Certificate #6613.01

FCC TEST REPORT

(PART 24)

Applicant:	HMD Global Oy
Address:	Bertel Jungin aukio 9 Espoo 02600 Finland

Manufacturer or Supplier:	HMD Global Oy
Address:	Bertel Jungin aukio 9 Espoo 02600 Finland
Product:	Mobile Phone
Brand Name:	HMD
Model Name:	TA-1606
FCC ID:	2AJOTTA-1606
Date of tests:	May. 14, 2024 ~ Jun. 13, 2024

The tests have been carried out according to the requirements of the following standard:

☒ **FCC PART 24, Subpart E** ☒ **FCC PART 2**
☒ **ANSI/TIA/EIA-603-D** ☒ **ANSI/TIA/EIA-603-E** ☒ **ANSI C63.26-2015**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Peibo Sun Manager / Mobile Department
Xu Hanwen	Sun Peibo
Date: Jun. 13, 2024	Date: Jun. 13, 2024

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/ and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-NQN2405090215RF02	Original release	Jun. 13, 2024

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**Test lab***
§2.1046	Coduncted Output Power	Compliance	A
§24.232(c)	Equivalent Isotropic Radiated Power	Compliance	A
§2.1055 §24.235	Frequency Stability	Compliance	A
§2.1049	Occupied Bandwidth	Compliance	A
§24.232(d)	Peak to average ratio	Compliance	A
§24.238(a)(b)	Band Edge Measurements	Compliance	A
§2.1051 §24.238(a)(b)	Conducted Spurious Emissions	Compliance	A
§2.1053 §24.238(a)(b)	Radiated Spurious Emissions	Compliance	A

***Test Lab Information Reference**

Lab A:

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zhuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

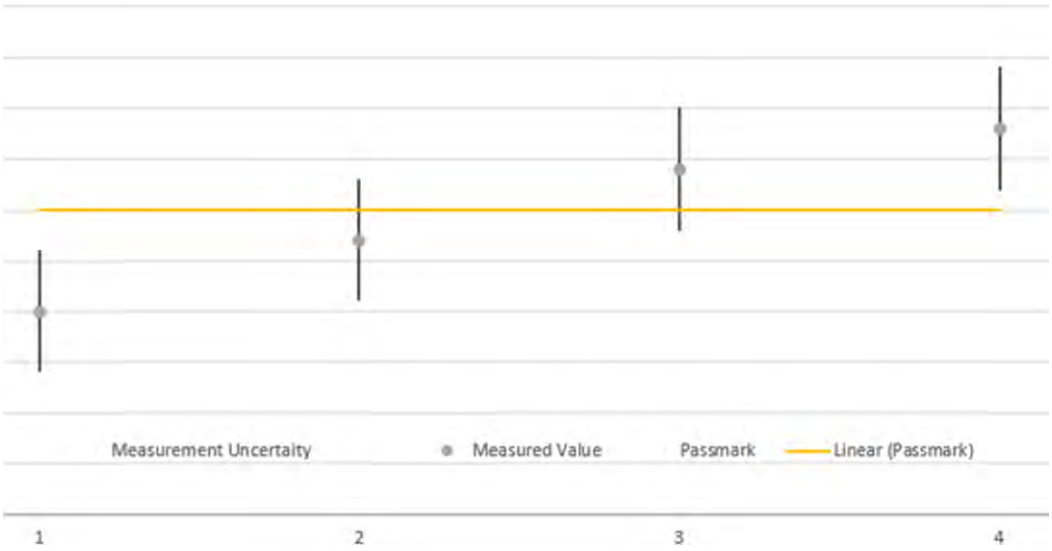
The FCC Site Registration No. is 434559; The Designation No. is CN1325.

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
Frequency Stability	±76.97Hz
Radiated emissions (9KHz~30MHz)	±2.68dB
Radiated emissions & Radiated Power (30MHz~1GHz)	±4.98dB
Radiated emissions & Radiated Power (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Conducted Output power	±2.06dB
Band Edge Measurements	±4.70dB
Peak to average ratio	±0.76dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.

1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,22	Aug.29,24
Pre-Amplifier	R&S	SCU08F1	101028	Sep.16,22	Sep.15,24
Vector Signal Generator	R&S	SMBV100B	102176	Feb.16,24	Feb.15,26
Signal Generator	R&S	SMB100A	182185	Feb.16,24	Feb.15,26
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-01Chamber	Nov.25,22	Nov.24,25
3m Semi-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-02Chamber	Nov.25,22	Nov.24,25
EMI TEST Receiver	R&S	ESR26	101734	Feb.25,24	Feb.24,26
EMI TEST Receiver	R&S	ESW44	101973	Feb.25,24	Feb.24,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Feb.28,24	Feb.27,26
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,22	Aug.21,24
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Feb.23,24	Feb.22,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,22	Aug.21,24
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.23,24	Feb.22,26
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.27,22	Jun.26,24
Test Software	EMC32	EMC32	N/A	N/A	N/A
6DB attenuator	Tonscend Technology Co., Ltd	N/A	23062787	N/A	N/A
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	Oct.01,22	Sep.30,24
DC Source	HYELEC	HY3010B	551016	Aug.31,22	Aug.30,24
Hygrothermograph	DELI	20210528	SZ014	Sep.06,22	Sep.05,24
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-7.00M	N/A	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-4.00M	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.26,24	Apr.25,25
CABLE	R&S	W12.14	N/A	Apr.26,24	Apr.25,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.26,24	Apr.25,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.26,24	Apr.25,25
Temperature Chamber	votsch	VT4002	58566078100050	May.31,22	May.30,24
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26

NOTE:

1. The calibration interval of the above test instruments is 12 months or 24 months or 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.
3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 434559; The Designation No. is CN1325.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	Mobile Phone	
BRAND NAME*	HMD	
MODEL NAME*	TA-1606	
NOMINAL VOLTAGE*	5.0 or 9.0 or 12.0 Vdc (adapter) 3.87Vdc (battery)	
MODULATION TYPE*	**GSM:** GMSK **EDGE:** 8PSK **WCDMA:** HSDPA/HSUPA/DC-HSDPA/ HSUPA+ **LTE Band 2:** QPSK, 16QAM, 64QAM	
FREQUENCY RANGE	**GSM, EDGE**	1850.2MHz ~ 1909.8MHz
	WCDMA	1852.4MHz ~ 1907.6MHz
	LTE Band 2 Channel Bandwidth: 1.4MHz	1850.7MHz ~ 1909.3MHz
	LTE Band 2 Channel Bandwidth: 3MHz	1851.5MHz ~ 1908.5MHz
	LTE Band 2 Channel Bandwidth: 5MHz	1852.5MHz ~ 1907.5MHz
	LTE Band 2 Channel Bandwidth: 10MHz	1855.0MHz ~ 1905.0MHz
	LTE Band 2 Channel Bandwidth: 15MHz	1857.5MHz ~ 1902.5MHz
	LTE Band 2 Channel Bandwidth: 20MHz	1860.0MHz ~ 1900.0MHz
MAX. EIRP POWER	**GSM**	734.51mW
	EDGE	342.77mW
	WCDMA	172.19mW
	LTE Band 2 Channel Bandwidth: 1.4MHz	192.31mW
	LTE Band 2 Channel Bandwidth: 3MHz	190.99mW
	LTE Band 2 Channel Bandwidth: 5MHz	192.31mW
	LTE Band 2 Channel Bandwidth: 10MHz	191.43mW
	LTE Band 2 Channel Bandwidth: 15MHz	194.09mW
	LTE Band 2 Channel Bandwidth: 20MHz	194.54mW

EMISSION DESIGNATOR	GSM	246KGXW
	EDGE	251KG7W
	WCDMA	4M15F9W
	LTE Band 2 Channel Bandwidth: 1.4MHz	QPSK: 1M10G7D
		16QAM: 1M10W7D
	LTE Band 2 Channel Bandwidth: 3MHz	QPSK: 2M71G7D
		16QAM: 2M70W7D
	LTE Band 2 Channel Bandwidth: 5MHz	QPSK: 4M54G7D
		16QAM: 4M50W7D
	LTE Band 2 Channel Bandwidth: 10MHz	QPSK: 9M02G7D
		16QAM: 9M01W7D
	LTE Band 2 Channel Bandwidth: 15MHz	QPSK: 13M5G7D
		16QAM: 13M5W7D
	LTE Band 2 Channel Bandwidth: 20MHz	QPSK: 18M1G7D
		16QAM: 18M0W7D
ANTENNA TYPE*	PIFA Antenna with -0.7dBi gain for GSM1900/ WCDMA II/ LTE B2	
HW VERSION*	V00	
SW VERSION*	V0.019_A01	
I/O PORTS*	Refer to user's manual	
CABLE SUPPLIED*	USB cable1: non-shielded cable, with w/o ferrite core, 1.0 meter USB cable2: non-shielded cable, with w/o ferrite core, 1.0 meter USB cable3: non-shielded cable, with w/o ferrite core, 1.0 meter USB cable4: non-shielded cable, with w/o ferrite core, 1.0 meter	
EXTREME TEMPERATURE*	-10 ~ 55 ℃	
EXTREME VOLTAGE*	3.6V ~ 4.45V	

NOTE:

1. *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

3. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
GSM/GPRS/EDGE	1TX/1RX
WCDMA	1TX/1RX

LTE	1TX/1RX

4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

5. For the product of TA-1606 (FCC ID: 2AJOTTA-1606), the following components are different between the first and second supply, other parameters are the same.

Key Component List

No.	Component	Description	First supply		Second supply	
			SUPPLIER	Spec	SUPPLIER	Spec
1	NMOS	PCBA	PRISEMI	PNM3FD20V2	JSCJ	CJBA3134K
2	E-compass		MEMSIC	MMC5603NJ	QST	QMC6308-TR
3	Memory-256GB		FORESEE	FEUDNN256G-C2G07	BIWIN	BWU2ASV46A256G
4	Memory-64GB		FORESEE	FLXC4008G-30	BIWIN	BWMZCX32H2A-64G-X
5	nano-SIM		LCN	CAF99-06033-0305	HRD	S186-1B01F13F
6	T-card		LCN	CAF11-08136-031901	HRD	S186-1B02F13F
7	iron covering		LCN	CAF00-21134-032307	HRD	S186-2B21F13F-1
8	Type C connector		LETCON	15-16815-110	LCN	UAF05-16323-3007
9	headphone socket		LETCON	11-058126A	HRD	PH157-0B12F36M
10	G sensor		slan	2*2 12bit	sensortek	2*2 12bit
11	Proximity light sensor		Liteon	LTR-569ALS-02	sensortek	STK3335-X
12	Backlight driver		AWINIC	dfn2*2-6L	broadchip	dfn2*2-6L
13	Flash driver		AWINIC	2A DCDC	OCS	2A DCDC
14	CKDID baschip		AWINIC	±5V	OCS	±5V
15	overvoltage protection chip		broadchip	6.8V FCQFN12	AWINIC	6.8V FCQFN12
16	CKD BDS/GPS/GAL LNA		SILICONWAVE	LNA 1.5*1.0 6pin	AWINIC	LNA 1.5*1.0 6pin
17	MIC		GETTOP	2.75*1.85*0.9mm	YUTAI	2.75*1.85*0.9mm
18	LCM	LCD	HUAXIAN	incell5.56HD+	DZX	incell5.56HD+
19	Macro cam	camera	CXT	2M CSP	lianhe	2M CSP
20	Finger print	module	SYX	side fingerprint	SHENAO	side fingerprint
21	Battery		GAOYUAN	Rated: 4900mAh Typical: 5000mAh	FENGHUA	Rated: 4900mAh Typical: 5000mAh
22	Receiver		SENNOR	'0809	TUNESS	'0809
23	Vibrator		JX	0830 3.35mm	JD	0830 3.35mm
24	Charger US		BJD	5V 2A	JUWEI	5V 2A
25	Data cable		JUWEI	A-C	FKY	A-C
			JUWEI	C-C	FKY	C-C

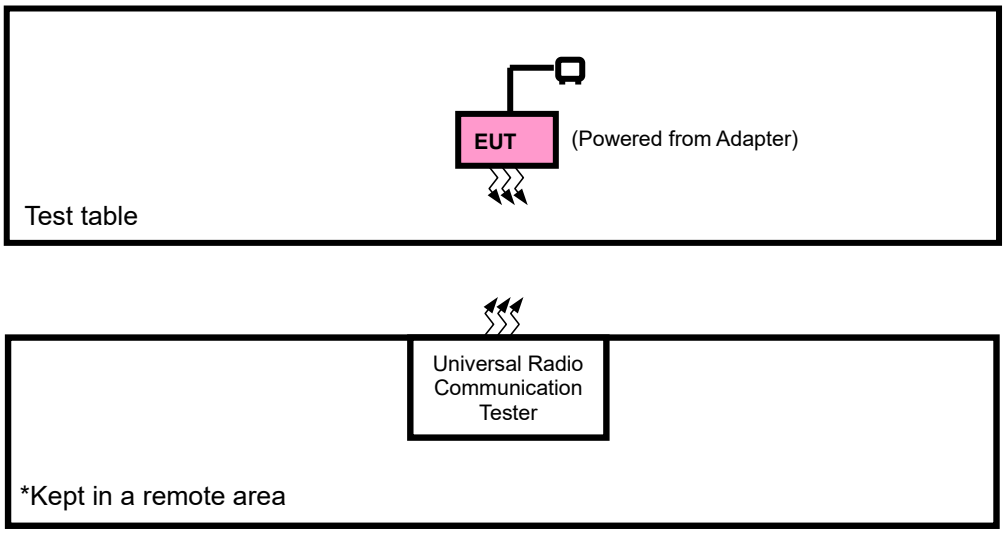
List of Accessory:

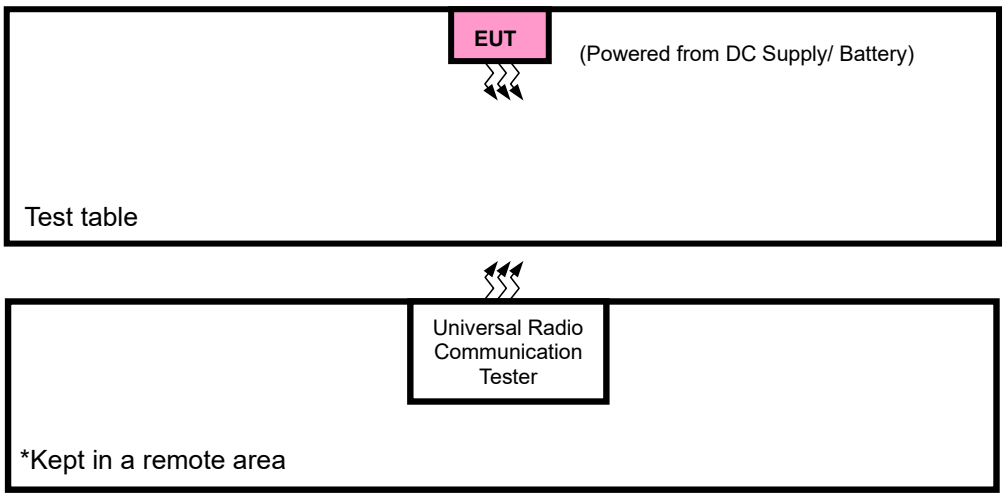
ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
Battery 1	HMD	Gaoyuan	HBA5020AA	Power Rating: 3.87 Vdc;18.963 Wh;4900 mAh
Battery 2	HMD	Fenghua	HBA5020AA	Power Rating: 3.87 Vdc;18.963 Wh;4900 mAh
AC Adapter 1	HMD	Shenzhen Baijunda Electronics Co.,Ltd	HAD-020U(US-PD 20W)	I/P: 100-240 V,50~60Hz,0.6A O/P: USB-C Output:5.0V 3.0A or 9.0V 2.22A or 12.0V 1.67A 20.0W Max
AC Adapter 2	HMD	Shenzhen Baijunda Electronics Co.,Ltd	HAD-010U(US)	I/P: 100-240 V,50~60Hz,0.35A O/P: 5V 2A,10W
AC Adapter 3	HMD	Huizhou Juwei Electronics Co., Ltd.	HAD-010U(US)	I/P: 100-240 V,50~60Hz,0.35A O/P: 5V 2A,10W
Earphone	HMD	N/A	JWEP1266-H24H	N/A
USB Cable 1	HMD	JUWEI	JWUB1684-M01H	A to C
USB Cable 2	HMD	JUWEI	JWUB1688-M01H	C to C
USB Cable 3	HMD	FUKANGYUAN	FKY-23-368	A to C
USB Cable 4	HMD	FUKANGYUAN	FKY-23-369	C to C

6. The worst-case scenario for all measurements is based on an engineering evaluation made on different modulations. Then, QPSK and 16QAM were observed as the worst mode to LTE bands respectively and set for all conducted and radiated. Output power measurements were measured on QPSK,16QAM, 64QAM modulations, and tests other than output power are performed only in worse-case QPSK and 16QAM modulations.

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST





2.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC Source	HYELEC	HY3010B	551016	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.0m

2.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports The worst case in EIRP and radiated emission was found when positioned on X-plane for GSM/EDGE/ LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + Adapter with GSM or WCDMA or LTE link
B	EUT + DC Supply with GSM or WCDMA or LTE link

GSM MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
A	EIRP	512 to 810	512, 661, 810	GSM,EDGE
B	FREQUENCY STABILITY	512 to 810	512, 661, 810	GSM,EDGE
A	OCCUPIED BANDWIDTH	512 to 810	512, 661, 810	GSM,EDGE
A	PEAK TO AVERAGE RATIO	512 to 810	512, 661, 810	GSM,EDGE
A	BAND EDGE	512 to 810	512, 810	GSM,EDGE
A	CONDCUDETED EMISSION	512 to 810	512, 661, 810	GSM,EDGE
A	RADIATED EMISSION	512 to 810	512, 661, 810	GSM,EDGE

WCDMA

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
A	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
B	FREQUENCY STABILITY	9262 to 9538	9262, 9400, 9538	WCDMA
A	OCCUPIED BANDWIDTH	9262 to 9538	9262, 9400, 9538	WCDMA
A	PEAK TO AVERAGE RATIO	9262 to 9538	9262, 9400, 9538	WCDMA
A	BAND EDGE	9262 to 9538	9262, 9538	WCDMA
A	CONDCUDETED EMISSION	9262 to 9538	9262, 9400, 9538	WCDMA
A	RADIATED EMISSION	9262 to 9538	9262, 9400, 9538	WCDMA

LTE BAND 2 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM	6 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM	15 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM	25 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM	50 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM	75 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM	100 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM	6 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM	15 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM	25 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM	50 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM	75 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM	100 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset 6 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM	1 RB / 0 RB Offset 15 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM	1 RB / 0 RB Offset 25 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM	1 RB / 0 RB Offset 50 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM	1 RB / 0 RB Offset 75 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM	1 RB / 0 RB Offset 100 RB / 0 RB Offset

A	BAND EDGE	18607 to 19193	18607	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			19193	1.4MHz	QPSK,16QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		18615 to 19185	18615	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			19185	3MHz	QPSK,16QAM	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		18625 to 19175	18625	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			19175	5MHz	QPSK,16QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		18650 to 19150	18650	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			19150	10MHz	QPSK,16QAM	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		18675 to 19125	18675	15MHz	QPSK,16QAM	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			19125	15MHz	QPSK,16QAM	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		18700 to 19100	26140	20MHz	QPSK,16QAM	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			26590	20MHz	QPSK,16QAM	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
A	CONDCUDETED EMISSION	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	18607 to 19193	18900	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18900	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18900	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650,18900,19150	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18900	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18900	20MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP	25deg. C, 57%RH	DC 5/9/12V By Adapter	Hanwen Xu
FREQUENCY STABILITY	23deg. C, 61%RH	DC 3.87V By DC Supply	Hanwen Xu
OCCUPIED BANDWIDTH	23deg. C, 61%RH	DC 5/9/12V By Adapter	Hanwen Xu
PEAK TO AVERAGE RATIO	23deg. C, 61%RH	DC 5/9/12V By Adapter	Hanwen Xu
BAND EDGE	23deg. C, 61%RH	DC 5/9/12V By Adapter	Hanwen Xu
CONDCUDETED EMISSION	23deg. C, 61%RH	DC 5/9/12V By Adapter	Hanwen Xu
RADIATED EMISSION	23deg. C, 70%RH	DC 5/9/12V By Adapter	Hanwen Xu

2.5 EUT OPERATING CONDITIONS

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

2.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

NOTE: All test items have been performed and recorded as per the above standards.

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile and portable stations are limited to 2 watts EIRP.

3.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

Per KDB 971168 D01 Power Meas License Digital Systems v03r01 or subclause 5.2.5.5 of ANSI C63.26-2015, the relevant equation for determing the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

ERP or EIRP = $P_{Meas} + G_T - L_C$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

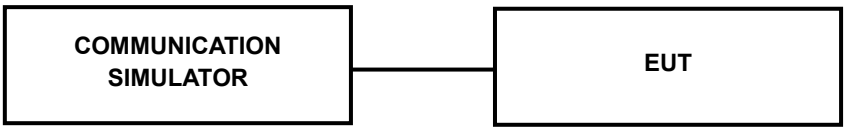
CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

3.1.3 TEST SETUP

EIRP / ERP Measurement:

CONDUCTED POWER MEASUREMENT:



3.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency	1850.2	1880	1909.8
GSM	**29.36**	29.04	28.81
GPRS (GMSK, 1Tx-slot)	29.24	29.06	28.91
GPRS (GMSK, 2Tx-slot)	26.81	26.87	26.65
GPRS (GMSK, 3Tx-slot)	24.91	25.37	25.19
GPRS (GMSK, 4Tx-slot)	23.17	23.41	23.25
EDGE (8PSK, 1Tx-slot)	25.88	26.05	25.78
EDGE (8PSK, 2Tx-slot)	23.84	23.99	23.63
EDGE (8PSK, 3Tx-slot)	21.75	21.67	21.84
EDGE (8PSK, 4Tx-slot)	20.03	19.57	19.83

Band	WCDMA II		
Channel	9262	9400	9538
Frequency	1852.4	1880	1907.6
RMC 12.2K	23.01	**23.06**	22.97
HSDPA Subtest-1	22.38	22.46	22.25
HSDPA Subtest-2	22.31	22.33	22.36
HSDPA Subtest-3	21.78	21.94	21.78
HSDPA Subtest-4	21.78	21.84	21.72
DC-HSDPA Subtest-1	22.25	22.32	22.23
DC-HSDPA Subtest-2	22.21	22.33	22.16
DC-HSDPA Subtest-3	21.83	21.84	21.77
DC-HSDPA Subtest-4	21.79	21.86	21.67
HSUPA Subtest-1	21.33	21.39	21.21
HSUPA Subtest-2	21.31	21.35	21.33
HSUPA Subtest-3	21.84	21.82	21.80
HSUPA Subtest-4	20.71	20.85	20.80
HSUPA Subtest-5	22.22	22.28	22.30
HSPA+ Subtest-1	21.38	21.35	21.35

LTE BAND 2

Band/BW	Modulation	RB Size	RB Offset	Low CH 18607	Mid CH 18900	High CH 19193
				Frequency 1850.7 MHz	Frequency 1880 MHz	Frequency 1909.3 MHz
2/ 1.4	QPSK	1	0	23.54	23.54	23.37
		1	2	23.43	23.48	23.38
		1	5	23.37	23.43	23.38
		3	0	23.28	23.32	23.33
		3	1	23.18	23.19	23.27
		3	3	23.08	23.12	23.16
		6	0	22.18	22.52	22.23
	16QAM	1	0	22.06	21.94	21.99
		1	2	22.20	22.14	22.60
		1	5	21.96	21.99	22.46
		3	0	21.87	22.16	21.79
		3	1	21.83	22.20	21.53
		3	3	21.80	22.32	21.61
		6	0	21.16	21.46	21.55
	64QAM	1	0	21.09	21.41	21.32
		1	2	21.10	21.20	21.31
		1	5	21.18	21.19	21.56
		3	0	21.18	21.26	21.36
		3	1	21.26	21.25	21.32
		3	3	21.15	21.22	21.38
		6	0	20.27	20.41	20.33

Band/BW	Modulation	RB Size	RB Offset	Low CH 18615	Mid CH 18900	High CH 19185
				Frequency 1851.5 MHz	Frequency 1880 MHz	Frequency 1908.5 MHz
2/ 3	QPSK	1	0	23.47	23.51	23.45
		1	7	23.39	23.41	23.37
		1	14	23.38	23.42	23.38
		8	0	22.36	22.49	22.40
		8	3	22.32	22.30	22.36
		8	7	22.34	22.21	22.37
		15	0	22.08	22.41	22.30
	16QAM	1	0	22.09	21.96	22.05
		1	7	22.22	22.07	22.51
		1	14	22.09	21.95	22.48
		8	0	21.17	21.39	20.91
		8	3	21.08	21.45	20.71
		8	7	20.99	21.41	20.80
		15	0	21.09	21.52	21.50
	64QAM	1	0	21.22	21.35	21.34
		1	7	21.17	21.28	21.33
		1	14	21.22	21.32	21.47
		8	0	20.33	20.48	20.51
		8	3	20.38	20.38	20.51
		8	7	20.36	20.53	20.49
		15	0	20.21	20.31	20.34

Band/BW	Modulation	RB Size	RB Offset	Low CH 18625	Mid CH 18900	High CH 19175
				Frequency 1852.5 MHz	Frequency 1880 MHz	Frequency 1907.5 MHz
2/ 5	QPSK	1	0	23.52	23.54	23.41
		1	12	23.33	23.52	23.38
		1	24	23.33	23.35	23.44
		12	0	22.46	22.43	22.48
		12	6	22.37	22.31	22.34
		12	13	22.26	22.21	22.44
		25	0	22.15	22.49	22.25
	16QAM	1	0	22.13	21.97	21.96
		1	12	22.23	22.13	22.51
		1	24	22.08	21.92	22.39
		12	0	21.18	21.44	20.96
		12	6	21.10	21.31	20.72
		12	13	21.02	21.40	20.77
		25	0	21.17	21.48	21.52
	64QAM	1	0	21.10	21.34	21.34
		1	12	21.05	21.26	21.39
		1	24	21.15	21.33	21.52
		12	0	20.33	20.36	20.47
		12	6	20.41	20.49	20.52
		12	13	20.36	20.48	20.57
		25	0	20.24	20.39	20.33

Band/BW	Modulation	RB Size	RB Offset	Low CH 18650	Mid CH 18900	High CH 19150
				Frequency 1855 MHz	Frequency 1880 MHz	Frequency 1905 MHz
2/ 10	QPSK	1	0	23.50	23.47	23.40
		1	24	23.41	23.52	23.45
		1	49	23.42	23.35	23.34
		25	0	22.39	22.51	22.41
		25	12	22.41	22.27	22.35
		25	25	22.29	22.23	22.45
		50	0	22.14	22.43	22.32
	16QAM	1	0	22.15	21.94	22.01
		1	24	22.21	22.15	22.51
		1	49	21.96	21.88	22.47
		25	0	21.17	21.46	20.87
		25	12	21.09	21.45	20.72
		25	25	21.10	21.49	20.80
		50	0	21.05	21.46	21.60
	64QAM	1	0	21.14	21.35	21.30
		1	24	21.19	21.24	21.42
		1	49	21.21	21.30	21.60
		25	0	20.33	20.36	20.43
		25	12	20.33	20.51	20.38
		25	25	20.38	20.48	20.59
		50	0	20.34	20.29	20.41

Band/BW	Modulation	RB Size	RB Offset	Low CH 18675	Mid CH 18900	High CH 19125
				Frequency 1857.5 MHz	Frequency 1880 MHz	Frequency 1902.5 MHz
2/ 15	QPSK	1	0	23.47	23.58	23.38
		1	37	23.42	23.54	23.44
		1	74	23.40	23.42	23.38
		36	0	22.40	22.46	22.50
		36	19	22.35	22.34	22.40
		36	39	22.36	22.26	22.38
		75	0	22.15	22.39	22.22
	16QAM	1	0	22.10	21.93	21.91
		1	37	22.22	22.07	22.57
		1	74	22.08	21.99	22.47
		36	0	21.13	21.33	20.96
		36	19	21.06	21.39	20.77
		36	39	21.01	21.37	20.78
		75	0	21.13	21.52	21.54
	64QAM	1	0	21.19	21.39	21.25
		1	37	21.14	21.29	21.40
		1	74	21.15	21.28	21.50
		36	0	20.30	20.40	20.40
		36	19	20.43	20.47	20.39
		36	39	20.46	20.52	20.47
		75	0	20.30	20.38	20.43

Band/BW	Modulation	RB Size	RB Offset	Low CH 18700	Mid CH 18900	High CH 19100
				Frequency 1860 MHz	Frequency 1880 MHz	Frequency 1900 MHz
2/ 20	QPSK	1	0	23.57	**23.59**	23.52
		1	50	23.46	23.55	23.51
		1	99	23.43	23.49	23.48
		50	0	22.51	**22.55**	22.52
		50	25	22.42	22.38	22.48
		50	50	22.37	22.31	22.47
		100	0	22.21	**22.54**	22.37
	16QAM	1	0	22.17	22.08	22.06
		1	50	22.34	22.20	22.63
		1	99	22.10	22.03	22.54
		50	0	21.19	21.47	21.02
		50	25	21.15	21.46	20.83
		50	50	21.12	21.51	20.87
		100	0	21.20	21.56	21.62
	64QAM	1	0	21.23	21.42	21.37
		1	50	21.20	21.35	21.45
		1	99	21.28	21.34	21.61
		50	0	20.44	20.49	20.55
		50	25	20.48	20.52	20.53
		50	50	20.47	20.54	20.62
		100	0	20.36	20.43	20.47

EIRP POWER (dBm)

GSM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
512	1850.2	29.36	-0.7	28.66	734.51	2
661	1880.0	29.06	-0.7	28.36	685.49	2
810	1909.8	28.91	-0.7	28.21	662.22	2

EDGE

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
512	1850.2	25.88	-0.7	25.18	329.61	2
661	1880.0	26.05	-0.7	25.35	342.77	2
810	1909.8	25.78	-0.7	25.08	322.11	2

WCDMA

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
9262	1852.4	23.01	-0.7	22.31	170.22	2
9400	1880	23.06	-0.7	22.36	172.19	2
9538	1907.6	22.97	-0.7	22.27	168.66	2

LTE BAND 2

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18607	1850.7	23.54	-0.7	22.84	192.31	2
18900	1880.0	23.54	-0.7	22.84	192.31	2
19193	1909.3	23.38	-0.7	22.68	185.35	2

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18607	1850.7	22.2	-0.7	21.5	141.25	2
18900	1880.0	22.32	-0.7	21.62	145.21	2
19193	1909.3	22.6	-0.7	21.9	154.88	2

CHANNEL BANDWIDTH: 1.4MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18607	1850.7	21.26	-0.7	20.56	113.76	2
18900	1880.0	21.41	-0.7	20.71	117.76	2
19193	1908.3	21.56	-0.7	20.86	121.9	2

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18615	1851.5	23.47	-0.7	22.77	189.23	2
18900	1880.0	23.51	-0.7	22.81	190.99	2
19185	1908.5	23.45	-0.7	22.75	188.36	2

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18615	1851.5	22.22	-0.7	21.52	141.91	2
18900	1880.0	22.07	-0.7	21.37	137.09	2
19185	1908.5	22.51	-0.7	21.81	151.71	2

CHANNEL BANDWIDTH: 3MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18615	1851.5	21.22	-0.7	20.52	112.72	2
18900	1880.0	21.35	-0.7	20.65	116.14	2
19185	1908.5	21.47	-0.7	20.77	119.4	2

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18625	1852.5	23.52	-0.7	22.82	191.43	2
18900	1880.0	23.54	-0.7	22.84	192.31	2
19175	1907.5	23.44	-0.7	22.74	187.93	2

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18625	1852.5	22.23	-0.7	21.53	142.23	2
18900	1880.0	22.13	-0.7	21.43	139	2
19175	1907.5	22.51	-0.7	21.81	151.71	2

CHANNEL BANDWIDTH: 5MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18625	1852.5	21.15	-0.7	20.45	110.92	2
18900	1880.0	21.34	-0.7	20.64	115.88	2
19175	1907.5	21.52	-0.7	20.82	120.78	2

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18650	1855.0	23.5	-0.7	22.8	190.55	2
18900	1880.0	23.52	-0.7	22.82	191.43	2
19150	1905.0	23.45	-0.7	22.75	188.36	2

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18650	1855.0	22.21	-0.7	21.51	141.58	2
18900	1880.0	22.15	-0.7	21.45	139.64	2
19150	1905.0	22.51	-0.7	21.81	151.71	2

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18650	1855.0	21.21	-0.7	20.51	112.46	2
18900	1880.0	21.35	-0.7	20.65	116.14	2
19150	1905.0	21.6	-0.7	20.9	123.03	2

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18675	1857.5	23.47	-0.7	22.77	189.23	2
18900	1880.0	23.58	-0.7	22.88	194.09	2
19125	1902.5	23.44	-0.7	22.74	187.93	2

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18675	1857.5	22.22	-0.7	21.52	141.91	2
18900	1880.0	22.07	-0.7	21.37	137.09	2
19125	1902.5	22.57	-0.7	21.87	153.82	2

CHANNEL BANDWIDTH: 15MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18675	1857.5	21.19	-0.7	20.49	111.94	2
18900	1880.0	21.39	-0.7	20.69	117.22	2
19125	1902.5	21.5	-0.7	20.8	120.23	2

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18700	1860	23.57	-0.7	22.87	193.64	2
18900	1880	23.59	-0.7	22.89	194.54	2
19100	1900	23.52	-0.7	22.82	191.43	2

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18700	1860	22.34	-0.7	21.64	145.88	2
18900	1880	22.2	-0.7	21.5	141.25	2
19100	1900	22.63	-0.7	21.93	155.96	2

CHANNEL BANDWIDTH: 20MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18700	1860	21.28	-0.7	20.58	114.29	2
18900	1880	21.42	-0.7	20.72	118.03	2
19100	1900	21.61	-0.7	20.91	123.31	2

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.2.2 TEST PROCEDURE

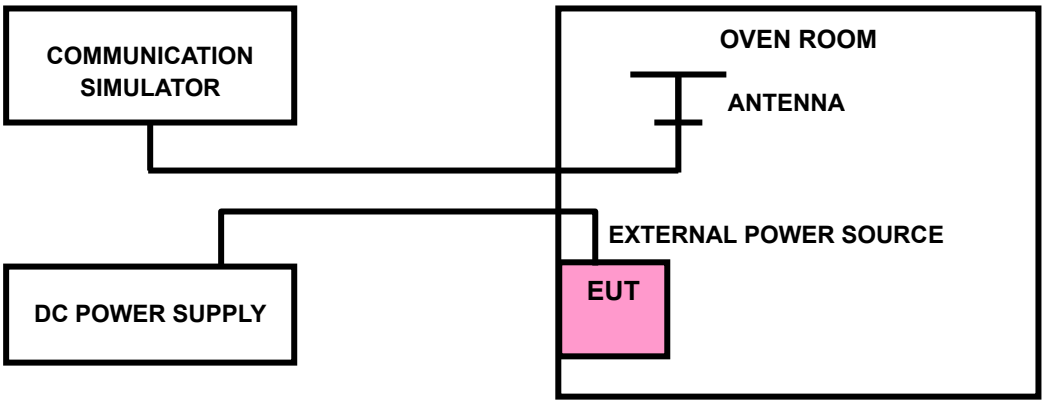
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

3.2.3 TEST SETUP



3.2.4 TEST RESULTS

Please Refer to Appendix Of this test report.

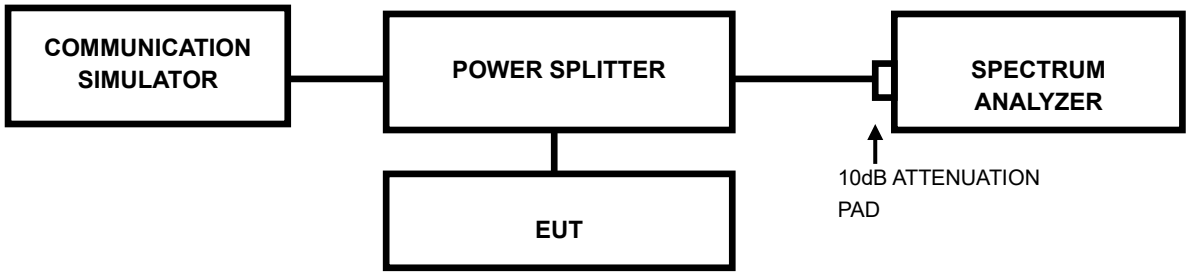
Note: VL = Low voltage(3.6V); VN/NV = Normal voltage(3.87V); VH = High voltage(4.45V);
NT = Normal temperature (25℃)

3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage
0.5 %of the total mean power of a given emission.

3.3.2 TEST SETUP



3.3.3 TEST PROCEDURES

a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

3.3.4 TEST RESULTS

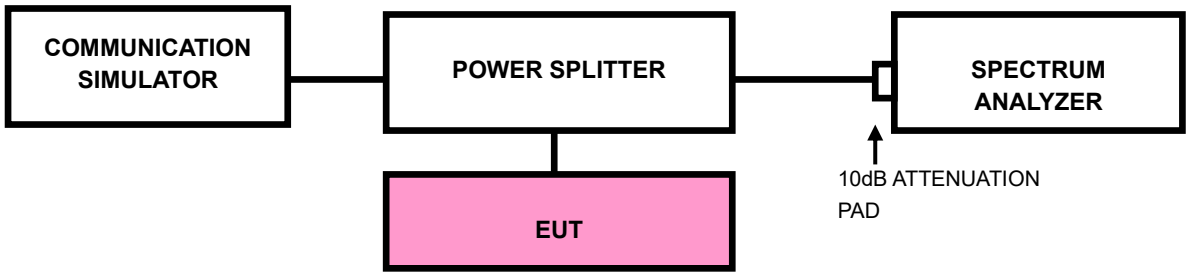
Please Refer to Appendix Of this test report.

3.4 BAND EDGE MEASUREMENTC

3.4.1 LIMITS OF BAND EDGE MEASUREMENT

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. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

3.4.2 TEST SETUP



3.4.3 TEST PROCEDURES

a) All measurements were done at low and high operational frequency range

b) Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.

c) Tune the analyzer to the nominal center frequency of the emission bandwidth (EBW)

d) .Set the resolution bandwidth (RBW) ≧ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.

e) Beyond the 1MHz band from the band edge, RBW=1MHz was used.

f) Set the video bandwidth (VBW) to ≧3 x RBW.

g) Select the average power (RMS) display detector.

h) Set the number of measurement points to ≧ 1001.

i) Use auto-coupled sweep time.

j) Perform the measurement over an interval of time when the transmission is continuous and at its maximum power level.

k) The RF fundamental frequency should be excluded against the limit line in the operating frequency band and use RBW is 10KHz or 100KHz.

l) Record the max trace plot into the test report.

3.4.4 TEST RESULTS

Please Refer to Appendix Of this test report.

3.5 CONDUCTED SPURIOUS EMISSIONS

3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

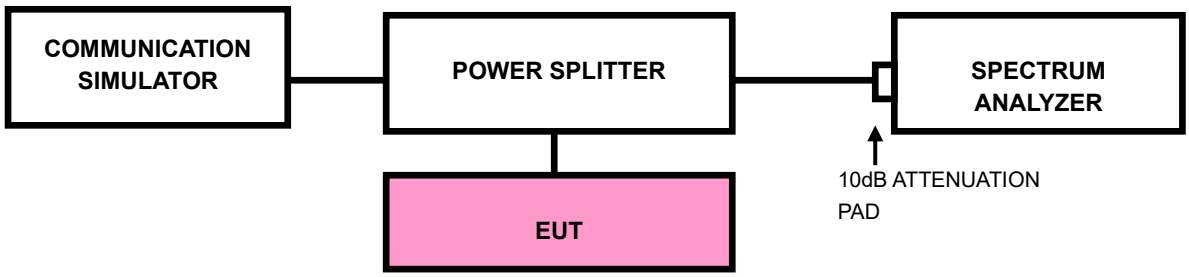
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

3.5.2 TEST PROCEDURE

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

b. Measuring frequency range is from 30MHz up to a frequency including its 10th harmonic. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

3.5.3 TEST SETUP



3.5.4 TEST RESULTS

NOTE ：The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

Please Refer to Appendix Of this test report.

3.6 RADIATED EMISSION MEASUREMENT

3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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. The emission limit equal to –13dBm.

3.6.2 TEST PROCEDURES

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.

b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G

c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

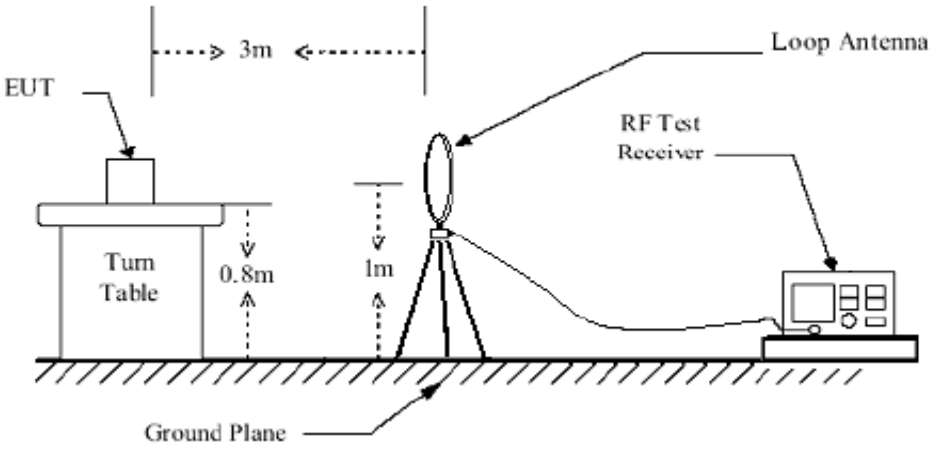
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.6.3 DEVIATION FROM TEST STANDARD

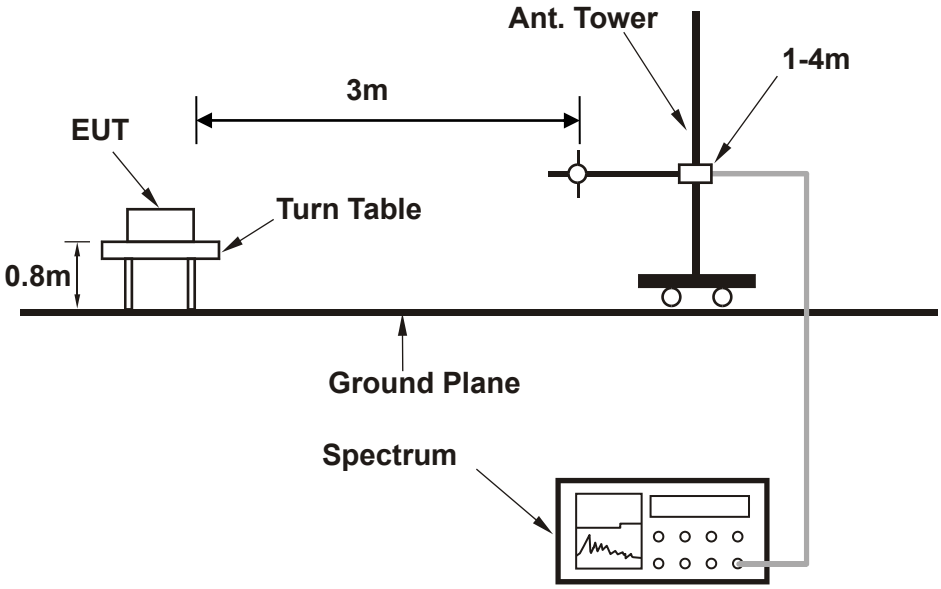
No deviation

3.6.4 TEST SETUP

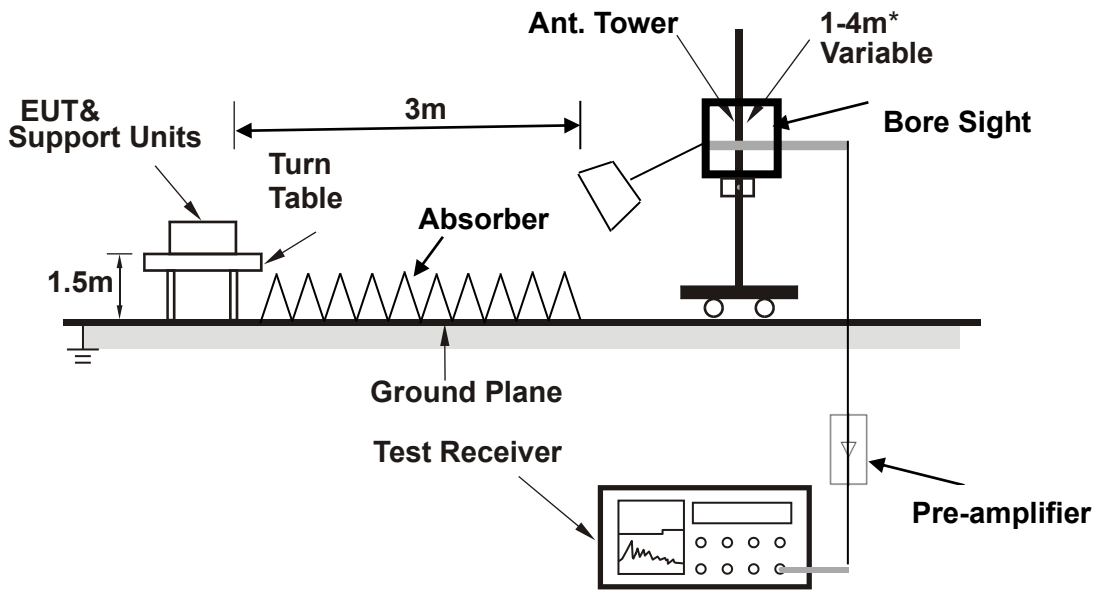
< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.6.5 TEST RESULTS

NOTE ：The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

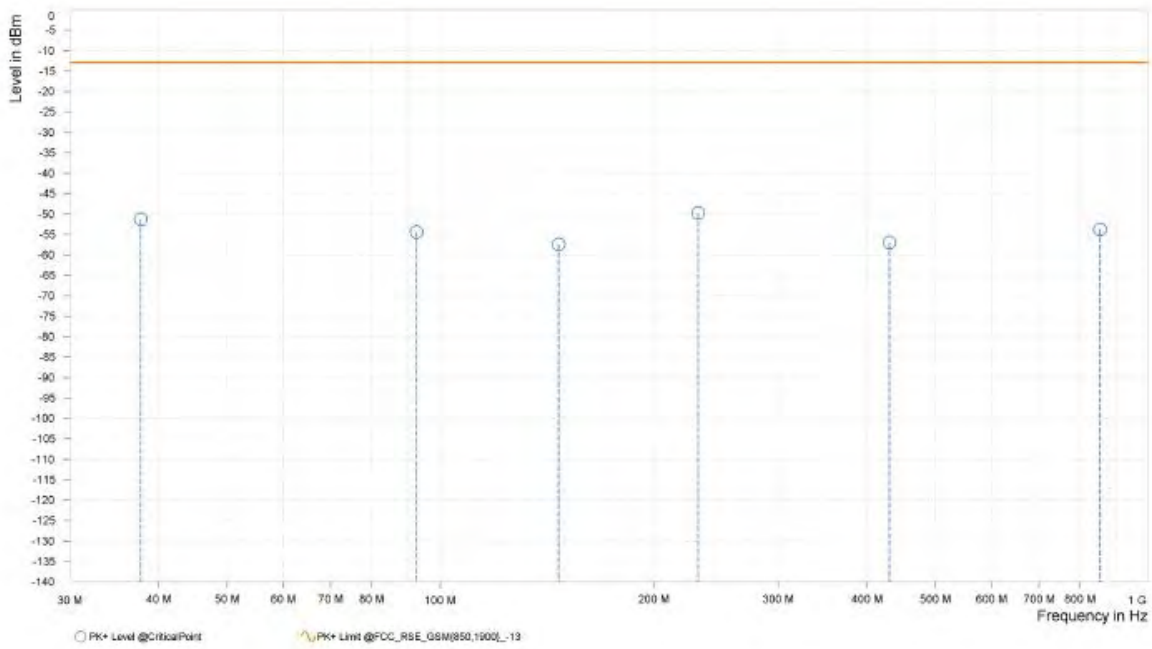
BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

EDGE1900: CH 661

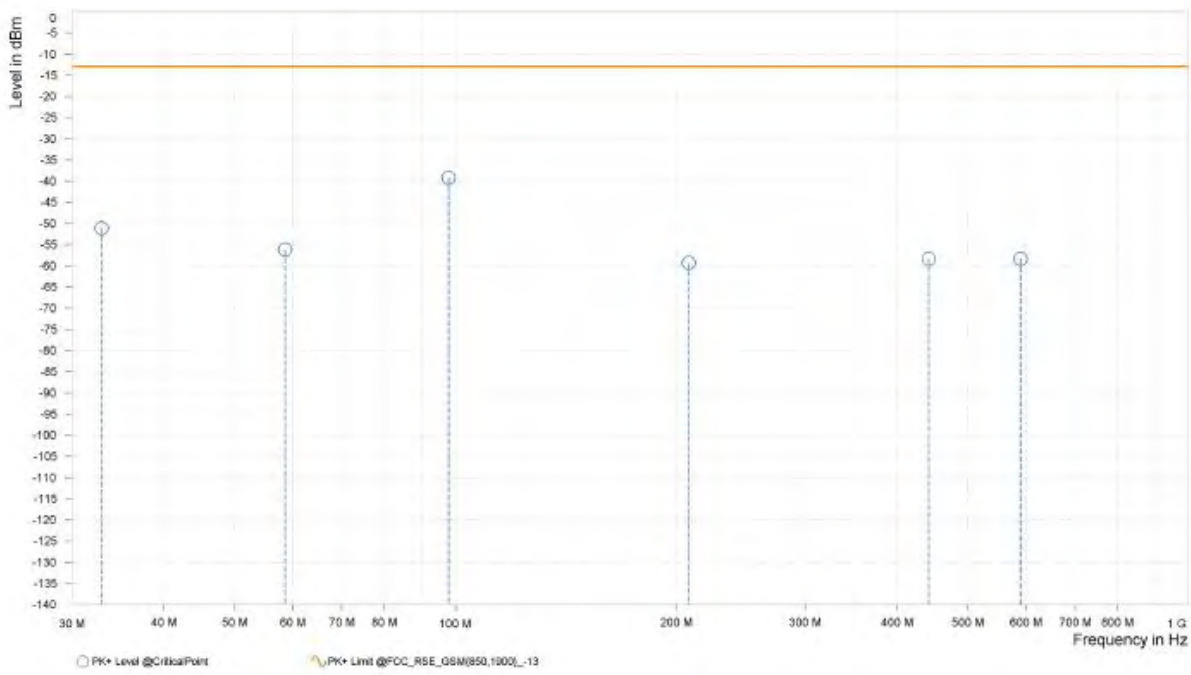
MODE	TX channel 661	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	37.760	-51.28	-13.00	38.28	5.54	H	355.3	1.00
1	92.565	-54.37	-13.00	41.37	-5.83	H	211.2	2.00
1	146.885	-57.42	-13.00	44.42	-9.13	H	134.7	2.00
1	231.275	-49.71	-13.00	36.71	7.16	H	218	1.00
1	430.610	-56.97	-13.00	43.97	8.74	H	1	1.00
1	854.015	-53.76	-13.00	40.76	11.41	H	5.6	1.00



MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	32.910	-51.12	-13.00	38.12	-1.18	V	225.3	1.00
1	58.615	-56.15	-13.00	43.15	1.98	V	1	1.00
1	97.900	-39.25	-13.00	26.25	8.84	V	359.1	1.00
1	207.995	-59.31	-13.00	46.31	-1.30	V	5.7	1.00
1	442.250	-58.39	-13.00	45.39	7.25	V	225.3	1.00
1	590.175	-58.37	-13.00	45.37	7.21	V	359.1	1.00



ABOVE 1GHz DATA

Note: For higher frequency, the emission is too low to be detected.

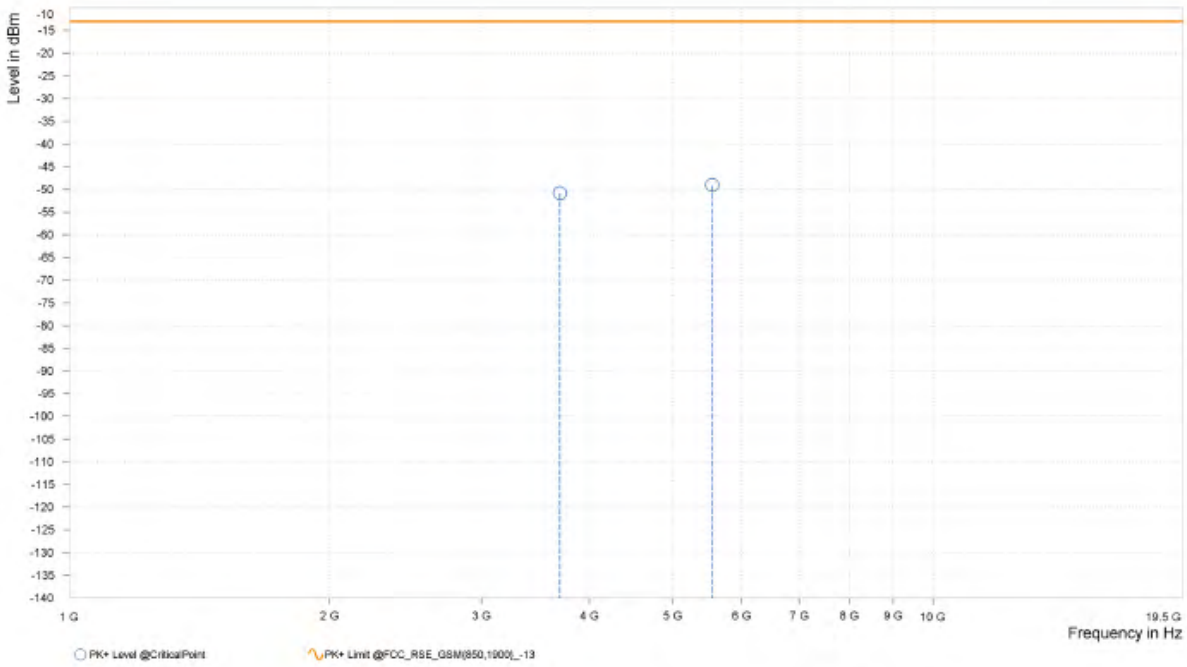
WORST-CASE DATA

GSM 1900:

CH 512

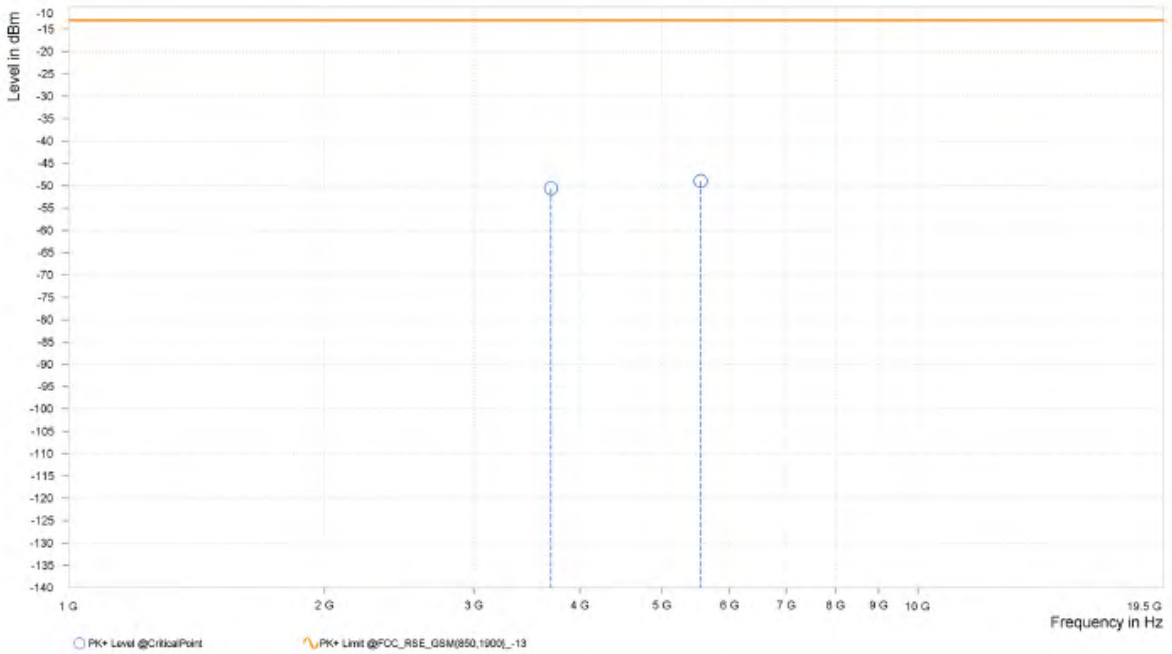
MODE	TX channel 512	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,700.000	-50.84	-13.00	37.84	20.98	H	99	2.00
4	5,550.000	-49.03	-13.00	36.03	23.76	H	240.7	1.00



MODE	TX channel 512	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

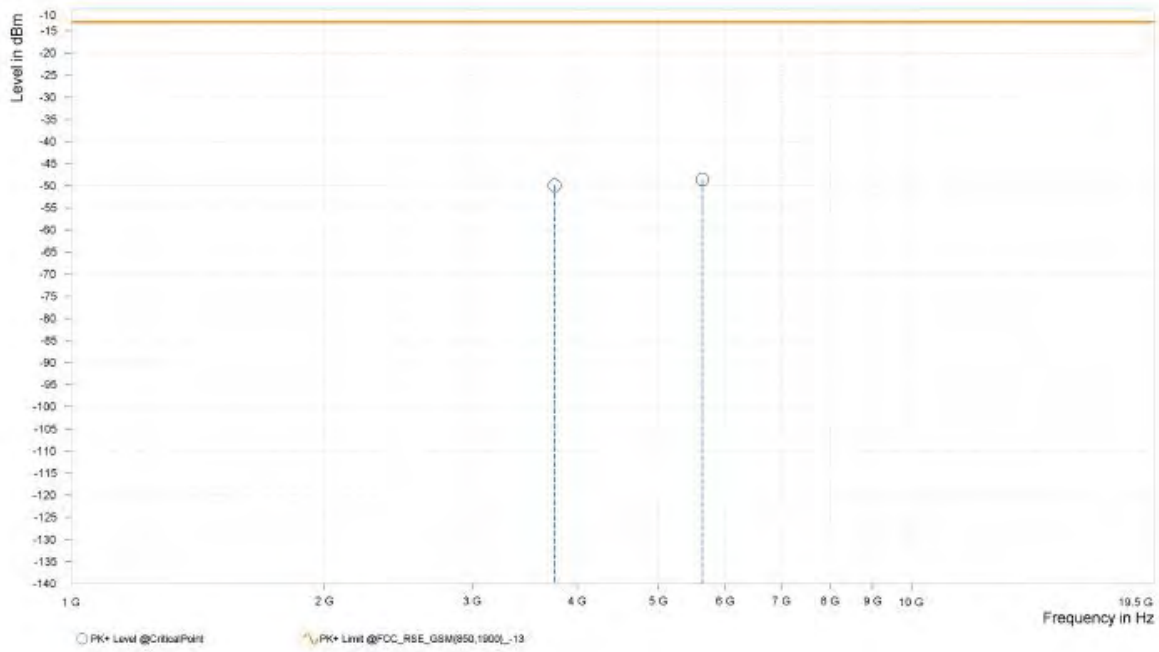
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,700.000	-50.62	-13.00	37.62	21.57	V	0.9	2.00
4	5,550.000	-48.98	-13.00	35.98	24.45	V	359.1	1.00



CH 661

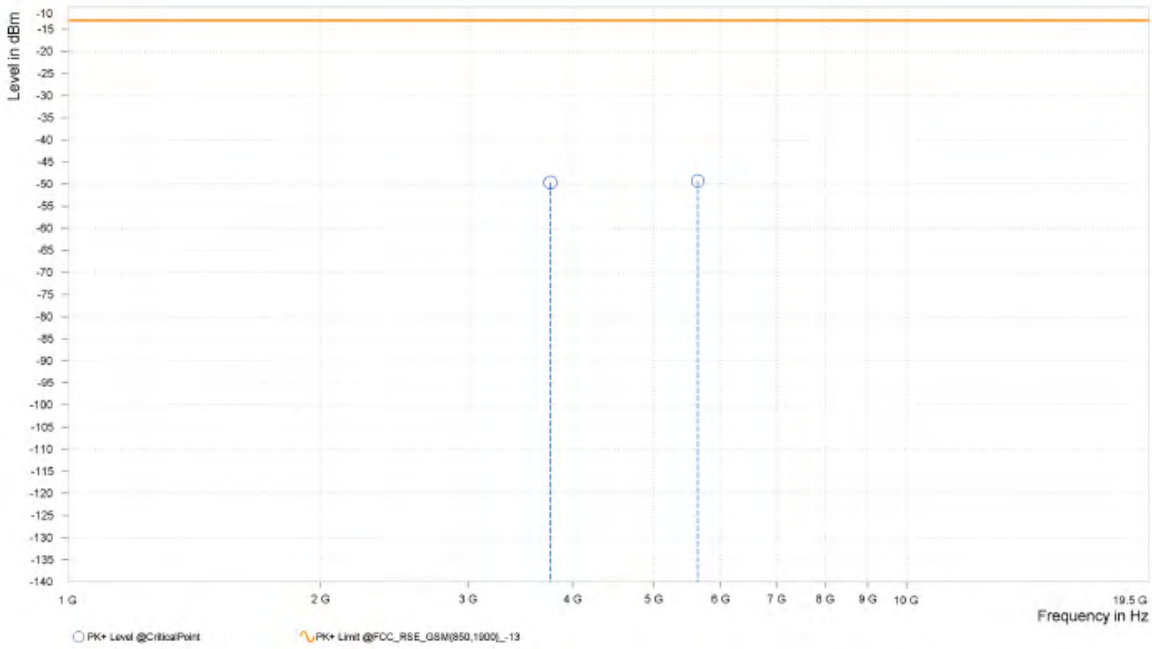
MODE	TX channel 661	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.000	-49.93	-13.00	36.93	21.19	H	1	2.00
4	5,640.000	-48.56	-13.00	35.56	24.12	H	256.2	1.00



MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

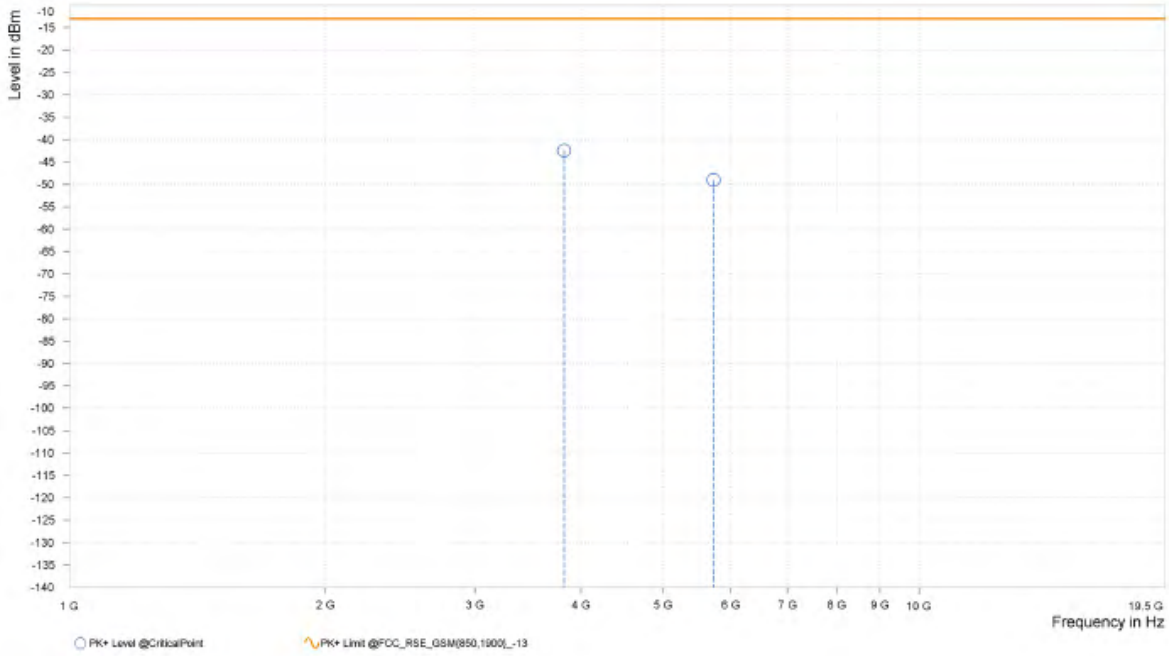
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.000	-49.71	-13.00	36.71	21.68	V	359	2.00
4	5,640.000	-49.31	-13.00	36.31	24.46	V	1	1.00



CH 810

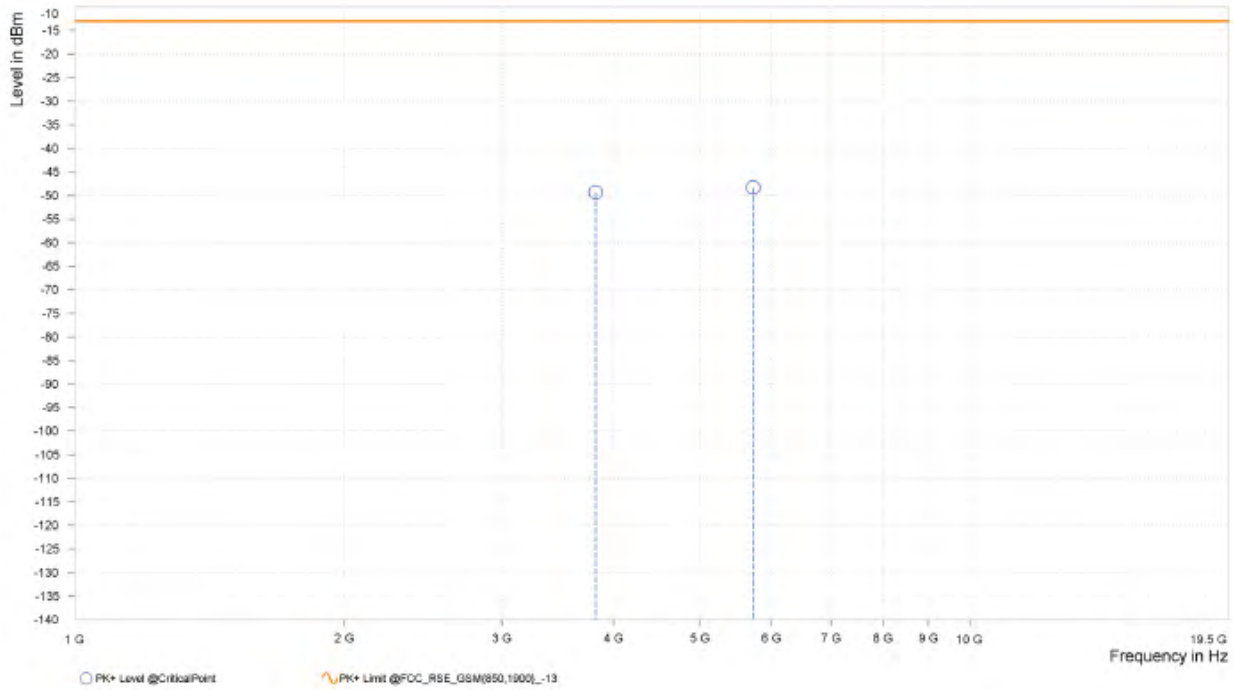
MODE	TX channel 810	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,819.000	-42.43	-13.00	29.43	21.85	H	95.3	2.00
4	5,729.400	-49.03	-13.00	36.03	24.45	H	269.5	1.00



MODE	TX channel 810	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,819.600	-49.31	-13.00	36.31	22.20	V	84.6	2.00
4	5,729.400	-48.31	-13.00	35.31	24.92	V	359.1	1.00

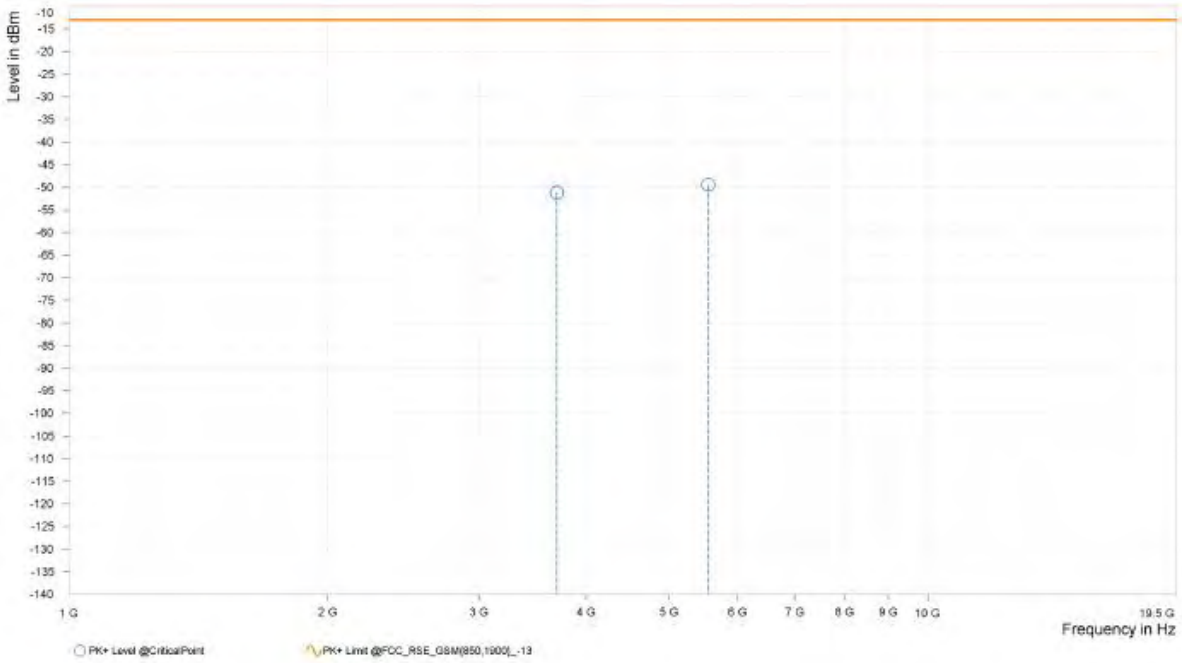


EDGE 1900:

CH 512

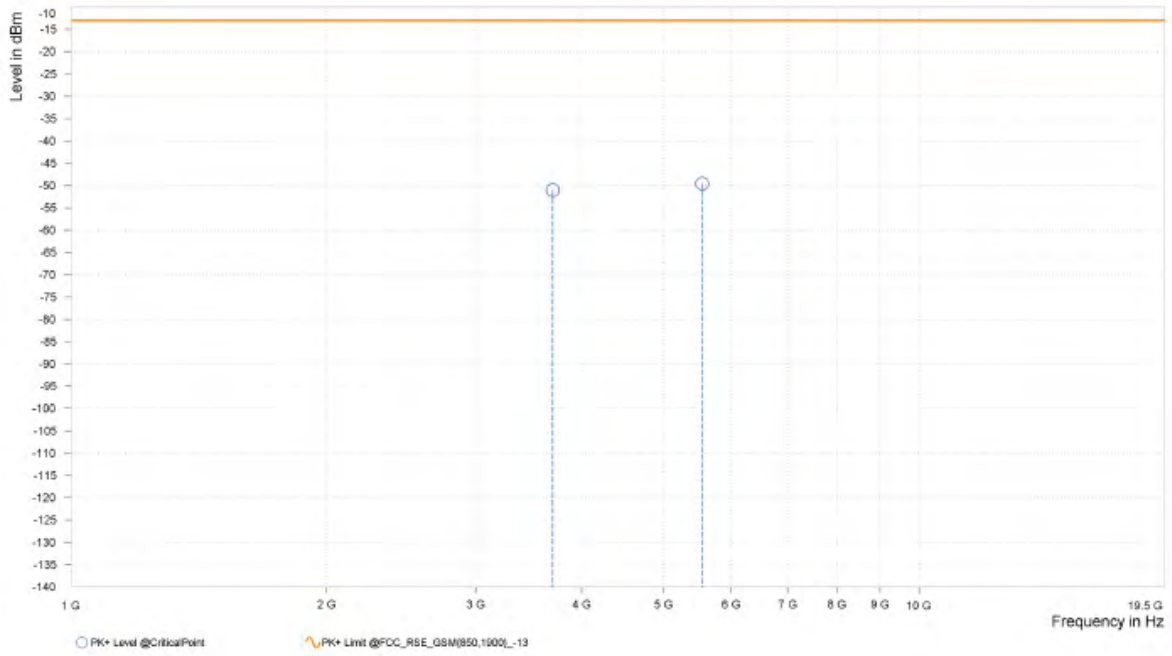
MODE	TX channel 512	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,700.000	-51.18	-13.00	38.18	20.98	H	1	1.00
4	5,550.000	-49.49	-13.00	36.49	23.76	H	1	2.00



MODE	TX channel 512	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

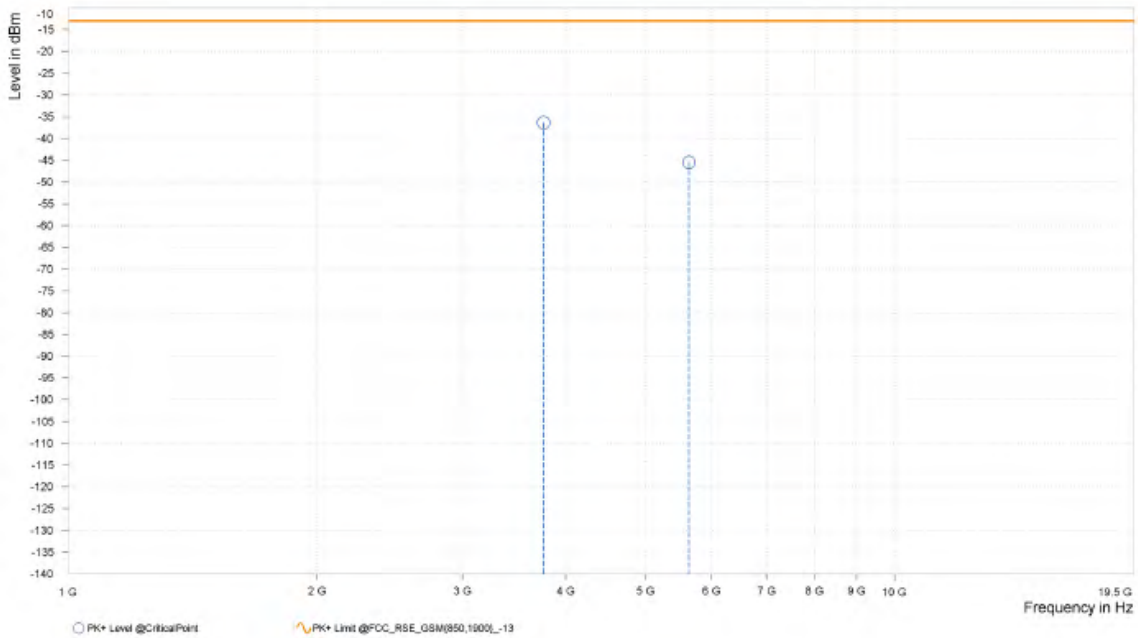
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,700.000	-51.06	-13.00	38.06	21.57	V	1	2.00
4	5,550.000	-49.59	-13.00	36.59	24.45	V	359	1.00



CH 661

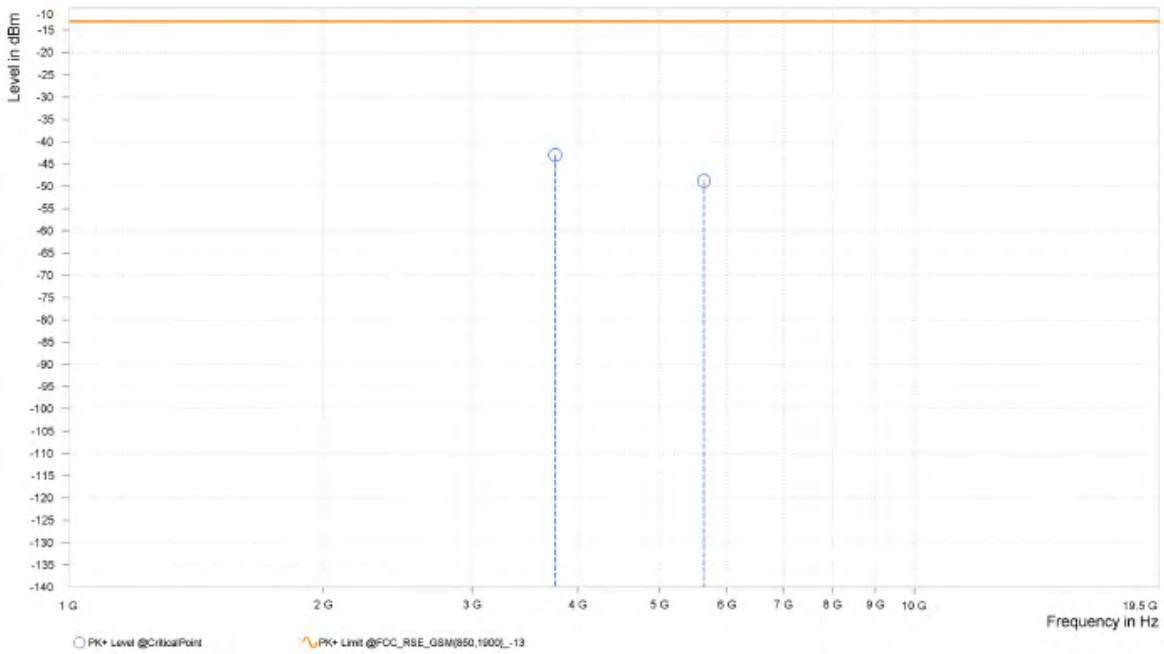
MODE	TX channel 661	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.000	-36.38	-13.00	23.38	21.19	H	359	1.00
4	5,640.000	-45.45	-13.00	32.45	24.12	H	237.2	1.00



MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

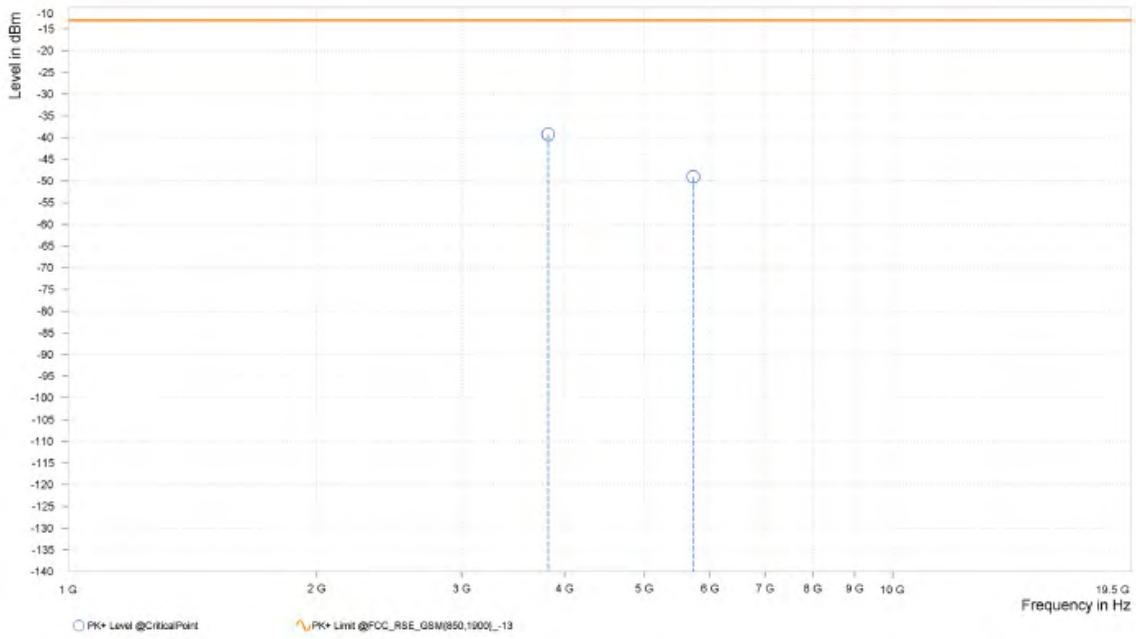
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.500	-43.05	-13.00	30.05	21.68	V	359	2.00
4	5,640.000	-48.80	-13.00	35.80	24.46	V	1	1.00



CH 810

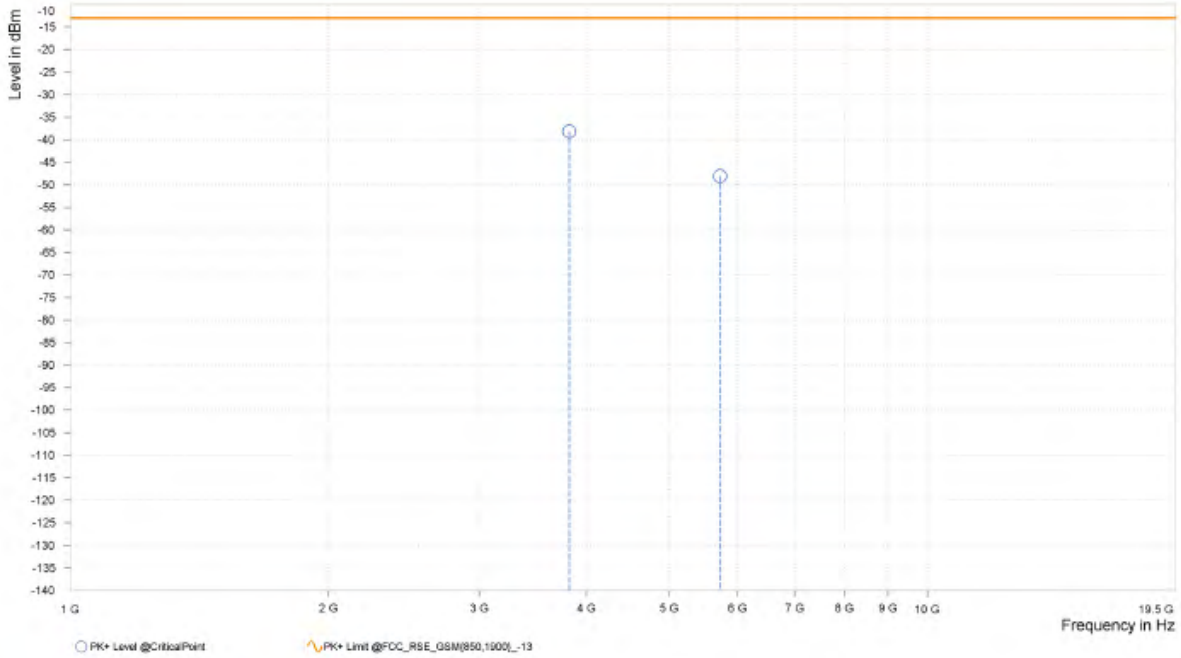
MODE	TX channel 810	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,819.500	-39.27	-13.00	26.27	21.85	H	118	2.00
4	5,729.400	-49.02	-13.00	36.02	24.45	H	359	1.00



MODE	TX channel 810	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,819.500	-38.16	-13.00	25.16	22.20	V	359	2.00
4	5,729.400	-48.06	-13.00	35.06	24.92	V	120.4	2.00

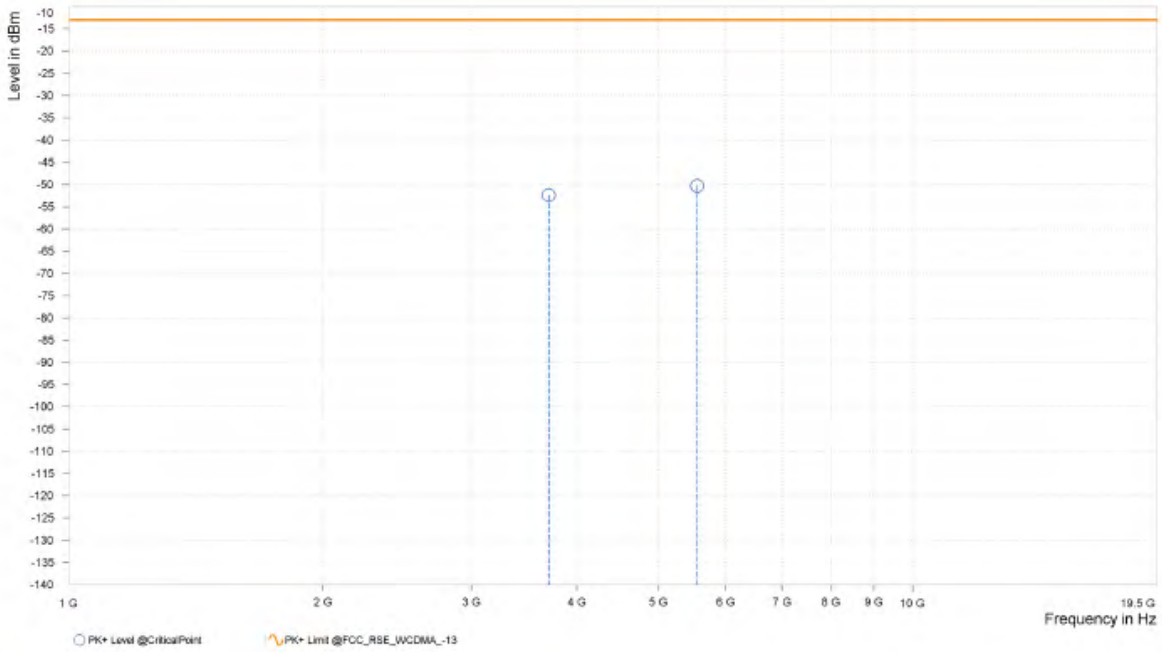


WCDMA Band II

CH 9262

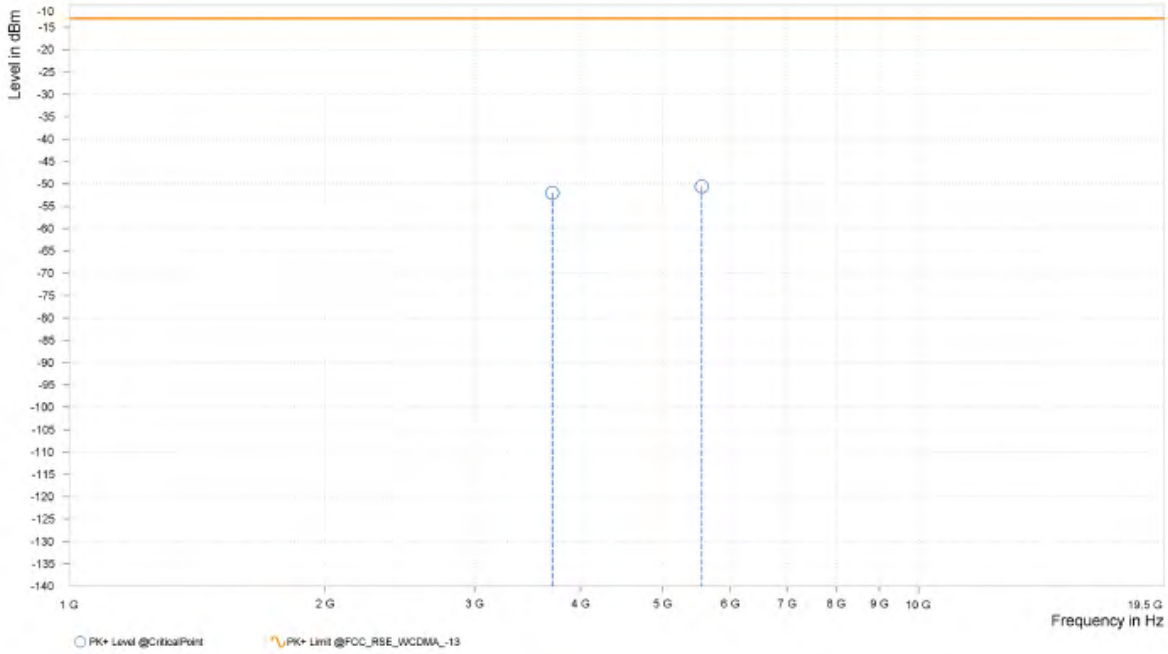
MODE	TX channel 9262	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,705.000	-52.41	-13.00	39.41	20.95	H	0.8	2.00
4	5,557.000	-50.29	-13.00	37.29	23.75	H	1	1.00



MODE	TX channel 9262	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

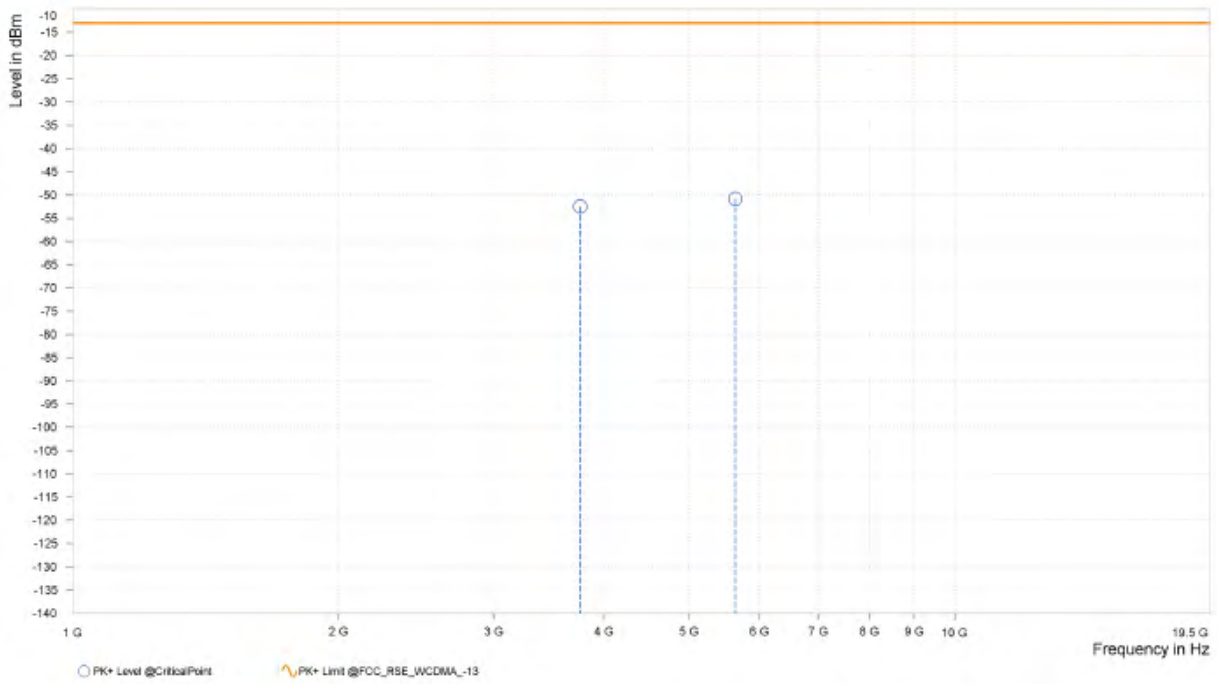
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,705.000	-52.02	-13.00	39.02	21.55	V	0.8	2.00
4	5,557.000	-50.63	-13.00	37.63	24.45	V	359	2.00



CH 9400

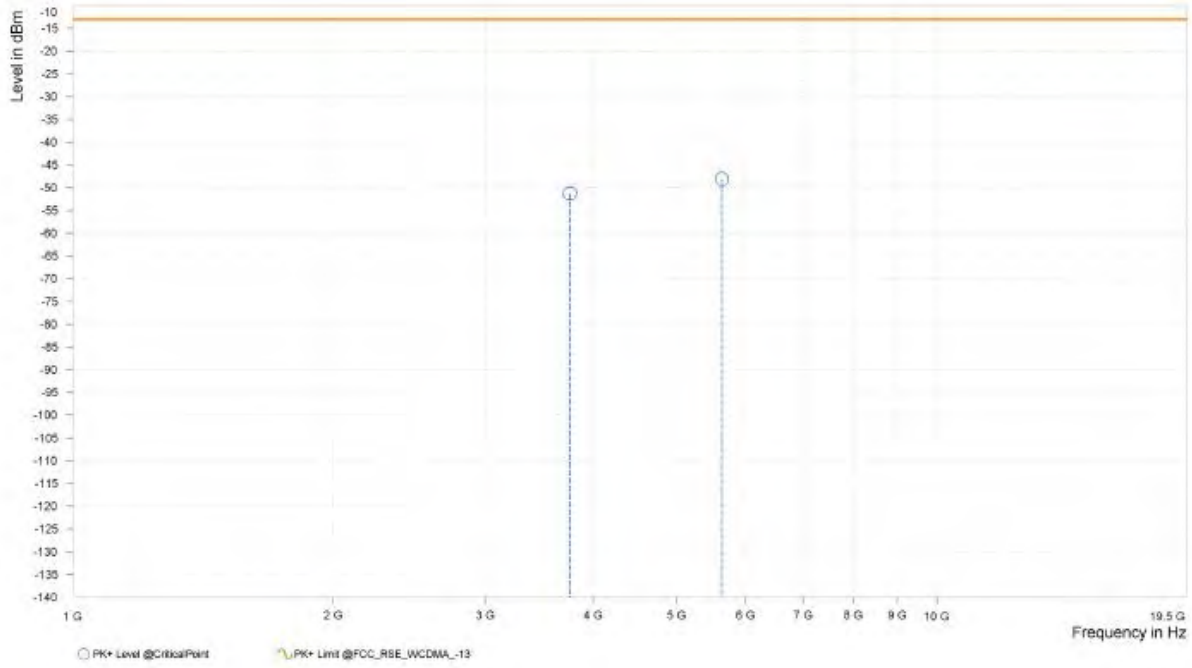
MODE	TX channel 9400	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.000	-52.50	-13.00	39.50	21.19	H	359.1	1.00
4	5,640.000	-50.81	-13.00	37.81	24.12	H	205.4	2.00



MODE	TX channel 9400	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

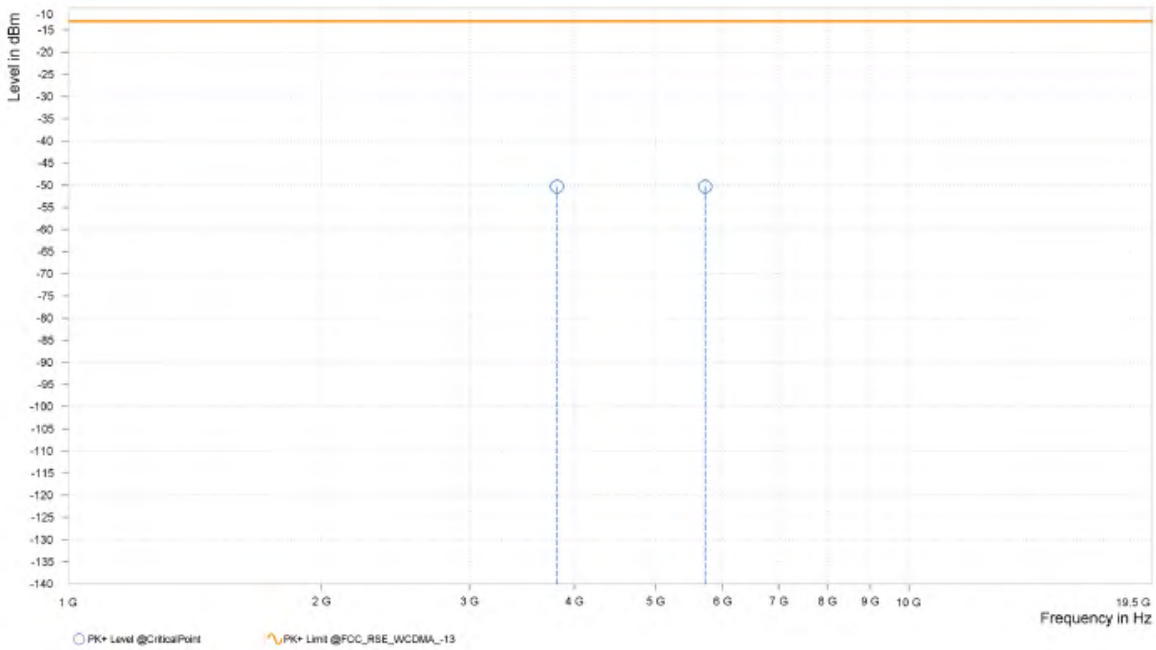
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,760.000	-51.27	-13.00	38.27	21.68	V	209	2.00
4	5,640.000	-48.11	-13.00	35.11	24.46	V	153.5	1.00



CH 9538

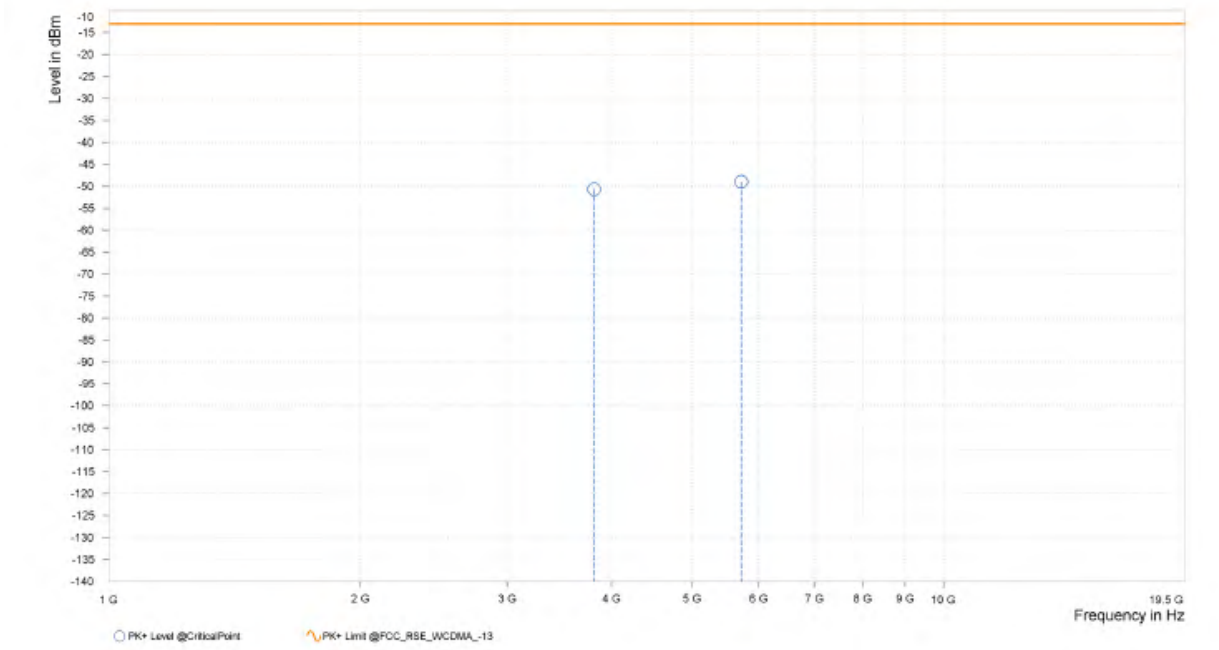
MODE	TX channel 9538	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,815.000	-50.32	-13.00	37.32	21.82	H	1	1.00
4	5,723.000	-50.31	-13.00	37.31	24.42	H	325.5	1.00



MODE	TX channel 9538	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,815.000	-50.65	-13.00	37.65	22.15	V	207.7	2.00
4	5,723.000	-48.97	-13.00	35.97	24.88	V	163	1.00

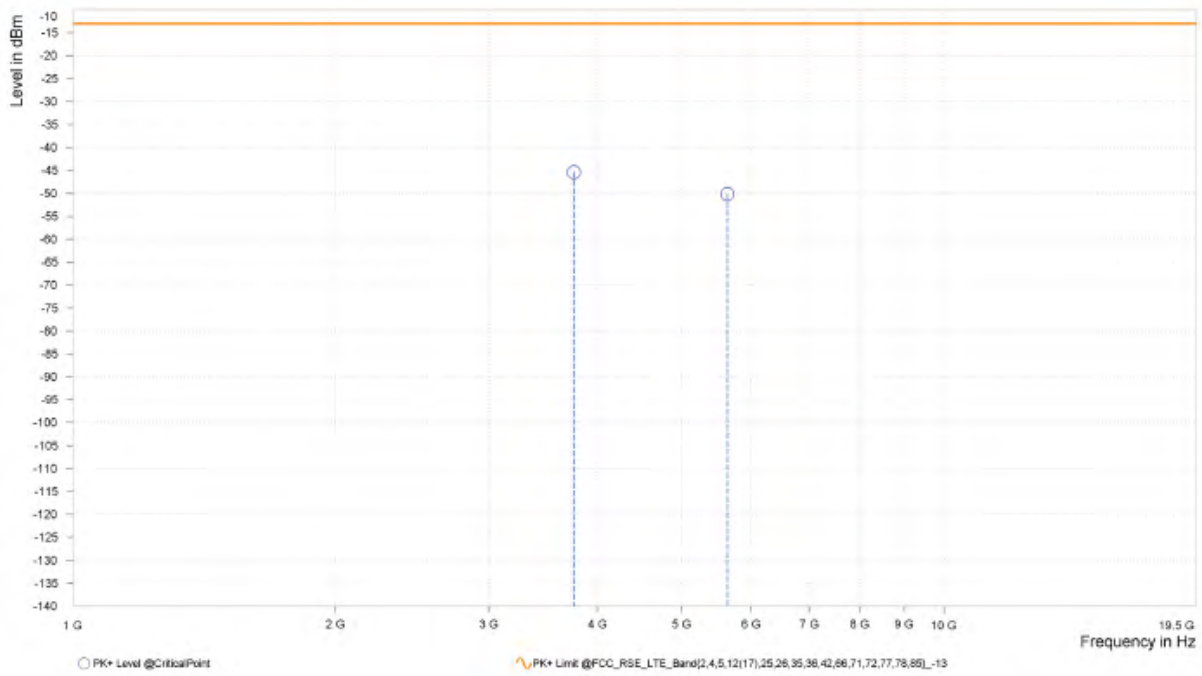


LTE Band 2

CHANNEL BANDWIDTH: 1.4MHz / QPSK

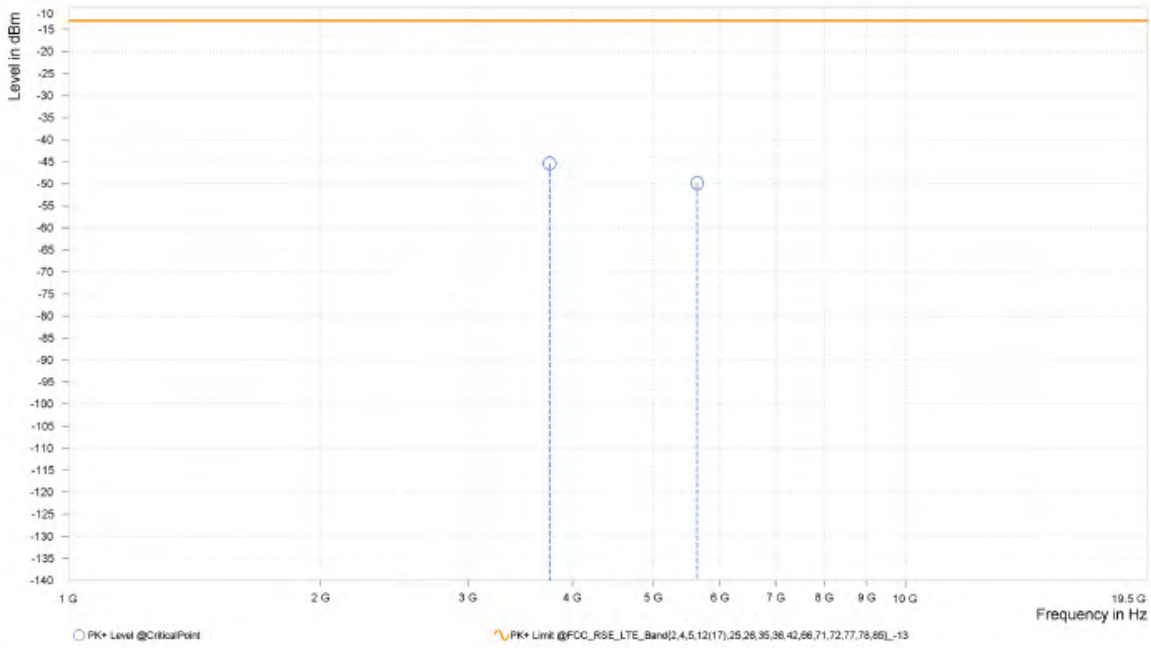
MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,759.000	-45.39	-13.00	32.39	21.18	H	199.4	2.00
4	5,638.000	-50.16	-13.00	37.16	24.11	H	331.6	1.00



MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

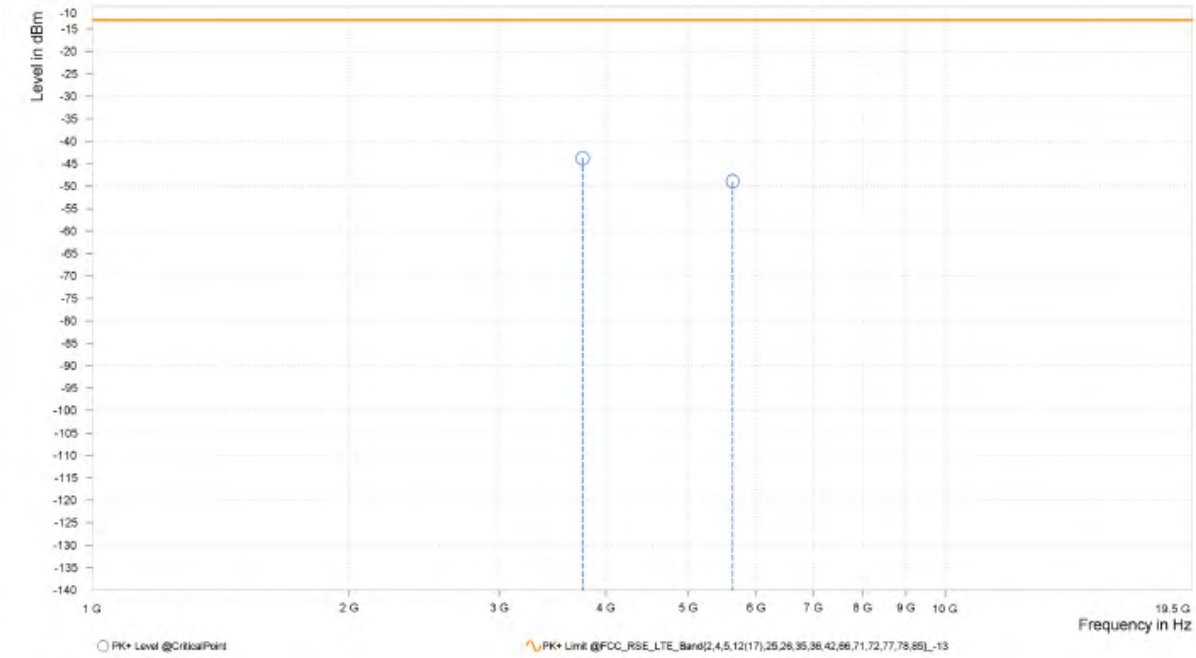
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,759.000	-45.42	-13.00	32.42	21.68	V	0.9	2.00
4	5,638.000	-49.92	-13.00	36.92	24.45	V	1	1.00



CHANNEL BANDWIDTH: 3MHz / QPSK

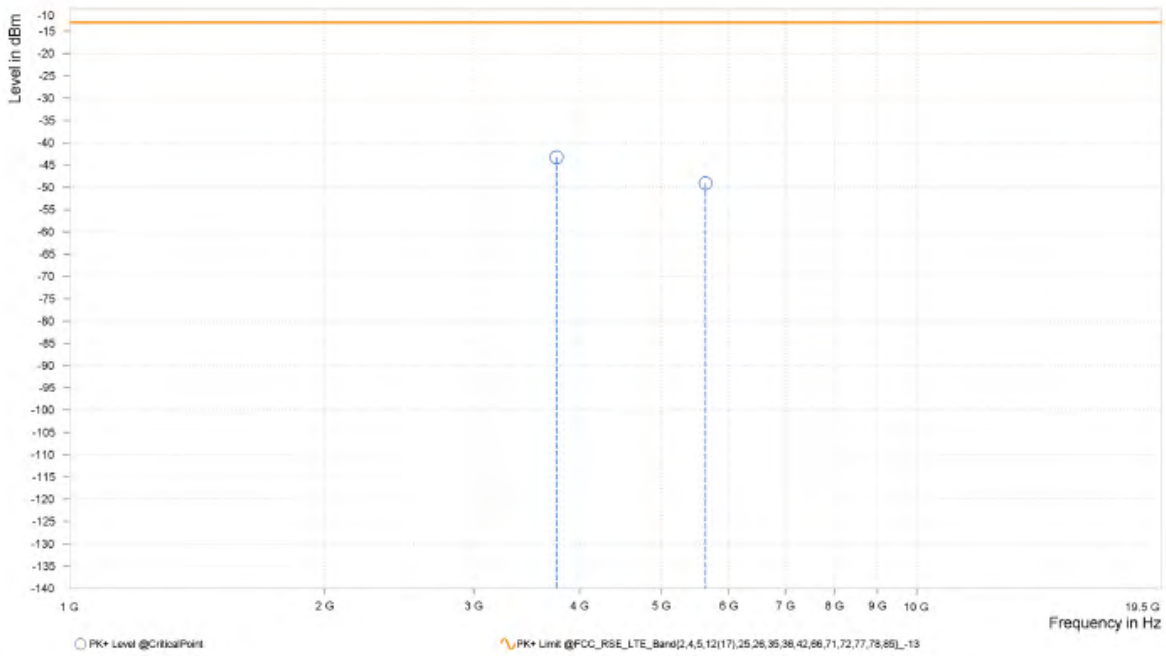
MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,758.000	-43.81	-13.00	30.81	21.16	H	328	1.00
4	5,636.000	-48.91	-13.00	35.91	24.11	H	159.4	1.00



MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

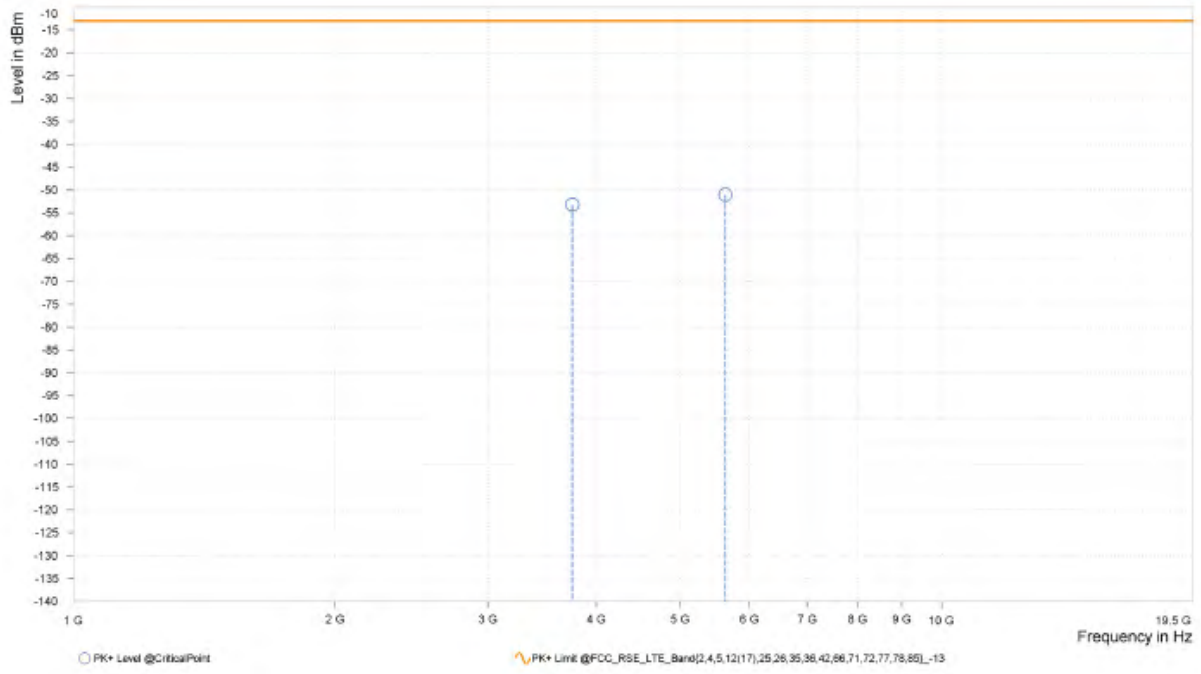
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,757.000	-43.22	-13.00	30.22	21.67	V	0.9	2.00
4	5,636.000	-49.06	-13.00	36.06	24.44	V	359	2.00



CHANNEL BANDWIDTH: 5MHz / QPSK

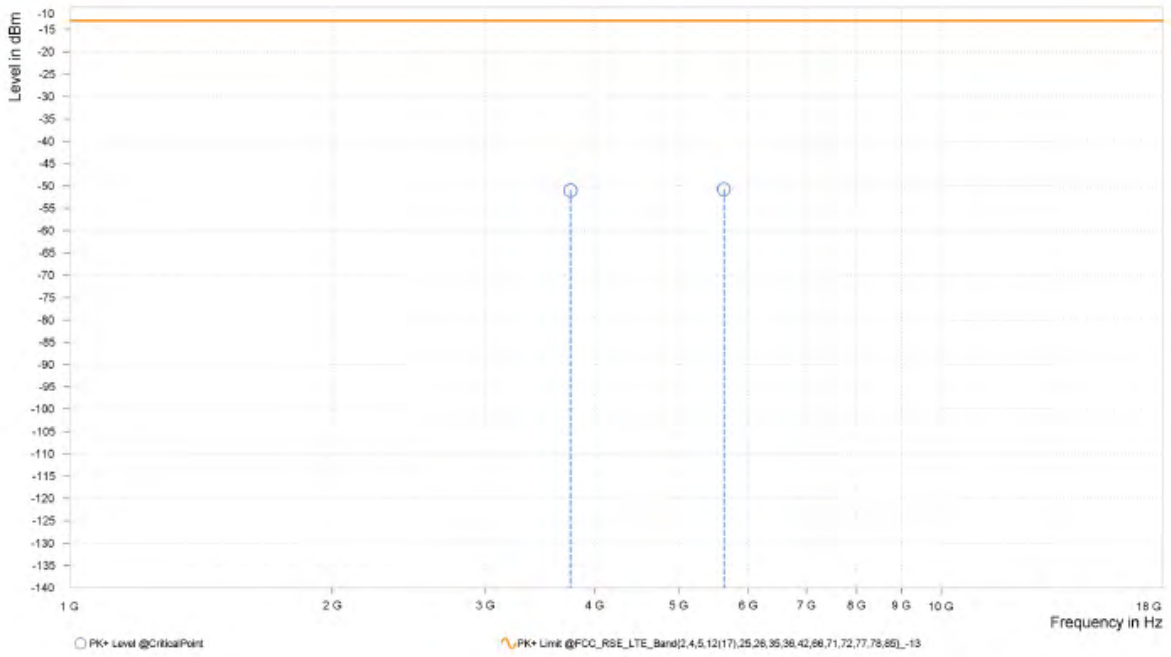
MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,755.500	-53.21	-13.00	40.21	21.11	H	330.4	1.00
4	5,633.000	-51.08	-13.00	38.08	24.10	H	359.1	1.00



MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,755.500	-51.04	-13.00	38.04	21.66	V	160.6	1.00
4	5,633.000	-50.73	-13.00	37.73	24.43	V	329.1	1.00

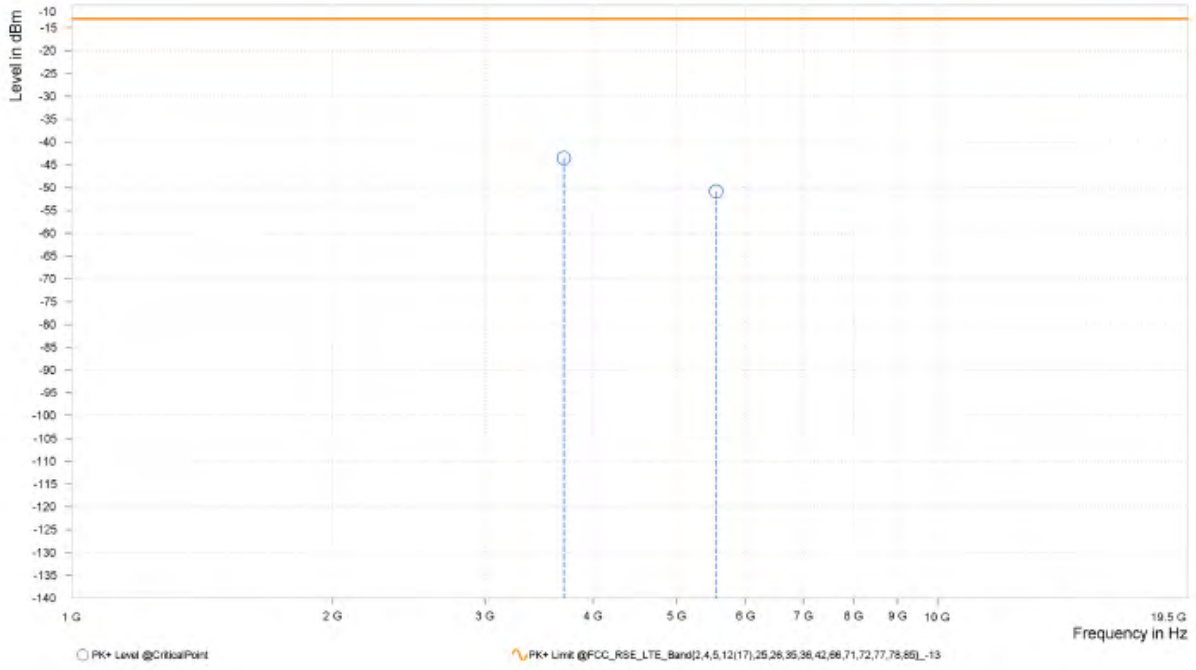


CHANNEL BANDWIDTH: 10MHz / QPSK

CH18650

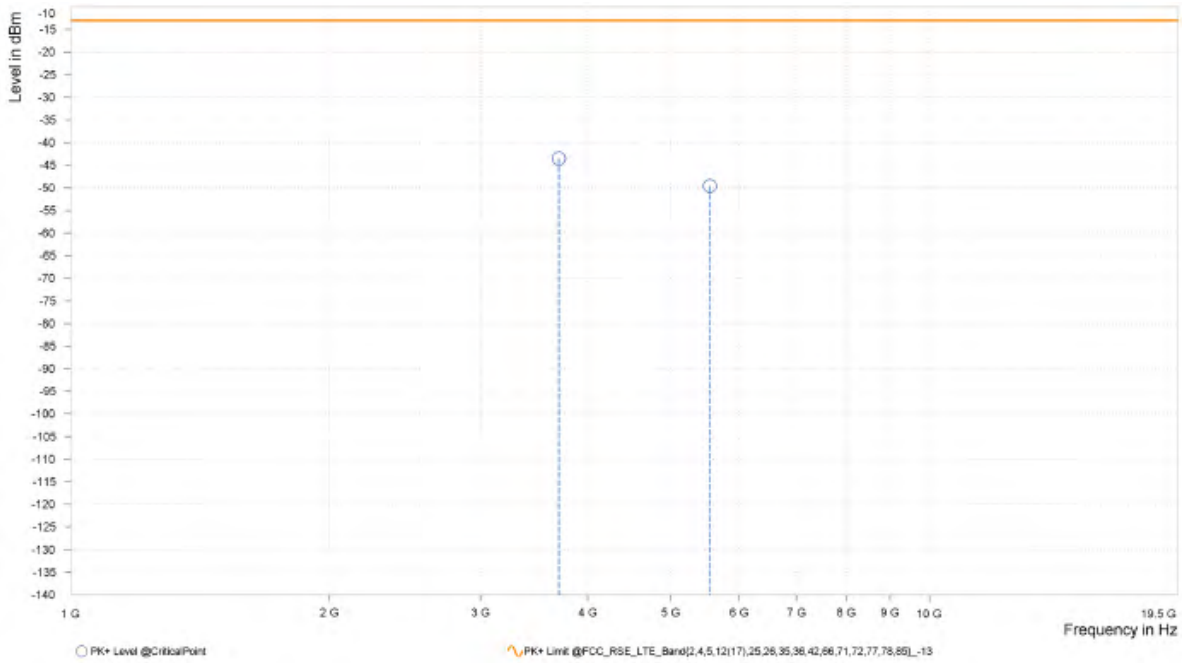
MODE	TX channel 18650	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,701.000	-43.55	-13.00	30.55	20.97	H	119.3	2.00
4	5,551.500	-50.86	-13.00	37.86	23.75	H	344.5	1.00



MODE	TX channel 18650	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

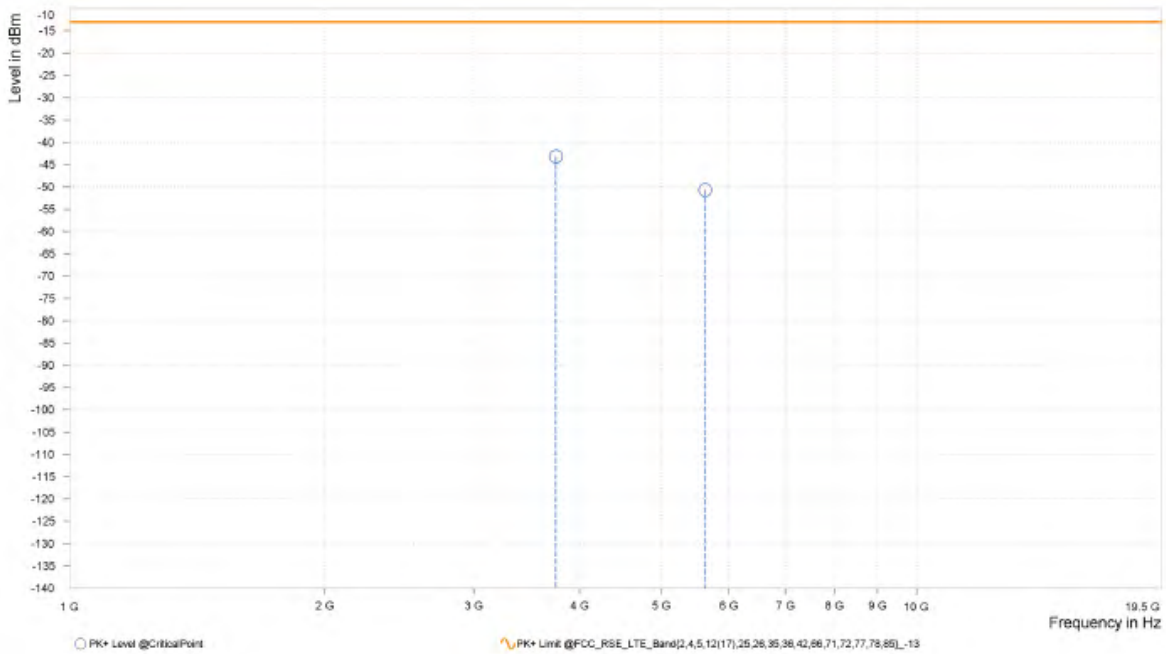
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,701.000	-43.52	-13.00	30.52	21.57	V	1	2.00
4	5,551.500	-49.64	-13.00	36.64	24.45	V	359	2.00



CH18900

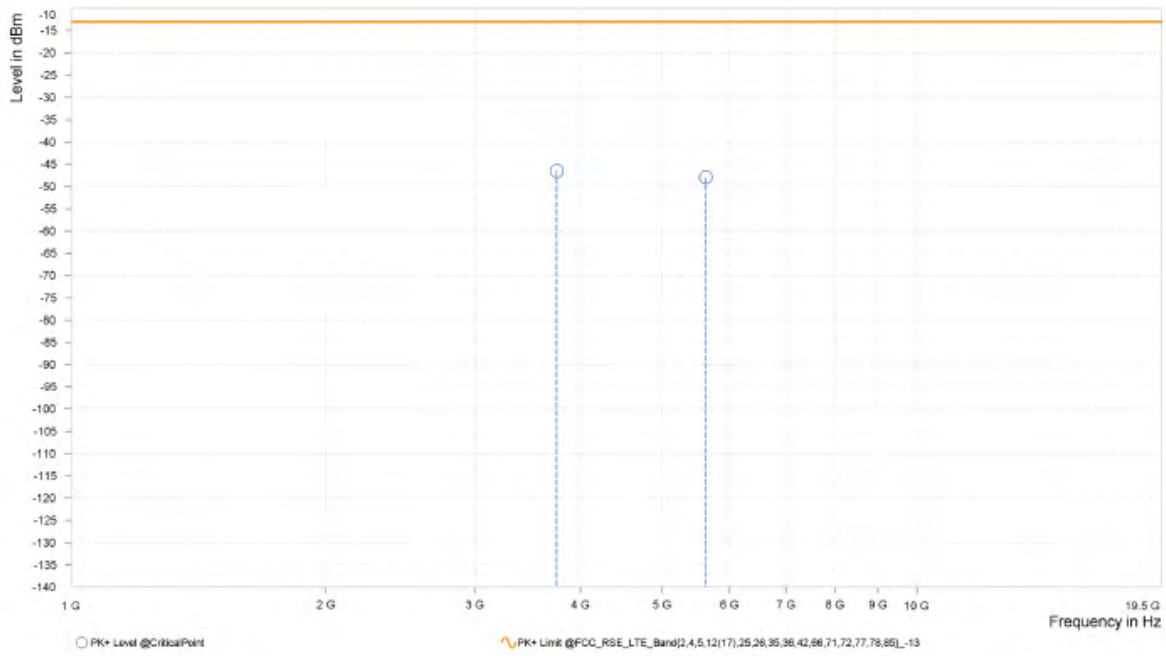
MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,751.000	-43.14	-13.00	30.14	21.04	H	157	1.00
4	5,627.000	-50.65	-13.00	37.65	24.07	H	193.3	2.00



MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

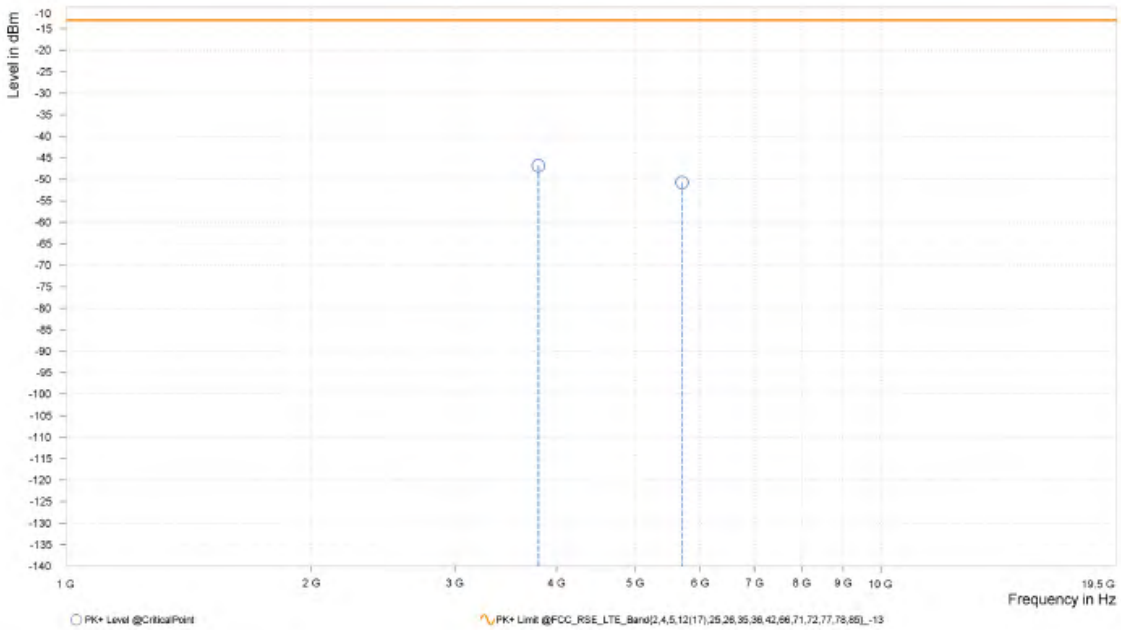
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,751.000	-46.49	-13.00	33.49	21.64	V	359	2.00
4	5,627.000	-47.94	-13.00	34.94	24.43	V	0.9	2.00



CH19150

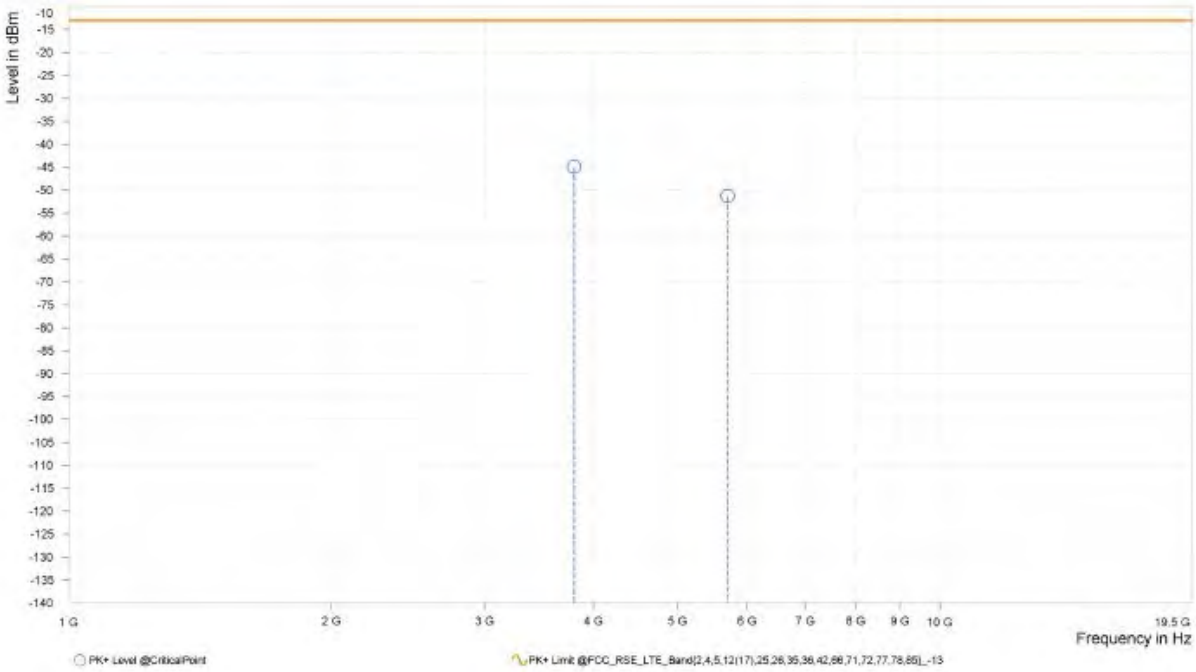
MODE	TX channel 19150	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,801.000	-46.83	-13.00	33.83	21.72	H	359	2.00
4	5,701.500	-50.74	-13.00	37.74	24.31	H	359	1.00



MODE	TX channel 19150	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

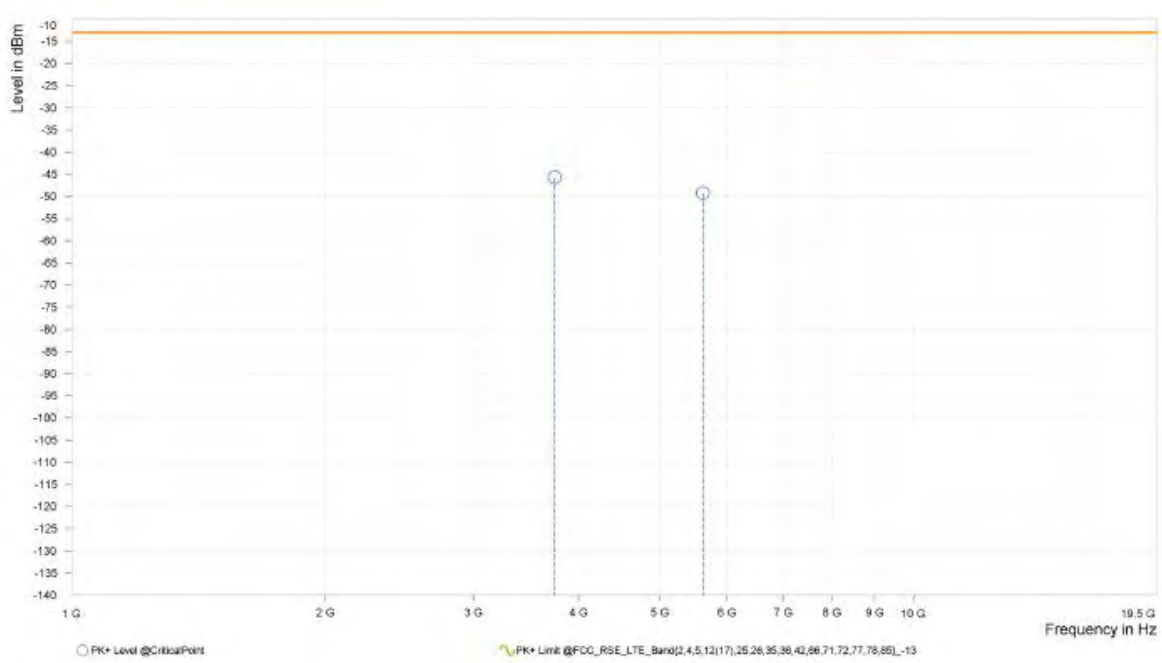
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,801.000	-44.92	-13.00	31.92	21.97	V	359	1.00
4	5,701.500	-51.27	-13.00	38.27	24.74	V	1	1.00



CHANNEL BANDWIDTH: 15MHz / QPSK

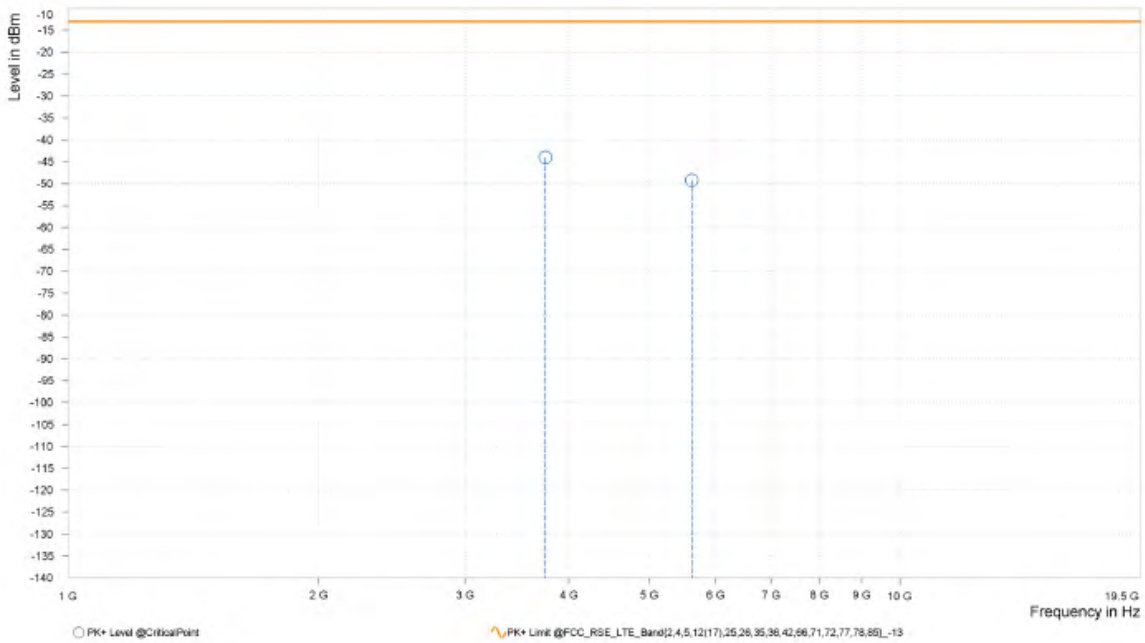
MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,746.500	-45.70	-13.00	32.70	20.97	H	160.6	1.00
4	5,620.000	-49.25	-13.00	36.25	24.03	H	1	2.00



MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

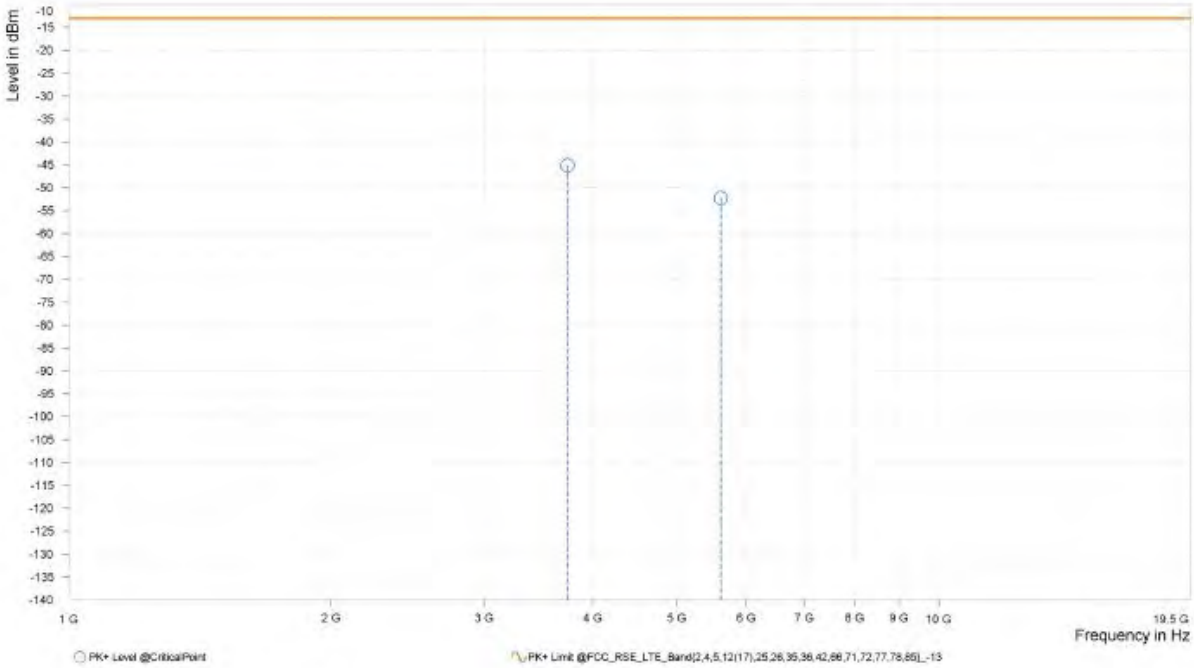
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,747.000	-44.05	-13.00	31.05	21.62	V	30.7	2.00
4	5,620.000	-49.23	-13.00	36.23	24.43	V	30.7	2.00



CHANNEL BANDWIDTH: 20MHz / QPSK

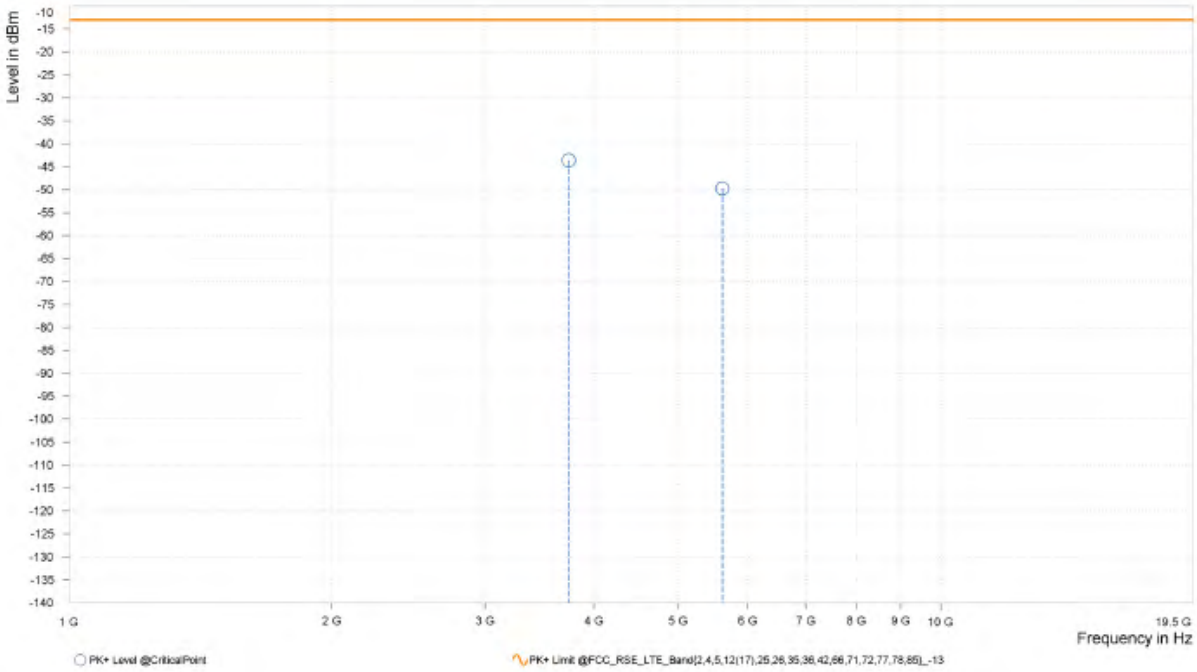
MODE	TX channel 18900	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	**INPUT POWER**	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,742.500	-45.11	-13.00	32.11	20.95	H	21.5	2.00
4	5,613.000	-52.24	-13.00	39.24	23.99	H	193.3	2.00



MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V/60HZ
TESTED BY	Hanwen Xu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
4	3,741.500	-43.62	-13.00	30.62	21.59	V	359	2.00
4	5,613.000	-49.74	-13.00	36.74	24.43	V	195.3	1.00

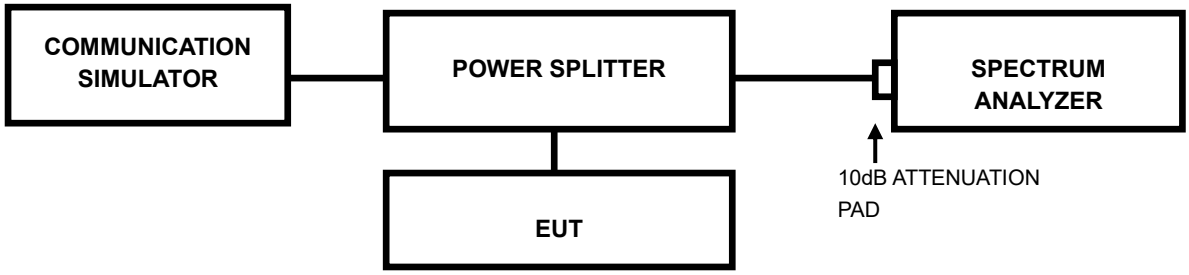


3.7 PEAK TO AVERAGE RATIO

3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

3.7.2 TEST SETUP



3.7.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.7.4 TEST RESULTS

Please Refer to Appendix Of this test report.

4 INFORMATION ON THE TESTING LABORATORIES

We, Huarui 7layers High Technology (Suzhou) Co., Ltd., were founded in 2020 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Suzhou EMC/RF Lab:
Tel: +86 (0557) 368 1008

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

6 APPENDIX

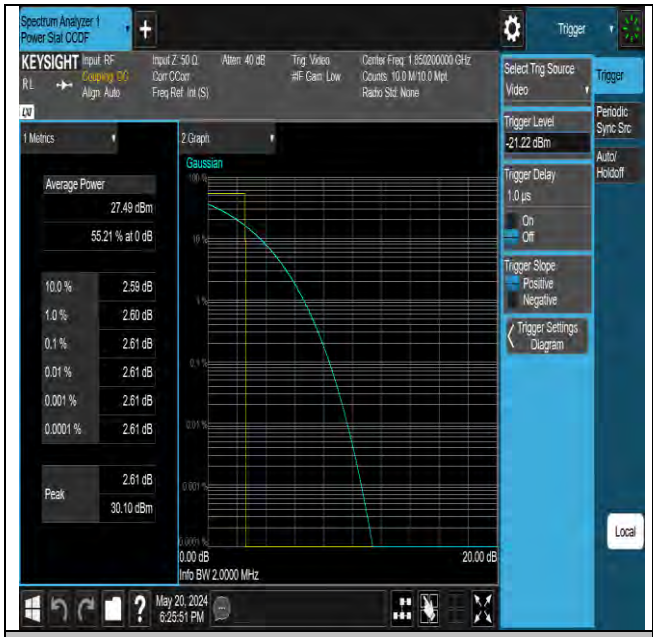
GSM 1900

PEAK-TO-AVERAGE RATIO(CCDF)

Test Result

Band	Channel	Result(dB)	Limit(dB)	Verdict
GSM1900	512	2.61	13	PASS
GSM1900	661	2.62	13	PASS
GSM1900	810	2.62	13	PASS
EGPRS1900	512	5.36	13	PASS
EGPRS1900	661	5.47	13	PASS
EGPRS1900	810	5.48	13	PASS

Test Graphs



GSM1900-512-0-PASS

GSM1900-661-0-PASS

GSM1900-810-0-PASS

EGPRS1900-512-2-PASS

EGPRS1900-661-2-PASS

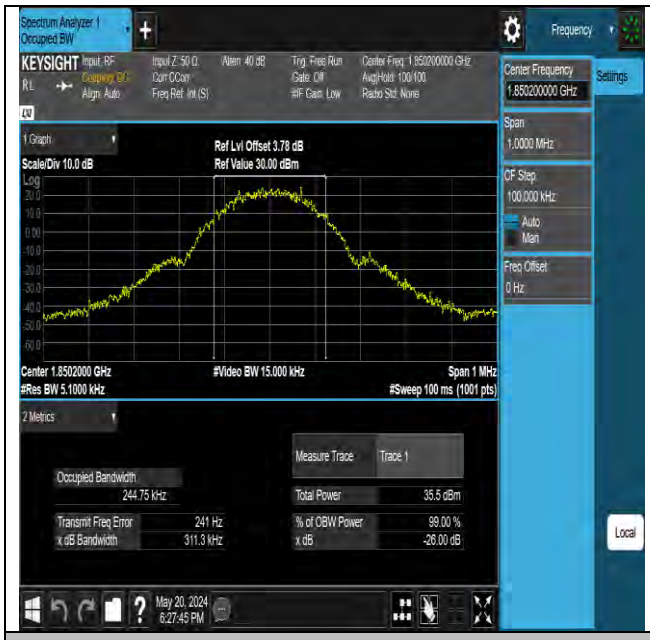
EGPRS1900-810-2-PASS

26DB BANDWIDTH AND OCCUPIED BANDWIDTH

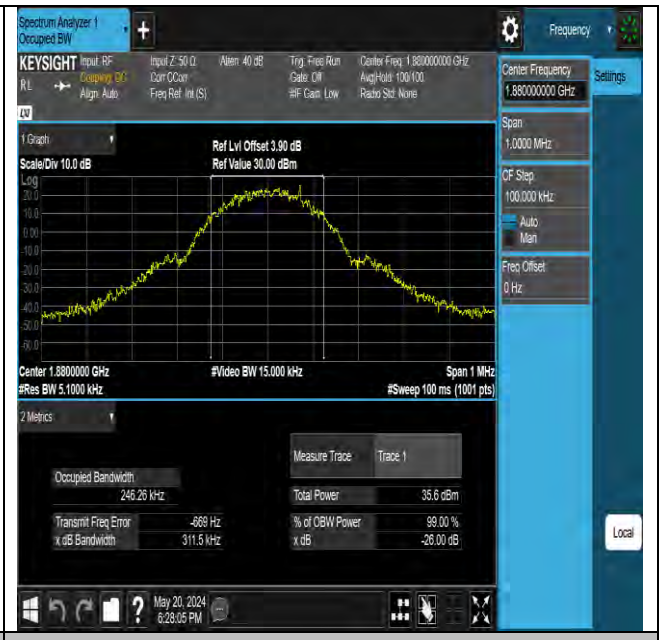
Test Result

Band	Channel	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
GSM1900	512	0.24475	0.3113	---	PASS
GSM1900	661	0.24626	0.3115	---	PASS
GSM1900	810	0.24210	0.3130	---	PASS
EGPRS1900	512	0.25014	0.3108	---	PASS
EGPRS1900	661	0.24696	0.3106	---	PASS
EGPRS1900	810	0.25059	0.3066	---	PASS

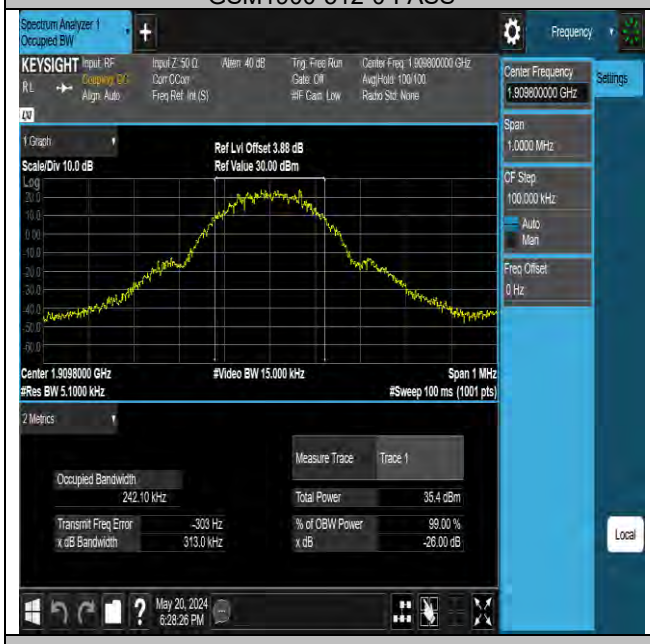
Test Graphs



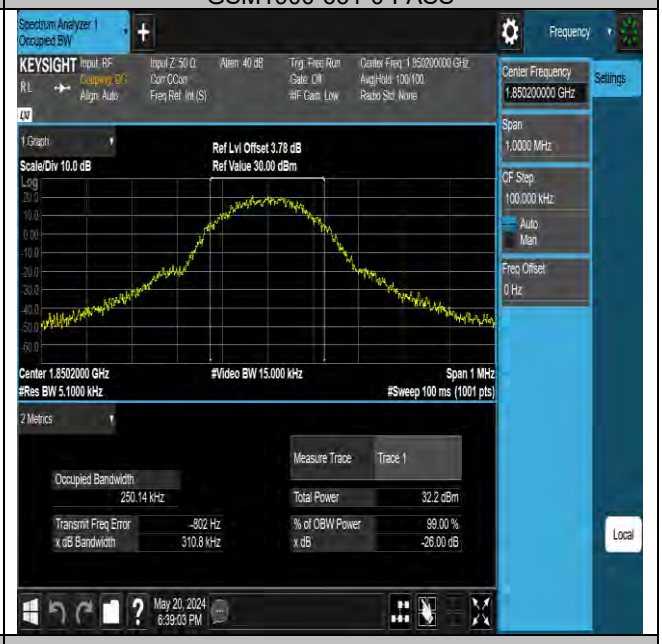
GSM1900-512-0-PASS



GSM1900-661-0-PASS



GSM1900-810-0-PASS



EGPRS1900-512-2-PASS

EGPRS1900-661-2-PASS

EGPRS1900-810-2-PASS

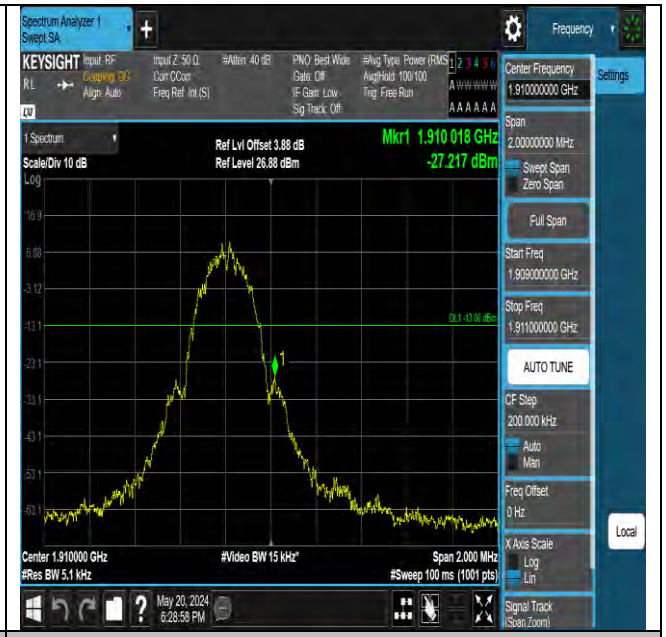
BAND EDGE

Test Result

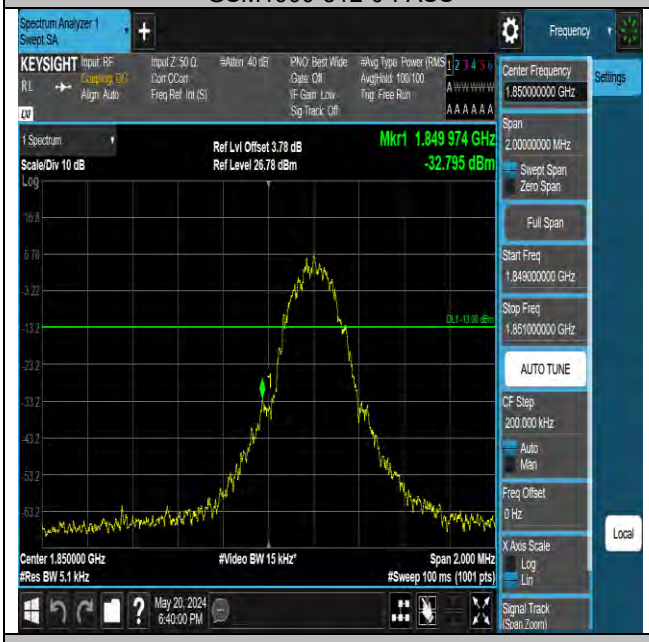
Band	Channel	Freq (MHz)	Result (dBm)	Limit(dBm)	Verdict
GSM1900	512	1849.98	-27.25	-13	PASS
GSM1900	810	1910.02	-27.22	-13	PASS
EGPRS1900	512	1849.97	-32.79	-13	PASS
EGPRS1900	810	1910.01	-31.01	-13	PASS

Test Graphs

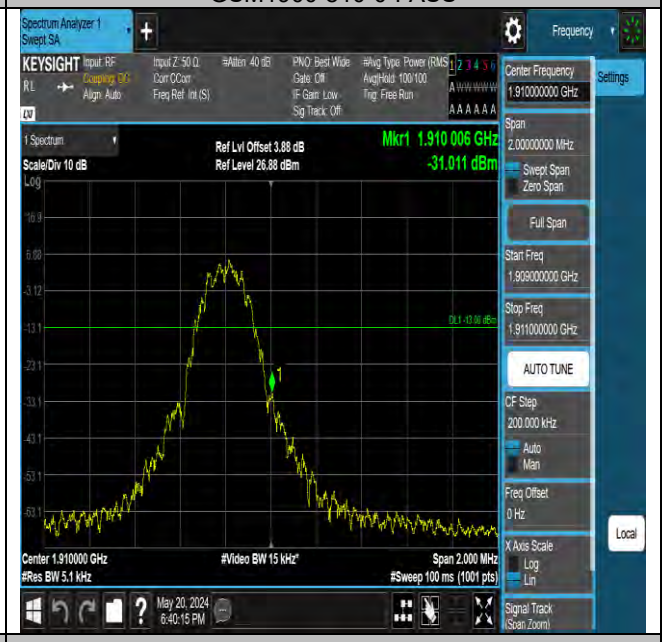
GSM1900-512-0-PASS



GSM1900-810-0-PASS



EGPRS1900-512-2-PASS



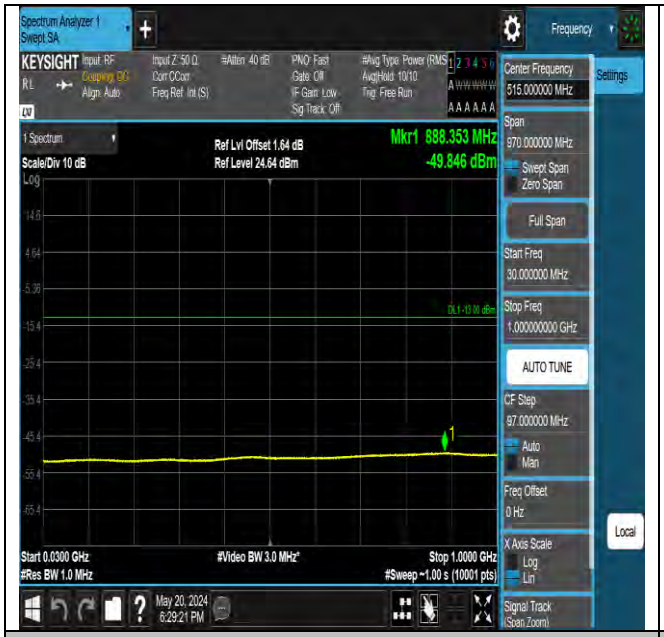
EGPRS1900-810-2-PASS

CONDUCTED SPURIOUS EMISSION

Test Result

Band	Channel	Frequency Range(MHz)	Max.Freq. (MHz)	Result (dBm)	Limit (dBm)	Verdict
GSM1900	512	30~1000MHz	888.35	-49.85	-13	PASS
GSM1900	512	1000~10000MHz	3827.8	-31.76	-13	PASS
GSM1900	512	10000~20000MHz	19309	-38.2	-13	PASS
GSM1900	661	30~1000MHz	899.8	-49.82	-13	PASS
GSM1900	661	1000~10000MHz	3847.6	-31.69	-13	PASS
GSM1900	661	10000~20000MHz	19422	-38.44	-13	PASS
GSM1900	810	30~1000MHz	886.8	-49.89	-13	PASS
GSM1900	810	1000~10000MHz	3856.6	-31.82	-13	PASS
GSM1900	810	10000~20000MHz	19309	-38.43	-13	PASS
EGPRS1900	512	30~1000MHz	902.61	-49.81	-13	PASS
EGPRS1900	512	1000~10000MHz	3845.35	-31.78	-13	PASS
EGPRS1900	512	10000~20000MHz	19275	-38.3	-13	PASS
EGPRS1900	661	30~1000MHz	889.23	-49.77	-13	PASS
EGPRS1900	661	1000~10000MHz	3843.55	-31.75	-13	PASS
EGPRS1900	661	10000~20000MHz	19148.5	-38.43	-13	PASS
EGPRS1900	810	30~1000MHz	860.13	-49.86	-13	PASS
EGPRS1900	810	1000~10000MHz	3830.5	-31.69	-13	PASS
EGPRS1900	810	10000~20000MHz	19327	-38.4	-13	PASS

Test Graphs

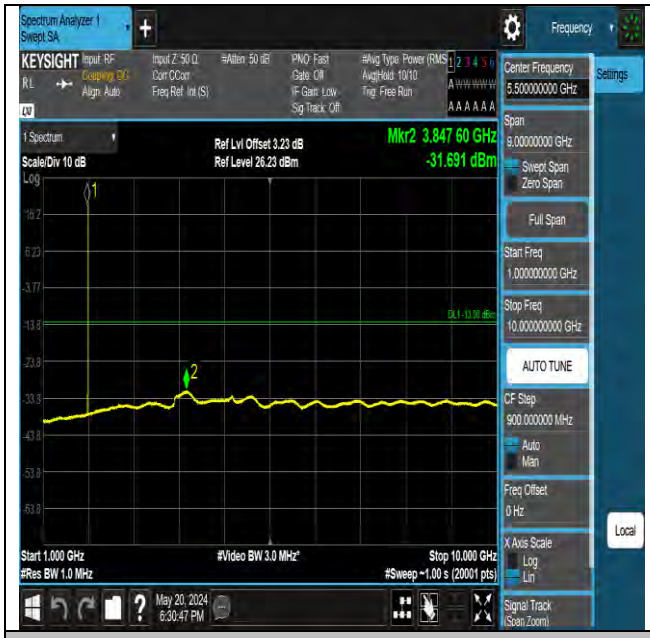


GSM1900-512-0-30~1000MHz-PASS

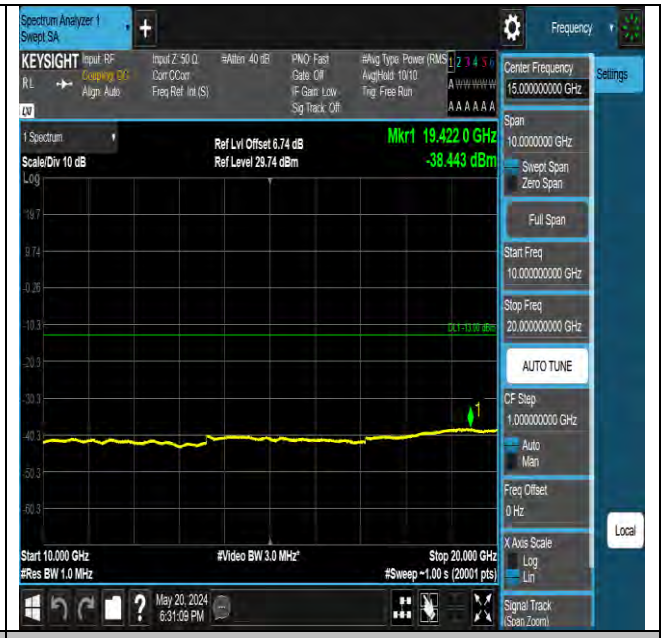
GSM1900-512-0-1000~10000MHz-PASS

GSM1900-512-0-10000~20000MHz-PASS

GSM1900-661-0-30~1000MHz-PASS



GSM1900-661-0-1000~10000MHz-PASS

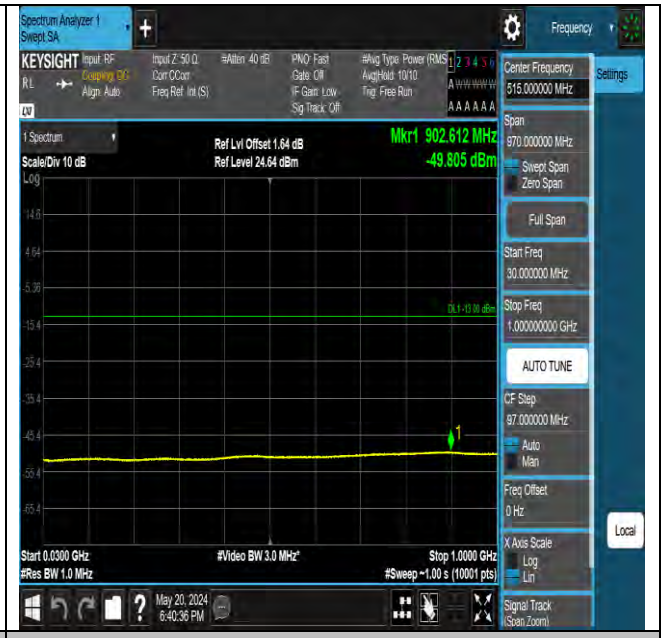


GSM1900-661-0-10000~20000MHz-PASS

GSM1900-810-0-30~1000MHz-PASS

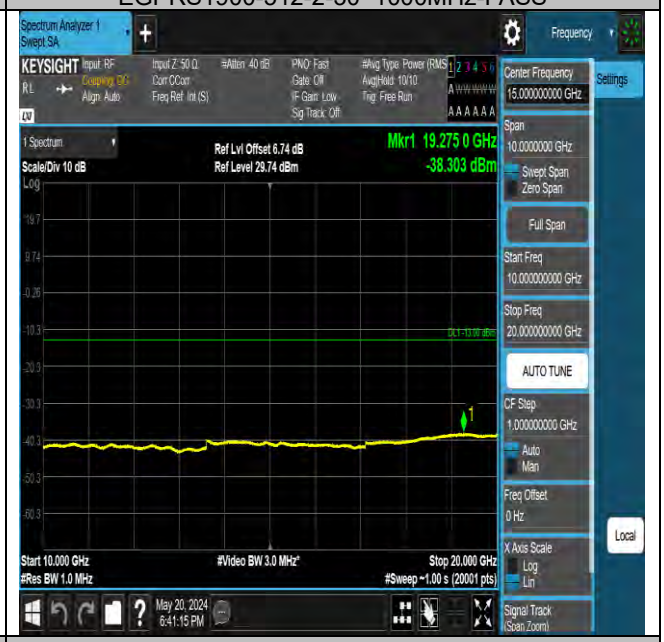
GSM1900-810-0-1000~10000MHz-PASS

GSM1900-810-0-10000~20000MHz-PASS

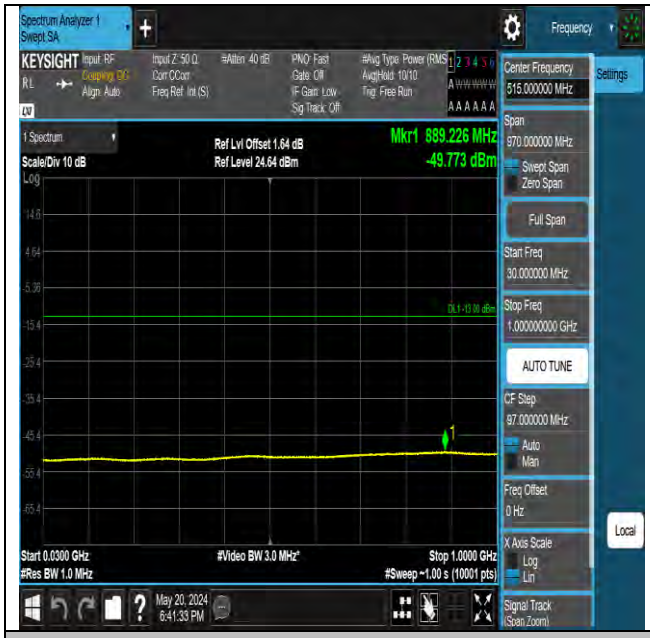


EGPRS1900-512-2-30~1000MHz-PASS

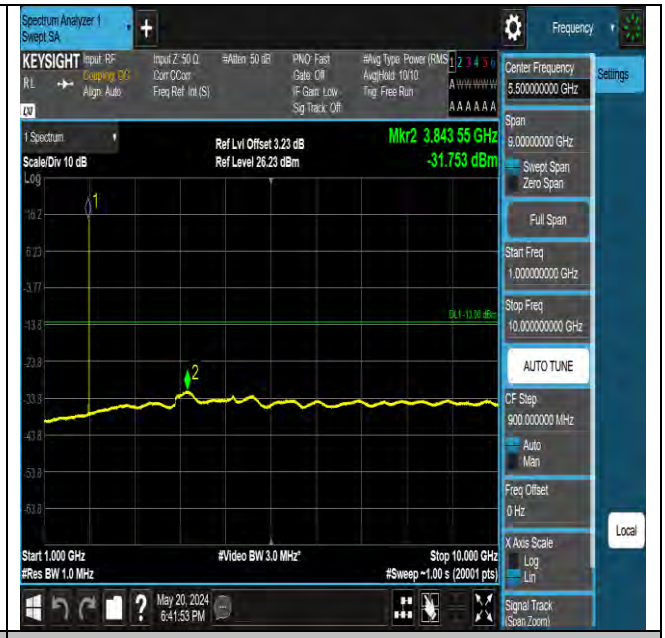
EGPRS1900-512-2-1000~10000MHz-PASS



EGPRS1900-512-2-10000~20000MHz-PASS

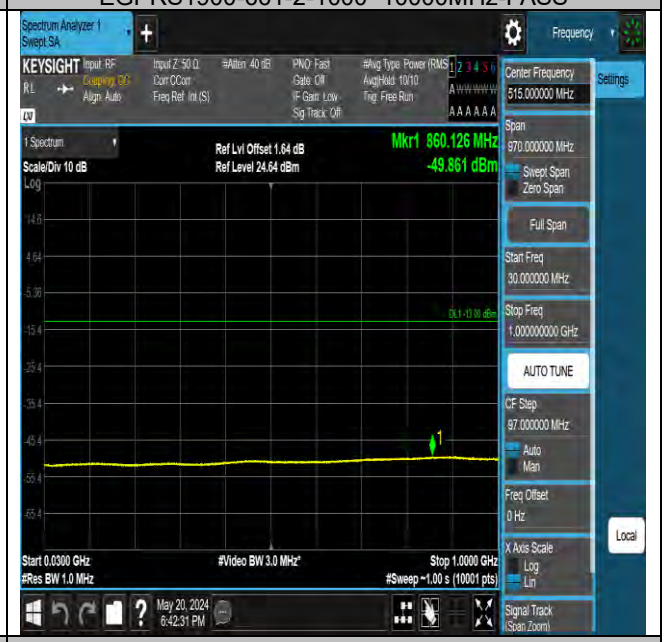


EGPRS1900-661-2-30~1000MHz-PASS

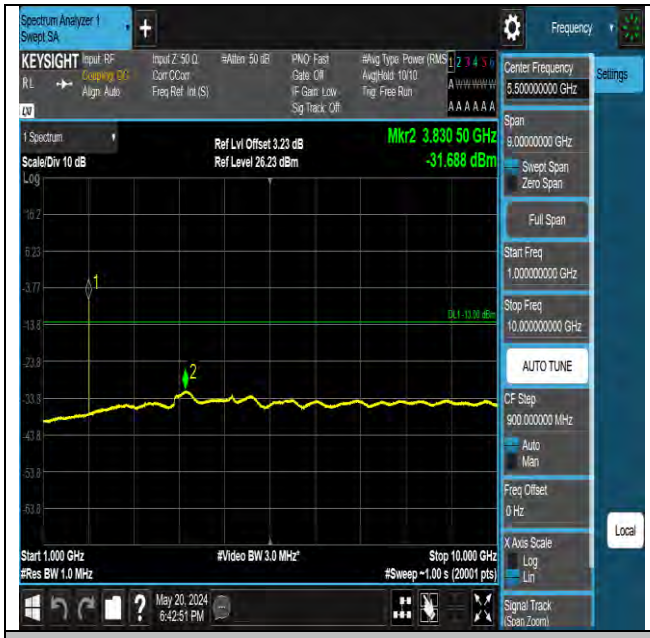


EGPRS1900-661-2-1000~10000MHz-PASS

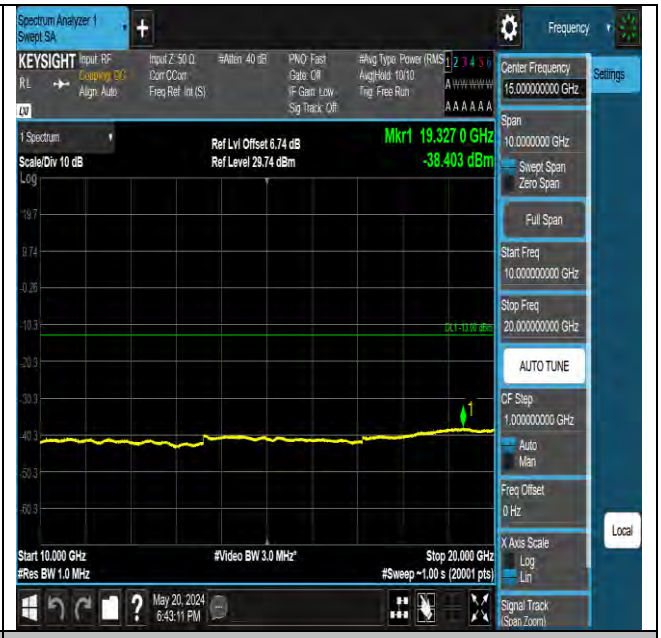
EGPRS1900-661-2-10000~20000MHz-PASS



EGPRS1900-810-2-30~1000MHz-PASS



EGPRS1900-810-2-1000~10000MHz-PASS



EGPRS1900-810-2-10000~20000MHz-PASS

FREQUENCY STABILITY

Test Result

Voltage									
Band	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	FL (MHz)	FH (MHz)	Limit (MHz)	Verdict
GSM1900	512	VN	NT	80.00	0.043239	1850.078655	---	1850-1910	PASS
GSM1900	512	VL	NT	630.00	0.340504	1850.07809	---	1850-1910	PASS
GSM1900	512	VH	NT	-30.00	-0.016214	1850.077755	---	1850-1910	PASS
GSM1900	810	VN	NT	-320.00	-0.167557	---	1909.92116	1850-1910	PASS
GSM1900	810	VL	NT	340.00	0.178029	---	1909.922195	1850-1910	PASS
GSM1900	810	VH	NT	1110.00	0.581213	---	1909.92297	1850-1910	PASS

Temperature									
Band	Channel	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	FL (MHz)	FH (MHz)	Limit (MHz)	Verdict
GSM1900	512	NV	-30	-220.00	-0.118906	1850.07718	---	1850-1910	PASS
GSM1900	512	NV	-20	880.00	0.475624	1850.07877	---	1850-1910	PASS
GSM1900	512	NV	-10	1190.00	0.643174	1850.079555	---	1850-1910	PASS
GSM1900	512	NV	0	910.00	0.491839	1850.07954	---	1850-1910	PASS
GSM1900	512	NV	10	2100.00	1.135012	1850.079135	---	1850-1910	PASS
GSM1900	512	NV	20	-150.00	-0.081072	1850.07808	---	1850-1910	PASS
GSM1900	512	NV	30	150.00	0.081072	1850.078175	---	1850-1910	PASS
GSM1900	512	NV	40	-110.00	-0.059453	1850.077255	---	1850-1910	PASS
GSM1900	512	NV	50	20.00	0.010810	1850.079135	---	1850-1910	PASS
GSM1900	810	NV	-30	1240.00	0.649283	---	1909.923625	1850-1910	PASS
GSM1900	810	NV	-20	370.00	0.193738	---	1909.923065	1850-1910	PASS
GSM1900	810	NV	-10	-380.00	-0.198974	---	1909.922565	1850-1910	PASS
GSM190	810	NV	0	630.00	0.329877	---	1909.922	1850-191	PASS

0							345	0	
GSM1900	810	NV	10	270.00	0.141376	---	1909.922805	1850-1910	PASS
GSM1900	810	NV	20	2470.00	**1.293329**	---	1909.925315	1850-1910	PASS
GSM1900	810	NV	30	760.00	0.397947	---	1909.921765	1850-1910	PASS
GSM1900	810	NV	40	620.00	0.324641	---	1909.92269	1850-1910	PASS
GSM1900	810	NV	50	370.00	0.193738	---	1909.92164	1850-1910	PASS

WCDMA BAND2

PEAK-TO-AVERAGE RATIO

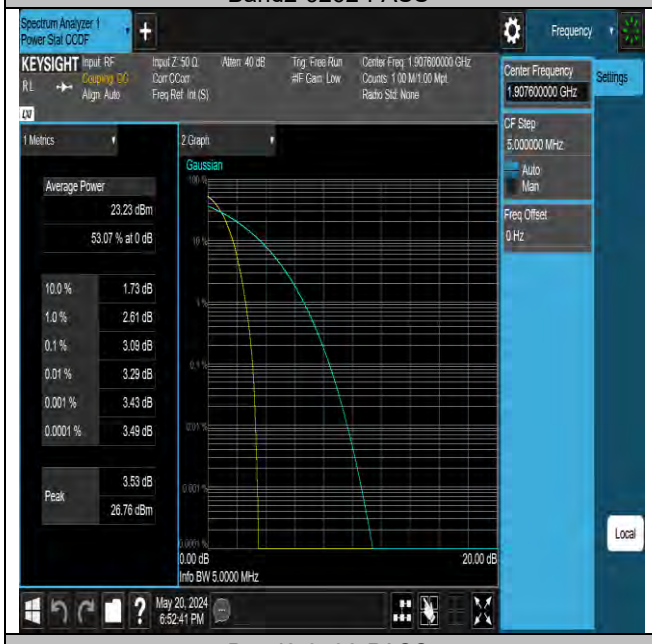
Test Result

Band	Channel	Peak-to-Average Ratio(dB)	Limit(dBm)	Verdict
Band2	9262	3.15	13	PASS
Band2	9400	3.12	13	PASS
Band2	9538	3.09	13	PASS

Test Graphs

Band2-9262-PASS

Band2-9400-PASS



Band2-9538-PASS

26DB BANDWIDTH AND OCCUPIED BANDWIDTH

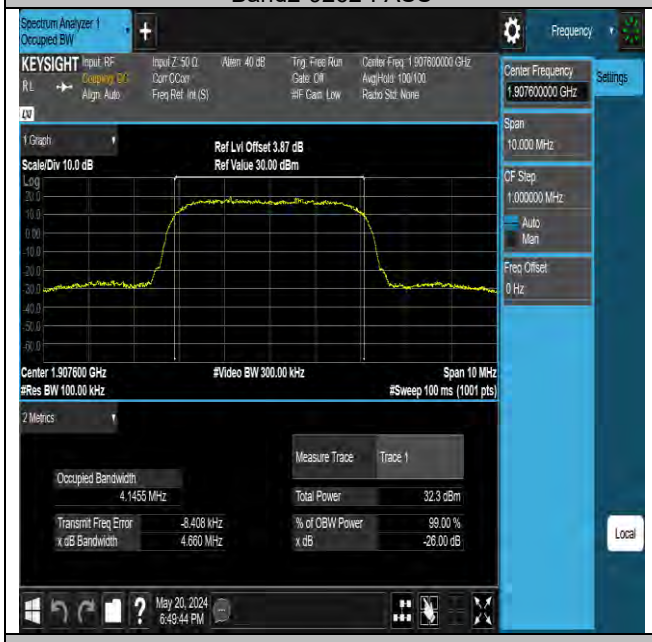
Test Result

Band	Channel	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit(MHz)	Verdict
Band2	9262	4.1454	4.665	---	PASS
Band2	9400	4.1418	4.656	---	PASS
Band2	9538	4.1455	4.660	---	PASS

Test Graphs

Band2-9262-PASS

Band2-9400-PASS



Band2-9538-PASS

BAND EDGE

Test Result

Band	Channel	Frequency (MHz)	Result (dBm)	Limit(dBm)	Verdict
Band2	9262	1849.87	-28.652	-13	PASS
Band2	9538	1910.07	-30.696	-13	PASS

Test Graphs

Band2-9262-PASS

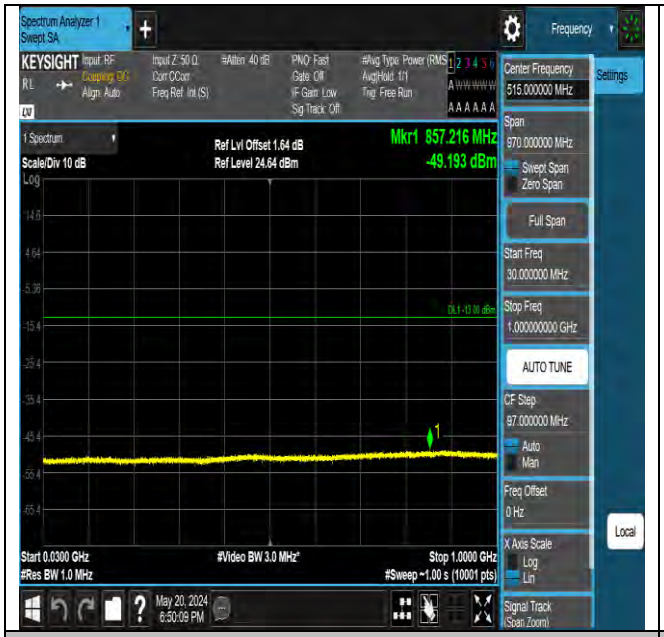
Band2-9538-PASS

CONDUCTED SPURIOUS EMISSION

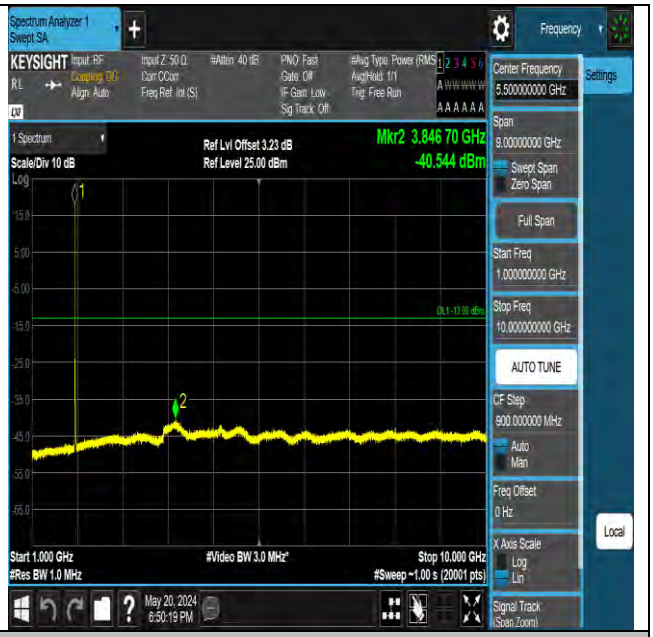
Test Result

Band	Channel	Frequency Range (Mhz)	Frequency (dBm)	Result (dBm)	Limit (dBm)	Verdict
Band2	9262	30~1000MHz	857.22	-49.19	-13	PASS
Band2	9262	1000~10000MHz	3846.7	-40.54	-13	PASS
Band2	9262	10000~20000MHz	19388	-37.1	-13	PASS
Band2	9400	30~1000MHz	897.08	-49.27	-13	PASS
Band2	9400	1000~10000MHz	3806.65	-40.85	-13	PASS
Band2	9400	10000~20000MHz	19383.5	-37.42	-13	PASS
Band2	9538	30~1000MHz	852.95	-49.12	-13	PASS
Band2	9538	1000~10000MHz	3862.45	-40.62	-13	PASS
Band2	9538	10000~20000MHz	18981	-37.41	-13	PASS

Test Graphs



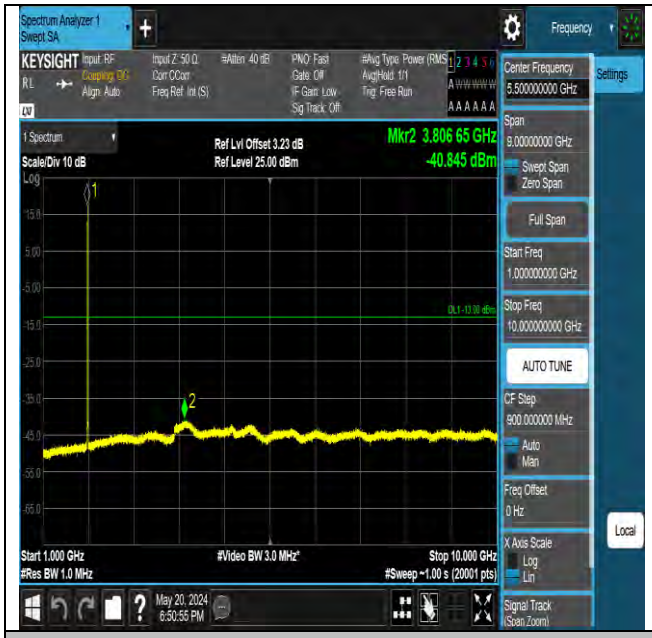
Band2-9262-30~1000MHz-PASS



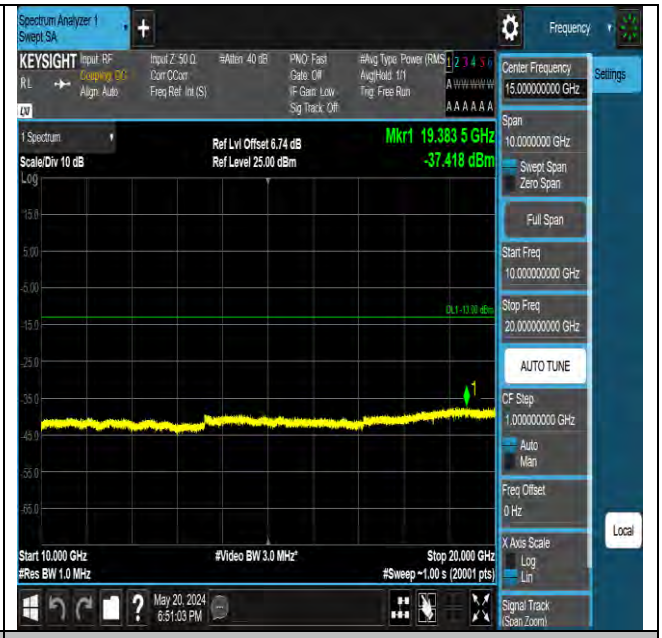
Band2-9262-1000~10000MHz-PASS

Band2-9262-10000~20000MHz-PASS

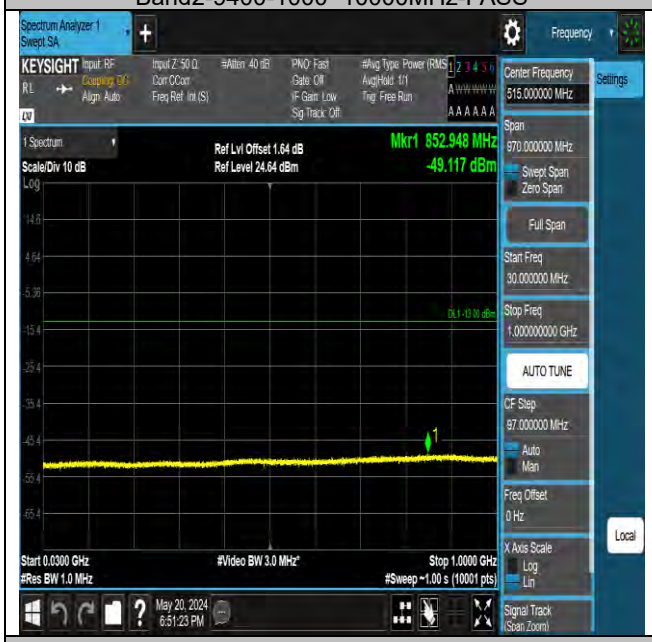
Band2-9400-30~1000MHz-PASS



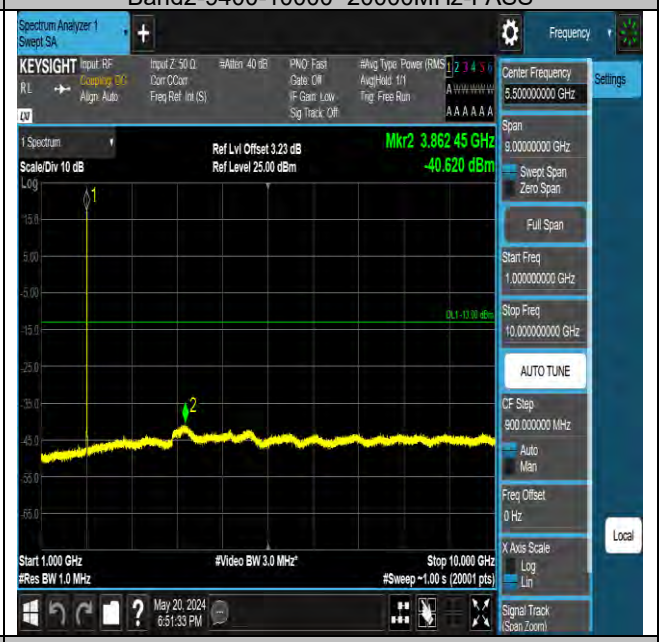
Band2-9400-1000~10000MHz-PASS



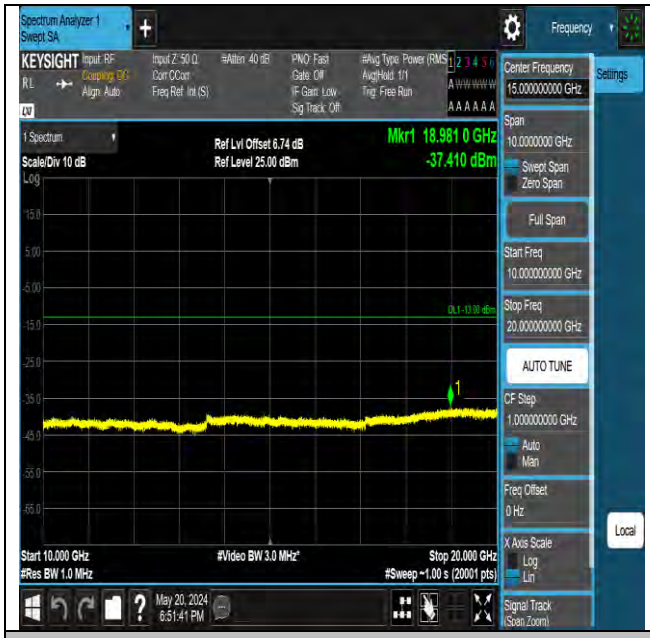
Band2-9400-10000~20000MHz-PASS



Band2-9538-30~1000MHz-PASS



Band2-9538-1000~10000MHz-PASS

	
Band2-9538-10000~20000MHz-PASS	

FREQUENCY STABILITY

Test Result

Voltage									
Band	Channel	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	FL (MHz)	FH (MHz)	Limit (MHz)	Verdict
Band2	9262	VN	NT	-2046.52	-1.1048	1850.32345	---	1850-1910	PASS
Band2	9262	VL	NT	-2104.99	-1.1364	1850.32188	---	1850-1910	PASS
Band2	9262	VH	NT	-2239.04	-1.2087	1850.32676	---	1850-1910	PASS
Band2	9538	VN	NT	-1843.31	-0.9663	---	1909.65942	1850-1910	PASS
Band2	9538	VL	NT	-2045.13	-1.0721	---	1909.66168	1850-1910	PASS
Band2	9538	VH	NT	-1892.68	-0.9922	---	1909.66116	1850-1910	PASS

Temperature									
Band	Channel	Voltage (Vdc)	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	FL (MHz)	FH (MHz)	Limit (MHz)	Verdict
Band2	9262	NV	-30	1866.65	1.0077	1850.32625	---	1850-1910	PASS
Band2	9262	NV	-20	2100.99	1.1342	1850.32734	---	1850-1910	PASS
Band2	9262	NV	-10	-1947.06	-1.0511	1850.32536	---	1850-1910	PASS
Band2	9262	NV	0	1865.52	1.0071	1850.32967	---	1850-1910	PASS
Band2	9262	NV	10	1936.15	1.0452	1850.32721	---	1850-1910	PASS
Band2	9262	NV	20	-1897.58	-1.0244	1850.32667	---	1850-1910	PASS
Band2	9262	NV	30	2099.38	1.1333	1850.32646	---	1850-1910	PASS
Band2	9262	NV	40	1731.34	0.9346	1850.32609	---	1850-1910	PASS
Band2	9262	NV	50	1849.88	0.9986	1850.32745	---	1850-1910	PASS
Band2	9538	NV	-30	1697.03	0.8896	---	1909.66095	1850-1910	PASS
Band2	9538	NV	-20	1764.00	0.9247	---	1909.66335	1850-1910	PASS
Band2	9538	NV	-10	1664.85	0.8727	---	1909.65793	1850-1910	PASS
Band2	9538	NV	0	-1954.61	-1.0246	---	1909.66465	1850-1910	PASS

Band2	9538	NV	10	1928.78	1.0111	---	1909.66364	1850-1910	PASS
Band2	9538	NV	20	1639.32	0.8594	---	1909.66728	1850-1910	PASS
Band2	9538	NV	30	-1950.57	-1.0225	---	1909.65753	1850-1910	PASS
Band2	9538	NV	40	-2043.17	-1.0711	---	1909.66657	1850-1910	PASS
Band2	9538	NV	50	-1983.03	-1.0395	---	1909.67038	1850-1910	PASS

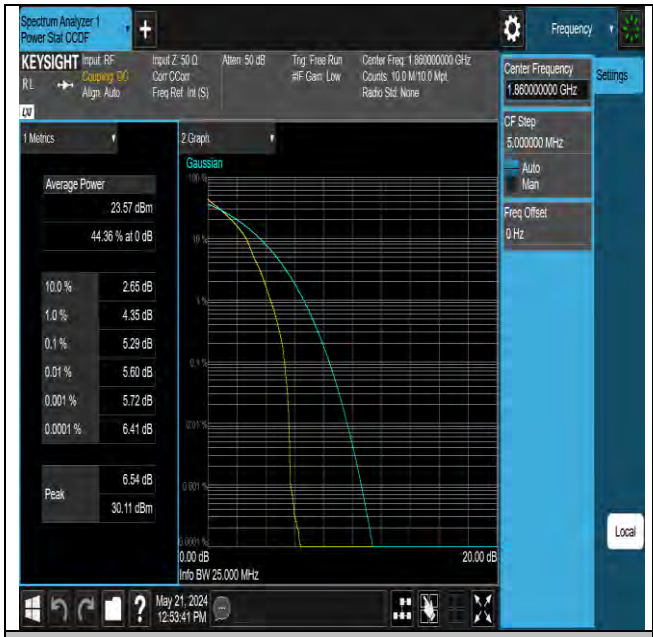
LTE BAND2

PEAK-TO-AVERAGE RATIO(CCDF)

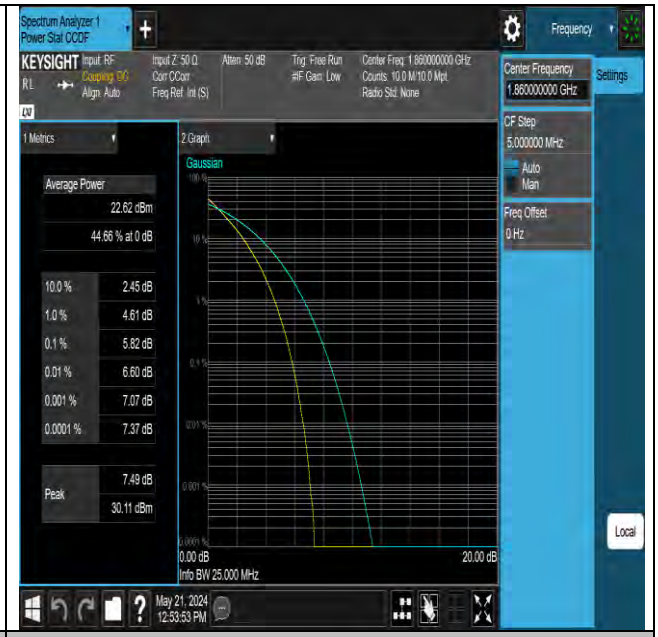
Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band2	20MHz	QPSK	18700	1RB#0	5.29	13	PASS
Band2	20MHz	QPSK	18700	100RB#0	5.82	13	PASS
Band2	20MHz	QPSK	18900	1RB#0	4.95	13	PASS
Band2	20MHz	QPSK	18900	100RB#0	5.87	13	PASS
Band2	20MHz	QPSK	19100	1RB#0	5.53	13	PASS
Band2	20MHz	QPSK	19100	100RB#0	5.67	13	PASS

Test Graphs



Band2-20MHz-QPSK-18700-1RB#0-PASS

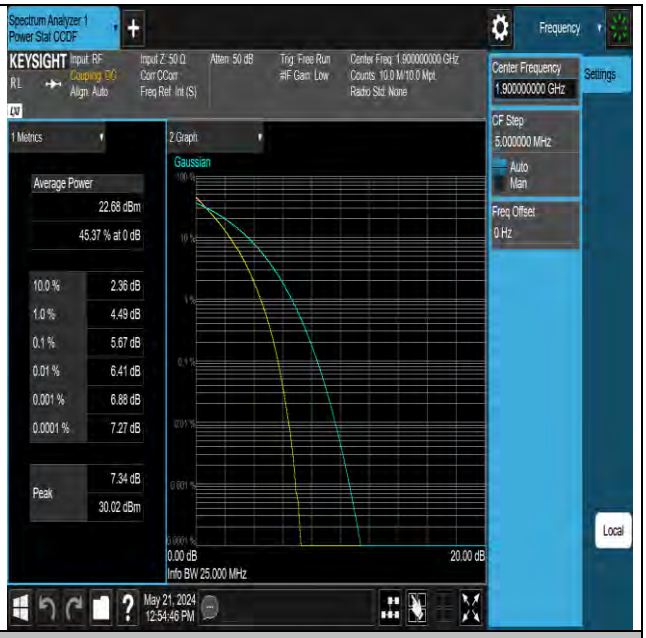


Band2-20MHz-QPSK-18700-100RB#0-PASS

Band2-20MHz-QPSK-18900-1RB#0-PASS

Band2-20MHz-QPSK-18900-100RB#0-PASS

Band2-20MHz-QPSK-19100-1RB#0-PASS



Band2-20MHz-QPSK-19100-100RB#0-PASS