

TEST REPORT

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Report Number: RA230525-29331E-RF-00B
FCC ID: 2ATUK-BN-405

Test Standard (s)

FCC PART 27; FCC PART 22H; FCC PART 24E

Sample Description

Product Type: GPS TRACKER
Model No.: 405,405ABCD, 405A, 405B, 405C, 405D, GPS-405,
GPS-405ABCD, GPS-405A, GPS-405B, GPS-405C, GPS-405D,
BN-405, BN-405ABCD, BN-405A, BN-405B, BN-405C, BN-405D
Trade Mark: BAANOOL, 
Date Received: 2023-05-25
Date of Test: 2023-06-03 to 2023-07-08
Report Date: 2023-07-10

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

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EMC Engineer

Approved By:

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Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230525-29331E-RF-00B	Original Report	2023-07-10

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Type	GPS TRACKER	
Tested Model	405	
Multiple Model	405ABCD, 405A, 405B, 405C, 405D, GPS-405, GPS-405ABCD, GPS-405A, GPS-405B, GPS-405C, GPS-405D, BN-405, BN-405ABCD, BN-405A, BN-405B, BN-405C, BN-405D	
Model difference	Please 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 5: 824-849MHz(TX); 869-894MHz(RX) LTE Band 7: 2500-2570MHz(TX); 2620-2690MHz(RX) LTE Band 40: 2305-2315MHz(TX/RX); 2350-2360MHz(TX/RX)	
Maximum Average Conducted Output Power	GSM 850: 32.75 dBm (GMSK) 26.70 dBm (8PSK)	PCS 1900: 30.58 dBm (GMSK) 25.92 dBm (8PSK)
	WCDMA B2: 22.42 dBm	WCDMA B5: 22.56 dBm
	LTE B2: 22.80 dBm	LTE B4: 23.36 dBm
	LTE B5: 22.84 dBm	LTE B7: 23.55 dBm
	LTE B40(2305-2315MHz): 23.26 dBm	LTE B40(2350-2360MHz): 22.49 dBm
Modulation Technique	2G: GMSK, 8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM	
Antenna Specification*	Internal Antenna (Antenna Gain provided by the applicant)	
	GSM850: -0.04dBi	PCS1900: 0.50dBi
	WCDMA B2: 0.50dBi	WCDMA B5: -0.04dBi
	LTE B2: 0.50dBi	LTE B4: -1.10dBi
	LTE B5: -0.04dBi	LTE B7: 0.60dBi
	LTE B40: 0.62dBi	
Voltage Range	DC 12-24V from Car Power or DC3.7V from built-in battery	
Sample number	268I-1 (RF Radiated Test), 268I-2 (RF Conducted Test) (Assigned by ATC, Shenzhen)	
Sample/EUT Status	Good condition	
Normal/Extreme Condition	L.V.: Low Voltage: 3.5V _{DC} N.V.: Normal Voltage: 3.7V _{DC} H.V.: High Voltage: 4.2V _{DC}	

Objective

This test report is in accordance with Part 2-Subpart J, Part 22-Subpart H, Part 24-Subpart E, and Part 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.
Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		0.082×10^{-7}
RF output power, conducted		0.71dB
Unwanted Emission, conducted		1.6dB
Emissions, Radiated	30MHz - 1GHz	5.08dB
	1GHz - 18GHz	4.96dB
	18GHz - 26.5GHz	5.16dB
	26.5GHz - 40GHz	4.64dB
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 Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, 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.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 30241.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

Test was performed as below table:

Frequency band	Bandwidth (MHz)	Test Frequency(MHz)		
		Low	Middle	High
GSM850	0.25	824.2	836.4	848.8
PCS1900	0.25	1850.2	1880.0	1909.8
WCDMA B2	4.2	1852.4	1880.0	1907.6
WCDMA B5	4.2	826.4	836.4	846.6
LTE B2	1.4	1850.7	1880.0	1909.3
	3	1851.5	1880.0	1908.5
	5	1852.5	1880.0	1907.5
	10	1855	1880.0	1905.0
	15	1857.5	1880.0	1902.5
	20	1860.0	1880.0	1900.0
LTE B4	1.4	1710.7	1732.5	1754.3
	3	1711.5	1732.5	1753.5
	5	1712.5	1732.5	1752.5
	10	1715.0	1732.5	1750.0
	15	1717.5	1732.5	1747.5
	20	1720.0	1732.5	1745.0
LTE B5	1.4	824.7	836.5	848.3
	3	825.5	836.5	847.5
	5	826.5	836.5	846.5
	10	829.0	836.5	844.0
LTE B7	5	2502.5	2535.0	2567.5
	10	2505.0	2535.0	2565.0
	15	2507.5	2535.0	2562.5
	20	2510.0	2535.0	2560.0
LTE B40 (2305MHz-2315MHz)	5	2307.5	2310	2312.5
	10	/	2310	/
LTE B40 (2350MHz-2360MHz)	5	2352.5	2355	2357.5
	10	/	2355.0	/

The path loss (cable loss and splitter inset loss) are 17dB (GSM) and 7dB (WCDMA<E) in the all tests.

Equipment Modifications

No modification was made to the EUT.

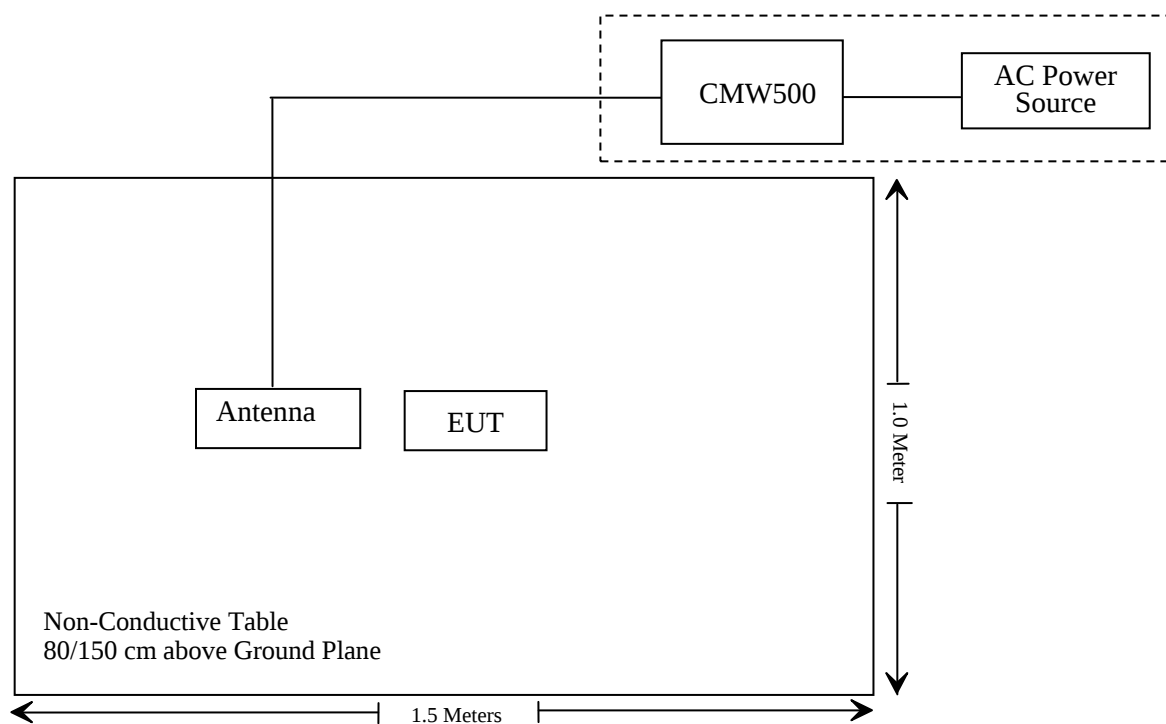
Support Equipment List and Details

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

Support Cable Description

Cable Description	Length (m)	From / Port	To
Unshielded Un-detachable AC cable	1.2	AC Power	CMW500

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde & Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
Rohde & Schwarz	Spectrum Analyzer	FSV40	101949	2022/11/25	2023/11/24
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2023/02/14	2026/02/13
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-655	2022/12/26	2025/12/25
Schwarzbeck	Horn Antenna	BBHA9120D	837	2023/02/22	2026/02/21
Unknown	Band Reject Filter	MSF824-862MS-1147	ATCE-141	2022/11/25	2023/11/24
Unknown	Band Reject Filter	MSF1850-1910MS-1148	ATCE-142	2022/11/25	2023/11/24
Unknown	Band Reject Filter	MSF2495-2570MS-1152	ATCE-146	2022/11/25	2023/11/24
PASTERNAK	Horn Antenn	PE9852/2F-20	1120 (ATC-BA-024-1)	2023/01/04	2026/01/03
PASTERNAK	Horn Antenn	PE9852/2F-20	1120 (ATC-BA-025-1)	2023/01/04	2026/01/03
Agilent	Signal Generator	N5183A	MY51040755	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.11	N1000	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.12	N040	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.13	N300	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.14	N800	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.15	N600	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.16	N650	2022/11/25	2023/11/24
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101948	2022/11/25	2023/11/24
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	154606	2022/11/25	2023/11/24
WEINSCHL	10dB Attenuator	5324	AU 3842	2022/11/25	2023/11/24
Mini-Circuits	Power Splitter	DC-18000MHz	SF10944151S	2022/11/25	2023/11/24
REALE	Temp. & Humid. Chamber	RHP-800BT	R20170318310	2022/11/23	2023/11/22
Fluke	Desktop Multi Meter	45	7664009	2022/12/14	2023/12/13
UNI-T	DC Power Supply	UTP8305B	10584	NCR	NCR
Unknown	RF Coaxial Cable	No.31	RF-01	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).

FCC §1.1307 (b) – RF EXPOSURE

Applicable Standard

According to FCC §1.1307(b), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D04 Interim General RF Exposure Guidance v01, clause 2.1.4 –MPE-Based Exemption:

An alternative to the SAR-based exemption is provided in § 1.1307(b)(3)(i)(C), for a much wider frequency range, from 300 kHz to 100 GHz, applicable for separation distances greater or equal to $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power. For this case, a RF source is an RF exempt device if its ERP (watts) is no more than a frequency-dependent value, as detailed tabular form in Appendix B. These limits have been derived based on the basic specifications on Maximum Permissible Exposure (MPE) considered for the FCC rules in § 1.1310(e)(1).

Table to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$.
1.34-30	$3,450 R^2/f^2$.
30-300	$3.83 R^2$.
300-1,500	$0.0128 R^2 f$.
1,500-100,000	$19.2 R^2$.

f = frequency in MHz;

R = minimum separation distance from the body of a nearby person (appropriate units, e.g., m);

For multiple RF sources: Multiple RF sources are exempt if:

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

Test result

For worst case:

Mode	Frequency Range (MHz)	Tune-up Output Power		Antenna Gain		ERP		Evaluation Distance (cm)	MPE-Based Exemption Threshold (mW)
		(dBm)	(mW)	(dBi)	(dBd)	(dBm)	(mW)		
2.4G Wi-Fi	2412-2462	13.0	19.95	1.72	-0.43	12.57	18.07	20	768
GSM850	824-849	27.5	562.34	-0.04	-2.19	25.31	339.63	20	422
PCS1900	1850-1910	25.0	316.23	0.50	-1.65	23.35	216.27	20	768
WCDMA B2	1850-1910	23.0	199.53	0.50	-1.65	21.35	136.46	20	768
WCDMA B5	824-849	23.0	199.53	-0.04	-2.19	20.81	120.50	20	422
LTE B2	1850-1910	23.0	199.53	0.50	-1.65	21.35	136.46	20	768
LTE B4	1710-1755	23.5	223.87	-1.10	-3.25	20.25	105.93	20	768
LTE B5	824-849	23.0	199.53	-0.04	-2.19	20.81	120.50	20	422
LTE B7	2500-2570	24.0	251.19	0.60	-1.55	22.45	175.79	20	768
LTE B40	2305-2315	23.5	223.87	0.62	-1.53	21.97	157.40	20	768
	2350-2360	23.5	223.87	0.62	-1.53	21.97	157.40	20	768

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

Note 2: 0dBd=2.15dBi.

Note 3: For GSM/GPRS/EDGE, the time base average power as below:

Number of Time slot	1	2	3	4
Duty Cycle	1:8	1:4	1:2.66	1:2
Time based Ave. power compared to slotted Ave. power	-9 dB	-6 dB	-4.25 dB	-3 dB

GSM850:

Mode	Frequency (MHz)	Conducted Output Power (dBm)				Time based average power (dBm)			
		1 slot	2 slots	3 slots	4 slots	1 slot	2 slots	3 slots	4 slots
GSM	824.2	32.71	/	/	/	23.71	/	/	/
	836.6	32.66	/	/	/	23.66	/	/	/
	848.8	32.60	/	/	/	23.60	/	/	/
GPRS	824.2	32.75	31.88	30.98	30.13	23.75	25.88	26.73	27.13
	836.6	32.51	31.32	30.16	29.15	23.51	25.32	25.91	26.15
	848.8	32.55	31.56	30.22	29.06	23.55	25.56	25.97	26.06
EDGE	824.2	26.53	25.36	24.14	23.02	17.53	19.36	19.89	20.02
	836.6	26.59	25.52	24.48	23.37	17.59	19.52	20.23	20.37
	848.8	26.70	25.33	24.48	23.43	17.70	19.33	20.23	20.43

PCS1900:

Mode	Frequency (MHz)	Conducted Output Power (dBm)				Time based average power (dBm)			
		1 slot	2 slots	3 slots	4 slots	1 slot	2 slots	3 slots	4 slots
GSM	1850.2	30.36	/	/	/	21.36	/	/	/
	1880.0	30.57	/	/	/	21.57	/	/	/
	1909.8	30.49	/	/	/	21.49	/	/	/
GPRS	1850.2	30.42	29.26	28.21	27.28	21.42	23.26	23.96	24.28
	1880.0	30.58	29.7	28.72	27.55	21.58	23.70	24.47	24.55
	1909.8	30.5	29.23	28.23	27.08	21.50	23.23	23.98	24.08
EDGE	1850.2	25.82	24.37	23.21	22.26	16.82	18.37	18.96	19.26
	1880.0	25.85	24.87	24.00	22.85	16.85	18.87	19.75	19.85
	1909.8	25.92	25.01	23.98	22.95	16.92	19.01	19.73	19.95

Simultaneous transmitting consideration:

The ratio= $ERP_{Wi-Fi}/limit + ERP_{WWAN}/limit = 18.07/768 + 339.63/422 = 0.83 < 1.0$

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

Result: Compliant.

FCC§2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H,24E&27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046; § 22.913 (a)(d)&§ 24.232 (c)(d); §27.50(a)(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)(d), 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(a), for mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

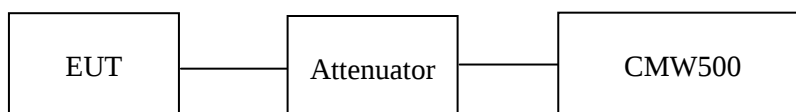
According to §27.50(d), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

According to §27.50(h), the maximum EIRP must not exceed 2Watts (33dBm) for 2496-2690MHz.

Test Procedure

Conducted method:

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



Note: the path loss (cable loss and attenuator) has including in result.

ANSI C63.26-2015 Section 5.5.

Test Data

Environmental Conditions

Temperature:	24-26 °C
Relative Humidity:	55-60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang from 2023-06-02 to 2023-06-16.

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

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	ERP(dBm)	Limit (dBm)
GSM	128	824.2	32.71	30.52	38.45
	190	836.6	32.66	30.47	38.45
	251	848.8	32.60	30.41	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	32.75	31.88	30.98	30.13	30.56	29.69	28.79	27.94	38.45
	190	836.6	32.51	31.32	30.16	29.15	30.32	29.13	27.97	26.96	38.45
	251	848.8	32.55	31.56	30.22	29.06	30.36	29.37	28.03	26.87	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	
EGPRS	128	824.2	26.53	25.36	24.14	23.02	24.34	23.17	21.95	20.83	38.45
	190	836.6	26.59	25.52	24.48	23.37	24.40	23.33	22.29	21.18	38.45
	251	848.8	26.70	25.33	24.48	23.43	24.51	23.14	22.29	21.24	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		22.10	22.42	22.11	19.91	20.23	19.92
	HSDPA	1	21.03	20.27	20.49	18.84	18.08	18.30
		2	20.94	20.20	20.38	18.75	18.01	18.19
		3	20.57	19.79	20.03	18.38	17.60	17.84
		4	20.53	19.79	20.03	18.34	17.60	17.84
	HSUPA	1	21.49	21.67	21.40	19.30	19.48	19.21
		2	21.38	21.56	21.31	19.19	19.37	19.12
		3	21.01	21.18	20.95	18.82	18.99	18.76
		4	20.97	21.09	20.85	18.78	18.90	18.66
		5	21.56	21.75	21.47	19.37	19.56	19.28

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd)

For GSM850 / WCDMA Band5: Antenna Gain = -0.04dBi = -2.19dBd (0dBd=2.15dBi)

Limit: ERP≤38.45dBm

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	EIRP(dBm)	Limit (dBm)
GSM	512	1850.2	30.36	30.86	33
	661	1880.0	30.57	31.07	33
	810	1909.8	30.49	30.99	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	30.42	29.26	28.21	27.28	30.92	29.76	28.71	27.78	33
	661	1880.0	30.58	29.70	28.72	27.55	31.08	30.20	29.22	28.05	33
	810	1909.8	30.50	29.23	28.23	27.08	31.00	29.73	28.73	27.58	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	
EGPRS	512	1850.2	25.82	24.37	23.21	22.26	26.32	24.87	23.71	22.76	33
	661	1880.0	25.85	24.87	24.00	22.85	26.35	25.37	24.50	23.35	33
	810	1909.8	25.92	25.01	23.98	22.95	26.42	25.51	24.48	23.45	33

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
WCDMA (Band 2)	RMC12.2k		22.56	22.12	22.16	23.06	22.62	22.66
	HSDPA	1	21.03	21.51	21.89	21.53	22.01	22.39
		2	20.97	21.40	21.79	21.47	21.90	22.29
		3	20.52	21.03	21.41	21.02	21.53	21.91
		4	20.55	21.05	21.43	21.05	21.55	21.93
	HSUPA	1	20.69	20.88	21.25	21.19	21.38	21.75
		2	20.58	20.77	21.16	21.08	21.27	21.66
		3	20.19	20.41	20.77	20.69	20.91	21.27
		4	20.18	20.40	20.76	20.68	20.90	21.26
		5	20.79	20.99	21.31	21.29	21.49	21.81

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)

For PCS1900 / WCDMA Band2: Antenna Gain = 0.5dBi

Limit: EIRP≤33dBm

LTE Band 2

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	22.68	22.77	22.49	23.18	23.27	22.99
		RB1#3	22.60	22.63	22.31	23.10	23.13	22.81
		RB1#5	22.72	22.76	22.39	23.22	23.26	22.89
		RB3#0	22.56	22.61	22.32	23.06	23.11	22.82
		RB3#3	22.55	22.62	22.26	23.05	23.12	22.76
		RB6#0	21.65	21.68	21.37	22.15	22.18	21.87
	16QAM	RB1#0	21.73	21.87	21.67	22.23	22.37	22.17
		RB1#3	21.68	21.72	21.52	22.18	22.22	22.02
		RB1#5	21.74	21.80	21.61	22.24	22.30	22.11
		RB3#0	21.72	21.89	21.37	22.22	22.39	21.87
		RB3#3	21.71	21.91	21.33	22.21	22.41	21.83
		RB6#0	20.64	20.78	20.43	21.14	21.28	20.93
3.0	QPSK	RB1#0	22.42	22.56	22.40	22.92	23.06	22.90
		RB1#8	22.47	22.62	22.29	22.97	23.12	22.79
		RB1#14	22.43	22.57	22.08	22.93	23.07	22.58
		RB6#0	21.47	21.61	21.41	21.97	22.11	21.91
		RB6#9	21.52	21.62	21.27	22.02	22.12	21.77
		RB15#0	21.48	21.61	21.36	21.98	22.11	21.86
	16QAM	RB1#0	21.55	21.69	21.99	22.05	22.19	22.49
		RB1#8	21.64	21.66	21.90	22.14	22.16	22.40
		RB1#14	21.65	21.62	21.70	22.15	22.12	22.20
		RB6#0	20.54	20.69	20.50	21.04	21.19	21.00
		RB6#9	20.63	20.63	20.41	21.13	21.13	20.91
		RB15#0	20.47	20.72	20.46	20.97	21.22	20.96

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	22.30	22.51	22.30	22.80	23.01	22.80
		RB1#13	22.44	22.50	22.26	22.94	23.00	22.76
		RB1#24	22.56	22.42	21.98	23.06	22.92	22.48
		RB15#0	21.37	21.48	21.35	21.87	21.98	21.85
		RB15#10	21.47	21.49	21.21	21.97	21.99	21.71
		RB25#0	21.43	21.44	21.21	21.93	21.94	21.71
	16QAM	RB1#0	21.63	21.66	21.22	22.13	22.16	21.72
		RB1#13	21.79	21.60	21.22	22.29	22.10	21.72
		RB1#24	21.88	21.58	20.98	22.38	22.08	21.48
		RB15#0	20.41	20.62	20.41	20.91	21.12	20.91
		RB15#10	20.53	20.56	20.27	21.03	21.06	20.77
		RB25#0	20.50	20.53	20.29	21.00	21.03	20.79
10.0	QPSK	RB1#0	22.05	22.39	22.30	22.55	22.89	22.80
		RB1#25	22.45	22.30	22.12	22.95	22.80	22.62
		RB1#49	22.60	22.20	21.70	23.10	22.70	22.20
		RB25#0	21.13	21.37	21.13	21.63	21.87	21.63
		RB25#25	21.54	21.19	20.99	22.04	21.69	21.49
		RB50#0	21.37	21.14	21.07	21.87	21.64	21.57
	16QAM	RB1#0	21.15	21.46	21.84	21.65	21.96	22.34
		RB1#25	21.69	21.34	21.77	22.19	21.84	22.27
		RB1#49	21.75	21.29	21.34	22.25	21.79	21.84
		RB25#0	20.25	20.49	20.27	20.75	20.99	20.77
		RB25#25	20.65	20.36	20.13	21.15	20.86	20.63
		RB50#0	20.47	20.25	20.17	20.97	20.75	20.67

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	22.07	22.60	22.14	22.57	23.10	22.64
		RB1#38	22.62	22.26	22.21	23.12	22.76	22.71
		RB1#74	22.78	22.19	21.81	23.28	22.69	22.31
		RB36#0	21.32	21.49	21.41	21.82	21.99	21.91
		RB36#39	21.78	21.27	21.13	22.28	21.77	21.63
		RB75#0	21.57	21.18	21.38	22.07	21.68	21.88
	16QAM	RB1#0	21.22	22.07	21.75	21.72	22.57	22.25
		RB1#38	21.81	21.71	21.81	22.31	22.21	22.31
		RB1#74	21.93	21.63	21.44	22.43	22.13	21.94
		RB36#0	20.43	20.51	20.50	20.93	21.01	21.00
		RB36#39	20.89	20.38	20.22	21.39	20.88	20.72
		RB75#0	20.70	20.28	20.48	21.20	20.78	20.98
20.0	QPSK	RB1#0	22.00	22.61	21.85	22.50	23.11	22.35
		RB1#50	22.76	22.18	22.50	23.26	22.68	23.00
		RB1#99	22.80	21.90	21.85	23.30	22.40	22.35
		RB50#0	21.31	21.41	21.07	21.81	21.91	21.57
		RB50#50	21.72	21.11	21.12	22.22	21.61	21.62
		RB100#0	21.68	21.04	21.57	22.18	21.54	22.07
	16QAM	RB1#0	21.18	22.25	21.17	21.68	22.75	21.67
		RB1#50	22.05	21.81	21.84	22.55	22.31	22.34
		RB1#99	21.99	21.59	21.22	22.49	22.09	21.72
		RB50#0	20.40	20.49	20.08	20.90	20.99	20.58
		RB50#50	20.81	20.24	20.15	21.31	20.74	20.65
		RB100#0	20.79	20.16	20.68	21.29	20.66	21.18

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)

For Band2: Antenna Gain = 0.50dBi

Limit: EIRP ≤ 33dBm

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	23.36	22.88	22.98	22.26	21.78	21.88
		RB1#3	23.19	22.79	22.72	22.09	21.69	21.62
		RB1#5	23.22	22.88	22.72	22.12	21.78	21.62
		RB3#0	23.20	22.79	22.79	22.10	21.69	21.69
		RB3#3	23.22	22.77	22.68	22.12	21.67	21.58
		RB6#0	22.21	21.83	21.79	21.11	20.73	20.69
	16QAM	RB1#0	22.40	21.93	22.05	21.30	20.83	20.95
		RB1#3	22.33	21.86	21.79	21.23	20.76	20.69
		RB1#5	22.32	21.92	21.85	21.22	20.82	20.75
		RB3#0	22.23	21.92	22.08	21.13	20.82	20.98
		RB3#3	22.21	21.90	21.95	21.11	20.80	20.85
		RB6#0	21.30	20.86	20.97	20.20	19.76	19.87
3.0	QPSK	RB1#0	23.21	22.81	22.99	22.11	21.71	21.89
		RB1#8	23.10	22.79	22.84	22.00	21.69	21.74
		RB1#14	23.11	22.78	22.55	22.01	21.68	21.45
		RB6#0	22.17	21.79	22.10	21.07	20.69	21.00
		RB6#9	22.14	21.74	21.77	21.04	20.64	20.67
		RB15#0	22.17	21.79	21.97	21.07	20.69	20.87
	16QAM	RB1#0	22.33	21.82	22.56	21.23	20.72	21.46
		RB1#8	22.31	21.81	22.45	21.21	20.71	21.35
		RB1#14	22.28	21.77	22.14	21.18	20.67	21.04
		RB6#0	21.30	20.87	21.23	20.20	19.77	20.13
		RB6#9	21.27	20.76	20.98	20.17	19.66	19.88
		RB15#0	21.24	20.96	21.08	20.14	19.86	19.98

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	23.16	22.74	23.25	22.06	21.64	22.15
		RB1#13	23.20	22.79	23.07	22.10	21.69	21.97
		RB1#24	23.16	22.74	22.62	22.06	21.64	21.52
		RB15#0	22.19	21.83	22.27	21.09	20.73	21.17
		RB15#10	22.24	21.80	21.98	21.14	20.70	20.88
		RB25#0	22.19	21.78	22.09	21.09	20.68	20.99
	16QAM	RB1#0	22.46	21.85	22.17	21.36	20.75	21.07
		RB1#13	22.51	21.91	22.05	21.41	20.81	20.95
		RB1#24	22.43	21.88	21.60	21.33	20.78	20.50
		RB15#0	21.23	20.92	21.34	20.13	19.82	20.24
		RB15#10	21.24	20.95	21.06	20.14	19.85	19.96
		RB25#0	21.25	20.92	21.21	20.15	19.82	20.11
10.0	QPSK	RB1#0	23.05	22.74	22.69	21.95	21.64	21.59
		RB1#25	23.12	22.71	23.23	22.02	21.61	22.13
		RB1#49	23.03	22.55	22.48	21.93	21.45	21.38
		RB25#0	22.03	21.55	21.95	20.93	20.45	20.85
		RB25#25	22.12	21.60	21.99	21.02	20.50	20.89
		RB50#0	22.04	21.60	22.21	20.94	20.50	21.11
	16QAM	RB1#0	22.17	21.78	22.35	21.07	20.68	21.25
		RB1#25	22.35	21.77	22.85	21.25	20.67	21.75
		RB1#49	22.29	21.63	22.14	21.19	20.53	21.04
		RB25#0	21.18	20.76	21.13	20.08	19.66	20.03
		RB25#25	21.18	20.78	21.18	20.08	19.68	20.08
		RB50#0	21.11	20.70	21.27	20.01	19.60	20.17

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	23.11	23.11	22.71	22.01	22.01	21.61
		RB1#38	23.21	22.82	23.05	22.11	21.72	21.95
		RB1#74	23.26	22.66	22.74	22.16	21.56	21.64
		RB36#0	22.14	21.84	21.86	21.04	20.74	20.76
		RB36#39	22.31	21.81	22.32	21.21	20.71	21.22
		RB75#0	22.23	21.74	22.14	21.13	20.64	21.04
	16QAM	RB1#0	22.29	22.52	22.27	21.19	21.42	21.17
		RB1#38	22.38	22.22	22.65	21.28	21.12	21.55
		RB1#74	22.43	22.10	22.36	21.33	21.00	21.26
		RB36#0	21.23	20.93	20.92	20.13	19.83	19.82
		RB36#39	21.35	20.83	21.38	20.25	19.73	20.28
		RB75#0	21.30	20.85	21.22	20.20	19.75	20.12
20.0	QPSK	RB1#0	23.06	23.08	22.66	21.96	21.98	21.56
		RB1#50	23.23	22.79	22.89	22.13	21.69	21.79
		RB1#99	22.94	22.71	22.82	21.84	21.61	21.72
		RB50#0	22.14	21.81	21.69	21.04	20.71	20.59
		RB50#50	22.14	21.72	22.23	21.04	20.62	21.13
		RB100#0	22.04	21.65	21.99	20.94	20.55	20.89
	16QAM	RB1#0	22.18	22.68	21.95	21.08	21.58	20.85
		RB1#50	22.47	22.37	22.20	21.37	21.27	21.10
		RB1#99	22.16	22.37	22.18	21.06	21.27	21.08
		RB50#0	21.19	20.90	20.80	20.09	19.80	19.70
		RB50#50	21.24	20.81	21.27	20.14	19.71	20.17
		RB100#0	21.13	20.69	21.06	20.03	19.59	19.96

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)

For Band4: Antenna Gain = -1.10dBi

Limit: EIRP ≤ 30dBm

LTE Band 5

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	22.77	22.55	22.39	20.58	20.36	20.20
		RB1#3	22.64	22.45	22.22	20.45	20.26	20.03
		RB1#5	22.84	22.59	22.27	20.65	20.40	20.08
		RB3#0	22.58	22.43	22.23	20.39	20.24	20.04
		RB3#3	22.63	22.47	22.16	20.44	20.28	19.97
		RB6#0	21.64	21.55	21.25	19.45	19.36	19.06
	16QAM	RB1#0	21.78	21.77	21.35	19.59	19.58	19.16
		RB1#3	21.66	21.69	21.27	19.47	19.50	19.08
		RB1#5	21.83	21.76	21.34	19.64	19.57	19.15
		RB3#0	21.87	21.53	21.36	19.68	19.34	19.17
		RB3#3	21.88	21.58	21.29	19.69	19.39	19.10
		RB6#0	20.65	20.56	20.25	18.46	18.37	18.06
3	QPSK	RB1#0	22.52	22.39	22.24	20.33	20.20	20.05
		RB1#8	22.68	22.43	22.25	20.49	20.24	20.06
		RB1#14	22.67	22.44	22.17	20.48	20.25	19.98
		RB6#0	21.53	21.46	21.34	19.34	19.27	19.15
		RB6#9	21.72	21.55	21.29	19.53	19.36	19.10
		RB15#0	21.66	21.55	21.35	19.47	19.36	19.16
	16QAM	RB1#0	21.67	21.52	21.90	19.48	19.33	19.71
		RB1#8	21.86	21.59	21.85	19.67	19.40	19.66
		RB1#14	21.88	21.59	21.79	19.69	19.40	19.60
		RB6#0	20.59	20.50	20.53	18.40	18.31	18.34
		RB6#9	20.80	20.59	20.45	18.61	18.40	18.26
		RB15#0	20.66	20.56	20.47	18.47	18.37	18.28

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
5	QPSK	RB1#0	22.54	22.44	22.43	20.35	20.25	20.24
		RB1#13	22.72	22.46	22.34	20.53	20.27	20.15
		RB1#24	22.71	22.48	22.23	20.52	20.29	20.04
		RB15#0	21.74	21.52	21.40	19.55	19.33	19.21
		RB15#10	21.79	21.59	21.38	19.60	19.40	19.19
		RB25#0	21.75	21.52	21.35	19.56	19.33	19.16
	16QAM	RB1#0	21.87	21.64	21.38	19.68	19.45	19.19
		RB1#13	22.15	21.69	21.33	19.96	19.50	19.14
		RB1#24	22.05	21.64	21.16	19.86	19.45	18.97
		RB15#0	20.74	20.59	20.54	18.55	18.40	18.35
		RB15#10	20.80	20.65	20.41	18.61	18.46	18.22
		RB25#0	20.70	20.59	20.46	18.51	18.40	18.27
10	QPSK	RB1#0	22.31	22.25	22.53	20.12	20.06	20.34
		RB1#25	22.51	22.27	22.60	20.32	20.08	20.41
		RB1#49	22.27	22.33	22.35	20.08	20.14	20.16
		RB25#0	21.44	21.29	21.70	19.25	19.10	19.51
		RB25#25	21.37	21.32	21.54	19.18	19.13	19.35
		RB50#0	21.41	21.24	21.50	19.22	19.05	19.31
	16QAM	RB1#0	21.41	21.25	22.09	19.22	19.06	19.90
		RB1#25	21.71	21.79	22.24	19.52	19.60	20.05
		RB1#49	21.43	21.82	21.93	19.24	19.63	19.74
		RB25#0	20.49	20.80	20.76	18.30	18.61	18.57
		RB25#25	20.47	20.74	20.61	18.28	18.55	18.42
		RB50#0	20.45	20.70	20.52	18.26	18.51	18.33

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd)

For Band5: Antenna Gain = -0.04dBi = -2.19dBd (0dBd=2.15dBi)

Limit: ERP≤38.45dBm

LTE Band 7

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	23.07	23.12	22.74	23.67	23.72	23.34
		RB1#13	23.29	23.23	22.79	23.89	23.83	23.39
		RB1#24	23.34	23.15	22.66	23.94	23.75	23.26
		RB15#0	22.39	22.30	21.90	22.99	22.90	22.50
		RB15#10	22.56	22.41	21.88	23.16	23.01	22.48
		RB25#0	22.47	22.33	21.86	23.07	22.93	22.46
	16QAM	RB1#0	22.47	22.23	21.77	23.07	22.83	22.37
		RB1#13	22.72	22.42	21.83	23.32	23.02	22.43
		RB1#24	22.75	22.31	21.73	23.35	22.91	22.33
		RB15#0	21.47	21.42	21.01	22.07	22.02	21.61
		RB15#10	21.70	21.54	20.99	22.30	22.14	21.59
		RB25#0	21.62	21.47	21.00	22.22	22.07	21.60
10.0	QPSK	RB1#0	23.08	23.10	22.79	23.68	23.70	23.39
		RB1#25	23.45	23.26	22.91	24.05	23.86	23.51
		RB1#49	23.47	23.17	22.61	24.07	23.77	23.21
		RB25#0	22.51	22.34	21.87	23.11	22.94	22.47
		RB25#25	22.73	22.48	21.84	23.33	23.08	22.44
		RB50#0	22.64	22.37	21.83	23.24	22.97	22.43
	16QAM	RB1#0	22.71	22.38	21.80	23.31	22.98	22.40
		RB1#25	23.04	22.59	21.97	23.64	23.19	22.57
		RB1#49	23.09	22.48	21.70	23.69	23.08	22.30
		RB25#0	21.69	21.41	21.01	22.29	22.01	21.61
		RB25#25	21.90	21.55	20.99	22.50	22.15	21.59
		RB50#0	21.77	21.43	20.92	22.37	22.03	21.52

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	23.21	23.25	22.72	23.81	23.85	23.32
		RB1#38	23.51	23.24	22.76	24.11	23.84	23.36
		RB1#74	23.52	23.23	22.52	24.12	23.83	23.12
		RB36#0	22.57	22.33	21.86	23.17	22.93	22.46
		RB36#39	22.74	22.45	21.84	23.34	23.05	22.44
		RB75#0	22.66	22.32	21.83	23.26	22.92	22.43
	16QAM	RB1#0	22.47	22.65	22.33	23.07	23.25	22.93
		RB1#38	22.81	22.68	22.42	23.41	23.28	23.02
		RB1#74	22.81	22.63	22.16	23.41	23.23	22.76
		RB36#0	21.73	21.39	20.98	22.33	21.99	21.58
		RB36#39	21.90	21.54	20.95	22.50	22.14	21.55
		RB75#0	21.81	21.39	20.98	22.41	21.99	21.58
20.0	QPSK	RB1#0	23.15	23.08	22.93	23.75	23.68	23.53
		RB1#50	23.55	23.15	22.74	24.15	23.75	23.34
		RB1#99	23.50	23.12	22.49	24.10	23.72	23.09
		RB50#0	22.56	22.26	21.79	23.16	22.86	22.39
		RB50#50	22.58	22.37	21.68	23.18	22.97	22.28
		RB100#0	22.58	22.24	21.77	23.18	22.84	22.37
	16QAM	RB1#0	22.37	22.78	22.27	22.97	23.38	22.87
		RB1#50	22.83	22.85	22.12	23.43	23.45	22.72
		RB1#99	22.72	22.78	21.89	23.32	23.38	22.49
		RB50#0	21.68	21.32	20.91	22.28	21.92	21.51
		RB50#50	21.71	21.46	20.80	22.31	22.06	21.40
		RB100#0	21.72	21.33	20.74	22.32	21.93	21.34

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)

For Band 7: Antenna Gain = 0.60dBi

Limit: EIRP≤33dBm

LTE Band 40:

2305-2315MHz

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	23.09	23.02	23.10	23.71	23.64	23.72
		RB1#13	23.17	23.13	23.00	23.79	23.75	23.62
		RB1#24	23.06	22.92	22.90	23.68	23.54	23.52
		RB15#0	22.17	22.08	21.99	22.79	22.70	22.61
		RB15#10	22.10	21.99	21.89	22.72	22.61	22.51
		RB25#0	22.12	22.06	21.89	22.74	22.68	22.51
	16QAM	RB1#0	22.17	22.13	22.37	22.79	22.75	22.99
		RB1#13	22.25	22.22	22.26	22.87	22.84	22.88
		RB1#24	22.12	22.00	22.15	22.74	22.62	22.77
		RB15#0	21.12	21.15	21.06	21.74	21.77	21.68
		RB15#10	21.04	21.10	21.03	21.66	21.72	21.65
		RB25#0	21.15	21.14	20.90	21.77	21.76	21.52
10.0	QPSK	RB1#0	/	23.18	/	/	23.80	/
		RB1#25	/	23.26	/	/	23.88	/
		RB1#49	/	22.78	/	/	23.40	/
		RB25#0	/	22.16	/	/	22.78	/
		RB25#25	/	21.95	/	/	22.57	/
		RB50#0	/	22.08	/	/	22.70	/
	16QAM	RB1#0	/	22.04	/	/	22.66	/
		RB1#25	/	22.21	/	/	22.83	/
		RB1#49	/	21.71	/	/	22.33	/
		RB25#0	/	21.20	/	/	21.82	/
		RB25#25	/	21.02	/	/	21.64	/
		RB50#0	/	21.11	/	/	21.73	/

2350-2360MHz

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5	QPSK	RB1#0	22.14	22.21	22.23	22.76	22.83	22.85
		RB1#13	22.28	22.43	22.43	22.90	23.05	23.05
		RB1#24	22.24	22.26	22.26	22.86	22.88	22.88
		RB15#0	21.28	21.33	21.37	21.90	21.95	21.99
		RB15#10	21.35	21.36	21.41	21.97	21.98	22.03
		RB25#0	21.29	21.34	21.37	21.91	21.96	21.99
	16QAM	RB1#0	21.34	21.49	21.30	21.96	22.11	21.92
		RB1#13	21.52	21.74	21.52	22.14	22.36	22.14
		RB1#24	21.36	21.56	21.35	21.98	22.18	21.97
		RB15#0	20.27	20.36	20.30	20.89	20.98	20.92
		RB15#10	20.34	20.39	20.33	20.96	21.01	20.95
		RB25#0	20.32	20.30	20.38	20.94	20.92	21.00
10	QPSK	RB1#0	/	22.11	/	/	22.73	/
		RB1#25	/	22.49	/	/	23.11	/
		RB1#49	/	22.20	/	/	22.82	/
		RB25#0	/	21.25	/	/	21.87	/
		RB25#25	/	21.35	/	/	21.97	/
		RB50#0	/	21.30	/	/	21.92	/
	16QAM	RB1#0	/	21.12	/	/	21.74	/
		RB1#25	/	21.47	/	/	22.09	/
		RB1#49	/	21.19	/	/	21.81	/
		RB25#0	/	20.26	/	/	20.88	/
		RB25#25	/	20.37	/	/	20.99	/
		RB50#0	/	20.29	/	/	20.91	/

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)

For Band 40: Antenna Gain = 0.62dBi

Limit: EIRP≤24dBm/5MHz

For 5MHz bandwidth, the channel power is equal to the test result in dBm/5MHz..

For 10MHz bandwidth, the channel power is the sum power of 10MHz bandwidth, the result is less than 24dBm, so in any 5MHz bandwidth, it's will not exceed limit

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

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	9.48	13
	Middle	9.62	13
	High	9.48	13
GPRS	Low	9.71	13
	Middle	9.65	13
	High	9.48	13
EGPRS	Low	9.62	13
	Middle	9.51	13
	High	9.54	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	2.99	13
	Middle	2.99	13
	High	2.99	13
HSDPA (16QAM)	Low	4.99	13
	Middle	5.04	13
	High	5.04	13
HSUPA (QPSK)	Low	6.17	13
	Middle	6.17	13
	High	6.09	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	9.54	13
	Middle	9.48	13
	High	9.59	13
GPRS	Low	9.59	13
	Middle	9.59	13
	High	9.71	13
EGPRS	Low	9.48	13
	Middle	9.48	13
	High	9.65	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.16	13
	Middle	3.22	13
	High	3.13	13
HSDPA (16QAM)	Low	5.10	13
	Middle	5.07	13
	High	5.04	13
HSUPA (QPSK)	Low	6.41	13
	Middle	6.49	13
	High	6.29	13

LTE Band: (pre-scan all bandwidth, the worst case as below)

LTE Band 2 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.93	5.04	4.49	13	Pass
QPSK (100RB Size)	4.06	4.17	4.00	13	Pass
16QAM (1RB Size)	5.80	6.26	5.25	13	Pass
16QAM (100RB Size)	5.83	5.94	5.77	13	Pass

LTE Band 4 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.57	4.93	5.01	13	Pass
QPSK (100RB Size)	4	4.17	4.06	13	Pass
16QAM (1RB Size)	5.77	5.83	6.06	13	Pass
16QAM (100RB Size)	5.71	5.94	5.71	13	Pass

LTE Band 5 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.3	6.17	5.45	13	Pass
QPSK (50RB Size)	5.19	5.16	5.04	13	Pass
16QAM (1RB Size)	5.86	7.1	5.48	13	Pass
16QAM (50RB Size)	6.12	6.06	6.09	13	Pass

LTE Band 7 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.04	4.41	3.51	13	Pass
QPSK (100RB Size)	3.59	3.68	3.88	13	Pass
16QAM (1RB Size)	3.97	5.48	4.29	13	Pass
16QAM (100RB Size)	5.3	5.45	5.68	13	Pass

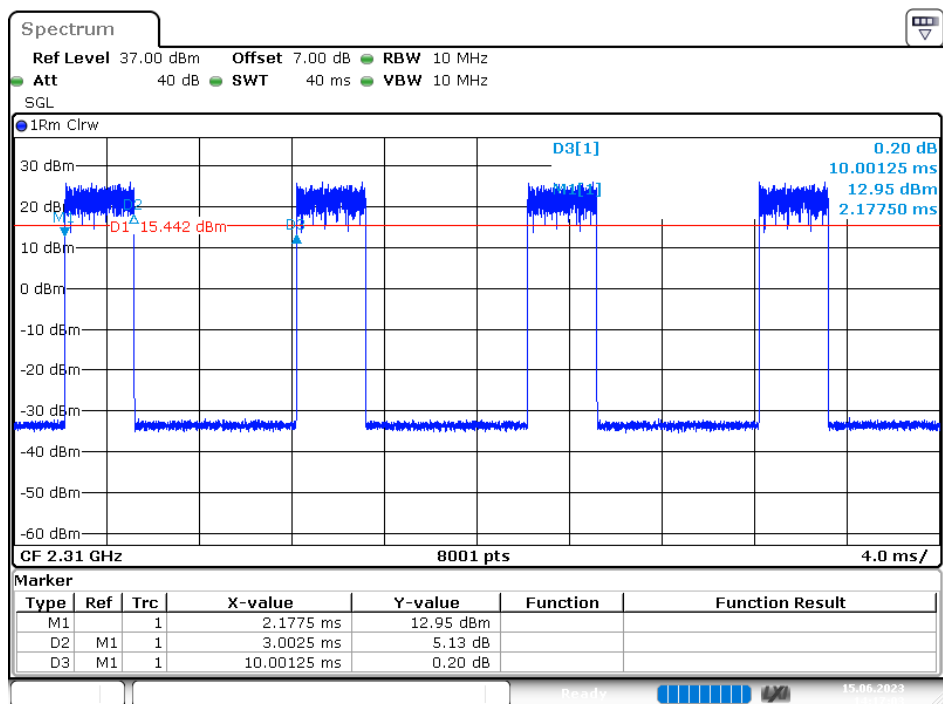
Duty Cycle:**LTE Band 40****2305-2315MHz**

Test Modulation	Test Bandwidth	Ton (ms)	Total (ms)	Duty Cycle (%)	Limit (%)
QPSK	5M	3.003	10.001	30.03	38
	10M	2.998	9.996	29.99	
16-QAM	5M	2.998	9.996	29.99	
	10M	2.988	10.001	29.98	

2350-2360MHz

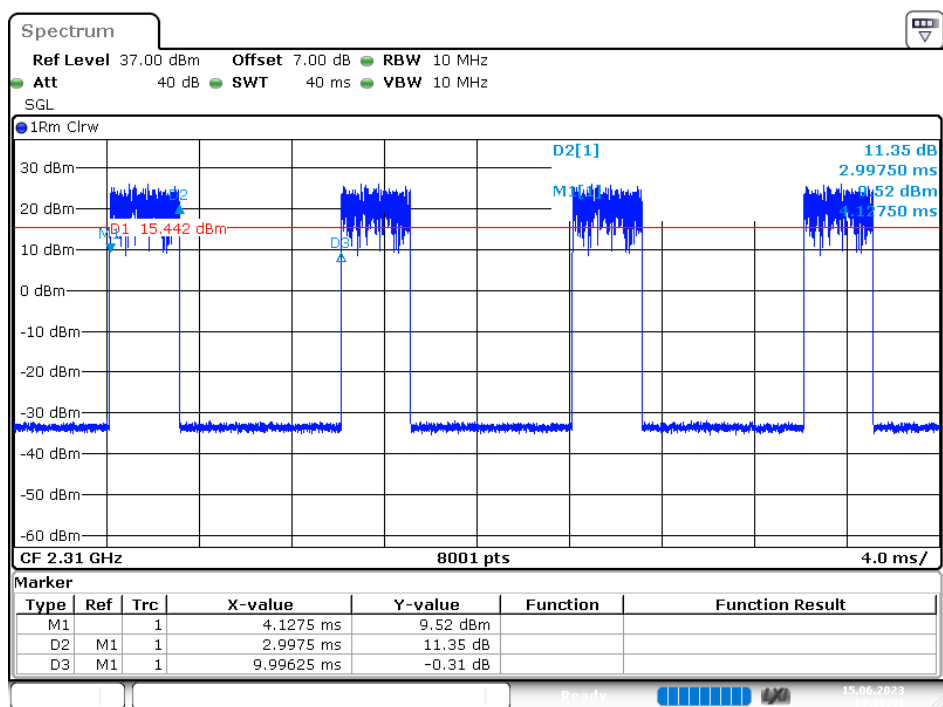
Test Modulation	Test Bandwidth	Ton (ms)	Total (ms)	Duty Cycle (%)	Limit (%)
QPSK	5M	2.933	9.971	29.42	38
	10M	2.993	9.996	29.94	
16-QAM	5M	2.928	10.071	29.07	
	10M	2.993	10.006	29.91	

LTE Band 40_5M_QPSK_(2305-2315)MHz



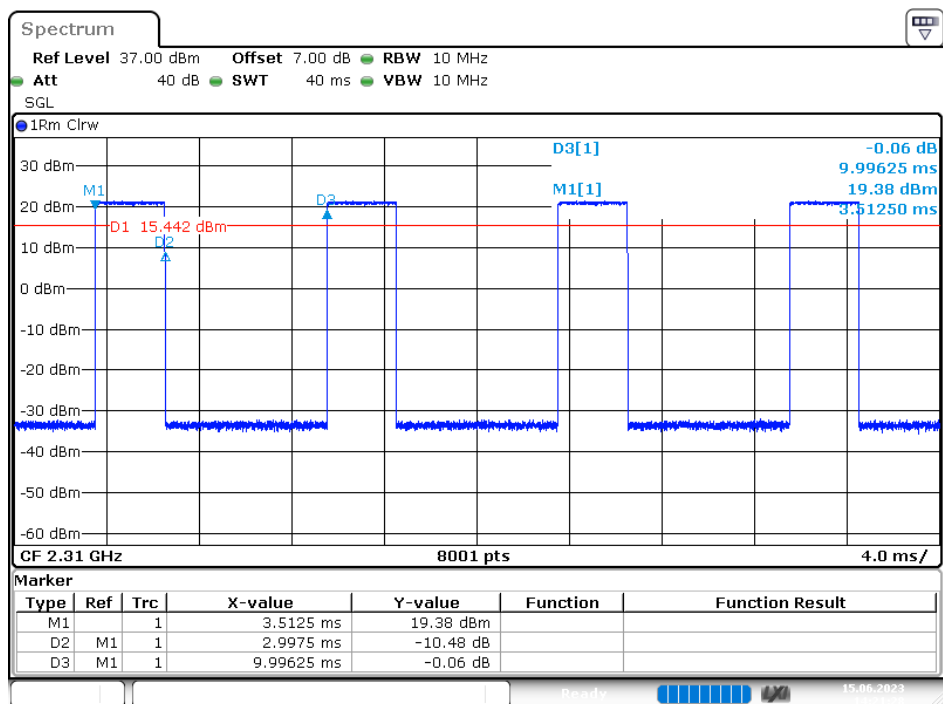
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LTE Band 40_5M_16QAM_(2305-2315)MHz



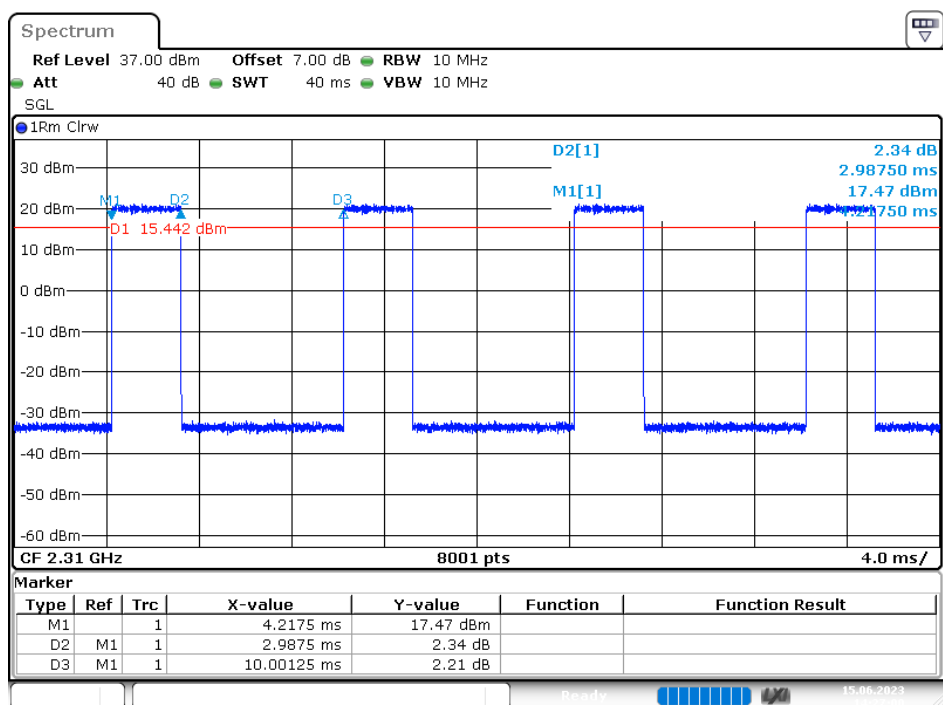
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LTE Band 40_10M_QPSK_(2305-2315)MHz



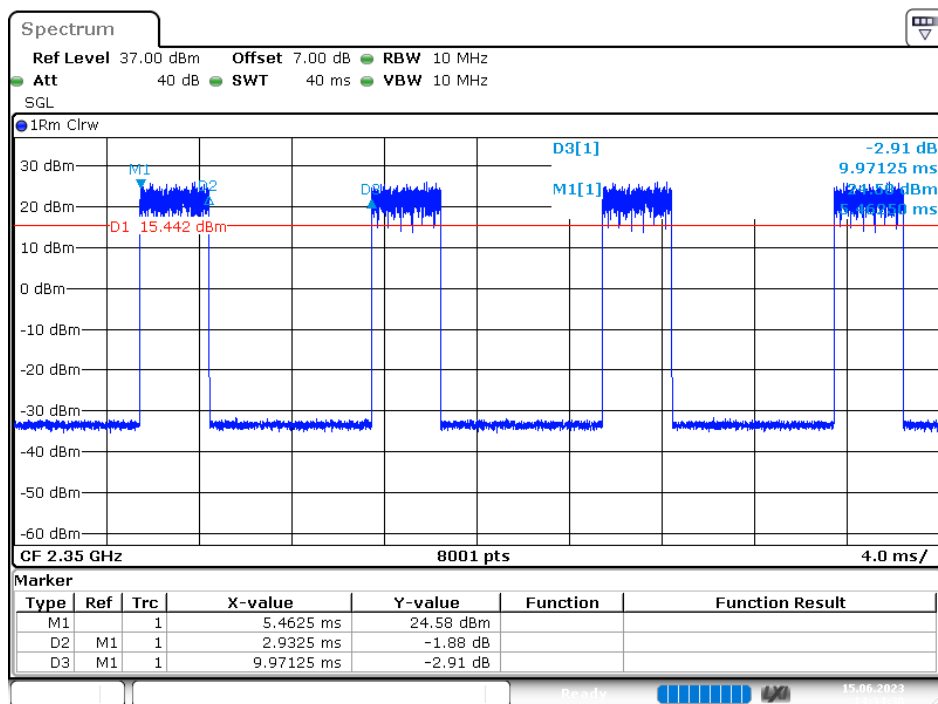
Date: 15.JUN.2023 14:21:29

LTE Band 40_10M_16QAM_(2305-2315)MHz



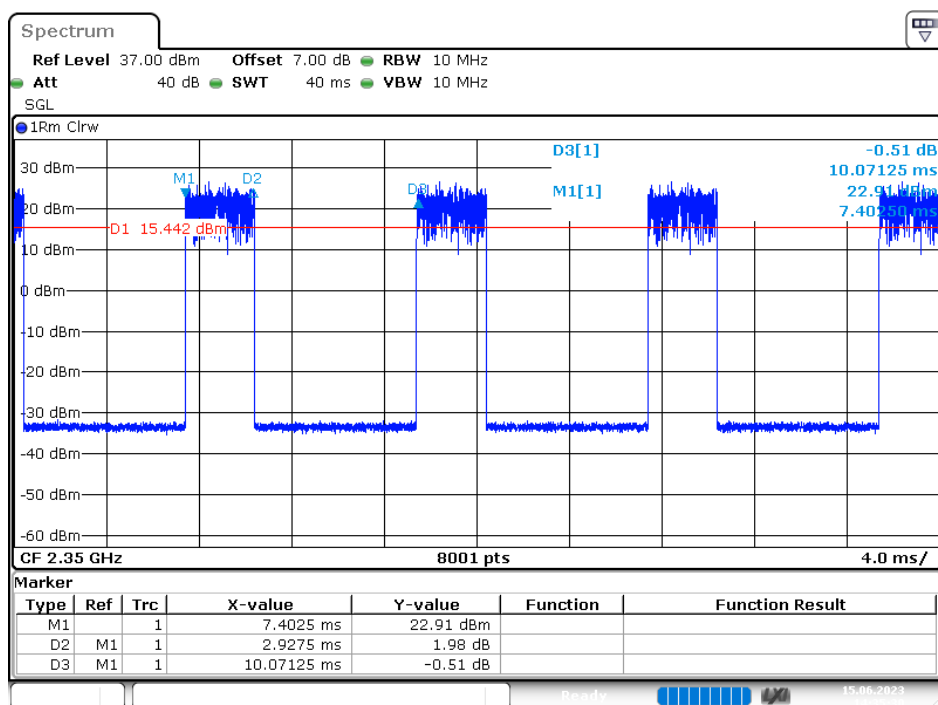
Date: 15.JUN.2023 14:27:00

LTE Band 40_5M_QPSK_(2350-2360)MHz



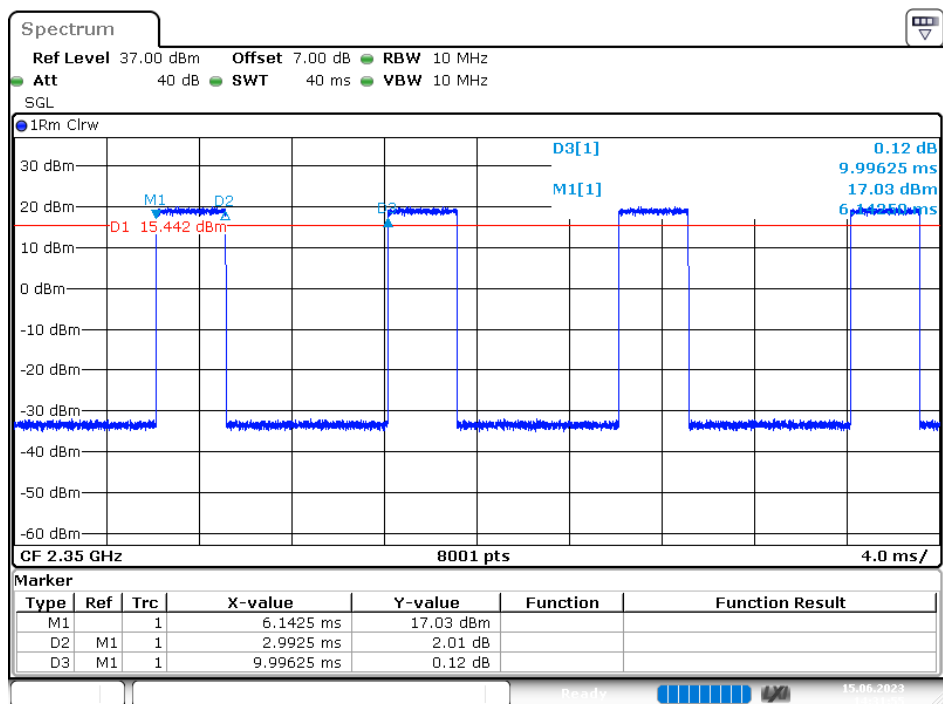
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LTE Band 40_5M_16QAM_(2350-2360)MHz



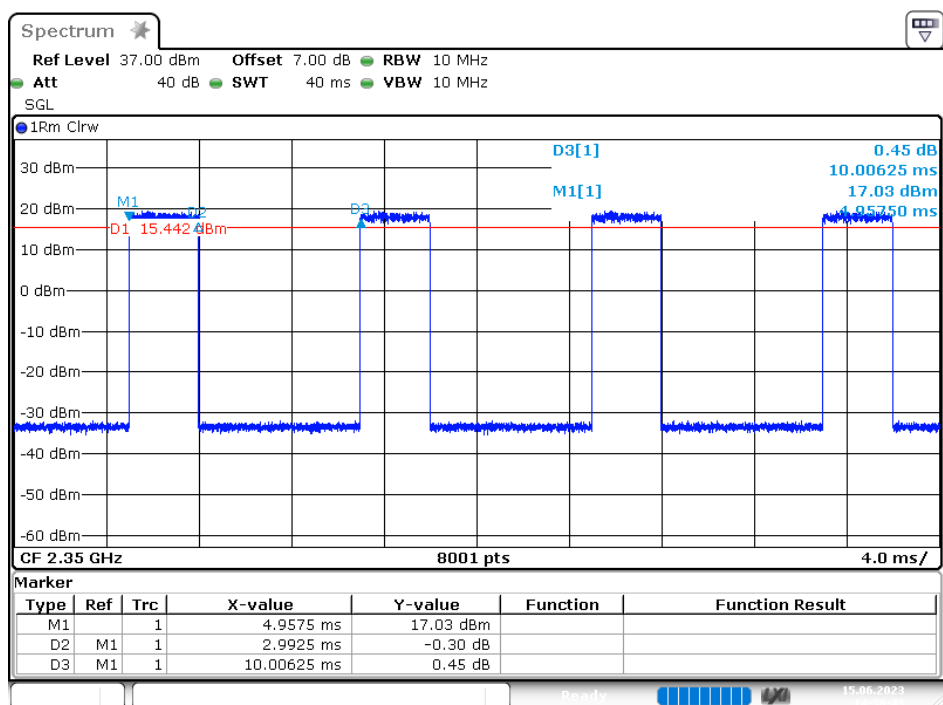
Date: 15.JUN.2023 14:35:31

LTE Band 40_10M_QPSK_(2350-2360)MHz



Date: 15.JUN.2023 14:31:56

LTE Band 40_10M_16QAM_(2350-2360)MHz



Date: 15.JUN.2023 14:30:43

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

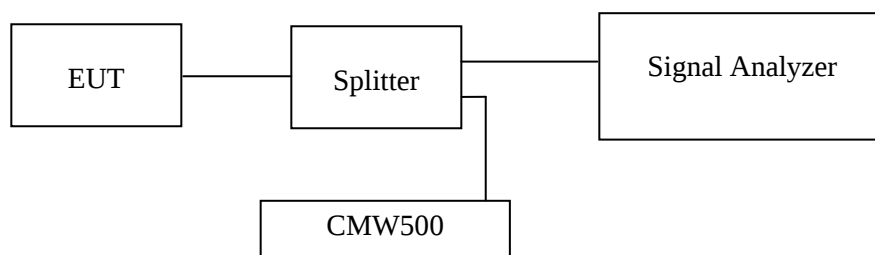
Applicable Standard

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.



Note: the path loss (cable loss and splitter inset loss) among the test frequency range has including in test plot.

Test Data

Environmental Conditions

Temperature:	24-26°C
Relative Humidity:	55-60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang from 2023-06-03 to 2023-07-08.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	128	824.2	242.76	320
	190	836.6	240.76	320
	251	848.8	238.76	321
GPRS(GMSK)	128	824.2	244.76	325
	190	836.6	239.76	320
	251	848.8	240.76	321
EGPRS(8PSK)	128	824.2	240.76	320
	190	836.6	244.76	316
	251	848.8	242.76	313

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC	826.4	4.14	4.74
	836.4	4.15	4.74
	846.6	4.15	4.74
HSDPA	826.4	4.17	4.73
	836.4	4.17	4.70
	846.6	4.15	4.73
HSUPA	826.4	4.17	4.73
	836.4	4.17	4.71
	846.6	4.15	4.71

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	512	1850.2	240.76	314
	661	1880.0	242.76	316
	810	1909.8	242.76	313
GPRS(GMSK)	512	1850.2	244.76	314
	661	1880.0	244.76	313
	810	1909.8	239.76	314
EGPRS(8PSK)	512	1850.2	252.75	330
	661	1880.0	249.75	323
	810	1909.8	247.75	322

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC	1852.4	4.15	4.74
	1880.0	4.15	4.73
	1907.6	4.15	4.73
HSDPA	1852.4	4.17	4.73
	1880.0	4.17	4.73
	1907.6	4.15	4.71
HSUPA	1852.4	4.17	4.73
	1880.0	4.17	4.74
	1907.6	4.15	4.74

LTE Band 2:

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
1.4 MHz	QPSK	1.108	1.266	1.102	1.272	1.102	1.278
	16QAM	1.102	1.272	1.114	1.278	1.102	1.266
3 MHz	QPSK	2.695	2.892	2.683	2.904	2.695	2.880
	16QAM	2.683	2.904	2.683	2.904	2.695	2.892
5 MHz	QPSK	4.511	4.880	4.491	4.880	4.511	4.880
	16QAM	4.511	4.880	4.531	4.920	4.511	4.880
10 MHz	QPSK	8.942	9.520	8.942	9.600	8.942	9.600
	16QAM	8.942	9.560	8.942	9.600	8.942	9.520
15 MHz	QPSK	13.473	14.520	13.473	14.520	13.533	14.520
	16QAM	13.473	14.520	13.473	14.520	13.533	14.520
20 MHz	QPSK	17.884	19.360	17.884	19.520	18.044	19.440
	16QAM	17.964	19.360	17.884	19.440	18.044	19.600

LTE Band 4:

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
1.4 MHz	QPSK	1.102	1.278	1.108	1.266	1.102	1.272
	16QAM	1.102	1.272	1.102	1.272	1.108	1.278
3 MHz	QPSK	2.695	2.892	2.683	2.892	2.695	2.880
	16QAM	2.683	2.904	2.683	2.904	2.695	2.892
5 MHz	QPSK	4.511	4.900	4.511	4.860	4.511	4.880
	16QAM	4.531	4.880	4.511	4.880	4.511	4.880
10 MHz	QPSK	8.942	9.600	8.942	9.600	8.942	9.640
	16QAM	8.942	9.560	8.982	9.560	8.942	9.600
15 MHz	QPSK	13.473	14.460	13.413	14.520	13.473	14.580
	16QAM	13.473	14.520	13.473	14.460	13.473	14.520
20 MHz	QPSK	17.884	19.360	17.964	19.360	17.884	19.520
	16QAM	17.884	19.520	17.884	19.360	17.884	19.520

LTE Band 5:

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
1.4 MHz	QPSK	1.102	1.266	1.102	1.272	1.102	1.272
	16QAM	1.102	1.266	1.114	1.278	1.102	1.266
3 MHz	QPSK	2.695	2.880	2.683	2.892	2.683	2.880
	16QAM	2.683	2.904	2.683	2.904	2.683	2.892
5 MHz	QPSK	4.511	4.880	4.491	4.880	4.511	4.880
	16QAM	4.491	4.880	4.491	4.880	4.491	4.860
10 MHz	QPSK	8.942	9.560	8.942	9.600	8.982	9.560
	16QAM	8.942	9.560	8.942	9.560	8.942	9.560

LTE Band 7:

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
5 MHz	QPSK	4.511	4.960	4.491	4.920	4.531	4.900
	16QAM	4.531	5.220	4.531	4.920	4.511	4.900
10 MHz	QPSK	8.942	9.600	8.942	9.520	8.942	9.600
	16QAM	8.942	9.520	8.942	9.560	8.942	9.520
15 MHz	QPSK	13.413	14.460	13.473	14.520	13.533	14.580
	16QAM	13.533	14.520	13.473	14.460	13.473	14.520
20 MHz	QPSK	17.884	19.280	17.964	19.600	17.884	19.440
	16QAM	17.884	20.560	17.964	19.440	18.044	19.440

LTE Band 40**2305-2315MHz**

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
5 MHz	QPSK	4.491	4.980	4.491	4.880	4.511	4.900
	16QAM	4.511	4.900	4.511	4.900	4.491	4.940
10 MHz	QPSK	/	/	8.942	9.600	/	/
	16QAM	/	/	8.942	9.560	/	/

2350-2360MHz

Bandwidth	Modulation	Low channel		Middle channel		High channel	
		OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)	OBW (MHz)	26dB EBW (MHz)
5 MHz	QPSK	4.491	4.900	4.491	4.900	4.511	4.880
	16QAM	4.491	4.880	4.511	4.960	4.511	4.920
10 MHz	QPSK	/	/	8.942	9.560	/	/
	16QAM	/	/	8.942	9.560	/	/

The test plots please refer to the Appendix A.

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

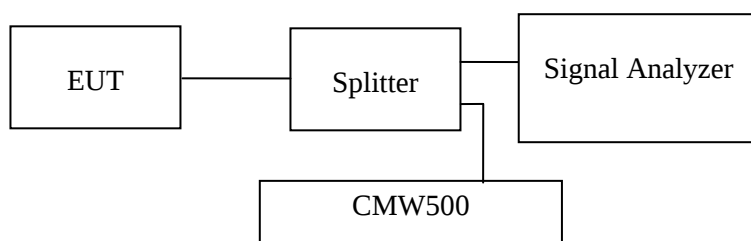
Applicable Standard

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.



Note: the path loss (cable loss and splitter inset loss) among the test frequency range has including in test plot.

Test Data

Environmental Conditions

Temperature:	24-26 °C
Relative Humidity:	54-60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang from 2023-06-03 to 2023-07-08.

EUT operation mode: Transmitting

Test result: Pass.

The test plots please 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:	24 °C
Relative Humidity:	52-53 %
ATM Pressure:	101.0 kPa

The Below 1GHz testing was performed by Jason Liu on 2023-05-31.

The Above 1GHz testing was performed by Jimi Zheng on 2023-05-31.

EUT operation mode: Transmitting

(Pre-scan in the X, Y and Z axes of orientation, the worst case orientation was photo and recorded)

Cellular Band (Part 22H)

30MHz-10GHz:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
	Reading (dBuV)	PK/Ave		Height (m)	Polar (H/V)				
GSM850, Low Channel									
58.31	-73.74	PK	228	1.3	H	4.47	-69.27	-13	-56.27
528.01	-78.70	PK	89	1.7	V	7.11	-71.59	-13	-58.59
1648.4	-42.70	PK	83	1.1	H	0.4	-42.30	-13	-29.30
1648.4	-44.14	PK	345	1.9	V	0.13	-44.01	-13	-31.01
GSM850, Middle Channel									
58.31	-73.25	PK	126	1.8	H	4.47	-68.78	-13	-55.78
528.01	-78.45	PK	194	1.9	V	7.11	-71.34	-13	-58.34
1673.2	-44.55	PK	19	2.1	H	0.45	-44.10	-13	-31.10
1673.2	-41.01	PK	153	2.0	V	0.51	-40.50	-13	-27.50
GSM850, High Channel									
58.31	-73.75	PK	1	1.2	H	4.47	-69.28	-13	-56.28
528.01	-78.80	PK	139	1.3	V	7.11	-71.69	-13	-58.69
1697.6	-44.39	PK	42	1.8	H	0.52	-43.87	-13	-30.87
1697.6	-46.37	PK	353	1.2	V	0.93	-45.44	-13	-32.44
WCDMA BAND5, Low Channel									
58.31	-72.55	PK	247	1.7	H	4.47	-68.08	-13	-55.08
528.01	-76.90	PK	140	2.0	V	7.11	-69.79	-13	-56.79
1652.8	-52.09	PK	236	1.8	H	0.4	-51.69	-13	-38.69
1652.8	-52.61	PK	226	2.2	V	0.16	-52.45	-13	-39.45
WCDMA BAND5, Middle Channel									
58.31	-71.59	PK	98	1.9	H	4.47	-67.12	-13	-54.12
528.01	-77.37	PK	48	1.4	V	7.11	-70.26	-13	-57.26
1673.2	-54.15	PK	75	1.9	H	0.45	-53.70	-13	-40.70
1673.2	-54.04	PK	163	1.0	V	0.51	-53.53	-13	-40.53
WCDMA BAND5, High Channel									
58.31	-71.42	PK	196	1.1	H	4.47	-66.95	-13	-53.95
528.01	-76.95	PK	231	2.1	V	7.11	-69.84	-13	-56.84
1693.2	-54.08	PK	189	1.6	H	0.51	-53.57	-13	-40.57
1693.2	-53.67	PK	41	1.0	V	0.85	-52.82	-13	-39.82

PCS Band (Part 24E)

30MHz-20GHz:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
	Reading (dBuV)	PK/Ave		Height (m)	Polar (H/V)				
PCS1900, Low Channel									
58.31	-71.22	PK	270	1.5	H	4.47	-66.75	-13	-53.75
528.01	-77.36	PK	251	1.1	V	7.11	-70.25	-13	-57.25
3700.4	-54.62	PK	125	1.0	H	5.88	-48.74	-13	-35.74
3700.4	-56.47	PK	150	1.4	V	6.36	-50.11	-13	-37.11
PCS1900, Middle Channel									
58.31	-72.33	PK	183	2.1	H	4.47	-67.86	-13	-54.86
528.01	-77.21	PK	281	1.1	V	7.11	-70.10	-13	-57.10
3760	-56.19	PK	49	1.2	H	6.24	-49.95	-13	-36.95
3760	-56.51	PK	75	1.9	V	6.68	-49.83	-13	-36.83
PCS1900, High Channel									
58.31	-73.10	PK	147	1.1	H	4.47	-68.63	-13	-55.63
528.01	-78.78	PK	119	1.3	V	7.11	-71.67	-13	-58.67
3819.6	-56.58	PK	70	2.1	H	6.09	-50.49	-13	-37.49
3819.6	-57.99	PK	15	1.5	V	6.35	-51.64	-13	-38.64
WCDMA BAND2, Low Channel									
58.31	-72.68	PK	99	1.0	H	4.47	-68.21	-13	-55.21
528.01	-77.47	PK	345	1.2	V	7.11	-70.36	-13	-57.36
3704.8	-55.86	PK	252	1.4	H	5.91	-49.95	-13	-36.95
3704.8	-57.54	PK	200	1.2	V	6.4	-51.14	-13	-38.14
WCDMA BAND2, Middle Channel									
58.31	-71.95	PK	188	1.3	H	4.47	-67.48	-13	-54.48
528.01	-78.42	PK	66	1.3	V	7.11	-71.31	-13	-58.31
3760	-57.36	PK	255	1.4	H	6.24	-51.12	-13	-38.12
3760	-59.06	PK	334	1.9	V	6.68	-52.38	-13	-39.38
WCDMA BAND2, High Channel									
58.31	-71.58	PK	195	1.4	H	4.47	-67.11	-13	-54.11
528.01	-77.54	PK	263	2.0	V	7.11	-70.43	-13	-57.43
3815.2	-59.43	PK	312	2.0	H	6.18	-53.25	-13	-40.25
3815.2	-59.35	PK	246	2.0	V	6.38	-52.97	-13	-39.97

LTE Bands: (pre-scan all bandwidth/modulation, the worst case as below)

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
	Reading (dBuV)	PK/Ave		Height (m)	Polar (H/V)				
LTE BAND2									
Test frequency range: 30MHz-20GHz									
1.4MHz bandwidth, QPSK, Low Channel									
58.31	-73.08	PK	139	1.3	H	4.47	-68.61	-13	-55.61
528.01	-78.38	PK	60	1.2	V	7.11	-71.27	-13	-58.27
3701.4	-48.86	PK	203	2.0	H	5.89	-42.97	-13	-29.97
3701.4	-50.59	PK	284	1.3	V	6.37	-44.22	-13	-31.22
1.4MHz bandwidth, QPSK, Middle Channel									
58.31	-73.92	PK	171	1.6	H	4.47	-69.45	-13	-56.45
528.01	-78.84	PK	303	1.2	V	7.11	-71.73	-13	-58.73
3760	-52.32	PK	106	1.5	H	6.24	-46.08	-13	-33.08
3760	-49.80	PK	243	1.0	V	6.68	-43.12	-13	-30.12
1.4MHz bandwidth, QPSK, High Channel									
58.31	-72.71	PK	132	1.3	H	4.47	-68.24	-13	-55.24
528.01	-77.47	PK	324	1.0	V	7.11	-70.36	-13	-57.36
3818.6	-51.55	PK	335	1.8	H	6.11	-45.44	-13	-32.44
3818.6	-50.61	PK	177	2.0	V	6.36	-44.25	-13	-31.25
LTE BAND4									
Test frequency range: 30MHz-20GHz									
1.4MHz bandwidth, QPSK,									
58.31	-72.28	PK	245	1.2	H	4.47	-67.81	-13	-54.81
528.01	-77.80	PK	96	1.8	V	7.11	-70.69	-13	-57.69
3421.4	-39.13	PK	231	1.8	H	4.83	-34.30	-13	-21.30
3421.4	-48.70	PK	114	1.3	V	5.29	-43.41	-13	-30.41
1.4MHz bandwidth, QPSK, Middle Channel									
58.31	-73.57	PK	358	1.6	H	4.47	-69.10	-13	-56.10
528.01	-79.00	PK	221	2.2	V	7.11	-71.89	-13	-58.89
3465	-39.19	PK	246	1.8	H	5.34	-33.85	-13	-20.85
3465	-49.63	PK	94	1.3	V	5.5	-44.13	-13	-31.13
1.4MHz bandwidth, QPSK, High Channel									
58.31	-70.91	PK	143	1.8	H	4.47	-66.44	-13	-53.44
528.01	-77.56	PK	338	1.3	V	7.11	-70.45	-13	-57.45
3508.6	-42.69	PK	143	1.6	H	5.74	-36.95	-13	-23.95
3508.6	-48.78	PK	42	1.9	V	5.9	-42.88	-13	-29.88

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
	Reading (dBuV)	PK/Ave		Height (m)	Polar (H/V)				
LTE BAND5									
Test frequency range: 30MHz-10GHz									
1.4MHz bandwidth, QPSK, Low Channel									
58.31	-72.59	PK	187	1.4	H	4.47	-68.12	-13	-55.12
528.01	-77.45	PK	228	1.9	V	7.11	-70.34	-13	-57.34
1649.4	-53.96	PK	6	1.9	H	0.39	-53.57	-13	-40.57
1649.4	-54.36	PK	254	2.1	V	0.12	-54.24	-13	-41.24
1.4MHz bandwidth, QPSK, Middle Channel									
58.31	-71.88	PK	115	2.1	H	4.47	-67.41	-13	-54.41
528.01	-77.30	PK	57	1.2	V	7.11	-70.19	-13	-57.19
1673	-55.91	PK	227	1.7	H	0.45	-55.46	-13	-42.46
1673	-54.87	PK	225	1.4	V	0.51	-54.36	-13	-41.36
1.4MHz bandwidth, QPSK, High Channel									
58.31	-71.25	PK	206	1.7	H	4.47	-66.78	-13	-53.78
528.01	-77.69	PK	295	1.3	V	7.11	-70.58	-13	-57.58
1696.6	-55.66	PK	268	1.8	H	0.52	-55.14	-13	-42.14
1696.6	-55.70	PK	153	1.5	V	0.91	-54.79	-13	-41.79
LTE BAND7									
Test frequency range: 30MHz-26GHz									
5MHz bandwidth, QPSK, Low Channel									
58.31	-71.51	PK	187	1.4	H	4.47	-67.04	-25	-42.04
528.01	-77.28	PK	228	1.9	V	7.11	-70.17	-25	-45.17
5005	-67.77	PK	238	1.4	H	9.27	-58.50	-25	-33.50
5005	-64.85	PK	241	1.8	V	9.15	-55.70	-25	-30.70
5MHz bandwidth, QPSK, Middle Channel									
58.31	-71.10	PK	115	2.1	H	4.47	-66.63	-25	-41.63
528.01	-76.60	PK	57	1.2	V	7.11	-69.49	-25	-44.49
5070	-68.81	PK	24	1.2	H	9.06	-59.75	-25	-34.75
5070	-65.40	PK	298	1.3	V	9.29	-56.11	-25	-31.11
5MHz bandwidth, QPSK, High Channel									
58.31	-72.35	PK	206	1.7	H	4.47	-67.88	-25	-42.88
528.01	-78.49	PK	295	1.3	V	7.11	-71.38	-25	-46.38
5135	-69.39	PK	85	1.5	H	8.9	-60.49	-25	-35.49
5135	-68.20	PK	279	1.2	V	9.25	-58.95	-25	-33.95

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
	Reading (dBuV)	PK/Ave		Height (m)	Polar (H/V)				
LTE BAND 40 (2305-2315MHz)									
Test frequency range: 30MHz-24GHz									
5MHz bandwidth, QPSK, Low Channel									
58.31	-72.04	PK	48	1.4	H	4.47	-67.57	-40	-27.57
528.01	-78.40	PK	132	1.3	V	7.11	-71.29	-40	-31.29
4615	-84.85	PK	29	2.1	H	6.99	-77.86	-40	-37.86
4615	-84	PK	189	1.6	V	7.41	-76.59	-40	-36.59
5MHz bandwidth, QPSK, Middle Channel									
58.31	-72.59	PK	231	2.1	H	4.47	-68.12	-40	-28.12
528.01	-78.88	PK	245	1.2	V	7.11	-71.77	-40	-31.77
4620	-85.74	PK	66	1.5	H	7.59	-78.15	-40	-38.15
4620	-85.17	PK	36	1.8	V	7.84	-77.33	-40	-37.33
5MHz bandwidth, QPSK, High Channel									
58.31	-71.84	PK	217	1.9	H	4.47	-67.37	-40	-27.37
528.01	-77.35	PK	358	1.6	V	7.11	-70.24	-40	-30.24
4625	-84.14	PK	31	1.1	H	7.67	-76.47	-40	-36.47
4625	-83.8	PK	344	1.3	V	7.86	-75.94	-40	-35.94
LTE BAND 40 (2350-2360MHz)									
Test frequency range: 30MHz-24GHz									
5MHz bandwidth, QPSK, Low Channel									
58.31	-70.72	PK	330	1.9	H	4.47	-66.25	-40	-26.25
528.01	-76.86	PK	143	1.8	V	7.11	-69.75	-40	-29.75
4705	-85	PK	31	1.1	H	7.99	-77.01	-40	-37.01
4705	-85.03	PK	344	1.3	V	8.51	-76.52	-40	-36.52
5MHz bandwidth, QPSK, Middle Channel									
58.31	-71.78	PK	187	1.0	H	4.47	-67.31	-40	-27.31
528.01	-76.63	PK	187	1.4	V	7.11	-69.52	-40	-29.52
4710	-84.77	PK	73	2.1	H	8.04	-76.73	-40	-36.73
4710	-84.63	PK	311	2.2	V	8.51	-76.12	-40	-36.12
5MHz bandwidth, QPSK, High Channel									
58.31	-70.84	PK	315	1.2	H	4.47	-66.37	-40	-26.37
528.01	-76.37	PK	115	2.1	V	7.11	-69.26	-40	-29.26
4715	-84.47	PK	117	1.9	H	8.09	-76.38	-40	-36.38
4715	-84.47	PK	128	2.0	V	8.5	-75.97	-40	-35.97

Note:

Absolute Level = Reading Level + Substituted Factor

Substituted Factor contains: SG Level - Cable loss+ Antenna Gain

Margin = Absolute Level - Limit

The data which below the 20 dB limit was not recorded.

FCC§ 22.917 (a)&§ 24.238 (a)&§27.53(g) (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.

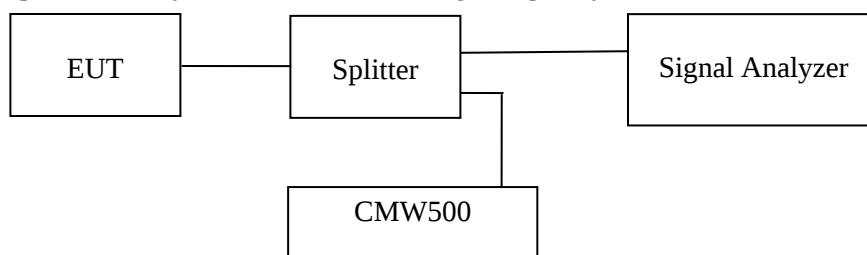
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC §27.53(g) (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



Note: the path loss (cable loss and splitter inset loss) among the test frequency range has including in test plot.

Test Data

Environmental Conditions

Temperature:	24-25 °C
Relative Humidity:	54-60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang from 2023-06-03 to 2023-07-08.

EUT operation mode: Transmitting (Worst case)

Test Result: Pass. The test plots please 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

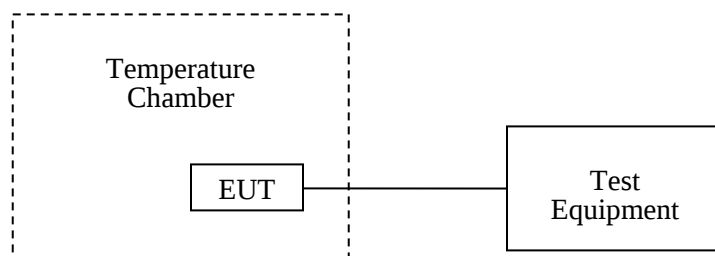
According to §24.235&§27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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:	24-26 °C
Relative Humidity:	55-60 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang from 2023-06-02 to 2023-06-16.

EUT operation mode: Transmitting

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

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

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	8.05	0.0096	2.5
-20		13.44	0.0161	2.5
-10		11.07	0.0132	2.5
0		8.89	0.0106	2.5
10		13.03	0.0156	2.5
20		4.23	0.0051	2.5
30		9.16	0.0110	2.5
40		5.93	0.0071	2.5
50		12.05	0.0144	2.5
20	L.V.	12.77	0.0153	2.5
	H.V.	13.32	0.0159	2.5

EDGE Mode

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	-3.10	-0.0037	2.5
-20		4.23	0.0051	2.5
-10		3.98	0.0048	2.5
0		1.31	0.0016	2.5
10		-5.80	-0.0069	2.5
20		-5.66	-0.0068	2.5
30		-3.28	-0.0039	2.5
40		0.87	0.0010	2.5
50		1.20	0.0014	2.5
20	L.V.	1.48	0.0018	2.5
	H.V.	2.01	0.0024	2.5

WCDMA Mode

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	-3.73	-0.0045	2.5
-20		0.56	0.0007	2.5
-10		-1.74	-0.0021	2.5
0		-1.78	-0.0021	2.5
10		-0.35	-0.0004	2.5
20		-7.32	-0.0087	2.5
30		-5.40	-0.0065	2.5
40		2.08	0.0025	2.5
50		-2.83	-0.0034	2.5
20	L.V.	-2.54	-0.0030	2.5
	H.V.	-1.97	-0.0024	2.5

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

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	1850.0281	1909.9773	1850	1910
-20		1850.0345	1909.9785	1850	1910
-10		1850.0292	1909.9754	1850	1910
0		1850.0349	1909.9821	1850	1910
10		1850.0309	1909.9777	1850	1910
20		1850.0308	1909.9768	1850	1910
30		1850.0292	1909.9751	1850	1910
40		1850.0281	1909.9771	1850	1910
50		1850.0349	1909.9782	1850	1910
20	L.V.	1850.0349	1909.9817	1850	1910
	H.V.	1850.0353	1909.9804	1850	1910

EDGE Mode

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	1850.0283	1909.9912	1850	1910
-20		1850.0249	1909.9883	1850	1910
-10		1850.0231	1909.9931	1850	1910
0		1850.0223	1909.9879	1850	1910
10		1850.0233	1909.9890	1850	1910
20		1850.0247	1909.9863	1850	1910
30		1850.0281	1909.9910	1850	1910
40		1850.0274	1909.9884	1850	1910
50		1850.0212	1909.9906	1850	1910
20	L.V.	1850.0217	1909.9922	1850	1910
	H.V.	1850.0239	1909.9912	1850	1910

WCDMA Mode

Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	1850.0305	1909.9668	1850	1910
-20		1850.0280	1909.9693	1850	1910
-10		1850.0267	1909.9716	1850	1910
0		1850.0305	1909.9696	1850	1910
10		1850.0261	1909.9681	1850	1910
20		1850.0242	1909.9702	1850	1910
30		1850.0302	1909.9680	1850	1910
40		1850.0271	1909.9678	1850	1910
50		1850.0281	1909.9694	1850	1910
20	L.V.	1850.0295	1909.9714	1850	1910
	H.V.	1850.0237	1909.9670	1850	1910

LTE:**QPSK:****Band 2:**

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	1850.0272	1909.9897	1850	1910
-20		1850.0239	1909.9898	1850	1910
-10		1850.0253	1909.9889	1850	1910
0		1850.0266	1909.9897	1850	1910
10		1850.0266	1909.9880	1850	1910
20		1850.0242	1909.9905	1850	1910
30		1850.0297	1909.9907	1850	1910
40		1850.0307	1909.9868	1850	1910
50		1850.0266	1909.9851	1850	1910
20	L.V.	1850.0237	1909.9883	1850	1910
	H.V.	1850.0254	1909.9900	1850	1910

Band 4:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	1710.1315	1754.8941	1710	1755
-20		1710.1284	1754.8949	1710	1755
-10		1710.1297	1754.8924	1710	1755
0		1710.1291	1754.8934	1710	1755
10		1710.1287	1754.8932	1710	1755
20		1710.1275	1754.8932	1710	1755
30		1710.1309	1754.8950	1710	1755
40		1710.1324	1754.8921	1710	1755
50		1710.1299	1754.8933	1710	1755
20	L.V.	1710.1258	1754.8924	1710	1755
	H.V.	1710.1307	1754.8926	1710	1755

Band 5:

10.0 MHz Middle Channel, f ₀ = 836.5MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	0.91	0.0011	2.5
-20		-0.24	-0.0003	2.5
-10		0.32	0.0004	2.5
0		-3.63	-0.0043	2.5
10		-6.84	-0.0082	2.5
20		-7.82	-0.0093	2.5
30		0.30	0.0004	2.5
40		-8.03	-0.0096	2.5
50		-5.75	-0.0069	2.5
20	L.V.	-5.62	-0.0067	2.5
	H.V.	-4.85	-0.0058	2.5

Band 7:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2500.1262	2569.9264	2500	2570
-20		2500.1281	2569.9262	2500	2570
-10		2500.1265	2569.9259	2500	2570
0		2500.1225	2569.9264	2500	2570
10		2500.1232	2569.9258	2500	2570
20		2500.1266	2569.9304	2500	2570
30		2500.1221	2569.9244	2500	2570
40		2500.1223	2569.9250	2500	2570
50		2500.1210	2569.9284	2500	2570
20	L.V.	2500.1260	2569.9282	2500	2570
	H.V.	2500.1250	2569.9251	2500	2570

Band 40 (2305-2315MHz):

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2305.1072	2314.9572	2305	2315
-20		2305.1069	2314.9563	2305	2315
-10		2305.1030	2314.9523	2305	2315
0		2305.1083	2314.9571	2305	2315
10		2305.1059	2314.9527	2305	2315
20		2305.1050	2314.9519	2305	2315
30		2305.1034	2314.9541	2305	2315
40		2305.1092	2314.9553	2305	2315
50		2305.1106	2314.9556	2305	2315
20	L.V.	2305.1079	2314.9514	2305	2315
	H.V.	2305.1080	2314.9522	2305	2315

Band 40 (2350-2360MHz):

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2350.2196	2359.9155	2350	2360
-20		2350.2164	2359.9107	2350	2360
-10		2350.2175	2359.9160	2350	2360
0		2350.2182	2359.9106	2350	2360
10		2350.2175	2359.9128	2350	2360
20		2350.2173	2359.9157	2350	2360
30		2350.2200	2359.9104	2350	2360
40		2350.2223	2359.9171	2350	2360
50		2350.2214	2359.9159	2350	2360
20	L.V.	2350.2185	2359.9159	2350	2360
	H.V.	2350.2170	2359.9105	2350	2360

16QAM:**Band 2:**

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	1850.0251	1909.9725	1850	1910
-20		1850.0286	1909.9753	1850	1910
-10		1850.0266	1909.9733	1850	1910
0		1850.0276	1909.9772	1850	1910
10		1850.0264	1909.9752	1850	1910
20		1850.0276	1909.9740	1850	1910
30		1850.0244	1909.9751	1850	1910
40		1850.0248	1909.9795	1850	1910
50		1850.0311	1909.9764	1850	1910
20	L.V.	1850.0314	1909.9759	1850	1910
	H.V.	1850.0298	1909.9757	1850	1910

Band 4:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	1710.2174	1754.9858	1710	1755
-20		1710.2194	1754.9828	1710	1755
-10		1710.2199	1754.9823	1710	1755
0		1710.2182	1754.9884	1710	1755
10		1710.2153	1754.9837	1710	1755
20		1710.2191	1754.9834	1710	1755
30		1710.2153	1754.9863	1710	1755
40		1710.2168	1754.9808	1710	1755
50		1710.2130	1754.9874	1710	1755
20	L.V.	1710.2174	1754.9860	1710	1755
	H.V.	1710.2161	1754.9869	1710	1755

Band 5:

10.0 MHz Middle Channel, f ₀ = 836.5 MHz				
Temperature (°C)	Voltage Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	N.V.	7.22	0.0086	2.5
-20		10.27	0.0123	2.5
-10		13.27	0.0159	2.5
0		6.66	0.0080	2.5
10		9.12	0.0109	2.5
20		6.61	0.0079	2.5
30		14.50	0.0173	2.5
40		7.26	0.0087	2.5
50		15.75	0.0188	2.5
20	L.V.	15.94	0.0190	2.5
	H.V.	16.43	0.0196	2.5

Band 7:

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2500.1006	2569.9170	2500	2570
-20		2500.0980	2569.9159	2500	2570
-10		2500.1014	2569.9135	2500	2570
0		2500.0972	2569.9122	2500	2570
10		2500.0993	2569.9126	2500	2570
20		2500.0971	2569.9145	2500	2570
30		2500.1031	2569.9172	2500	2570
40		2500.1001	2569.9118	2500	2570
50		2500.1017	2569.9135	2500	2570
20	L.V.	2500.0973	2569.9164	2500	2570
	H.V.	2500.0992	2569.9104	2500	2570

Band 40 (2305-2315MHz):

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2305.1127	2314.8981	2305	2315
-20		2305.1067	2314.9000	2305	2315
-10		2305.1119	2314.8971	2305	2315
0		2305.1072	2314.9030	2305	2315
10		2305.1089	2314.8993	2305	2315
20		2305.1125	2314.9033	2305	2315
30		2305.1093	2314.8992	2305	2315
40		2305.1136	2314.9036	2305	2315
50		2305.1122	2314.8977	2305	2315
20	L.V.	2305.1102	2314.9005	2305	2315
	H.V.	2305.1100	2314.9042	2305	2315

Band 40 (2350-2360MHz):

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V _{DC})	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
-30	N.V.	2350.1985	2359.9080	2350	2360
-20		2350.1976	2359.9075	2350	2360
-10		2350.2028	2359.9139	2350	2360
0		2350.2028	2359.9086	2350	2360
10		2350.1987	2359.9096	2350	2360
20		2350.1962	2359.9101	2350	2360
30		2350.1989	2359.9092	2350	2360
40		2350.2031	2359.9129	2350	2360
50		2350.2021	2359.9100	2350	2360
20	L.V.	2350.2000	2359.9095	2350	2360
	H.V.	2350.2017	2359.9117	2350	2360

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