SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch

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TEST REPORT

Application No.:	SZEM1712012659CR
Applicant:	Gree Electric Appliances, Inc. of Zhuhai
Address of Applicant:	Jinji West Rd,Qianshan,Zhuhai, 519070, Guangdong P.R.China
Manufacturer:	Gree Electric Appliances, Inc. of Zhuhai
Address of Manufacturer:	Jinji West Rd,Qianshan,Zhuhai, 519070, Guangdong P.R.China
Factory:	Gree Electric Appliances, Inc. of Zhuhai
Address of Factory:	Jinji West Rd,Qianshan,Zhuhai, 519070, Guangdong P.R.China
Equipment Under Test (EUT):	
EUT Name:	LTE DTU
Model No.:	IE60-33/CF2
FCC ID:	2ADAP-IE6033CF2
IC:	12478A-IE6033CF2
Standard(s) :	47 CFR Part 2(2017) 47 CFR Part 22 subpart H 47 CFR Part 24 subpart E RSS-Gen Issue 4 RSS-132 Issue 3 RSS-133 Issue 6
Date of Receipt:	2017-12-19
Date of Test:	2017-12-20 to 2018-02-09
Date of Issue:	2018-02-10
Test Result:	**Pass**

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2018-02-10		Original

Authorized for issue by:				
		Jacky Li /Project Engineer		
		Eric Fu /Reviewer		

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2 Test Summary

Test Item	FCC Rule No.	IC Rule No.	Requirements	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913, §24.232	RSS-132 §5.4, RSS-133 §6.4	FCC: ERP≤7W(WCDMAband V) EIRP ≤ 2 W(WCDMA band II) IC: EIRP≤11.5W(WCDMAband V) EIRP ≤ 2 W(WCDMA band II)	PASS
Peak-Average Ratio	§24.232	RSS-132 §5.4, RSS-133 §6.4	≤13dB	PASS
Modulation Characteristics	§2.1047	RSS-132 §5.2, RSS-133 §6.2	Digital modulation	PASS
Bandwidth	§2.1049(h)	RSS-Gen §6.6	OBW:No limit EBW: No limit	PASS
Band Edge Compliance	§2.1051, §22.917, §24.238	RSS-132 §5.5, RSS-133 §6.5	≤ -13dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	PASS
Spurious emissions at antenna terminals	§2.1051, §22.917, §24.238	RSS-132 §5.5, RSS-133 §6.5	≤ -13dBm	PASS
Field strength of spurious radiation	§2.1051, §22.917, §24.238	RSS-132 §5.5, RSS-133 §6.5	≤ -13dBm	PASS
Frequency stability	§2.1055, §22.355, §24.235	RSS-132 §5.3, RSS-133 §6.3	≤ ±2.5ppm.	PASS

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4 General Information

4.1 Details of E.U.T.

	Power supply:	DC 12V
	Sample Type:	Fixed production
	UMTS Operation Frequency Band:	UMTS FDD Band II/V
	Modulation Type:	QPSK
	Supported Channel Bandwidth:	5 MHz
	WCDMA Release Version:	R99
	HSDPA Release Version:	Release 10
	HSUPA Release Version:	Release 6
	UMTS Power Class:	Level 3
	Designation of Emissions	UMTS band II: 4M19F9W
		UMTS band V: 4M18F9W
	Antenna Type:	Detachable Antenna
	Antenna Gain:	2.5dBi
	Extreme temp. Tolerance:	-30℃ to +50℃
	Extreme vol. Limits:	10.2VDC to 13.80VDC (nominal: 12.0VDC)

4.2 Test Frequency

Test Mode	RF Channel		
	Low (L)	Middle (M)	High (H)
WCDMA Band V	Channel 4132	Channel 4182	Channel 4233
	826.4MHz	836.4 MHz	846.6 MHz
Test Mode	**RF Channel**		
	Low (L)	**Middle (M)**	**High (H)**
WCDMA Band II	Channel 9262	Channel 9400	Channel 9538
	1852.4 MHz	1880.0 MHz	1907.6 MHz

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4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	GREE Electric Appliances, Inc. of Zhuhai	GPE-12125	/

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25×10^{-8}
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (Below 1GHz)
		4.8dB (Above 1GHz)
9	Temperature test	1℃
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%

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4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.6 Test Facility

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

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Industry Canada (IC)

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

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5 Equipment List

RF Conducted Test					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2017-09-27	2018-09-26
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-02	2017-07-13	2018-07-12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26
Audio Analyzer	Rohde & Schwarz	UPL	SEM0093	2017-09-27	2018-09-26
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	W005-02	2016-03-06	2017-03-06
Wireless Communication Tester	Rohde & Schwarz	CMW500	W005-03	2016-03-06	2017-03-06
Splitter	MACOM	2090-6214-00	SEL0226	2016-03-06	2017-03-06

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Radiated Spurious Emissions					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2017-05-02	2020-05-01
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2017-04-14	2018-04-13
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-13
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2017-09-27	2018-09-26
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2017-09-27	2018-09-27
Pre-amplifier(18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2017-12-04	2018-12-03
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2017-04-14	2018-04-13
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21
Band filter	N/A	N/A	SEM023-01	N/A	N/A
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	W005-02	2016-03-06	2017-03-06
Wireless Communication Tester	Rohde & Schwarz	CMW500	W005-03	2016-03-06	2017-03-06

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RE in Chamber					
Test Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (yyyy-mm-dd)**	**Cal. Due date (yyyy-mm-dd)**
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2017-09-27	2018-09-26
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
Trilog-Broadband Antenna(30M-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-06-29	2019-06-28
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2017-04-14	2018-04-13
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2017-07-13	2018-07-12

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2017-09-29	2018-09-28
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2017-04-18	2018-04-17

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6 Radio Spectrum Matter Test Results

6.1 Effective (Isotropic) Radiated Power Output Data

Test Requirement: §2.1046, §22.913, §24.232, RSS-132 §5.4, RSS-133 §6.4

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: FCC:
ERP≤7W(WCDMAband V)
EIRP ≤ 2 W(WCDMA band II)
IC:
EIRP≤11.5W(WCDMAband V)
EIRP ≤ 2 W(WCDMA band II)

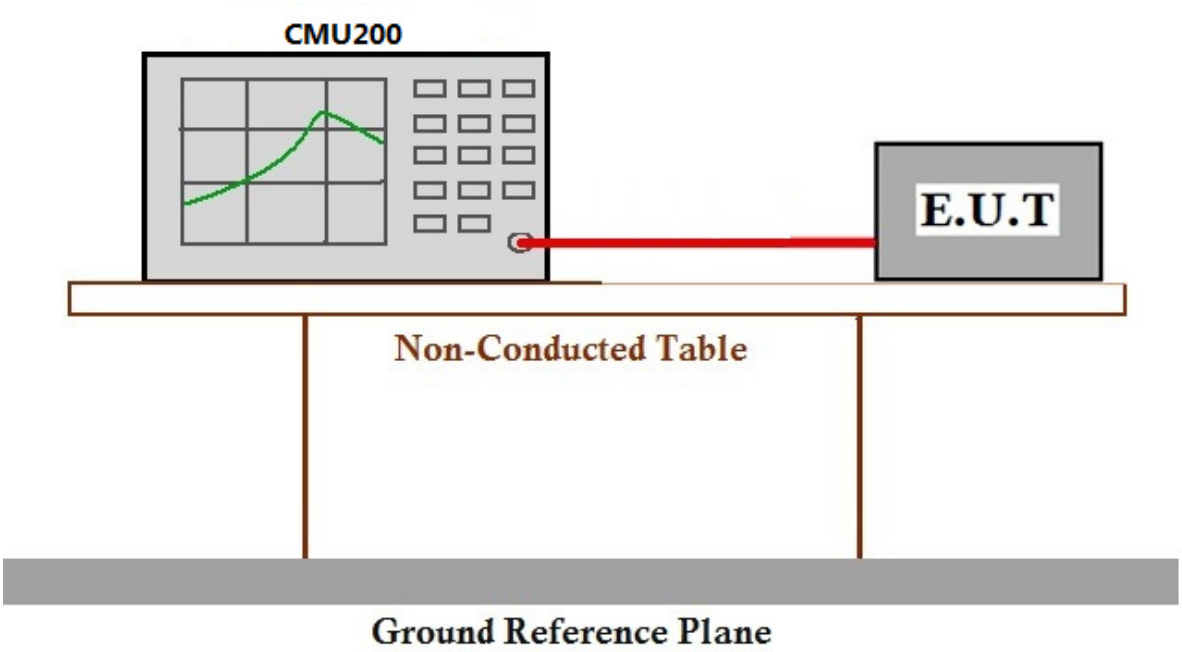
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 18.6 °C Humidity: 29.1 % RH Atmospheric Pressure: 1025 mbar

Test mode a: Tx mode, Keep the EUT in transmitting mode.

6.1.2 Test Setup Diagram



6.1.3 Measurement Data

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Test band: WCDMA Band V						
Test mode	**Test Channel**	**Conducted output power (dBm)**	**Antenna gain (dBd)**	**Antenna gain (dBi)**	**FCC: ERP (dBm)**	**IC: EIRP (dBm)**
RMC	LCH	22.53	0.35	2.50	22.88	25.03
	MCH	22.43	0.35	2.50	22.78	24.93
	HCH	22.43	0.35	2.50	22.78	24.93
HSDPA	LCH_SubTest-1	22.43	0.35	2.50	22.78	24.93
	LCH_SubTest-2	22.19	0.35	2.50	22.54	24.69
	LCH_SubTest-3	21.36	0.35	2.50	21.71	23.86
	LCH_SubTest-4	21.16	0.35	2.50	21.51	23.66
	MCH_SubTest-1	22.49	0.35	2.50	22.84	24.99
	MCH_SubTest-2	22.18	0.35	2.50	22.53	24.68
	MCH_SubTest-3	21.38	0.35	2.50	21.73	23.88
	MCH_SubTest-4	21.17	0.35	2.50	21.52	23.67
	HCH_SubTest-1	22.46	0.35	2.50	22.81	24.96
	HCH_SubTest-2	22.1	0.35	2.50	22.45	24.60
	HCH_SubTest-3	21.65	0.35	2.50	22.00	24.15
	HCH_SubTest-4	21.42	0.35	2.50	21.77	23.92
HSUPA	LCH_SubTest-1	22.65	0.35	2.50	23.00	25.15
	LCH_SubTest-2	22.41	0.35	2.50	22.76	24.91
	LCH_SubTest-3	21.56	0.35	2.50	21.91	24.06
	LCH_SubTest-4	21.07	0.35	2.50	21.42	23.57
	LCH_SubTest-5	21.29	0.35	2.50	21.64	23.79
	MCH_SubTest-1	22.46	0.35	2.50	22.81	24.96
	MCH_SubTest-2	22.11	0.35	2.50	22.46	24.61
	MCH_SubTest-3	21.82	0.35	2.50	22.17	24.32
	MCH_SubTest-4	21.36	0.35	2.50	21.71	23.86
	MCH_SubTest-5	21.26	0.35	2.50	21.61	23.76
	HCH_SubTest-1	22.46	0.35	2.50	22.81	24.96
	HCH_SubTest-2	22.16	0.35	2.50	22.51	24.66
	HCH_SubTest-3	21.74	0.35	2.50	22.09	24.24
	HCH_SubTest-4	21.08	0.35	2.50	21.43	23.58
	HCH_SubTest-5	21.25	0.35	2.50	21.60	23.75
Conclusion: ERP limit for FCC is 7W(38.45dBm) and EIRP limit for IC is 11.5W(40.61dBm), so the test is pass						

Note:

1) dBd= dBi-2.15

2) ERP= Conducted output power+Antenna gain (dBd)

3) EIRP= Conducted output power+Antenna gain (dBi)

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Test band: WCDMA Band II					
Test mode	**Test Channel**	**Conducted output power (dBm)**	**Antenna gain (dBi)**	**FCC: EIRP (dBm)**	**IC: EIRP (dBm)**
RMC	LCH	22.45	2.50	24.95	24.95
	MCH	22.63	2.50	25.13	25.13
	HCH	22.78	2.50	25.28	25.28
HSDPA	LCH_SubTest-1	22.45	2.50	24.95	24.95
	LCH_SubTest-2	22.36	2.50	24.86	24.86
	LCH_SubTest-3	21.78	2.50	24.28	24.28
	LCH_SubTest-4	21.24	2.50	23.74	23.74
	MCH_SubTest-1	22.39	2.50	24.89	24.89
	MCH_SubTest-2	22.13	2.50	24.63	24.63
	MCH_SubTest-3	21.42	2.50	23.92	23.92
	MCH_SubTest-4	21.09	2.50	23.59	23.59
	HCH_SubTest-1	22.41	2.50	24.91	24.91
	HCH_SubTest-2	22.09	2.50	24.59	24.59
	HCH_SubTest-3	21.58	2.50	24.08	24.08
	HCH_SubTest-4	21.06	2.50	23.56	23.56
HSUPA	LCH_SubTest-1	22.65	2.50	25.15	25.15
	LCH_SubTest-2	22.18	2.50	24.68	24.68
	LCH_SubTest-3	21.44	2.50	23.94	23.94
	LCH_SubTest-4	21.02	2.50	23.52	23.52
	LCH_SubTest-5	21.34	2.50	23.84	23.84
	MCH_SubTest-1	22.63	2.50	25.13	25.13
	MCH_SubTest-2	22.03	2.50	24.53	24.53
	MCH_SubTest-3	21.45	2.50	23.95	23.95
	MCH_SubTest-4	21.02	2.50	23.52	23.52
	MCH_SubTest-5	21.37	2.50	23.87	23.87
	HCH_SubTest-1	22.47	2.50	24.97	24.97
	HCH_SubTest-2	22.41	2.50	24.91	24.91
	HCH_SubTest-3	21.52	2.50	24.02	24.02
	HCH_SubTest-4	21.06	2.50	23.56	23.56
	HCH_SubTest-5	21.33	2.50	23.83	23.83
Conclusion: EIRP limit for FCC and IC is 2W(33.01dBm), so the test is pass					

Note:

1) EIRP= Conducted output power+Antenna gain (dBi)

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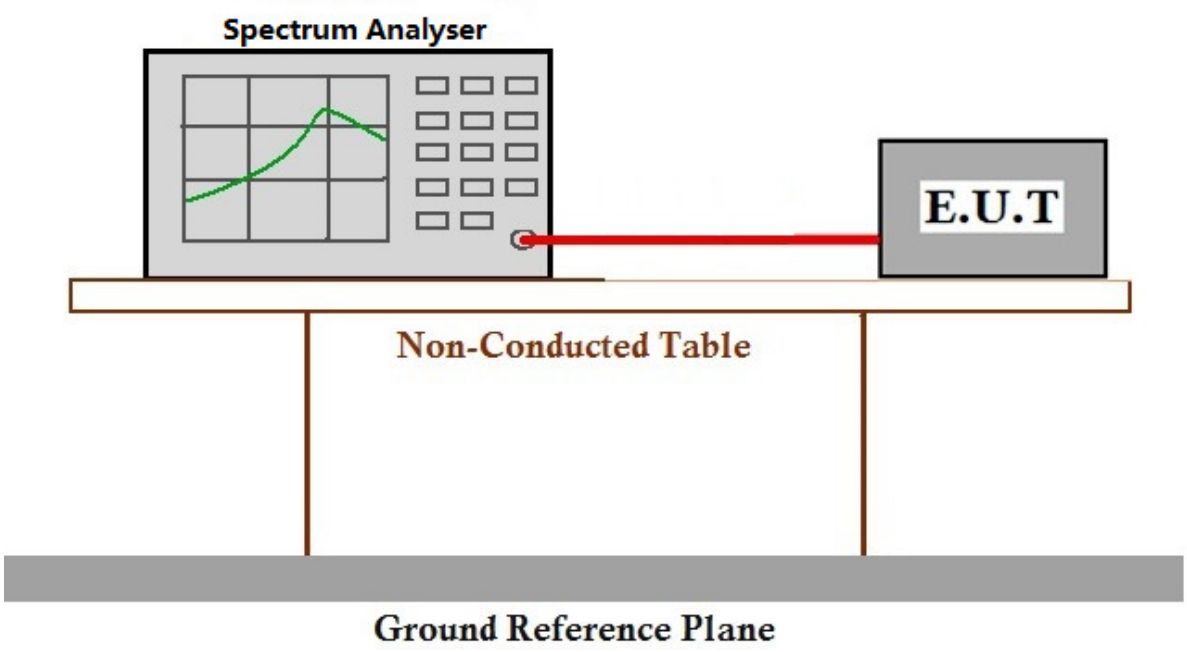
6.2 Peak-Average Ratio

Test Requirement: §24.232, RSS-132 §5.4, RSS-133 §6.4
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: ≤13dB

6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 18.6 °C Humidity: 29.1 % RH Atmospheric Pressure: 1025 mbar
Test mode a: Tx mode, Keep the EUT in transmitting mode.

6.2.2 Test Setup Diagram



6.2.3 Measurement Data

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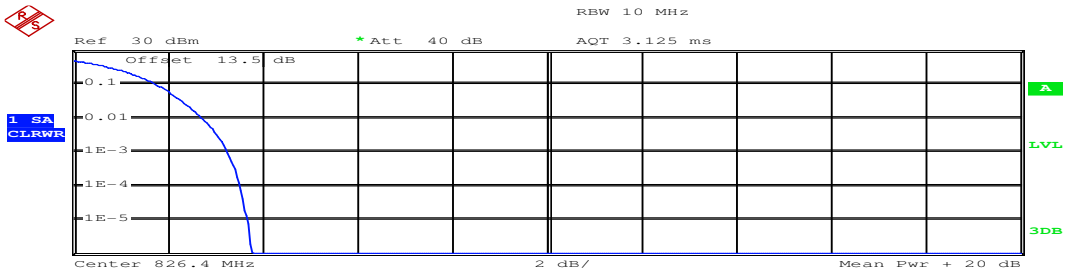
Test mode	Test Band	Test result (dB)			Limit (dB)	Verdict
		LCH	MCH	HCH		
RMC	WCDMA Band V	3.28	3.08	3.16	13	Pass
	WCDMA Band II	3.16	3.08	3.04	13	Pass
Test result of WCDMA Band V is only for IC application.						

Note: All modes have been tested and we found RMC test mode has the worst test result. Only record the worst test result.

Test Plot

WCDMA Band V-Low Channel

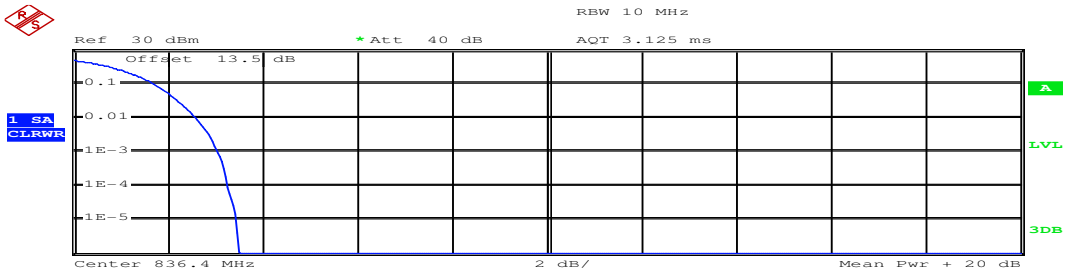


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.07 dBm
Peak	24.84 dBm
Crest	3.77 dB
10 %	1.76 dB
1 %	2.72 dB
.1 %	3.28 dB
.01 %	3.52 dB

Date: 30.JAN.2018 03:25:00

WCDMA Band V-Middle Channel



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.65 dBm
Peak	24.14 dBm
Crest	3.49 dB
10 %	1.72 dB
1 %	2.60 dB
.1 %	3.08 dB
.01 %	3.28 dB

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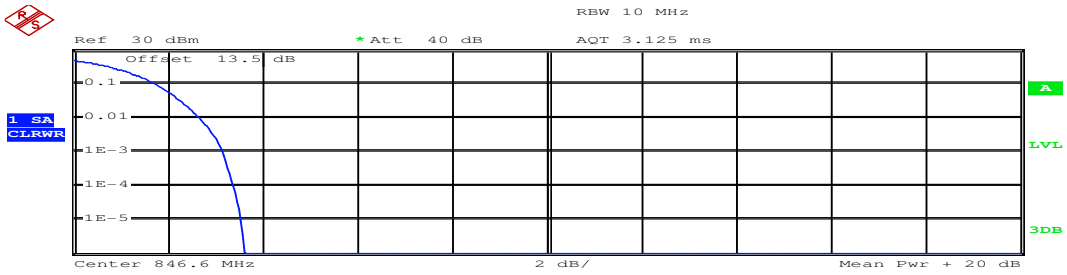
WCDMA Band V-High Channel

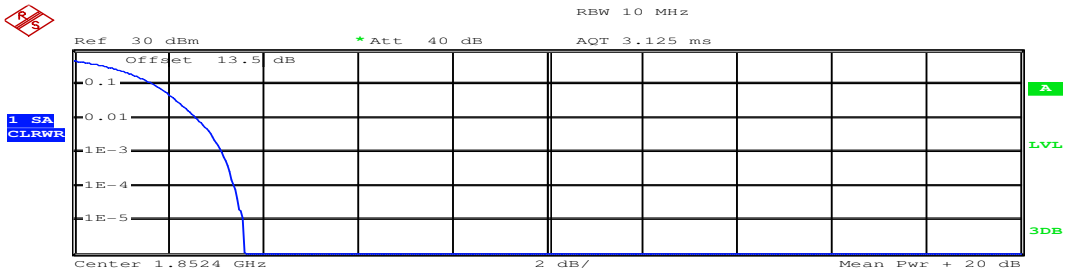


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.87 dBm
Peak	24.49 dBm
Crest	3.62 dB
10 %	1.76 dB
1 %	2.68 dB
.1 %	3.16 dB
.01 %	3.40 dB

Date: 30.JAN.2018 03:19:48

WCDMA Band II-Low Channel



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.71 dBm
Peak	24.35 dBm
Crest	3.64 dB
10 %	1.72 dB
1 %	2.64 dB
.1 %	3.16 dB
.01 %	3.40 dB

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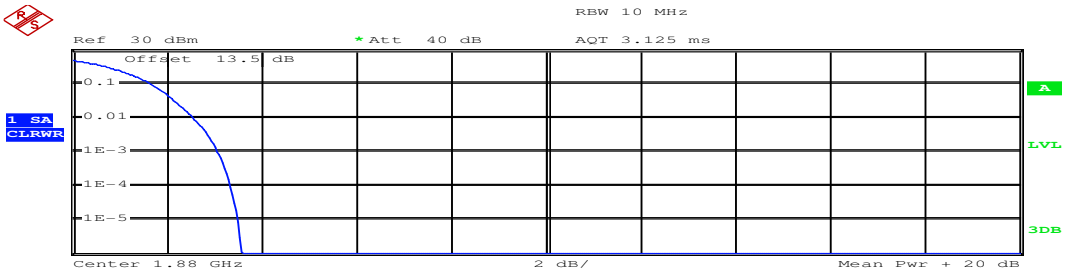
WCDMA Band II-Middle Channel

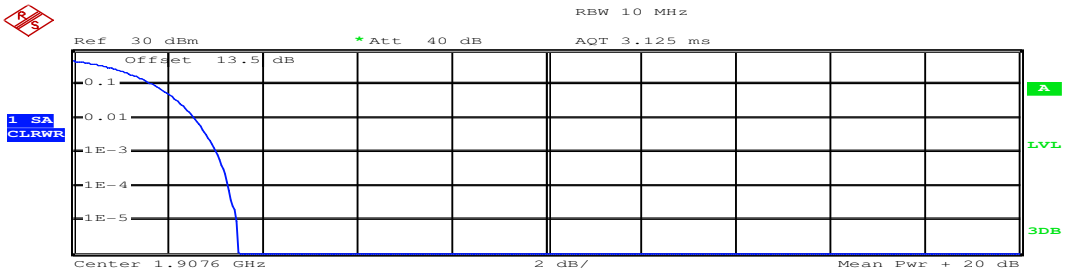


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.56 dBm
Peak	24.14 dBm
Crest	3.57 dB
10 %	1.68 dB
1 %	2.56 dB
.1 %	3.08 dB
.01 %	3.36 dB

Date: 30.JAN.2018 03:29:10

WCDMA Band II-High Channel



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.85 dBm
Peak	23.36 dBm
Crest	3.51 dB
10 %	1.72 dB
1 %	2.60 dB
.1 %	3.04 dB
.01 %	3.32 dB

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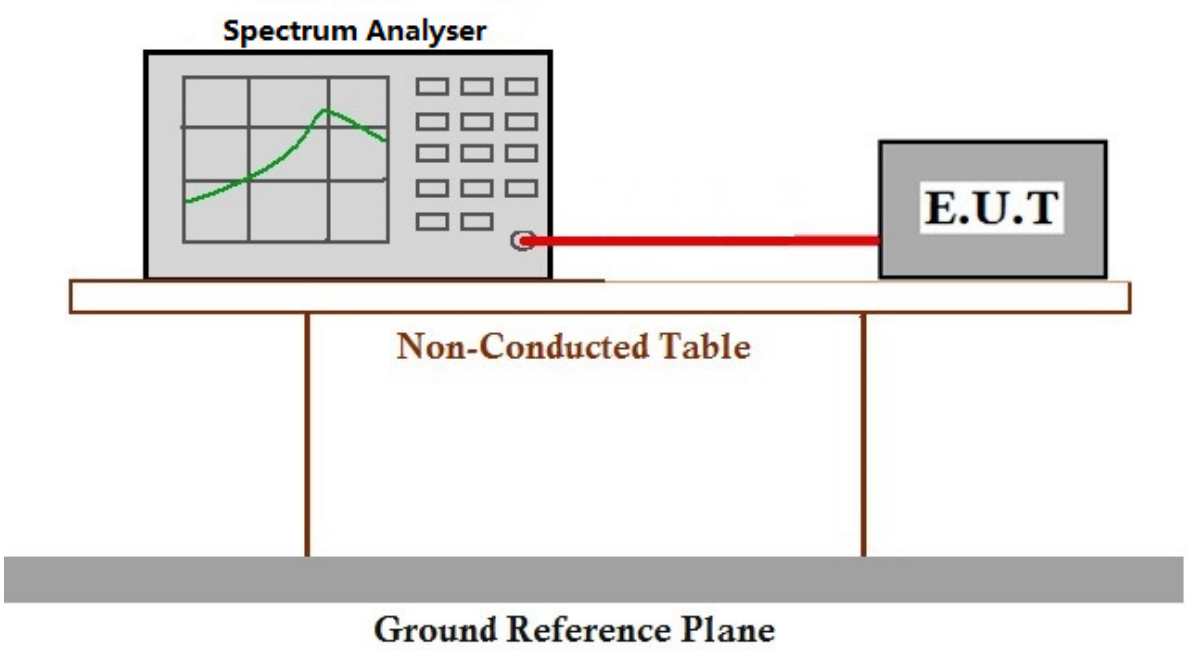
6.3 Bandwidth

Test Requirement: §2.1049(h), §22.917, §24.238, RSS-Gen §6.6
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: OBW: No limit
EBW: No limit

6.3.1 E.U.T. Operation

Operating Environment:
Temperature: 18.6 °C Humidity: 29.1 % RH Atmospheric Pressure: 1025 mbar
Test mode a: Tx mode, Keep the EUT in transmitting mode.

6.3.2 Test Setup Diagram



6.3.3 Measurement Data

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Test mode	Test Band	Test result of OBW (MHz)			Limit (dB)	Verdict
		LCH	MCH	HCH		
RMC	WCDMA Band V	4.16	4.16	4.18	N/A	Pass
	WCDMA Band II	4.18	4.19	4.17	N/A	Pass

Test mode	Test Band	Test result of EBW (MHz)			Limit (dB)	Verdict
		LCH	MCH	HCH		
RMC	WCDMA Band V	4.66	4.66	4.68	N/A	Pass
	WCDMA Band II	4.67	4.67	4.66	N/A	Pass

Note: All modes have been tested and we found RMC test mode has the worst test result. Only record the worst test result.

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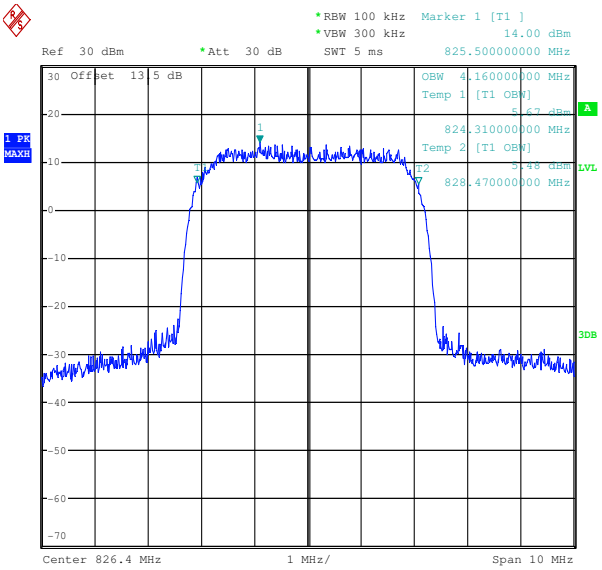
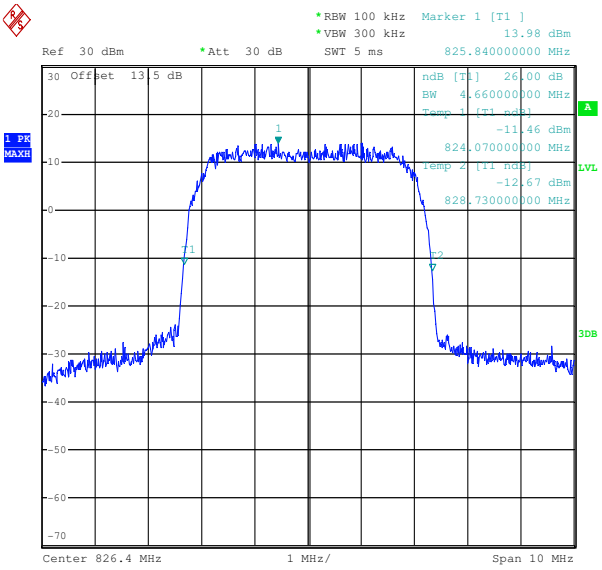
Test Plot

WCDMA Band V-Low Channel

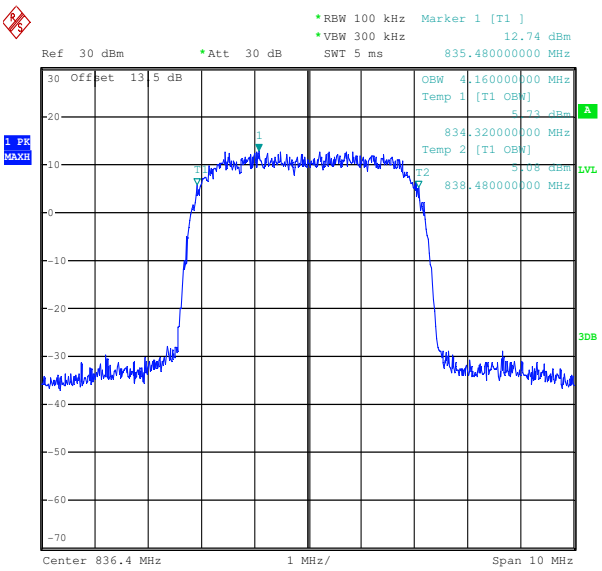


Date: 29.JAN.2018 11:08:15

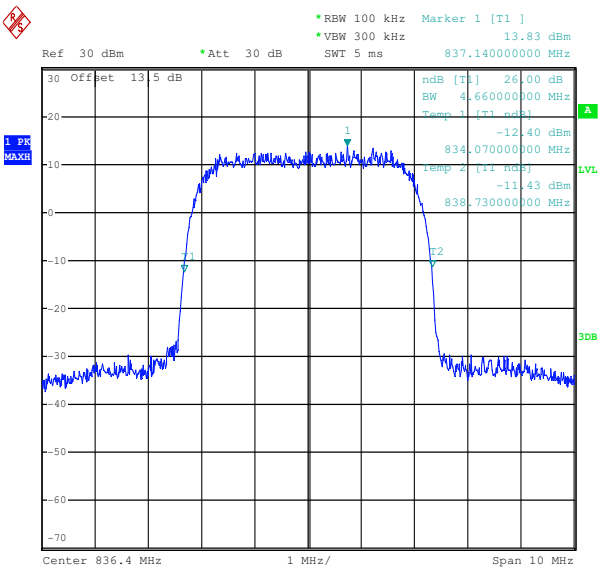


Date: 29.JAN.2018 11:08:24

WCDMA Band V-Middle Channel



Date: 29.JAN.2018 11:13:34



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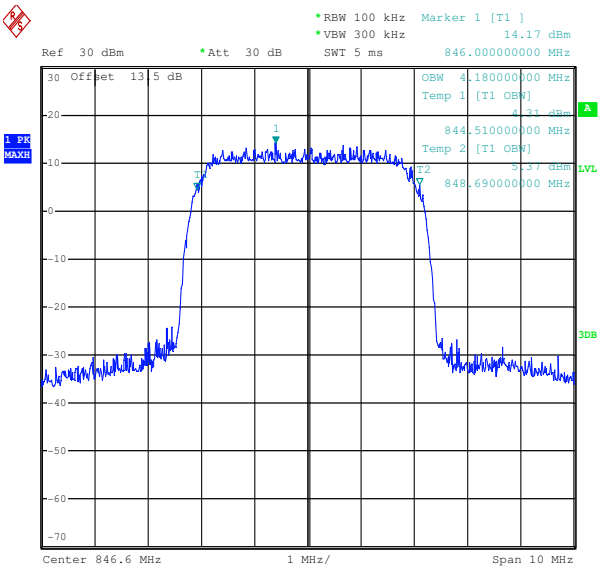
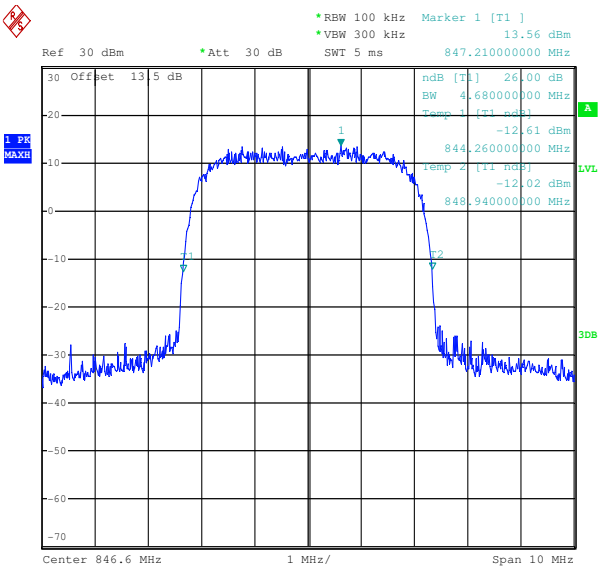
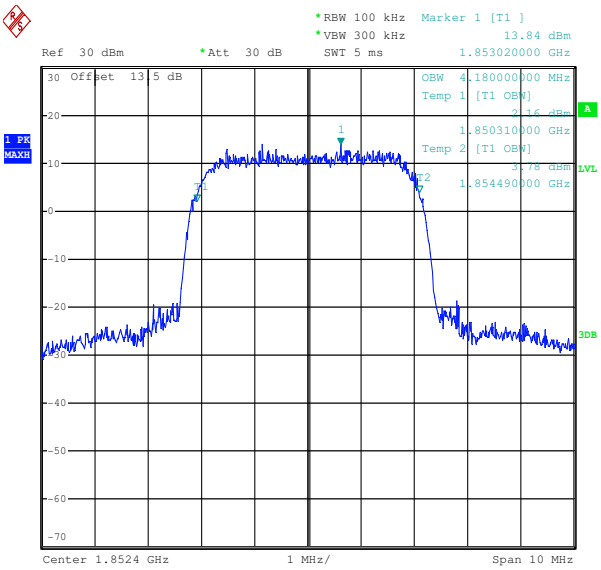
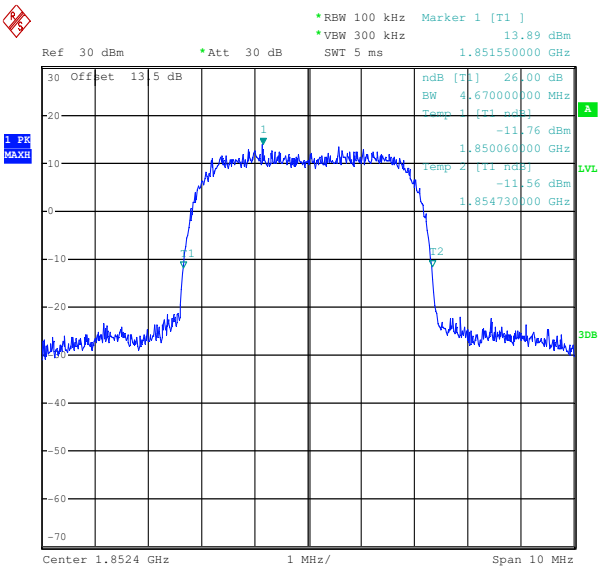
WCDMA Band V-High Channel





WCDMA Band II-Low Channel





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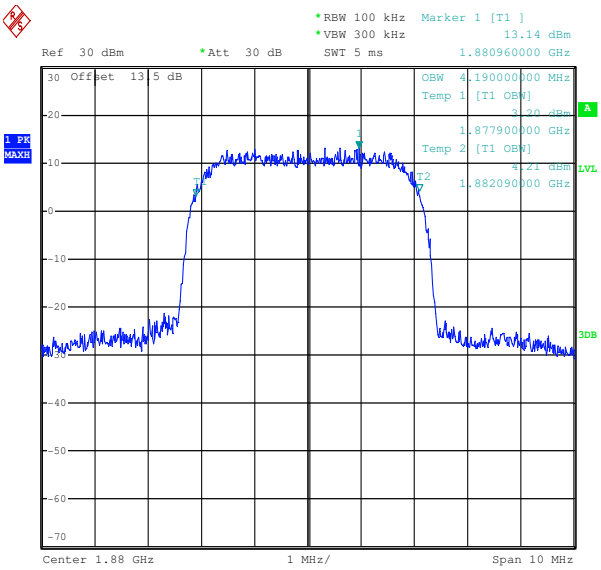
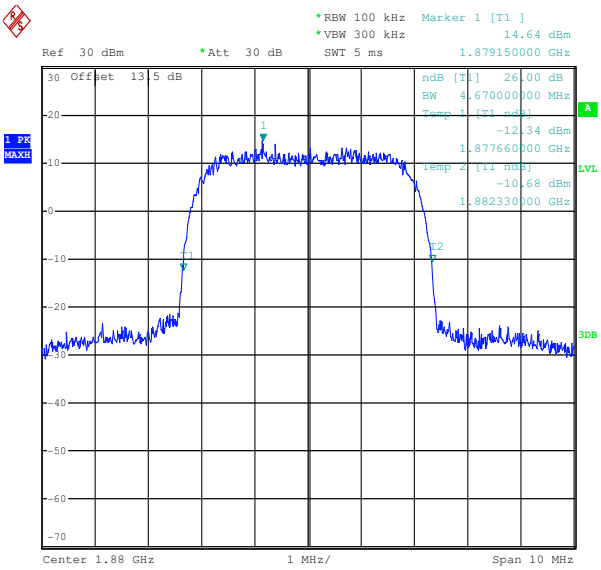
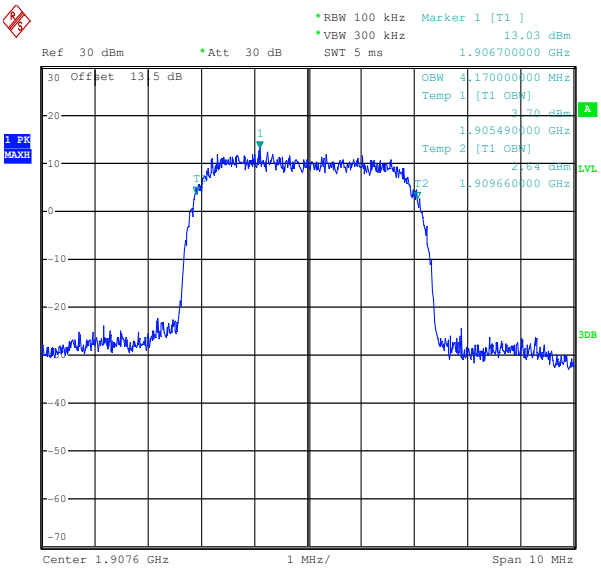
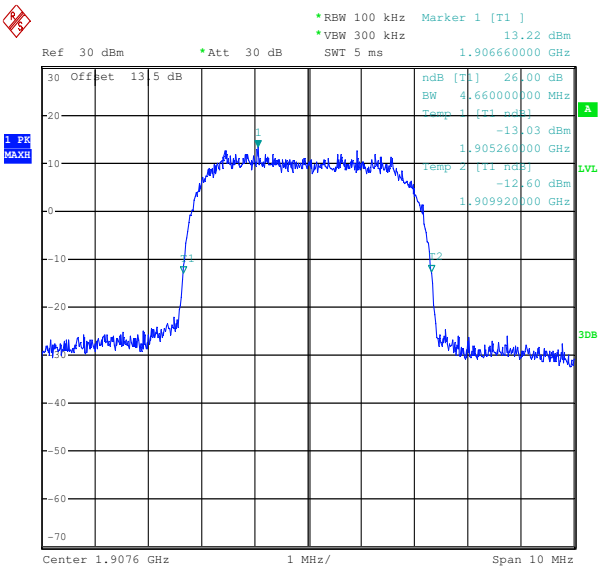
WCDMA Band II-Middle Channel





WCDMA Band II-High Channel





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6.4 Band Edge Compliance

Test Requirement: §2.1051, §22.917, §24.238, RSS-132 §5.5, RSS-133 §6.5

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: ≤ -13dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.

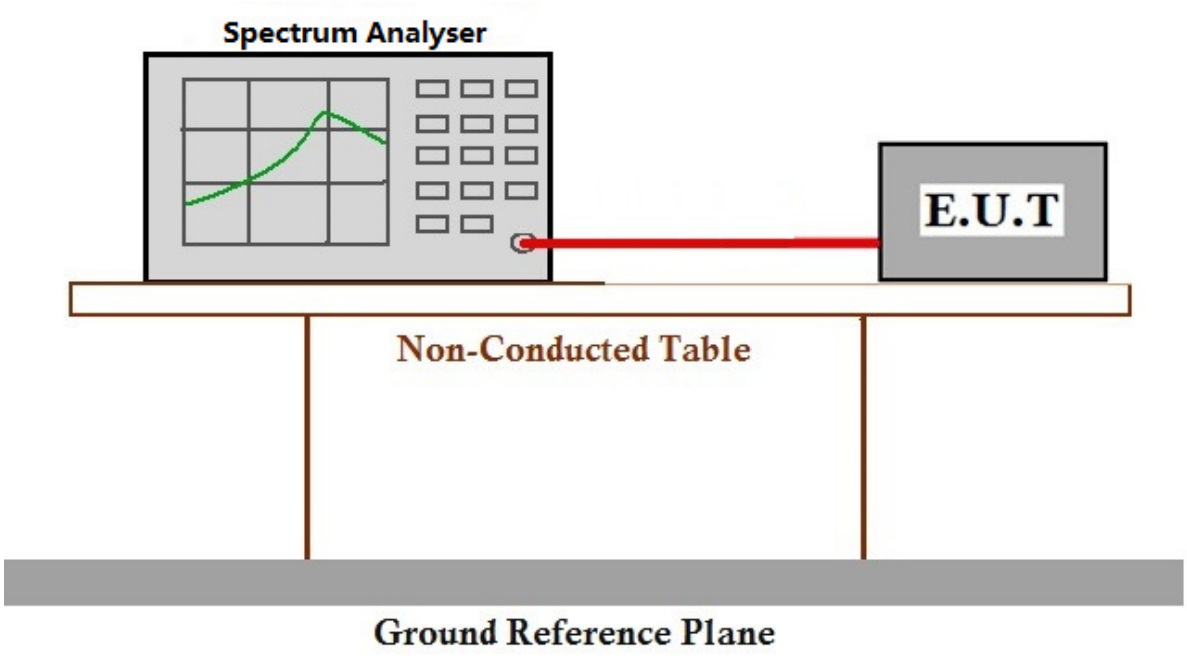
6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 18.6 °C Humidity: 29.1 % RH Atmospheric Pressure: 1025 mbar

Test mode a: Tx mode, Keep the EUT in transmitting mode.

6.4.2 Test Setup Diagram



6.4.3 Measurement Data

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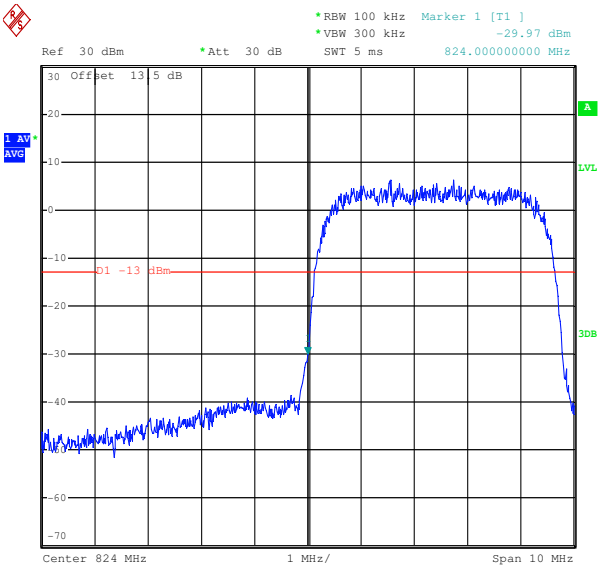
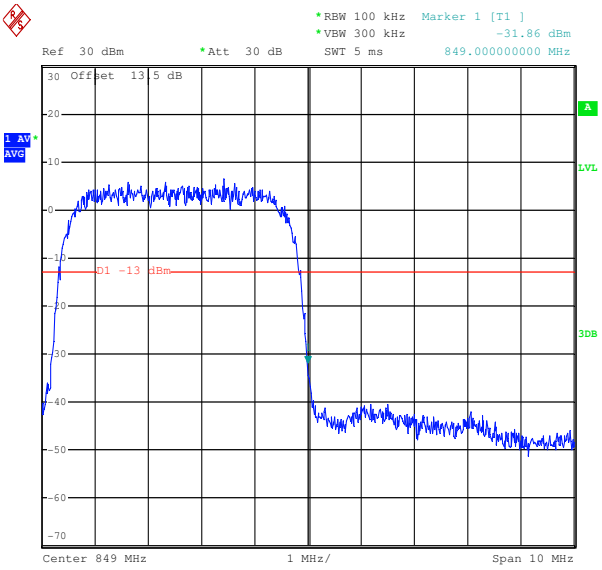
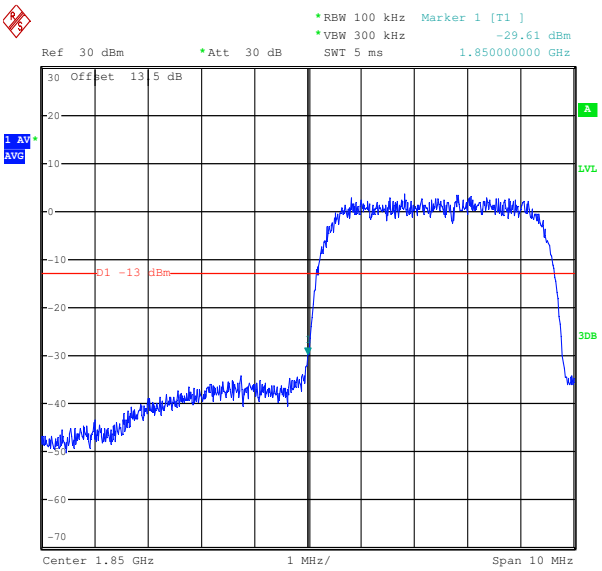
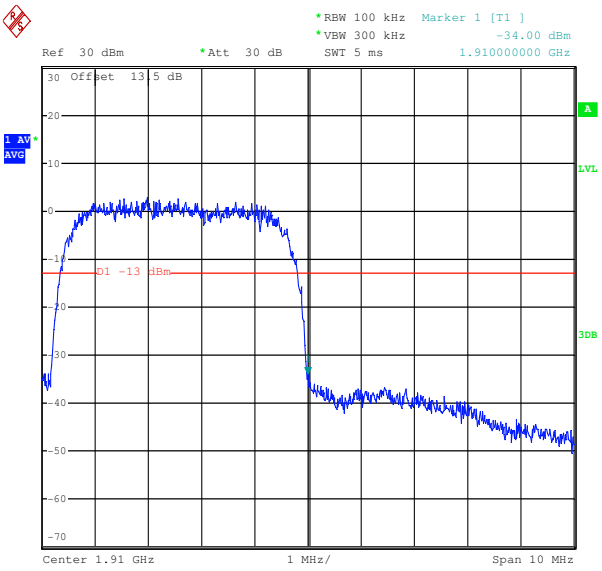
Test Plot	
WCDMA Band V-Low Channel	WCDMA Band V-High Channel
 Date: 29.JAN.2018 11:32:15	 Date: 29.JAN.2018 11:36:22
WCDMA Band II-Low Channel	WCDMA Band II-High Channel
 Date: 29.JAN.2018 11:29:51	 Date: 29.JAN.2018 11:28:04

Note: All modes have been tested and we found RMC test mode has the worst test result. Only record the worst test result.

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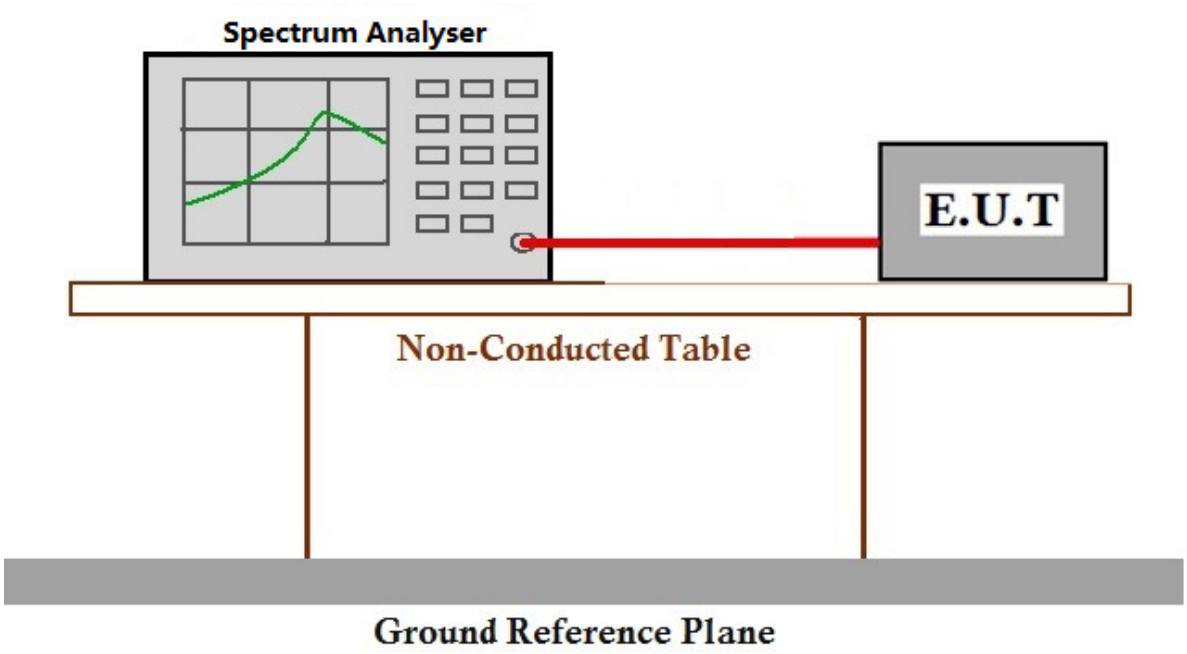
6.5 Spurious emissions at antenna terminals

Test Requirement: §2.1051, §22.917, §24.238, RSS-132 §5.5, RSS-133 §6.5
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: ≤ -13dBm

6.5.1 E.U.T. Operation

Operating Environment:
Temperature: 18.6 °C Humidity: 29.1 % RH Atmospheric Pressure: 1025 mbar
Test mode a: Tx mode, Keep the EUT in transmitting mode.

6.5.2 Test Setup Diagram



6.5.3 Measurement Data

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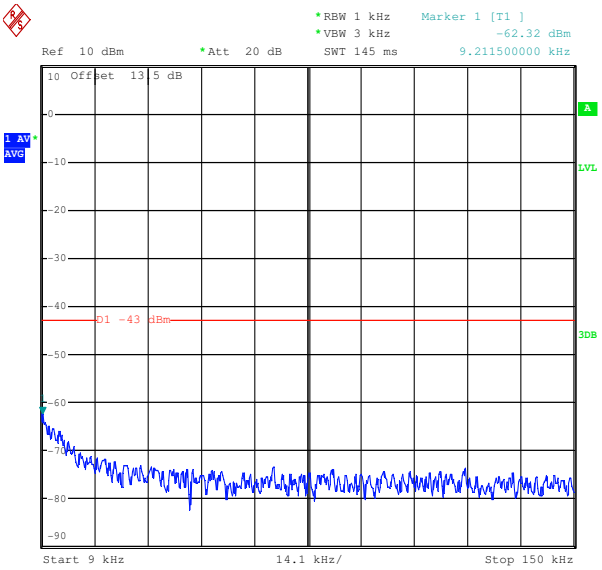
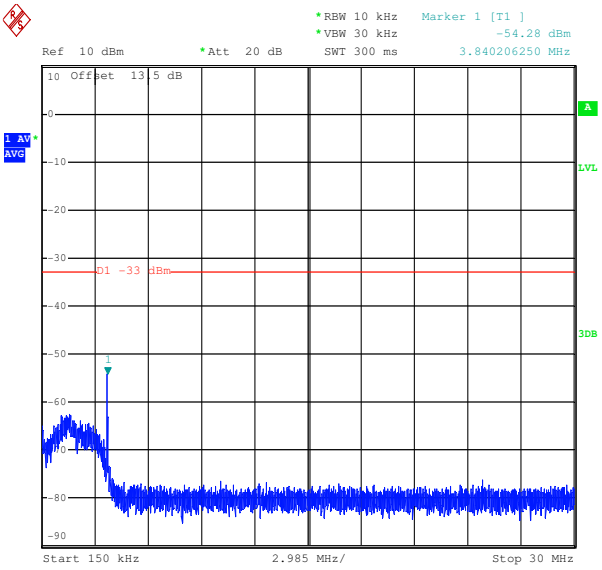
Test Plot

WCDMA Band V-Low Channel



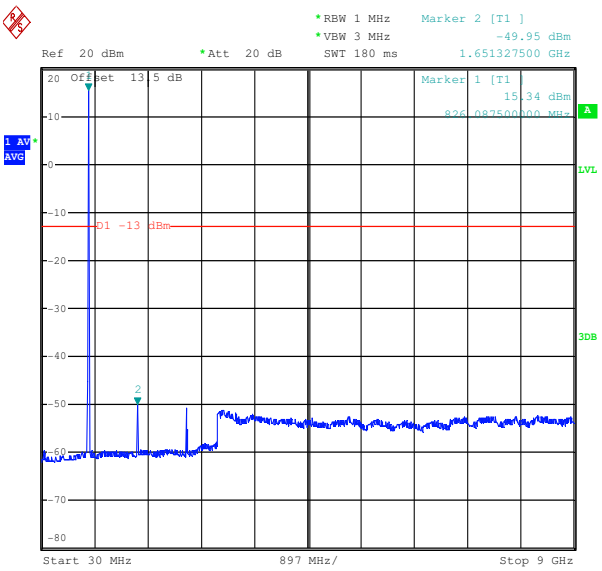
Date: 30.JAN.2018 02:53:51

WCDMA Band V-Low Channel



Date: 30.JAN.2018 02:54:03

WCDMA Band V-Low Channel



Date: 30.JAN.2018 02:55:06

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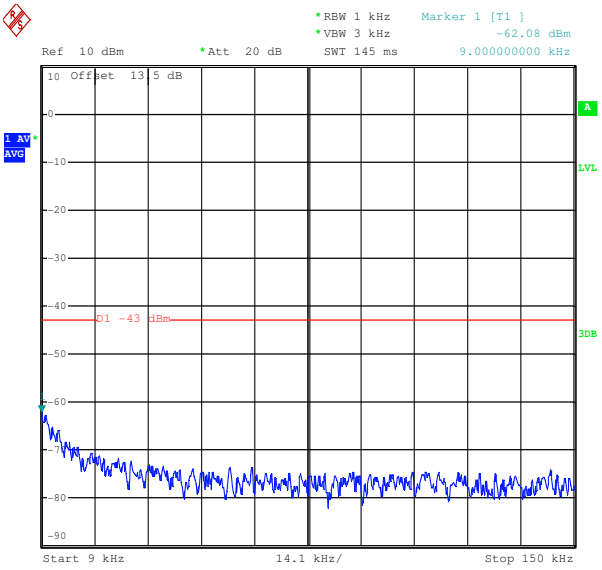
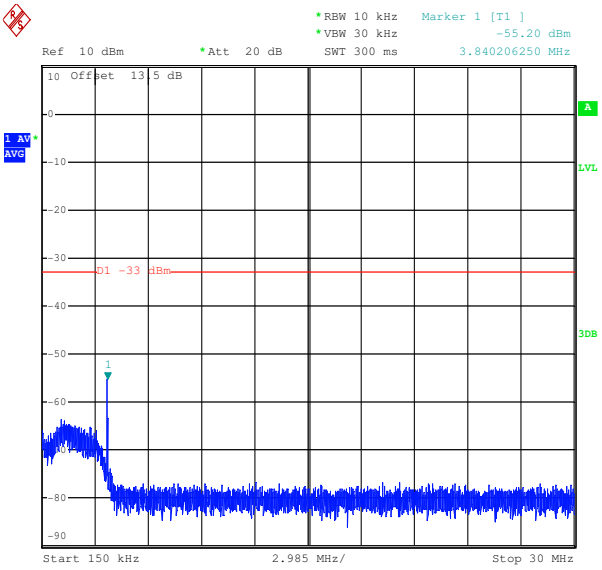
Test Plot

WCDMA Band V-Middle Channel



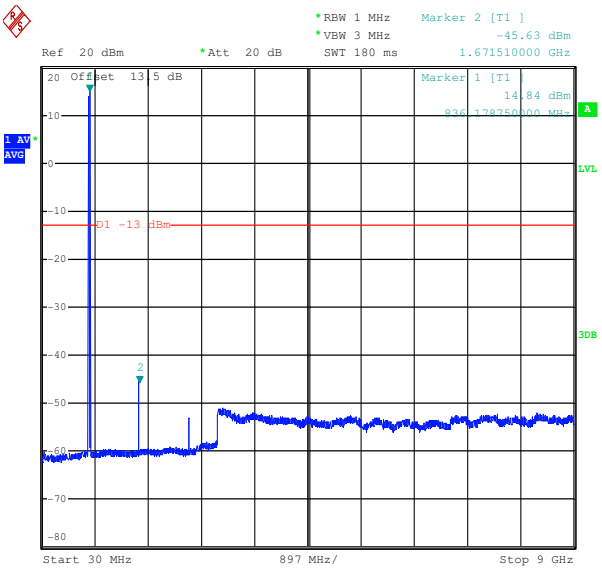
Date: 30.JAN.2018 02:56:48

WCDMA Band V-Middle Channel



Date: 30.JAN.2018 02:57:01

WCDMA Band V-Middle Channel



Date: 30.JAN.2018 02:57:14

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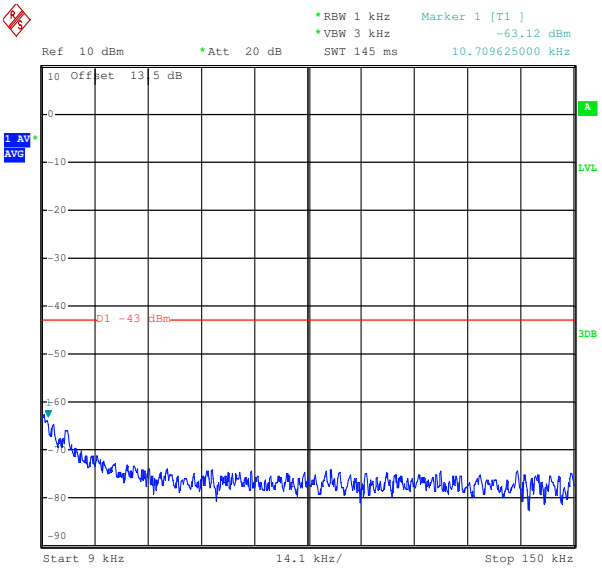
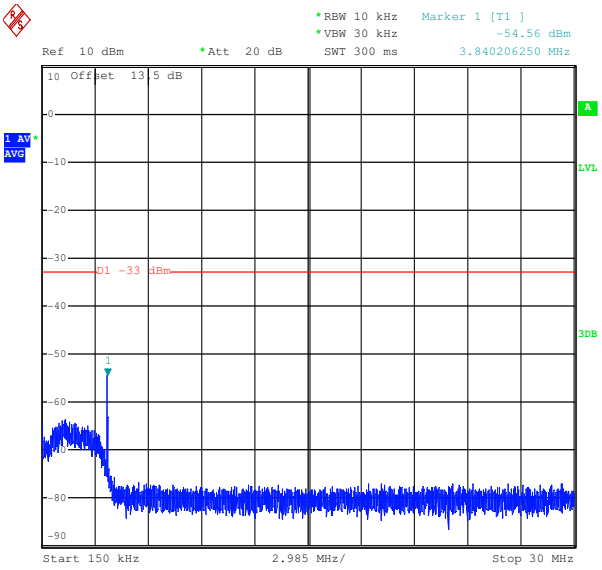
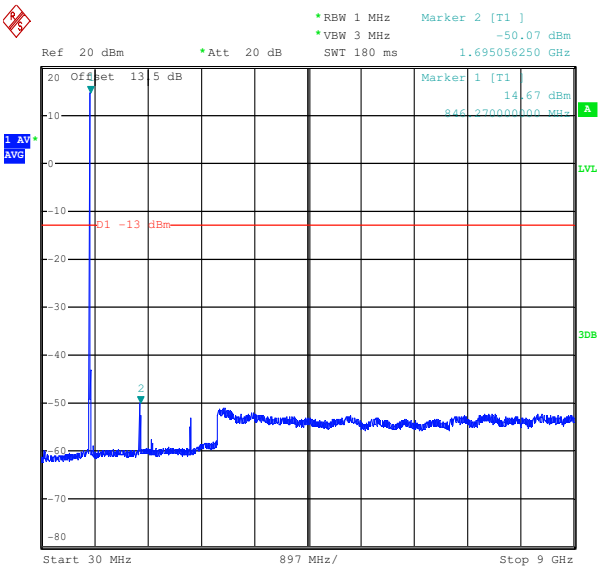
Test Plot	
WCDMA Band V-High Channel	WCDMA Band V-High Channel
 Date: 30.JAN.2018 02:57:54	 Date: 30.JAN.2018 02:58:06
WCDMA Band V-High Channel	
 Date: 30.JAN.2018 02:58:19	

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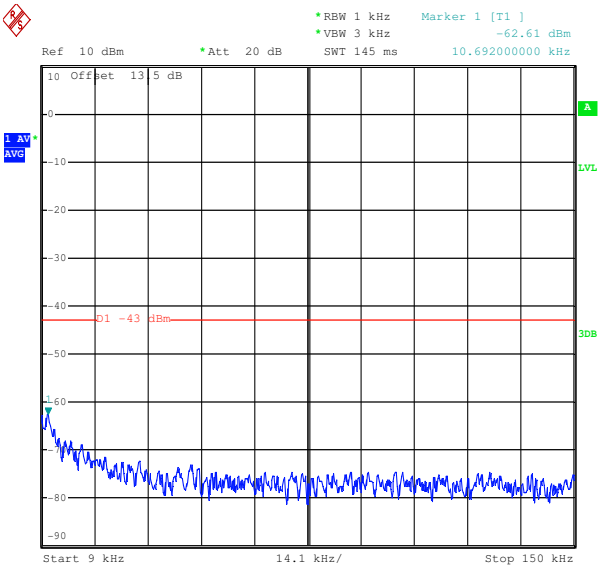
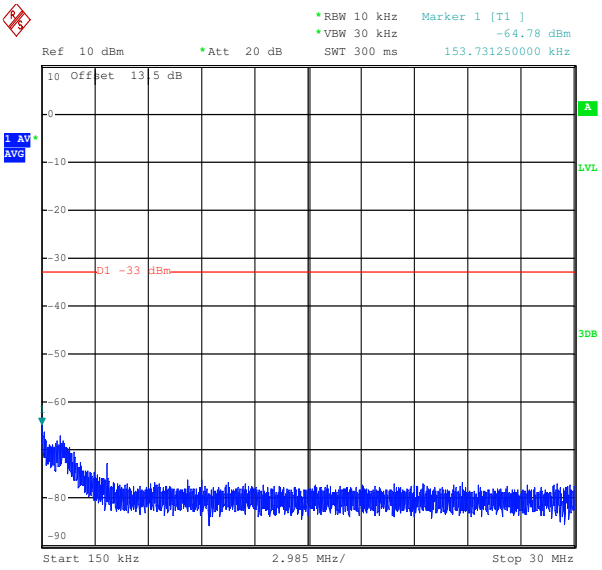
Test Plot

WCDMA Band II-Low Channel



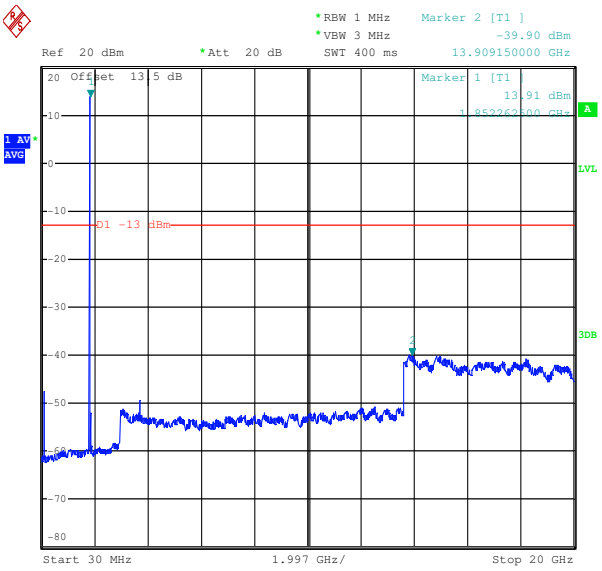
Date: 30.JAN.2018 03:00:06

WCDMA Band II-Low Channel



Date: 30.JAN.2018 03:00:18

WCDMA Band II-Low Channel



Date: 30.JAN.2018 03:00:31

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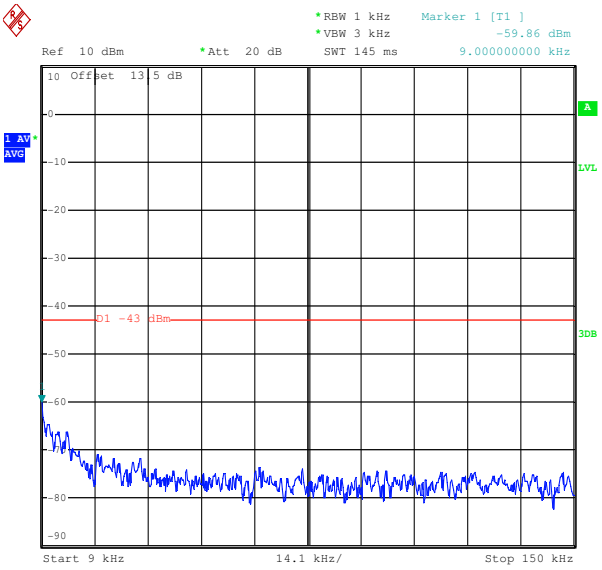
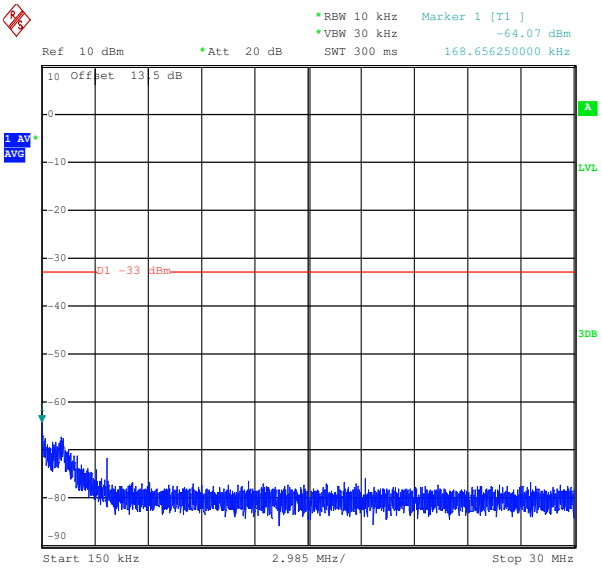
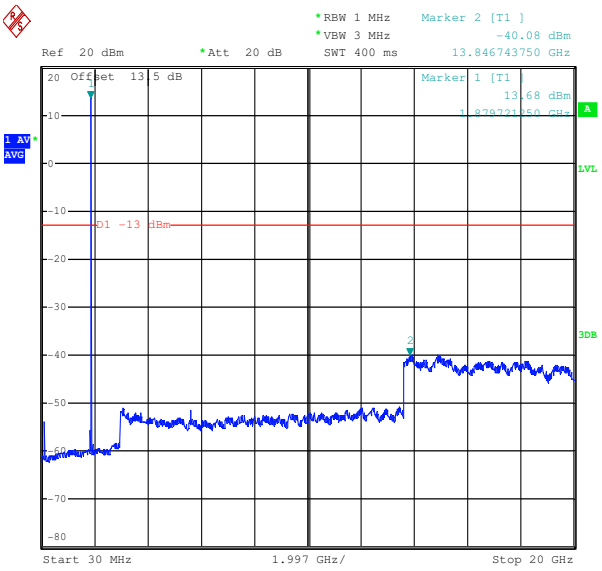
Test Plot	
WCDMA Band II-Middle Channel	WCDMA Band II-Middle Channel
 Date: 30.JAN.2018 03:02:10	 Date: 30.JAN.2018 03:02:22
WCDMA Band II-Middle Channel	
 Date: 30.JAN.2018 03:02:35	

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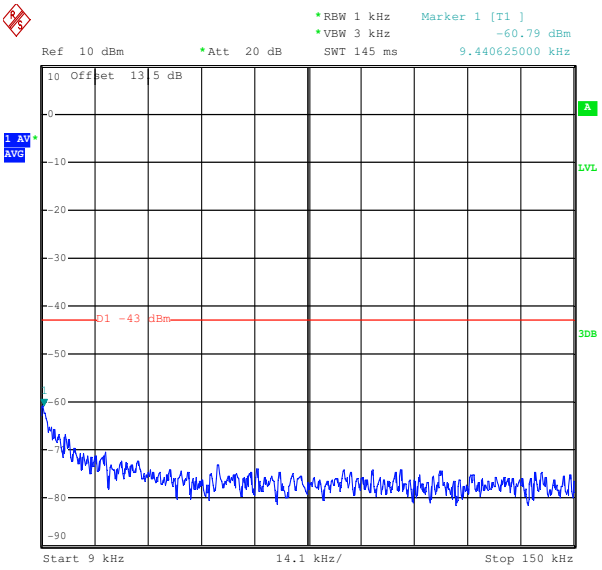
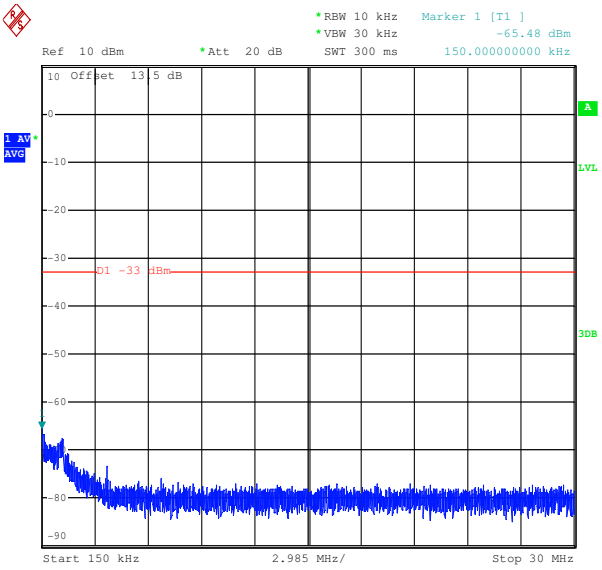
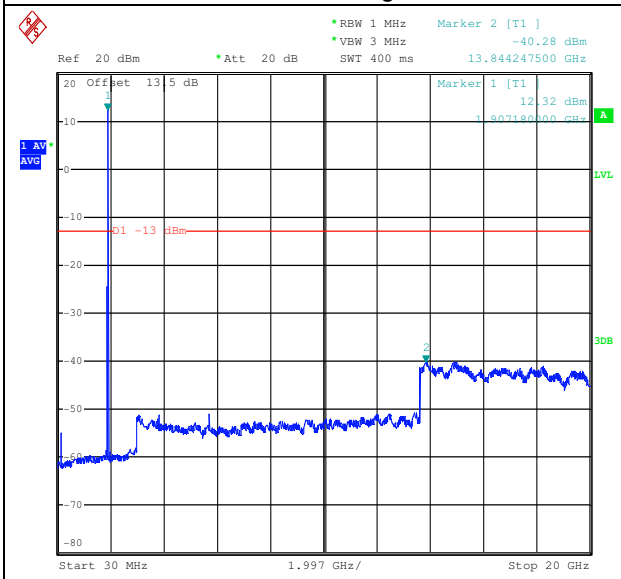
Test Plot	
WCDMA Band II-High Channel	WCDMA Band II-High Channel
 Date: 30.JAN.2018 03:04:09	 Date: 30.JAN.2018 03:04:22
WCDMA Band II-High Channel	
 Date: 30.JAN.2018 03:04:35	
Note: All modes have been tested and we found RMC test mode has the worst test result. Only record the worst test result.	

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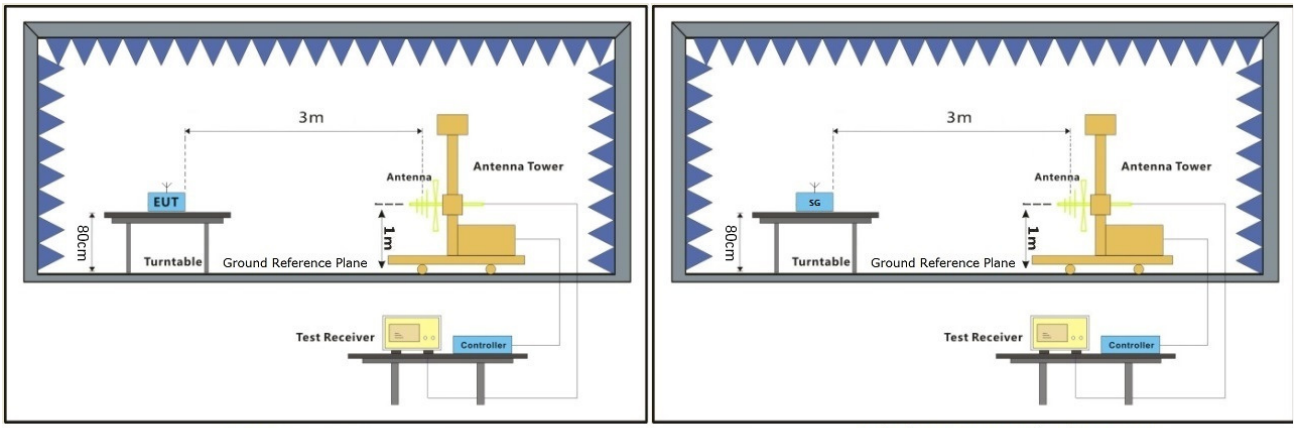
6.6 Field strength of spurious radiation

Test Requirement: §2.1051, §22.917, §24.238, RSS-132 §5.5, RSS-133 §6.5
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: ≤ -13dBm

6.6.1 E.U.T. Operation

Operating Environment:
Temperature: 18.6 °C Humidity: 29.1 % RH Atmospheric Pressure: 1025 mbar
Test mode a: Tx mode, Keep the EUT in transmitting mode.

6.6.2 Test Setup Diagram



EUT Substiute Antenna+Signal Generator

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6.6.3 Measurement Procedure and Data

Test Procedure:

(1)On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
(2)The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
(3)The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
(4)The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
(5)The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
(6)The transmitter shall than be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
(7)The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
(8)The maximum signal level detected by the measuring receiver shall be noted.
(9)The measurement shall be repeated with the test antenna set to horizontal polarization.
(10) Replace the antenna with a proper Antenna (substitution antenna).
(11)The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
(12)The substitution antenna shall be connected to a calibrated signal generator.
(13)If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
(14)The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
(15)The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
(16)The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
(17)The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

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WCDMA Band V-Low channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization (H/V)	Result
1652.8	-60.01	0.52	6	-48.67	-13	-41.53	Horizontal	Pass
2479.2	-48.12	0.53	5.8	-41.88	-13	-29.85	Horizontal	Pass
3305.6	-56.92	0.65	6.2	-51.71	-13	-38.37	Horizontal	Pass
1652.8	-54.15	0.52	6	-54.53	-13	-35.67	Vertical	Pass
2479.2	-47.15	0.53	5.8	-42.85	-13	-28.88	Vertical	Pass
3305.6	-57.26	0.65	6.2	-51.37	-13	-38.71	Vertical	Pass

WCDMA Band V-Middle channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization (H/V)	Result
1672.8	-60.77	0.52	6	-51.43	-13	-42.29	Horizontal	Pass
2509.2	-47.64	0.59	5.3	-44.07	-13	-29.93	Horizontal	Pass
3345.6	-58.66	0.65	6.2	-53.64	-13	-40.11	Horizontal	Pass
1672.8	-56.91	0.52	6	-55.29	-13	-38.43	Vertical	Pass
2509.2	-48.78	0.59	5.3	-42.93	-13	-31.07	Vertical	Pass
3345.6	-59.19	0.65	6.2	-53.11	-13	-40.64	Vertical	Pass

WCDMA Band V-High channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization (H/V)	Result
1693.2	-57.65	0.52	6	-52.17	-13	-39.17	Horizontal	Pass
2539.8	-50.19	0.59	5.3	-45.48	-13	-32.48	Horizontal	Pass
3386.4	-58.91	0.65	6.2	-53.36	-13	-40.36	Horizontal	Pass
1693.2	-58.84	0.52	6	-53.36	-13	-40.36	Vertical	Pass
2539.8	-47.68	0.59	5.3	-42.97	-13	-29.97	Vertical	Pass
3386.4	-59.44	0.65	6.2	-53.89	-13	-40.89	Vertical	Pass

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WCDMA Band II-Low channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization (H/V)	Result
3704.8	-43.48	0.71	7.6	-36.59	-13	-23.59	Horizontal	Pass
5557.2	-54.76	0.85	10.3	-45.31	-13	-32.31	Horizontal	Pass
7409.6	-58.59	1	12.9	-46.69	-13	-33.69	Horizontal	Pass
3704.8	-42.73	0.71	7.6	-35.84	-13	-22.84	Vertical	Pass
5557.2	-51.41	0.85	10.3	-41.96	-13	-28.96	Vertical	Pass
7409.6	-58.41	1	12.9	-46.51	-13	-33.51	Vertical	Pass

WCDMA Band II-Middle channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization (H/V)	Result
3760	-38.96	0.71	7.6	-32.07	-13	-19.07	Horizontal	Pass
5640	-46.79	0.85	10.3	-37.34	-13	-24.34	Horizontal	Pass
7520	-58.55	0.99	13.2	-46.34	-13	-33.34	Horizontal	Pass
3760	-38.37	0.71	7.6	-31.48	-13	-18.48	Vertical	Pass
5640	-44.76	0.85	10.3	-35.31	-13	-22.31	Vertical	Pass
7520	-56.6	0.99	13.2	-44.39	-13	-31.39	Vertical	Pass

WCDMA Band II-High channel								
Frequency (MHz)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization (H/V)	Result
3815.2	-48.52	0.71	7.6	-41.63	-13	-28.63	Horizontal	Pass
5722.8	-53.65	0.85	10.3	-44.2	-13	-31.2	Horizontal	Pass
7630.4	-59.81	0.99	13.2	-47.6	-13	-34.6	Horizontal	Pass
3815.2	-48.32	0.71	7.6	-41.43	-13	-28.43	Vertical	Pass
5722.8	-50.43	0.85	10.3	-40.98	-13	-27.98	Vertical	Pass
7630.4	-59.21	0.99	13.2	-47	-13	-34	Vertical	Pass

Note: All modes have been tested and we found RMC test mode has the worst test result. Only record the worst test result.

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6.7 Frequency stability

Test Requirement: §2.1055, §22.355, §24.235, RSS-132 §5.3, RSS-133 §6.3

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: ≤ ±2.5ppm.

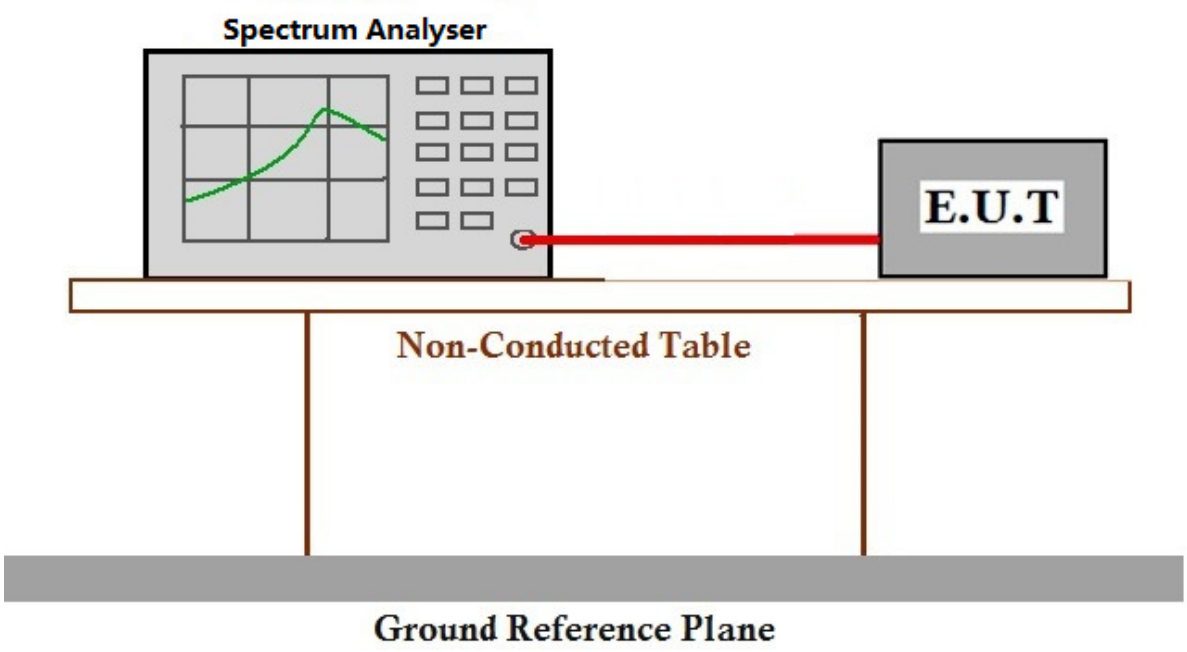
6.7.1 E.U.T. Operation

Operating Environment:

Temperature: 18.6 °C Humidity: 29.1 % RH Atmospheric Pressure: 1025 mbar

Test mode a: Tx mode, Keep the EUT in transmitting mode.

6.7.2 Test Setup Diagram



6.7.3 Measurement Data

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WCDMA Band V Assigned Frequency:836.4MHz					
Voltage(V)	Temperature (℃)	Frequency Deviation(Hz)	Frequency Deviation(ppm)	Limit (ppm)	Result
12.0	-30	11	0.013	±2.5	Pass
	-20	13	0.016		
	-10	18	0.022		
	0	11	0.013		
	10	14	0.017		
	20	15	0.018		
	30	11	0.013		
	40	17	0.020		
	50	13	0.016		
10.2	25	17	0.020		
13.8	25	15	0.018		

WCDMA Band II Assigned Frequency:1880.0MHz					
Voltage(V)	Temperature (℃)	Frequency Deviation(Hz)	Frequency Deviation(ppm)	Limit (ppm)	Result
12.0	-30	14	0.007	±2.5	Pass
	-20	11	0.006		
	-10	16	0.009		
	0	13	0.007		
	10	19	0.010		
	20	12	0.006		
	30	15	0.008		
	40	14	0.007		
	50	17	0.009		
10.2	25	13	0.007		
13.8	25	18	0.010		

Note: All modes have been tested and we found RMC test mode has the worst test result. Only record the worst test result.

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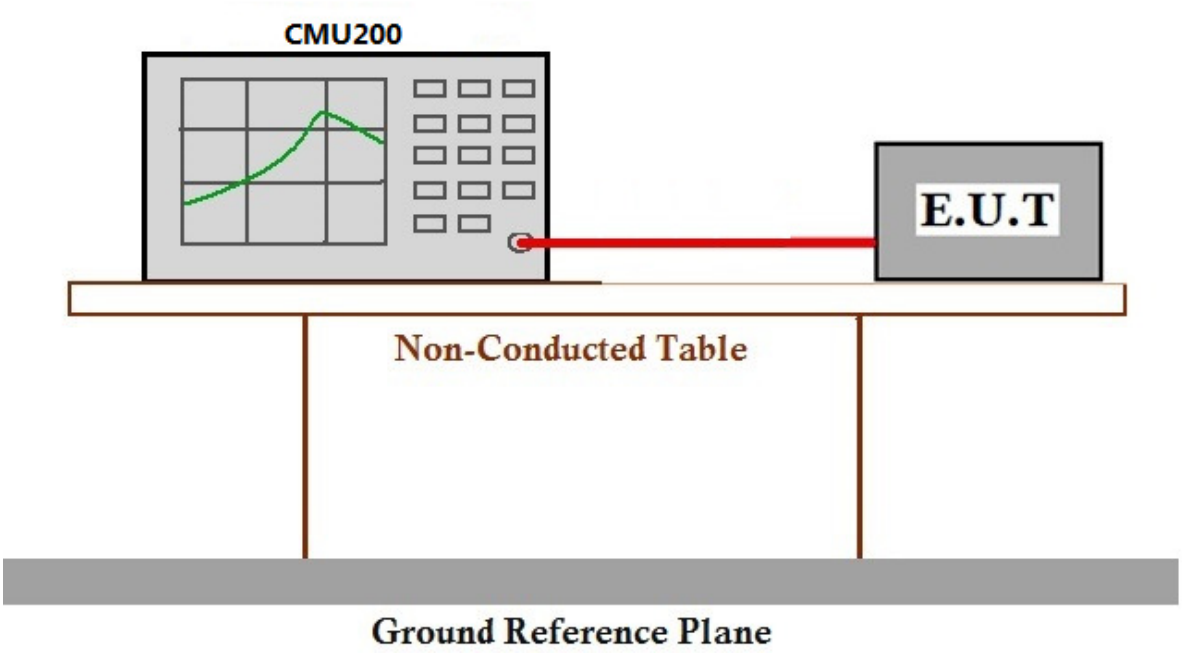
6.8 Modulation Characteristics

Test Requirement: §2.1047, RSS-132 §5.2, RSS-133 §6.2
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: Digital modulation

6.8.1 E.U.T. Operation

Operating Environment:
Temperature: 18.6 °C Humidity: 29.1 % RH Atmospheric Pressure: 1025 mbar
Test mode a: Tx mode, Keep the EUT in transmitting mode.

6.8.2 Test Setup Diagram



6.8.3 Measurement Data

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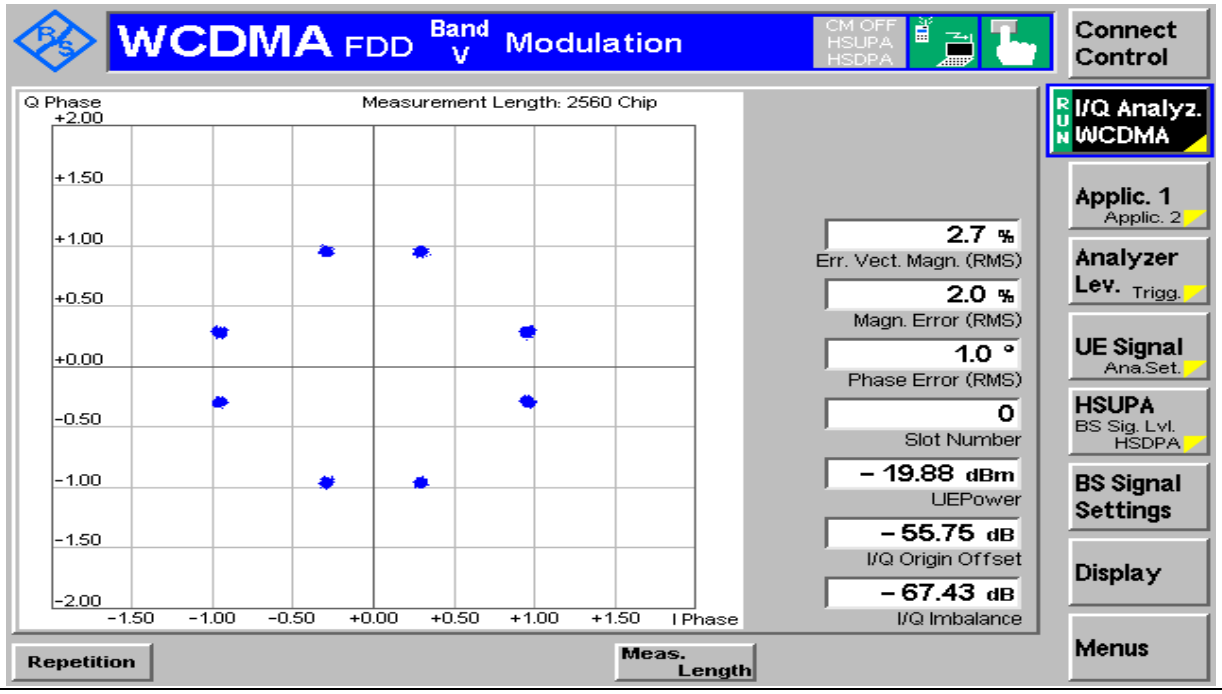
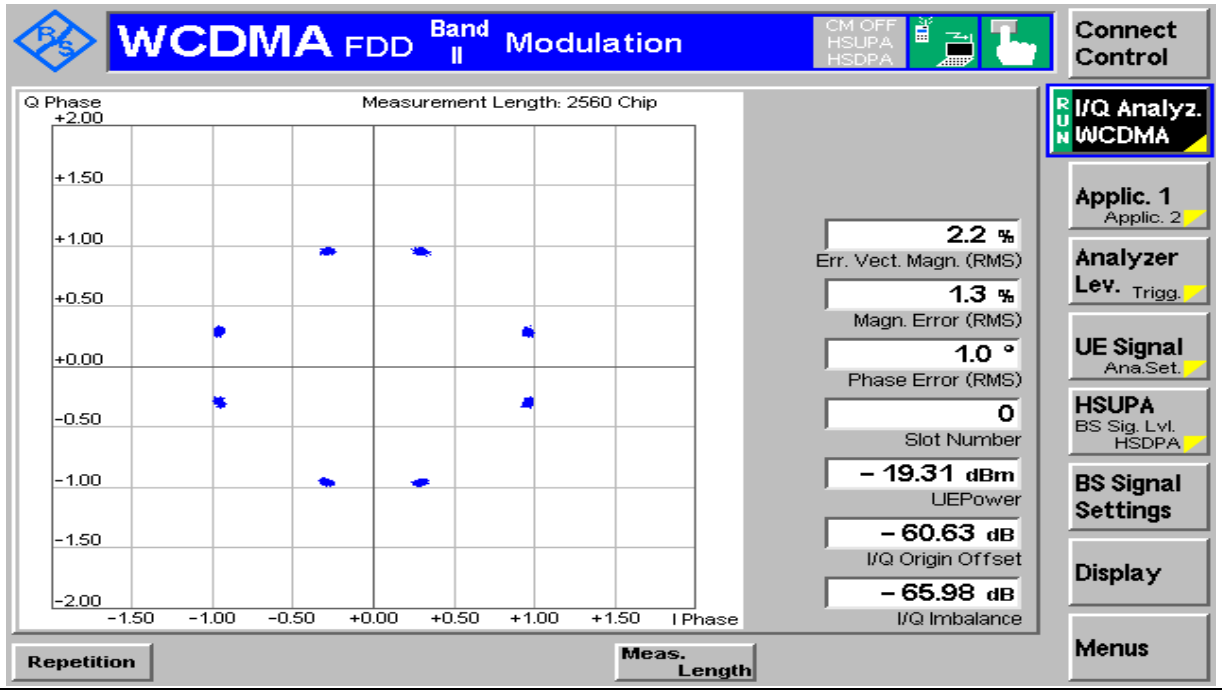
Test Plot
WCDMA Band V



WCDMA Band II



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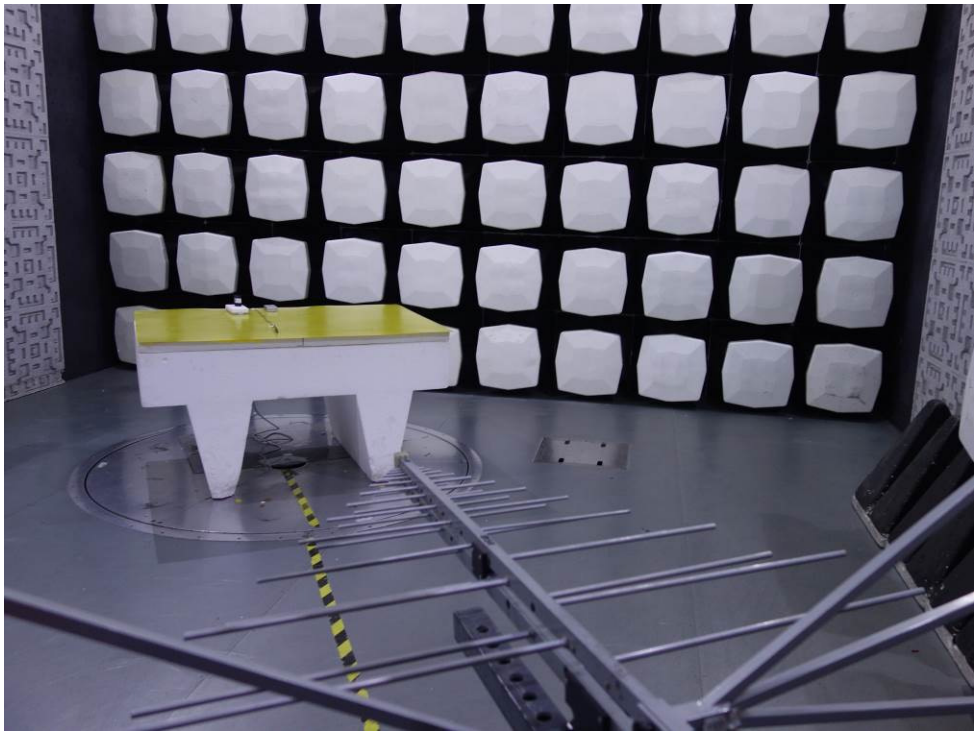
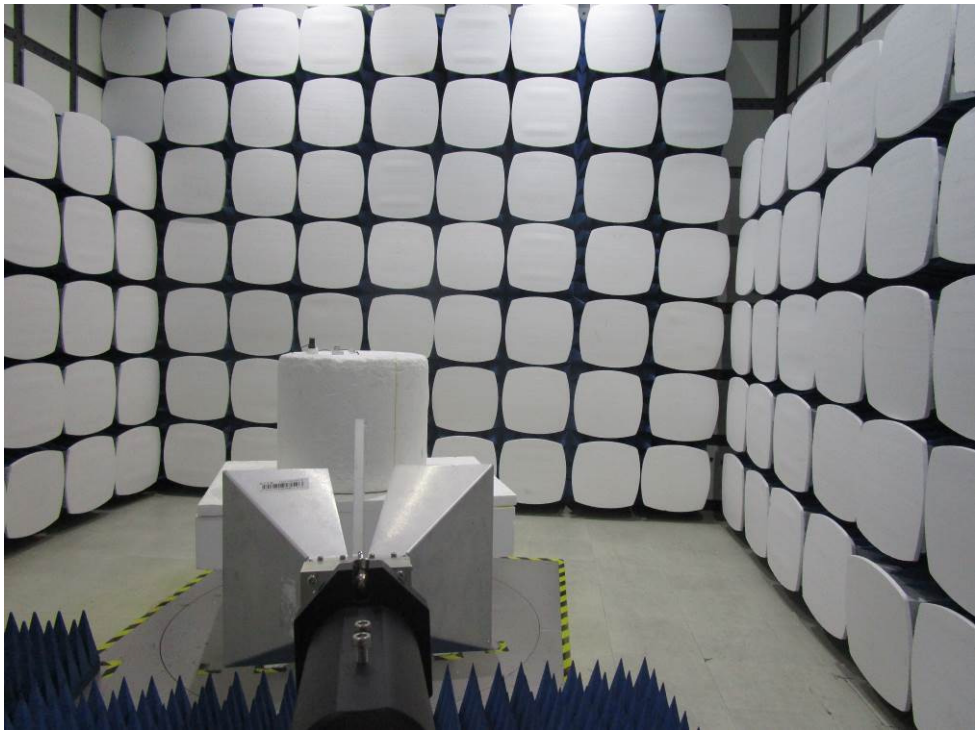
7 Photographs

7.1 Radiated Emissions (30MHz-1GHz) Test Setup



7.2 Radiated Emissions (Above 1GHz) Test Setup



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7.3 EUT Constructional Details (EUT Photos)

Refer to EUT external and internal photos.

- End of the Report -

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