

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Report No: CCISE161100701

FCC REPORT

(GSM & WCDMA)

Applicant: i-Mobile Technology corporation

Address of Applicant: 3F #8 Alley 15 Lane 120 Sec. 1 Neihu Road, Neihu District,

Taipei City 114, Taiwan

Equipment Under Test (EUT)

Product Name: Tablet PC

Model No.: IMT-10PLUS

Trade mark: @mobile

FCC ID: XZO-IMT-10PLUS

FCC CFR Title 47 Part 2

Applicable standards: FCC CFR Title 47 Part 22 Subpart H

FCC CFR Title 47 Part 24 Subpart E

Date of sample receipt: 02 Nov., 2016

Date of Test: 02 Nov., to 14 Dec., 2016

Date of report issued: 14 Dec., 2016

Test Result: PASS*

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

Authorized Signature:



Bruce Zhang Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. 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.

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2. Version

Version No.	Date	Description
00	14 Nov., 2016	Original

Tested by: Date: 14 Nov., 2016

Test Engineer

Reviewed by: Date: 14 Nov., 2016

Project Engineer



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4. Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c)	Pass
Peak-to-Average Power Ratio	Part 24.232 (d)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917(b) Part 24.238(b)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Pass: The EUT complies with the essential requirements in the standard.





5. General Information

5.1 Client Information

Applicant:	i-Mobile Technology corporation
Address of Applicant:	3F #8 Alley 15 Lane 120 Sec. 1 Neihu Road , Neihu District ,Taipei City 114 ,Taiwan
Manufacturer and Factory:	i-Mobile Technology corporation
Address of Manufacturer and Factory:	3F #8 Alley 15 Lane 120 Sec. 1 Neihu Road , Neihu District ,Taipei City 114 ,Taiwan

5.2 General Description of E.U.T.

Product Name:	Tablet PC	
Model No.:	IMT-10PLUS	
Operation Frequency range:	GSM 850: 824.20MHz-848.80MHz	
	PCS1900: 1850.20MHz-1909.80MHz	
	WCDMA Band V: 826.4MHz-846.6MHz	
	WCDMA Band II: 1852.4 MHz -1907.6 MHz	
Modulation type:	GSM/GPRS:GMSK, UMTS:QPSK,	
Antenna type:	Internal Antenna	
Antenna gain:	GSM 850: -3.02 dBi	
	PCS 1900: -0.37 dBi	
	WCDMA Band V:-3.02 dBi	
	WCDMA Band II: -0.37 dBi	
Power supply:	Rechargeable Li-ion Battery DC10.8Vx2, 3400mAh/pcs	
AC adapter:	Model: ATS065S-P160 LPS	
	Input: AC100-240V 50/60Hz 1.4A	
	Output: DC 16V, 4.07A	





Operation Frequency List:

Operation Frequency List:				
GS	SM 850	PCS	1900	
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)	
128	824.20	512	1850.20	
129	824.40	513	1850.40	
189	836.40	660	1879.80	
190	836.60	661	1880.00	
191	836.80	662	1880.20	
250	848.60	809	1909.60	
251	848.80	810	1909.80	
WCDN	MA Band V	WCDMA Band II		
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)	
4132	826.40	9262	1852.40	
4133	826.60	9263	1852.60	
4182	836.40	9399	1879.80	
4183	836.60	9400	1880.00	
4184	836.80	9401	1880.20	
4232	846.40	9537	1907.40	
4233	846.60	9538	1907.60	



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Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

GSM850			PCS1900		
Channel Frequency(N		Frequency(MHz)	Channel		Frequency(MHz)
Lowest channel	128	824.20	Lowest channel 512		1850.20
Middle channel	190	836.60	Middle channel	661	1880.00
Highest channel	251	848.80	Highest channel 810		1909.80
WCDMA Band V			WCDMA Band II		
Channe	el	Frequency(MHz)	Channe	I	Frequency(MHz)
Lowest channel	4132	826.40	Lowest channel	9262	1852.40
Middle channel	4183	836.60	Middle channel	9400	1880.00
Highest channel	4233	846.60	Highest channel	9538	1907.60



5.3 Test modes

Voice mode	Keep the EUT in voice mode on GSM 850 and PCS 1900 respectively.
Data mode (GPRS)	Keep the EUT in GPRS mode on GSM 850 and PCS 1900 respectively.
Voice mode (AMR 12.2 kbps)	Keep the EUT in voice mode on WCDMA Band II and V respectively.
Data mode (RMC 12.2kbps)	Keep the EUT in RMC on WCDMA Band II and V respectively.
Data mode (HSDPA Subtest 1~4)	Keep the EUT in HSDPA mode on WCDMA Band II and V respectively.
Data mode (HSUPA Subtest 1~5)	Keep the EUT in HSUPA mode on WCDMA Band II and V respectively.
Remark:	Just the worst case mode shown in report.

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5.4 Measurement Uncertainty

Items	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 30MHz)	2.14 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	4.24 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	4.35 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	4.44 dB (k=2)
Radiated Emission (18GHz ~ 26.5GHz)	4.56 dB (k=2)

5.5 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22 subpart H and Part 24 subpart E of the FCC CFR 47 Rules.

5.6 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603 and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

5.7 Laboratory Facility

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

• FCC - Registration No.: 817957

Shenzhen Zhongjian Nanfang Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in out files. Registration 817957, February 27, 2012.

• IC - Registration No.: 10106A-1

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

• CNAS - Registration No.: CNAS L6048

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

5.8 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China

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5.9 Test Instruments list

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m Semi- Anechoic Chamber	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2017
BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	03-25-2016	03-25-2017
Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	03-25-2016	03-25-2017
EMI Test Software	AUDIX	E3	N/A	N/A	N/A
Amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	04-01-2016	03-31-2017
Amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	04-01-2016	03-31-2017
Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	04-01-2016	03-31-2017
Horn Antenna	ETS-LINDGREN	3160	GTS217	04-01-2016	03-31-2017
Printer	HP	HP LaserJet P1007	N/A	N/A	N/A
Positioning Controller	UC	UC3000	CCIS0015	N/A	N/A
Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP 30	CCIS0023	03-28-2016	03-28-2017
EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	03-28-2016	03-28-2017
EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	03-24-2016	03-24-2017
Loop antenna	Laplace instrument	RF300	EMC0701	04-01-2016	03-31-2017
Universal radio communication tester	Rhode & Schwarz	CMU200	CCIS0069	03-28-2016	03-28-2017
Signal Analyzer	Rohde & Schwarz	FSIQ3	CCIS0088	04-08-2016	04-08-2017
DC Power Supply	Shenzhen XinNuoEr Technologies Co., Ltd.	WYK-10020K	CCIS0201	10-31-2016	10-30-2017
Temperature Humidity Chamber	Fo Shan Heng Pu Electronics Co., Ltd.	HPGDS-500	CCIS0240	09-24-2016	09-23-2017
Coaxial Cable	N/A	N/A	CCIS0018	04-01-2016	03-31-2017
Coaxial Cable	N/A	N/A	CCIS0020	04-01-2016	03-31-2017



6. System test configuration

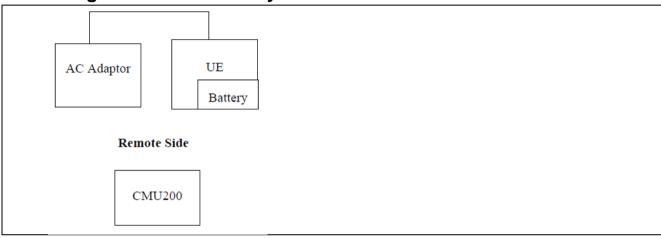
6.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

6.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.

6.3 Configuration of Tested System



6.4 Description of Test Modes

The EUT has been tested under operating condition.

EUT staying in continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for three modes (GSM850, PCS1900, WCDMA Band V and WCDMA Band II) with power adaptor, earphone and Data cable. The worst-case H mode for GSM850, PCS1900, WCDMA Band V and WCDMA Band II.





6.5 Conducted Output Power

Test Requirement:	FCC part 22.913(a), FCC part 24.232(b)
Test Method:	FCC part 2.1046
Limit:	GSM 850: 7W PCS 1900: 2W WCDMA Band V: 7W WCDMA Band II: 2W
Test setup:	EUT ATT Communication Tester Note: Measurement setup for testing on Antenna connector
Test Procedure:	The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the simulated station. Transmitter output power was read off in dBm.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed





Measurement Data:

Wiedsurement Data.				
	Bur			
EUT Mode	128	190	251	Limit(dBm)
	824.20MHz	836.60MHz	848.80MHz	
GSM 850	33.35	33.33	33.29	
GPRS 850 (1 Uplink slot)	33.34	33.34	33.31	
GPRS 850 (2 Uplink slot)	32.66	32.65	32.61	38.45
GPRS 850 (3 Uplink slot)	31.00	30.98	30.92	
GPRS 850 (4 Uplink slot)	29.99	29.96	29.95	
	Bur	st Average power (d	Bm)	
EUT Mode	Bur 512	st Average power (d 661	Bm) 810	Limit(dBm)
EUT Mode		, , , , , , , , , , , , , , , , , , ,	,	Limit(dBm)
EUT Mode PCS 1900	512	661	810	Limit(dBm)
	512 1850.20MHz	661 1880.00MHz	810 1909.80MHz	Limit(dBm)
PCS 1900	512 1850.20MHz 29.38	661 1880.00MHz 29.12	810 1909.80MHz 28.89	Limit(dBm) 33.00
PCS 1900 GPRS 1900 (1 Uplink slot)	512 1850.20MHz 29.38 29.32	661 1880.00MHz 29.12 29.13	810 1909.80MHz 28.89 28.91	





EUT Mode		Burst Average power (dBm)			
		4132	4183	4233	Limit(dBm)
		826.40MHz	836.60MHz	846.60MHz	
UMTS 850 HSDPA	Subtest 1	21.68	22.29	21.58	
	Subtest 2	21.68	21.83	21.13	
	Subtest 3	19.78	20.38	19.66	
	Subtest 4	19.48	20.09	19.44	
	Subtest 1	22.10	22.21	21.52	
	Subtest 2	22.13	22.28	21.59	38.45
UMTS 850 HSUPA	Subtest 3	19.77	20.29	19.72	
110017	Subtest 4	22.21	22.39	21.64	
	Subtest 5	20.85	21.37	20.60	
UMTS 850 RMC	12.2kbps	22.80	23.35	22.64	1
UMTS 850 AMR	12.2kbps	22.79	23.30	22.49	
EUT Mode		Burst Average power (dBm)			
		9262	9400	9538	Limit(dBm)
		1852.40MHz	1880.00MHz	1907.60MHz	
	Subtest 1	21.27	20.61	21.35	
UMTS 1900	Subtest 2	20.61	20.12	20.95	
HSDPA	Subtest 3	18.39	18.52	19.36	
	Subtest 4	18.51	18.42	19.28	
	Subtest 1	20.98	20.48	21.32	
UMTS 1900 HSUPA	Subtest 2	21.11	20.54	21.33	33.00
	Subtest 3	17.79	18.57	19.24	
	Subtest 4	21.16	20.55	21.29	
	Subtest 5	19.73	19.5	20.4	
UMTS 1900 RMC	12.2kbps	22.13	21.56	22.36	
UMTS 1900 AMR	12.2kbps	22.14	21.58	22.36	



6.6 Occupy Bandwidth

Test Requirement:	FCC part 22.913(a), FCC part 24.232(b)		
Test Method:	FCC part 2.1049		
Test setup:	EUT Splitter Communication Tester SPA Note: Measurement setup for testing on Antenna connector		
Test Procedure:	 The EUT's output RF connector was connected with a short cable to the spectrum analyzer RBW was set to about 1% of emission BW, VBW= 3 times RBW. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. 		
Test Instruments:	Refer to section 5.8 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		





Measurement Data:

mododi omone Bata.				
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (kHz)	-26dB bandwidth (kHz)
GSM 850	128	824.2	244	326
	190	836.6	246	316
	251	848.8	248	320
PCS 1900	512	1850.2	250	326
	661	1880.0	246	314
	810	1909.8	244	322
MODMA DAND V	4132	826.4	4180	4700
WCDMA BAND V 12.2k RMC	4183	836.6	4180	4700
12.2K KIVIC	4233	846.6	4180	4700
WCDMA BAND II 12.2k RMC	9262	1852.4	4160	4680
	9400	1880.0	4180	4700
	9538	1907.6	4200	4720

Note: GSM & GPRS use the same modulation technical (GMSK), and with the same channels, so the 99% OBW and the -26dB of GPRS not performed.



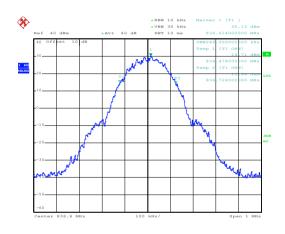
Test plot as follows:

99% Occupy bandwidth GSM850



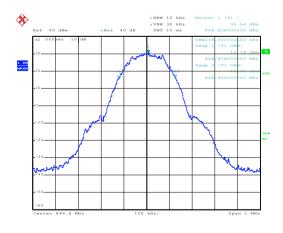
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Lowest channel



Date: 7.NOV.2016 14:59:26

Middle channel



Date: 7.NOV.2016 15:01:37

Highest channel



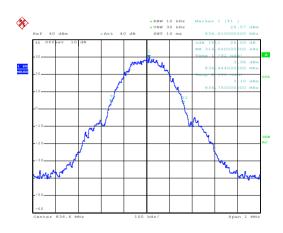
26dB Emission Bandwidth





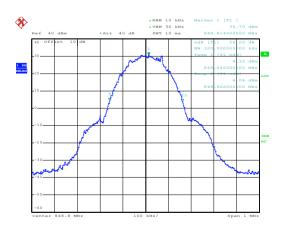
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Lowest channel



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Middle channel

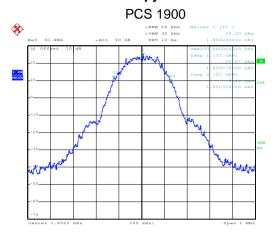


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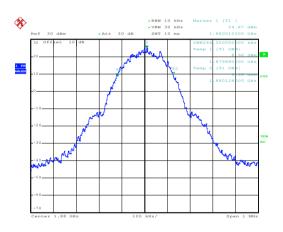


99% Occupy bandwidth



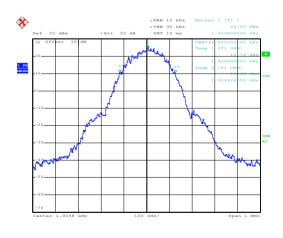
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Lowest channel



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Middle channel

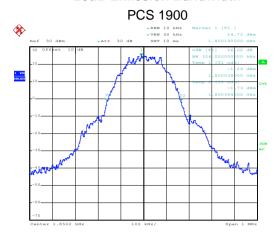


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Highest channel

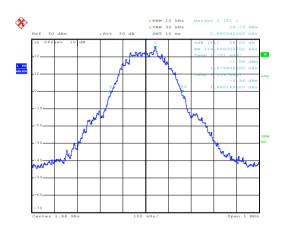


26dB Emission Bandwidth



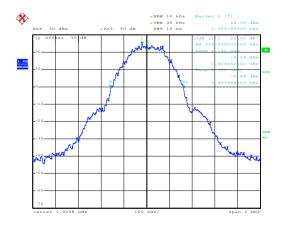
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Lowest channel



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Middle channel



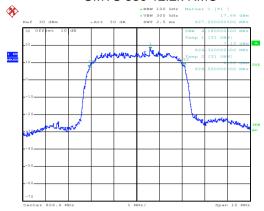
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Highest channel



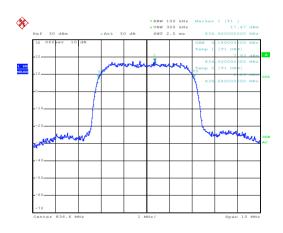
99% Occupy bandwidth

UMTS 850 12.2k RMC



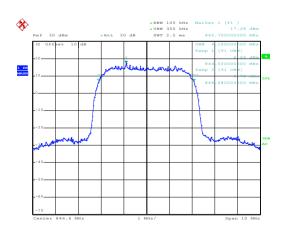
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Middle channel



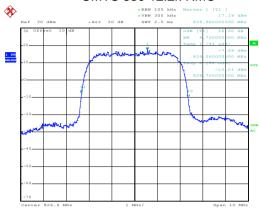
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Highest channel



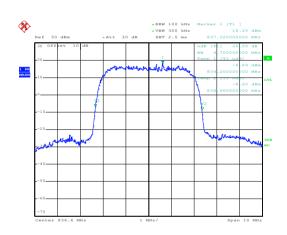
26dB Emission Bandwidth

UMTS 850 12.2k RMC



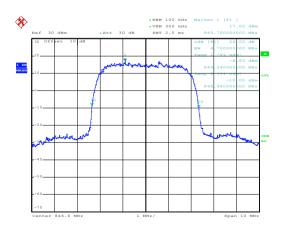
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Lowest channel



Date: 7.NOV.2016 15:25:36

Middle channel



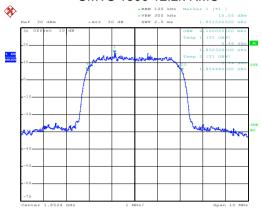
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Highest channel



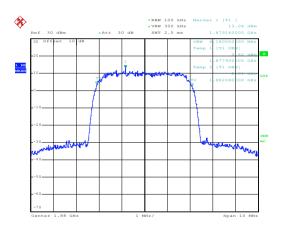
99% Occupy bandwidth

UMTS 1900 12.2k RMC



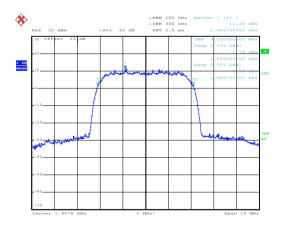
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Lowest channel



Date: 7.NOV.2016 15:33:41

Middle channel



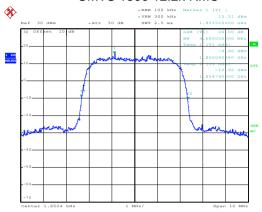
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Highest channel



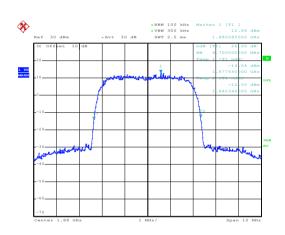
26dB Emission Bandwidth

UMTS 1900 12.2k RMC



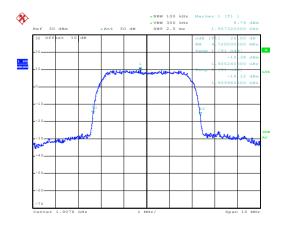
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Lowest channel



Date: 7.NOV.2016 15:33:30

Middle channel



Date: 7.NOV.2016 15:34:51

Highest channel



6.7 Peak-to-Average Power Ratio

Test Requirement:	FCC part 24.232(d)		
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.		
Test setup:	EUT Splitter Communication Tester ATT SPA Note: Measurement setup for testing on Antenna connector		
Test Procedure:	 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. Set the CCDF option in spectrum analyzer, RBW ≥ OBW, Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level. Repeat step 1~3 at other frequency and modulations. 		
Test Instruments:	Refer to section 5.8 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data (worst case):

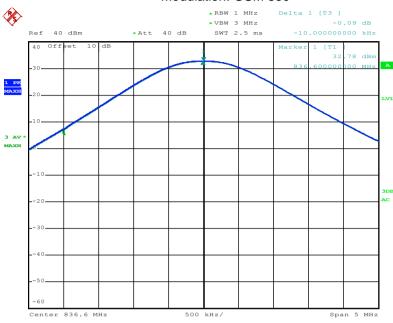
Modulation	Test channel	PAPR
GSM 850	190	0.09
PCS 1900	661	0.05
UMTS 850 RMC	4183	3.08
UMTS 1900 RMC	9400	2.72



Test plots as below:

Middle channel

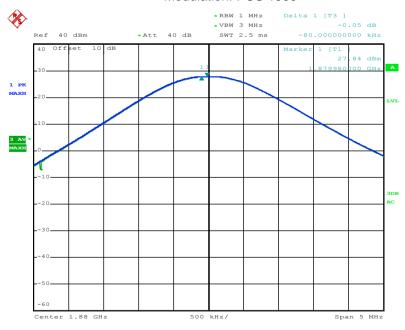
Modulation: GSM 850



Date: 7.NOV.2016 15:11:58

Middle channel

Modulation: PCS 1900

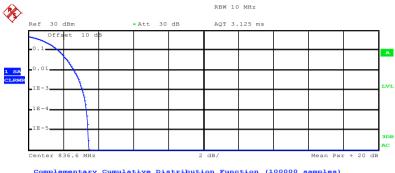


Date: 7.NOV.2016 15:15:27



Middle channel

Modulation: WCDMA Band V RMC



Complementary Cumulative Distribution Function (100000 samples)

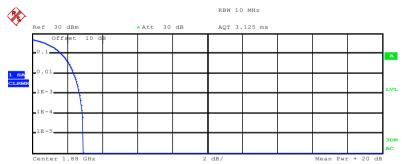
Trace 1 22.90 dBm Mean Peak 26.34 dBm 3.44 dB 10 % 1.72 dB

1 % 2.60 dB .1 % 3.08 dB .01 % 3.32 dB

Date: 7.NOV.2016 15:29:07

Middle channel

Modulation: WCDMA BAND II RMC



Complementary Cumulative Distribution Function (100000 samples) Trace 1

Mean 20.54 dBm 23.45 dBm Peak 2.91 dB Crest 10 % 1.64 dB 2.36 dB 1 % 2.72 dB .1 % .01 % 2.88 dB

Date: 7.NOV.2016 15:30:27



6.8 Modulation Characteristic

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

6.9 Out of band emission at antenna terminals

Test Requirement:	FCC part 22.917(a), FCC part 24.238(a)	
Test Method:	FCC part 2.1051	
Limit:	-13dBm	
Test setup:	EUT Splitter Communication Tester	
	SPA Note: Measurement setup for testing on Antenna connector	
Test Procedure:	 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic. Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. 	
Test Instruments:	Refer to section 5.8 for details	
Test mode:	Refer to section 5.3 for details	
Test results:	Passed	

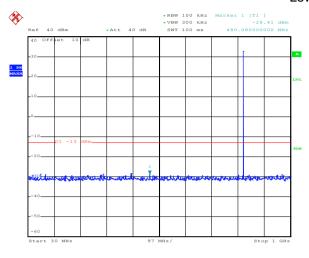


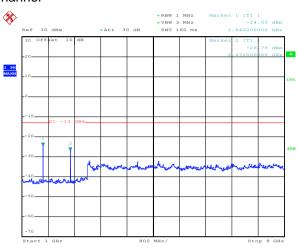
Test plots as follows:

Spurious emission:

GSM 850

Lowest Channel



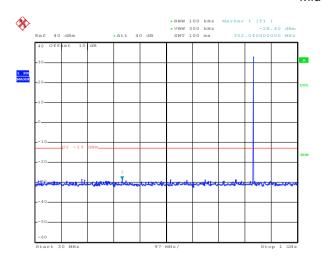


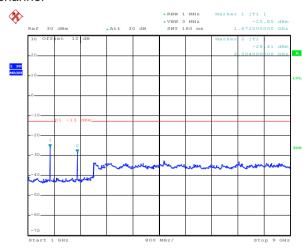
Date: 6.NOV.2016 20:00:14

30MHz~1GHz

1GHz~9GHz

Middle channel





Date: 6.NOV.2016 20:00:33

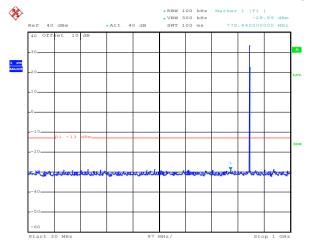
Date: 6.NOV.2016 19:58:46

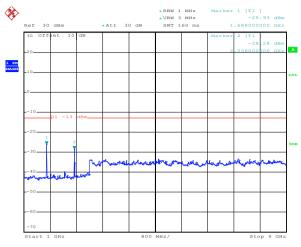
Date: 6.NOV.2016 19:58:23

30MHz~1GHz 1GHz~9GHz



Highest Channel





Date: 6.NOV.2016 19:59:55

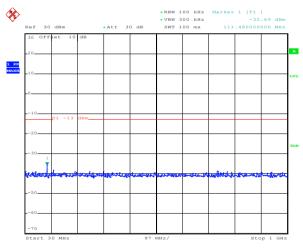
Date: 6.NOV.2016 19:59:22

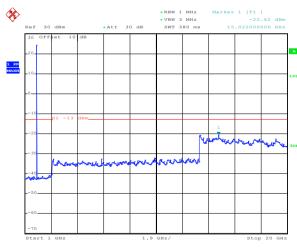
30MHz~1GHz

1GHz~9GHz

PCS 1900

Lowest Channel





Date: 6.NOV.2016 20:01:58

Date: 6.NOV.2016 20:03:16

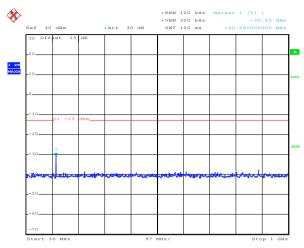
30MHz~1GHz

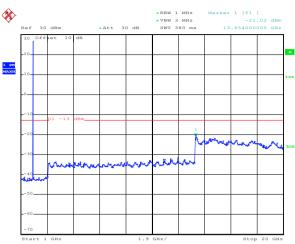
1GHz~20GHz





Middle Channel





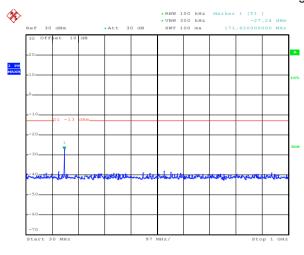
Date: 6.NOV.2016 20:02:21

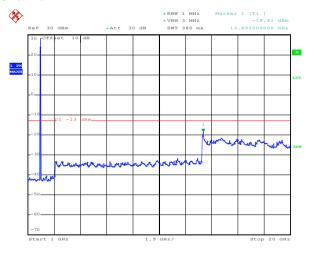
30MHz~1GHz

1GHz~20GHz

Highest Channel

Date: 6.NOV.2016 20:03:37





Date: 6.NOV.2016 20:02:32

Date: 6.NOV.2016 20:04:14

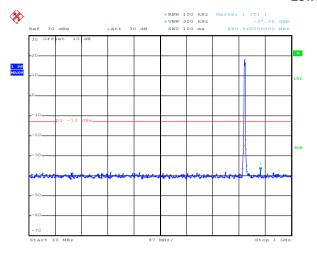
30MHz~1GHz

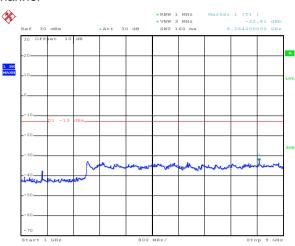
1GHz~20GHz



WCDMA Band V 12.2k RMC

Lowest Channel





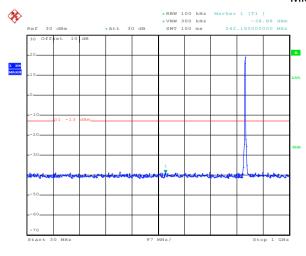
Date: 6.NOV.2016 19:54:28

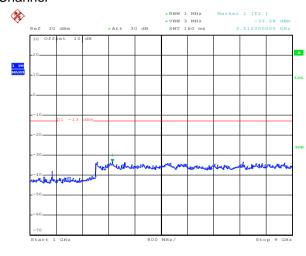
Date: 6.NOV.2016 19:56:32

30MHz~1GHz

1GHz~9GHz

Middle Channel





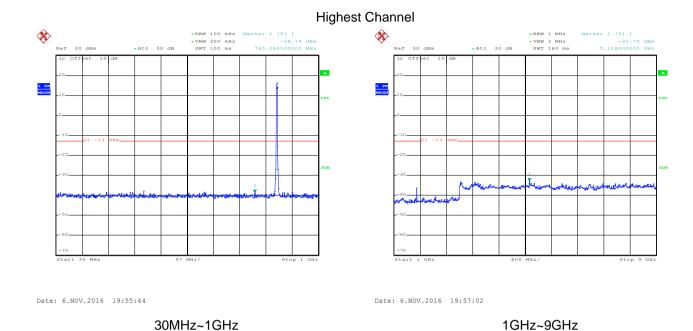
Date: 6.NOV.2016 19:55:07

Date: 6.NOV.2016 19:56:48

30MHz~1GHz

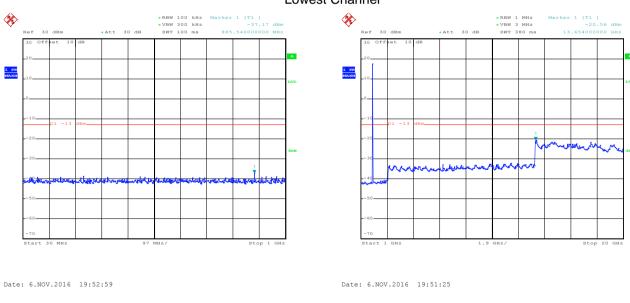
1GHz~9GHz





WCDMA Band II 12.2k RMC

Lowest Channel

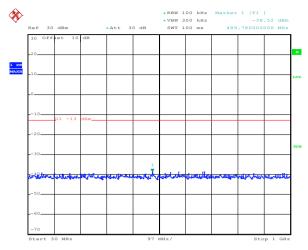


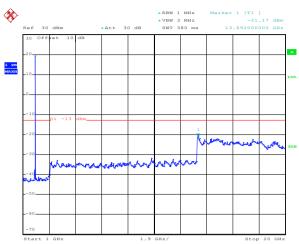
30MHz~1GHz 1GHz~20GHz





Middle Channel





Date: 6.NOV.2016 19:53:08

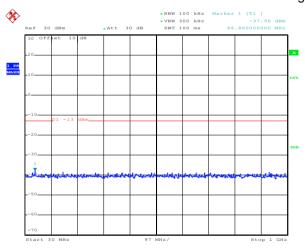
30MHz~1GHz

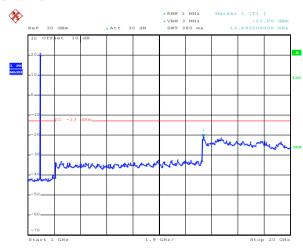
1GHz~20GHz

Highest Channel

Date: 6.NOV.2016 19:51:44

Date: 6.NOV.2016 19:52:06





Date: 6.NOV.2016 19:52:52

30MHz~1GHz

1GHz~20GHz

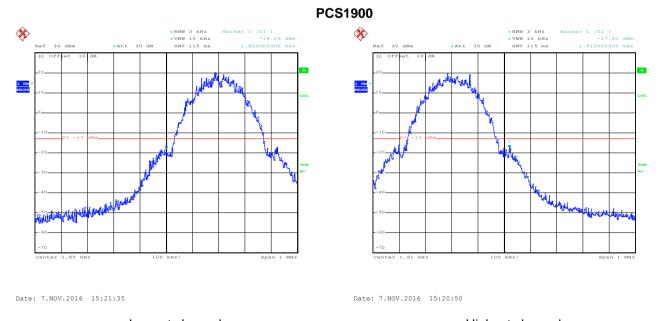


Band edge emission:



Lowest channel

Highest channel

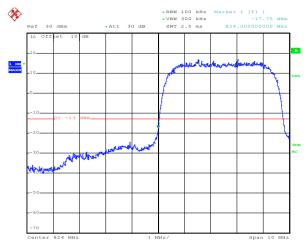


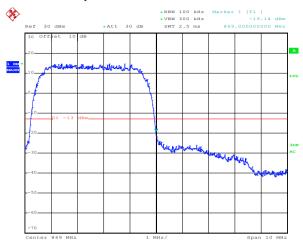
Lowest channel

Highest channel



WCDMA BAND V RMC 12.2kbps





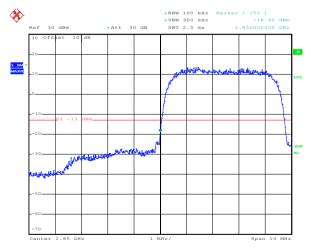
Date: 7.NOV.2016 15:27:04

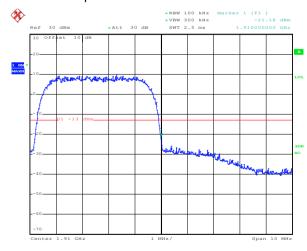
Date: 7.NOV.2016 15:27:30

Lowest channel

Highest channel

WCDMA Band II RMC 12.2kbps





Date: 7.NOV.2016 15:36:50

Date: 7.NOV.2016 15:36:21

Lowest channel

Highest channel



6.10 ERP, EIRP Measurement

0.10 LIXI, LIIXI WIEda	Surement
Test Requirement:	FCC part 22.913(a), FCC part 24.232(b)
Test Method:	FCC part 2.1046
Limit:	GSM850 7W: ERP PCS1900 2W: EIRP WCDMA Band V: 7W ERP WCDMA Band II: 2W EIRP
Test setup:	Below 1GHz
	Antenna Tower Search Antenna RF Test Receiver Ground Plane Above 1GHz Antenna Tower Antenna Tower Antenna Tower Antenna Tower Antenna Tower Antenna Tower Antenna Tower
	Substituted method:
	Ground plane d: distance in meters d:3 meter I m S.G. Substituted Dipole or Horn Antenna Bi-Log Antenna or Horn Antenna





Test Procedure:	 The EUT was placed on an non-conductive turntable using a non- conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
	 During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.
	 ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:
	ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB)
	4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:
	EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)
	5. The worse case was relating to the conducted output power.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed (All three channels were tested, and just the worst case data were shown in the report.)





Measurement Data (worst case):

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result	
GSM850	190	Н	V	21.35			
GSIVIOSU	190		171	Н	19.18	38.45	Door
UMTS 850 12.2k	4132	Н	V	18.07	30.43	Pass	
RMC	4132	П	Н	18.82			

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result			
PCS1900	512	Н	V	19.34					
PC31900	312	512	312	312		Н	21.73	22	Pass
UMTS 1900	9262	Н	V	19.17	33	Pass			
12.2k RMC	9202	17	Н	18.98					



6.11 Field strength of spurious radiation measurement

	Spurious radiation measurement
Test Requirement:	FCC part 22.917(a), FCC part 24.238(a)
Test Method:	FCC part 2.1053
Limit:	-13dBm
Test setup:	Below 1GHz: Antenna Tower Search Antenna Antenna RF Test Receiver Table Ground Plane
	Antenna Tower Horn Antenna Spectrum Analyzer Turn Table Ground plane Antenna mast Ground plane Antenna mast Ground plane Antenna mast 1-4 meter SPA Substituted Dipole or Horn Antenna Bi-Log Antenna or Horn Antenna
Test Procedure:	 The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details.
Test mode. Test results:	Passed
Test results.	r asseu





easurement Data (w Test mode:	GSM	1850	Test channel:	Lowest
10011110001	Spurious		Tool Gridinion	
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result
1648.40	Vertical	-27.52		
2472.60	V	-32.41	_	
3296.80	V	-38.63	_	
4121.00	V	-39.66	-13.00	Pass
4945.20	V	-36.78		
5769.40	V	-40.15	-	
1648.40	Horizontal	-34.28		
2472.60	Н	-37.1		
3296.80	Н	-39.86		_
4121.00	Н	-44.04	-13.00	Pass
4945.20	Н	-40.71		
5769.40	Н	-42.41		
Test mode:	GSM	1850	Test channel:	Middle
- (MIL)	Spurious	Emission		
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result
1673.20	Vertical	-32.51		
1673.20 2509.80		-32.51 -36.57	-	
	Vertical			
2509.80	Vertical V	-36.57	-13.00	Pass
2509.80 3346.40	Vertical V V	-36.57 -33.59	-13.00	Pass
2509.80 3346.40 4183.00	Vertical V V V	-36.57 -33.59 -44.42	-13.00	Pass
2509.80 3346.40 4183.00 5019.60	Vertical V V V V	-36.57 -33.59 -44.42 -34.14	-13.00	Pass
2509.80 3346.40 4183.00 5019.60 5856.20	Vertical V V V V V V	-36.57 -33.59 -44.42 -34.14 -41.01	-13.00	Pass
2509.80 3346.40 4183.00 5019.60 5856.20 1673.20	Vertical V V V V V Horizontal	-36.57 -33.59 -44.42 -34.14 -41.01 -32.74	- - -	
2509.80 3346.40 4183.00 5019.60 5856.20 1673.20 2509.80	Vertical V V V V V V Horizontal	-36.57 -33.59 -44.42 -34.14 -41.01 -32.74 -40.65	-13.00	Pass
2509.80 3346.40 4183.00 5019.60 5856.20 1673.20 2509.80 3346.40	Vertical V V V V V Horizontal H	-36.57 -33.59 -44.42 -34.14 -41.01 -32.74 -40.65 -34.7	- - -	



Report No: CCISE161100701

Test mode:	GSM850		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
Frequency (MHZ)	Polarization	Level (dBm)	Liffiit (dbiff)	Result
1697.60	Vertical	-34.47		
2546.40	V	-37.09		
3395.20	V	-37.75	12.00	Door
4244.00	V	-41.26	-13.00	Pass
5092.80	V	-34.55		
5941.60	V	-39.05		
1697.60	Horizontal	-35.62		
2546.40	Н	-37.84		
3395.20	Н	-37.95	12.00	Door
4244.00	Н	-41.37	-13.00	Pass
5092.80	Н	-35.54		
5941.60	Н	-39.48		

Remark:

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





Test mode:	PCS	1900	Test channel:	Lowest	
Frequency (MHz)	Spurious	Emission	Limit (dBm)	Result	
Frequency (IVII12)	Polarization	Level (dBm)	Limit (dbin)	Result	
3700.40	Vertical	-31.93	-13.00	Pass	
5550.60	V	-30.46	-13.00	Pa55	
3700.40	Horizontal	-35.24	-13.00	Pass	
5550.60	Н	-35.50	-13.00	Pa55	
Test mode:	PCS	1900	Test channel:	Middle	
Frequency (MHz)	Spurious	Emission	Limit (dBm)	Result	
Frequency (IVII 12)	Polarization	Level (dBm)	Limit (dbin)	Kesuit	
3760.00	Vertical	-30.16	-13.00	Pass	
5640.00	V	-29.82	-13.00	F d 5 5	
3760.00	Horizontal	-34.21	-13.00	Pass	
5640.00	Н	-34.25	-13.00	Pa55	
Test mode:	PCS	1900	Test channel:	Highest	
Frequency (MHz)	Spurious	Emission	Limit (dBm)	Result	
Frequency (MHZ)	Polarization	Level (dBm)	Limit (dbiii)	Result	
3819.60	Vertical	-34.49	-13.00	Pass	
5729.40	V	-32.29	-13.00	Fa55	
3819.60	Horizontal	-31.37	12.00	Door	
5729.40	Н	-37.69	-13.00	Pass	

Remark:

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





Test mode:	WCDMA BANI	O V 12.2k RMC	Test channel:	Lowest	
Frague and (MILE)	Spurious	Emission	Limit (dDms)	Decult	
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
1652.80	Vertical	-29.92			
2479.20	V	-32.67	-13.00	Pass	
3305.60	V	-39.63			
1652.80	Horizontal	-31.48			
2479.20	Н	-35.53	-13.00	Pass	
3305.60	Н	-35.26	1		
Test mode:	WCDMA BANI	O V 12.2k RMC	Test channel:	Middle	
[Spurious	Emission	Limit (dDm)	Darrik	
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
1673.20	Vertical	-32.84			
2509.80	V	-38.85	-13.00	Pass	
3346.40	V	-40.02			
1673.20	Horizontal	-33.24			
2509.80	Н	-39.01	-13.00	Pass	
3346.40	Н	-39.55			
Test mode:	WCDMA BANI	O V 12.2k RMC	Test channel:	Highest	
[Spurious	Emission	Limit (dDms)	Desult	
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
1693.20	Vertical	-28.63			
2539.80	V	-38.10	-13.00	Pass	
3386.40	V	-40.16			
1693.20	Horizontal	-29.86			
2539.80	Н	-39.47	-13.00	Pass	
3386.40	Н	-39.76			

Remark:

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





Test mode:	WCDMA Band	l II 12.2k RMC	Test channel:	Lowest	
Frequency (MHz)	Spurious	Emission	Limit (dBm)	Result	
Frequency (IVII12)	Polarization	Level (dBm)	Limit (dbin)	Result	
3704.80	Vertical	-29.93			
5557.20	V	-30.13	-13.00	Pass	
3704.80	Horizontal	-38.08	-13.00	F 455	
5557.20	Н	-37.51			
Test mode:	WCDMA Band	l II 12.2k RMC	Test channel:	Middle	
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
Frequency (IVII 12)	Polarization	Level (dBm)	Limit (dbin)	Nesull	
3760.00	Vertical	-32.73			
5640.00	V	-28.00	-13.00	Pass	
3760.00	Horizontal	-37.94	-13.00	F 455	
5640.00	Н	-36.79			
Test mode:	WCDMA Band	d II 12.2k RMC	Test channel:	Highest	
	Spurious	Emission			
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
3815.20	Vertical	-28.61			
5722.80	V	-23.55		_	
3815.20	Horizontal	-37.41	-13.00	Pass	
5722.80	Н	-33.33			

Remark:

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



6.12 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part 2.1055(a)(1)(b)
Test Method:	FCC Part 2.1055(a)(1)(b)
Limit:	±2.5 ppm
Test setup:	Spectrum analyzer EUT Att. Variable Power Supply
	Note: Measurement setup for testing on Antenna connector
Test procedure:	 The equipment under test was connected to an external DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to −30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	All three channels of all modulations have been tested, but only the worst channel and the worst modulation show in this test item.





Measurement Data (the worst channel):

Re	ference Frequency: G	SM850 Middle	channel=190 channe	el=836.6MHz		
Power supplied	Temperature (°C)	Frequ	uency error	Limit (nnm)	Doort	
(Vdc)	Temperature (°C)	Hz	ppm	Limit (ppm)	Result	
	-30	189	0.225914			
	-20	165	0.197227			
	-10	122	0.145828			
	0	143	0.170930			
10.8	10	124	0.148219	±2.5	Pass	
	20	125	0.149414			
	30	156	0.186469			
	40	154	0.184078			
	50	122	0.145828			
Re	ference Frequency: P0	CS1900 Middle	channel=661 chann	el=1880MHz		
Power supplied	Tomporature (°C)	Frequ	uency error	Limit (nnm)	Dogult	
(Vdc)	Temperature (℃)	Hz	ppm	Limit (ppm)	Result	
	-30	169	0.089894			
	-20	145	0.077128			
	-10	152	0.080851			
	0	154	0.081915			
10.8	10	133	0.070745	±2.5	Pass	
-	20	135	0.071809			
	30	125	0.066489			
	40	124	0.065957			
	50	103	0.054787			





Power supplied	Temperature (°C)	Frequency error			
(Vdc)	remperature (C)	Hz	ppm	Limit (ppm)	Result
	-30	177	0.211571		
	-20	154	0.184078		
	-10	122	0.145828		
	0	133	0.158977	±2.5	
10.8	10	134	0.160172		Pass
	20	105	0.125508		
	30	126	0.150610		
	40	141	0.168539		
	50	155	0.185274		
Reference Fr	equency: WCDMA BAI	ND II 12.2k	RMC Middle channel=9	400 channel=18	80MHz
Power supplied	Tomporatura (°C)	Frequency error		Limit (ppm)	Recult
(Vdc)	Temperature (℃)	Hz	ppm	Limit (ppm)	Result
	-30	157	0.083511		
	-20	124	0.065957		
	-10	122	0.064894		
	0	145	0.077128		
10.8	10	104	0.055319	±2.5	Pass
	20	106	0.056383		
	30	147	0.078191		
	40	145	0.077128		
	50	124	0.065957		



6.13 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part 2.1055(d)(1)(2)				
Test Method:	FCC Part 2.1055(d)(1)(2)				
Limit:	±2.5ppm				
Test setup:	Spectrum analyzer EUT Att. Variable Power Supply				
Test procedure:	 Note: Measurement setup for testing on Antenna connector Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. Reduce the input voltage to specify extreme voltage variation (+/-15%) and endpoint, record the maximum frequency change. 				
Test Instruments:	Refer to section 5.8 for details				
Test mode:	Refer to section 5.3 for details, and all channels have been tested, only shows the worst channel data in this report.				
Test results:	Passed				





Measurement Data (the worst channel):

Measurement Data (the worst channel):							
Refe	erence Frequency: G	SM850 Middle o	channel=190 chann	el=836.6MHz			
Temperature (°C)	Power supplied (Vdc)	Frequency error			D !!		
		Hz	ppm	Limit (ppm)	Result		
25	11.88	91	0.108774	±2.5	Pass		
	10.8	83	0.099211				
	9.72	74	0.088453				
Refe	rence Frequency: PO	CS1900 Middle	channel=661 chanr	nel=1880MHz			
Temperature (℃)	Power supplied	Frequency error		Limit (ppm)	Result		
	(Vdc)	Hz	ppm	Еппі (рріп)	Result		
25	11.88	89	0.047340		Pass		
	10.8	46	0.024468	±2.5			
	9.72	34	0.018085				
Reference F	requency: UMTS 85	0 12.2k RMC M	iddle channel=4183	3 channel=836.6	МНz		
Temperature (°C)	Power supplied	Frequency error		Limit (nnm)	Result		
	(Vdc)	Hz	ppm	Limit (ppm)	Result		
25	11.88	78	0.093235		Pass		
	10.8	74	0.088453	±2.5			
	9.72	82	0.098016				
Reference F	requency: UMTS 190	00 12.2k RMC N	Middle channel=940	00 channel=1880	MHz		
Temperature (°C)	Power supplied (Vdc)	Frequency error Hz ppm		Limit (ppm)	Result		
25	11.88	77	0.040957				
				_	Pass		
	10.8	86	0.045745	±2.5			
	9.72	54	0.028723				