001 GHz	-37.79 dBm	-24.79 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57393 GHz	-37.00 dBm	-24.00 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57802 GHz	-44.13 dBm	-19.13 dB

Date:2 MAY 2014 16:23:36

Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0



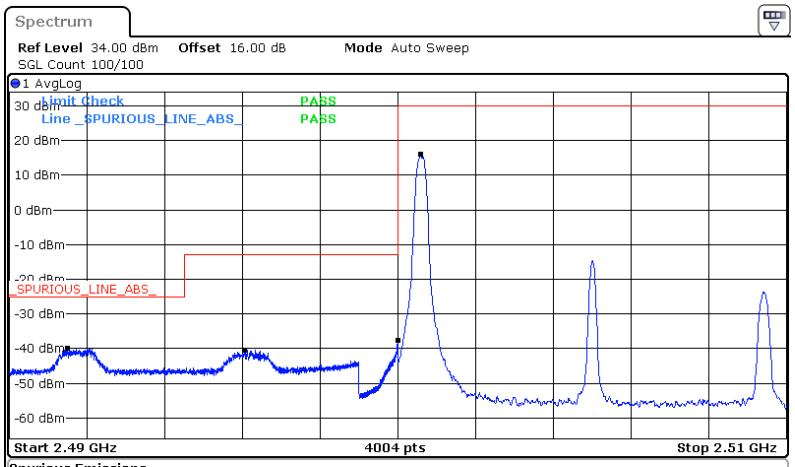
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56585 GHz	0.00 dBm	-30.00 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57001 GHz	-33.91 dBm	-20.91 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57114 GHz	-27.02 dBm	-14.02 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57554 GHz	-32.07 dBm	-7.07 dB

Date:2 MAY 2014 16:29:10

Band :	LTE Band 7	Band Width :	10MHz / 16QAM

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0

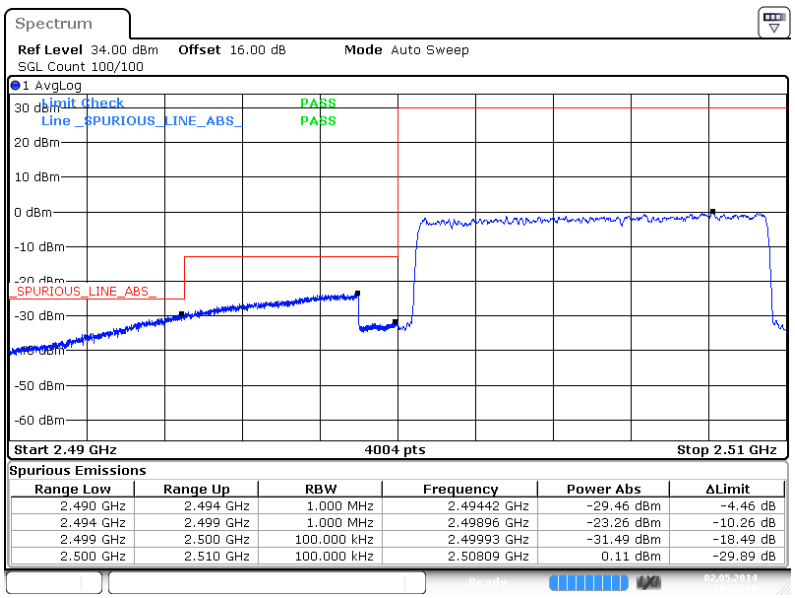


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49149 GHz	-39.99 dBm	-14.99 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49606 GHz	-40.39 dBm	-27.39 dB
2.499 GHz	2.500 GHz	100.000 kHz	2.50000 GHz	-37.72 dBm	-24.72 dB
2.500 GHz	2.510 GHz	100.000 kHz	2.50058 GHz	15.98 dBm	-14.02 dB

Date:2 MAY 2014 16:20:38

Lower Band Edge Plot for 16QAM-RB Size 50, RB Offset 0

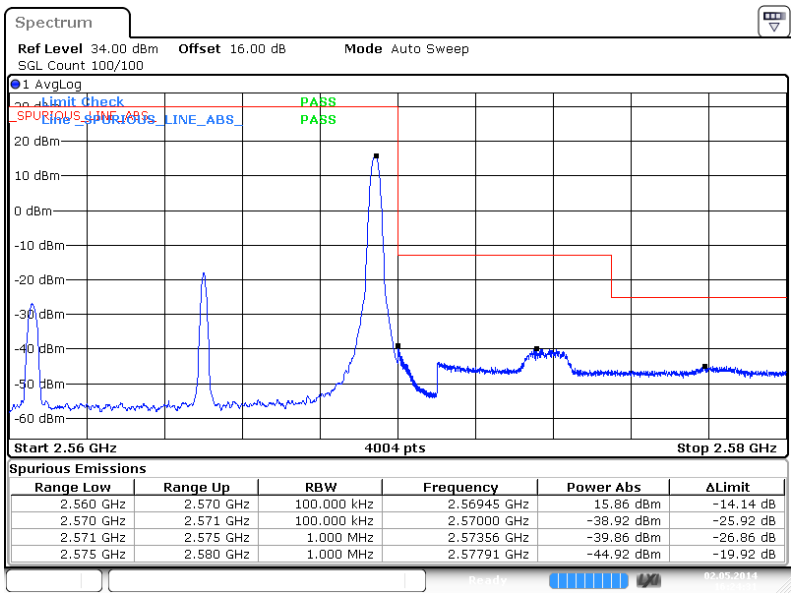


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49442 GHz	-29.46 dBm	-4.46 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49896 GHz	-23.26 dBm	-10.26 dB
2.499 GHz	2.500 GHz	100.000 kHz	2.49993 GHz	-31.49 dBm	-18.49 dB
2.500 GHz	2.510 GHz	100.000 kHz	2.50809 GHz	0.11 dBm	-29.89 dB

Date:2 MAY 2014 16:22:10

Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 49

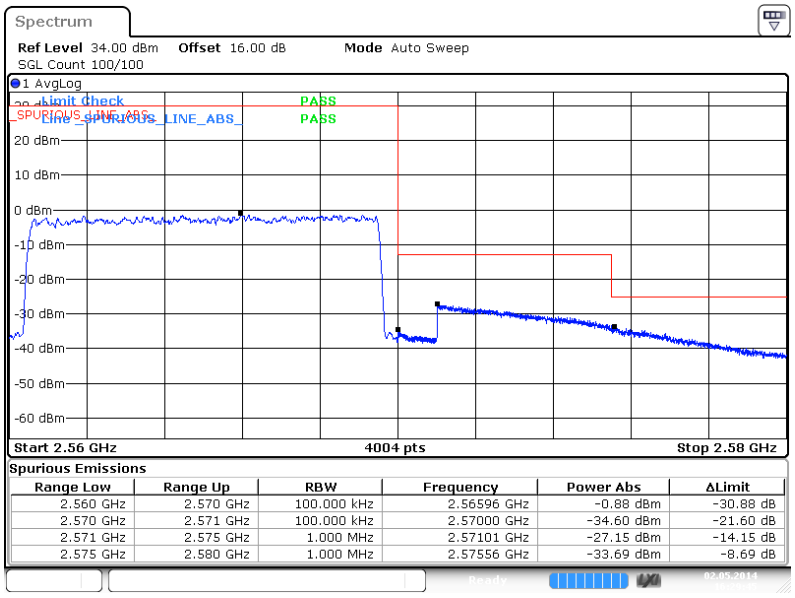


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56945 GHz	15.86 dBm	-14.14 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-38.92 dBm	-25.92 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57356 GHz	-39.86 dBm	-26.86 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57791 GHz	-44.92 dBm	-19.92 dB

Date: 2 MAY 2014 16:24:32

Higher Band Edge Plot for 16QAM-RB Size 50, RB Offset 0



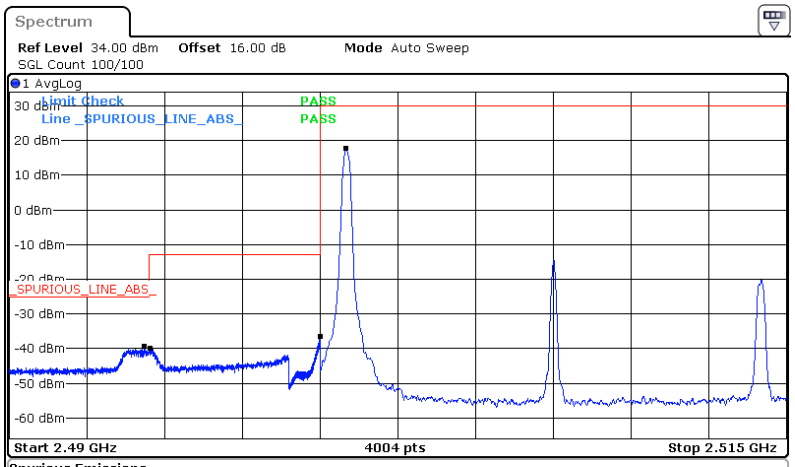
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.560 GHz	2.570 GHz	100.000 kHz	2.56596 GHz	-0.88 dBm	-30.88 dB
2.570 GHz	2.571 GHz	100.000 kHz	2.57000 GHz	-34.60 dBm	-21.60 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57101 GHz	-27.15 dBm	-14.15 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57556 GHz	-33.69 dBm	-8.69 dB

Date: 2 MAY 2014 16:29:45

Band :	LTE Band 7	Band Width :	15MHz / QPSK

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

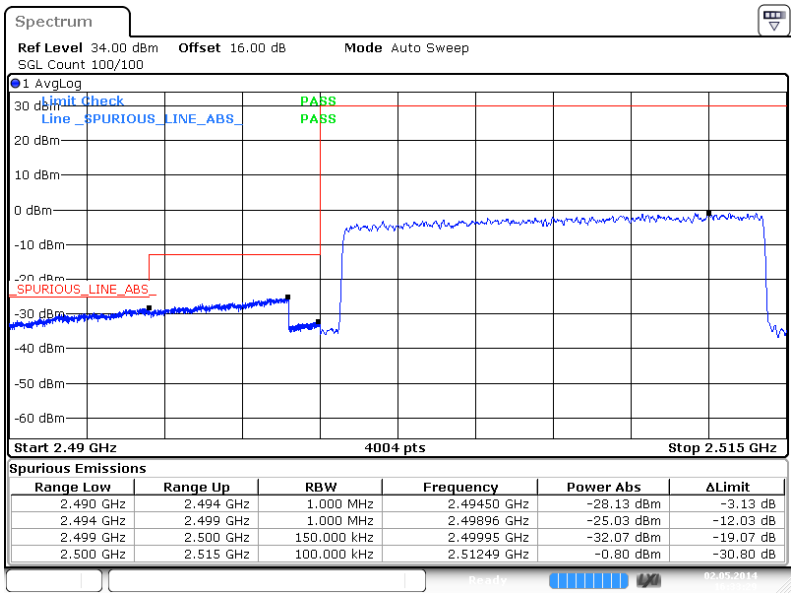


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49435 GHz	-39.31 dBm	-14.31 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49452 GHz	-39.85 dBm	-26.85 dB
2.499 GHz	2.500 GHz	150.000 kHz	2.50000 GHz	-36.37 dBm	-23.37 dB
2.500 GHz	2.515 GHz	100.000 kHz	2.50083 GHz	17.95 dBm	-12.05 dB

Date: 2 MAY 2014 16:31:49

Lower Band Edge Plot for QPSK-RB Size 75, RB Offset 0

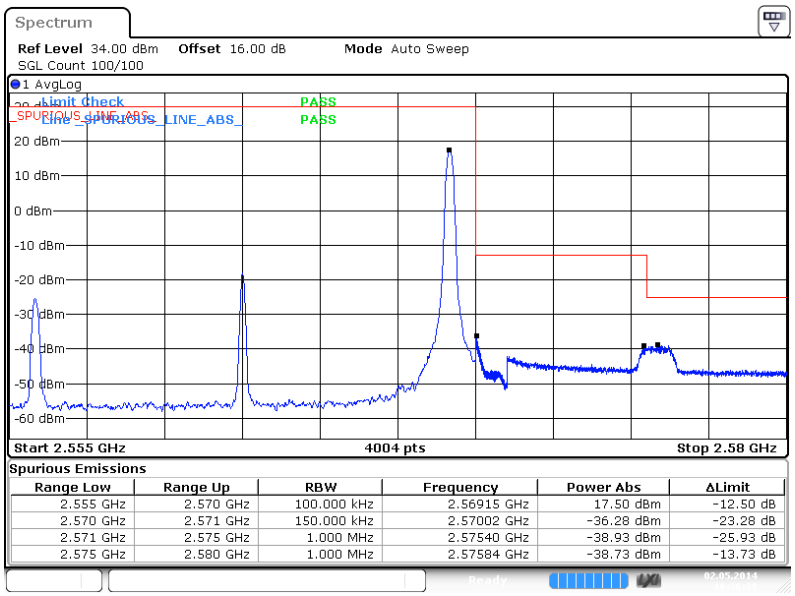


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49450 GHz	-28.13 dBm	-3.13 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49896 GHz	-25.03 dBm	-12.03 dB
2.499 GHz	2.500 GHz	150.000 kHz	2.49995 GHz	-32.07 dBm	-19.07 dB
2.500 GHz	2.515 GHz	100.000 kHz	2.51249 GHz	-0.80 dBm	-30.80 dB

Date: 2 MAY 2014 16:33:29

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 74

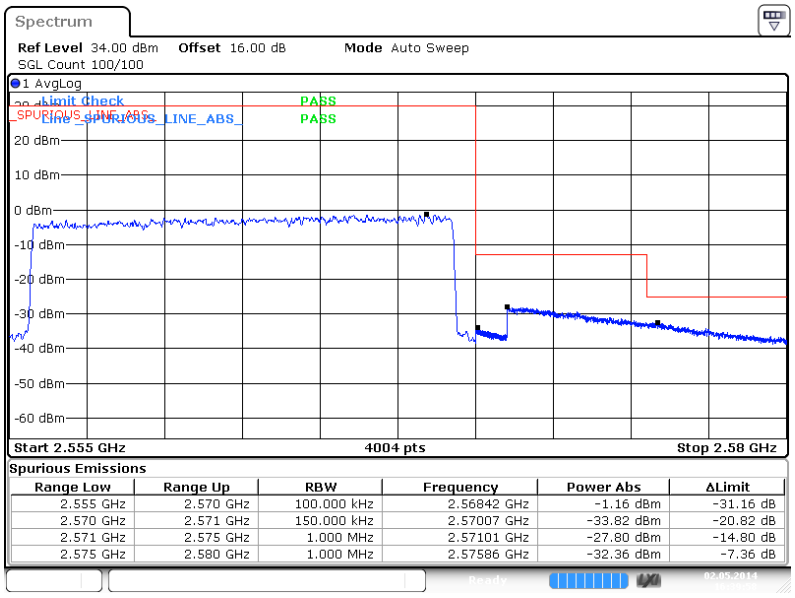


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.555 GHz	2.570 GHz	100.000 kHz	2.56915 GHz	17.50 dBm	-12.50 dB
2.570 GHz	2.571 GHz	150.000 kHz	2.57002 GHz	-36.28 dBm	-23.28 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57540 GHz	-38.93 dBm	-25.93 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57584 GHz	-38.73 dBm	-13.73 dB

Date: 2 MAY 2014 16:36:31

Higher Band Edge Plot for QPSK-RB Size 75, RB Offset 0



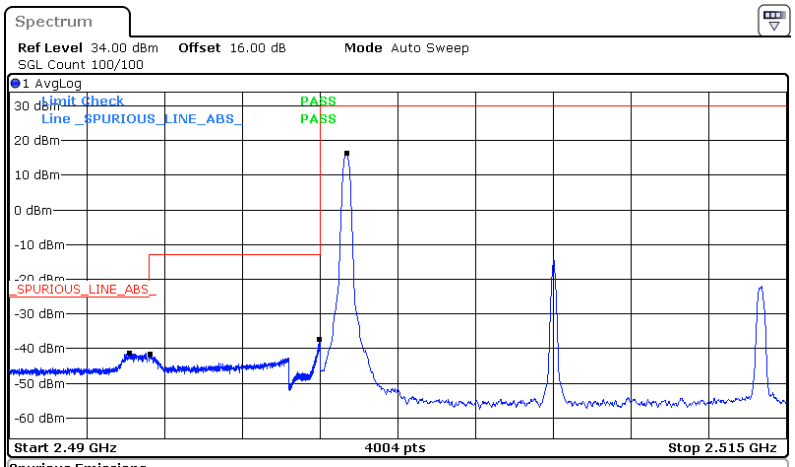
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.555 GHz	2.570 GHz	100.000 kHz	2.56842 GHz	-1.16 dBm	-31.16 dB
2.570 GHz	2.571 GHz	150.000 kHz	2.57007 GHz	-33.82 dBm	-20.82 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57101 GHz	-27.80 dBm	-14.80 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57586 GHz	-32.36 dBm	-7.36 dB

Date: 2 MAY 2014 16:39:58

Band :	LTE Band 7	Band Width :	15MHz / 16QAM

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0

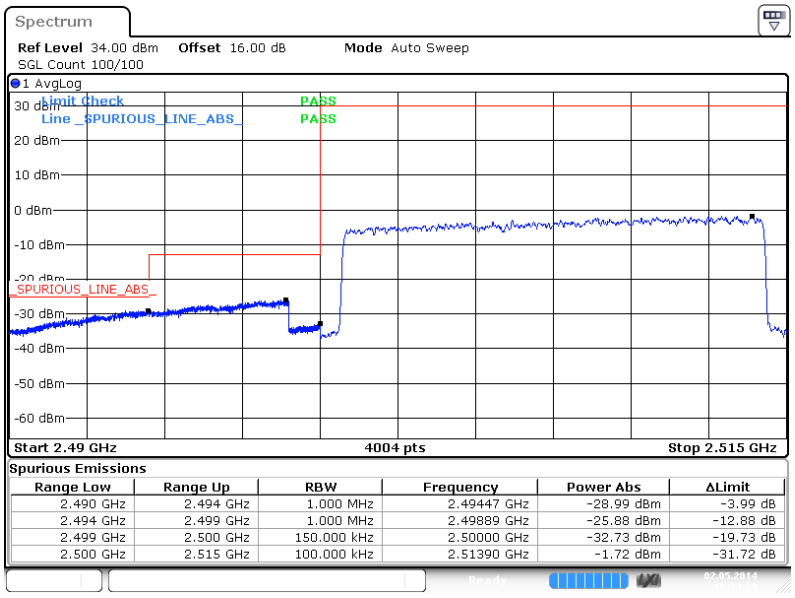


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49386 GHz	-41.31 dBm	-16.31 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49453 GHz	-41.45 dBm	-28.45 dB
2.499 GHz	2.500 GHz	150.000 kHz	2.49998 GHz	-37.32 dBm	-24.32 dB
2.500 GHz	2.515 GHz	100.000 kHz	2.50085 GHz	16.27 dBm	-13.73 dB

Date: 2 MAY 2014 16:32:24

Lower Band Edge Plot for 16QAM-RB Size 75, RB Offset 0

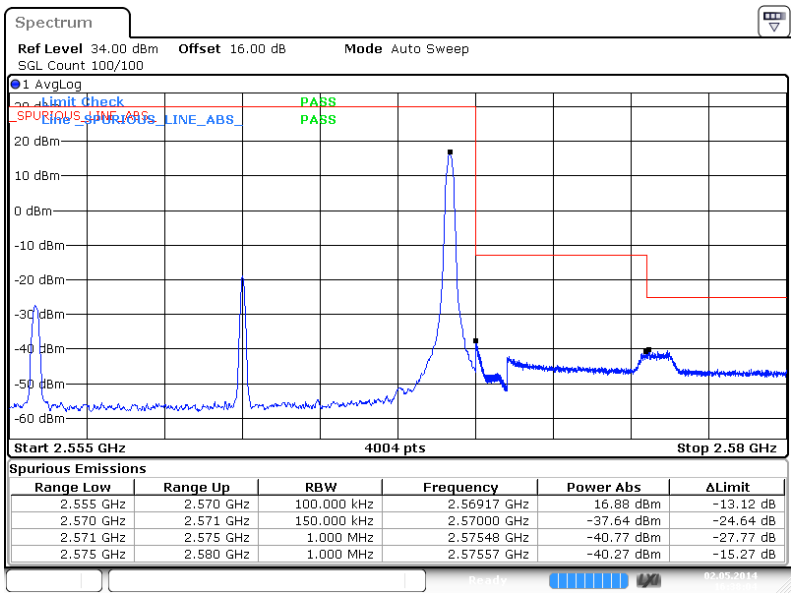


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49447 GHz	-28.99 dBm	-3.99 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49889 GHz	-25.88 dBm	-12.88 dB
2.499 GHz	2.500 GHz	150.000 kHz	2.50000 GHz	-32.73 dBm	-19.73 dB
2.500 GHz	2.515 GHz	100.000 kHz	2.51390 GHz	-1.72 dBm	-31.72 dB

Date: 2 MAY 2014 16:34:25

Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 74

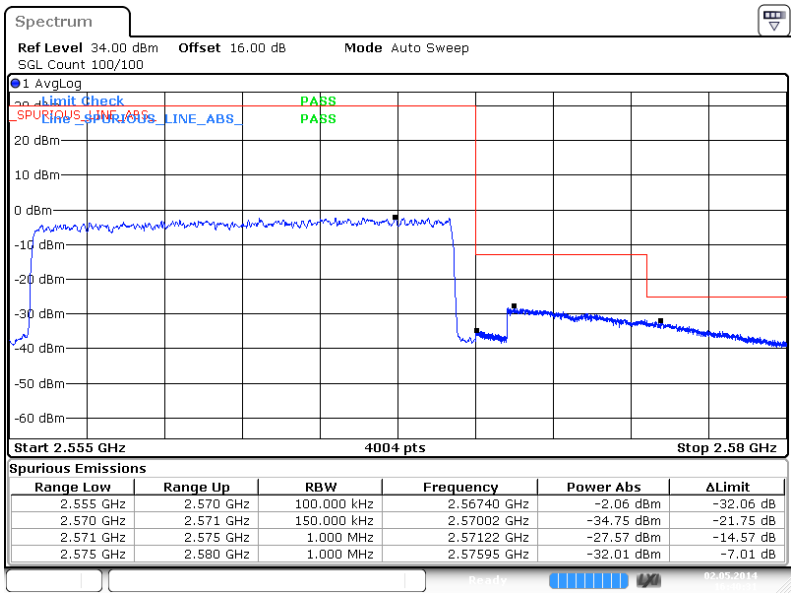


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.555 GHz	2.570 GHz	100.000 kHz	2.56917 GHz	16.88 dBm	-13.12 dB
2.570 GHz	2.571 GHz	150.000 kHz	2.57000 GHz	-37.64 dBm	-24.64 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57548 GHz	-40.77 dBm	-27.77 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57557 GHz	-40.27 dBm	-15.27 dB

Date: 2 MAY 2014 16:38:04

Higher Band Edge Plot for 16QAM-RB Size 75, RB Offset 0



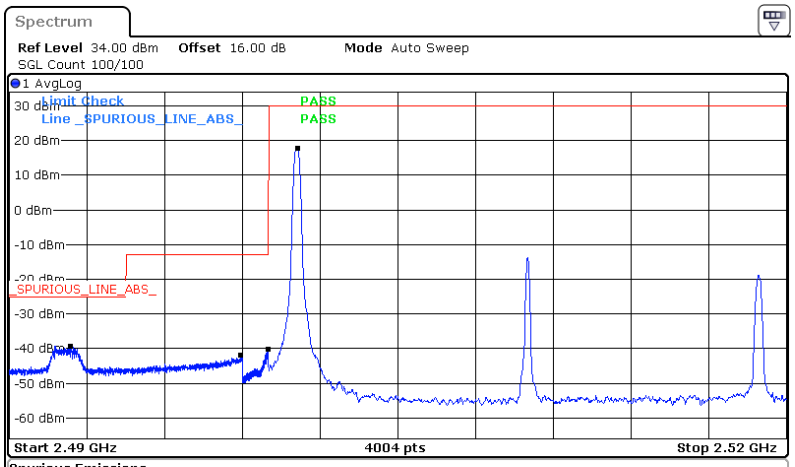
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.555 GHz	2.570 GHz	100.000 kHz	2.56740 GHz	-2.06 dBm	-32.06 dB
2.570 GHz	2.571 GHz	150.000 kHz	2.57002 GHz	-34.75 dBm	-21.75 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57122 GHz	-27.57 dBm	-14.57 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57595 GHz	-32.01 dBm	-7.01 dB

Date: 2 MAY 2014 16:40:31

Band :	LTE Band 7	Band Width :	20MHz / QPSK

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

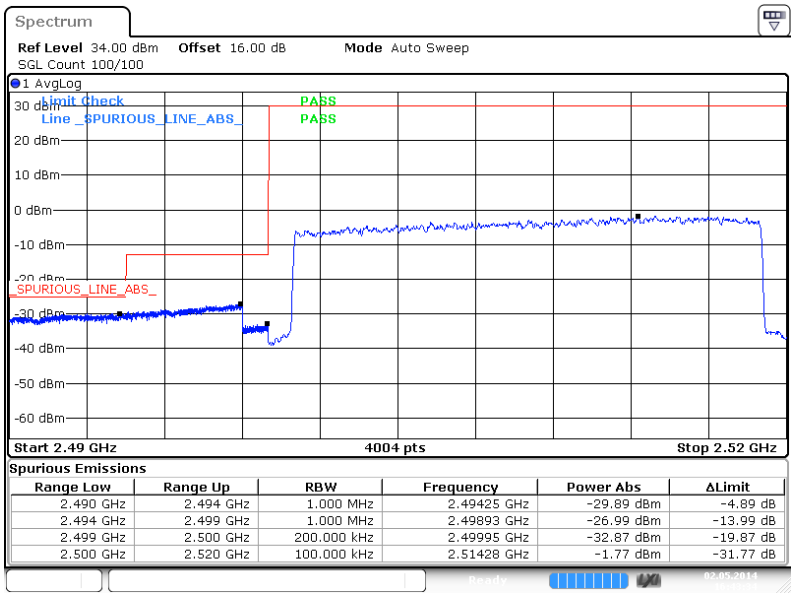


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49234 GHz	-39.17 dBm	-14.17 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49892 GHz	-41.84 dBm	-28.84 dB
2.499 GHz	2.500 GHz	200.000 kHz	2.49999 GHz	-40.09 dBm	-27.09 dB
2.500 GHz	2.520 GHz	100.000 kHz	2.50113 GHz	17.80 dBm	-12.20 dB

Date:2 MAY 2014 16:41:39

Lower Band Edge Plot for QPSK-RB Size 100, RB Offset 0

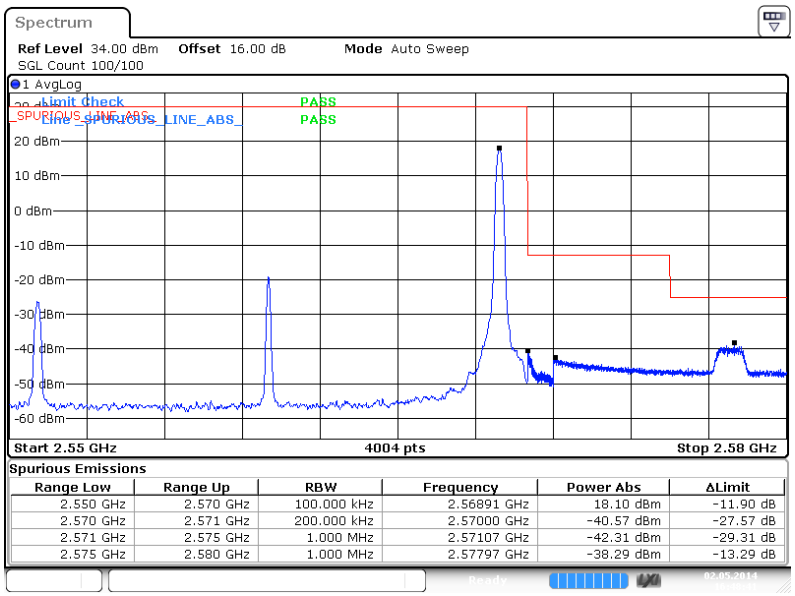


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49425 GHz	-29.89 dBm	-4.89 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49893 GHz	-26.99 dBm	-13.99 dB
2.499 GHz	2.500 GHz	200.000 kHz	2.49995 GHz	-32.87 dBm	-19.87 dB
2.500 GHz	2.520 GHz	100.000 kHz	2.51428 GHz	-1.77 dBm	-31.77 dB

Date:2 MAY 2014 16:43:34

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 99

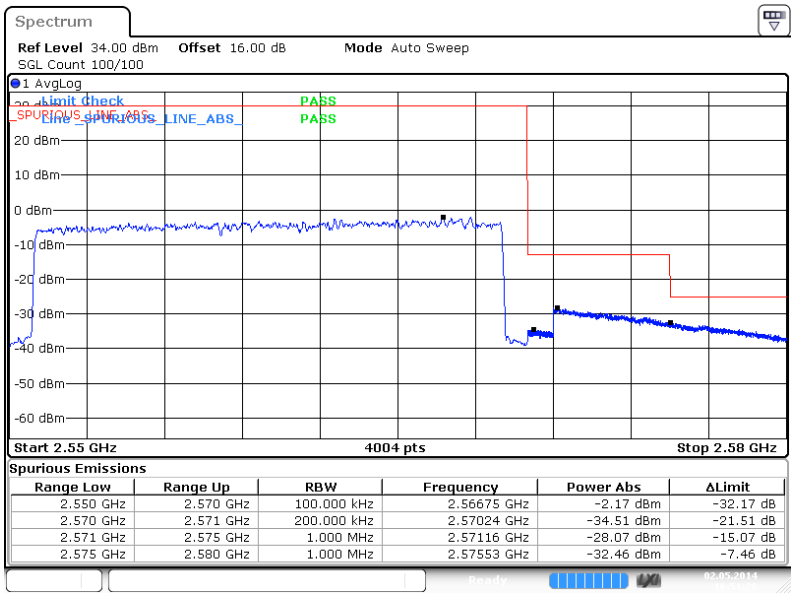


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.550 GHz	2.570 GHz	100.000 kHz	2.56891 GHz	18.10 dBm	-11.90 dB
2.570 GHz	2.571 GHz	200.000 kHz	2.57000 GHz	-40.57 dBm	-27.57 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57107 GHz	-42.31 dBm	-29.31 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57797 GHz	-38.29 dBm	-13.29 dB

Date: 2 MAY 2014 16:48:41

Higher Band Edge Plot for QPSK-RB Size 100, RB Offset 0



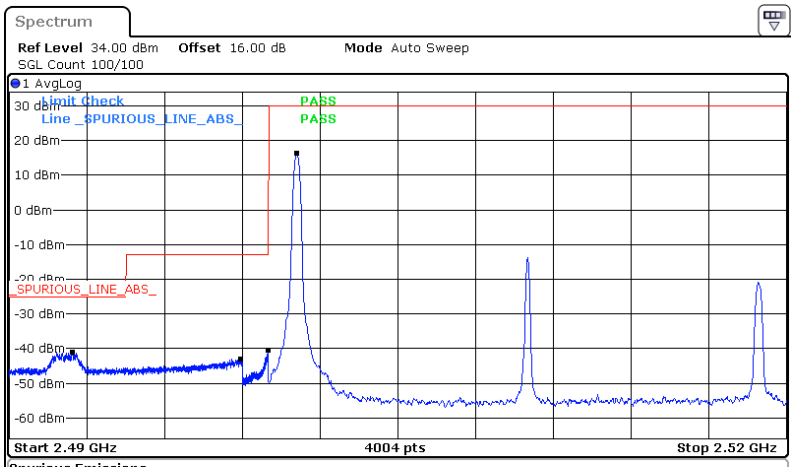
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.550 GHz	2.570 GHz	100.000 kHz	2.56675 GHz	-2.17 dBm	-32.17 dB
2.570 GHz	2.571 GHz	200.000 kHz	2.57024 GHz	-34.51 dBm	-21.51 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57116 GHz	-28.07 dBm	-15.07 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57553 GHz	-32.46 dBm	-7.46 dB

Date: 2 MAY 2014 16:51:27

Band :	LTE Band 7	Band Width :	20MHz / 16QAM

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0

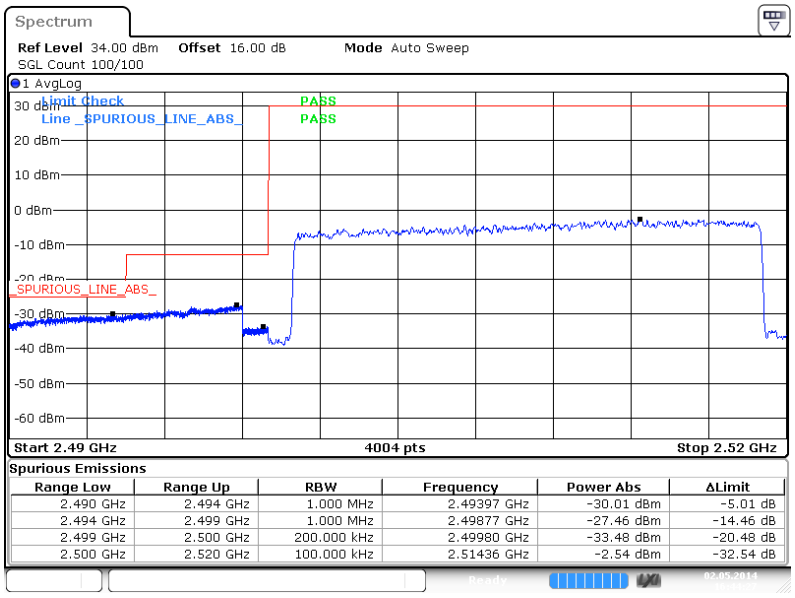


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49242 GHz	-41.01 dBm	-16.01 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49892 GHz	-42.92 dBm	-29.92 dB
2.499 GHz	2.500 GHz	200.000 kHz	2.49999 GHz	-40.42 dBm	-27.42 dB
2.500 GHz	2.520 GHz	100.000 kHz	2.50109 GHz	16.28 dBm	-13.72 dB

Date: 2 MAY 2014 16:42:47

Lower Band Edge Plot for 16QAM-RB Size 100, RB Offset 0

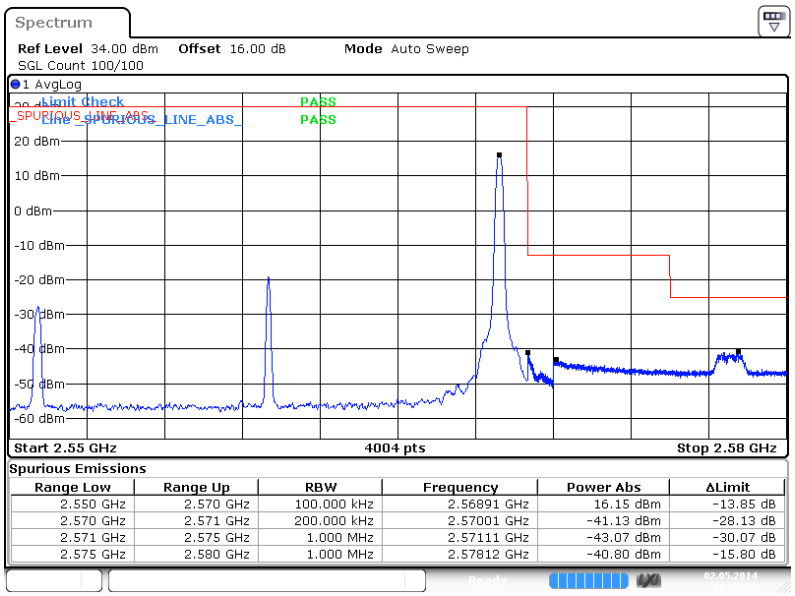


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.490 GHz	2.494 GHz	1.000 MHz	2.49397 GHz	-30.01 dBm	-5.01 dB
2.494 GHz	2.499 GHz	1.000 MHz	2.49877 GHz	-27.46 dBm	-14.46 dB
2.499 GHz	2.500 GHz	200.000 kHz	2.49980 GHz	-33.48 dBm	-20.48 dB
2.500 GHz	2.520 GHz	100.000 kHz	2.51436 GHz	-2.54 dBm	-32.54 dB

Date: 2 MAY 2014 16:44:27

Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 99

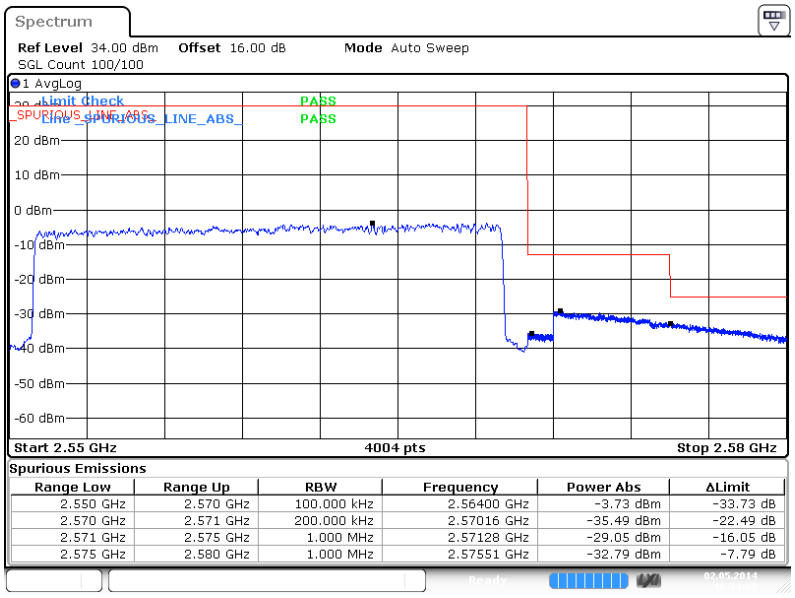


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.550 GHz	2.570 GHz	100.000 kHz	2.56891 GHz	16.15 dBm	-13.85 dB
2.570 GHz	2.571 GHz	200.000 kHz	2.57001 GHz	-41.13 dBm	-28.13 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57111 GHz	-43.07 dBm	-30.07 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57812 GHz	-40.80 dBm	-15.80 dB

Date: 2 MAY 2014 16:45:53

Higher Band Edge Plot for 16QAM-RB Size 100, RB Offset 0



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
2.550 GHz	2.570 GHz	100.000 kHz	2.56400 GHz	-3.73 dBm	-33.73 dB
2.570 GHz	2.571 GHz	200.000 kHz	2.57016 GHz	-35.49 dBm	-22.49 dB
2.571 GHz	2.575 GHz	1.000 MHz	2.57128 GHz	-29.05 dBm	-16.05 dB
2.575 GHz	2.580 GHz	1.000 MHz	2.57551 GHz	-32.79 dBm	-7.79 dB

Date: 2 MAY 2014 16:54:02

3.5 Conducted Spurious Emission Measurement

3.5.1 Description of Conducted Spurious Emission Measurement

For Band 7

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 9 kHz up to a frequency including its 10th harmonic.

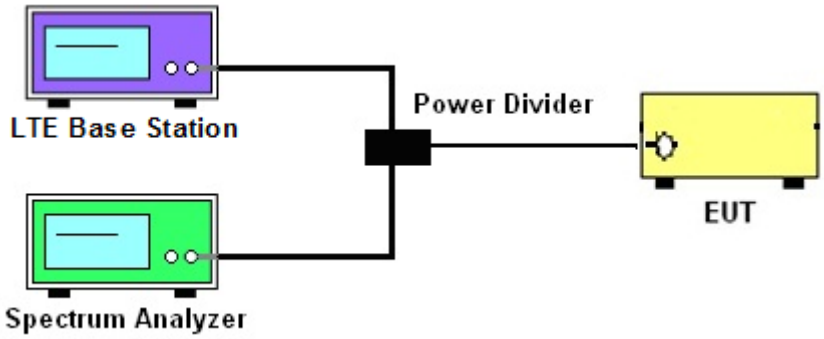
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [55 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)
   = -25dBm.

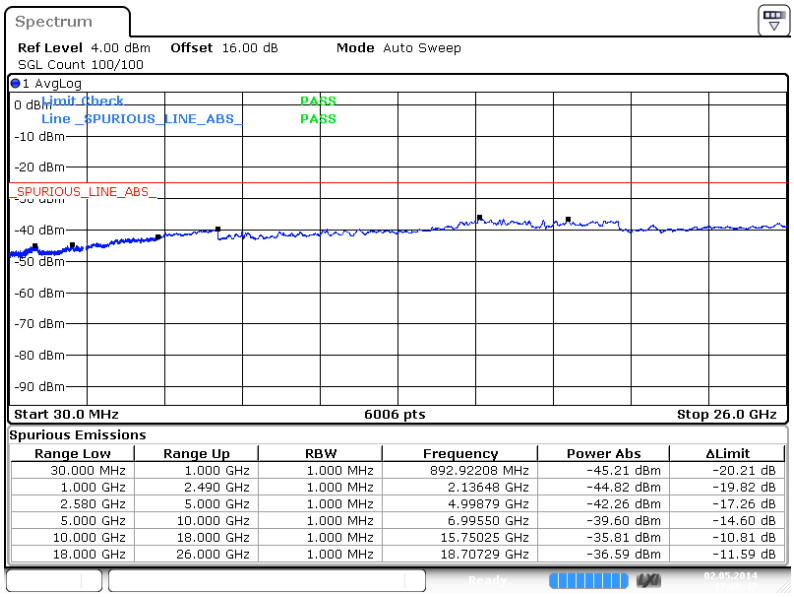
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Spurious Emission

Band :	LTE Band 7	Channel :	CH20775 (Low)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)

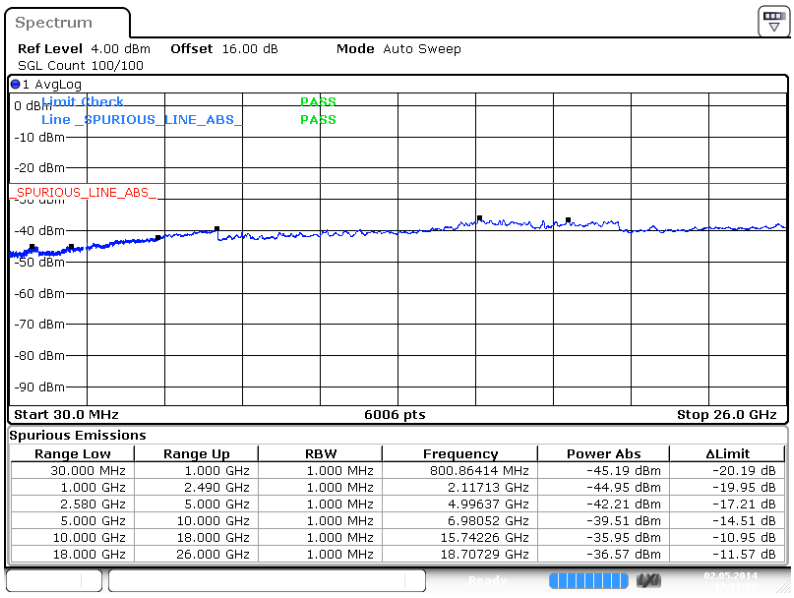


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	892.92208 MHz	-45.21 dBm	-20.21 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.13648 GHz	-44.82 dBm	-19.82 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99879 GHz	-42.26 dBm	-17.26 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.60 dBm	-14.60 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75025 GHz	-35.81 dBm	-10.81 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.70729 GHz	-36.59 dBm	-11.59 dB

Date: 2 MAY 2014 17:09:46

16QAM (RB Size 1, RB Offset 24)



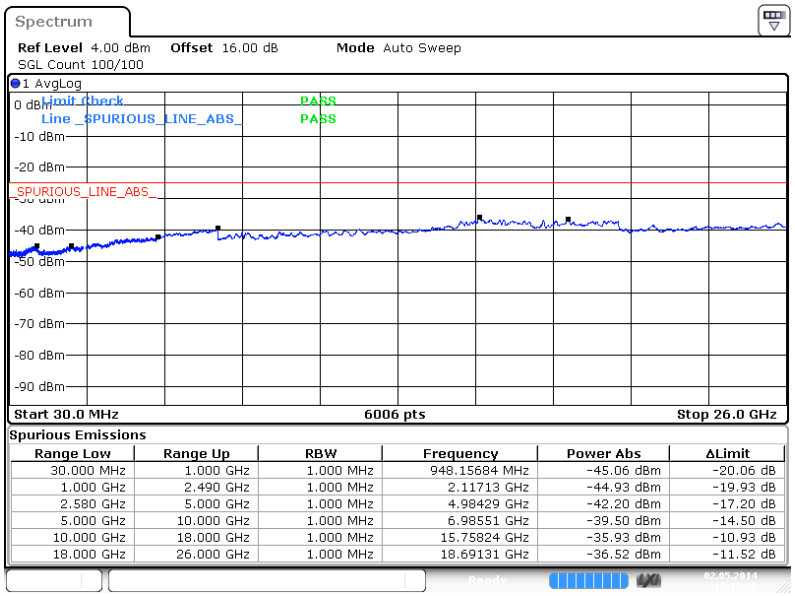
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	800.86414 MHz	-45.19 dBm	-20.19 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.11713 GHz	-44.95 dBm	-19.95 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99637 GHz	-42.21 dBm	-17.21 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.98052 GHz	-39.51 dBm	-14.51 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.74226 GHz	-35.95 dBm	-10.95 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.70729 GHz	-36.57 dBm	-11.57 dB

Date: 2 MAY 2014 17:11:09

Band :	LTE Band 7	Channel :	CH21100 (Middle)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)

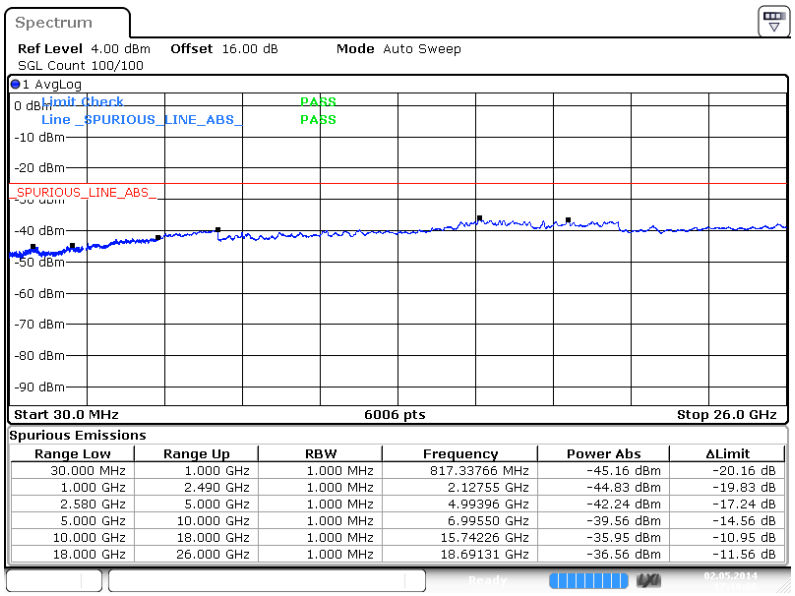


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	948.15684 MHz	-45.06 dBm	-20.06 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.11713 GHz	-44.93 dBm	-19.93 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.98429 GHz	-42.20 dBm	-17.20 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.98551 GHz	-39.50 dBm	-14.50 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75824 GHz	-35.93 dBm	-10.93 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69131 GHz	-36.52 dBm	-11.52 dB

Date: 2 MAY 2014 17:17:25

16QAM (RB Size 1, RB Offset 24)



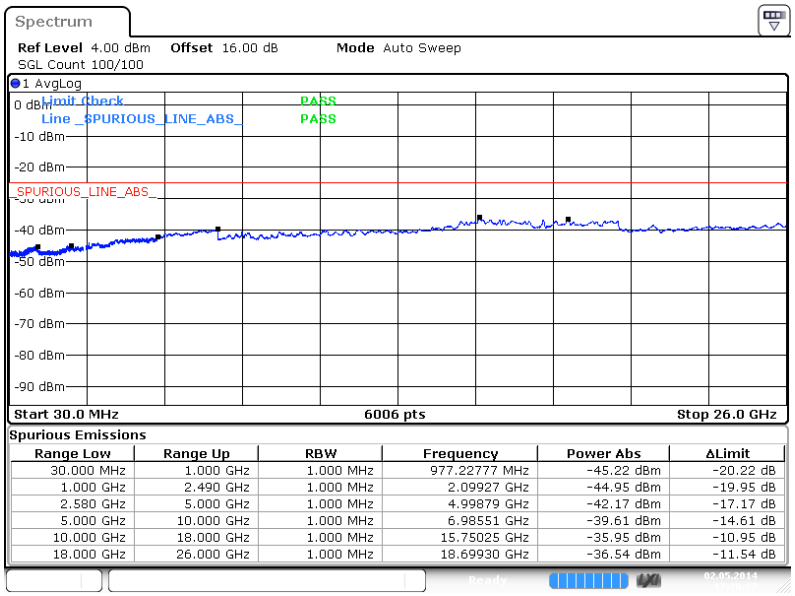
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	817.33766 MHz	-45.16 dBm	-20.16 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.12755 GHz	-44.83 dBm	-19.83 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99396 GHz	-42.24 dBm	-17.24 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.56 dBm	-14.56 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.74226 GHz	-35.95 dBm	-10.95 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69131 GHz	-36.56 dBm	-11.56 dB

Date: 2 MAY 2014 17:19:99

Band :	LTE Band 7	Channel :	CH21425 (High)
Band Width :	5MHz		

QPSK (RB Size 1, RB Offset 24)

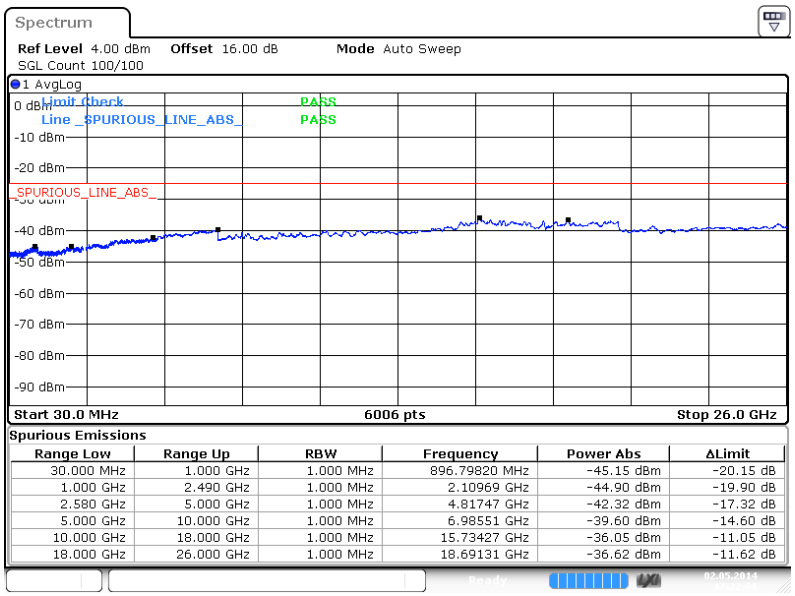


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	977.22777 MHz	-45.22 dBm	-20.22 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.09927 GHz	-44.95 dBm	-19.95 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99879 GHz	-42.17 dBm	-17.17 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.98551 GHz	-39.61 dBm	-14.61 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75025 GHz	-35.95 dBm	-10.95 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69930 GHz	-36.54 dBm	-11.54 dB

Date: 2 MAY 2014 17:20:26

16QAM (RB Size 1, RB Offset 24)



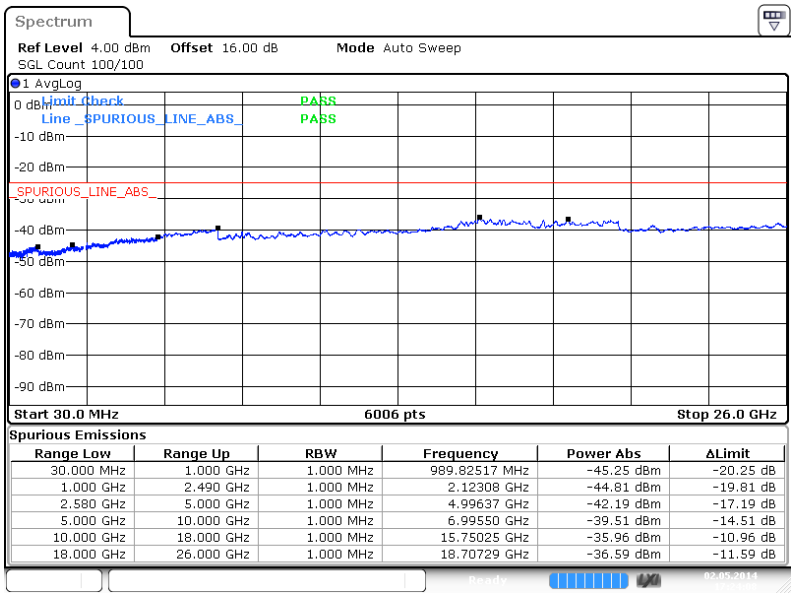
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	896.79820 MHz	-45.15 dBm	-20.15 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.10969 GHz	-44.90 dBm	-19.90 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.81747 GHz	-42.32 dBm	-17.32 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.98551 GHz	-39.60 dBm	-14.60 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.73427 GHz	-36.05 dBm	-11.05 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69131 GHz	-36.62 dBm	-11.62 dB

Date: 2 MAY 2014 17:22:01

Band :	LTE Band 7	Channel :	CH20800 (Low)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

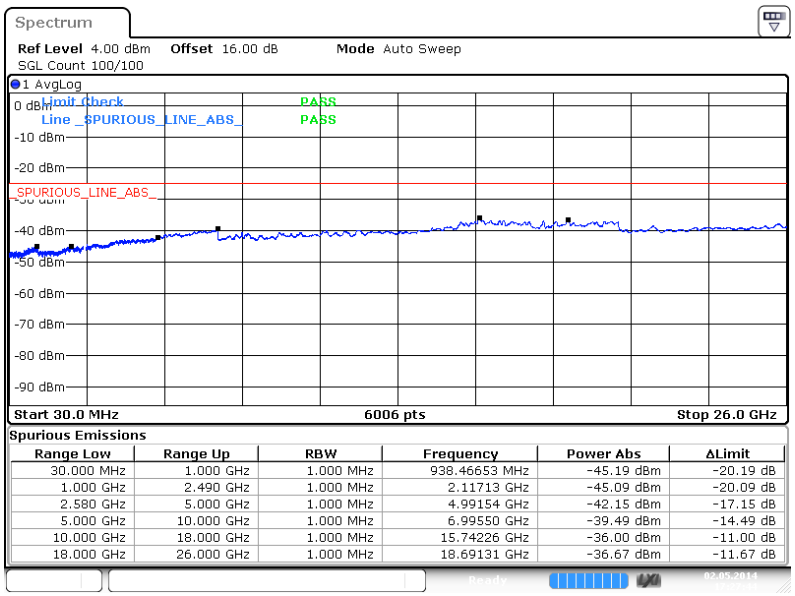


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	989.82517 MHz	-45.25 dBm	-20.25 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.12308 GHz	-44.81 dBm	-19.81 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99637 GHz	-42.19 dBm	-17.19 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.51 dBm	-14.51 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75025 GHz	-35.96 dBm	-10.96 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.70729 GHz	-36.59 dBm	-11.59 dB

Date: 2 MAY 2014 17:24:07

16QAM (RB Size 1, RB Offset 49)



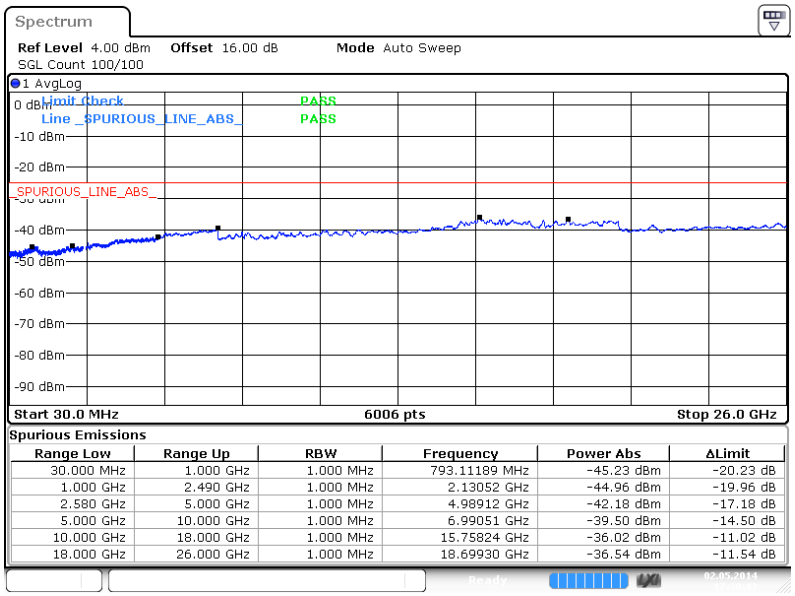
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	938.46653 MHz	-45.19 dBm	-20.19 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.11713 GHz	-45.09 dBm	-20.09 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99154 GHz	-42.15 dBm	-17.15 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.49 dBm	-14.49 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.74226 GHz	-36.00 dBm	-11.00 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69131 GHz	-36.67 dBm	-11.67 dB

Date: 2 MAY 2014 17:27:44

Band :	LTE Band 7	Channel :	CH21100 (Middle)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

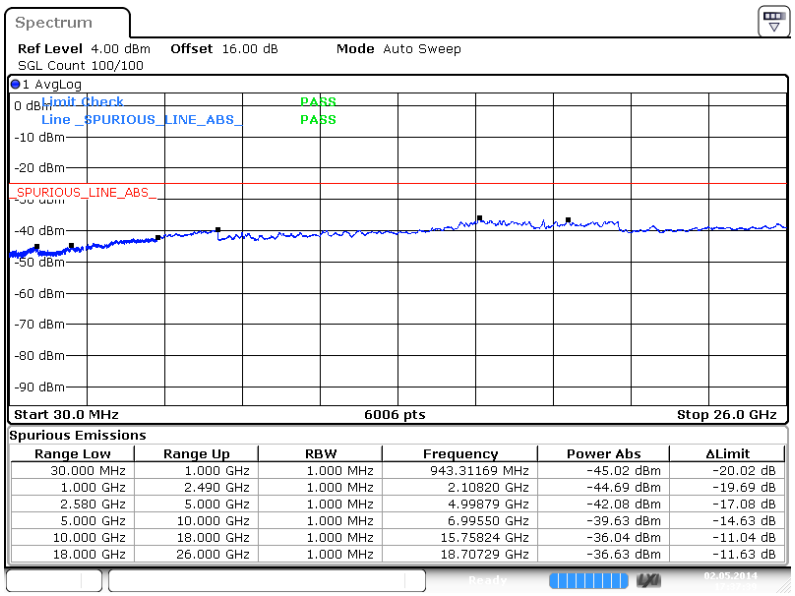


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	793.11189 MHz	-45.23 dBm	-20.23 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.13052 GHz	-44.96 dBm	-19.96 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.98912 GHz	-42.18 dBm	-17.18 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99051 GHz	-39.50 dBm	-14.50 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75824 GHz	-36.02 dBm	-11.02 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69930 GHz	-36.54 dBm	-11.54 dB

Date: 2 MAY 2014 17:30:43

16QAM (RB Size 1, RB Offset 49)



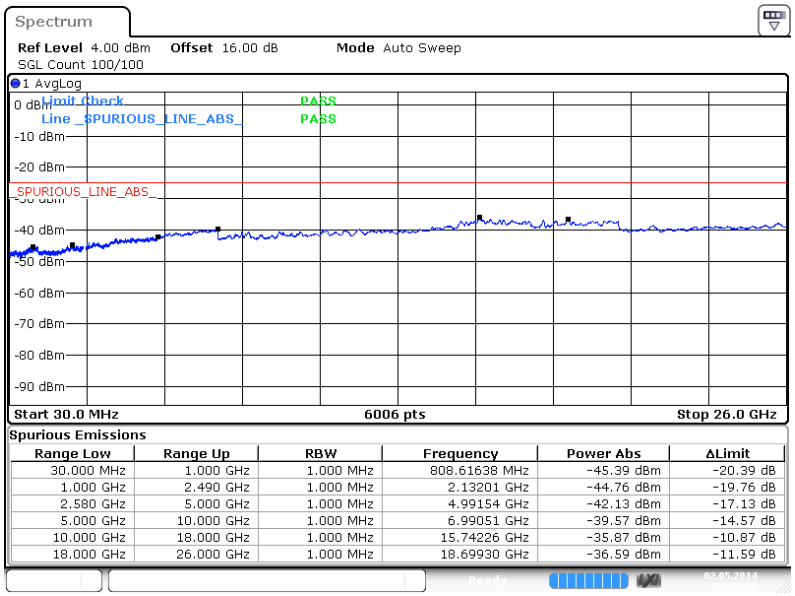
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	943.31169 MHz	-45.02 dBm	-20.02 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.10820 GHz	-44.69 dBm	-19.69 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99879 GHz	-42.08 dBm	-17.08 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.63 dBm	-14.63 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75824 GHz	-36.04 dBm	-11.04 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.70729 GHz	-36.63 dBm	-11.63 dB

Date: 2 MAY 2014 17:37:39

Band :	LTE Band 7	Channel :	CH21400 (High)
Band Width :	10MHz		

QPSK (RB Size 1, RB Offset 49)

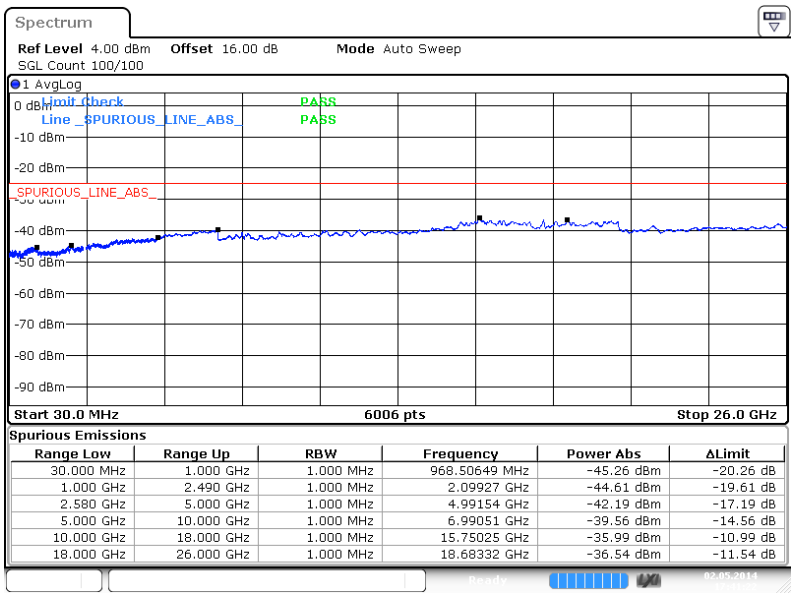


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	808.61638 MHz	-45.39 dBm	-20.39 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.13201 GHz	-44.76 dBm	-19.76 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99154 GHz	-42.13 dBm	-17.13 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99051 GHz	-39.57 dBm	-14.57 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.74226 GHz	-35.87 dBm	-10.87 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69930 GHz	-36.59 dBm	-11.59 dB

Date:2.MAY.2014 17:40:16

16QAM (RB Size 1, RB Offset 49)



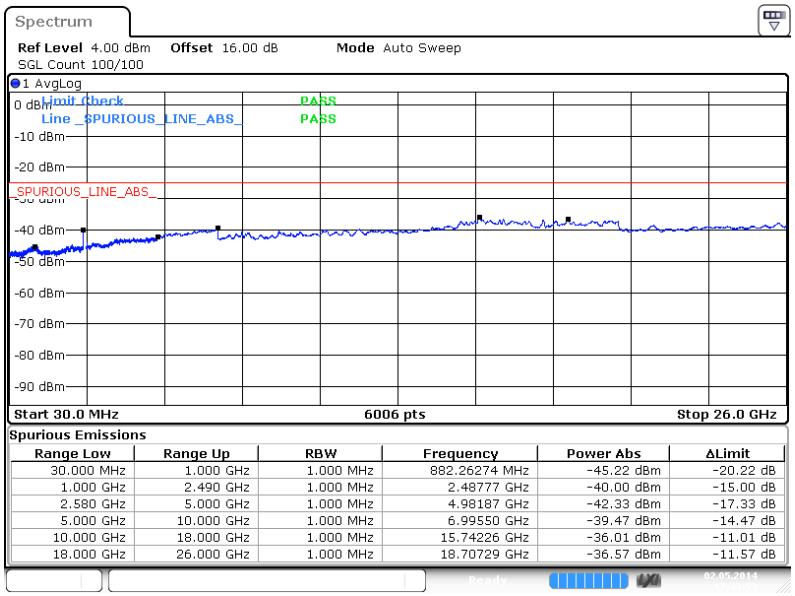
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	968.50649 MHz	-45.26 dBm	-20.26 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.09927 GHz	-44.61 dBm	-19.61 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99154 GHz	-42.19 dBm	-17.19 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99051 GHz	-39.56 dBm	-14.56 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75025 GHz	-35.99 dBm	-10.99 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.68332 GHz	-36.54 dBm	-11.54 dB

Date:2.MAY.2014 17:41:22

Band :	LTE Band 7	Channel :	CH20825 (Low)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 74)

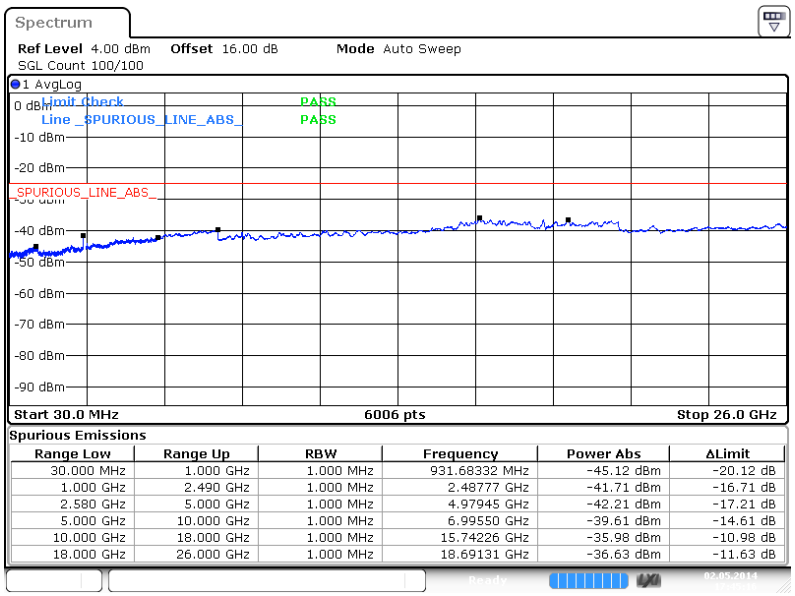


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	882.26274 MHz	-45.22 dBm	-20.22 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.48777 GHz	-40.00 dBm	-15.00 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.98187 GHz	-42.33 dBm	-17.33 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.47 dBm	-14.47 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.74226 GHz	-36.01 dBm	-11.01 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.70729 GHz	-36.57 dBm	-11.57 dB

Date: 2 MAY 2014 17:43:53

16QAM (RB Size 1, RB Offset 74)



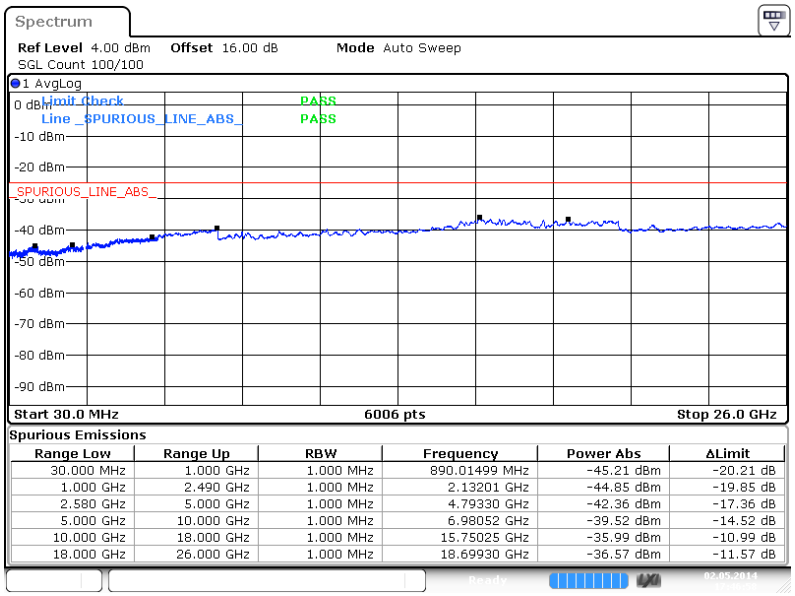
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	931.68332 MHz	-45.12 dBm	-20.12 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.48777 GHz	-41.71 dBm	-16.71 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.97945 GHz	-42.21 dBm	-17.21 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.61 dBm	-14.61 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.74226 GHz	-35.98 dBm	-10.98 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69131 GHz	-36.63 dBm	-11.63 dB

Date: 2 MAY 2014 17:45:17

Band :	LTE Band 7	Channel :	CH21100 (Middle)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 74)

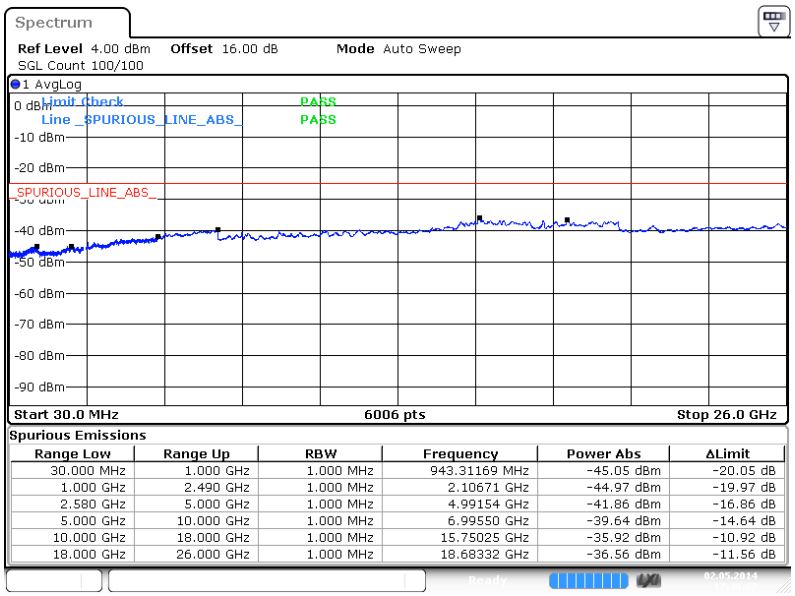


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	890.01499 MHz	-45.21 dBm	-20.21 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.13201 GHz	-44.85 dBm	-19.85 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.79330 GHz	-42.36 dBm	-17.36 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.98052 GHz	-39.52 dBm	-14.52 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75025 GHz	-35.99 dBm	-10.99 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69930 GHz	-36.57 dBm	-11.57 dB

Date: 2 MAY 2014 17:46:58

16QAM (RB Size 1, RB Offset 74)



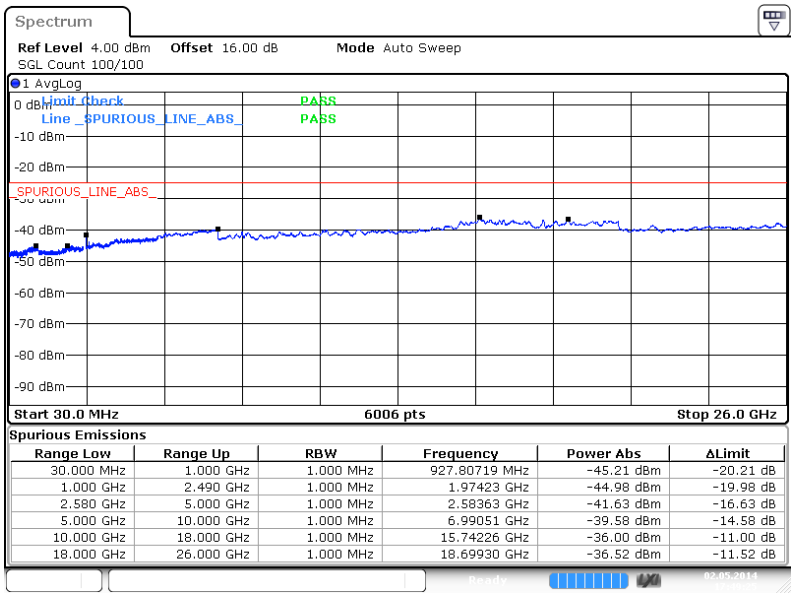
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	943.31169 MHz	-45.05 dBm	-20.05 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.10671 GHz	-44.97 dBm	-19.97 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99154 GHz	-41.86 dBm	-16.86 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.64 dBm	-14.64 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75025 GHz	-35.92 dBm	-10.92 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.68332 GHz	-36.56 dBm	-11.56 dB

Date: 2 MAY 2014 17:48:06

Band :	LTE Band 7	Channel :	CH21375 (High)
Band Width :	15MHz		

QPSK (RB Size 1, RB Offset 74)

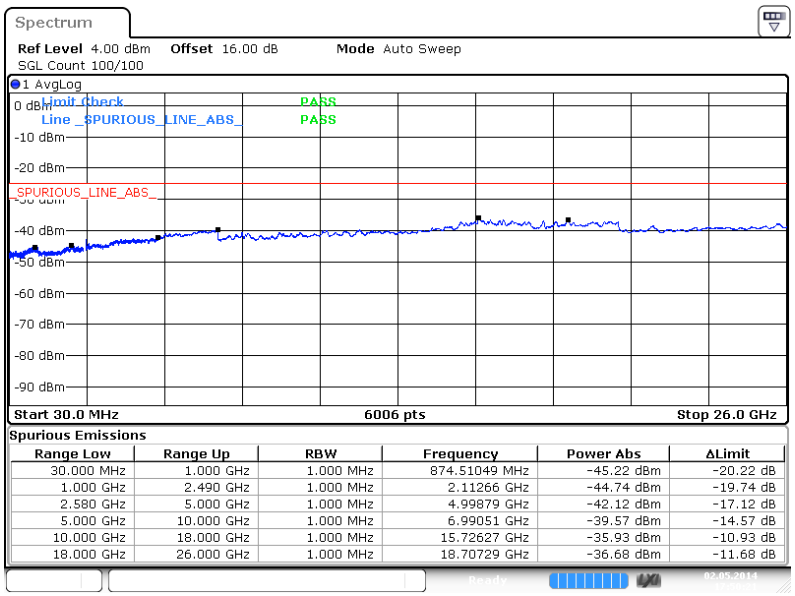


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	927.80719 MHz	-45.21 dBm	-20.21 dB
1.000 GHz	2.490 GHz	1.000 MHz	1.97423 GHz	-44.98 dBm	-19.98 dB
2.580 GHz	5.000 GHz	1.000 MHz	2.58363 GHz	-41.63 dBm	-16.63 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99051 GHz	-39.58 dBm	-14.58 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.74226 GHz	-36.00 dBm	-11.00 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69930 GHz	-36.52 dBm	-11.52 dB

Date: 2 MAY 2014 17:49:25

16QAM (RB Size 1, RB Offset 74)



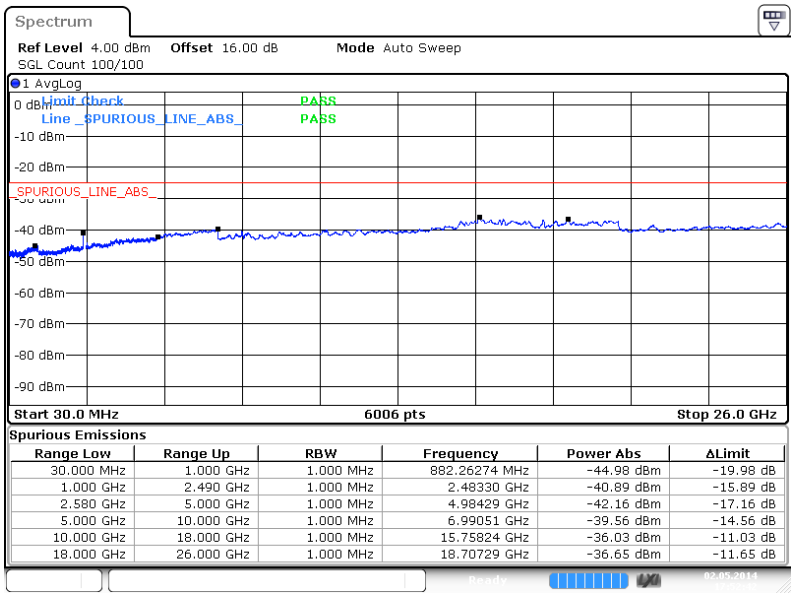
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	874.51049 MHz	-45.22 dBm	-20.22 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.11266 GHz	-44.74 dBm	-19.74 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99879 GHz	-42.12 dBm	-17.12 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99051 GHz	-39.57 dBm	-14.57 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.72627 GHz	-35.93 dBm	-10.93 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.70729 GHz	-36.68 dBm	-11.68 dB

Date: 2 MAY 2014 17:50:21

Band :	LTE Band 7	Channel :	CH20850 (Low)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 99)

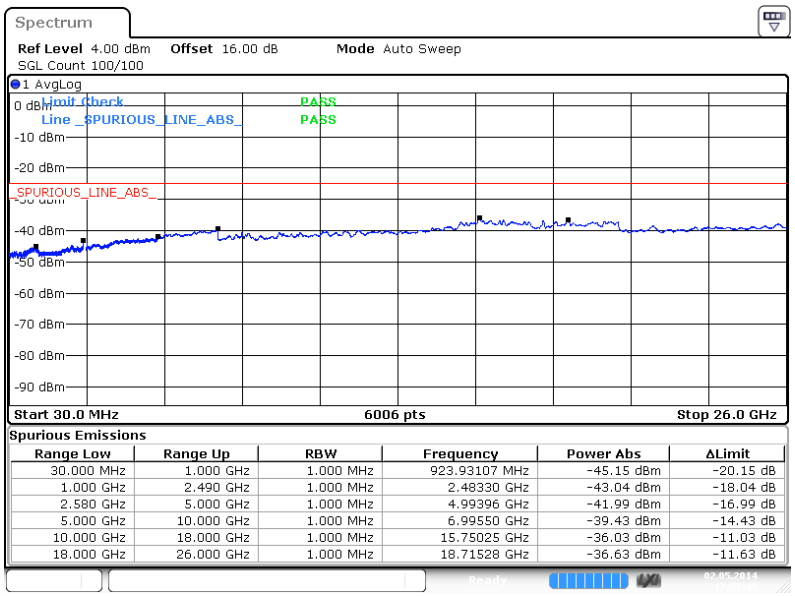


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	882.26274 MHz	-44.98 dBm	-19.98 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.48330 GHz	-40.89 dBm	-15.89 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.98429 GHz	-42.16 dBm	-17.16 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99051 GHz	-39.56 dBm	-14.56 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75824 GHz	-36.03 dBm	-11.03 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.70729 GHz	-36.65 dBm	-11.65 dB

Date: 2 MAY 2014 17:52:42

16QAM (RB Size 1, RB Offset 99)



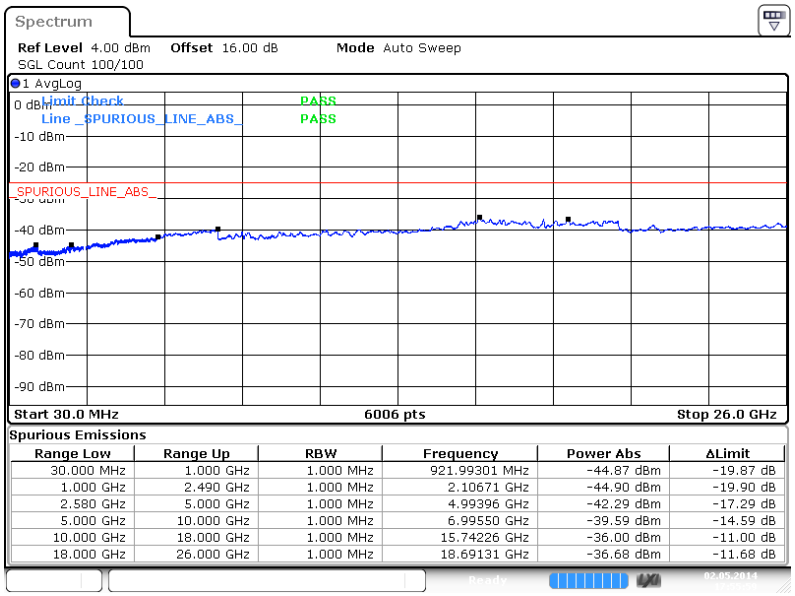
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	923.93107 MHz	-45.15 dBm	-20.15 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.48330 GHz	-43.04 dBm	-18.04 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99396 GHz	-41.99 dBm	-16.99 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.43 dBm	-14.43 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75025 GHz	-36.03 dBm	-11.03 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.71528 GHz	-36.63 dBm	-11.63 dB

Date: 2 MAY 2014 17:53:49

Band :	LTE Band 7	Channel :	CH21100 (Middle)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 99)

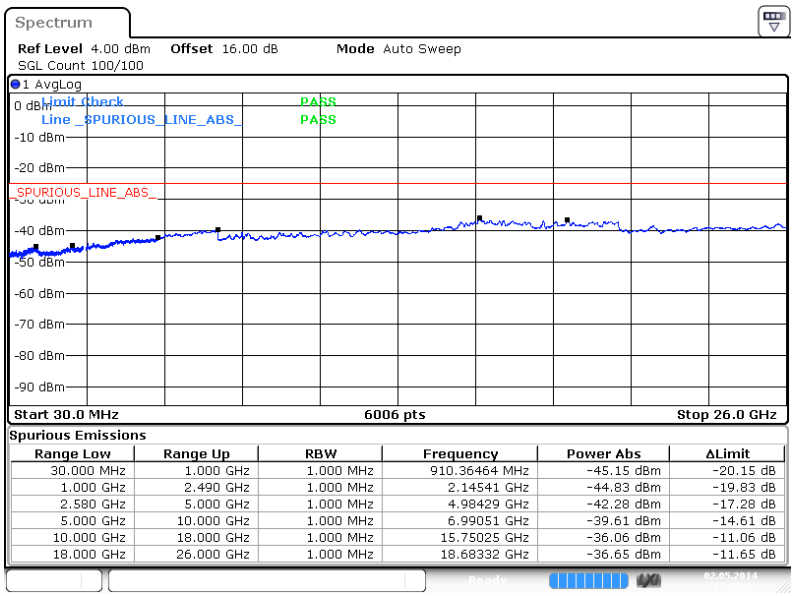


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	921.99301 MHz	-44.87 dBm	-19.87 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.10671 GHz	-44.90 dBm	-19.90 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99396 GHz	-42.29 dBm	-17.29 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.59 dBm	-14.59 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.74226 GHz	-36.00 dBm	-11.00 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69131 GHz	-36.68 dBm	-11.68 dB

Date: 2 MAY 2014 17:55:59

16QAM (RB Size 1, RB Offset 99)



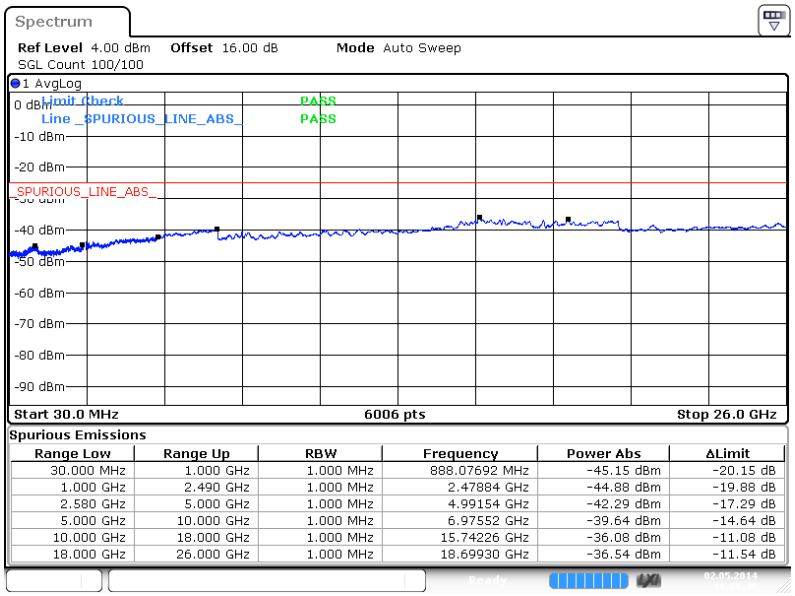
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	910.36464 MHz	-45.15 dBm	-20.15 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.14541 GHz	-44.83 dBm	-19.83 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.98429 GHz	-42.28 dBm	-17.28 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99051 GHz	-39.61 dBm	-14.61 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.75025 GHz	-36.06 dBm	-11.06 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.68332 GHz	-36.65 dBm	-11.65 dB

Date: 2 MAY 2014 17:59:23

Band :	LTE Band 7	Channel :	CH21350 (High)
Band Width :	20MHz		

QPSK (RB Size 1, RB Offset 99)

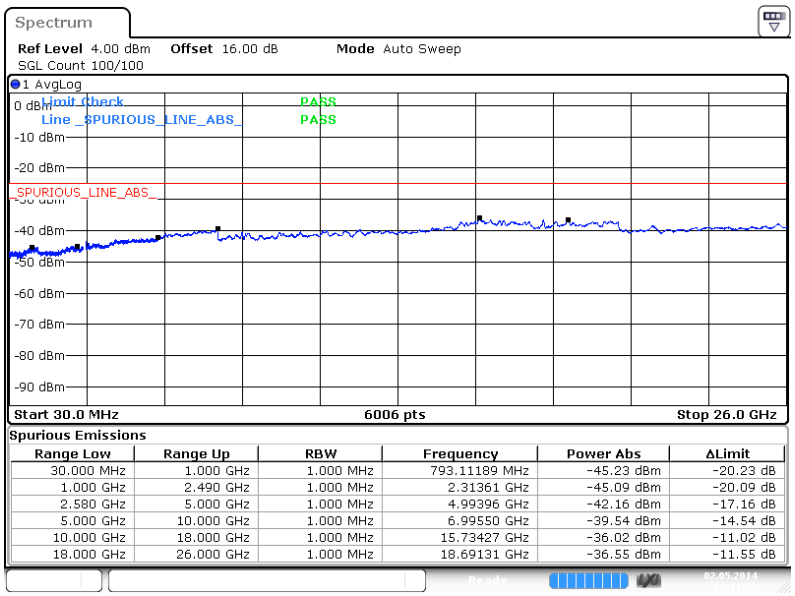


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	888.07692 MHz	-45.15 dBm	-20.15 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.47884 GHz	-44.88 dBm	-19.88 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99154 GHz	-42.29 dBm	-17.29 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.97552 GHz	-39.64 dBm	-14.64 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.74226 GHz	-36.08 dBm	-11.08 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69930 GHz	-36.54 dBm	-11.54 dB

Date: 2 MAY 2014 18:08:48

16QAM (RB Size 1, RB Offset 99)



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	793.11189 MHz	-45.23 dBm	-20.23 dB
1.000 GHz	2.490 GHz	1.000 MHz	2.31361 GHz	-45.09 dBm	-20.09 dB
2.580 GHz	5.000 GHz	1.000 MHz	4.99396 GHz	-42.16 dBm	-17.16 dB
5.000 GHz	10.000 GHz	1.000 MHz	6.99550 GHz	-39.54 dBm	-14.54 dB
10.000 GHz	18.000 GHz	1.000 MHz	15.73427 GHz	-36.02 dBm	-11.02 dB
18.000 GHz	26.000 GHz	1.000 MHz	18.69131 GHz	-36.55 dBm	-11.55 dB

Date: 2 MAY 2014 18:11:22

3.6 Radiated Spurious Emission Measurement

3.6.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004.

For Band 7

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.6.2 Measuring Instruments

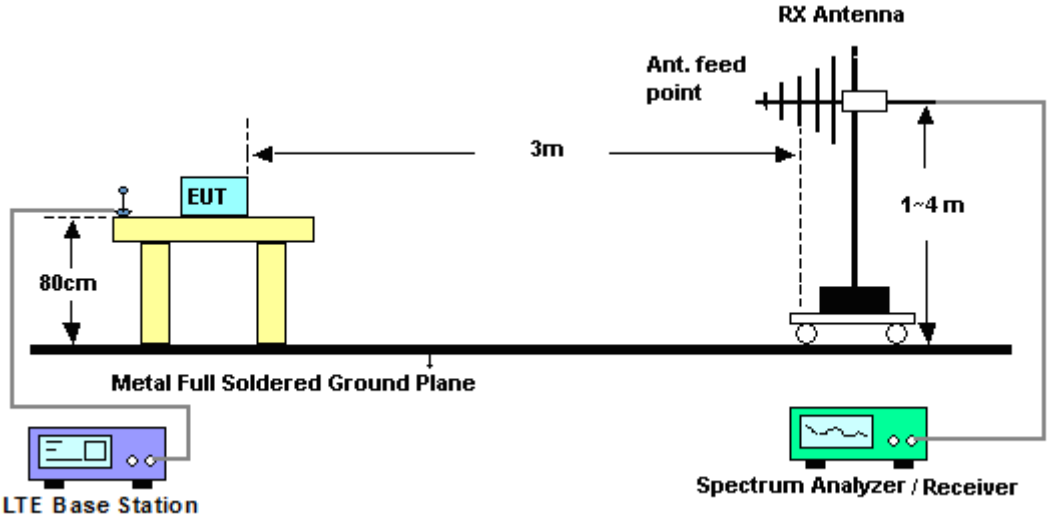
The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

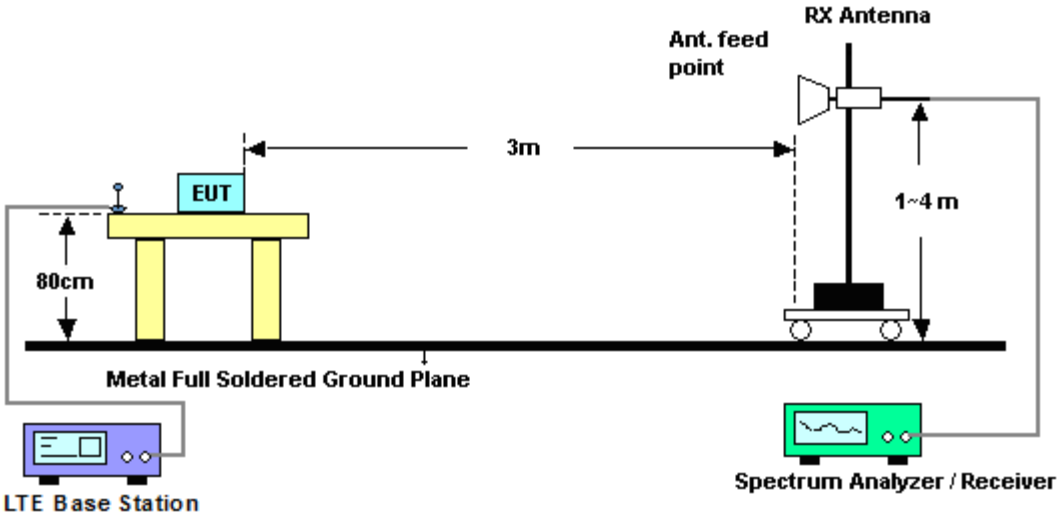
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 55+ 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [55 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)
    = -25dBm.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15

3.6.4 Test Setup

For radiated emissions from 30MHz to 1GHz

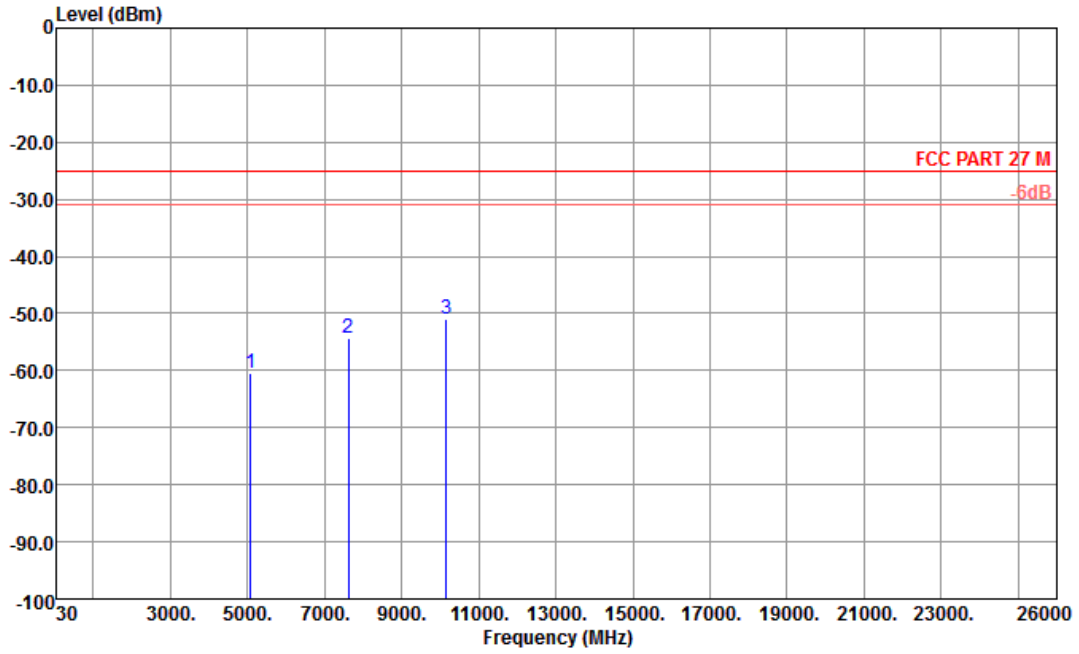


For radiated emissions above 1GHz



3.6.5 Test Result of Field Strength of Spurious Radiated

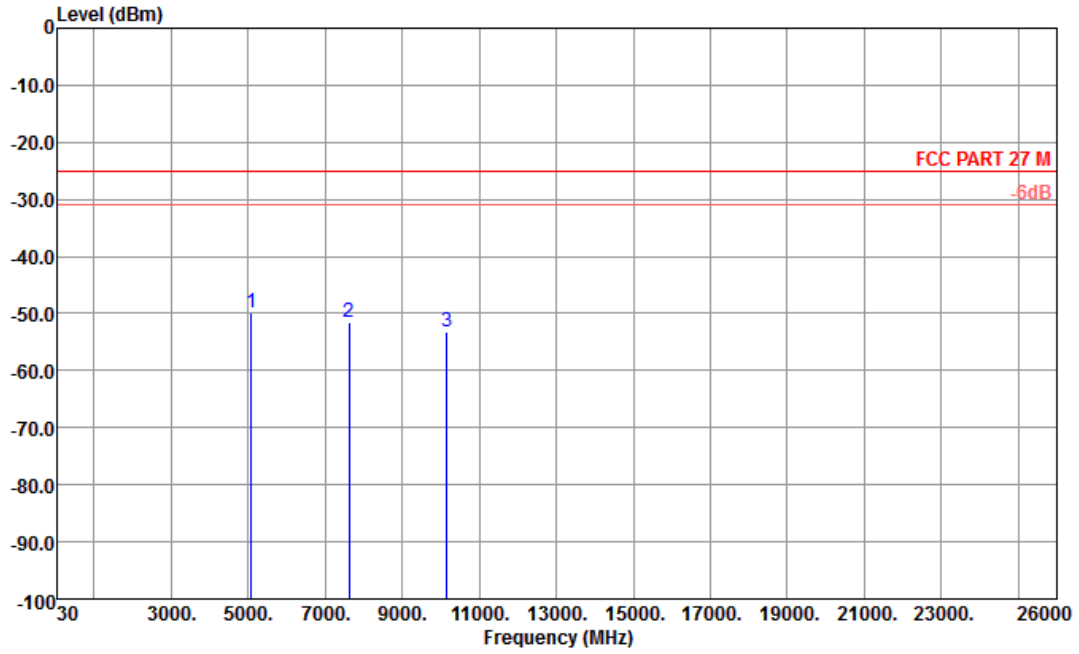
Band :	LTE Band 7	**Temperature :**	22~23°C
Test Mode :	5MHz QPSK RB Size 1 Offset 24	**Relative Humidity :**	42~43%
Test Engineer :	Star Wei	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition : FCC PART 27 M HF_EIRP_FACTOR130726 HORIZONTAL

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5074	-60.55	-25	-35.55	-62.39	-65.95	2.2	7.60	H	Pass
7611	-54.30	-25	-29.30	-65.84	-61.08	3.12	9.90	H	Pass
10148	-51.08	-25	-26.08	-65.92	-58.97	2.98	10.87	H	Pass

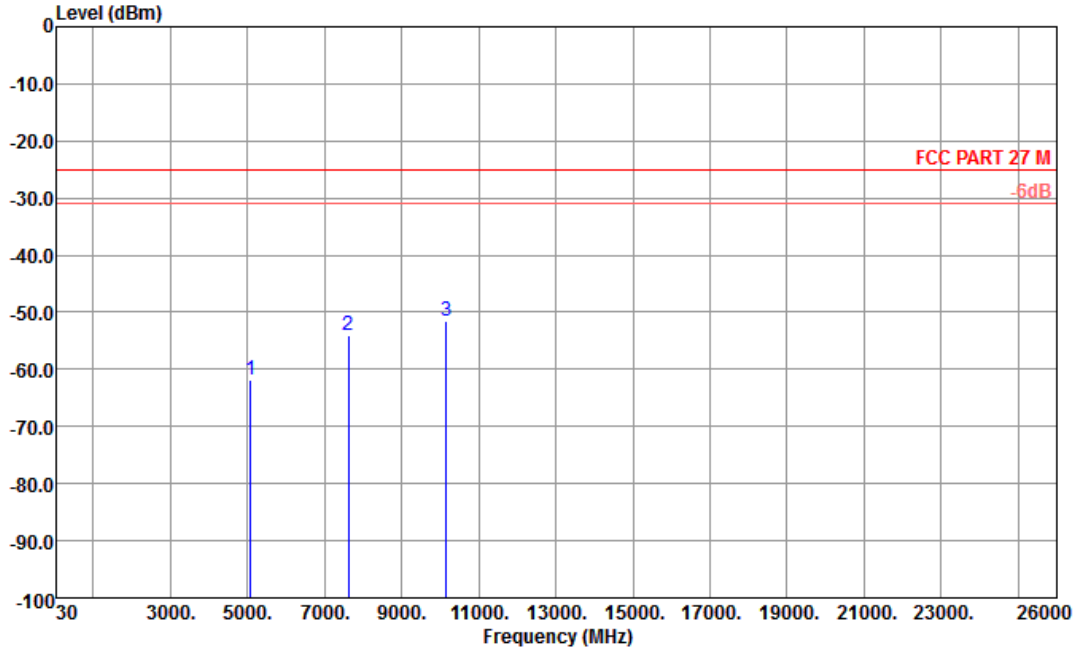
Band :	LTE Band 7	**Temperature :**	22~23°C
Test Mode :	5MHz QPSK RB Size 1 Offset 24	**Relative Humidity :**	42~43%
Test Engineer :	Star Wei	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition : FCC PART 27 M HF_EIRP_FACTOR130726 VERTICAL

Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5074	-49.84	-25	-24.84	-59.45	-55.24	2.2	7.6	V	Pass
7612	-51.46	-25	-26.46	-65.55	-58.24	3.12	9.9	V	Pass
10148	-53.29	-25	-28.29	-65.94	-61.18	2.98	10.87	V	Pass

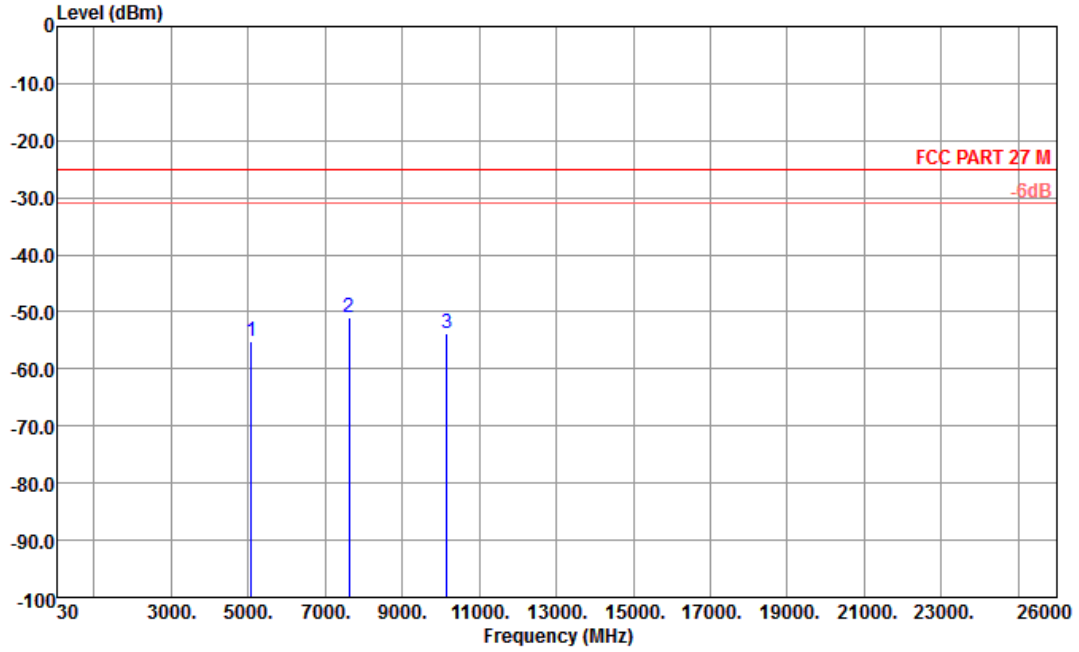
Band :	LTE Band 7	**Temperature :**	22~23°C
Test Mode :	10MHz QPSK RB Size 1 Offset 49	**Relative Humidity :**	42~43%
Test Engineer :	Star Wei	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition : FCC PART 27 M HF_EIRP_FACTOR130726 HORIZONTAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5078	-61.97	-25	-36.97	-63.61	-67.37	2.2	7.60	H	Pass
7620	-54.13	-25	-29.13	-65.67	-60.91	3.12	9.90	H	Pass
10161	-51.62	-25	-26.62	-66.46	-59.51	2.98	10.87	H	Pass

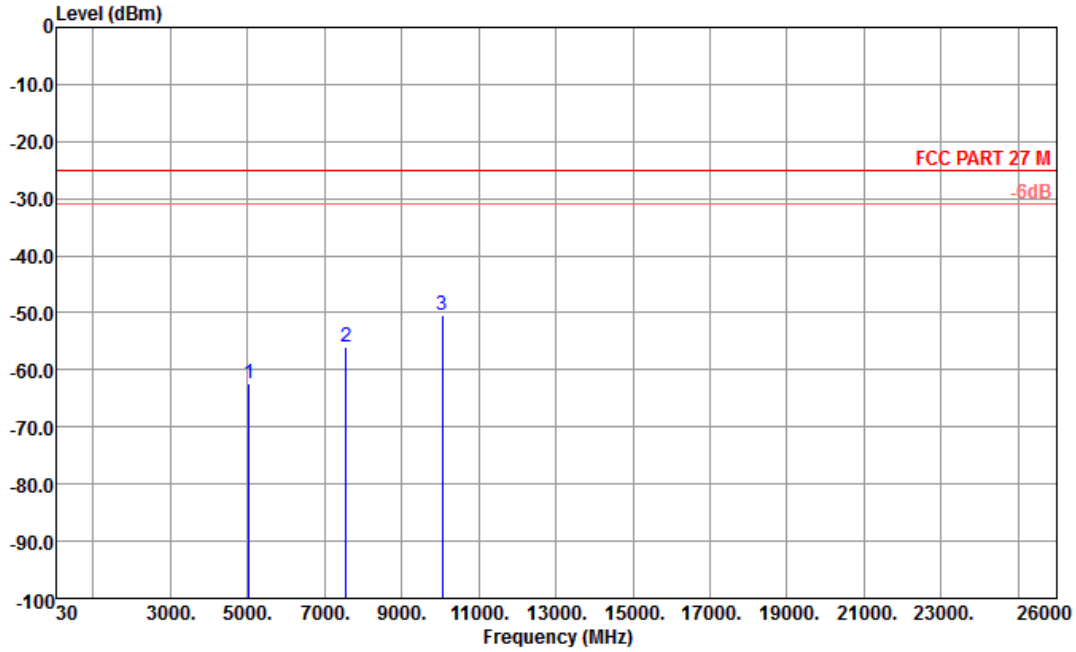
Band :	LTE Band 7	**Temperature :**	22~23°C
Test Mode :	10MHz QPSK RB Size 1 Offset 49	**Relative Humidity :**	42~43%
Test Engineer :	Star Wei	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition : FCC PART 27 M HF_EIRP_FACTOR130726 VERTICAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5078	-55.13	-25	-30.13	-62.24	-60.53	2.2	7.6	V	Pass
7620	-51.08	-25	-26.08	-65.17	-57.86	3.12	9.9	V	Pass
10161	-53.71	-25	-28.71	-66.36	-61.60	2.98	10.87	V	Pass

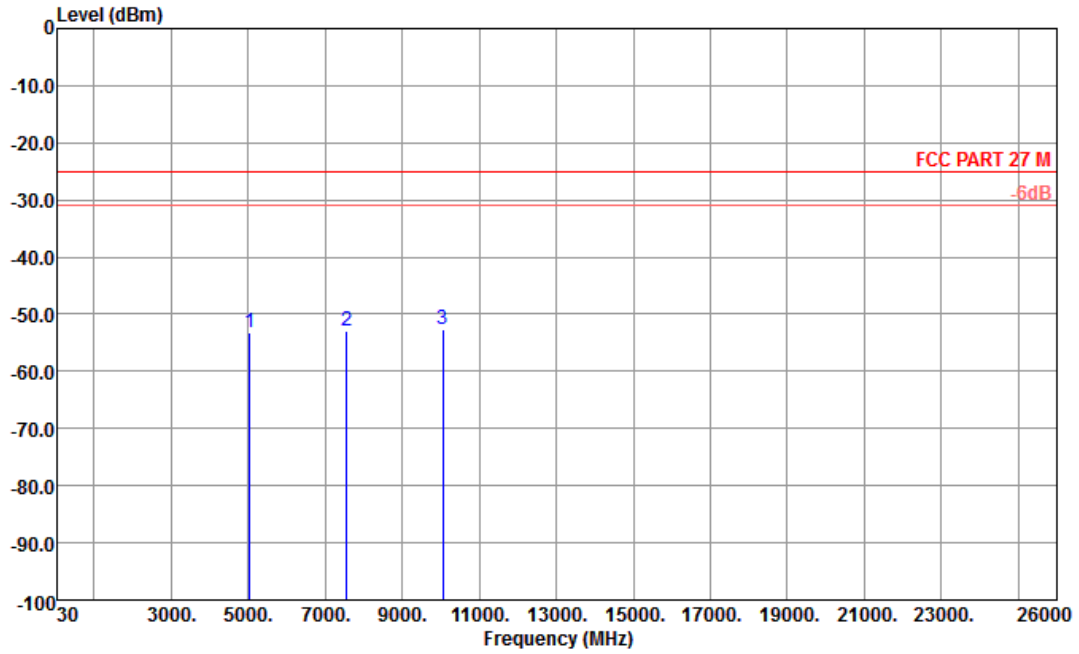
Band :	LTE Band 7	**Temperature :**	22~23°C
Test Mode :	15MHz QPSK RB Size 1 Offset 74	**Relative Humidity :**	42~43%
Test Engineer :	Star Wei	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition : FCC PART 27 M HF_EIRP_FACTOR130726 HORIZONTAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5028	-62.31	-25	-37.31	-63.95	-67.71	2.2	7.60	H	Pass
7545	-55.86	-25	-30.86	-67.40	-62.64	3.12	9.90	H	Pass
10059	-50.45	-25	-25.45	-65.29	-58.34	2.98	10.87	H	Pass

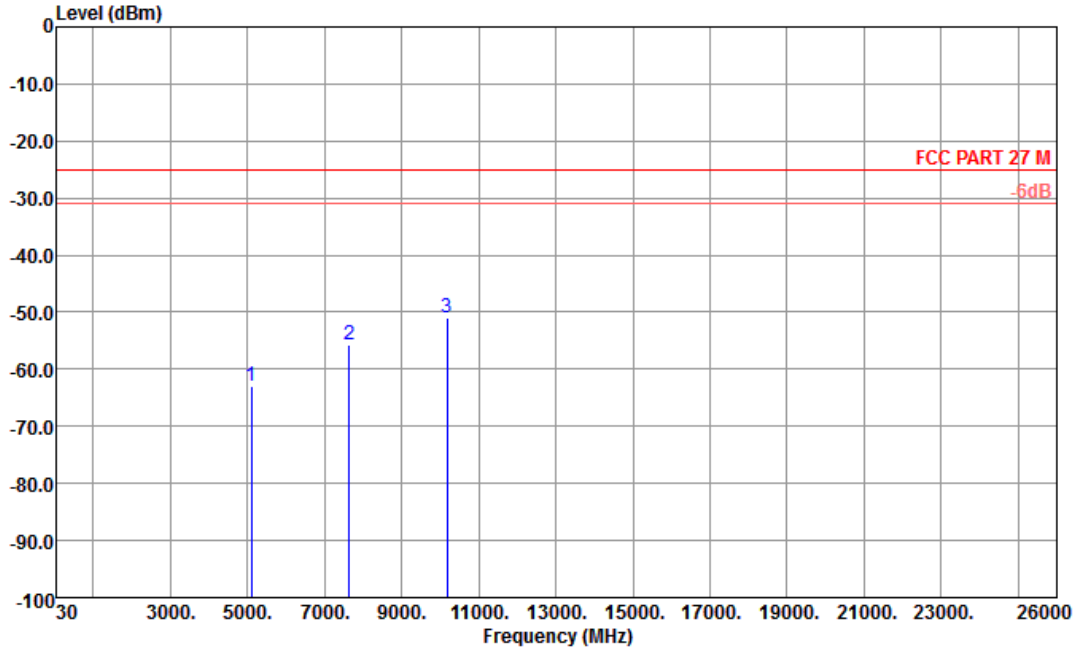
Band :	LTE Band 7	**Temperature :**	22~23°C
Test Mode :	15MHz QPSK RB Size 1 Offset 74	**Relative Humidity :**	42~43%
Test Engineer :	Star Wei	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition : FCC PART 27 M HF_EIRP_FACTOR130726 VERTICAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5028	-53.27	-25	-28.27	-60.96	-58.67	2.2	7.6	V	Pass
7545	-52.90	-25	-27.90	-66.99	-59.68	3.12	9.9	V	Pass
10060	-52.65	-25	-27.65	-65.3	-60.54	2.98	10.87	V	Pass

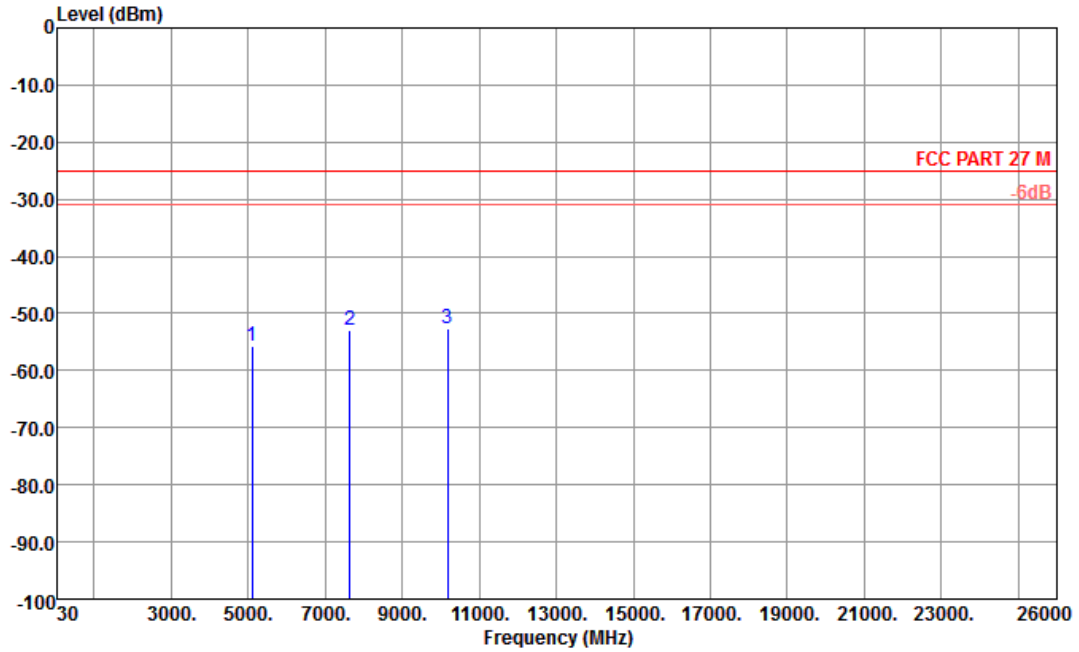
Band :	LTE Band 7	**Temperature :**	22~23°C
Test Mode :	20MHz QPSK RB Size 1 Offset 99	**Relative Humidity :**	42~43%
Test Engineer :	Star Wei	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition : FCC PART 27 M HF_EIRP_FACTOR130726 HORIZONTAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5088	-62.87	-25	-37.87	-64.51	-68.27	2.2	7.60	H	Pass
7634	-55.59	-25	-30.59	-67.13	-62.37	3.12	9.90	H	Pass
10179	-50.96	-25	-25.96	-65.80	-58.85	2.98	10.87	H	Pass

Band :	LTE Band 7	**Temperature :**	22~23°C
Test Mode :	20MHz QPSK RB Size 1 Offset 99	**Relative Humidity :**	42~43%
Test Engineer :	Star Wei	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition : FCC PART 27 M HF_EIRP_FACTOR130726 VERTICAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5088	-55.66	-25	-30.66	-62.43	-61.06	2.2	7.6	V	Pass
7634	-53.03	-25	-28.03	-67.12	-59.81	3.12	9.9	V	Pass
10179	-52.54	-25	-27.54	-65.19	-60.43	2.98	10.87	V	Pass

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

3.7.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

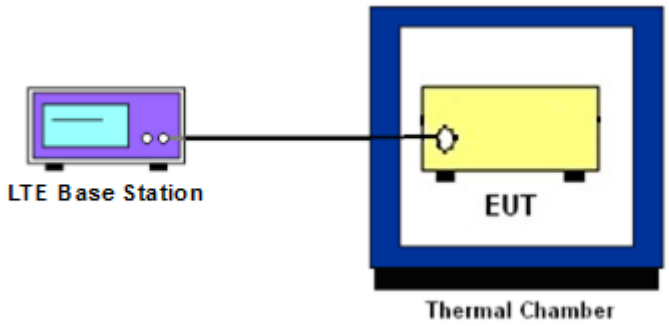
3.7.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.7.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.7.5 Test Setup



3.7.6 Test Result of Temperature Variation (FCC)

Band :	LTE Band 7 (QPSK)	Limit (ppm) :	2.5

Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-5.4	-0.002	5.6	+0.002	PASS
-20	-2.5	-0.001	3.9	+0.002	
-10	-11.5	-0.005	-5.6	-0.002	
0	-2.9	-0.001	-3.6	-0.001	
10	-11.0	-0.004	-9.0	-0.004	
20	-2.0	-0.001	-2.5	-0.001	
30	3.8	+0.001	6.9	+0.003	
40	9.1	+0.004	-5.4	-0.002	
50	-8.0	-0.003	4.0	+0.002	

Band :	LTE Band 7 (QPSK)	Limit (ppm) :	2.5

Temperature (°C)	BW 15MHz		BW 20MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	3.6	+0.001	8.2	+0.003	PASS
-20	-8.2	-0.003	-11.0	-0.004	
-10	-6.7	-0.003	-10.0	-0.004	
0	8.2	+0.003	-8.2	-0.003	
10	-11.0	-0.004	8.2	+0.003	
20	5.9	+0.002	-11.0	-0.004	
30	9.1	+0.004	-4.7	-0.002	
40	-5.6	-0.002	3.6	+0.001	
50	-2.5	-0.001	8.2	+0.003	

Band :	LTE Band 7 (16QAM)	Limit (ppm) :	2.5

Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	8.0	+0.003	-5.4	-0.002	PASS
-20	11.3	+0.004	-2.5	-0.001	
-10	-10.0	-0.004	-11.5	-0.005	
0	-8.2	-0.003	-5.6	-0.002	
10	8.0	+0.003	-3.6	-0.001	
20	-6.7	-0.003	3.8	+0.001	
30	-9.8	-0.004	4.9	+0.002	
40	-10.0	-0.004	-2.5	-0.001	
50	7.0	+0.003	-5.6	-0.002	

Band :	LTE Band 7 (16QAM)	Limit (ppm) :	2.5

Temperature (°C)	BW 15MHz		BW 20MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	6.3	+0.002	5.0	+0.002	PASS
-20	4.9	+0.002	-11.0	-0.004	
-10	-5.6	-0.002	8.0	+0.003	
0	-3.6	-0.001	-10.0	-0.004	
10	-10.0	-0.004	-5.6	-0.002	
20	3.6	+0.001	-3.6	-0.001	
30	8.2	+0.003	-11.5	-0.005	
40	3.6	+0.001	-5.6	-0.002	
50	8.2	+0.003	3.8	+0.001	

3.7.7 Test Result of Voltage Variation (FCC)

Band	Bandwidth	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 7 (QPSK)	5M	3.4	3.0	0.001	2.5	PASS
		3.7	3.2	0.001		
		4.2	5.6	0.002		
	10M	3.4	3.9	0.002		
		3.7	-5.6	-0.002		
		4.2	-2.5	-0.001		
	15M	3.4	-5.6	-0.002		
		3.7	-2.5	-0.001		
		4.2	5.6	0.002		
	20M	3.4	-11.5	-0.005		
		3.7	7.1	0.003		
		4.2	10.3	0.004		
LTE Band 7 (16QAM)	5M	3.4	-11.5	-0.005		
		3.7	-2.9	-0.001		
		4.2	3.8	0.001		
	10M	3.4	4.9	0.002		
		3.7	-2.5	-0.001		
		4.2	-10.0	-0.004		
	15M	3.4	-5.6	-0.002		
		3.7	3.8	0.001		
		4.2	3.2	0.001		
	20M	3.4	4.9	0.002		
		3.7	5.8	0.002		
		4.2	6.0	0.002		

Note:

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.4 V.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV30	101338	9kHz~30GHz	Jun. 17, 2013	May 02, 2014~ May 12, 2014	Jun. 16, 2014	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Dec. 10, 2013	May 02, 2014~ May 12, 2014	Dec. 09, 2014	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 05, 2013	May 15, 2014	Nov. 04, 2014	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 23, 2013	May 15, 2014	May 22, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Jan. 08, 2014	May 15, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 08, 2014	May 15, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 18, 2013	May 15, 2014	Nov. 17, 2014	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Mar. 10, 2014	May 15, 2014	Mar. 09, 2015	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161073	1MHz~1GHz	May 04, 2014	May 15, 2014	May 03, 2015	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02371	1GHz~26.5GHz	Dec. 10, 2013	May 15, 2014	Dec. 09, 2014	Radiation (03CH01-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	May 15, 2014	NCR	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	May 15, 2014	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	May 15, 2014	NCR	Radiation (03CH01-KS)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP 7	100819	9kHz~7GHz	May 23, 2013	May 02, 2014~ May 12, 2014	May 22, 2014	ERP/EIRP (OTA01-KS)
Switch Control Manframe	Agilent	3499A	MY42005452	N/A	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)
Dual 1-to-6(4) MW MUX	Agilent	N2276A	MY42000841	N/A	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY42002573	N/A	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)
Microwave Switch	Agilent	44476A	MY42002586	N/A	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)
Diagonal Dual Polarized Horn	ETS-Lindgren	3164-04	00066993	700MHz~6GHz	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)
Multi-Devices Controller	ETS-Lindgren	2090-OPT1	00066604	N/A	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)
Conical Log Spiral (Small)	ETS-Lindgren	3102	00066951	1~10GHz	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)
Turn Table	ETS-Lindgren	2088	N/A	Resolution : 0.1degree	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)
Limiting Amplifier	ETS-lindgren	109643	920326	10MHz~2.5GHz	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)
EMQuest	ETS-Lindgren	EMQ-100	1125	N/A	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)
Medium Duty Holder	ETS-Lindgren	2015	N/A	N/A	N/A	May 02, 2014~ May 12, 2014	N/A	ERP/EIRP (OTA01-KS)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.54