




FCC PART 27
FCC PART 22H, PART 24E
TEST REPORT

For

Shenzhen Jingwah Information Technology Co., Ltd.

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FCC ID: RBD-FAMILINK10

Report Type: Original Report	Product Type: Digital Photo Frame
Report Number: RSZ210317001-00D	
Report Date: 2021-04-02	
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GENERAL INFORMATION**Product Description for Equipment under Test (EUT)**

Product	Digital Photo Frame
Trade	FAMILINK
Tested Model	M1018FLK
Multiple Model	Familink AWS 10.1 inches 4G + WiFi Photo Diary
Model Differences	Refer to DOS letter.
Frequency Range	GSM 850: 824-849MHz(TX); 869-894MHz(RX) PCS 1900: 1850-1910MHz(TX); 1930-1990MHz(RX) WCDMA Band 2: 1850-1910MHz(TX); 1930-1990MHz(RX) WCDMA Band 5: 824-849MHz(TX); 869-894MHz(RX) LTE Band 2: 1850-1910MHz(TX); 1930-1990MHz(RX) LTE Band 4: 1710-1755MHz(TX); 2110-2155MHz(RX) LTE Band 7: 2500-2570MHz(TX); 2620-2690MHz(RX) LTE Band 12: 699-716MHz(TX); 729-746MHz(RX) LTE Band 13: 777-787MHz(TX); 746-756MHz(RX) LTE Band 17: 704-716MHz(TX); 734-746MHz(RX) LTE Band 25: 1850-1915MHz(TX); 1930-1995MHz(RX)
Maximum Target Output Power (Conducted power)	GSM 850: 32dBm PCS 1900: 28.5dBm WCDMA Band 2: 22dBm WCDMA Band 5: 23dBm LTE Band 2:24dBm LTE Band 4:24.5dBm LTE Band 7:21.5dBm LTE Band 12:25.5dBm LTE Band 13:25.5dBm LTE Band 17:25.5dBm LTE Band 25:24dBm
Modulation Technique	2G: GMSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification*	FPC Main Antenna: GSM 850: 0.9 dBi* PCS 1900: 2.39 dBi* WCDMA Band 2: 2.39dBi* WCDMA Band 5: 0.9dBi* LTE Band 2: 2.39dBi * LTE Band 4: 0.93dBi * LTE Band 7: 1.58dBi * LTE Band 12: 0.88dBi * LTE Band 13: 0.88dBi * LTE Band 17: 0.88dBi * LTE Band 25: 2.39dBi * (provided by the applicant)
Voltage Range	DC5V from adapter
Date of Test	2021-03-21 to 2021-03-30
Sample serial number	RSZ210317001-RF-S1(Assigned by ATC)
Received date	2021-03-15
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2-Subpart J, Part 22-Subpart H, Part 24-Subpart E, and Subpart 27 of the Federal Communication Commission's rules.

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

Test Methodology

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

Part 22 Subpart H - Public Mobile Services
 Part 24 Subpart E - Personal Communication Services
 Part 27 - Miscellaneous Wireless Communications Services

ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF output power, conducted		±0.73dB
Unwanted Emission, conducted		±1.6dB
RF Frequency		±0.082*10 ⁻⁷
Emissions, Radiated	30MHz - 1GHz	±4.28dB
	1GHz- 18GHz	±4.98dB
	18GHz- 26.5GHz	±5.06dB
Temperature		±1 °C
Humidity		±6%
Supply voltages		±0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01.

Listed by Innovation, Science and Economic Development Canada (ISED), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

The test items were performed with the EUT operating at testing mode. Test was performed with channels as below table:

Band	Channel Bandwidth	Frequency
GSM 850	0.3 MHz	824.2MHz, 836.6MHz, 848.8MHz
PCS 1900	0.3 MHz	1850.2MHz, 1880.0MHz, 1909.8MHz;
WCDMA Band 2	4.2 MHz	826.4MHz, 836.6MHz, 846.6MHz
WCDMA Band 5	4.2 MHz	1712.4MHz, 1732.6 MHz, 1752.6MHz
LTE Band 2	1.4 MHz	1850.7MHz, 1880.0 MHz, 1909.3 MHz;
	3.0 MHz	1851.5MHz, 1880.0 MHz, 1908.5 MHz;
	5.0 MHz	1852.5MHz, 1880.0 MHz, 1907.5 MHz;
	10.0 MHz	1855MHz, 1880.0 MHz, 1905 MHz;
	15.0 MHz	1857.5MHz, 1880.0 MHz, 1902.5 MHz;
	20.0 MHz	1860MHz, 1880.0 MHz, 1900MHz;
LTE Band 4	1.4 MHz	1710.7MHz, 1732.5MHz, 1754.3MHz;
	3.0 MHz	1711.5MHz, 1732.5MHz, 1753.5MHz
	5.0 MHz	1712.5MHz, 1732.5MHz, 1752.5MHz
	10.0 MHz	1715MHz, 1732.5MHz, 1750MHz
	15.0 MHz	1717.5MHz, 1732.5MHz, 1747.5MHz
	20.0 MHz	1720MHz, 1732.5MHz, 1745MHz
LTE Band 7	5.0 MHz	2502.5MHz, 2535.0MHz, 2567.5MHz
	10.0 MHz	2505MHz, 2535.0MHz, 2565MHz
	15.0 MHz	2507.5MHz, 2535.0MHz, 2562.5MHz
	20.0 MHz	2510MHz, 2535.0MHz, 2560MHz
LTE Band 12	1.4 MHz	699.7MHz, 707.5MHz, 715.3MHz
	3.0 MHz	700.5MHz, 707.5MHz, 714.5MHz
	5.0 MHz	701.5MHz, 707.5MHz, 713.5MHz
	10.0 MHz	704MHz, 707.5MHz, 711MHz
LTE Band 13	5.0 MHz	779.5MHz, 782MHz, 784.5MHz
	10.0 MHz	782MHz
LTE Band 17	5.0 MHz	706.5MHz, 710.0MHz, 713.5MHz;
	10.0 MHz	709.0MHz, 710MHz, 711MHz;
LTE Band 25	1.4 MHz	1850.7MHz, 1882.5MHz, 1914.3MHz
	3.0 MHz	1851.5MHz, 1882.5MHz, 1913.5MHz
	5.0 MHz	1852.5MHz, 1882.5MHz, 1912.5MHz
	10.0 MHz	1855MHz, 1882.5MHz, 1910MHz
	15.0 MHz	1857.5MHz, 1882.5MHz, 1907.5MHz
	20.0 MHz	1860MHz, 1882.5MHz, 1905MHz

Equipment Modifications

No modification was made to the EUT.

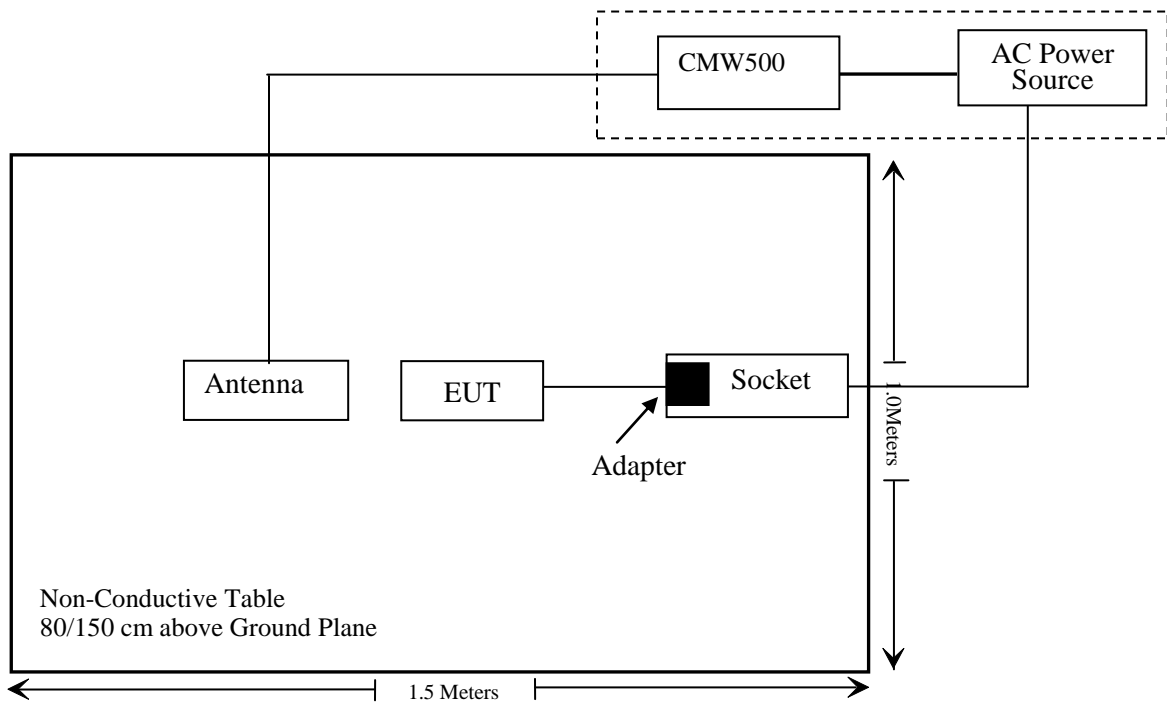
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606

Support Cable Description

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

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b) (1) & §2.1091	Maximum Permissible exposure (MPE)	Compliance
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (b) (c) (d) (h);	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53;	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a); §27.53 (c) (h) (m)	Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235; §27.54;	Frequency stability	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2020/12/24	2021/12/23
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606	2020/12/25	2021/12/24
Vector Signal Generator	AGILENT	N5182A	MY50143401	2020/12/25	2021/12/24
V.R. of Signal Generators	Anritsu	68369B	004114	2020/07/31	2020/0730
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
SCHWARZBECK	HORN ANTENNA	BBHA9120D	9120D-655	2020/01/05	2023/01/04
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2020/01/05	2023/01/04
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-01 1304	2020/12/06	2023/12/05
A.H. Systems, inc.	Preamplifier	PAM-0118P	531	2020/07/08	2021/07/07
Quinstar	Amplifier	QLW-184055 36-J0	15964001002	2020/11/28	2021/11/27
Rohde& Schwarz	Test Receiver	ESR	101817	2020/12/24	2021/12/23
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2020/01/05	2023/01/04
RF Coaxial Cable	Unknown	N-5m	No.1	2020/12/25	2021/12/24
RF Coaxial Cable	Unknown	N-1m	No.6	2020/12/25	2021/12/24
RF Coaxial Cable	Unknown	N-6m	No.10	2020/12/25	2021/12/24
RF Coaxial Cable	Unknown	N-2m	No.11	2020/12/25	2021/12/24
RF Coaxial Cable	Unknown	N-8m	No.15	2020/12/25	2021/12/24

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Unknown	Band Reject Filter	MSF1850-191 OMS-1148	201706003	2020/12/25	2021/12/24
Unknown	Band Reject Filter	MSF1710-178 5MS-1150	201706003	2020/12/25	2021/12/24
Unknown	Band Reject Filter	MSF824-862 MS-1147	201706003	2020/12/25	2021/12/24
Unknown	Band Reject Filter	MSF700-800 MS-1153	201706003	2020/12/25	2021/12/24
Unknown	High Pass Filter	HPM-1.2/18G -60	110	2020/12/25	2021/12/24
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2020/12/24	2021/12/23
Rohde & Schwarz	Test Receiver	ESPI	100396/003	2020/12/24	2021/12/23
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606	2020/12/25	2021/12/24
Fluke	Desktop Multi Meter	45	7664009	2020/12/25	2021/12/24
Mini-Circuits	Power Splitter	DC-18000MH z	SF10944151S	2020/12/25	2021/12/24
NEW AOKO	ALL POWER FREQUENCY CONVERTER	AFC-220	Unknown	NCR	NCR
Gongwen	Temp. & Humid. Chamber	HSD-500	109	2020/12/25	2021/12/24
Fluke	Desktop Multi Meter	45	7664009	2020/12/25	2021/12/24
WEINSCHL	10dB Attenuator	5324	AU 3842	Each time	

* Statement of Traceability: Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

§1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**Applicable Standard**

According to subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

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

Result**Calculated Formulary:**

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

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)

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

For worst case:

Mode	Frequency (MHz)	Antenna Gain		Tune up conducted power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
BDR/EDR	2402-2480	1.53	1.42	1.0	1.26	20	0.0004	1
BLE	2402-2480	1.53	1.42	4.0	2.51	20	0.0007	1
2.4G Wi-Fi	2412-2462	1.53	1.42	17.0	50.12	20	0.0142	1
5.2G Wi-Fi	5180-5270	2.66	1.85	16.0	39.81	20	0.0146	1
5.8G Wi-Fi	5745-5825	2.66	1.85	10.5	11.22	20	0.0041	1
GSM 850	824-849	0.9	1.23	32	1584.89	20	0.3879	0.55
PCS 1900	1850-1910	2.39	1.73	28.5	707.95	20	0.2442	1
WCDMA B2	1850-1910	2.39	1.73	22	158.49	20	0.0547	1
WCDMA B5	824-849	0.9	1.23	23	199.53	20	0.0488	0.55
LTE B2	1850-1910	2.39	1.73	24	251.19	20	0.0866	1
LTE B4	1710-1755	0.93	1.24	24.5	281.84	20	0.0695	1
LTE B7	2500-2570	1.58	1.44	21.5	141.25	20	0.0404	1
LTE B12	699-716	0.88	1.22	25.5	354.81	20	0.0864	0.47
LTE B13	777-787	0.88	1.22	25.5	354.81	20	0.0784	0.52
LTE B17	704-716	0.88	1.22	25.5	354.81	20	0.0714	0.47
LTE B25	1850-1915	2.39	1.73	24	251.19	20	0.0655	1

Note 1: The tune up conducted power was declared by the applicant.

Note 2: Bluetooth or Wi-Fi function can transmit at the same time with the WWAN.

So the worst simultaneous transmitting consideration:

$$\text{The ratio} = \text{MPE}_{5.2\text{GWi-Fi}}/\text{limit} + \text{MPE}_{\text{GSM } 850}/\text{limit} = 0.0146/1.0 + 0.3879/0.55 = 0.72 < 1.0$$

So simultaneous exposure is not required.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance

FCC §2.1047 - 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.

FCC § 2.1046, § 22.913 (a) & § 24.232 (c); §27.50 (b) (c) (d) (h) - RF OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

According to §27.50(b), Control stations and mobile stations transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands and fixed stations transmitting in the 787-788 MHz and 805-806 MHz bands are limited to 30 watts ERP.

According to §27.50(c), Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP. And Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

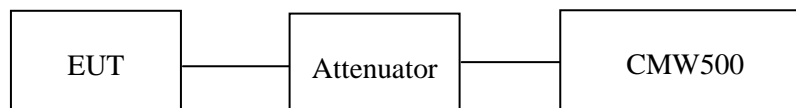
According to §27.50(d), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

According to §27.50(h), the maximum EIRP must not exceed 2Watts (33dBm) for 2500-2570MHz.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the CMW500 through sufficient attenuation.



Radiated method:

ANSI C63.26-2015 Section 5.5.

Test Data

Environmental Conditions

Temperature:	28~29.3 °C
Relative Humidity:	50~58 %
ATM Pressure:	101.0~101.1 kPa

The testing was performed by Black Ding on 2021-3-22 to 2021-3-29.

Conducted Power**Cellular Band (Part 22H)**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	ERP(dBm)	Limit (dBm)
GSM	128	824.2	31.96	30.21	38.45
	190	836.6	31.99	30.24	38.45
	251	848.8	31.93	30.18	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				ERP(dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	31.83	31.09	30.31	29.35	30.08	29.34	28.56	27.60	38.45
	190	836.6	31.89	31.12	30.34	29.41	30.14	29.37	28.59	27.66	38.45
	251	848.8	31.81	31.03	30.24	29.28	30.06	29.28	28.49	27.53	38.45

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
WCDMA (Band 5)	RMC12.2k		22.23	22.26	22.15	20.48	20.51	20.40
	HSDPA	1	22.28	22.17	22.03	20.53	20.42	20.28
		2	22.37	22.28	22.35	20.62	20.53	20.6
		3	22.26	22.34	22.26	20.51	20.59	20.51
		4	22.45	22.39	22.41	20.70	20.64	20.66
	HSUPA	1	22.34	22.31	22.37	20.59	20.56	20.62
		2	22.39	22.47	22.54	20.64	20.72	20.79
		3	22.24	22.36	22.43	20.49	20.61	20.68
		4	22.33	22.25	22.32	20.58	20.5	20.57
		5	22.41	22.22	22.14	20.66	20.47	20.39
HSPA+	1	21.54	21.49	21.46	19.79	19.74	19.71	

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable loss(dB)

For GSM850 / WCDMA Band5: Antenna Gain = 0.9dBi = -1.25dBd (0dBd=2.15dBi)

For 600-1000MHz, Cable Loss=0.5dB* (provided by the applicant)

Limit: ERP ≤ 38.45dBm

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	EIRP(dBm)	Limit (dBm)
GSM	512	1850.2	28.03	29.62	33
	661	1880.0	28.09	29.68	33
	810	1909.8	28.05	29.64	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				EIRP(dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	27.33	26.62	25.65	24.67	28.92	28.21	27.24	26.26	33
	661	1880.0	27.39	26.71	25.72	24.75	28.98	28.3	27.31	26.34	33
	810	1909.8	27.35	26.66	25.69	24.70	28.94	28.25	27.28	26.29	33

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
WCDMA (Band 2)	RMC12.2k		21.28	21.32	21.26	22.87	22.91	22.85
	HSDPA	1	21.26	21.24	21.17	22.85	22.83	22.76
		2	21.30	21.27	21.23	22.89	22.86	22.82
		3	21.38	21.43	21.32	22.97	23.02	22.91
		4	21.19	21.26	21.10	22.78	22.85	22.69
	HSUPA	1	21.25	21.16	21.04	22.84	22.75	22.63
		2	21.14	21.04	20.97	22.73	22.63	22.56
		3	21.45	21.46	21.52	23.04	23.05	23.11
		4	21.36	21.35	21.29	22.95	22.94	22.88
		5	21.33	21.08	21.29	22.92	22.67	22.88
	HSPA+	1	20.49	20.55	20.34	22.08	22.14	21.93

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable loss(dB)

For PCS1900 / WCDMA Band2: Antenna Gain = 2.39dBi

For 1000-3000MHz, Cable Loss=0.8dB*(provided by the applicant)

Limit: EIRP ≤ 33dBm

Peak-to-average ratio (PAR)**Cellular Band**

Mode	Channel	PAR (dB)	Limit (dB)
RMC	Low	2.69	13
	Middle	3.42	13
	High	2.82	13
HSDPA	Low	3.91	13
	Middle	2.55	13
	High	3.62	13
HSUPA	Low	2.74	13
	Middle	3.92	13
	High	2.73	13
HSPA+	Low	3.37	13
	Middle	2.84	13
	High	3.39	13

PCS Band (Part 24E)

Mode	Channel	PAR (dB)	Limit (dB)
RMC	Low	3.67	13
	Middle	2.45	13
	High	2.72	13
HSDPA	Low	2.66	13
	Middle	3.41	13
	High	3.75	13
HSUPA	Low	2.16	13
	Middle	2.24	13
	High	2.73	13
HSPA+	Low	2.41	13
	Middle	3.60	13
	High	3.14	13

LTE Band 2:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	23.74	23.58	23.21	25.33	25.17	24.80
		RB1#3	23.86	23.77	22.96	25.45	25.36	24.55
		RB1#5	23.64	23.35	22.80	25.23	24.94	24.39
		RB3#0	23.68	23.35	22.88	25.27	24.94	24.47
		RB3#3	23.74	23.23	22.87	25.33	24.82	24.46
		RB6#0	22.78	22.48	21.86	24.37	24.07	23.45
	16QAM	RB1#0	22.71	22.32	21.78	24.30	23.91	23.37
		RB1#3	22.91	22.57	22.00	24.50	24.16	23.59
		RB1#5	22.76	22.36	21.80	24.35	23.95	23.39
		RB3#0	23.75	23.45	22.89	25.34	25.04	24.48
		RB3#3	23.75	23.43	22.85	25.34	25.02	24.44
		RB6#0	21.83	21.40	20.91	23.42	22.99	22.50
3.0	QPSK	RB1#0	23.26	23.69	23.49	24.85	25.28	25.08
		RB1#8	23.20	23.55	23.33	24.79	25.14	24.92
		RB1#14	23.20	23.39	22.74	24.79	24.98	24.33
		RB6#0	22.50	22.59	21.85	24.09	24.18	23.44
		RB6#9	22.61	22.51	21.80	24.20	24.10	23.39
		RB15#0	22.72	22.48	21.88	24.31	24.07	23.47
	16QAM	RB1#0	23.01	22.55	21.85	24.60	24.14	23.44
		RB1#8	23.13	22.56	21.87	24.72	24.15	23.46
		RB1#14	23.10	22.56	21.88	24.69	24.15	23.47
		RB6#0	21.84	21.51	20.85	23.43	23.10	22.44
		RB6#9	21.79	21.50	20.75	23.38	23.09	22.34
		RB15#0	21.81	21.47	20.98	23.40	23.06	22.57

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	23.15	23.57	23.45	24.74	25.16	25.04
		RB1#13	23.31	23.59	23.31	24.90	25.18	24.90
		RB1#24	23.14	23.14	22.79	24.73	24.73	24.38
		RB15#0	22.76	22.49	22.08	24.35	24.08	23.67
		RB15#10	22.57	22.37	21.68	24.16	23.96	23.27
		RB25#0	22.70	22.45	21.84	24.29	24.04	23.43
	16QAM	RB1#0	22.45	22.55	21.87	24.04	24.14	23.46
		RB1#38	22.58	22.69	22.12	24.17	24.28	23.71
		RB1#74	22.40	22.58	21.85	23.99	24.17	23.44
		RB36#0	22.78	22.55	22.09	24.37	24.14	23.68
		RB36#39	22.69	22.44	21.69	24.28	24.03	23.28
		RB75#0	21.82	21.47	21.07	23.41	23.06	22.66
10.0	QPSK	RB1#0	23.76	23.61	23.61	25.35	25.20	25.20
		RB1#25	23.65	23.61	23.57	25.24	25.20	25.16
		RB1#49	23.47	22.98	22.84	25.06	24.57	24.43
		RB25#0	22.75	22.63	21.70	24.34	24.22	23.29
		RB25#25	22.42	22.37	21.73	24.01	23.96	23.32
		RB50#0	22.72	22.44	21.99	24.31	24.03	23.58
	16QAM	RB1#0	23.03	22.54	21.99	24.62	24.13	23.58
		RB1#25	23.43	22.67	22.23	25.02	24.26	23.82
		RB1#49	23.07	22.52	21.82	24.66	24.11	23.41
		RB25#0	22.83	22.65	21.92	24.42	24.24	23.51
		RB25#25	22.68	22.40	21.68	24.27	23.99	23.27
		RB50#0	21.78	21.55	21.12	23.37	23.14	22.71

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	23.64	23.41	23.06	25.23	25.00	24.65
		RB1#38	23.53	23.29	23.08	25.12	24.88	24.67
		RB1#74	23.27	22.78	22.73	24.86	24.37	24.32
		RB36#0	22.60	22.42	21.84	24.19	24.01	23.43
		RB36#39	22.55	22.19	21.81	24.14	23.78	23.40
		RB75#0	22.68	22.37	21.84	24.27	23.96	23.43
	16QAM	RB1#0	22.81	22.45	22.09	24.40	24.04	23.68
		RB1#38	23.06	22.52	21.97	24.65	24.11	23.56
		RB1#74	22.77	22.24	22.13	24.36	23.83	23.72
		RB36#0	22.57	22.73	21.83	24.16	24.32	23.42
		RB36#39	22.49	22.38	21.84	24.08	23.97	23.43
		RB75#0	21.77	21.57	20.80	23.36	23.16	22.39
20.0	QPSK	RB1#0	23.38	23.07	22.61	24.97	24.66	24.20
		RB1#50	23.46	23.29	23.07	25.05	24.88	24.66
		RB1#99	22.84	22.74	22.57	24.43	24.33	24.16
		RB50#0	22.45	22.16	21.72	24.04	23.75	23.31
		RB50#50	22.35	21.97	21.74	23.94	23.56	23.33
		RB100#0	22.32	22.22	21.72	23.91	23.81	23.31
	16QAM	RB1#0	22.50	22.20	22.14	24.09	23.79	23.73
		RB1#50	22.87	22.68	22.35	24.46	24.27	23.94
		RB1#99	22.08	21.99	22.13	23.67	23.58	23.72
		RB50#0	22.73	22.33	21.74	24.32	23.92	23.33
		RB50#50	22.49	21.94	21.72	24.08	23.53	23.31
		RB100#0	21.55	21.43	20.78	23.14	23.02	22.37

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable loss(dB)

For Band2: Antenna Gain = 2.39dBi

For 1000-3000MHz, Cable Loss=0.8dB*(provided by the applicant)

Limit: EIRP ≤ 33dBm

Peak-to-average ratio (PAR)**20MHz Bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.62	4.21	3.06	13	Pass
QPSK (100RB Size)	5.87	5.57	5.51	13	Pass
16QAM (1RB Size)	4.20	4.90	4.66	13	Pass
16QAM (100RB Size)	6.12	6.49	6.18	13	Pass

LTE Band 4

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	23.99	23.90	23.83	24.12	24.03	23.96
		RB1#3	24.18	24.15	24.09	24.31	24.28	24.22
		RB1#5	23.97	23.90	23.84	24.10	24.03	23.97
		RB3#0	24.02	23.97	23.92	24.15	24.10	24.05
		RB3#3	24.00	24.00	23.89	24.13	24.13	24.02
		RB6#0	23.09	23.00	22.93	23.22	23.13	23.06
	16QAM	RB1#0	22.91	23.00	22.79	23.04	23.13	22.92
		RB1#3	23.08	23.17	23.00	23.21	23.30	23.13
		RB1#5	22.91	23.02	22.79	23.04	23.15	22.92
		RB3#0	24.07	24.00	23.92	24.20	24.13	24.05
		RB3#3	24.03	23.96	23.92	24.16	24.09	24.05
		RB6#0	22.07	22.06	21.88	22.20	22.19	22.01
3.0	QPSK	RB1#0	24.03	23.94	23.87	24.16	24.07	24.00
		RB1#8	24.02	23.95	23.90	24.15	24.08	24.03
		RB1#14	23.99	23.93	23.89	24.12	24.06	24.02
		RB6#0	23.03	22.91	22.87	23.16	23.04	23.00
		RB6#9	22.99	22.90	22.83	23.12	23.03	22.96
		RB15#0	22.98	22.94	22.85	23.11	23.07	22.98
	16QAM	RB1#0	23.46	23.05	22.83	23.59	23.18	22.96
		RB1#8	23.40	23.05	22.82	23.53	23.18	22.95
		RB1#14	23.41	23.03	22.80	23.54	23.16	22.93
		RB6#0	22.11	21.98	21.85	22.24	22.11	21.98
		RB6#9	22.04	21.98	21.83	22.17	22.11	21.96
		RB15#0	22.07	21.95	21.93	22.20	22.08	22.06

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	23.91	23.86	23.76	24.04	23.99	23.89
		RB1#13	24.00	23.98	23.82	24.13	24.11	23.95
		RB1#24	23.85	23.85	23.75	23.98	23.98	23.88
		RB15#0	22.97	22.94	22.88	23.10	23.07	23.01
		RB15#10	23.00	22.88	22.86	23.13	23.01	22.99
		RB25#0	22.93	22.90	22.85	23.06	23.03	22.98
	16QAM	RB1#0	22.73	23.08	22.75	22.86	23.21	22.88
		RB1#13	22.83	23.25	22.88	22.96	23.38	23.01
		RB1#24	22.75	23.09	22.79	22.88	23.22	22.92
		RB15#0	23.00	22.94	22.87	23.13	23.07	23.00
		RB15#10	23.00	22.90	22.86	23.13	23.03	22.99
		RB25#0	22.02	21.93	21.89	22.15	22.06	22.02
10.0	QPSK	RB1#0	24.07	23.97	23.87	24.20	24.10	24.00
		RB1#25	24.20	24.10	24.03	24.33	24.23	24.16
		RB1#49	24.06	23.94	23.87	24.19	24.07	24.00
		RB25#0	23.00	23.01	22.85	23.13	23.14	22.98
		RB25#25	23.00	22.96	22.83	23.13	23.09	22.96
		RB50#0	23.01	23.00	22.90	23.14	23.13	23.03
	16QAM	RB1#0	23.47	23.07	22.83	23.60	23.20	22.96
		RB1#25	23.62	23.25	22.96	23.75	23.38	23.09
		RB1#49	23.47	23.04	22.84	23.60	23.17	22.97
		RB25#0	22.99	23.00	22.88	23.12	23.13	23.01
		RB25#25	22.99	22.94	22.83	23.12	23.07	22.96
		RB50#0	22.04	22.01	21.88	22.17	22.14	22.01

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	23.94	23.88	23.83	24.07	24.01	23.96
		RB1#38	23.98	23.94	23.91	24.11	24.07	24.04
		RB1#74	23.95	23.84	23.87	24.08	23.97	24.00
		RB36#0	23.02	23.05	22.98	23.15	23.18	23.11
		RB36#39	23.06	22.99	22.96	23.19	23.12	23.09
		RB75#0	23.10	23.04	23.02	23.23	23.17	23.15
	16QAM	RB1#0	23.37	22.96	23.15	23.50	23.09	23.28
		RB1#38	23.38	23.08	23.19	23.51	23.21	23.32
		RB1#74	23.42	22.97	23.10	23.55	23.10	23.23
		RB36#0	23.03	23.06	23.01	23.16	23.19	23.14
		RB36#39	23.08	23.03	23.03	23.21	23.16	23.16
		RB75#0	22.03	22.06	21.95	22.16	22.19	22.08
20.0	QPSK	RB1#0	23.75	23.75	23.58	23.88	23.88	23.71
		RB1#50	24.13	24.10	23.99	24.26	24.23	24.12
		RB1#99	23.77	23.72	23.59	23.90	23.85	23.72
		RB50#0	22.94	23.01	22.95	23.07	23.14	23.08
		RB50#50	22.94	22.91	22.82	23.07	23.04	22.95
		RB100#0	22.94	22.95	22.85	23.07	23.08	22.98
	16QAM	RB1#0	22.96	22.89	23.12	23.09	23.02	23.25
		RB1#50	23.31	23.22	23.45	23.44	23.35	23.58
		RB1#99	22.99	22.87	23.11	23.12	23.00	23.24
		RB50#0	22.95	23.04	22.89	23.08	23.17	23.02
		RB50#50	22.94	22.90	22.89	23.07	23.03	23.02
		RB100#0	22.04	21.98	21.89	22.17	22.11	22.02

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable loss(dB)

For Band4: Antenna Gain = 0.93dBi

For 1000-3000MHz, Cable Loss=0.8dB*(provided by the applicant)

Limit: EIRP ≤ 30dBm

Peak-to-average ratio (PAR)**20MHz Bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.36	4.26	3.77	13	Pass
QPSK (100RB Size)	4.62	5.45	6.12	13	Pass
16QAM (1RB Size)	4.58	4.56	4.21	13	Pass
16QAM (100RB Size)	5.50	5.59	5.47	13	Pass

LTE Band 7:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	21.15	20.71	21.12	21.93	21.49	21.90
		RB1#25	21.04	20.80	21.26	21.82	21.58	22.04
		RB1#49	20.69	20.75	21.20	21.47	21.53	21.98
		RB25#0	19.83	19.87	20.22	20.61	20.65	21.00
		RB25#25	19.73	19.75	20.35	20.51	20.53	21.13
		RB50#0	19.79	19.78	20.29	20.57	20.56	21.07
	16QAM	RB1#0	19.52	19.96	20.20	20.30	20.74	20.98
		RB1#25	19.64	20.04	20.34	20.42	20.82	21.12
		RB1#49	19.56	19.97	20.28	20.34	20.75	21.06
		RB25#0	19.81	19.85	20.24	20.59	20.63	21.02
		RB25#25	19.77	19.68	20.35	20.55	20.46	21.13
		RB50#0	18.79	18.77	19.25	19.57	19.55	20.03
10.0	QPSK	RB1#0	20.74	20.70	21.16	21.52	21.48	21.94
		RB1#38	20.93	20.97	21.46	21.71	21.75	22.24
		RB1#74	20.68	20.80	21.23	21.46	21.58	22.01
		RB36#0	19.89	19.96	20.10	20.67	20.74	20.88
		RB36#39	19.82	19.74	20.38	20.60	20.52	21.16
		RB75#0	19.81	19.90	20.24	20.59	20.68	21.02
	16QAM	RB1#0	20.14	19.81	20.14	20.92	20.59	20.92
		RB1#38	20.42	20.03	20.40	21.20	20.81	21.18
		RB1#74	20.18	19.93	20.25	20.96	20.71	21.03
		RB36#0	19.89	19.98	20.10	20.67	20.76	20.88
		RB36#39	19.81	19.74	20.34	20.59	20.52	21.12
		RB75#0	18.84	18.85	19.23	19.62	19.63	20.01

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	20.67	20.65	21.03	21.45	21.43	21.81
		RB1#50	20.71	20.81	21.25	21.49	21.59	22.03
		RB1#99	20.55	20.77	21.20	21.33	21.55	21.98
		RB50#0	19.87	19.94	20.13	20.65	20.72	20.91
		RB50#50	19.77	19.79	20.39	20.55	20.57	21.17
		RB100#0	19.89	19.97	20.32	20.67	20.75	21.10
	16QAM	RB1#0	20.06	19.75	20.34	20.84	20.53	21.12
		RB1#50	20.21	19.87	20.57	20.99	20.65	21.35
		RB1#99	20.10	19.88	20.53	20.88	20.66	21.31
		RB50#0	19.86	19.93	20.12	20.64	20.71	20.90
		RB50#50	19.81	19.84	20.36	20.59	20.62	21.14
		RB100#0	18.86	18.87	19.21	19.64	19.65	19.99
20.0	QPSK	RB1#0	20.52	20.48	20.76	21.30	21.26	21.54
		RB1#50	20.96	20.94	21.29	21.74	21.72	22.07
		RB1#99	20.52	20.72	20.96	21.30	21.50	21.74
		RB50#0	19.77	20.02	19.94	20.55	20.80	20.72
		RB50#50	19.97	19.66	20.44	20.75	20.44	21.22
		RB100#0	19.88	19.90	20.27	20.66	20.68	21.05
	16QAM	RB1#0	19.75	19.66	20.21	20.53	20.44	20.99
		RB1#50	20.13	20.05	20.81	20.91	20.83	21.59
		RB1#99	19.76	19.83	20.54	20.54	20.61	21.32
		RB50#0	19.82	20.00	19.98	20.60	20.78	20.76
		RB50#50	19.97	19.67	20.43	20.75	20.45	21.21
		RB100#0	18.88	18.85	19.26	19.66	19.63	20.04

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable loss(dB)

For Band7: Antenna Gain = 1.58dBi

For 1000-3000MHz, Cable Loss=0.8dB*(provided by the applicant)

Limit: EIRP ≤ 33dBm

Peak-to-average ratio (PAR)**10MHz bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.19	4.52	4.32	13	Pass
QPSK (50RB Size)	5.31	5.69	5.14	13	Pass
16QAM (1RB Size)	5.26	4.73	5.02	13	Pass
16QAM (50RB Size)	6.48	6.20	6.14	13	Pass

LTE Band 12

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	24.86	24.74	24.78	23.09	22.97	23.01
		RB1#3	25.02	25.01	24.88	23.25	23.24	23.11
		RB1#5	24.84	24.75	24.79	23.07	22.98	23.02
		RB3#0	24.92	24.83	24.80	23.15	23.06	23.03
		RB3#3	24.89	24.82	24.78	23.12	23.05	23.01
		RB6#0	23.90	23.86	23.85	22.13	22.09	22.08
	16QAM	RB1#0	23.82	23.85	23.68	22.05	22.08	21.91
		RB1#3	23.97	24.02	23.88	22.20	22.25	22.11
		RB1#5	23.82	23.82	23.70	22.05	22.05	21.93
		RB3#0	24.90	24.84	24.79	23.13	23.07	23.02
		RB3#3	24.89	24.80	24.79	23.12	23.03	23.02
		RB6#0	22.88	22.86	22.73	21.11	21.09	20.96
3.0	QPSK	RB1#0	24.94	24.83	24.87	23.17	23.06	23.10
		RB1#8	24.90	24.83	24.86	23.13	23.06	23.09
		RB1#14	24.89	24.81	24.92	23.12	23.04	23.15
		RB6#0	23.88	23.76	23.84	22.11	21.99	22.07
		RB6#9	23.87	23.76	23.82	22.10	21.99	22.05
		RB15#0	23.90	23.80	23.83	22.13	22.03	22.06
	16QAM	RB1#0	24.39	23.92	23.85	22.62	22.15	22.08
		RB1#8	24.35	23.90	23.79	22.58	22.13	22.02
		RB1#14	24.35	23.93	23.75	22.58	22.16	21.98
		RB6#0	22.92	22.74	22.74	21.15	20.97	20.97
		RB6#9	22.87	22.80	22.73	21.10	21.03	20.96
		RB15#0	22.94	22.75	22.86	21.17	20.98	21.09

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	24.84	24.81	24.71	23.07	23.04	22.94
		RB1#13	24.90	24.84	24.85	23.13	23.07	23.08
		RB1#24	24.86	24.75	24.80	23.09	22.98	23.03
		RB15#0	23.90	23.67	24.00	22.13	21.90	22.23
		RB15#10	24.06	23.83	23.86	22.29	22.06	22.09
		RB25#0	23.97	23.74	23.89	22.20	21.97	22.12
	16QAM	RB1#0	23.71	24.01	23.76	21.94	22.24	21.99
		RB1#13	23.74	24.08	23.85	21.97	22.31	22.08
		RB1#24	23.69	24.00	23.75	21.92	22.23	21.98
		RB15#0	23.94	23.68	23.96	22.17	21.91	22.19
		RB15#10	24.06	23.81	23.87	22.29	22.04	22.10
		RB25#0	22.99	22.74	22.91	21.22	20.97	21.14
10.0	QPSK	RB1#0	24.86	24.85	24.76	23.09	23.08	22.99
		RB1#25	25.05	24.94	24.92	23.28	23.17	23.15
		RB1#49	24.80	24.83	24.84	23.03	23.06	23.07
		RB25#0	23.86	23.56	23.82	22.09	21.79	22.05
		RB25#25	24.15	23.66	23.67	22.38	21.89	21.90
		RB50#0	24.06	23.61	23.79	22.29	21.84	22.02
	16QAM	RB1#0	24.35	23.93	23.71	22.58	22.16	21.94
		RB1#25	24.52	23.99	23.88	22.75	22.22	22.11
		RB1#49	24.29	23.92	23.77	22.52	22.15	22.00
		RB25#0	23.81	23.56	23.80	22.04	21.79	22.03
		RB25#25	24.16	23.64	23.66	22.39	21.87	21.89
		RB50#0	23.04	22.58	22.77	21.27	20.81	21.00

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable loss(dB)

For Band12: Antenna Gain = 0.88dBi = -1.27dBd (0dBd=2.15dBi)

For 600-1000MHz, Cable Loss=0.5dB*(provided by the applicant)

Limit: ERP ≤ 34.77dBm

Peak-to-average ratio (PAR)**10MHz bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.52	4.41	4.42	13	Pass
QPSK (50RB Size)	5.23	5.45	5.46	13	Pass
16QAM (1RB Size)	5.42	5.28	5.09	13	Pass
16QAM (50RB Size)	6.27	6.66	6.03	13	Pass

LTE Band 13

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	24.35	24.73	24.86	22.58	22.96	23.09
		RB1#13	24.46	24.58	24.62	22.69	22.81	22.85
		RB1#24	24.34	24.44	24.57	22.57	22.67	22.80
		RB15#0	23.43	23.57	23.73	21.66	21.80	21.96
		RB15#10	23.39	23.56	23.88	21.62	21.79	22.11
		RB25#0	23.33	23.55	23.88	21.56	21.78	22.11
	16QAM	RB1#0	23.15	23.89	23.75	21.38	22.12	21.98
		RB1#13	23.39	24.13	23.87	21.62	22.36	22.10
		RB1#24	23.28	23.79	23.60	21.51	22.02	21.83
		RB15#0	23.61	23.85	23.90	21.84	22.08	22.13
		RB15#10	23.58	23.84	24.05	21.81	22.07	22.28
RB25#0	22.83	22.96	22.90	21.06	21.19	21.13		
10.0	QPSK	RB1#0	24.93	/	/	23.16	/	/
		RB1#25	25.00	/	/	23.23	/	/
		RB1#49	24.89	/	/	23.12	/	/
		RB25#0	23.93	/	/	22.16	/	/
		RB25#25	24.05	/	/	22.28	/	/
		RB50#0	24.05	/	/	22.28	/	/
	16QAM	RB1#0	24.20	/	/	22.43	/	/
		RB1#25	24.52	/	/	22.75	/	/
		RB1#49	24.21	/	/	22.44	/	/
		RB25#0	24.03	/	/	22.26	/	/
		RB25#25	24.06	/	/	22.29	/	/
		RB50#0	23.02	/	/	21.25	/	/

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable loss(dB)

For Band13: Antenna Gain =0.88dBi = -1.27dBd (0dBd=2.15dBi)

For 600-1000MHz, Cable Loss=0.5dB*(provided by the applicant)

Limit: ERP≤34.77dBm

Peak-to-average ratio (PAR)**10MHz bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.06	4.18	4.45	13	Pass
QPSK (50RB Size)	5.50	5.72	5.29	13	Pass
16QAM (1RB Size)	5.36	5.41	5.29	13	Pass
16QAM (50RB Size)	6.17	6.18	6.21	13	Pass

LTE Band 17

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	25.06	24.94	24.87	23.29	23.17	23.10
		RB1#13	25.13	24.99	24.64	23.36	23.22	22.87
		RB1#24	24.94	24.55	24.46	23.17	22.78	22.69
		RB15#0	23.97	23.77	23.73	22.20	22.00	21.96
		RB15#10	24.15	23.83	23.60	22.38	22.06	21.83
		RB25#0	23.95	23.72	23.60	22.18	21.95	21.83
	16QAM	RB1#0	23.62	24.19	23.49	21.85	22.42	21.72
		RB1#13	23.67	24.26	23.59	21.90	22.49	21.82
		RB1#24	23.67	23.93	23.45	21.90	22.16	21.68
		RB15#0	23.84	24.10	23.72	22.07	22.33	21.95
		RB15#10	24.16	23.85	23.61	22.39	22.08	21.84
		RB25#0	23.03	22.94	22.70	21.26	21.17	20.93
10.0	QPSK	RB1#0	24.56	24.74	24.64	22.79	22.97	22.87
		RB1#25	24.64	24.71	24.68	22.87	22.94	22.91
		RB1#49	24.58	24.56	24.56	22.81	22.79	22.79
		RB25#0	23.35	23.46	23.58	21.58	21.69	21.81
		RB25#25	23.28	23.40	23.48	21.51	21.63	21.71
		RB50#0	23.36	23.41	23.56	21.59	21.64	21.79
	16QAM	RB1#0	24.04	23.64	23.48	22.27	21.87	21.71
		RB1#25	24.17	23.87	23.71	22.40	22.10	21.94
		RB1#49	24.04	23.65	23.49	22.27	21.88	21.72
		RB25#0	23.36	23.45	23.57	21.59	21.68	21.80
		RB25#25	23.31	23.47	23.48	21.54	21.70	21.71
		RB50#0	22.60	22.44	22.59	20.83	20.67	20.82

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable loss(dB)
For Band 17: Antenna Gain = 0.88dBi = -1.27dBd (0dBd=2.15dBi)
For 600-1000MHz, Cable Loss=0.5dB*(provided by the applicant)
Limit: EIRP ≤ 34.77dBm

Peak-to-average ratio (PAR)**10MHz Bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.30	4.39	3.58	13	Pass
QPSK (100RB Size)	4.47	5.31	6.28	13	Pass
16QAM (1RB Size)	5.12	4.71	4.63	13	Pass
16QAM (100RB Size)	5.27	5.26	5.33	13	Pass

LTE Band 25

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	23.56	23.56	22.92	25.15	25.15	24.51
		RB1#3	23.57	23.30	22.87	25.16	24.89	24.46
		RB1#5	23.50	22.97	22.65	25.09	24.56	24.24
		RB3#0	23.49	23.00	22.88	25.08	24.59	24.47
		RB3#3	23.47	22.97	22.71	25.06	24.56	24.30
		RB6#0	22.83	22.05	22.61	24.42	23.64	24.20
	16QAM	RB1#0	22.49	22.09	22.13	24.08	23.68	23.72
		RB1#3	22.63	22.39	22.27	24.22	23.98	23.86
		RB1#5	22.57	22.28	22.19	24.16	23.87	23.78
		RB3#0	23.64	23.14	22.73	25.23	24.73	24.32
		RB3#3	23.60	23.06	22.58	25.19	24.65	24.17
		RB6#0	21.73	21.17	20.95	23.32	22.76	22.54
3.0	QPSK	RB1#0	23.54	23.57	22.78	25.13	25.16	24.37
		RB1#8	23.63	23.49	23.03	25.22	25.08	24.62
		RB1#14	23.56	23.41	23.22	25.15	25.00	24.81
		RB6#0	22.70	22.49	22.36	24.29	24.08	23.95
		RB6#9	22.56	22.35	22.14	24.15	23.94	23.73
		RB15#0	22.57	22.38	22.19	24.16	23.97	23.78
	16QAM	RB1#0	22.94	22.40	22.35	24.53	23.99	23.94
		RB1#8	22.94	22.39	21.81	24.53	23.98	23.40
		RB1#14	22.96	22.44	21.81	24.55	24.03	23.40
		RB6#0	21.69	21.39	20.80	23.28	22.98	22.39
		RB6#9	21.59	21.36	20.82	23.18	22.95	22.41
		RB15#0	21.67	21.32	20.74	23.26	22.91	22.33

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	23.06	23.35	22.89	24.65	24.94	24.48
		RB1#13	23.12	23.14	22.53	24.71	24.73	24.12
		RB1#24	23.00	22.87	22.68	24.59	24.46	24.27
		RB15#0	22.34	22.15	22.03	23.93	23.74	23.62
		RB15#10	22.24	22.15	21.90	23.83	23.74	23.49
		RB25#0	22.52	22.21	21.88	24.11	23.80	23.47
	16QAM	RB1#0	21.96	22.32	21.95	23.55	23.91	23.54
		RB1#13	22.33	22.45	22.05	23.92	24.04	23.64
		RB1#24	22.13	22.39	21.83	23.72	23.98	23.42
		RB15#0	22.70	22.46	21.91	24.29	24.05	23.50
		RB15#10	22.56	22.34	21.89	24.15	23.93	23.48
		RB25#0	21.71	21.36	20.89	23.30	22.95	22.48
10.0	QPSK	RB1#0	23.21	23.25	23.33	24.80	24.84	24.92
		RB1#25	23.26	23.24	22.96	24.85	24.83	24.55
		RB1#49	23.03	22.81	22.67	24.62	24.40	24.26
		RB25#0	22.35	22.04	22.17	23.94	23.63	23.76
		RB25#25	22.11	22.10	21.76	23.70	23.69	23.35
		RB50#0	22.24	22.25	22.02	23.83	23.84	23.61
	16QAM	RB1#0	22.51	22.27	21.57	24.10	23.86	23.16
		RB1#25	22.96	22.51	21.90	24.55	24.10	23.49
		RB1#49	22.78	22.37	21.63	24.37	23.96	23.22
		RB25#0	22.72	22.42	22.12	24.31	24.01	23.71
		RB25#25	22.49	22.14	21.73	24.08	23.73	23.32
		RB50#0	21.65	21.41	21.06	23.24	23.00	22.65

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
15.0	QPSK	RB1#0	23.10	23.54	23.14	24.69	25.13	24.73
		RB1#38	23.05	23.35	22.95	24.64	24.94	24.54
		RB1#74	22.98	22.78	22.81	24.57	24.37	24.40
		RB36#0	22.29	22.33	21.96	23.88	23.92	23.55
		RB36#39	22.27	22.18	21.74	23.86	23.77	23.33
		RB75#0	22.38	22.43	21.68	23.97	24.02	23.27
	16QAM	RB1#0	22.75	22.37	21.76	24.34	23.96	23.35
		RB1#38	23.11	22.44	21.95	24.70	24.03	23.54
		RB1#74	22.86	22.34	21.82	24.45	23.93	23.41
		RB36#0	22.63	22.74	21.96	24.22	24.33	23.55
		RB36#39	22.56	22.22	21.71	24.15	23.81	23.30
		RB75#0	21.76	21.48	20.61	23.35	23.07	22.20
20.0	QPSK	RB1#0	23.06	23.33	22.67	24.65	24.92	24.26
		RB1#50	23.42	23.45	23.06	25.01	25.04	24.65
		RB1#99	22.85	22.64	22.67	24.44	24.23	24.26
		RB50#0	22.70	22.05	21.48	24.29	23.64	23.07
		RB50#50	22.48	22.03	21.23	24.07	23.62	22.82
		RB100#0	22.49	22.35	21.45	24.08	23.94	23.04
	16QAM	RB1#0	22.39	22.12	22.03	23.98	23.71	23.62
		RB1#50	22.91	22.65	22.12	24.50	24.24	23.71
		RB1#99	22.42	22.24	21.95	24.01	23.83	23.54
		RB50#0	22.78	22.42	21.43	24.37	24.01	23.02
		RB50#50	22.62	22.09	21.23	24.21	23.68	22.82
		RB100#0	21.68	21.45	20.55	23.27	23.04	22.14

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable loss(dB)

For Band2: Antenna Gain = 2.39dBi

For 1000-3000MHz, Cable Loss=0.8dB*(provided by the applicant)

Limit: EIRP ≤ 33dBm

Peak-to-average ratio (PAR)**20MHz Bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.29	4.66	4.02	13	Pass
QPSK (100RB Size)	4.48	5.56	5.21	13	Pass
16QAM (1RB Size)	5.09	4.69	4.71	13	Pass
16QAM (100RB Size)	5.42	5.15	5.29	13	Pass

FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53 - OCCUPIED BANDWIDTH

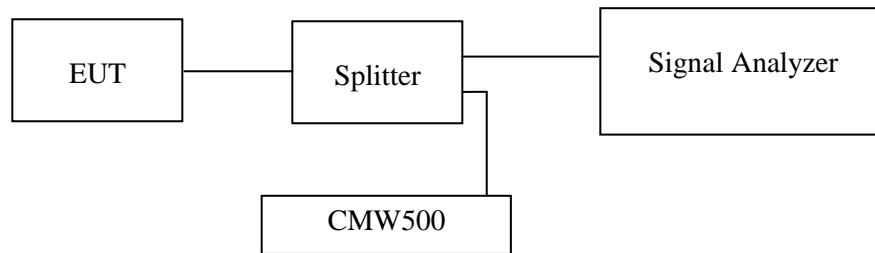
Applicable Standard

FCC 47 §2.1049, §22.917, §22.905, §24.238, and §27.53.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.



Test Data

Environmental Conditions

Temperature:	23 - 25 °C
Relative Humidity:	51- 55 %
ATM Pressure:	100.8 - 101.3 kPa

The testing was performed by Black Ding on 2021-03-23 to 2021-03-25.

EUT operation mode: Transmitting

Test Result: Pass

Test plots refer to the Appendix A.

FCC §2.1051, §22.917(a) & §24.238(a) & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

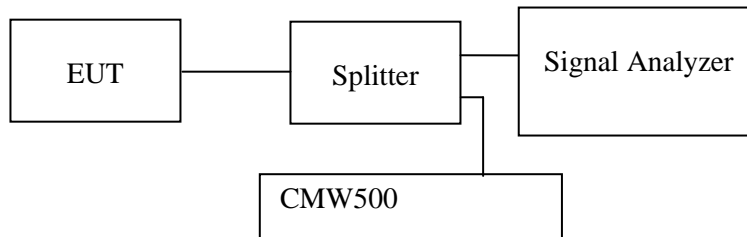
Applicable Standard

FCC §2.1051, §22.917(a) & §24.238(a) & §27.53.

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

Test Procedure

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



Test Data

Environmental Conditions

Temperature:	23-25 °C
Relative Humidity:	51-55 %
ATM Pressure:	100.8 - 101.0 kPa

The testing was performed by Fan Yang on 2021-03-23 to 2021-03-25.

EUT operation mode: Transmitting

Test result: Pass

Test plots refer to the Appendix B.

FCC § 2.1053; § 22.917 (a); § 24.238 (a); §27.53 - SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 2.1053, §22.917(a) & § 24.238(a) & § 27.53.

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 receiving 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.

Test Data

Environmental Conditions

Temperature:	28~29.3 °C
Relative Humidity:	50~58 %
ATM Pressure:	101.0~101.1 kPa

The testing was performed by Black Ding on 2021-03-21.

EUT operation mode: Transmitting

The worst case is as below:

30MHz- 1GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/QP/Ave.		Height (m)	Polar (H/V)				
GSM850, Low Channel									
129.47	-36.63	PK	238	1.0	H	-4.35	-40.98	-13	27.98
129.48	-41.26	PK	107	1.2	V	-3.48	-44.74	-13	31.74
GSM850, Middle Channel									
129.47	-35.71	PK	119	1.9	H	-4.35	-40.06	-13	27.06
129.45	-41.33	PK	234	1.3	V	-3.48	-44.81	-13	31.81
GSM850, High Channel									
129.47	-36.41	PK	241	1.1	H	-4.35	-40.76	-13	27.76
129.47	-40.84	PK	21	1.3	V	-3.48	-44.32	-13	31.32
PCS1900, Low Channel									
129.47	-35.93	PK	102	1.7	H	-4.35	-40.28	-13	27.28
129.56	-40.61	PK	157	1.3	V	-3.48	-44.09	-13	31.09
PCS1900, Middle Channel									
129.47	-36.87	PK	232	1	H	-4.35	-41.22	-13	28.22
129.47	-40.62	PK	205	1.2	V	-3.48	-44.1	-13	31.1
PCS1900, High Channel									
129.47	-36.3	PK	148	1.5	H	-4.35	-40.65	-13	27.65
129.61	-41.45	PK	214	1.4	V	-3.48	-44.93	-13	31.93

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/QP/Ave.		Height (m)	Polar (H/V)				
WCDMA BAND2, Low Channel									
129.47	-36.29	PK	215	1	H	-4.35	-40.64	-13	27.64
129.53	-40.75	PK	207	1.1	V	-3.48	-44.23	-13	31.23
WCDMA BAND2, Middle Channel									
129.48	-36.71	PK	92	1.5	H	-4.35	-41.06	-13	28.06
129.44	-40.56	PK	107	1.3	V	-3.48	-44.04	-13	31.04
WCDMA BAND2, High Channel									
129.54	-37.17	PK	289	1	H	-4.35	-41.52	-13	28.52
129.46	-41.2	PK	224	1.2	V	-3.48	-44.68	-13	31.68
WCDMA BAND5, Low Channel									
129.51	-36.44	PK	174	1.5	H	-4.35	-40.79	-13	27.79
129.47	-41.32	PK	96	1.7	V	-3.48	-44.8	-13	31.8
WCDMA BAND5, Middle Channel									
129.47	-36.96	PK	27	1.1	H	-4.35	-41.31	-13	28.31
129.47	-40.96	PK	206	1.2	V	-3.48	-44.44	-13	31.44
WCDMA BAND5, High Channel									
129.45	-36.66	PK	126	1.4	H	-4.35	-41.01	-13	28.01
129.49	-41.54	PK	109	1.8	V	-3.48	-45.02	-13	32.02

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/QP/Ave.		Height (m)	Polar (H/V)				
LTE BAND2, 1.4M Low Channel									
129.47	-36.92	PK	193	1.1	H	-4.35	-41.27	-13	28.27
129.47	-41.26	PK	145	1	V	-3.48	-44.74	-13	31.74
LTE BAND2, 1.4M Middle Channel									
129.47	-36.97	PK	95	1.8	H	-4.35	-41.32	-13	28.32
129.44	-41.41	PK	197	1.6	V	-3.48	-44.89	-13	31.89
LTE BAND2, 1.4M High Channel									
129.47	-36.87	PK	177	1	H	-4.35	-41.22	-13	28.22
129.47	-41.02	PK	156	1.1	V	-3.48	-44.5	-13	31.5
LTE BAND4, 1.4M Low Channel									
129.47	-36.51	PK	148	1.4	H	-4.35	-40.86	-13	27.86
129.42	-41.51	PK	175	1.5	V	-3.48	-44.99	-13	31.99
LTE BAND4, 1.4M Middle Channel									
129.47	-37.6	PK	195	1.1	H	-4.35	-41.95	-13	28.95
129.45	-41.86	PK	79	1	V	-3.48	-45.34	-13	32.34
LTE BAND4, 1.4M High Channel									
129.47	-36.98	PK	86	1.8	H	-4.35	-41.33	-13	28.33
129.47	-40.78	PK	103	1.6	V	-3.48	-44.26	-13	31.26
LTE BAND7, 5M Low Channel									
129.42	-36.93	PK	173	1.20	H	-4.35	-41.28	-25.00	16.28
129.47	-41.22	PK	126	1.10	V	-3.48	-44.70	-25.00	19.70
LTE BAND7, 5M Middle Channel									
129.47	-36.54	PK	48	2.00	H	-4.35	-40.89	-25.00	15.89
129.47	-41.67	PK	194	1.60	V	-3.48	-45.15	-25.00	20.15
LTE BAND7, 5M High Channel									
129.41	-36.53	PK	113	1.00	H	-4.35	-40.88	-25.00	12.88
129.43	-41.12	PK	135	1.10	V	-3.48	-44.60	-25.00	19.60
LTE BAND12, 1.4M Low Channel									
129.47	-36.61	PK	104	1.4	H	-4.35	-40.96	-13	27.96
129.47	-41.18	PK	175	2.1	V	-3.48	-44.66	-13	31.66
LTE BAND12, 1.4M Middle Channel									
129.52	-36.62	PK	190	1.1	H	-4.35	-40.97	-13	27.97
129.39	-41.47	PK	97	1	V	-3.48	-44.95	-13	31.95
LTE BAND12, 1.4M High Channel									
129.47	-36.11	PK	274	1.9	H	-4.35	-40.46	-13	27.46
129.49	-40.92	PK	210	1.6	V	-3.48	-44.4	-13	31.4
LTE BAND13, 5M Low Channel									
129.47	-36.38	PK	113	1.10	H	-4.35	-40.73	-13.00	27.73
129.48	-41.58	PK	132	1.40	V	-3.48	-45.06	-13.00	32.06

LTE BAND13, 5M Middle Channel									
129.47	-36.68	PK	207	1.50	H	-4.35	-41.03	-13.00	28.03
129.44	-40.95	PK	128	1.60	V	-3.48	-44.43	-13.00	31.43
LTE BAND13, 5M High Channel									
129.47	-37.18	PK	234	1.10	H	-4.35	-41.53	-13.00	28.53
129.47	-41.84	PK	81	1.30	V	-3.48	-45.32	-13.00	32.32
LTE BAND17, 5M Low Channel									
129.47	-37	PK	17	1.1	H	-4.35	-41.35	-13	28.35
129.45	-41.23	PK	115	1.2	V	-3.48	-44.71	-13	31.71
LTE BAND17, 5M Middle Channel									
129.47	-37.48	PK	219	1.6	H	-4.35	-41.83	-13	28.83
129.47	-41.98	PK	297	1.4	V	-3.48	-45.46	-13	32.46
LTE BAND17, 5M High Channel									
129.49	-37.32	PK	48	1.5	H	-4.35	-41.67	-13	28.67
129.48	-41.07	PK	28	1.1	V	-3.48	-44.55	-13	31.55
LTE BAND25, 1.4M Low Channel									
129.46	-37.09	PK	247	1.5	H	-4.35	-41.44	-13	28.44
129.47	-41.48	PK	25	1.4	V	-3.48	-44.96	-13	31.96
LTE BAND25, 1.4M Middle Channel									
129.52	-37.03	PK	314	1.3	H	-4.35	-41.38	-13	28.38
129.43	-40.9	PK	35	1.1	V	-3.48	-44.38	-13	31.38
LTE BAND25, 1.4M High Channel									
129.56	-37.08	PK	207	2	H	-4.35	-41.43	-13	28.43
129.46	-41.07	PK	123	1.7	V	-3.48	-44.55	-13	31.55

1-10 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/QP/Ave.		Height (m)	Polar (H/V)				
GSM850, Low Channel									
1648.4	-19.82	PK	216	1.5	H	-2.32	-22.14	-13	9.14
1648.4	-22.63	PK	18	1.7	V	-2.29	-24.92	-13	11.92
GSM850, Middle Channel									
1673.2	-19.86	PK	14	1.4	H	-2.34	-22.2	-13	9.2
1673.2	-23.64	PK	317	2	V	-2.31	-25.95	-13	12.95
GSM850, High Channel									
1697.6	-19.65	PK	95	1.5	H	-2.38	-22.03	-13	9.03
1697.6	-21.19	PK	127	1.4	V	-2.34	-23.53	-13	10.53

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/QP/Ave.		Height (m)	Polar (H/V)				
WCDMA BAND5, Low Channel									
1652.8	-28.66	PK	297	1.5	H	-2.32	-30.98	-13	17.98
1652.8	-34.71	PK	219	1.3	V	-2.29	-37	-13	24
WCDMA BAND5, Middle Channel									
1673.2	-27.42	PK	98	1.7	H	-2.34	-29.76	-13	16.76
1673.2	-34.26	PK	191	1.6	V	-2.31	-36.57	-13	23.57
WCDMA BAND5, High Channel									
1693.2	-27.14	PK	12	1.5	H	-2.38	-29.52	-13	16.52
1693.2	-35.05	PK	337	1.6	V	-2.34	-37.39	-13	24.39

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/QP/Ave.		Height (m)	Polar (H/V)				
LTE BAND12, 1.4M Low Channel									
1399.4	-30.27	PK	27	1.7	H	-0.62	-30.89	-13	17.89
1399.4	-34.08	PK	247	1.8	V	-0.84	-34.92	-13	21.92
LTE BAND12, 1.4M Middle Channel									
1415	-29.62	PK	115	1.4	H	-0.65	-30.27	-13	17.27
1415	-34.65	PK	10	1.5	V	-0.87	-35.52	-13	22.52
LTE BAND12, 1.4M High Channel									
1430.6	-50.59	PK	109	1.5	H	-0.71	-31.3	-13	18.3
1430.6	-35.12	PK	227	1.6	V	-0.94	-36.06	-13	23.06
LTE BAND13, 5M Low Channel									
1559.00	-41.68	PK	94	1.50	H	-0.89	-42.57	-40.00	2.57
1559.00	-43.68	PK	95	1.70	V	-1.14	-44.82	-40.00	4.82
LTE BAND13, 5M Middle Channel									
1564.00	-41.51	PK	16	1.30	H	-0.98	-42.49	-40.00	2.49
1564.00	-44.11	PK	247	1.80	V	-1.23	-45.34	-40.00	5.34
LTE BAND13, 5M High Channel									
1569.00	-41.74	PK	217	1.40	H	-1.07	-42.81	-40.00	2.81
1569.00	-44.44	PK	12	1.50	V	-1.34	-45.78	-40.00	5.78
LTE BAND17, 5M Low Channel									
1413	-30.32	PK	106	1.5	H	-0.65	-30.97	-13	17.97
1413	-34.58	PK	108	1.7	V	-0.87	-35.45	-13	22.45
LTE BAND17, 5M Middle Channel									
129.47	-37.48	PK	219	1.6	H	-4.35	-41.83	-13	28.83
129.47	-41.98	PK	297	1.4	V	-3.48	-45.46	-13	32.46
1420	-29.58	PK	242	2	H	-0.67	-30.25	-13	17.25
1420	-34.53	PK	23	1.6	V	-0.91	-35.44	-13	22.44
LTE BAND17, 5M High Channel									
129.49	-37.32	PK	48	1.5	H	-4.35	-41.67	-13	28.67
129.48	-41.07	PK	28	1.1	V	-3.48	-44.55	-13	31.55
1427	-30.21	PK	45	2	H	-0.71	-30.92	-13	17.92
1427	-34.23	PK	315	1.6	V	-0.94	-35.17	-13	22.17

1-20 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/QP/Ave.		Height (m)	Polar (H/V)				
PCS1900, Low Channel									
3700.4	-31.59	PK	314	1.5	H	4.72	-26.87	-13	13.87
3700.4	-36.96	PK	35	1.6	V	4.61	-32.35	-13	19.35
PCS1900, Middle Channel									
3760	-31.88	PK	210	2.1	H	4.94	-26.94	-13	13.94
3760	-37.2	PK	100	1.8	V	4.85	-32.35	-13	19.35
PCS1900, High Channel									
3819.6	-31.24	PK	347	1.5	H	5.25	-25.99	-13	12.99
3819.6	-38.06	PK	305	1.6	V	5.08	-32.98	-13	19.98

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/QP/Ave.		Height (m)	Polar (H/V)				
WCDMA BAND2, Low Channel									
3704.8	-35.55	PK	151	1.8	H	4.75	-30.8	-13	17.8
3704.8	-43.72	PK	182	1.4	V	4.62	-39.1	-13	26.1
WCDMA BAND2, Middle Channel									
3760	-35.09	PK	304	1.5	H	4.94	-30.15	-13	17.15
3760	-43.29	PK	331	1.2	V	4.85	-38.44	-13	25.44
WCDMA BAND2, High Channel									
3815.2	-34.93	PK	162	2.1	H	5.22	-29.71	-13	16.71
3815.2	-40.7	PK	153	1.4	V	5.05	-35.65	-13	22.65

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/QP/Ave.		Height (m)	Polar (H/V)				
LTE BAND2, 1.4M Low Channel									
3701.4	-35.09	PK	271	1.4	H	4.72	-30.37	-13	17.37
3701.4	-42.78	PK	234	1.5	V	4.61	-38.17	-13	25.17
LTE BAND2, 1.4M Middle Channel									
3760	-34.99	PK	159	1.5	H	4.94	-30.05	-13	17.05
3760	-41.09	PK	163	1.7	V	4.85	-36.24	-13	23.24
LTE BAND2, 1.4M High Channel									
3818.6	-35.63	PK	314	1.5	H	5.25	-30.38	-13	17.38
3818.6	-43.55	PK	207	1.4	V	5.08	-38.47	-13	25.47
LTE BAND4, 1.4M Low Channel									
3421.4	-33.39	PK	223	1.6	H	2.72	-30.67	-13	17.67
3421.4	-38.64	PK	240	1.7	V	2.59	-36.05	-13	23.05
LTE BAND4, 1.4M Middle Channel									
3465	-33.86	PK	221	1.6	H	3.09	-30.77	-13	17.77
3465	-39.06	PK	124	1.5	V	2.97	-36.09	-13	23.09
LTE BAND4, 1.4M High Channel									
3508.6	-33.65	PK	214	1.3	H	3.44	-30.21	-13	17.21
3508.6	-40.14	PK	207	1.4	V	3.31	-36.83	-13	23.83
LTE BAND25, 1.4M Low Channel									
129.46	-37.09	PK	247	1.5	H	-4.35	-41.44	-13	28.44
129.47	-41.48	PK	25	1.4	V	-3.48	-44.96	-13	31.96
3701.4	-35.33	PK	9	2.1	H	4.72	-30.61	-13	17.61
3701.4	-40.02	PK	109	1.7	V	4.61	-35.41	-13	22.41
LTE BAND25, 1.4M Middle Channel									
129.52	-37.03	PK	314	1.3	H	-4.35	-41.38	-13	28.38
129.43	-40.9	PK	35	1.1	V	-3.48	-44.38	-13	31.38
3765	-35.32	PK	233	1.4	H	4.97	-30.35	-13	17.35
3765	-42.44	PK	96	1.5	V	4.88	-37.56	-13	24.56
LTE BAND25, 1.4M High Channel									
129.56	-37.08	PK	207	2	H	-4.35	-41.43	-13	28.43
129.46	-41.07	PK	123	1.7	V	-3.48	-44.55	-13	31.55
3828.6	-36.12	PK	74	1.4	H	5.31	-30.81	-13	17.81
3828.6	-41.01	PK	187	1.5	V	5.12	-35.89	-13	23.89

1-26.5 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
	Reading (dBm)	PK/QP/Ave.		Height (m)	Polar (H/V)				
LTE BAND7, 5M Low Channel									
5005.00	-39.75	PK	156	1.40	H	8.82	-30.93	-25.00	5.93
5005.00	-43.79	PK	17	1.70	V	8.53	-35.26	-25.00	10.26
LTE BAND7, 5M Middle Channel									
5070.00	-39.53	PK	217	1.70	H	9.18	-30.35	-25.00	5.35
5070.00	-44.16	PK	249	1.50	V	8.56	-35.60	-25.00	10.60
LTE BAND7, 5M High Channel									
5135.00	-39.92	PK	227	1.50	H	9.47	-30.45	-25.00	5.45
5135.00	-42.90	PK	129	1.60	V	8.65	-34.25	-25.00	9.25

Note:

Corrected Amplitude = Corrected Factor + Reading

Margin = Limit - Corrected. Amplitude

The other spurious emission which is in the noise floor level was not recorded.

The test result of peak was less than the limit of average, so just peak value were recorded.

FCC § 22.917 (a); § 24.238 (a); §27.53 (c)(h)(m) - BAND EDGES

Applicable Standard

According to § 22.917(a), the power of any emissions 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.

According to §24.238(a), the power of any emissions 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.

According to FCC §27.53 (c), For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

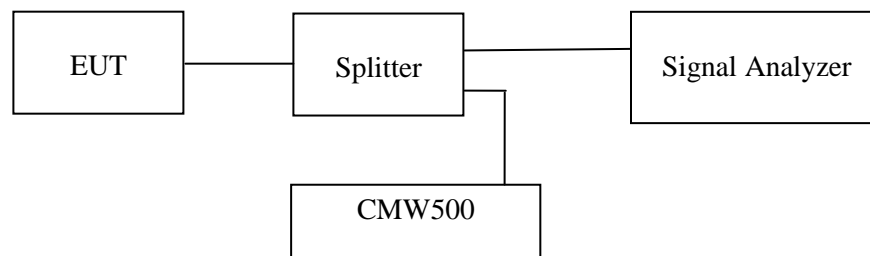
- (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;
- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

According to FCC §27.53 (h)(m), 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.

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 Data**Environmental Conditions**

Temperature:	23-25 °C
Relative Humidity:	50-55 %
ATM Pressure:	100.8- 101.3 kPa

The testing was performed by Black Ding on 2021-03-23 to 2021-03-25.

EUT operation mode: Transmitting (Worst case)

Test Result: Pass

Test plots refer to the Appendix C.

FCC § 2.1055; § 22.355; § 24.235; §27.54 - FREQUENCY STABILITY**Applicable Standard**

FCC § 2.1055, §22.355, §24.235 & §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 §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile > 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

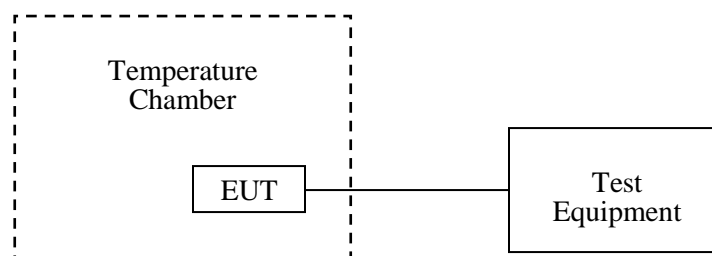
According to §24.235 & §27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC 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 AC 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 Data**Environmental Conditions**

Temperature:	20 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding on 2021-03-23 to 2021-03-25.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the following tables.

Cellular Band (Part 22H)**GSM Mode**

Middle Channel				
Temperature (°C)	Voltage Supplied (V _{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	120	3.41	0.0041	2.5
-20		3.36	0.004	2.5
-10		6.09	0.0073	2.5
0		5.21	0.0062	2.5
10		-4.39	-0.0052	2.5
20		3.41	0.0041	2.5
30		7.01	0.0084	2.5
40		-2.21	-0.0026	2.5
50		4.32	0.0052	2.5
20		V min.=108	5.31	0.0063
	V max.= 132	6.06	0.0072	2.5

WCDMA Mode

Middle Channel				
Temperature (°C)	Voltage Supplied (V_{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	120	-2.32	-0.0028	2.5
-20		2.32	0.0028	2.5
-10		-4.91	-0.0059	2.5
0		5.27	0.0063	2.5
10		4.41	0.0053	2.5
20		5.29	0.0063	2.5
30		3.32	0.004	2.5
40		6.96	0.0083	2.5
50		4.12	0.0049	2.5
20		V min.=102	4.12	0.0049
	V max.= 138	3.45	0.0041	2.5

PCS Band (Part 24E)**GSM Mode**

Middle Channel				
Temperature (°C)	Voltage Supplied (V_{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	120	3.14	0.0017	pass
-20		3.06	0.0016	pass
-10		5.21	0.0028	pass
0		1.21	0.0006	pass
10		-6.24	-0.0033	pass
20		2.62	0.0014	pass
30		-4.27	-0.0023	pass
40		-6.36	-0.0034	pass
50		-335	-0.1782	pass
20		V min.=102	-5.32	-0.0028
	V max.= 138	-3.65	-0.0019	pass

WCDMA Mode

Middle Channel				
Temperature (°C)	Voltage Supplied (V_{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	120	4.25	0.0023	pass
-20		3.23	0.0017	pass
-10		-4.26	-0.0023	pass
0		6.03	0.0032	pass
10		3.21	0.0017	pass
20		-2.24	-0.0012	pass
30		5.42	0.0029	pass
40		4.09	0.0022	pass
50		2.41	0.0013	pass
20		V min.=102	3.03	0.0016
	V max.= 138	2.27	0.0012	pass

LTE:
QPSK:
Band 2:

10.0 MHz Middle Channel				
Temperature (°C)	Voltage Supplied (V _{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	120	-5.14	-0.0027	pass
-20		-6.97	-0.0037	pass
-10		-5.50	-0.0029	pass
0		6.06	0.0032	pass
10		9.80	0.0052	pass
20		5.03	0.0027	pass
30		-6.62	-0.0035	pass
40		-8.73	-0.0046	pass
50		-7.05	-0.0038	pass
20		V min.=102	8.99	0.0048
	V max.= 138	-7.17	-0.0038	pass

Band 4:

10 MHz Bandwidth Middle Channel					
Temperature (°C)	Voltage Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	1710.0426	1754.9732	1710	1755
-20		1710.0432	1754.9728	1710	1755
-10		1710.0441	1754.9735	1710	1755
0		1710.0429	1754.9724	1710	1755
10		1710.0422	1754.9722	1710	1755
20		1710.0425	1754.9733	1710	1755
30		1710.0442	1754.9729	1710	1755
40		1710.0439	1754.9733	1710	1755
50		1710.0441	1754.9736	1710	1755
20		V min.=102	1710.0445	1754.9725	1710
	V max.= 138	1710.0426	1754.9732	1710	1755

Band 7:

10 MHz Bandwidth Middle Channel					
Temperature (°C)	Voltage Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	2500.0525	2569.9621	2500	2570
-20		2500.0497	2569.9642	2500	2570
-10		2500.0494	2569.9655	2500	2570
0		2500.0499	2569.9644	2500	2570
10		2500.0512	2569.9652	2500	2570
20		2500.0495	2569.9643	2500	2570
30		2500.0502	2569.9649	2500	2570
40		2500.0509	2569.9651	2500	2570
50		2500.0491	2569.9666	2500	2570
20		V min.=102	2500.0507	2569.9635	2500
	V max.= 138	2500.0525	2569.9621	2500	2570

Band 12:

10 MHz Bandwidth Middle Channel					
Temperature (°C)	Voltage Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	699.1202	715.9822	699	716
-20		699.1197	715.9825	699	716
-10		699.1206	715.9831	699	716
0		699.1191	715.9824	699	716
10		699.1194	715.9832	699	716
20		699.1195	715.9814	699	716
30		699.1195	715.9826	699	716
40		699.1198	715.9836	699	716
50		699.1205	715.9799	699	716
20		V min.=102	699.1192	715.9818	699
	V max.= 138	699.1202	715.9822	699	716

Band 13:

10 MHz Bandwidth Middle Channel					
Temperature (°C)	Voltage Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	777.0925	786.9435	777	787
-20		777.0933	786.9444	777	787
-10		777.0924	786.9437	777	787
0		777.0922	786.9451	777	787
10		777.0936	786.9456	777	787
20		777.0942	786.9399	777	787
30		777.0955	786.9458	777	787
40		777.0946	786.9441	777	787
50		777.0942	786.9437	777	787
20		V min.=102	777.0938	786.9439	777
	V max.= 138	777.0925	786.9435	777	787

Band 17:

10 MHz Bandwidth Middle Channel					
Temperature (°C)	Voltage Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	704.0925	715.9435	704	716
-20		704.0933	715.9444	704	716
-10		704.0924	715.9437	704	716
0		704.0922	715.9451	704	716
10		704.0936	715.9456	704	716
20		704.0942	715.9399	704	716
30		704.0955	715.9458	704	716
40		704.0946	715.9441	704	716
50		704.0942	715.9437	704	716
20		V min.=102	704.0938	715.9439	704
	V max.= 138	704.0925	715.9435	704	716

Band 25:

10.0 MHz Middle Channel				
Temperature (°C)	Voltage Supplied (V _{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	120	-7.00	-0.0037	pass
-20		-8.92	-0.0047	pass
-10		7.27	0.0039	pass
0		-8.25	-0.0044	pass
10		5.57	0.003	pass
20		7.28	0.0039	pass
30		7.01	0.0037	pass
40		7.29	0.0039	pass
50		6.57	0.0035	pass
20		V min.=102	5.31	0.0028
	V max.= 138	7.44	0.004	pass

16QAM:**Band 2:**

10.0 MHz Middle Channel				
Temperature (°C)	Voltage Supplied (V _{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	120	-4.79	-0.0025	pass
-20		8.10	0.0043	pass
-10		-8.59	-0.0046	pass
0		9.33	0.005	pass
10		-6.94	-0.0037	pass
20		7.54	0.004	pass
30		6.43	0.0034	pass
40		-6.17	-0.0033	pass
50		-6.44	-0.0034	pass
20		V min.=102	6.34	0.0034
	V max.= 138	-6.89	-0.0037	pass

Band 4:

10 MHz Bandwidth Middle Channel					
Temperature (°C)	Voltage Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	1710.0415	1754.9725	1710	1755
-20		1710.0436	1754.9730	1710	1755
-10		1710.0432	1754.9754	1710	1755
0		1710.0448	1754.9732	1710	1755
10		1710.0436	1754.9771	1710	1755
20		1710.0424	1754.9743	1710	1755
30		1710.0460	1754.9740	1710	1755
40		1710.0431	1754.9767	1710	1755
50		1710.0419	1754.9729	1710	1755
20		V min.=102	1710.0460	1754.9724	1710
	V max.= 138	1710.0430	1754.9731	1710	1755

Band 7:

10 MHz Bandwidth Middle Channel					
Temperature (°C)	Voltage Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	2500.0529	2569.9674	2500	2570
-20		2500.0423	2569.9671	2500	2570
-10		2500.0431	2569.9669	2500	2570
0		2500.0424	2569.9672	2500	2570
10		2500.0526	2569.9674	2500	2570
20		2500.0427	2569.9673	2500	2570
30		2500.0529	2569.9674	2500	2570
40		2500.0521	2569.9672	2500	2570
50		2500.0419	2569.9636	2500	2570
20		V min.=102	2500.0561	2569.9671	2500
	V max.= 138	2500.0534	2569.9670	2500	2570

Band 12:

10 MHz Bandwidth Middle Channel					
Temperature (°C)	Voltage Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	699.1216	715.9830	699	716
-20		699.1116	715.9831	699	716
-10		699.1225	715.9829	699	716
0		699.1119	715.9841	699	716
10		699.1112	715.9830	699	716
20		699.1114	715.9825	699	716
30		699.1116	715.9826	699	716
40		699.1119	715.9841	699	716
50		699.1222	715.9733	699	716
20		V min.=102	699.11116	715.9854	699
	V max.= 138	699.1213	715.9832	699	716

Band 13:

10 MHz Bandwidth Middle Channel					
Temperature (°C)	Voltage Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	777.0941	786.9451	777	787
-20		777.0929	786.9458	777	787
-10		777.0934	786.9453	777	787
0		777.0937	786.9459	777	787
10		777.0935	786.9450	777	787
20		777.0940	786.9361	777	787
30		777.0964	786.9457	777	787
40		777.0971	786.9452	777	787
50		777.0939	786.9456	777	787
20		V min.=102	777.0975	786.9454	777
	V max.= 138	777.0966	786.9457	777	787

Band 17:

10 MHz Bandwidth Middle Channel					
Temperature (°C)	Voltage Supplied (V _{AC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	120	704.0919	715.9427	704	716
-20		704.0926	715.9426	704	716
-10		704.0951	715.9427	704	716
0		704.0930	715.9440	704	716
10		704.0917	715.9434	704	716
20		704.0926	715.9326	704	716
30		704.0932	715.9431	704	716
40		704.0929	715.9426	704	716
50		704.0926	715.9440	704	716
20		V min.=102	704.0930	715.9419	704
	V max.= 138	704.0928	715.9428	704	716

Band 25:

10.0 MHz Middle Channel				
Temperature (°C)	Voltage Supplied (V _{AC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	120	-6.02	-0.0032	pass
-20		8.17	0.0043	pass
-10		8.25	0.0044	pass
0		-7.85	-0.0042	pass
10		6.46	0.0034	pass
20		-6.60	-0.0035	pass
30		-9.98	-0.0053	pass
40		5.47	0.0029	pass
50		-8.73	-0.0046	pass
20		V min.=102	-8.19	-0.0044
	V max.= 138	6.15	0.0033	pass

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