FCC PART 27

MEASUREMENT AND TEST REPORT

For

Quectel Wireless Solutions Company Limited

Room501,Building 13,No.99 TianZhou Road, Xuhui District, Shanghai, China

FCC ID: XMR201606EC21A

Report Type:	**Product Type:**
CIIPC	LTE Module

Test Engineer:	David. Hsu
Report Number:	RKS170320003-00A
Report Date:	2017-03-20
Reviewed By:	Jerry.Chang
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The Quectel Wireless Solutions Company Limited's product, model number: EC21-A (FCC ID: XMR201606EC21A) or the "EUT" in this report was a LTE Module , which was measured approximately 32mm(L) × 29mm(W) × 2.4mm(H). Rated with input voltage: DC3.8 V, EUT Operating Voltage Range: 3.3~4.3V.

** Note: The product's series model number: EC21-A MINIPCIE The difference between them was explained in the declaration letter.*

** All measurement and test data in this report was gathered from production sample serial number: 20160519001 (Assigned by BACL, Taibei).The EUT supplied by the applicant was received on 2016-05-19.*

Objective

This type approval report is prepared on behalf of Quectel Wireless Solutions Company Limited in accordance with Part 2, Part 27 of the Federal Communication Commission's rules.

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

This is a CIIPC base on the original report with FCC ID: XMR201606EC21A which was granted on 2016-07-27, the differences between the original device and the current one are as follows:

1.Add new Band (WCDMA Band Ⅳ)

2.Update RF Exposure Evaluation (MPE）

For the changes made to the device, according to Part 27-Subpart, the test items were performed.

Related Submittal(s)/Grant(s)

N/A

Test Methodology

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

Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA/EIA 603-D.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. (Taiwan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.81 dB for 30MHz-1GHz.and 4.88 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Taiwan) 70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

Test site at Bay Area Compliance Laboratories Corp. (Taiwan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on October 31, 2103. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 431084. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Justification

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

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

Equipment Modifications

No modifications were made to the EUT.

Specific Accessory Equipment

Description	Parameter	Serial Number
WCDMA antenna	PCB antenna with typical gain:1.0dBi	N/A

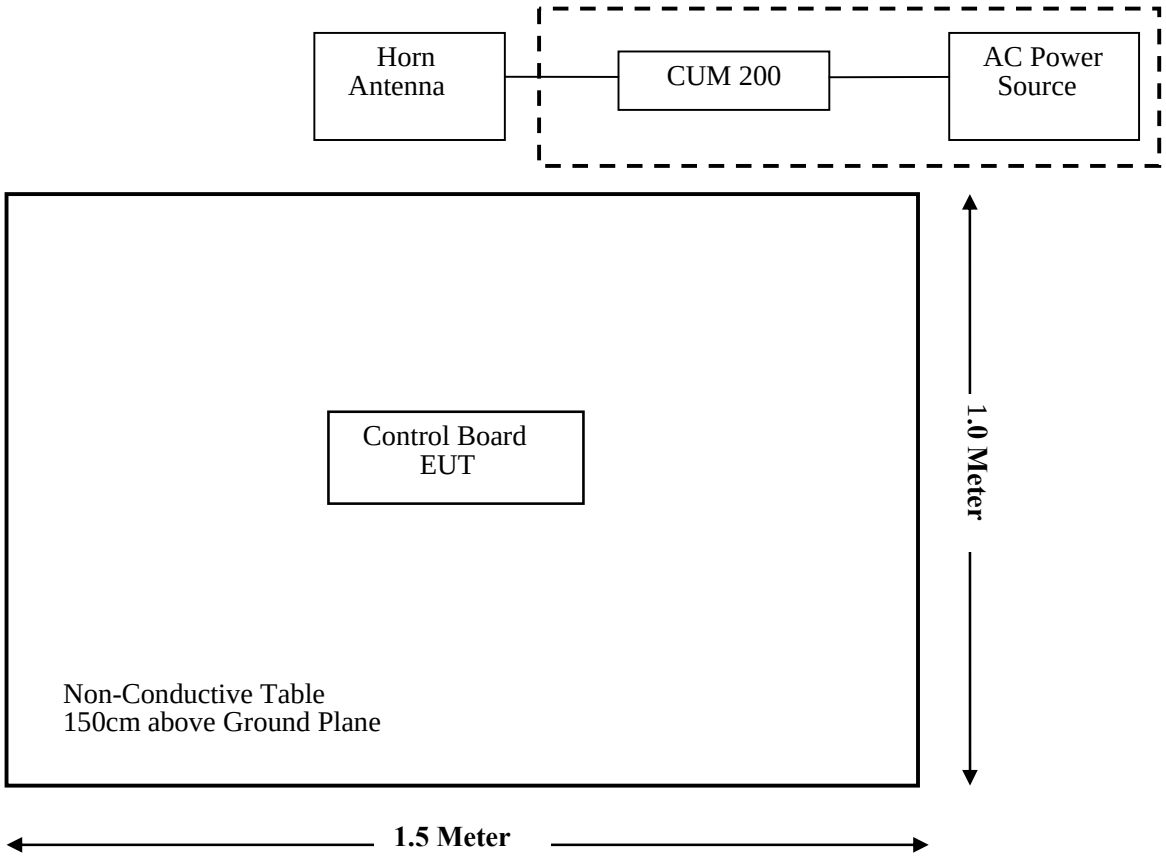
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891
Dell	Notebook	E6410	N/A
Quectel	Test Fixer	N/A	N/A
Shanghai Jingsai Electronic Techology Co.,Ltd.	ADAPATER I/P: AC 100-240V, 50-60Hz O/P: DC 5V, 2A, 12W	JS-400K	N/A
Quectel Wireless Solutions	Control Board	S2-W2231	MP76121D4000228

External Cable List and Details

Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1310, §2.1091	MAXIMUM PERMISSIBLE EXPOSURE (MPE)	Compliant
§2.1046;§27.50 (d) (c)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; §27.53 (c)	Occupied Bandwidth	Compliant
§ 2.1051; §27.53 (c) (h)	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; §27.53 (c) (h)	Spurious Radiated Emissions	Compliant
§27.53 (c) (h)	Band Edge	Compliant
§ 2.1055; §27.54	Frequency stability	Compliant

FCC §1.1310& §2.1091 –MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart § 2.1091and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f^2)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:
Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Base on ERP/EIRP Calculated Data:

Mode	**Max Turn-up Power (dBm)**	**ERP/EIRP Limit (dBm)**	**Max Antenna Gain (dBi)**
WCDMA (Band V)	23.5	38.45	14.95
WCDMA (Band II)	23.5	33	9.5
WCDMA (Band IV)	23.5	30	6.5
LTE (Band II)	24	33	9.0
LTE (Band Ⅳ)	24	30	6.0
LTE (Band Ⅻ)	24	34.77	10.77

To meet MPE requirement, the allowed maximal gain for each band is below:

Mode	Frequency Range (MHz)	Antenna Gain		Target Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(Numeric)	(dBm)	(mW)			
WCDMA (Band V)	826.4-846.6	10.92	12.36	23.5	223.87	20	0.551	0.551
WCDMA (Band II)	1852.4-1907.6	13.51	22.44	23.5	223.87	20	1.0	1.0
WCDMA (Band Ⅳ)	1712.4-1752.6	13.51	22.44	23.5	223.87	20	1.0	1.0
LTE (Band II)	1850.7-1909.3	13.01	20.00	24	251.19	20	1.0	1.0
LTE (Band Ⅳ)	1710.7-1754.3	13.01	20.00	24	251.19	20	1.0	1.0
LTE (Band Ⅻ)	699.7-715.3	9.69	9.31	24	251.19	20	0.465	0.466

Note：

1. The device meets FCC MPE at 20 cm distance.
2. Target Power =the max power including Tune-up tolerance, the tune up power declared by manufacture as:

WCDMA Bands: 22.5±1dBm;
LTE Bands: 22.5±1.5dBm

Output power is conducted. This device is to be used in mobile or fixed applications only. Antenna gain including cable loss must not exceed:

9.69 dBi of frequency band 699-716MHz
10.92 dBi of frequency band 824-849MHz
6.0dBi of frequency band 1710-1755MHz
9.0 dBi of frequency band 1850-1910MHz

FCC §2.1047 - MODULATION CHARACTERISTIC

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

FCC§27.50 (d) (c) - RF OUTPUT POWER

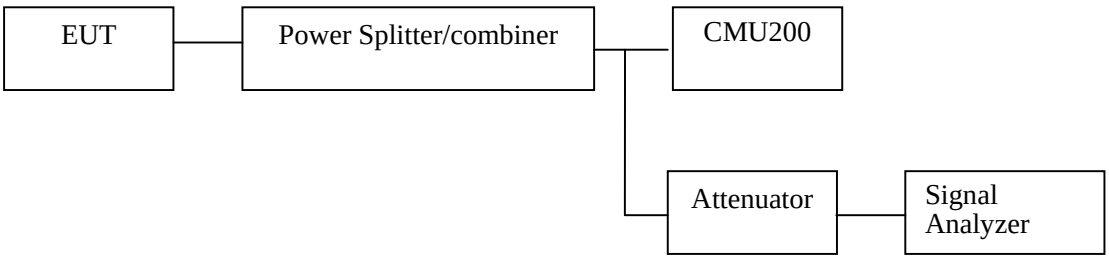
Applicable Standards

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

Test Procedure

Conducted method:

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



Radiated method:

TIA603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Rohde & Schwarz	EMI Test Receiver	ESCI	100540	2016-07-25	2017-07-24
Agilent	Signal Generator	8648C	3537A01810	2016-07-04	2017-07-03
Sunol Sciences	Broadband Antenna	JB6	A050115	2016-06-15	2017-06-14
EMCO	Horn Antenna	3115	9311-4158	2016-05-08	2017-05-07
ETS	Horn Antenna	3115	6431	2015-11-07	2016-11-06
Rohde & Schwarz	Spectrum Analyzer	FSU 26	200268	2016-07-29	2017-08-28
EMCO	Turn Table	2081-1.21	9709-1885	N.C.R	N.C.R
EMCO	Antenna Tower	2075-2	9707-2060	N.C.R	N.C.R
Controller	EMCO	2090	9709-1256	N.C.R	N.C.R
R&S	Software	EMC32	V9.10.00	NCR	NCR
BACL	RF cable	KS-LAB-012	KS-LAB-012	2015-12-16	2016-12-15
BACL	RF cable	KS-LAB-010	KS-LAB-010	2015-12-16	2016-12-15
Mini	Attenuator	10dB	N/A	2016-01-11	2017-01-10

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

Test Data

Environmental Conditions

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

The testing was performed by David. Hsu on 2016-09-07.

Conducted Power

WCDMA Band IV

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band Ⅳ)	Normal	Rel99	1	22.53	22.33	22.40
		HSDPA	1	22.33	22.42	22.45
			2	22.52	22.32	22.58
			3	22.36	22.45	22.58
			4	22.44	22.53	22.42
		HSUPA	1	22.35	22.36	22.46
			2	22.40	22.45	22.40
			3	22.30	22.32	22.49
			4	22.41	22.52	22.53
			5	22.34	22.47	22.59
		HSPA+	1	22.37	22.44	22.51

EIRP:

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Limit	Margin
			Height	Polar	SG Level	Cable	Antenna Gain			
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band Ⅳ Mode, Middle channel										
1732.40	78.52	233	2.1	H	4.69	0.31	10.40	14.78	30	15.22
1732.40	84.65	358	1.3	V	11.52	0.31	10.40	21.61	30	15.39

Note:
1) The unit of antenna gain is dBd for frequency below 1GHz and dBi for frequency above 1GHz.
2) Absolute Level = SG Level - Cable loss + Antenna Gain
3) Margin = Limit-Absolute Level
4) The antenna with gain (typical: 1.0dBi) which provided by manufacturer was used during test.
5) The fundamental was tested without amplifier.

Peak-to-average ratio (PAR)

WCDMA Band IV

Mode	Channel	PAR (dB)	Limit (dB)
Rel99	Low	2.65	13
	Middle	2.64	13
	High	2.61	13
HSDPA	Low	2.45	13
	Middle	2.43	13
	High	2.52	13
HSUPA	Low	2.41	13
	Middle	2.44	13
	High	2.47	13

FCC § 2.1049; §27.53 (c) - OCCUPIED BANDWIDTH

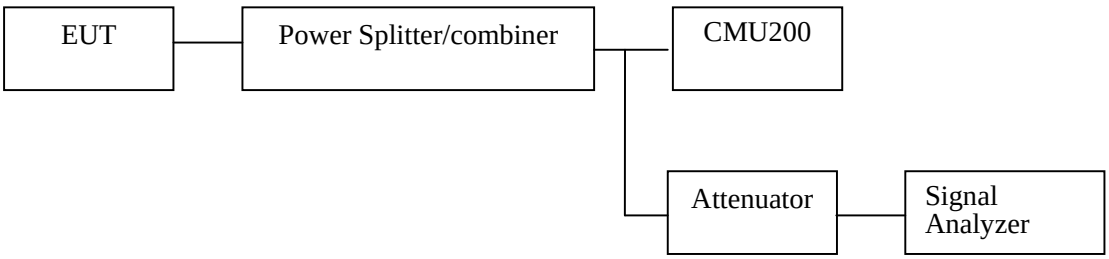
Applicable Standards

FCC 47 §2.1049, §27.53.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 100 kHz (WCDMA) and the 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde &Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Rohde & Schwarz	Signal Analyzer	FSV40	101116	2016-07-04	2017-07-03
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2015-11-23	2016-11-23
Mini	Splitter	ZFRSC-14-S+	SF019411452	2016-07-11	2016-12-10
BACL	RF cable	KS-LAB-020	KS-LAB-020	2016-07-11	2016-12-10
Mini	Attenuator	10dB	N/A	2016-07-11	2016-12-10

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

Test Data

Environmental Conditions

Temperature:	21 ℃
Relative Humidity:	49 %
ATM Pressure:	101.0kPa

The testing was performed by David. Hsu on 2016-09-07.

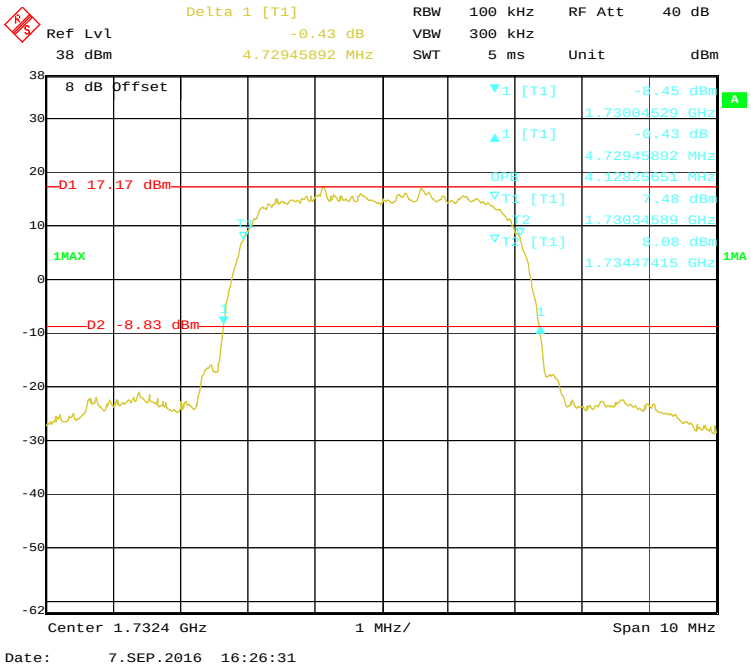
EUT operation mode: Transmitting

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

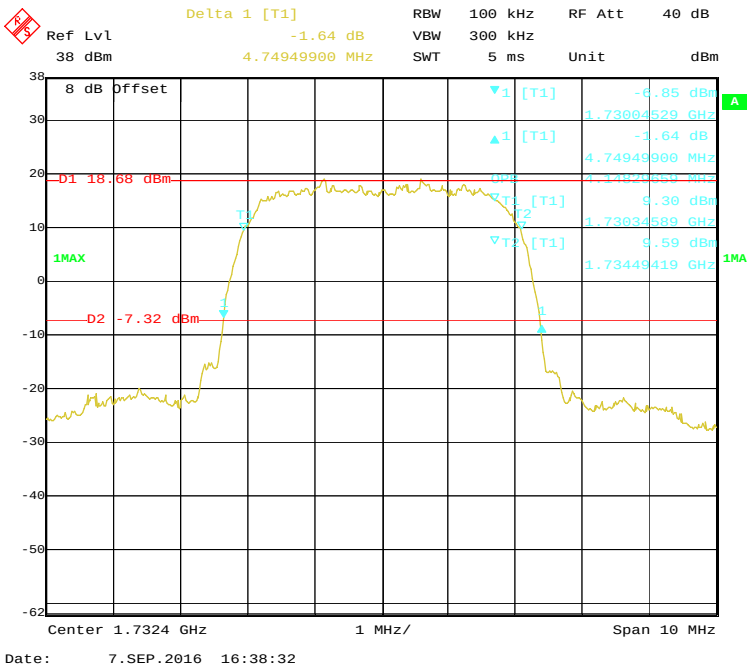
WCDMA Band IV

Mode	Test Condition	Test Mode	OCCUPIED BANDWIDTH (MHz)	26dB BANDWIDTH (MHz)
WCDMA (Band Ⅳ)	Normal	Rel99	4.13	4.73
		HSDPA	4.15	4.75
		HSUPA	4.13	4.75

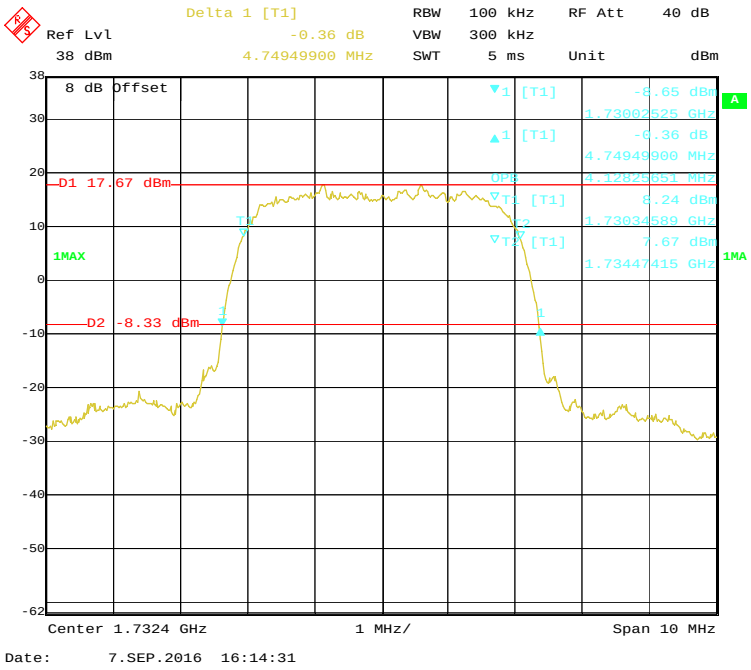
99% Occupied & 26 dB Emissions Bandwidth for Rel99 Mode



99% Occupied & 26 dB Emissions Bandwidth for HSDPA Mode



99% Occupied & 26 dB Emissions Bandwidth for HSUPA Mode



FCC§ 2.1051;§27.53 (c) (h)-SPURIOUS EMISSIONS AT ANTENNA TERMINALS

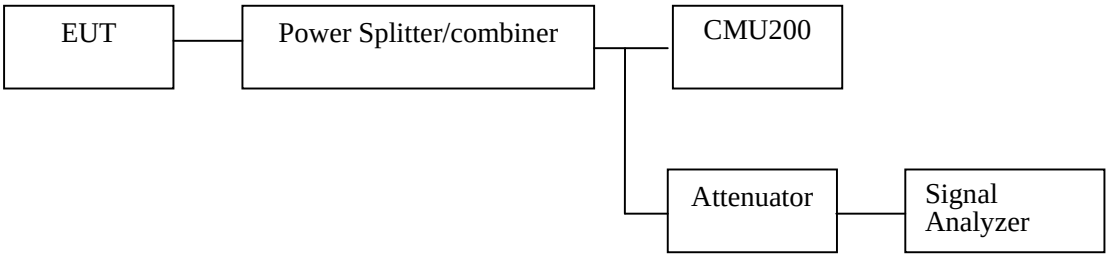
Applicable Standards

FCC §2.1051, §27.53(c)(h).

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

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for below 1GHz; 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde &Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2015-11-23	2016-11-23
Mini	Splitter	ZFRSC-14-S+	SF019411452	2016-07-11	2016-12-10
BACL	RF cable	KS-LAB-020	KS-LAB-020	2016-07-11	2016-12-10
Mini	Attenuator	10dB	N/A	2016-07-11	2016-12-10

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

Test Data

Environmental Conditions

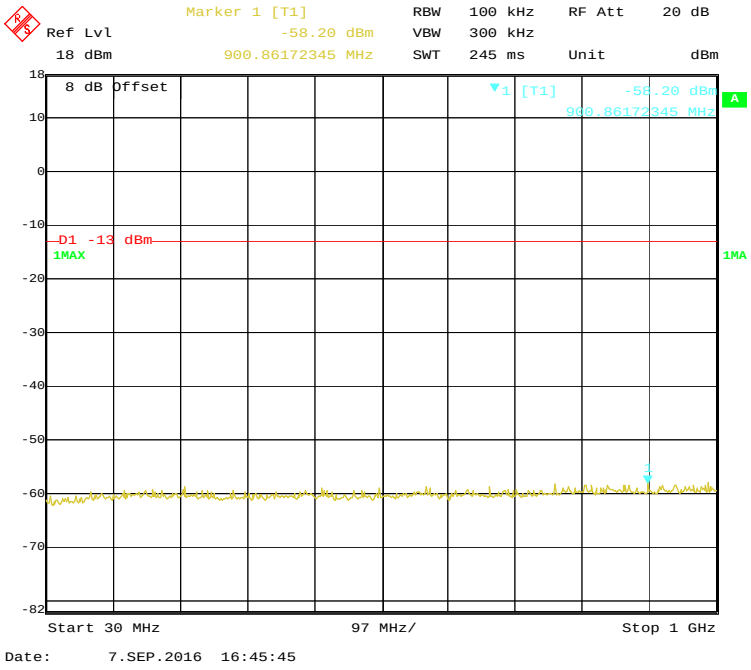
Temperature:	20~23 ℃
Relative Humidity:	48~50 %
ATM Pressure:	100.5~101.0kPa

The testing was performed by David. Hsu on 2016-09-07.

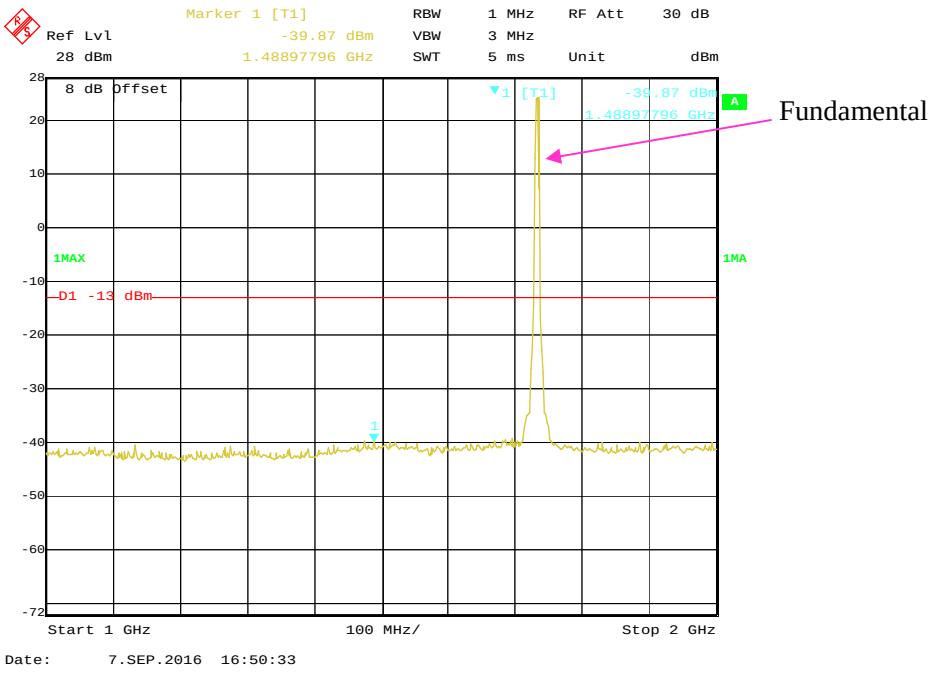
Please refer to the following plots.

WCDMA Band IV

30 MHz – 1 GHz



1 GHz – 2 GHz



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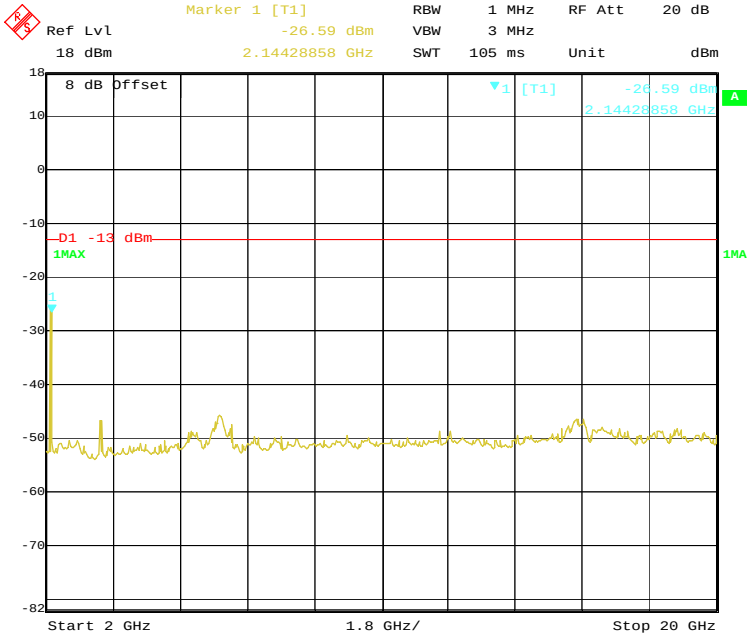
2 GHz – 20 GHz



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FCC § 2.1053; §27.53 (c) (h) SPURIOUS RADIATED EMISSIONS

Applicable Standards

FCC § 2.1053, § 27.53(c)(h)

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Test Procedure

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

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

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

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TX pwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Sonoma	Amplifier	310N	130601	2016-07-02	2017-07-01
Rohde & Schwarz	EMI Test Receiver	ESCI	100540	2016-07-25	2017-07-24
Sunol Sciences	Broadband Antenna	JB6	A050115	2016-06-15	2017-06-14
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2015-11-07	2016-11-06
Mini	Amplifier	ZVA-213-S+	460901516	2016-08-21	2017-08-21
EMCO	Horn Antenna	3115	9311-4158	2016-05-08	2017-05-07
ETS	Horn Antenna	3115	6431	2015-11-07	2016-11-06
Rohde & Schwarz	Spectrum Analyzer	FSU 26	200268	2016-07-29	2017-08-28
EMCO	Turn Table	2081-1.21	9709-1885	N.C.R	N.C.R
EMCO	Antenna Tower	2075-2	9707-2060	N.C.R	N.C.R
Controller	EMCO	2090	9709-1256	N.C.R	N.C.R
R&S	Software	EMC32	V9.10.00	NCR	NCR
HP	Signal Generator	E4421B	3426A01336	2015-11-04	2016-11-03
BACL	RF cable	KS - LAB - 012	KS - LAB - 012	2015-12-16	2016-12-15
BACL	RF cable	KS - LAB - 010	KS - LAB - 010	2015-12-16	2016-12-15

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

Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	48 %
ATM Pressure:	101.0kPa

The testing was performed by David. Hsu on 2016-09-07.

Test mode: Transmitting

For EC21-A

Test mode: Transmitting (Pre-scan with Low, Middle, High channel, and the worse case data as below)

30 MHz ~ 18 GHz:

WCDMA Band IV

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Middle Channel: 1732.400 MHz								
3464.80	H	61.40	-48.60	13.90	1.90	-36.60	-13.00	23.60
3464.80	V	64.00	-46.00	13.90	1.90	-34.00	-13.00	21.00
5197.20	H	62.00	-45.20	14.00	2.30	-33.50	-13.00	20.50
5197.20	V	63.80	-43.40	14.00	2.30	-31.70	-13.00	18.70
239.20	H	28.60	-69.60	0.00	0.50	-70.10	-13.00	57.10
281.30	V	31.20	-67.00	0.00	0.50	-67.50	-13.00	54.50

For EC21-A MINIPCIE

Test mode: Transmitting (Pre-scan with Low, Middle, High channel, and the worse case data as below)

30 MHz ~ 18 GHz:

WCDMA Band IV

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Middle Channel: 1732.400 MHz								
3464.80	H	61.27	-48.73	13.90	1.90	-36.73	-13.00	23.73
3464.80	V	63.51	-46.49	13.90	1.90	-34.49	-13.00	21.49
5197.20	H	61.09	-46.11	14.00	2.30	-34.41	-13.00	21.41
5197.20	V	64.68	-42.52	14.00	2.30	-30.82	-13.00	17.82
239.20	H	27.64	-70.56	0.00	0.50	-71.06	-13.00	58.06
281.30	V	31.53	-66.67	0.00	0.50	-67.17	-13.00	54.17

FCC §27.53 (c)(h) - BAND EDGES

Applicable Standards

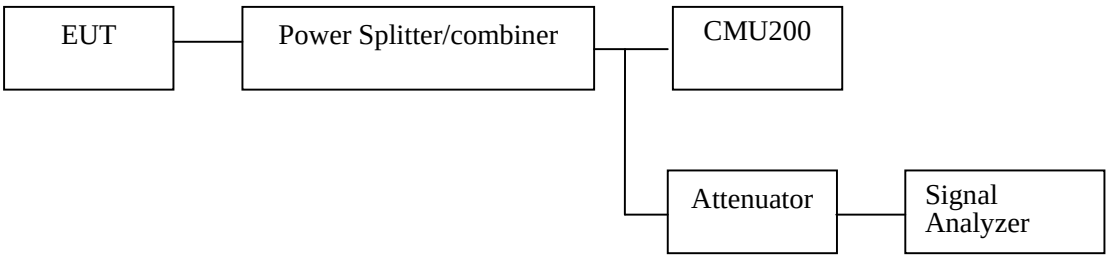
According to FCC §27.53 (c)(h), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Test Procedure

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

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde &Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2015-11-23	2016-11-23
Mini	Splitter	ZFRSC-14-S+	SF019411452	2016-07-11	2016-12-10
BACL	RF cable	KS-LAB-020	KS-LAB-020	2016-07-11	2016-12-10
Mini	Attenuator	10dB	N/A	2016-07-11	2016-12-10

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

Test Data

Environmental Conditions

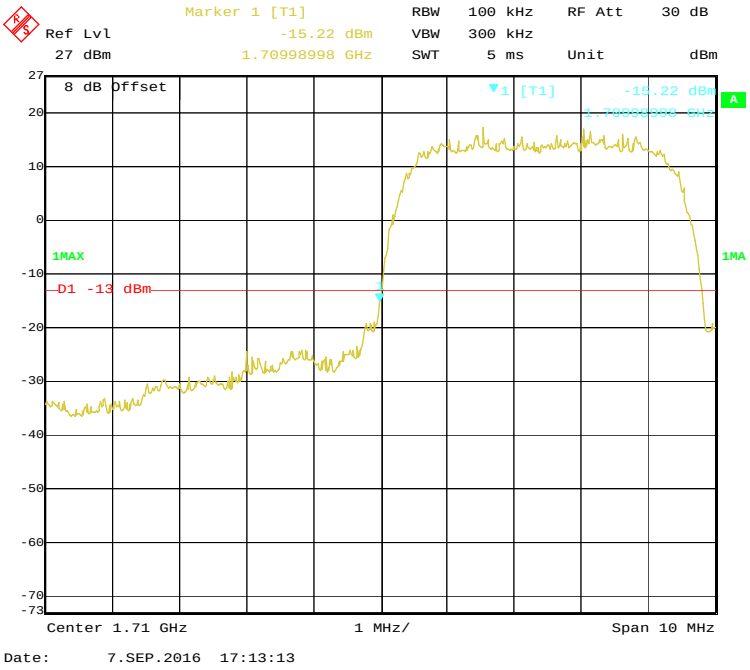
Temperature:	20~23 ℃
Relative Humidity:	48~52 %
ATM Pressure:	100.5~101.0kPa

The testing was performed by David. Hsu on 2016-09-07.

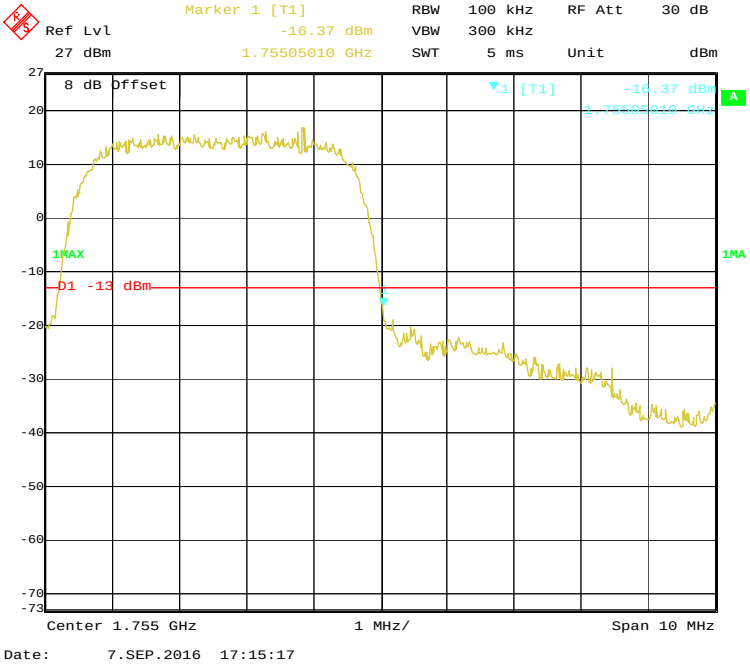
EUT operation mode: Transmitting

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

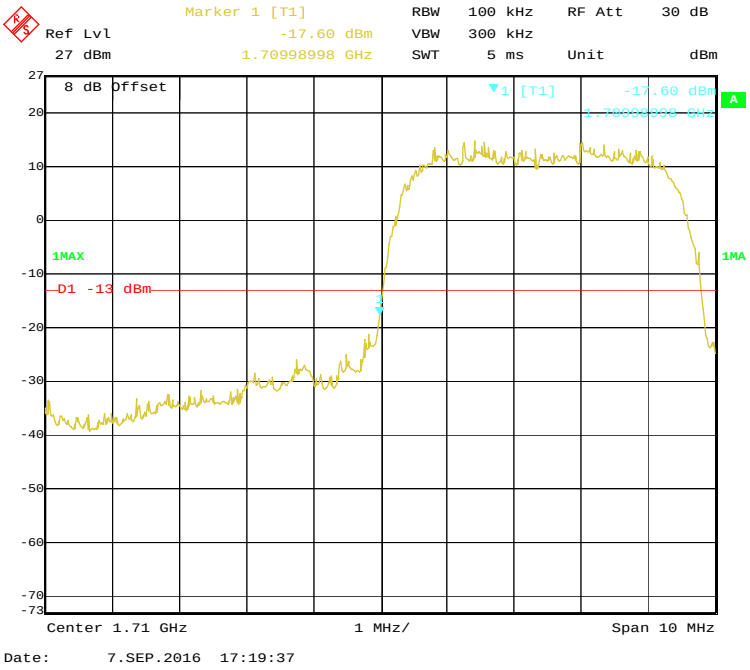
Left Band Edge for Rel99 Mode



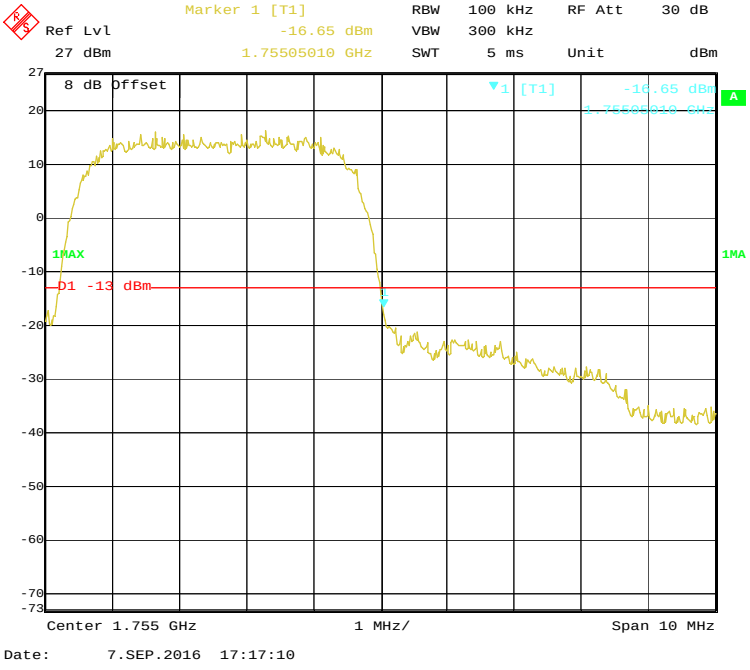
Right Band Edge for Rel99 Mode



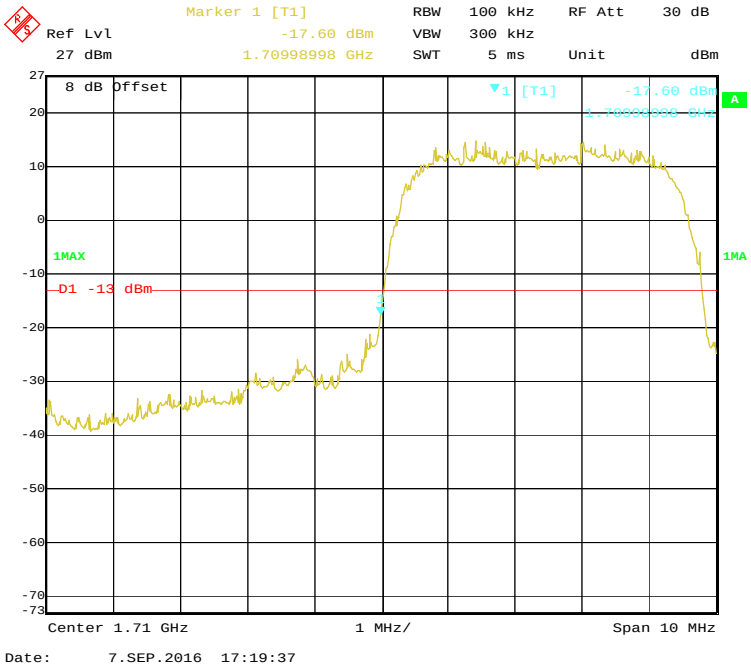
Left Band Edge for HSDPA Mode



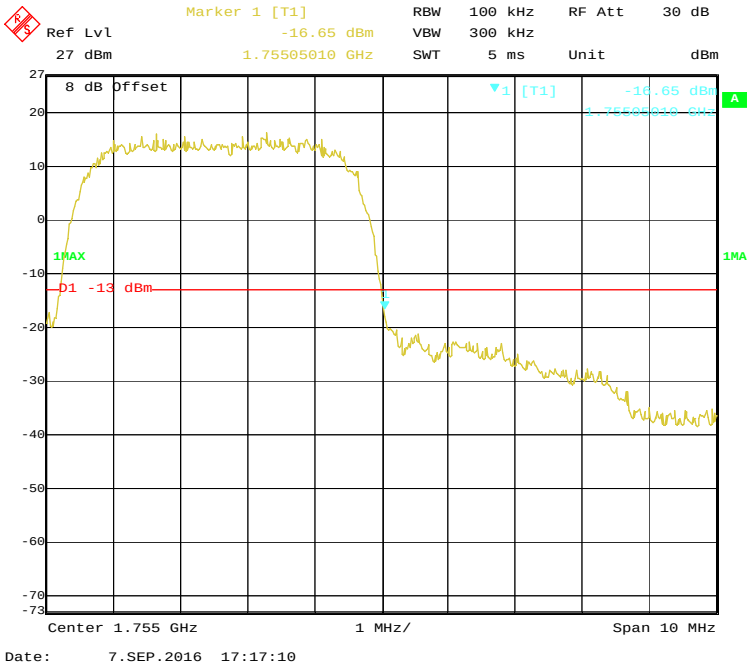
Right Band Edge for HSDPA Mode



Left Band Edge for HSUPA Mode



Right Band Edge for HSUPA Mode



FCC § 2.1055; §27.54 - FREQUENCY STABILITY

Applicable Standards

FCC § 2.1055 & §27.54.

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

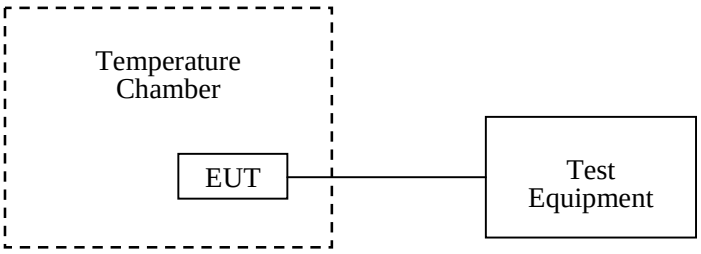
According to §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde &Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
BACL	Temperature Chamber	BTH - 150	30023	2015-11-12	2016-11-11
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2015-11-23	2016-11-23
Mini	Splitter	ZFRSC-14-S+	SF019411452	2016-07-11	2016-12-10
BACL	RF cable	KS-LAB-020	KS-LAB-020	2016-07-11	2016-12-10
Mini	attenuator	10dB	N/A	2016-07-11	2016-12-10

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

Test Data

Environmental Conditions

Temperature:	23 ℃
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by David. Hsu on 2016-09-07.

EUT operation mode: Transmitting

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

WCDMA Band IV Rel99 Mode

Middle Channel, f_o=1732.4MHz				
Temperature (℃)	**Power Supplied (VDC)**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	7	0.0040	pass
-20		9	0.0052	pass
-10		7	0.0040	pass
0		8	0.0046	pass
10		7	0.0040	pass
20		9	0.0052	pass
30		13	0.0075	pass
40		13	0.0075	pass
50		11	0.0063	pass
25	$V_{min.}$= 3.5	13	0.0075	pass
25	$V_{max.}$= 4.2	11	0.0063	pass

WCDMA Band IV HSDPA Mode

Middle Channel, f_o=1732.4MHz				
Temperature (℃)	**Power Supplied (VDC)**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	12	0.0069	pass
-20		11	0.0063	pass
-10		11	0.0063	pass
0		14	0.0081	pass
10		15	0.0087	pass
20		6	0.0035	pass
30		12	0.0069	pass
40		8	0.0046	pass
50		7	0.0040	pass
25	$V_{min.}$= 3.5	13	0.0075	pass
25	$V_{max.}$= 4.2	10	0.0058	pass

WCDMA Band IV HSUPA Mode

Middle Channel, f_o =1732.4 MHz				
Temperature (℃)	**Power Supplied (VDC)**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
-30	3.8	6	0.0035	pass
-20		9	0.0052	pass
-10		14	0.0081	pass
0		12	0.0069	pass
10		5	0.0029	pass
20		10	0.0058	pass
30		14	0.0081	pass
40		7	0.0040	pass
50		12	0.0069	pass
25	$V_{min.}$= 3.5	14	0.0081	pass
25	$V_{max.}$= 4.2	11	0.0063	pass

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