

FCC TEST REPORT

(PART 22)

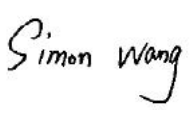
Applicant:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Address:	Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone

Manufacturer or Supplier:	Lenovo PC HK Limited
Address:	23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, China
Product:	Portable Tablet Computer
Brand Name:	Lenovo
Model Name:	TB311XU
FCC ID	O57TB311XU
Date of tests	Aug. 15, 2024 ~ Sep. 24, 2024

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

- | | |
|---|---|
| ☒ FCC PART 22, Subpart H | ☒ FCC Part 2 |
| ☒ ANSI/TIA/EIA-603-D | ☒ ANSI C63.26-2015 |
| ☒ ANSI/TIA/EIA-603-E | |

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

Prepared by Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
 Date: Sep. 24, 2024	 Date: Sep. 24, 2024

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-NQN2407300216RF01	Original release	Sep. 24, 2024



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 22 & Part 2			
STANDARD SECTION	TEST TYPE	RESULT	Test lab*
§2.1046	Coducted Output Power	Compliance	A
§22.913 (a)(5)	Equivalent Isotropic Radiated Power	Compliance	A
§2.1055 §22.355	Frequency Stability	Compliance	A
§2.1049	Occupied Bandwidth	Compliance	A
§22.913 (d)	Peak to average ratio*	Compliance	A
§2.1051 §22.917(a)	Band Edge Measurements	Compliance	A
§2.1051 §22.917(a)	Conducted Spurious Emissions	Compliance	A
§2.1053 §22.917(a)	Radiated Spurious Emissions	Compliance	A

* Refer to KDB 971168 D01 Power Meas License Digital Systems v03r01.

*Test Lab Information Reference

Lab A:

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

Lab Address:

Tower N, Innovation Center, 88 Zuyi 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
Maximum Peak Output Power	$\pm 2.06\text{dB}$
Frequency Stability	$\pm 76.97\text{Hz}$
Radiated emissions (9KHz~30MHz)	$\pm 2.68\text{dB}$
Radiated emissions (30MHz~1GHz)	$\pm 4.98\text{dB}$
Radiated emissions (1GHz ~6GHz)	$\pm 4.70\text{dB}$
Radiated emissions (6GHz ~18GHz)	$\pm 4.60\text{dB}$
Radiated emissions (18GHz ~40GHz)	$\pm 4.12\text{dB}$
Conducted emissions	$\pm 4.01\text{dB}$
Occupied Channel Bandwidth	$\pm 43.58\text{KHz}$
Band Edge Measurements	$\pm 4.70\text{dB}$
Peak to average ratio	$\pm 0.76\text{dB}$

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



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	SCU18F1	100815	Aug.29,24	Aug.28,26
Pre-Amplifier	R&S	SCU08F1	101028	Sep.16,22	Sep.15,24
Pre-Amplifier	R&S	SCU08F1	101028	Sep.15,24	Sep.14,26
Vector Signal Generator	R&S	SMBV100B	102176	Mar.29,24	Mar.28,26
Signal Generator	R&S	SMB100A	182185	Mar.29,24	Mar.28,26
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	Mar.28,24	Mar.27,26
EMI TEST Receiver	R&S	ESW44	101973	Mar.28,24	Mar.27,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Dec.26,23	Dec.25,25
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,22	Aug.21,24
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.21,24	Aug.20,26
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Jul.15,24	Jul.14,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,22	Aug.21,24
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.21,24	Aug.20,26
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.22,24	Feb.21,26
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
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
DC Source	HYELEC	HY3010B	551016	Aug.30,24	Aug.29,26
Hygrothermograph	DELI	20210528	SZ014	Sep.06,22	Sep.05,24
Hygrothermograph	DELI	20210528	SZ014	Sep.05,24	Sep.04,26
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.27,24	Apr.26,25
CABLE	R&S	W12.14	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,24	Apr.26,25
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26

NOTE:

1. The calibration interval of the above test instruments is 12/24/36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



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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*	Portable Tablet Computer	
BRAND NAME*	Lenovo	
MODEL NAME*	TB311XU	
NOMINAL VOLTAGE*	5Vdc (Adapter or host equipment) 3.9Vdc (Li-Polymer, battery)	
MODULATION TYPE	GSM/EDGE	GMSK, 8PSK
	WCDMA	BPSK, QPSK
	LTE	QPSK, 16QAM, 64QAM
FREQUENCY RANGE	GSM/EDGE	824.2MHz ~ 848.8MHz
	WCDMA	826.4MHz ~ 846.6MHz
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	824.7MHz ~ 848.3MHz
	LTE Band 5 (Channel Bandwidth: 3MHz)	825.5MHz ~ 847.5MHz
	LTE Band 5 (Channel Bandwidth: 5MHz)	826.5MHz ~ 846.5MHz
	LTE Band 5 (Channel Bandwidth: 10MHz)	829MHz ~ 844MHz
	LTE Band 26 (Channel Bandwidth: 1.4MHz)	824.7MHz ~ 848.3MHz
	LTE Band 26 (Channel Bandwidth: 3MHz)	825.5MHz ~ 847.5MHz
	LTE Band 26 (Channel Bandwidth: 5MHz)	826.5MHz ~ 846.5MHz
	LTE Band 26 (Channel Bandwidth: 10MHz)	829MHz ~ 844MHz
	LTE Band 26 (Channel Bandwidth: 15MHz)	831.5MHz ~ 841.5MHz
MAX. ERP POWER	GSM	576.77mW
	EDGE	171.4mW
	WCDMA	86.1mW
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	67.92mW
	LTE Band 5 (Channel Bandwidth: 3MHz)	65.31mW
	LTE Band 5 (Channel Bandwidth: 5MHz)	64.27mW
	LTE Band 5 (Channel Bandwidth: 10MHz)	65.61mW
	LTE Band 26 (Channel Bandwidth: 1.4MHz)	67.61mW
	LTE Band 26 (Channel Bandwidth: 3MHz)	67.76mW



	LTE Band 26 (Channel Bandwidth: 5MHz)	67.61mW
	LTE Band 26 (Channel Bandwidth: 10MHz)	67.61mW
	LTE Band 26 (Channel Bandwidth: 15MHz)	68.71mW
EMISSION DESIGNATOR GOGN	GSM	247KGXW
	EDGE	247KG7W
	WCDMA	4M16F9W
	LTE Band 26 (Channel Bandwidth: 1.4MHz)	QPSK: 1M09G7D
		16QAM: 1M09W7D
		64QAM: 1M08W7D
	LTE Band 26 (Channel Bandwidth: 3MHz)	QPSK: 2M68G7D
		16QAM: 2M68W7D
		64QAM: 2M68W7D
	LTE Band 26 (Channel Bandwidth: 5MHz)	QPSK: 4M48G7D
		16QAM: 4M47W7D
		64QAM: 4M47W7D
	LTE Band 26 (Channel Bandwidth: 10MHz)	QPSK: 8M96G7D
		16QAM: 8M94W7D
		64QAM: 8M95W7D
	LTE Band 26 (Channel Bandwidth: 15MHz)	QPSK: 13M5G7D
		16QAM: 13M4W7D
		64QAM: 13M4W7D
ANTENNA TYPE*	PIFA Antenna with -2.86dBi gain for GSM850/WCDMA V/LTE B5	
HW VERSION*	TB311XU	
SW VERSION*	TB311XU_RF01_20240921	
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	
EXTREME TEMPERATURE*	-10℃~55℃	
EXTREME VOLTAGE*	3.5V~4.5V	

NOTE:

- *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.
- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receivers.

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



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

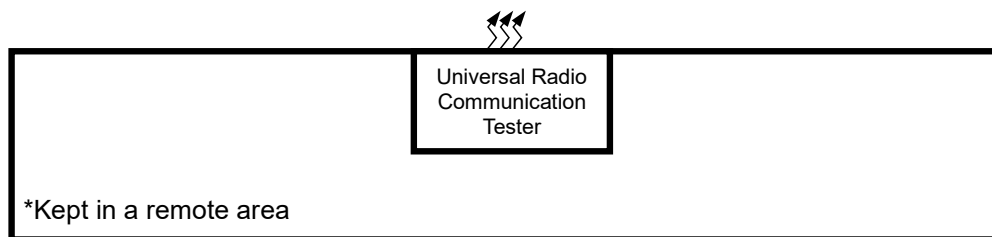
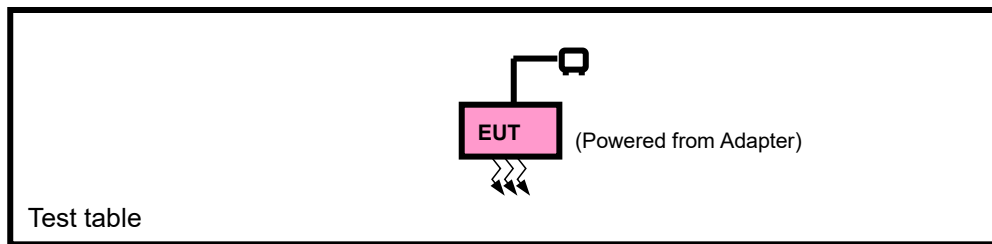
5. List of Accessory:

ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
Battery 1	N/A	Zhejiang Sunwoda Electronic Co., Ltd.	L24D1P32	Nominal Energy: 19.55Wh, Typical Energy: 19.95Wh
Battery 2	N/A	Ningde Amperex Technology Limited	L24D1P32	Nominal Energy: 19.55Wh, Typical Energy: 19.95Wh
AC Adapter 1	Salcomp	Salcomp (Shenzhen) Co., Ltd	MC-201L (US)	AC Input: 100-240V~, 50/60Hz, 0.7A DC Output: 5.0Vdc 3.0A 15W 10Vdc 2.0A 20W 12Vdc 1.67A 20W
AC Adapter 2	Aohai	Jiangxi Jian Aohai Technology Co., Ltd.	MC-201L (US)	AC Input: 100-240V~, 50/60Hz, 0.7A DC Output: 5.0Vdc 3.0A 15W 10Vdc 2.0A 20W 12Vdc 1.67A 20W
USB Cable 1 (support unit)	Saibao	Saibao (Jiangxi) Industrial Co., LTD	SLQ-A263A	Signal Line, 1.0meter
USB Cable 2	Jieye	Jiangxi Jieye Electronics Co., LTD	JY-C03-422	Signal Line, 1.0meter
Earphone(optional)	Lenovo	N/A	E310	N/A
Pen(optional)	Lenovo	N/A	passive pen	N/A



2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION



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	Laptop	Lenovo	ThinkPad E14	HRSW00024	N/A
2	Earphone	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB Cable: 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 ERP and radiated emission was found when positioned on X-plane for GSM /EDGE /WCDMA /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	ERP	128 to 251	128, 189, 251	GSM,EDGE
B	FREQUENCY STABILITY	128 to 251	128, 189, 251	GSM,EDGE
A	OCCUPIED BANDWIDTH	128 to 251	128, 189, 251	GSM,EDGE
A	BAND EDGE	128 to 251	128, 251	GSM,EDGE
A	CONDUCTED EMISSION	128 to 251	128, 189, 251	GSM,EDGE
A	RADIATED EMISSION	128 to 251	128, 189, 251	GSM,EDGE
A	PEAK TO AVERAGE RATIO	128 to 251	128, 189, 251	GSM,EDGE

WCDMA MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
A	ERP	4132 to 4233	4132, 4182, 4233	WCDMA
B	FREQUENCY STABILITY	4132 to 4233	4132, 4182, 4233	WCDMA
A	OCCUPIED BANDWIDTH	4132 to 4233	4132, 4182, 4233	WCDMA
A	BAND EDGE	4132 to 4233	4132, 4233	WCDMA
A	CONDCUDED EMISSION	4132 to 4233	4132, 4182, 4233	WCDMA
A	RADIATED EMISSION	4132 to 4233	4132, 4182, 4233	WCDMA
A	PEAK TO AVERAGE RATIO	4132 to 4233	4132, 4182, 4233	WCDMA



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LTE BAND 5 MODE

EUT CONFIGURE MODE	TEST ITEM	Available Channel	Tested Channel	Channel bandwidth	modulation	mode
A	ERP	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		20415 to 20635	20415, 20525, 20635	3MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		20425 to 20625	20425, 20525, 20625	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		20450 to 20600	20450, 20525, 20600	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset

Note: 1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

2. LTE Band 5 are covered by LTE Band 26, Because it is a subset of LTE Band 26 with the same output power and supported bandwidths, So the test data please refer to LTE Band 26

LTE BAND 26 MODE

EUT CONFIGURE MODE	TEST ITEM	Available Channel	Tested Channel	Channel bandwidth	modulation	mode
A	ERP	26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	26865 to 26965	26865, 26915, 26965	15MHz	QPSK	75 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK,16QAM,64QAM	6 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3MHz	QPSK,16QAM,64QAM	15 RB / 0 RB Offset
		26815 to 27015	26815, 26915, 27015	5MHz	QPSK,16QAM,64QAM	25 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15MHz	QPSK,16QAM,64QAM	75 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	26865 to 26965	26865, 26915, 26965	15MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset 75 RB / 0 RB Offset
A	BAND EDGE	26797 to 27033	26797	1.4 MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset 6 RB / 0 RB Offset
			27033	1.4 MHz	QPSK,16QAM,64QAM	1 RB / 5 RB Offset 6 RB / 0 RB Offset
		26805 to 27025	26805	3 MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset 15 RB / 0 RB Offset



		26805 to 27025	27025	3 MHz	QPSK,16QAM,64QAM	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		26815 to 27015	26815	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
		26815 to 27015	27015	5MHz	QPSK,16QAM,64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		26840 to 26990	26840	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
A	CONDCUETED EMISSION	26840 to 26990	26990	10MHz	QPSK,16QAM,64QAM	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		26865 to 26965	26865	15MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
		26865 to 26965	26965	15MHz	QPSK,16QAM,64QAM	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		26805 to 27025	26805, 26915, 27025	3MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	26815 to 27015	26815, 26915, 27015	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		26840 to 26990	26840, 26915, 26990	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		26865 to 26965	26865, 26915, 26965	15MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		26797 to 27033	26915	1.4MHz	QPSK	1 RB / 0 RB Offset
		26805 to 27025	26915	3MHz	QPSK	1 RB / 0 RB Offset
		26815 to 27015	26915	5MHz	QPSK	1 RB / 0 RB Offset
		26840 to 26990	26840,26915,26990	10MHz	QPSK	1 RB / 0 RB Offset
		26865 to 26965	26915	15MHz	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
ERP	23deg. C, 70%RH	DC 3.9V By Battery	Jace Hu
FREQUENCY STABILITY	23deg. C, 70%RH	DC 5V By DC Source	James Fu
OCCUPIED BANDWIDTH	23deg. C, 70%RH	DC 3.9V By Battery	James Fu
BAND EDGE	23deg. C, 70%RH	DC 3.9V By Battery	James Fu
CONDCUDED EMISSION	23deg. C, 70%RH	DC 3.9V By Battery	James Fu
RADIATED EMISSION	23deg. C, 70%RH	AC 120V/60Hz	Jace Hu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	DC 3.9V By Battery	James Fu

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 22

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 / Portable station are limited to 7 watts e.r.p.

3.1.2 TEST PROCEDURES

EIRP / ERP 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 determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

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

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:

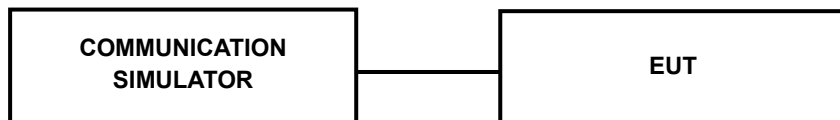
The EUT was set up for the maximum power with WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



3.1.3 TEST SETUP

EIRP / ERP Measurement:

CONDUCTED POWER MEASUREMENT:



3.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm):

Band	GSM850		
Channel	128	189	251
Frequency	824.2	836.4	848.8
GSM	32.61	32.56	32.52
GPRS 1Tx Slot	32.62	32.55	32.51
GPRS 2Tx Slot	31.74	31.73	31.79
GPRS 3Tx Slot	29.82	29.88	29.91
GPRS 4Tx Slot	28.59	28.70	28.74
EDGE 1Tx Slot	27.13	27.27	27.35
EDGE 2Tx Slot	25.87	26.07	26.13
EDGE 3Tx Slot	23.65	23.71	23.87
EDGE 4Tx Slot	22.55	22.58	22.69

Band	WCDMA V		
TX Channel	4132	4182	4233
Rx Channel	4357	4407	4458
Frequency	826.4	836.4	846.6
RMC 12.2K	24.33	24.36	24.31
HSDPA Subtest-1	23.78	23.65	23.73
HSDPA Subtest-2	23.77	23.64	23.72
HSDPA Subtest-3	23.26	23.13	23.21
HSDPA Subtest-4	23.25	23.12	23.20
DC-HSDPA Subtest-1	23.70	23.59	23.65
DC-HSDPA Subtest-2	23.69	23.58	23.64
DC-HSDPA Subtest-3	23.27	23.07	23.15
DC-HSDPA Subtest-4	23.26	23.06	23.14
HSUPA Subtest-1	23.74	23.61	23.69
HSUPA Subtest-2	22.73	22.60	22.68
HSUPA Subtest-3	23.21	23.09	23.17
HSUPA Subtest-4	22.70	22.58	22.66
HSUPA Subtest-5	23.69	23.57	23.65
HSPA+ Subtest-1	23.25	23.14	23.22



LTE Band 5						
Band/BW	Modulation	RB Size	RB Offset	Low CH20407	Mid CH20525	High CH20643
				Frequency 824.7 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz
5/ 1.4	QPSK	1	0	22.97	23.01	23.00
		1	2	23.03	23.11	23.13
		1	5	22.92	22.92	22.96
		3	0	23.33	23.22	23.15
		3	1	23.01	23.17	23.19
		3	3	23.17	23.17	23.02
		6	0	22.23	22.11	22.07
	16QAM	1	0	22.39	22.43	22.36
		1	2	22.40	22.53	22.32
		1	5	22.29	22.38	22.22
		3	0	22.08	22.22	22.15
		3	1	22.17	22.15	22.13
		3	3	22.00	22.15	22.06
		6	0	21.09	21.13	21.10
	64QAM	1	0	21.12	21.32	21.28
		1	2	21.38	21.33	21.28
		1	5	21.23	21.18	21.27
		3	0	21.09	21.20	21.17
		3	1	21.16	21.20	21.06
		3	3	21.14	21.18	21.17
		6	0	20.05	20.09	20.14
Band/BW	Modulation	RB Size	RB Offset	Low CH20415	Mid CH20525	High CH20635
				Frequency 825.5 MHz	Frequency 836.5 MHz	Frequency 847.5 MHz
5/ 3	QPSK	1	0	23.07	22.96	23.00
		1	7	23.15	23.16	23.14
		1	14	22.99	22.99	22.99
		8	0	22.24	22.21	22.26
		8	3	22.08	22.19	22.17
		8	7	22.09	22.15	22.03
		15	0	22.23	22.09	22.13
	16QAM	1	0	22.35	22.32	22.42
		1	7	22.34	22.52	22.35
		1	14	22.24	22.27	22.22
		8	0	21.10	21.26	21.17
		8	3	21.11	21.23	21.10
		8	7	21.04	21.15	21.02
		15	0	21.13	21.08	21.12
	64QAM	1	0	21.15	21.25	21.28
		1	7	21.39	21.30	21.27
		1	14	21.27	21.17	21.28
		8	0	20.16	20.17	20.11
		8	3	20.16	20.10	20.20
		8	7	20.17	20.26	20.15
		15	0	20.09	20.19	20.07



LTE Band 5						
Band/BW	Modulation	RB Size	RB Offset	Low CH20425	Mid CH20525	High CH20625
				Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz
5/ 5	QPSK	1	0	23.04	22.96	23.01
		1	12	23.07	23.09	23.01
		1	24	22.97	23.01	22.94
		12	0	22.31	22.25	22.16
		12	6	22.07	22.16	22.14
		12	13	22.14	22.11	21.94
		25	0	22.24	22.17	22.08
	16QAM	1	0	22.34	22.38	22.33
		1	12	22.37	22.51	22.36
		1	24	22.29	22.32	22.21
		12	0	21.14	21.26	21.07
		12	6	21.15	21.17	21.10
		12	13	21.10	21.03	21.10
		25	0	21.07	21.21	21.08
	64QAM	1	0	21.21	21.26	21.38
		1	12	21.31	21.25	21.33
		1	24	21.29	21.17	21.23
		12	0	20.11	20.20	20.22
		12	6	20.24	20.20	20.06
		12	13	20.15	20.24	20.24
		25	0	20.11	20.19	20.12
Band/BW	Modulation	RB Size	RB Offset	Low CH20450	Mid CH20525	High CH20600
				Frequency 829 MHz	Frequency 836.5 MHz	Frequency 844 MHz
5/ 10	QPSK	1	0	23.09	23.10	23.09
		1	24	23.17	23.18	23.15
		1	49	23.05	23.02	23.06
		25	0	22.27	22.34	22.30
		25	12	22.22	22.15	22.22
		25	25	22.18	22.19	22.07
		50	0	22.23	22.26	22.21
	16QAM	1	0	22.41	22.44	22.45
		1	24	22.49	22.59	22.44
		1	49	22.35	22.39	22.34
		25	0	21.22	21.27	21.21
		25	12	21.21	21.24	21.22
		25	25	21.15	21.16	21.14
		50	0	21.20	21.23	21.21
	64QAM	1	0	21.26	21.37	21.42
		1	24	21.41	21.38	21.40
		1	49	21.33	21.32	21.33
		25	0	20.24	20.26	20.23
		25	12	20.27	20.23	20.21
		25	25	20.27	20.30	20.25
		50	0	20.20	20.22	20.20



LTE BAND 26						
Band/BW	Modulation	RB Size	RB Offset	Low CH26797 Frequency 824.7 MHz	Mid CH26915 Frequency 836.5 MHz	High CH27033 Frequency 848.3 MHz
26/ 1.4	QPSK	1	0	23.05	22.91	23.01
		1	2	23.19	23.22	23.31
		1	5	23.09	22.92	23.08
		3	0	23.05	23.10	23.31
		3	1	23.11	23.18	23.21
		3	3	23.10	23.19	23.13
		6	0	22.03	21.99	22.23
	16QAM	1	0	22.36	22.31	22.23
		1	2	22.50	22.57	22.49
		1	5	22.38	22.32	22.35
		3	0	22.05	22.06	22.29
		3	1	22.01	22.15	22.21
		3	3	22.14	22.16	22.15
		6	0	21.12	21.17	21.10
	64QAM	1	0	21.21	21.24	21.39
		1	2	21.47	21.37	21.53
		1	5	21.17	21.26	21.34
		3	0	21.11	21.19	21.23
		3	1	21.09	21.22	21.25
		3	3	21.07	21.12	21.12
		6	0	20.09	20.11	20.16
Band/BW	Modulation	RB Size	RB Offset	Low CH26805 Frequency 825.5 MHz	Mid CH26915 Frequency 836.5 MHz	High CH27025 Frequency 847.5 MHz
26/ 3	QPSK	1	0	22.98	22.95	23.07
		1	7	23.15	23.26	23.32
		1	14	22.99	23.00	23.04
		8	0	22.12	22.15	22.31
		8	3	22.11	22.23	22.27
		8	7	22.13	22.24	22.19
		15	0	21.99	21.99	22.15
	16QAM	1	0	22.26	22.26	22.21
		1	7	22.57	22.53	22.58
		1	14	22.33	22.23	22.38
		8	0	21.06	21.02	21.26
		8	3	21.04	21.13	21.31
		8	7	21.11	21.13	21.11
		15	0	21.04	21.13	21.18
	64QAM	1	0	21.18	21.21	21.35
		1	7	21.54	21.37	21.63
		1	14	21.29	21.23	21.36
		8	0	20.07	20.09	20.29
		8	3	20.03	20.25	20.28
		8	7	20.08	20.18	20.18
		15	0	20.12	20.11	20.15



LTE BAND 26						
Band/BW	Modulation	RB Size	RB Offset	Low CH26815	Mid CH26915	High CH27015
				Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz
26/ 5	QPSK	1	0	23.01	22.98	23.12
		1	12	23.15	23.21	23.31
		1	24	23.07	23.04	23.13
		12	0	22.15	22.18	22.25
		12	6	22.18	22.22	22.29
		12	13	22.08	22.19	22.18
		25	0	22.04	22.09	22.20
	16QAM	1	0	22.27	22.26	22.32
		1	12	22.52	22.60	22.60
		1	24	22.38	22.29	22.36
		12	0	21.10	21.11	21.27
		12	6	21.12	21.20	21.26
		12	13	21.13	21.11	21.20
		25	0	21.08	21.16	21.11
	64QAM	1	0	21.26	21.21	21.38
		1	12	21.50	21.49	21.50
		1	24	21.16	21.30	21.42
		12	0	20.16	20.10	20.19
		12	6	20.08	20.13	20.30
		12	13	20.10	20.19	20.23
		25	0	20.05	20.17	20.10
Band/BW	Modulation	RB Size	RB Offset	Low CH26840	Mid CH26915	High CH26990
				Frequency 829 MHz	Frequency 836.5 MHz	Frequency 844 MHz
26/10	QPSK	1	0	22.98	23.01	23.10
		1	24	23.16	23.26	23.31
		1	49	23.00	23.04	23.13
		25	0	22.09	22.10	22.26
		25	12	22.13	22.11	22.33
		25	25	22.21	22.10	22.16
		50	0	21.97	22.07	22.12
	16QAM	1	0	22.30	22.23	22.21
		1	24	22.52	22.60	22.60
		1	49	22.40	22.26	22.40
		25	0	21.18	21.04	21.30
		25	12	21.15	21.14	21.20
		25	25	21.20	21.14	21.24
		50	0	21.08	21.13	21.21
	64QAM	1	0	21.26	21.22	21.42
		1	24	21.40	21.49	21.59
		1	49	21.22	21.26	21.42
		25	0	20.18	20.20	20.33
		25	12	20.09	20.25	20.26
		25	25	20.17	20.09	20.22
		50	0	20.06	20.13	20.21



LTE BAND 26						
Band/BW	Modulation	RB Size	RB Offset	Low CH26865	Mid CH26915	High CH26965
				Frequency 831.5 MHz	Frequency 836.5 MHz	Frequency 841.5 MHz
26/ 15	QPSK	1	0	23.08	23.03	23.15
		1	37	23.23	23.27	23.38
		1	74	23.12	23.05	23.14
		36	0	22.16	22.22	22.33
		36	19	22.23	22.26	22.34
		36	39	22.22	22.25	22.21
		75	0	22.11	22.13	22.27
	16QAM	1	0	22.37	22.35	22.36
		1	37	22.59	22.67	22.62
		1	74	22.41	22.34	22.45
		36	0	21.19	21.14	21.31
		36	19	21.16	21.24	21.35
		36	39	21.22	21.22	21.26
		75	0	21.19	21.25	21.23
	64QAM	1	0	21.31	21.30	21.48
		1	37	21.55	21.52	21.64
		1	74	21.31	21.32	21.45
		36	0	20.21	20.23	20.34
		36	19	20.18	20.26	20.35
		36	39	20.19	20.24	20.24
		75	0	20.20	20.18	20.25



ERP POWER (dBm)

GSM 850						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
128	824.2	32.62	-2.86	27.61	576.77	7
189	836.4	32.56	-2.86	27.55	568.85	7
251	848.8	32.52	-2.86	27.51	563.64	7

EDGE 850						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
128	824.2	27.13	-2.86	22.12	162.93	7
189	836.4	27.27	-2.86	22.26	168.27	7
251	848.8	27.35	-2.86	22.34	171.4	7

WCDMA						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
4132	826.4	24.33	-2.86	19.32	85.51	7
4182	836.4	24.36	-2.86	19.35	86.1	7
4233	846.6	24.31	-2.86	19.3	85.11	7

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



CHANNEL BANDWIDTH: 1.4MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20407	824.7	23.33	-2.86	18.32	67.92	7
20525	836.5	23.22	-2.86	18.21	66.22	7
20643	848.3	23.19	-2.86	18.18	65.77	7

CHANNEL BANDWIDTH: 1.4MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20407	824.7	22.4	-2.86	17.39	54.83	7
20525	836.5	22.53	-2.86	17.52	56.49	7
20643	848.3	22.36	-2.86	17.35	54.33	7

CHANNEL BANDWIDTH: 1.4MHz 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20407	824.7	21.38	-2.86	16.37	43.35	7
20525	836.5	21.33	-2.86	16.32	42.85	7
20643	848.3	21.28	-2.86	16.27	42.36	7

CHANNEL BANDWIDTH: 3MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20415	825.5	23.15	-2.86	18.14	65.16	7
20525	836.5	23.16	-2.86	18.15	65.31	7
20635	847.5	23.14	-2.86	18.13	65.01	7

CHANNEL BANDWIDTH: 3MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20415	825.5	22.35	-2.86	17.34	54.2	7
20525	836.5	22.52	-2.86	17.51	56.36	7
20635	847.5	22.42	-2.86	17.41	55.08	7

CHANNEL BANDWIDTH: 3MHz 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20415	825.5	21.39	-2.86	16.38	43.45	7
20525	836.5	21.3	-2.86	16.29	42.56	7
20635	847.5	21.28	-2.86	16.27	42.36	7



CHANNEL BANDWIDTH: 5MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20425	826.5	23.07	-2.86	18.06	63.97	7
20525	836.5	23.09	-2.86	18.08	64.27	7
20625	846.5	23.01	-2.86	18	63.1	7

CHANNEL BANDWIDTH: 5MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20425	826.5	22.37	-2.86	17.36	54.45	7
20525	836.5	22.51	-2.86	17.5	56.23	7
20625	846.5	22.36	-2.86	17.35	54.33	7

CHANNEL BANDWIDTH: 5MHz 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20425	826.5	21.31	-2.86	16.3	42.66	7
20525	836.5	21.26	-2.86	16.25	42.17	7
20625	846.5	21.38	-2.86	16.37	43.35	7

CHANNEL BANDWIDTH: 10MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829	23.17	-2.86	18.16	65.46	7
20525	836.5	23.18	-2.86	18.17	65.61	7
20600	844	23.15	-2.86	18.14	65.16	7

CHANNEL BANDWIDTH: 10MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829	22.49	-2.86	17.48	55.98	7
20525	836.5	22.59	-2.86	17.58	57.28	7
20600	844	22.45	-2.86	17.44	55.46	7

CHANNEL BANDWIDTH: 10MHz 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829	21.41	-2.86	16.4	43.65	7
20525	836.5	21.38	-2.86	16.37	43.35	7
20600	844	21.42	-2.86	16.41	43.75	7

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



LTE BAND 26

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26797	824.7	23.19	-2.86	18.18	65.77	7
26915	836.5	23.22	-2.86	18.21	66.22	7
27033	848.3	23.31	-2.86	18.3	67.61	7

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26797	824.7	22.5	-2.86	17.49	56.1	7
26915	836.5	22.57	-2.86	17.56	57.02	7
27033	848.3	22.49	-2.86	17.48	55.98	7

CHANNEL BANDWIDTH: 1.4MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26797	824.7	21.47	-2.86	16.46	44.26	7
26915	836.5	21.37	-2.86	16.36	43.25	7
27033	848.3	21.53	-2.86	16.52	44.87	7

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26805	825.5	23.15	-2.86	18.14	65.16	7
26915	836.5	23.26	-2.86	18.25	66.83	7
27025	847.5	23.32	-2.86	18.31	67.76	7

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26805	825.5	22.57	-2.86	17.56	57.02	7
26915	836.5	22.53	-2.86	17.52	56.49	7
27025	847.5	22.58	-2.86	17.57	57.15	7

CHANNEL BANDWIDTH: 3MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26805	825.5	21.54	-2.86	16.53	44.98	7
26915	836.5	21.37	-2.86	16.36	43.25	7
27025	847.5	21.63	-2.86	16.62	45.92	7



CHANNEL BANDWIDTH: 5MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26815	826.5	23.15	-2.86	18.14	65.16	7
26915	836.5	23.21	-2.86	18.2	66.07	7
27015	846.5	23.31	-2.86	18.3	67.61	7

CHANNEL BANDWIDTH: 5MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26815	826.5	22.52	-2.86	17.51	56.36	7
26915	836.5	22.6	-2.86	17.59	57.41	7
27015	846.5	22.6	-2.86	17.59	57.41	7

CHANNEL BANDWIDTH: 5MHz 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26815	826.5	21.5	-2.86	16.49	44.57	7
26915	836.5	21.49	-2.86	16.48	44.46	7
27015	846.5	21.5	-2.86	16.49	44.57	7

CHANNEL BANDWIDTH: 10MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26840	829	23.16	-2.86	18.15	65.31	7
26915	836.5	23.26	-2.86	18.25	66.83	7
26990	844	23.31	-2.86	18.3	67.61	7

CHANNEL BANDWIDTH: 10MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26840	829	22.52	-2.86	17.51	56.36	7
26915	836.5	22.6	-2.86	17.59	57.41	7
26990	844	22.6	-2.86	17.59	57.41	7

CHANNEL BANDWIDTH: 10MHz 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26840	829	21.4	-2.86	16.39	43.55	7
26915	836.5	21.49	-2.86	16.48	44.46	7
26990	844	21.59	-2.86	16.58	45.5	7



CHANNEL BANDWIDTH: 15MHz QPSK						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26865	831.5	23.23	-2.86	18.22	66.37	7
26915	836.5	23.27	-2.86	18.26	66.99	7
26965	841.5	23.38	-2.86	18.37	68.71	7

CHANNEL BANDWIDTH: 15MHz 16QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26865	831.5	22.59	-2.86	17.58	57.28	7
26915	836.5	22.67	-2.86	17.66	58.34	7
26965	841.5	22.62	-2.86	17.61	57.68	7

CHANNEL BANDWIDTH: 15MHz 64QAM						
Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26865	831.5	21.55	-2.86	16.54	45.08	7
26915	836.5	21.52	-2.86	16.51	44.77	7
26965	841.5	21.64	-2.86	16.63	46.03	7

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



3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

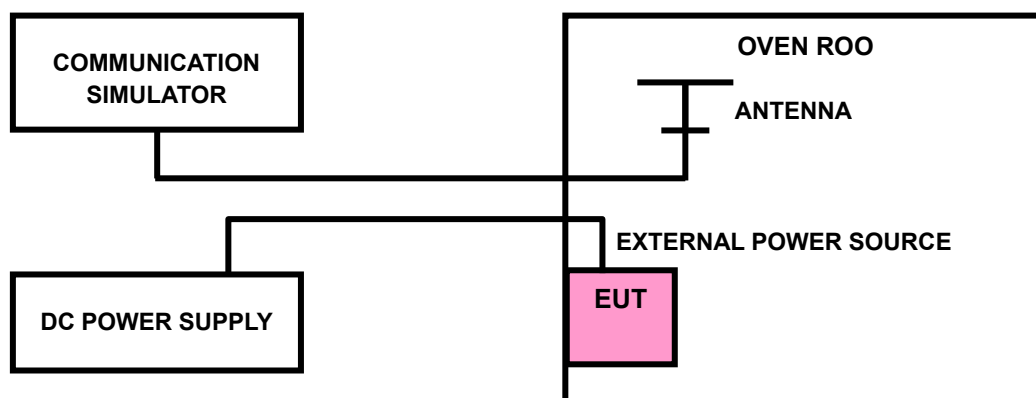
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

3.2.2 TEST PROCEDURE

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ 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.

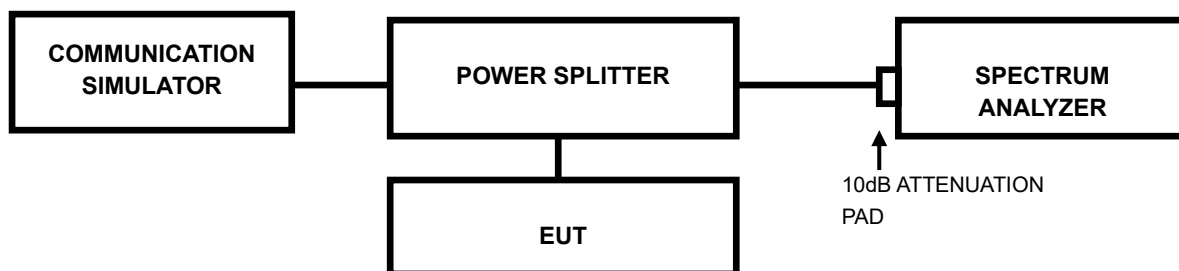


3.3 OCCUPIED BANDWIDTH MEASUREMENT

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

- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- 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.

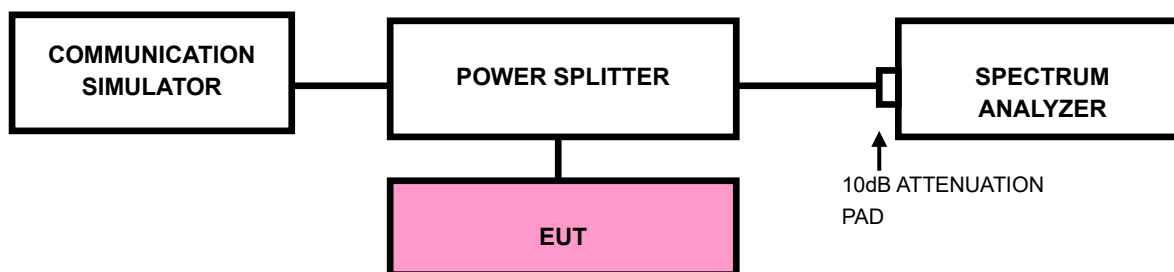


3.4 BAND EDGE MEASUREMENT

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) $\geq 1\%$ 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 $\geq 3 \times$ 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

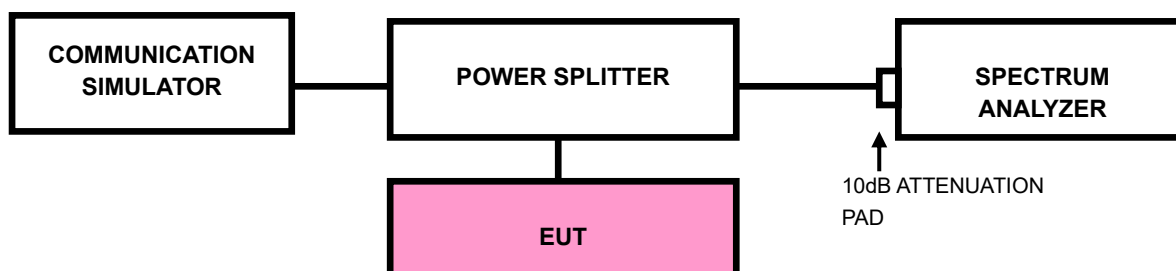
3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9kHz 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. $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,
 $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}$.

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

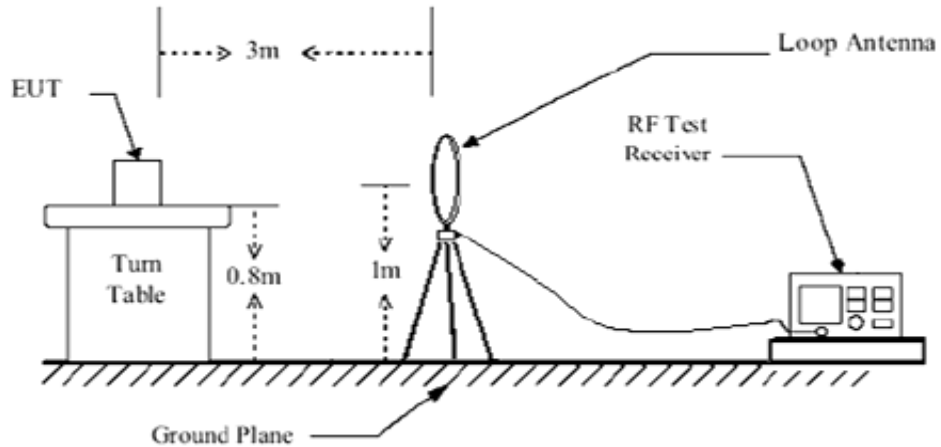
3.6.3 DEVIATION FROM TEST STANDARD

No deviation

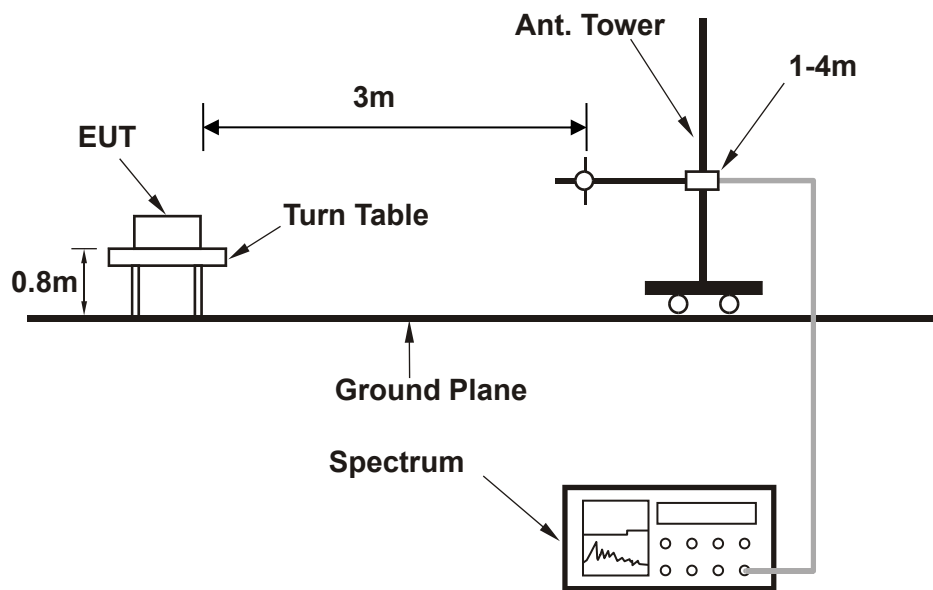


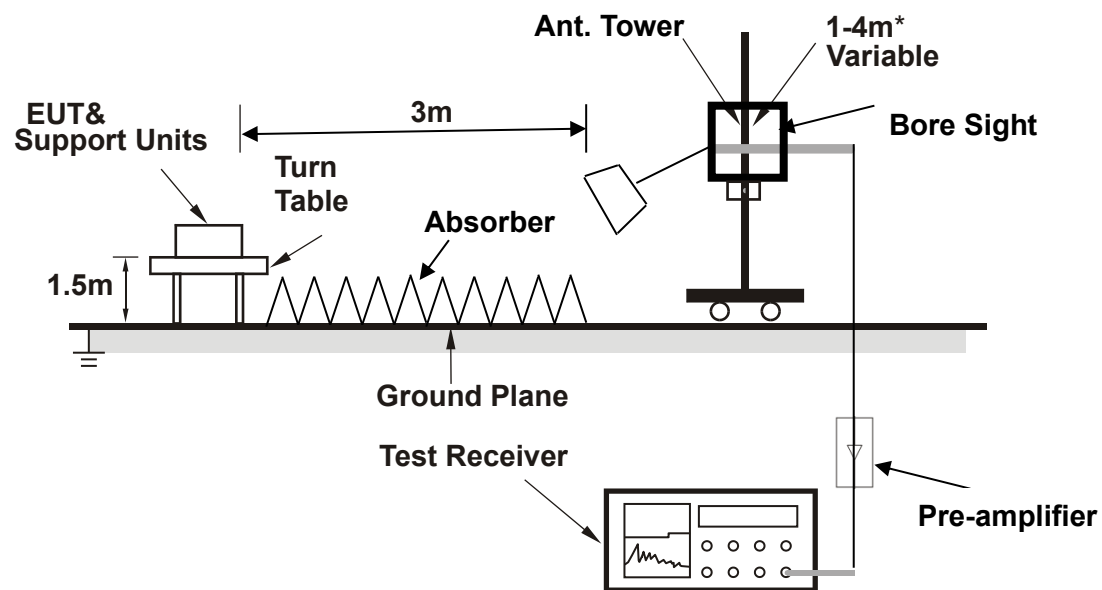
3.6.4 TEST SETUP

< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >





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

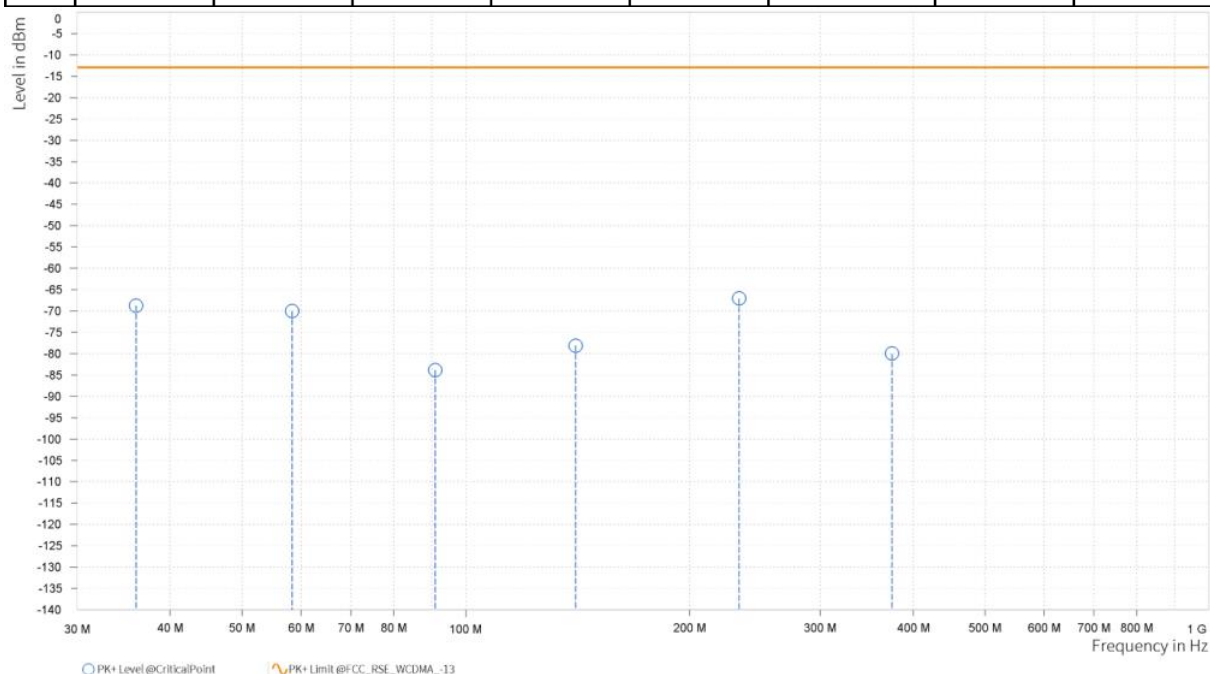
NOTE : The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

BELOW 1GHz WORST-CASE DATA

GSM 850			
MODE	TX channel 189	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

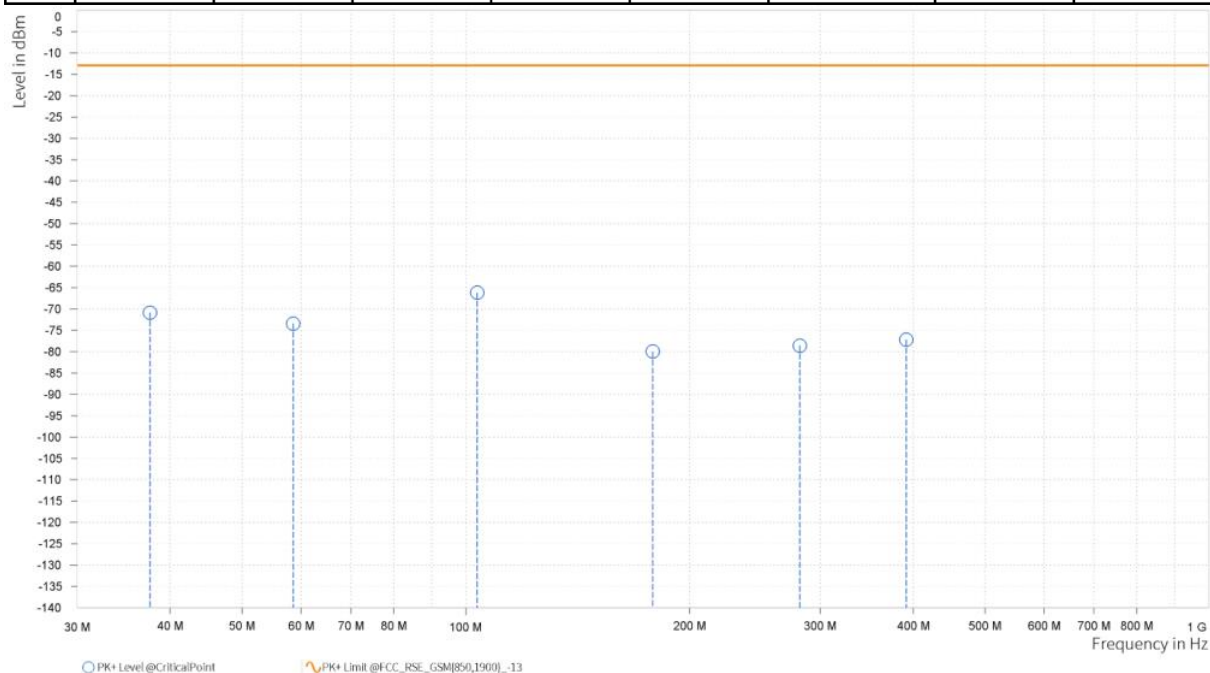
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	36.0	-68.71	-13.0	55.71	-0.84	H	114.4	2.0
1	58.35	-70.01	-13.0	57.01	-3.13	H	285.4	2.0
1	90.95	-83.86	-13.0	70.86	-10.27	H	114.4	2.0
1	140.55	-78.13	-13.0	65.13	-13.5	H	285.4	2.0
1	233.2	-67.03	-13.0	54.03	2.54	H	158.6	2.0
1	374.7	-79.95	-13.0	66.95	0.19	H	294.5	1.0





MODE	TX channel 189	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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	37.6	-70.82	-13.0	57.82	-7.62	V	197.8	1.0
1	58.55	-73.42	-13.0	60.42	-3.01	V	139.5	2.0
1	103.65	-66.17	-13.0	53.17	3.69	V	4.9	1.0
1	178.55	-79.96	-13.0	66.96	-9.05	V	276.6	1.0
1	281.65	-78.58	-13.0	65.58	-0.51	V	59.4	2.0
1	391.55	-77.17	-13.0	64.17	1.47	V	197.8	1.0





BUREAU VERITAS Test Report No.: PSU-NQN2407300216RF01
ABOVE 1GHz DATA

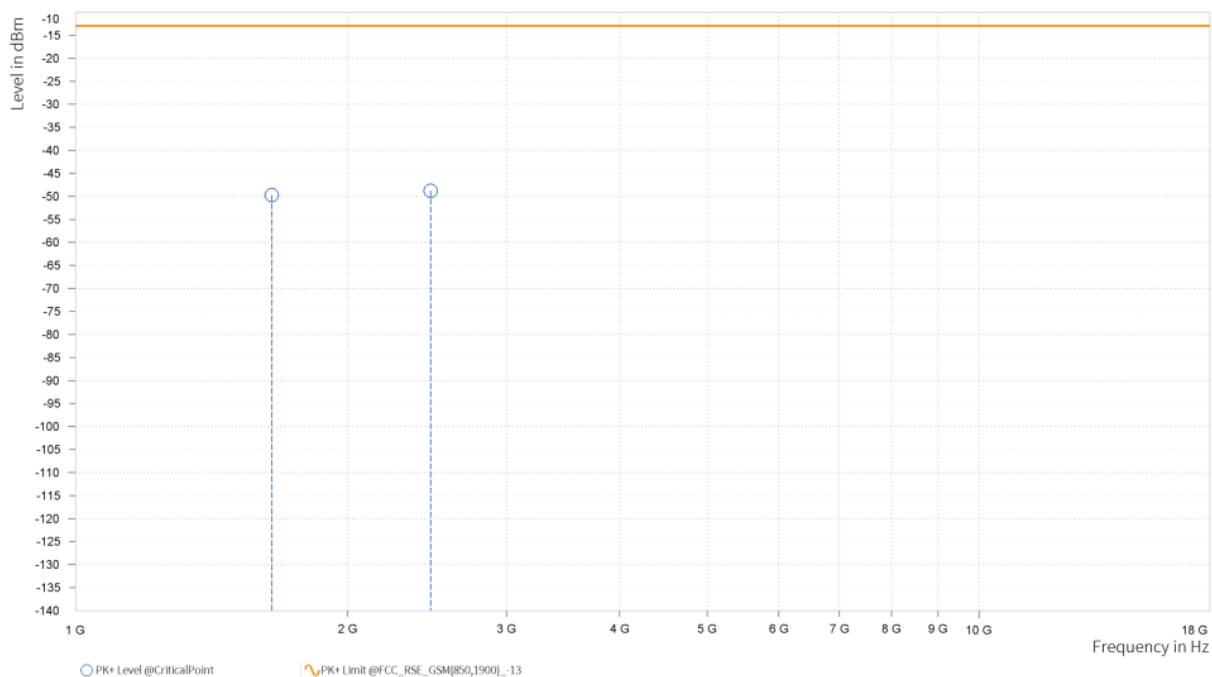
Note: For higher frequency, the emission is too low to be detected.

GSM 850

CH 128:

MODE	TX channel 128	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

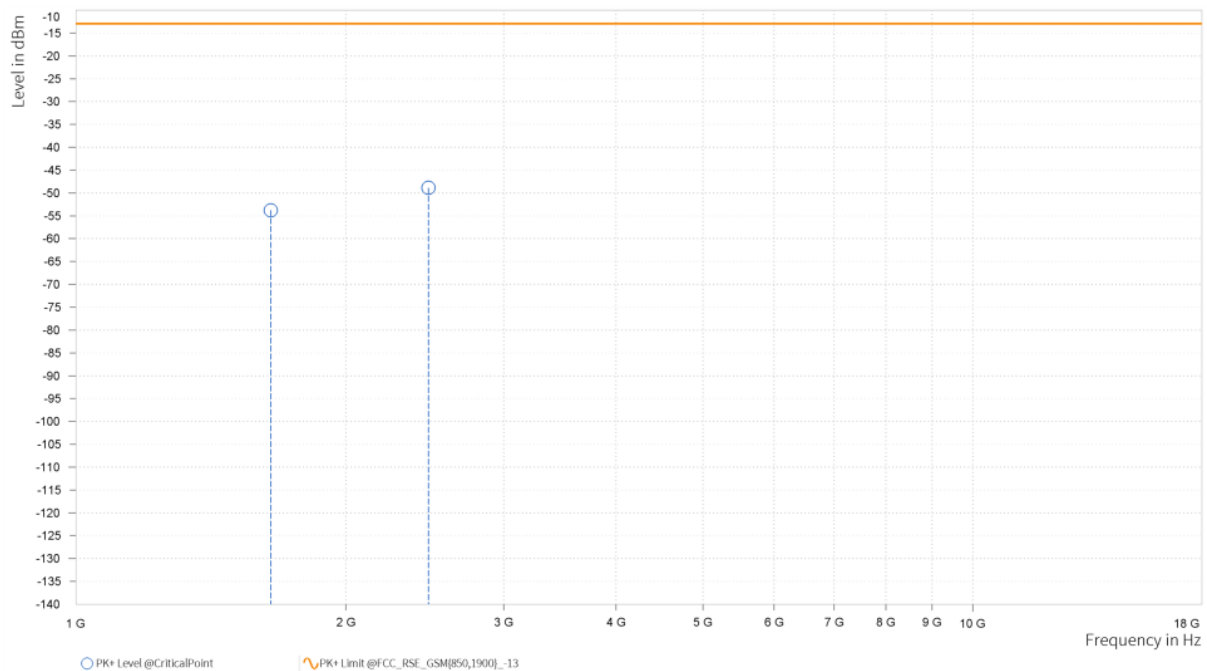
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,648.400	-49.75	-13.0	36.75	15.93	H	93.8	1.0
3	2,472.600	-48.77	-13.0	35.77	20.69	H	0.9	2.0





MODE	TX channel 128	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,648.400	-53.77	-13.0	40.77	15.51	V	0.9	2.0
3	2,472.600	-48.87	-13.0	35.87	20.95	V	0.9	2.0





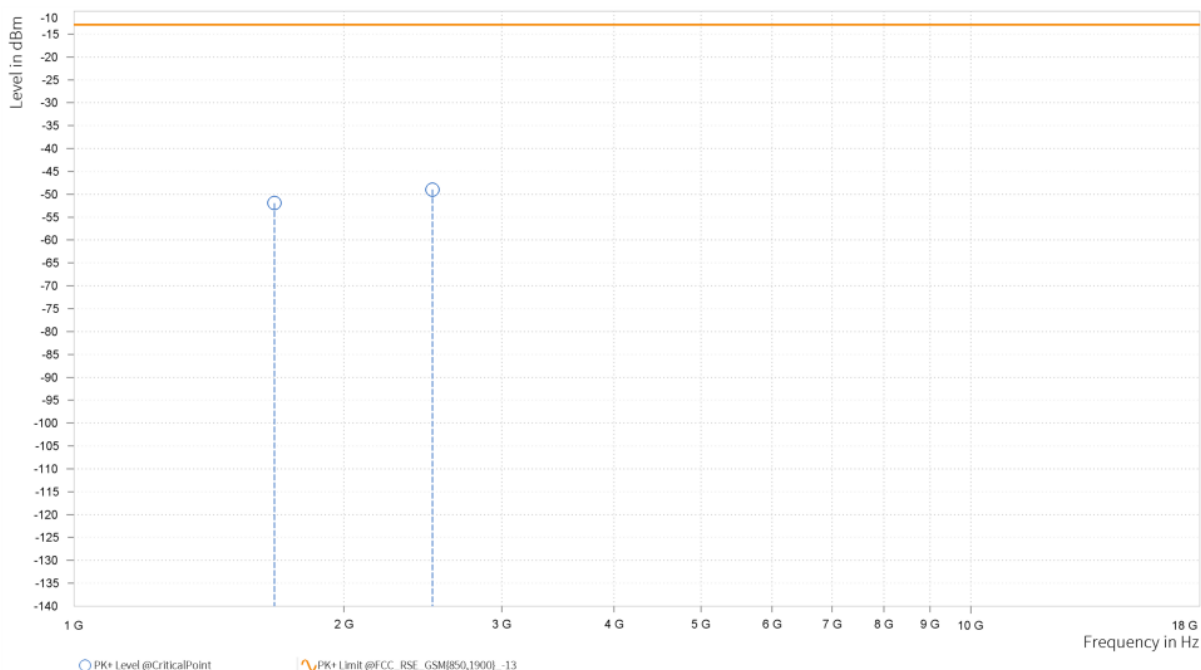
BUREAU
VERITAS

Test Report No.: PSU-NQN2407300216RF01

CH 189:

MODE	TX channel 189	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

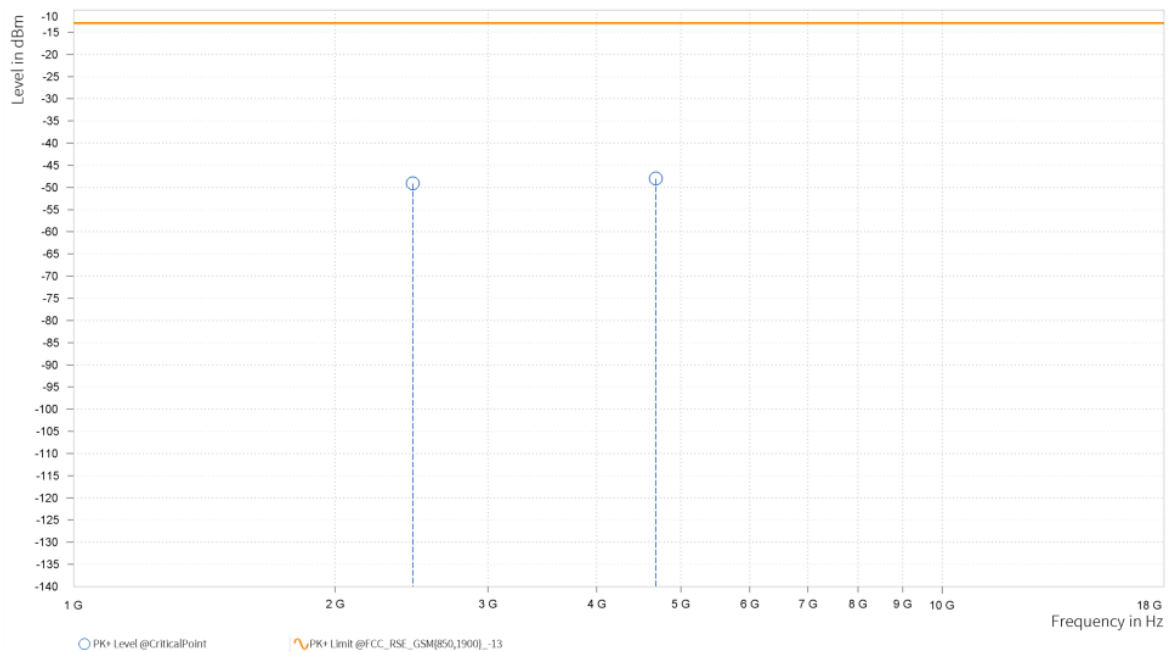
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,672.800	-51.94	-13.0	38.94	16.68	H	359.1	1.0
3	2,509.200	-48.97	-13.0	35.97	21.0	H	1.0	1.0





MODE	TX channel 189	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
3	2,458.000	-49.09	-13.0	36.09	20.96	V	172.6	1.0
4	4,678.000	-48.0	-13.0	35.0	23.24	V	251.5	1.0





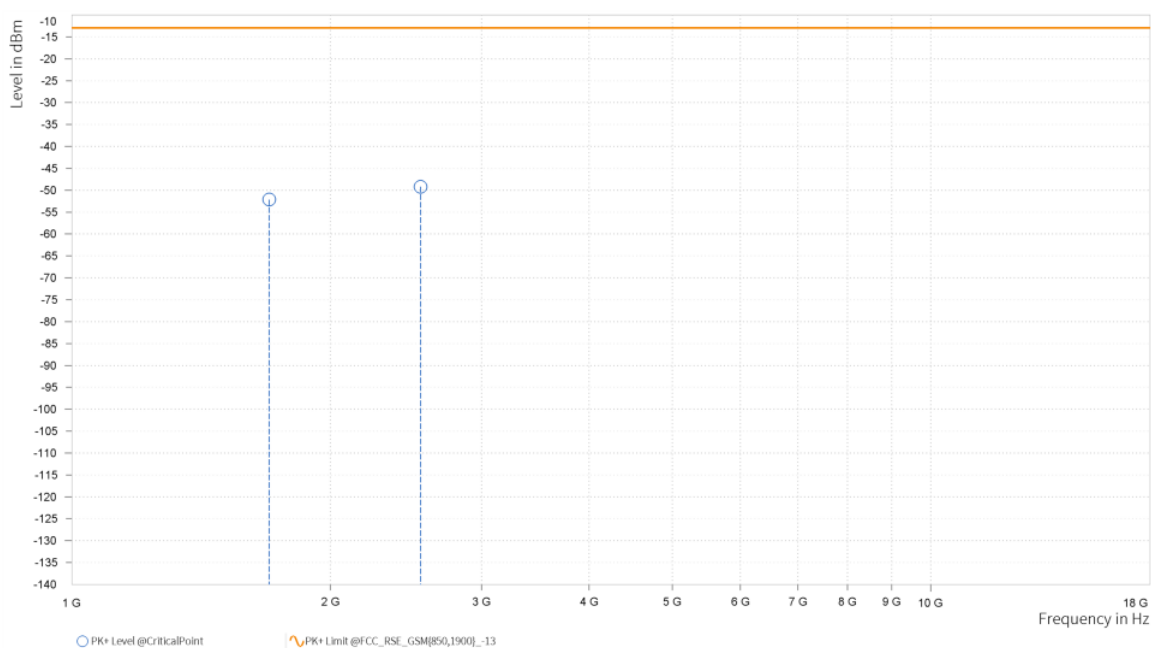
BUREAU
VERITAS

Test Report No.: PSU-NQN2407300216RF01

CH 251:

MODE	TX channel 251	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

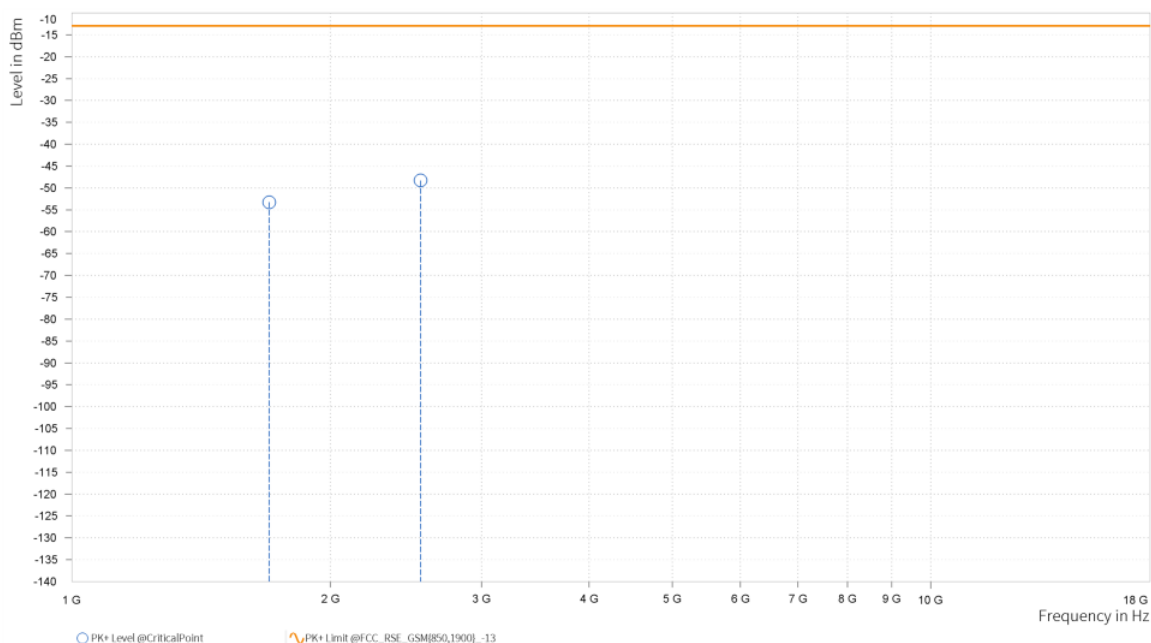
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,697.600	-52.15	-13.0	39.15	17.07	H	1	2.0
3	2,546.400	-49.21	-13.0	36.21	20.94	H	359	1.0





MODE	TX channel 251	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,697.600	-53.28	-13.0	40.28	16.29	V	93.8	1.0
3	2,546.400	-48.3	-13.0	35.3	21.56	V	1.0	2.0

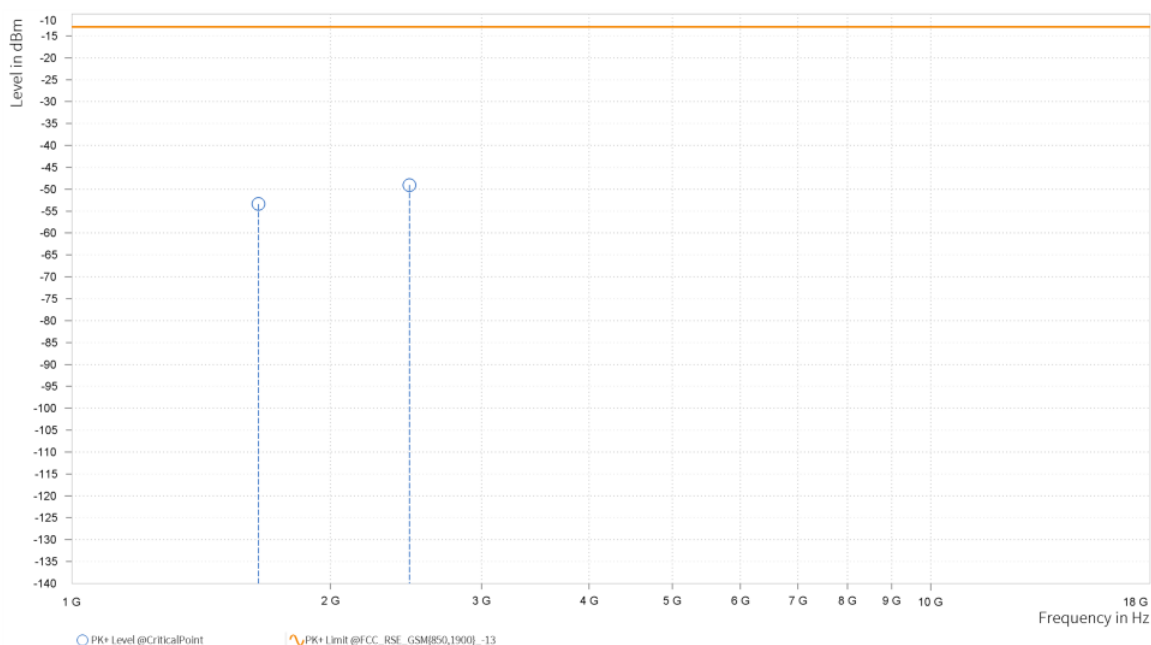


EDGE 850:

CH 128:

MODE	TX channel 128	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

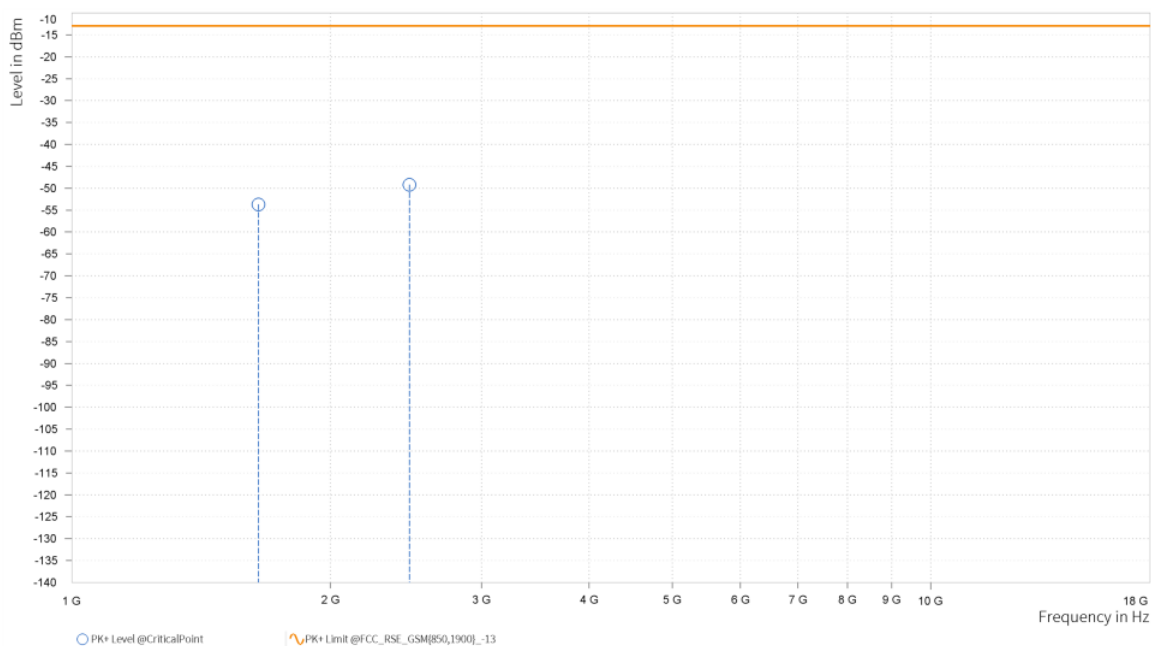
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,648.400	-53.38	-13.0	40.38	15.93	H	1.0	2.0
3	2,472.600	-49.05	-13.0	36.05	20.69	H	171.4	1.0





MODE	TX channel 128	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,648.400	-53.7	-13.0	40.7	15.51	V	1	1.0
3	2,472.600	-49.19	-13.0	36.19	20.95	V	359	2.0





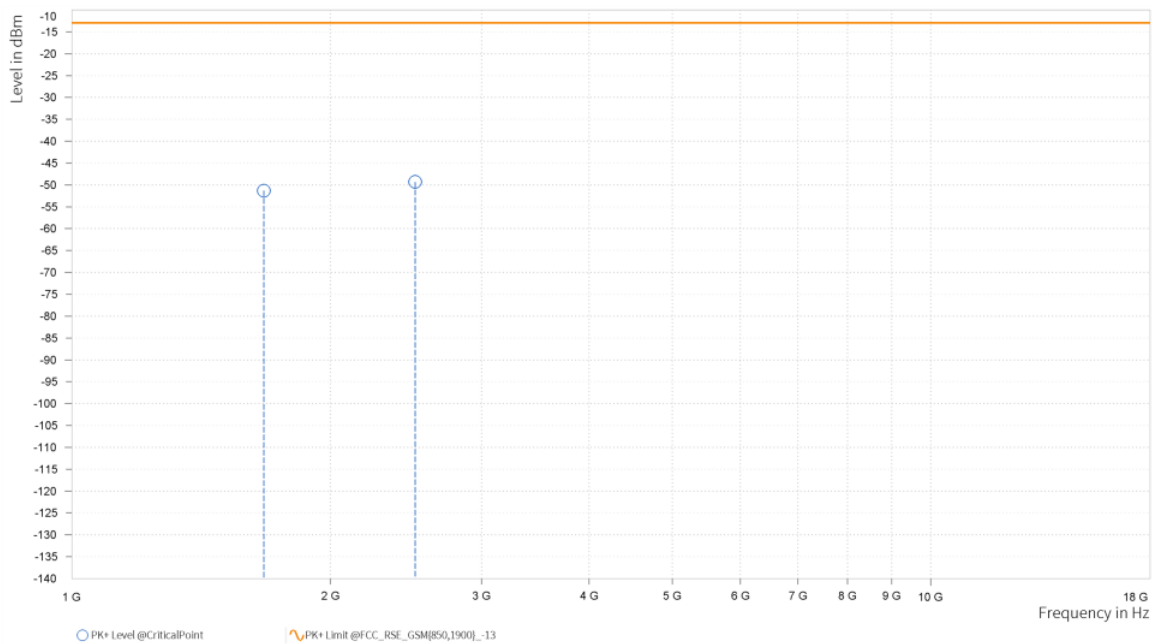
**BUREAU
VERITAS**

Test Report No.: PSU-NQN2407300216RF01

CH 189:

MODE	TX channel 189	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

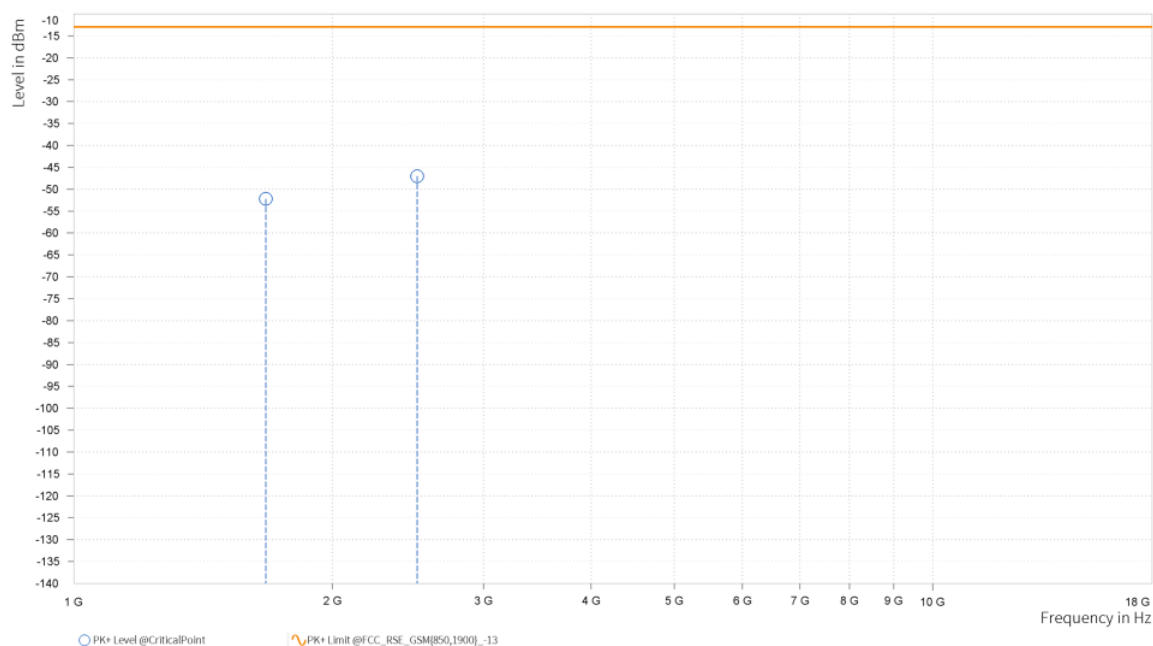
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,672.800	-51.3	-13.0	38.3	16.68	H	359.0	1.0
3	2,509.200	-49.32	-13.0	36.32	21.0	H	170.2	1.0





MODE	TX channel 189	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,672.800	-52.22	-13.0	39.22	15.57	V	359	1.0
3	2,509.200	-47.01	-13.0	34.01	21.61	V	359	2.0

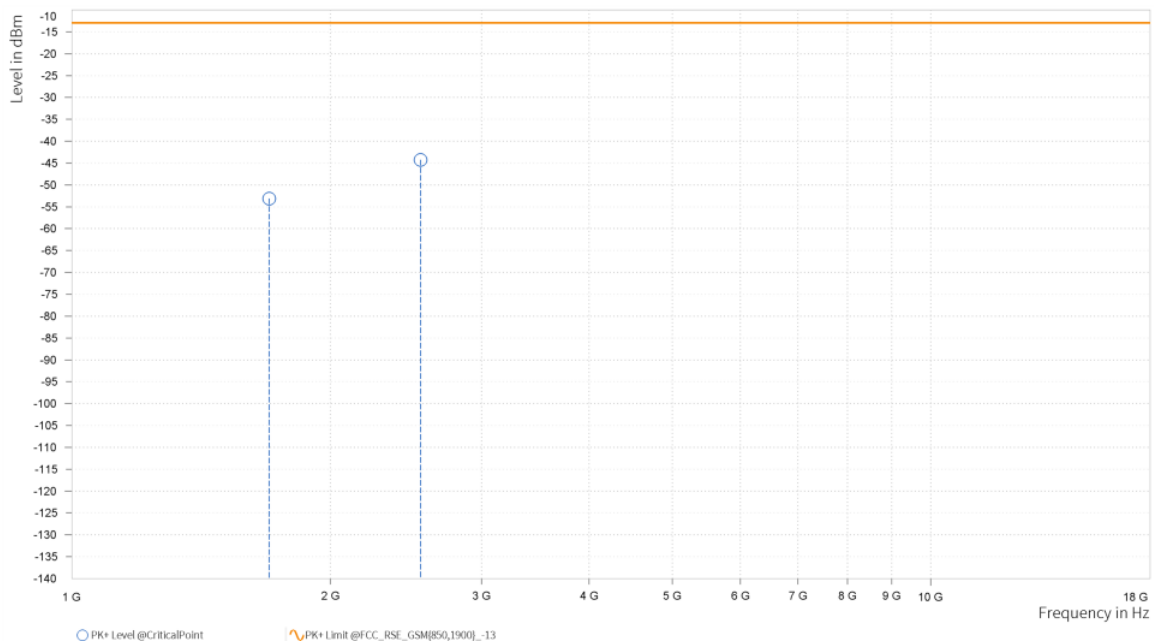




BUREAU VERITAS Test Report No.: PSU-NQN2407300216RF01
CH 251:

MODE	TX channel 251	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

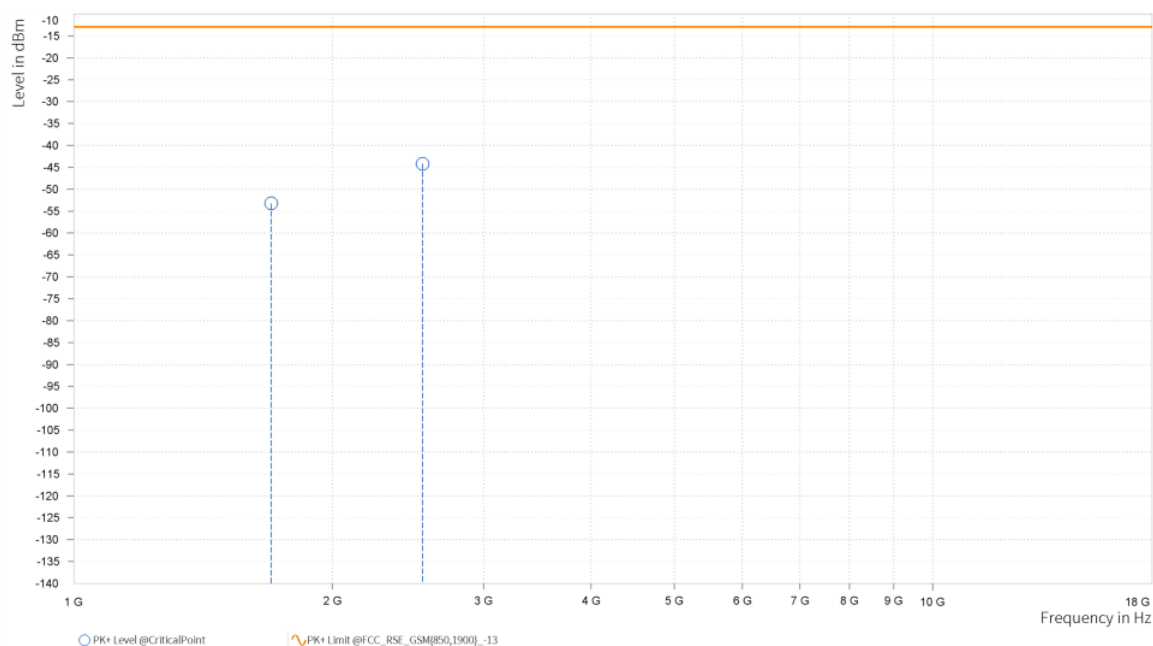
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,697.600	-53.12	-13.0	40.12	17.07	H	1.0	1.0
3	2,546.400	-44.26	-13.0	31.26	20.94	H	188.6	2.0





MODE	TX channel 251	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,697.600	-53.21	-13.0	40.21	16.29	V	1.0	1.0
3	2,546.400	-44.18	-13.0	31.18	21.56	V	177.4	1.0



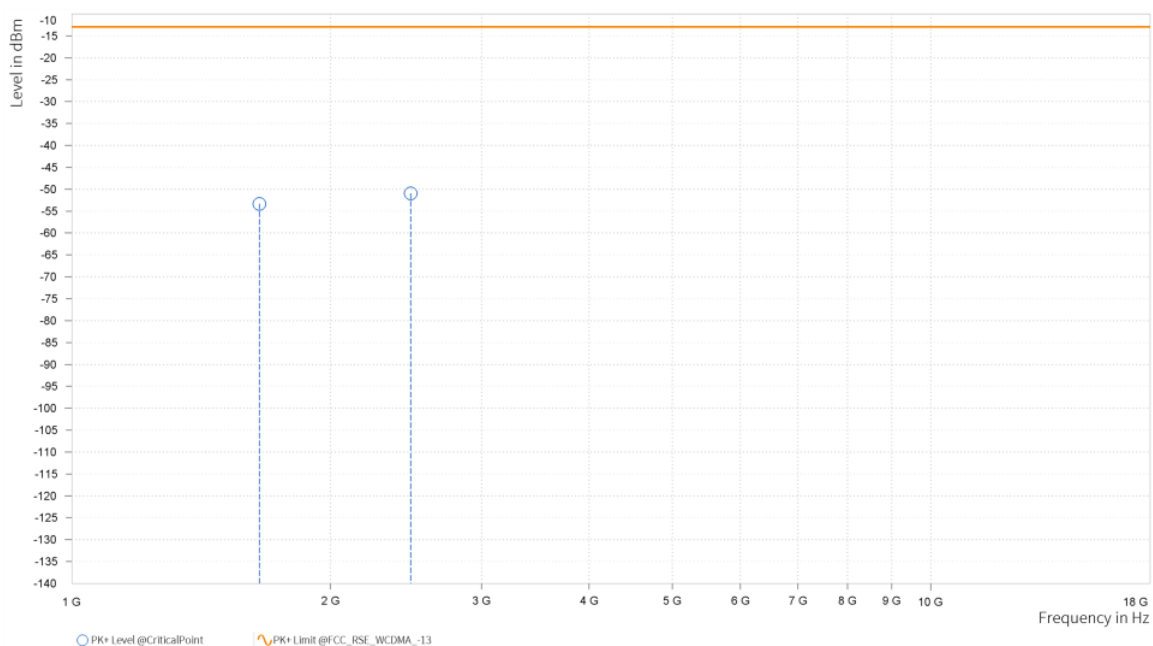


BUREAU VERITAS Test Report No.: PSU-NQN2407300216RF01
WCDMA Band V:

CH 4132:

MODE	TX channel 4132	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

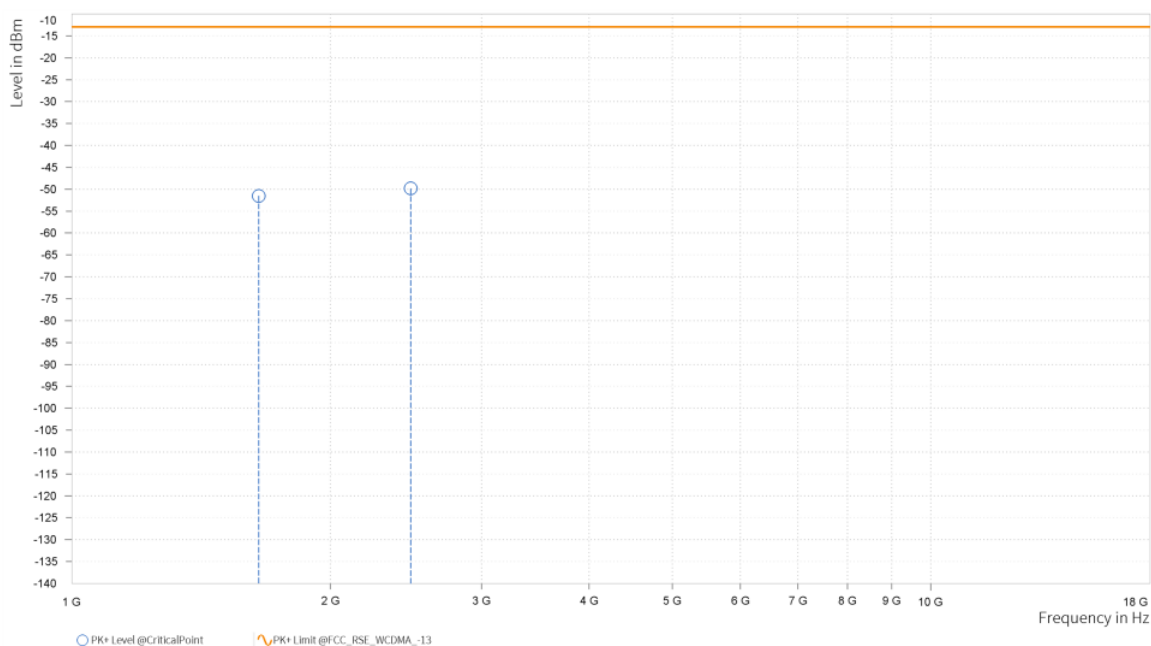
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,652.800	-53.35	-13.0	40.35	14.29	H	326.1	2.0
3	2,479.200	-50.96	-13.0	37.96	19.47	H	1.0	2.0





TESTER			
MODE	TX channel 4132	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,650.500	-51.51	-13.0	38.51	13.62	V	132.2	2.0
3	2,479.200	-49.82	-13.0	36.82	19.71	V	358.4	1.0

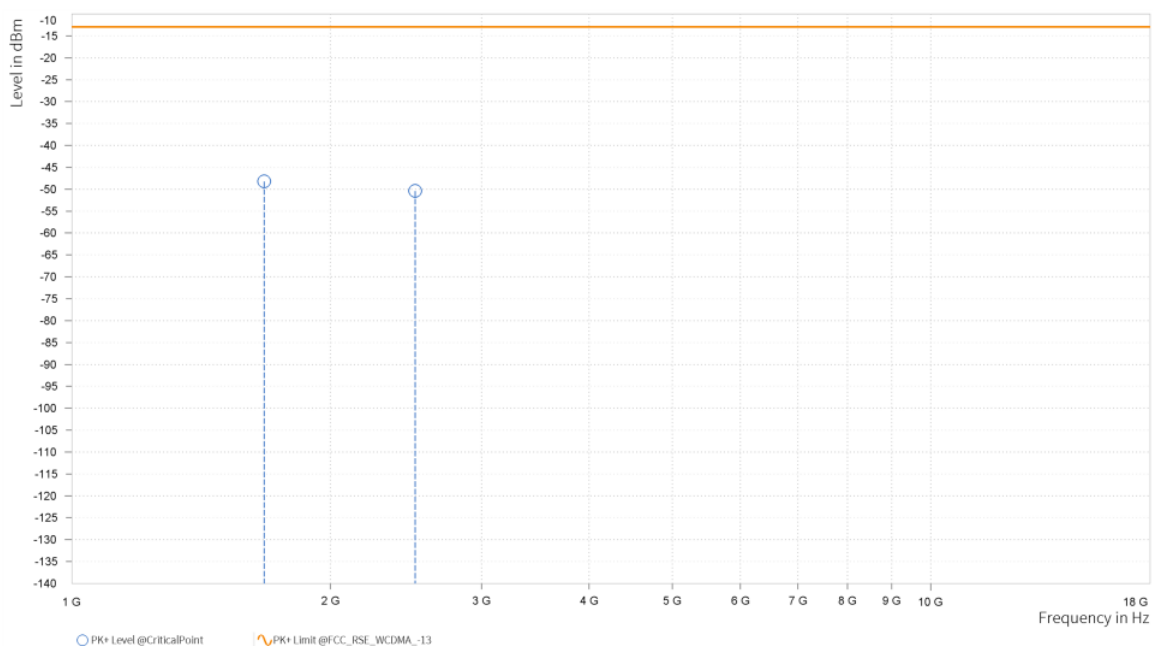




BUREAU VERITAS Test Report No.: PSU-NQN2407300216RF01
CH 4182:

MODE	TX channel 4182	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

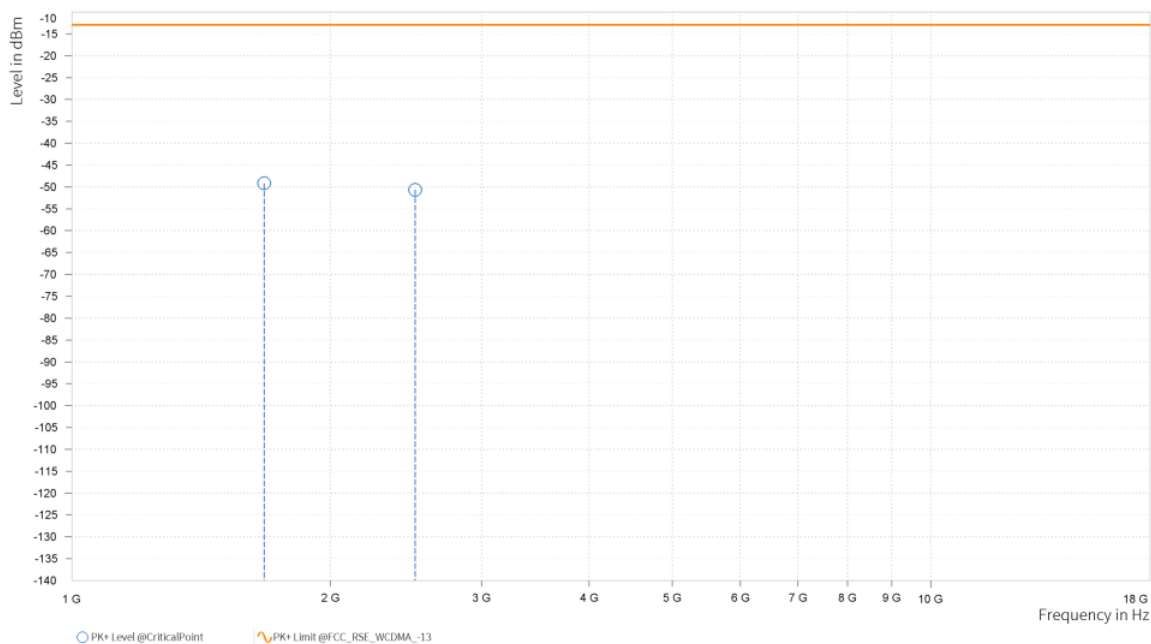
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,674.500	-48.21	-13.0	35.21	14.81	H	31.7	2.0
3	2,509.200	-50.38	-13.0	37.38	19.71	H	64.2	1.0





TESTER			
MODE	TX channel 4182	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

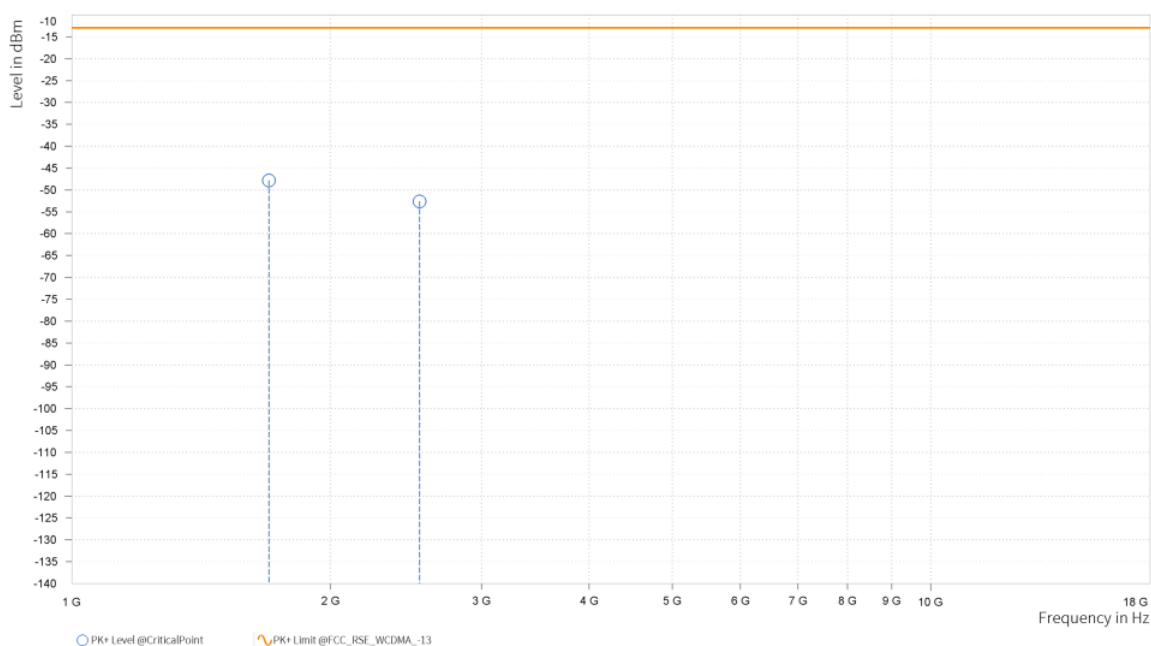
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,675.000	-49.15	-13.0	36.15	13.71	V	125.8	2.0
3	2,509.200	-50.65	-13.0	37.65	20.32	V	291.4	1.0





MODE	TX channel 4233	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

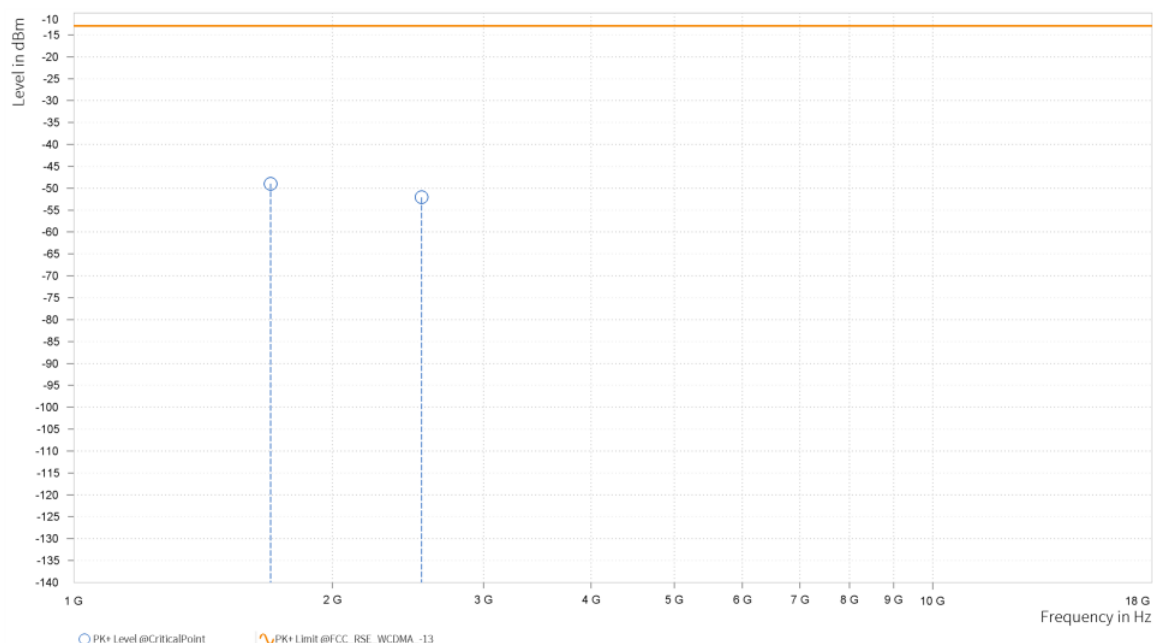
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,695.500	-47.81	-13.0	34.81	15.13	H	331.8	1.0
3	2,539.800	-52.63	-13.0	39.63	19.36	H	178.3	1.0





ENVIRONMENTAL CONDITIONS			
MODE	TX channel 4233	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,694.500	-48.99	-13.0	35.99	14.23	V	136.4	2.0
3	2,539.800	-52.05	-13.0	39.05	20.05	V	336.7	1.0



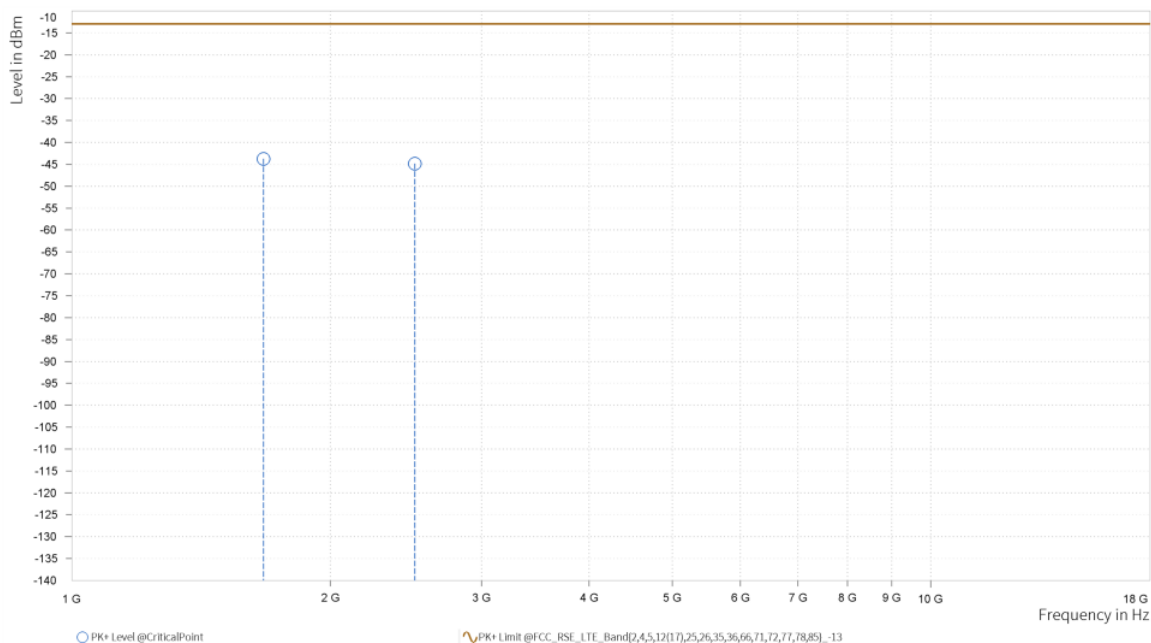


CHANNEL BANDWIDTH: 1.4MHz / QPSK

CH26915

MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

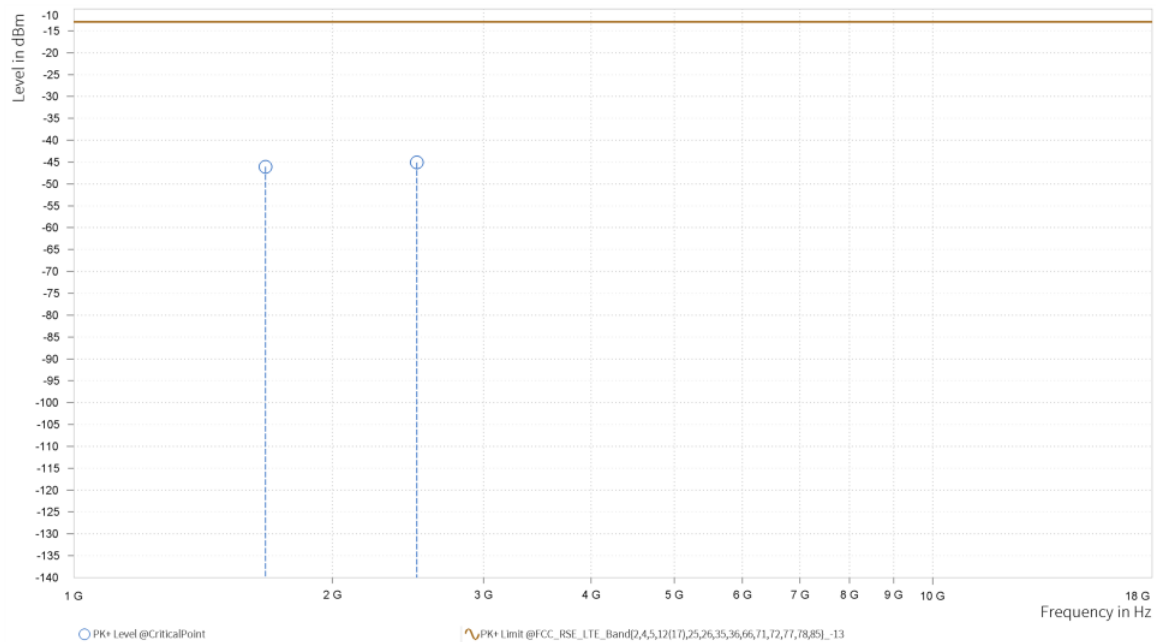
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,671.740	-43.76	-13.0	30.76	22.48	H	0.9	2.0
3	2,507.610	-44.85	-13.0	31.85	26.38	H	1.0	1.0





MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,671.740	-46.06	-13.0	33.06	22.26	V	293.6	2.0
3	2,507.610	-45.1	-13.0	32.1	26.03	V	359.1	1.0

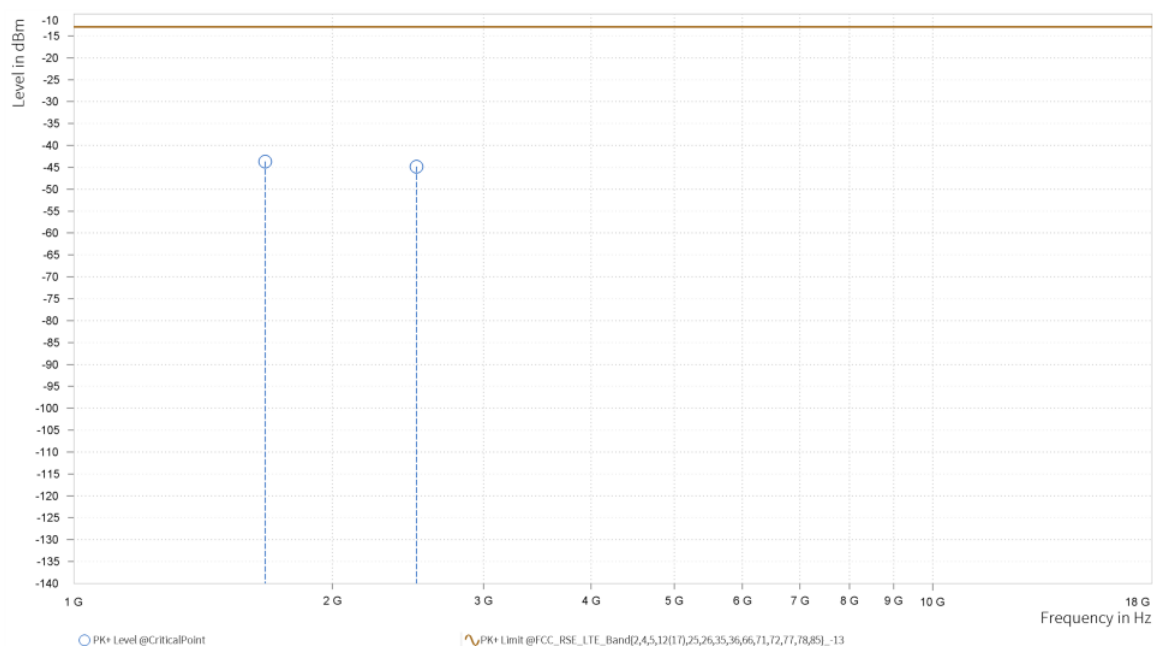




CHANNEL BANDWIDTH: 3MHz / QPSK

MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

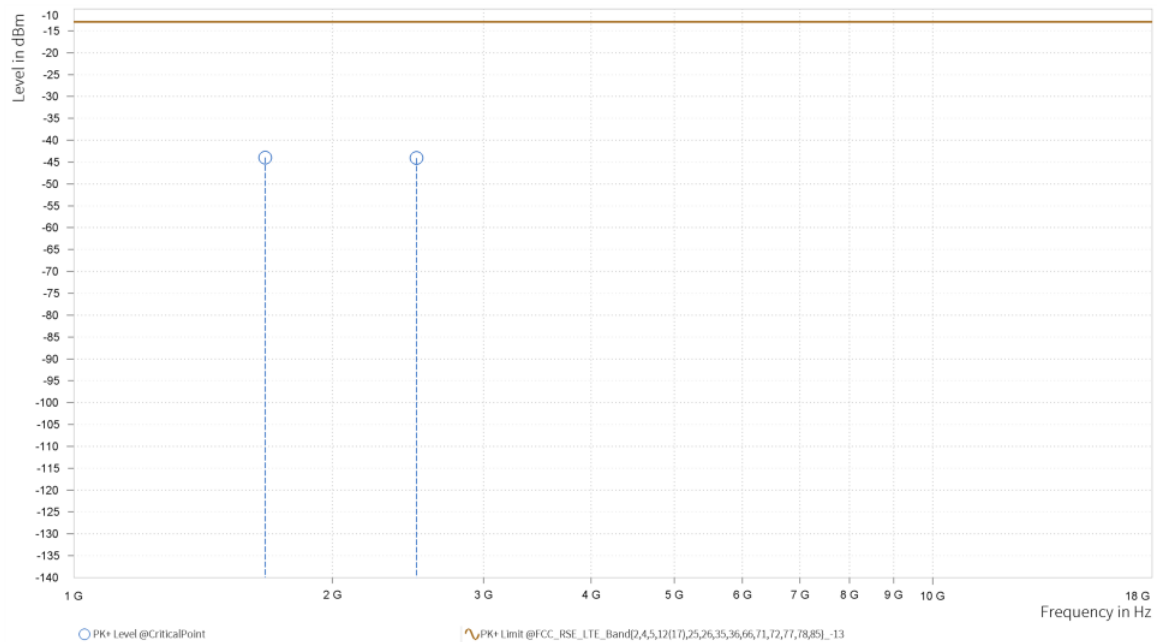
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,670.300	-43.69	-13.0	30.69	22.46	H	1	1.0
3	2,505.450	-44.84	-13.0	31.84	26.14	H	1	2.0





MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,670.300	-43.96	-13.0	30.96	22.22	V	292.3	2.0
3	2,505.450	-44.1	-13.0	31.1	25.79	V	0.9	2.0

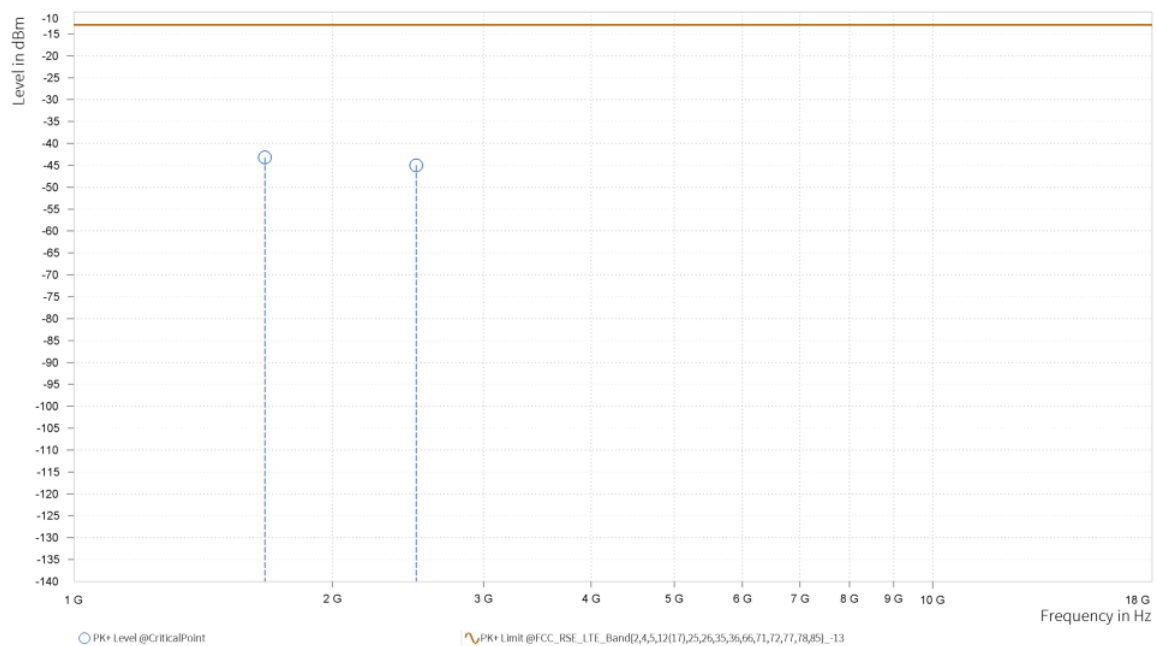




CHANNEL BANDWIDTH: 5MHz / QPSK

MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

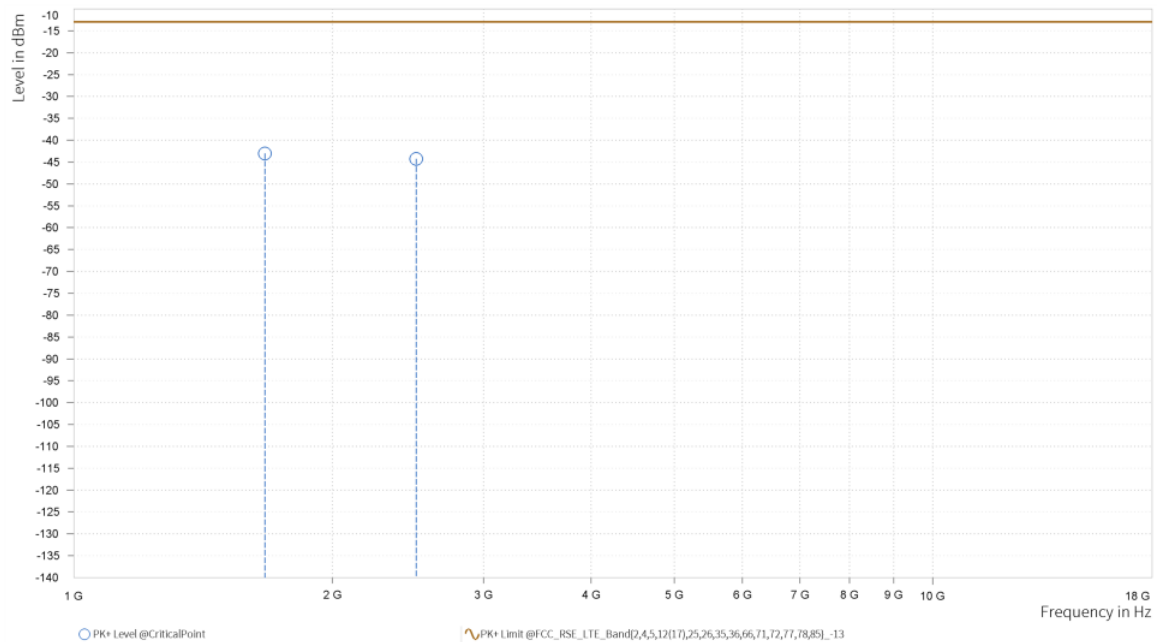
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,668.500	-43.2	-13.0	30.2	22.49	H	200.2	2.0
3	2,502.750	-44.98	-13.0	31.98	25.78	H	1.0	1.0





MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,668.500	-43.04	-13.0	30.04	22.22	V	292.3	2.0
3	2,502.750	-44.27	-13.0	31.27	25.42	V	359.0	2.0



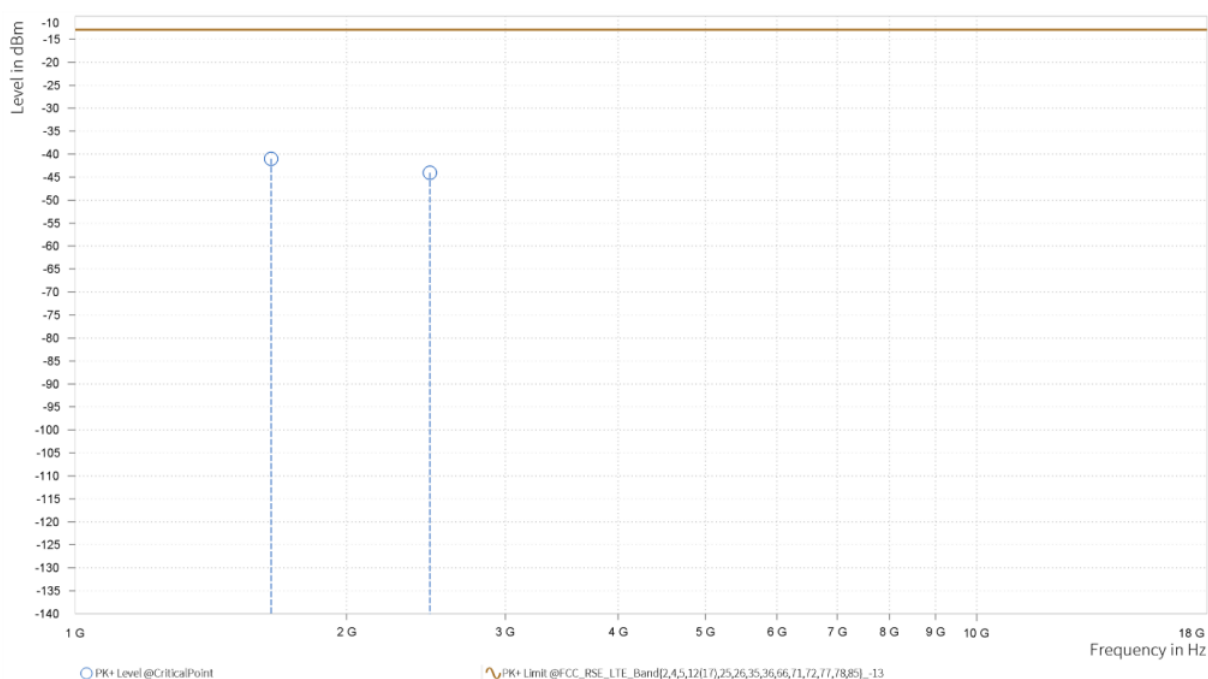


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CHANNEL BANDWIDTH: 10MHz / QPSK

MODE	TX channel 26840	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

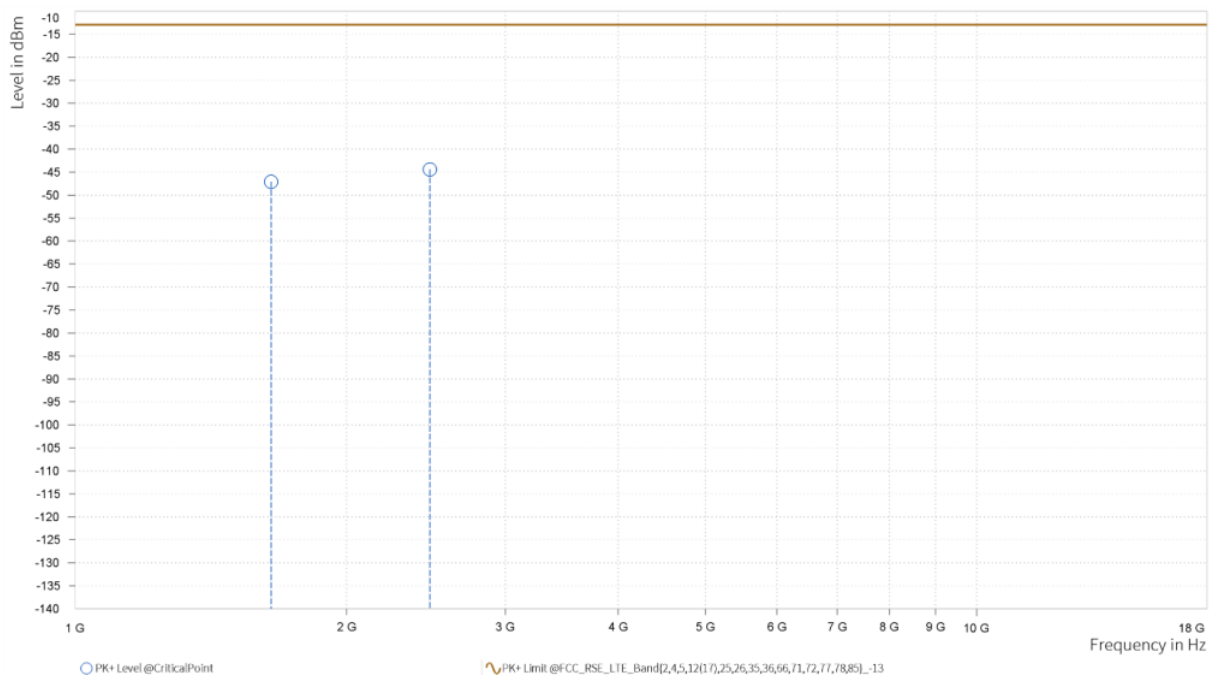
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,649.000	-41.01	-13.0	28.01	22.21	H	1.0	1.0
3	2,473.500	-44.03	-13.0	31.03	26.58	H	138.1	1.0





MODE	TX channel 26840	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

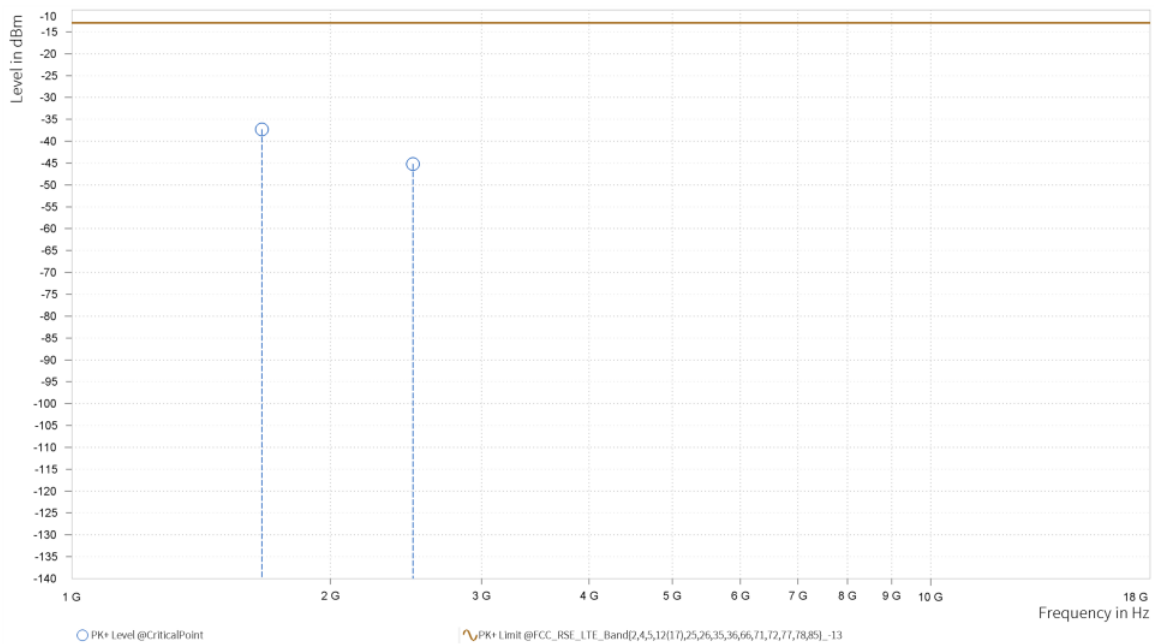
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,649.000	-47.09	-13.0	34.09	21.68	V	293.6	2.0
3	2,473.500	-44.39	-13.0	31.39	26.28	V	1.0	2.0





MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

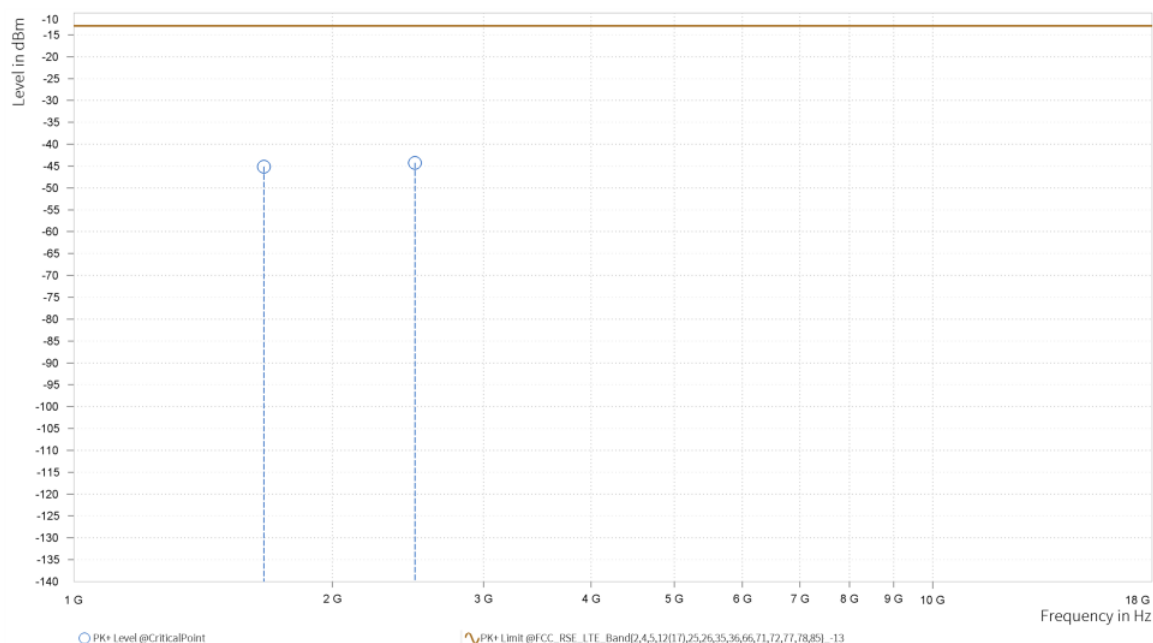
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,664.000	-37.28	-13.0	24.28	22.62	H	359	1.0
3	2,496.000	-45.21	-13.0	32.21	26.0	H	359	1.0





MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

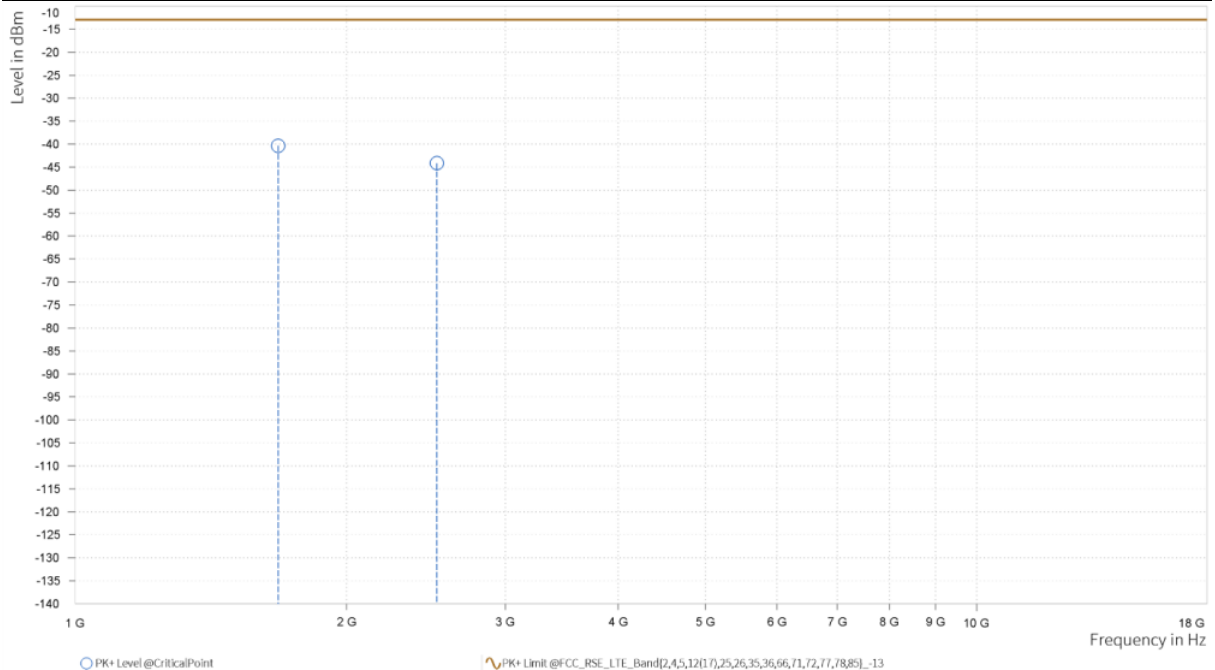
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,664.000	-45.12	-13.0	32.12	22.28	V	359.1	1.0
3	2,496.000	-44.25	-13.0	31.25	25.61	V	217.0	2.0





MODE	TX channel 26990	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

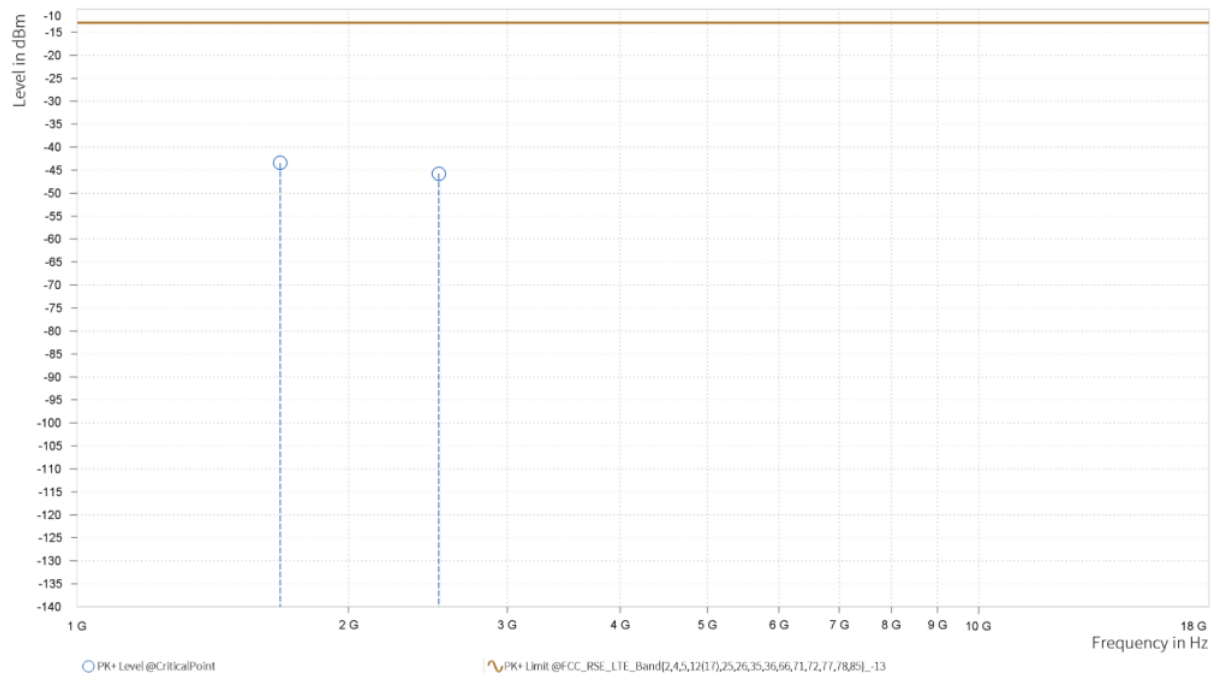
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,679.000	-40.33	-13.0	27.33	22.63	H	359.0	2.0
3	2,518.500	-44.15	-13.0	31.15	26.47	H	359.1	1.0





MODE	TX channel 26990	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,679.000	-43.44	-13.0	30.44	22.54	V	291.1	2.0
3	2,518.500	-45.78	-13.0	32.78	26.17	V	359.0	2.0

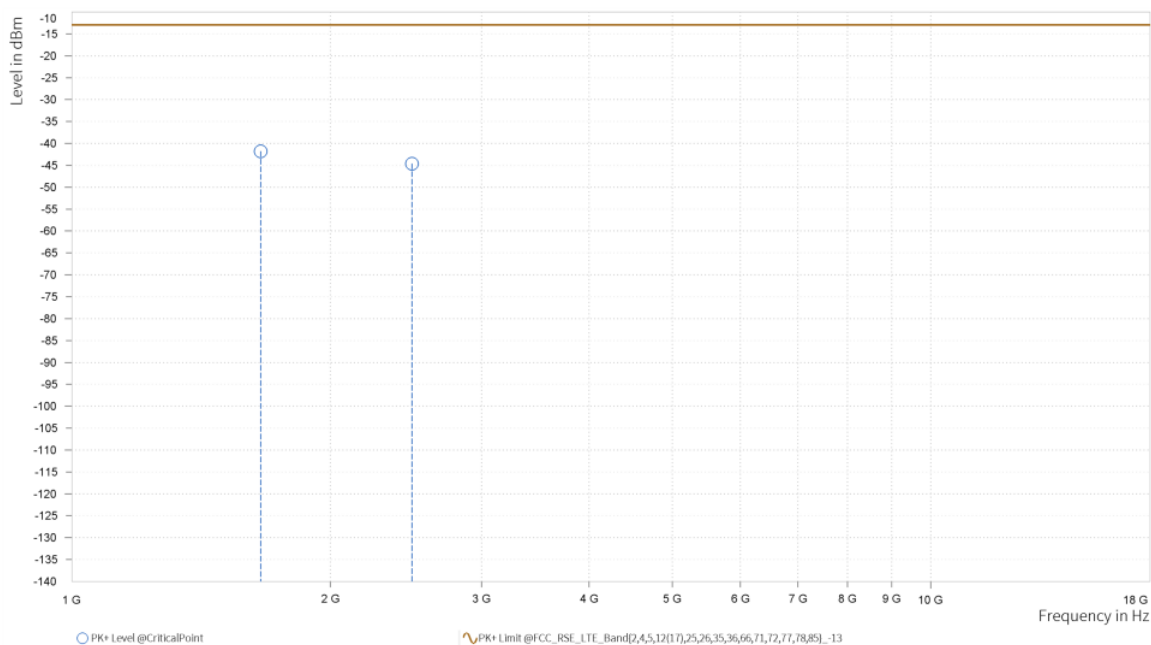


CHANNEL BANDWIDTH: 15MHz / QPSK

CH26915

MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

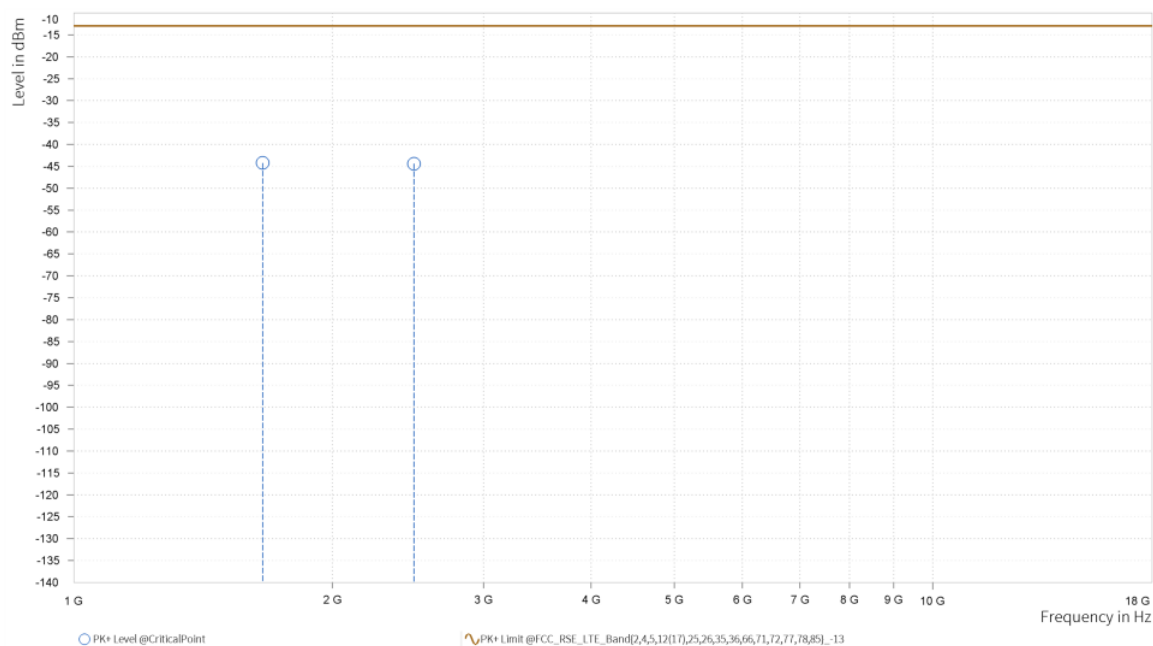
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,659.500	-41.79	-13.0	28.79	22.72	H	359	2.0
3	2,489.250	-44.61	-13.0	31.61	26.82	H	359	2.0





ENVIRONMENTAL CONDITIONS			
MODE	TX channel 26915	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	120Vac 60HZ
TESTED BY	Jace Hu		
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]
2	1,659.500	-44.24	-13.0	31.24	22.31	V	1.0	1.0
3	2,489.250	-44.4	-13.0	31.4	26.46	V	0.9	2.0

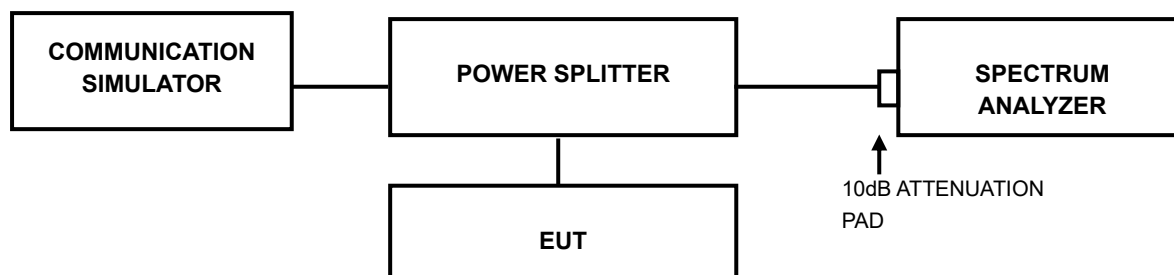


3.7 PEAK TO AVERAGE RATIO

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 $\geq$ 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%.



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3.7.4 TEST RESULTS

Please Refer to Appendix Of this test report.



4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



5 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 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:

Shenzhen EMC/RF Lab:

Tel: +86-755-88696566

Fax: +86-755-88696577

Email: customerservice.sw@bureauveritas.com

Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.



7 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.



8 APPENDIX:

GSM850

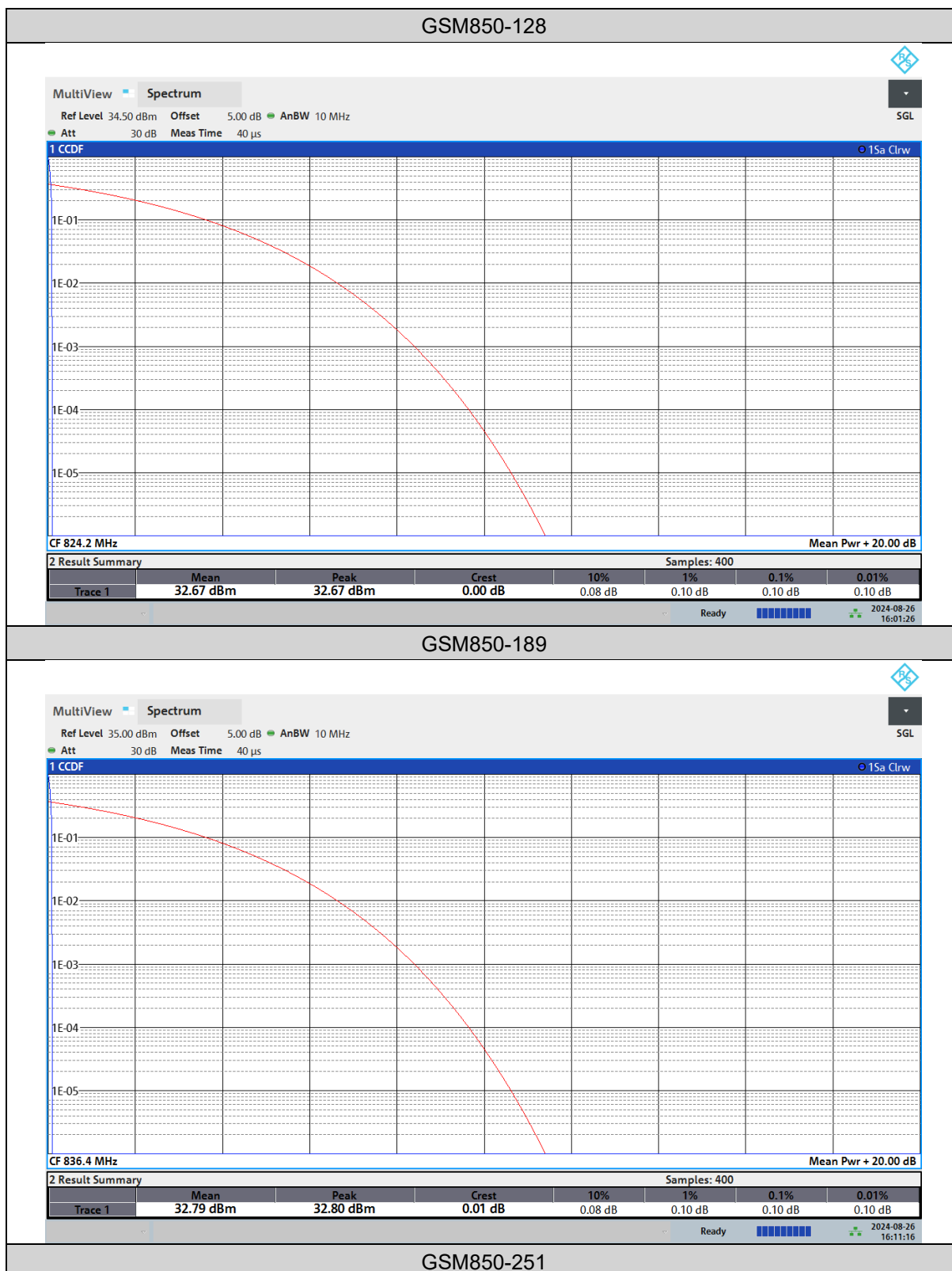
PEAK-TO-AVERAGE RATIO(CCDF)

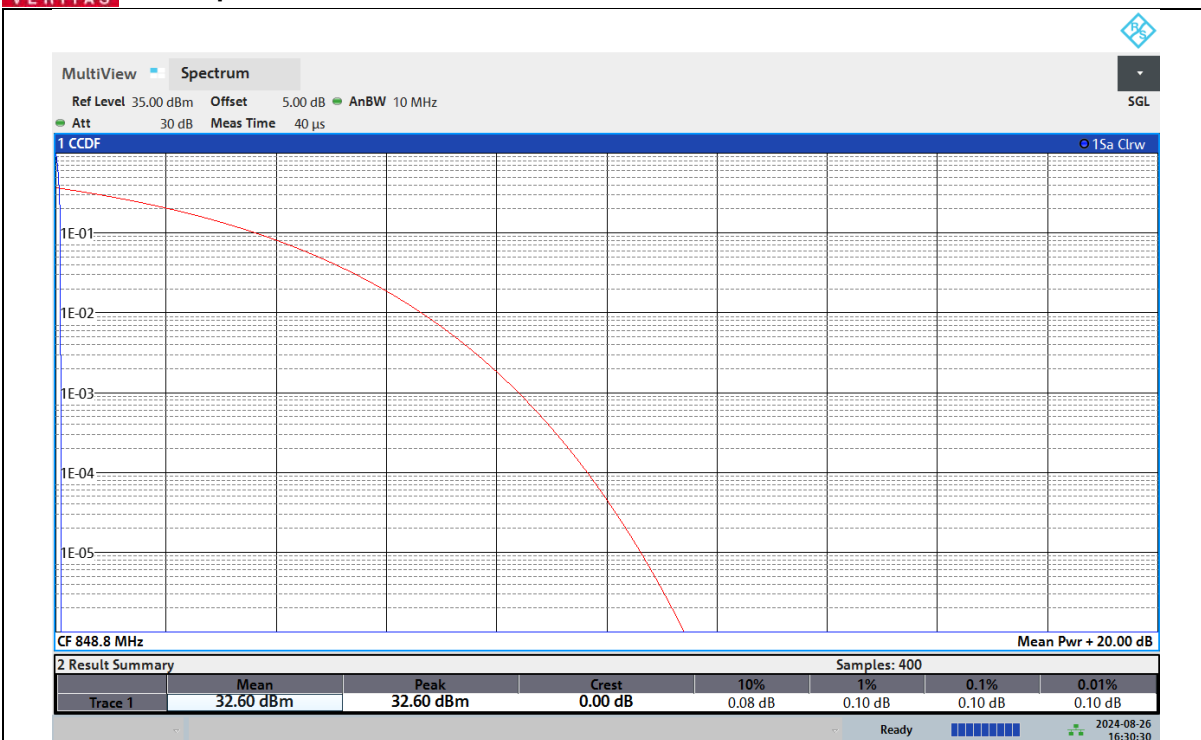
Test Result

Band	Channel	Result(dB)	Limit(dB)	Verdict
GSM850	128	0.10	13	PASS
GSM850	189	0.10	13	PASS
GSM850	251	0.10	13	PASS
EGPRS850	128	1.68	13	PASS
EGPRS850	189	2.74	13	PASS
EGPRS850	251	1.88	13	PASS

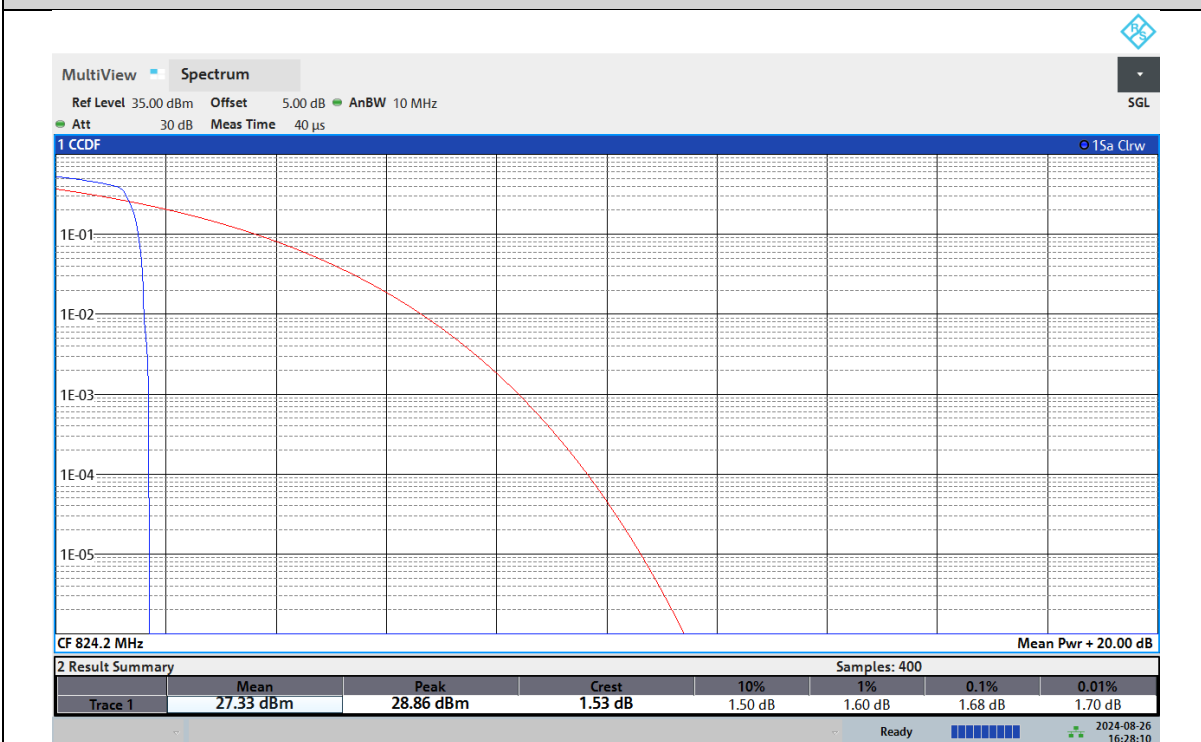


Test Graphs

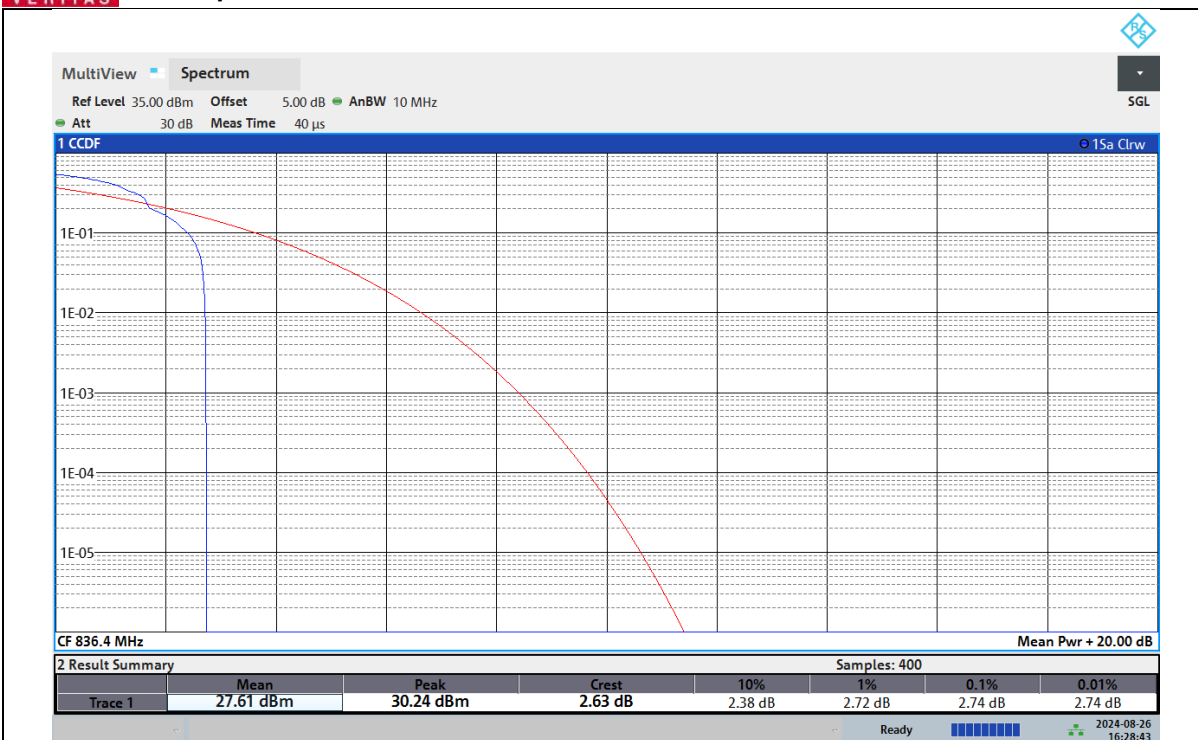




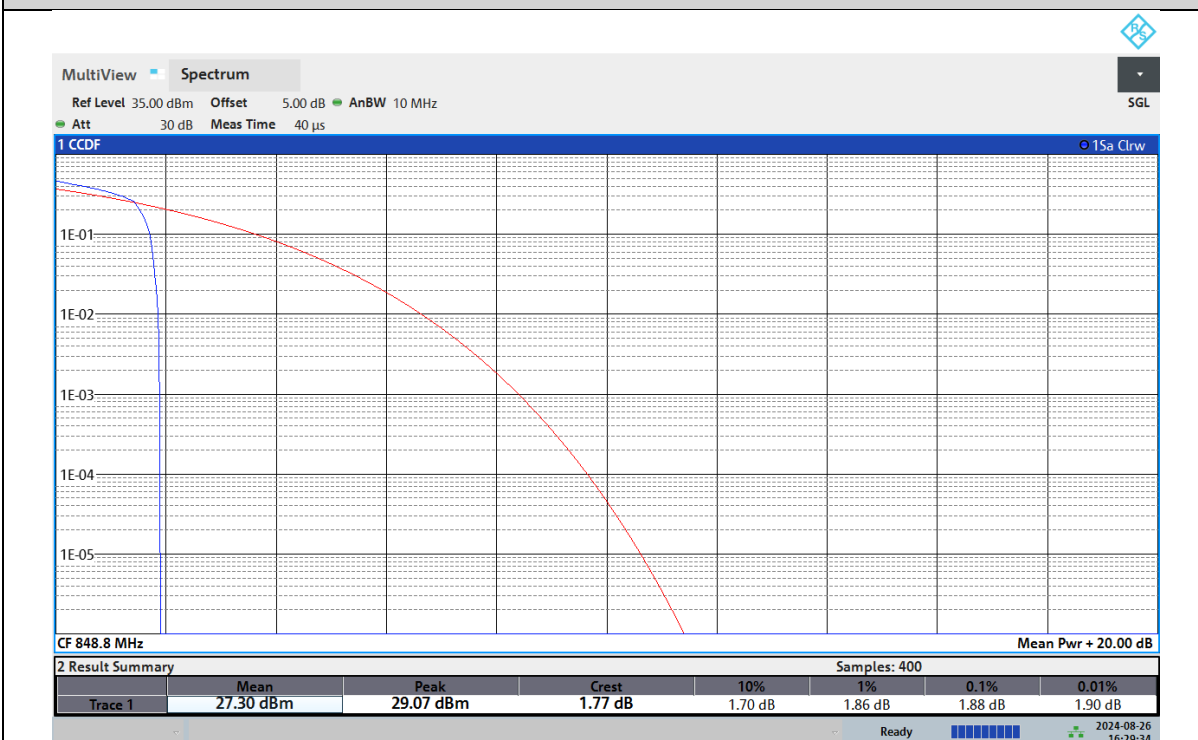
EGPRS850-128



EGPRS850-189



EGPRS850-251



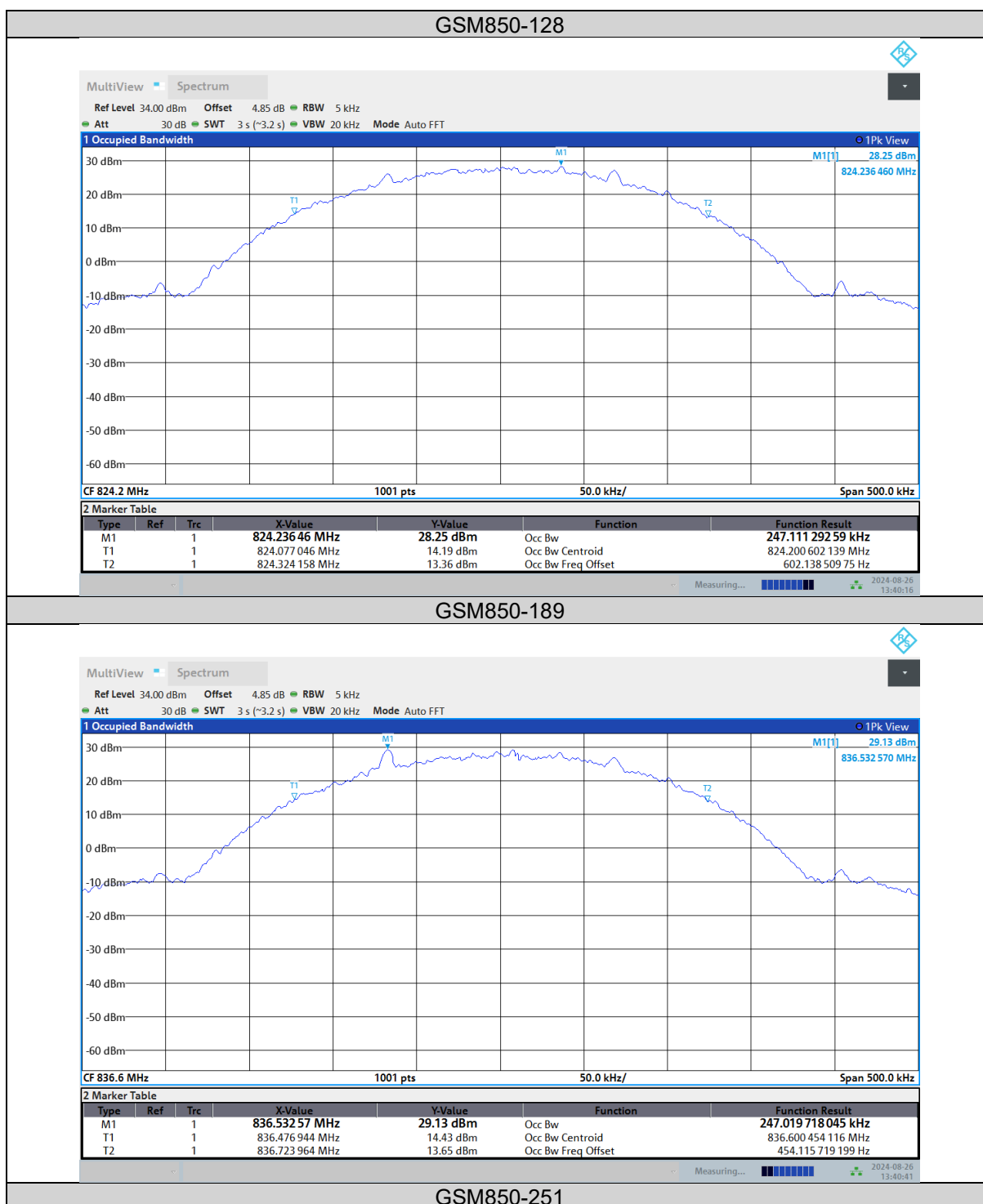
**26DB BANDWIDTH AND OCCUPIED BANDWIDTH****Test Result**

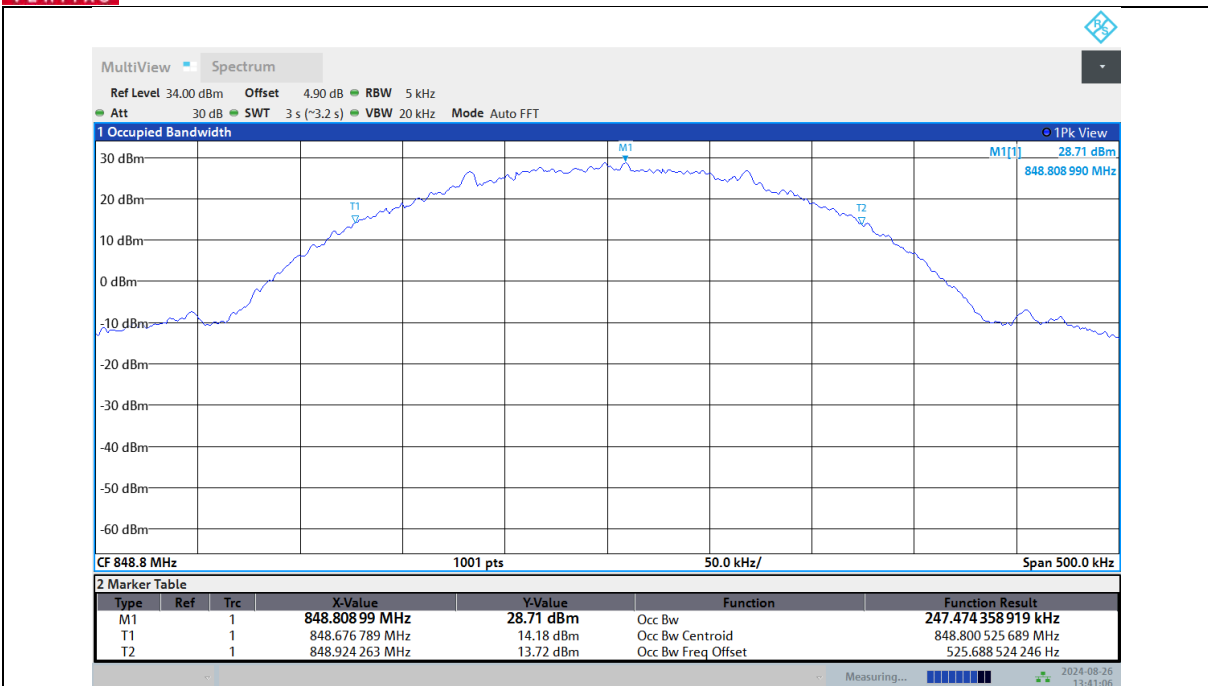
Band	Channel	Occupied Bandwidth (KHz)	26dB Bandwidth (KHz)	Verdict
GSM850	128	247.111	322.18	PASS
GSM850	189	247.020	319.18	PASS
GSM850	251	247.474	312.69	PASS
EGPRS850	128	247.019	319.68	PASS
EGPRS850	189	244.264	322.68	PASS
EGPRS850	251	245.163	317.68	PASS



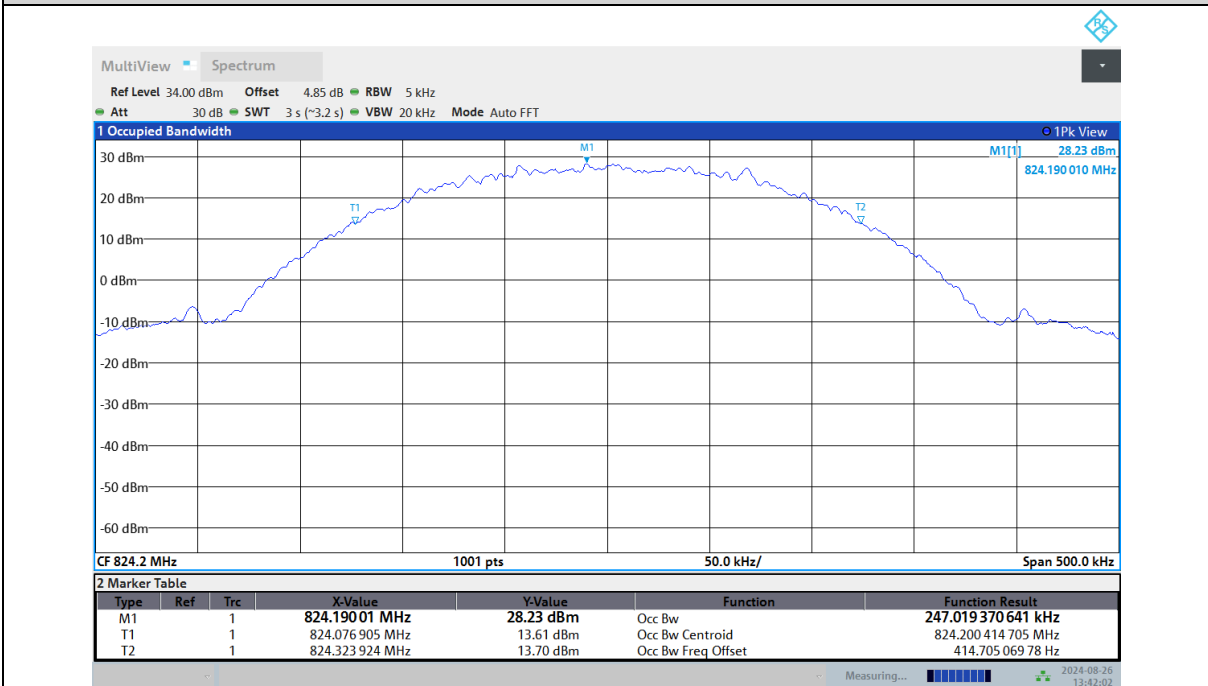
Test Graphs

Occupied Bandwidth





EGPRS850-128



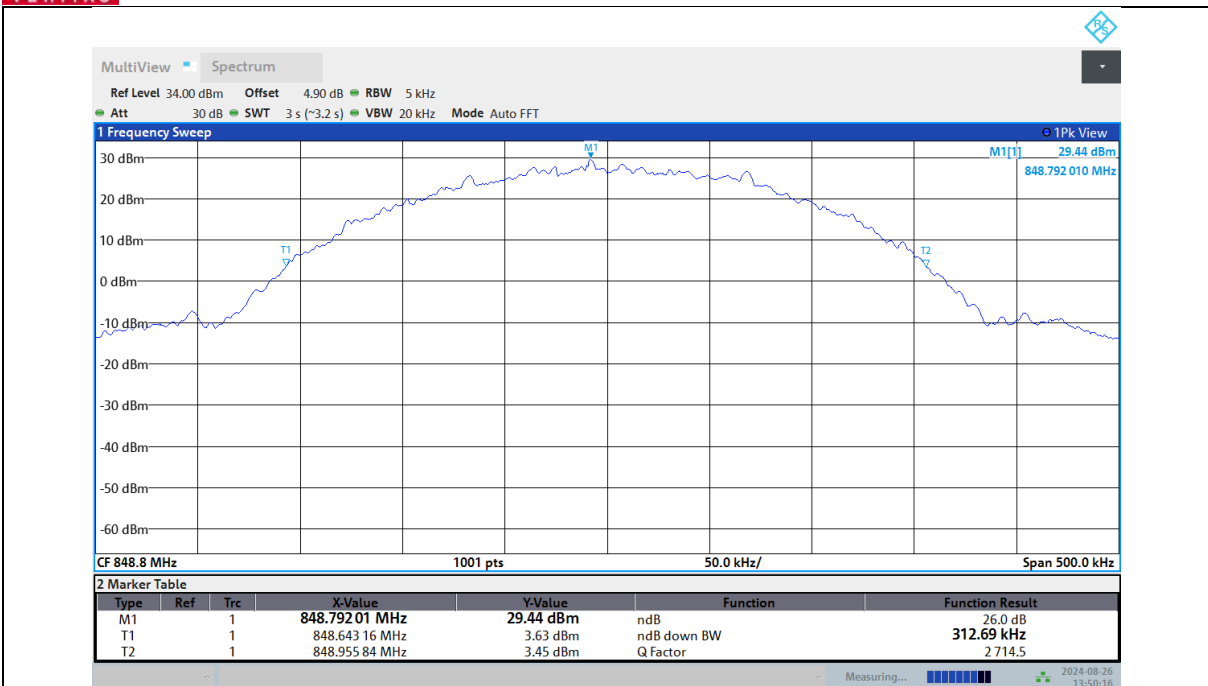
EGPRS850-189



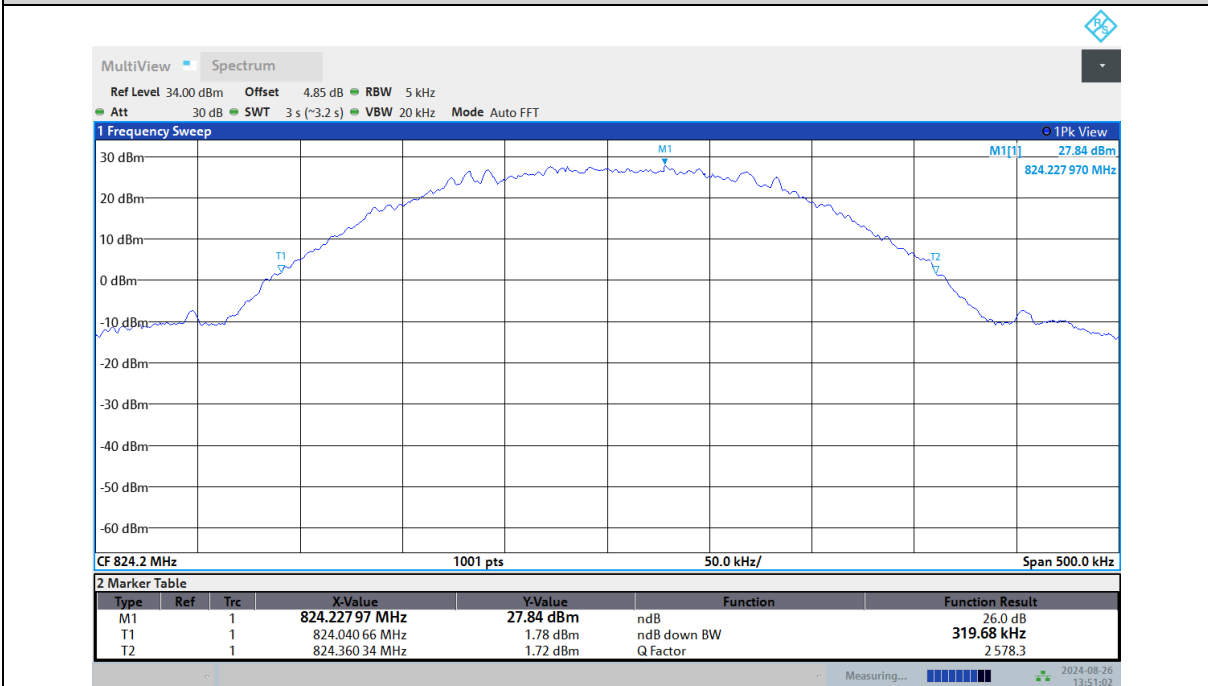
26dB Bandwidth

GSM850-128

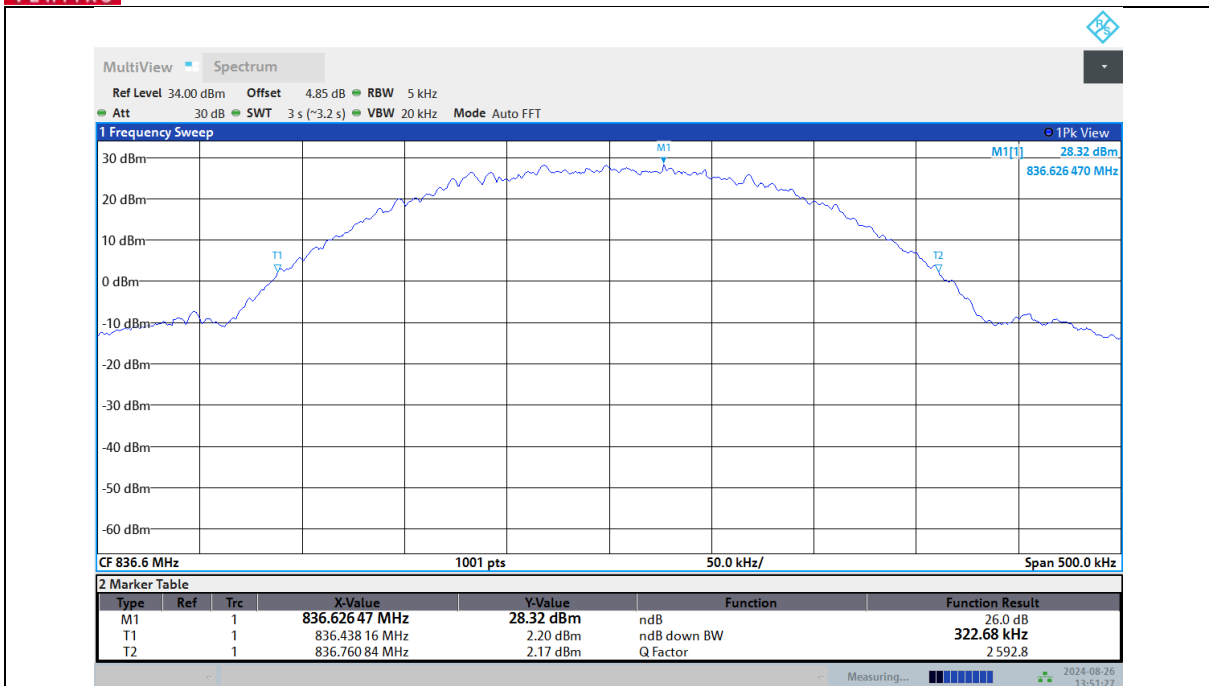




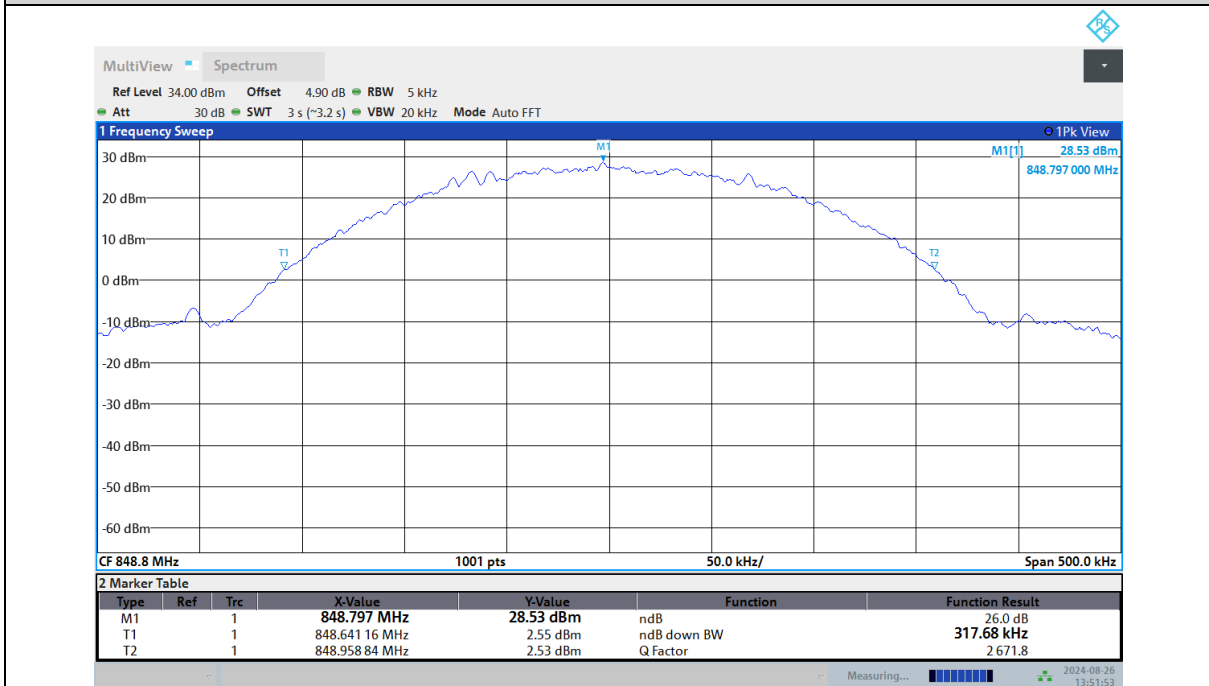
EGPRS850-128



EGPRS850-189



EGPRS850-251



BAND EDGE

Test Result

Band	Channel	Freq (MHz)	Result (dBm)	Limit(dBm)	Verdict
GSM850	128	823.980	-28.10	-13	PASS
GSM850	251	849.022	-26.59	-13	PASS
EGPRS850	128	823.980	-28.05	-13	PASS
EGPRS850	251	849.022	-27.34	-13	PASS

BV 7Layers Communications
Technology (Shenzhen) Co., Ltd

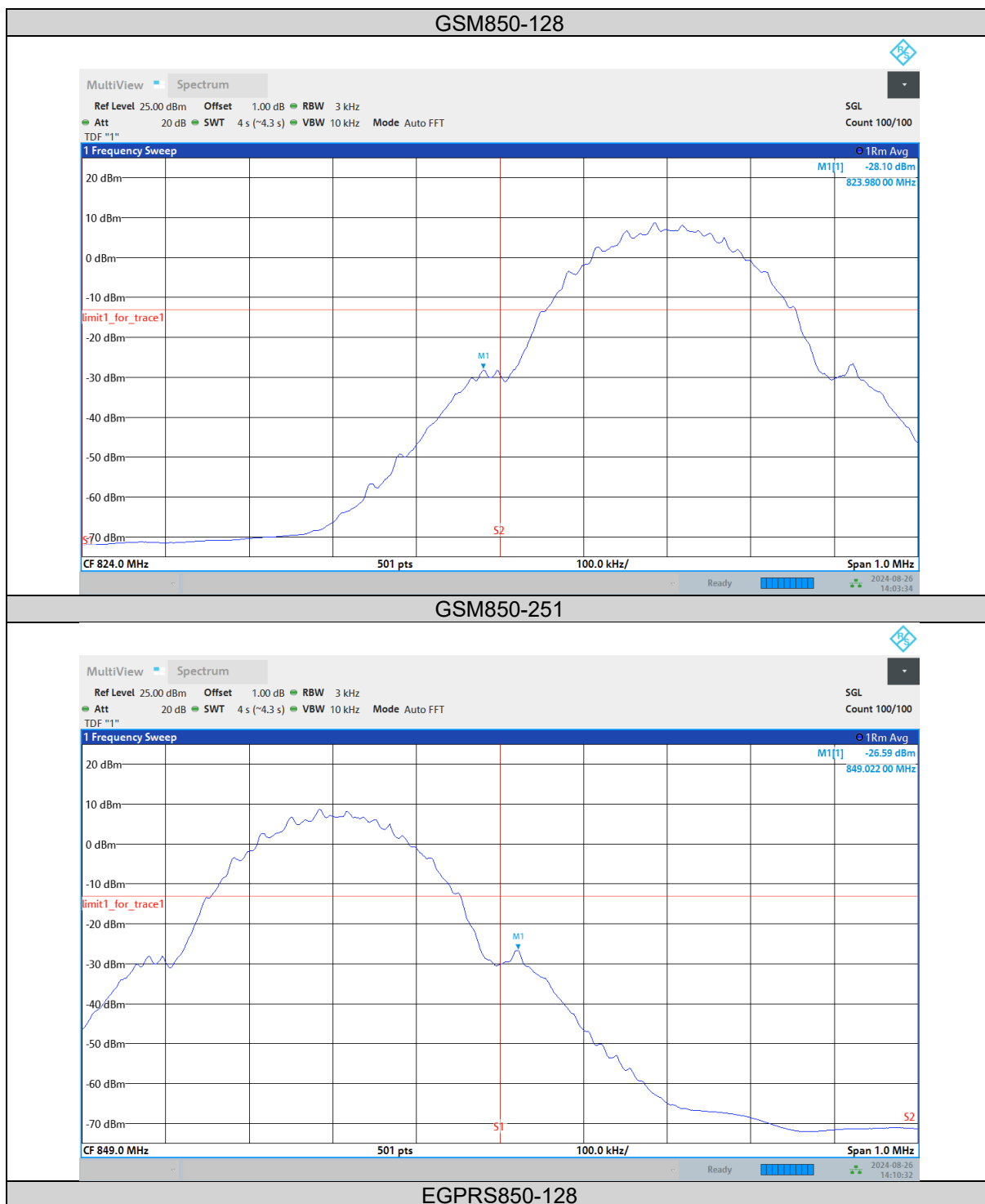
Room B37, Warehouse A5, No.3 Chiwan
4th Road, Zhaoshang Street, Nanshan
District Shenzhen, Guangdong, People's
Republic of China

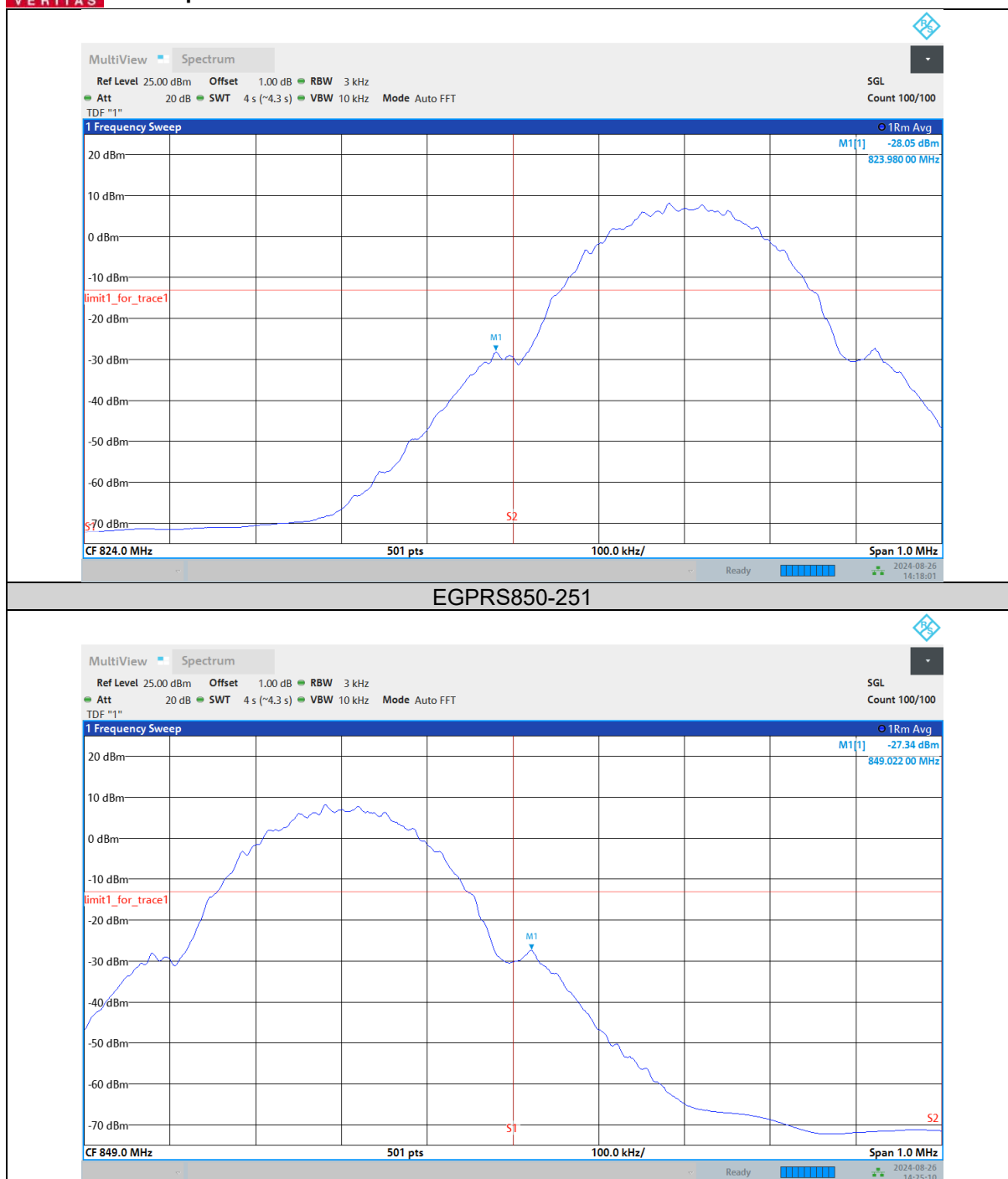
Tel: +86 755 8869 6566
Fax: +86 755 8869 6577
Email:

customerservice.sw@bureauveritas.com



Test Graphs







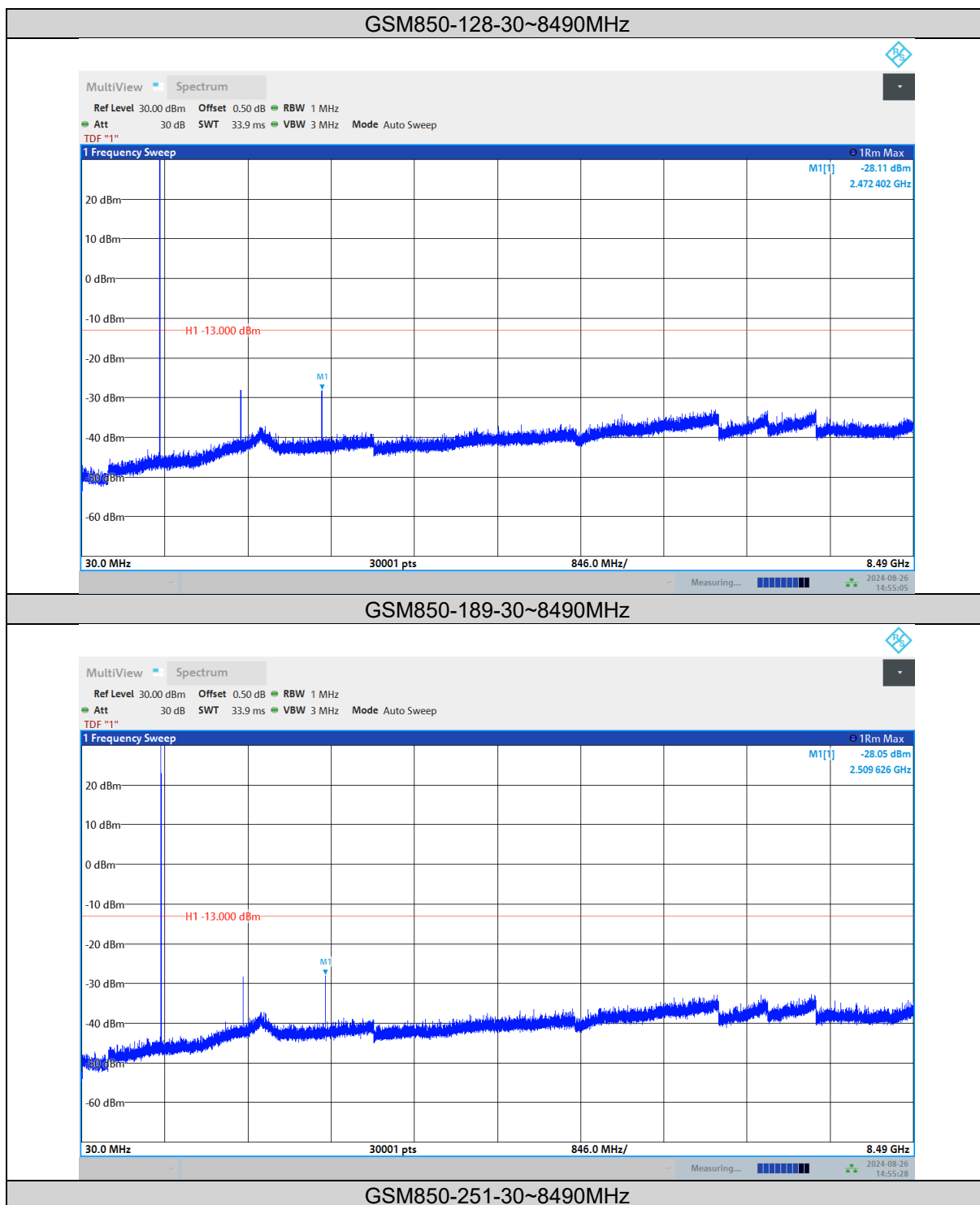
BUREAU VERITAS Test Report No.: PSU-NQN2407300216RF01
CONDUCTED SPURIOUS EMISSION

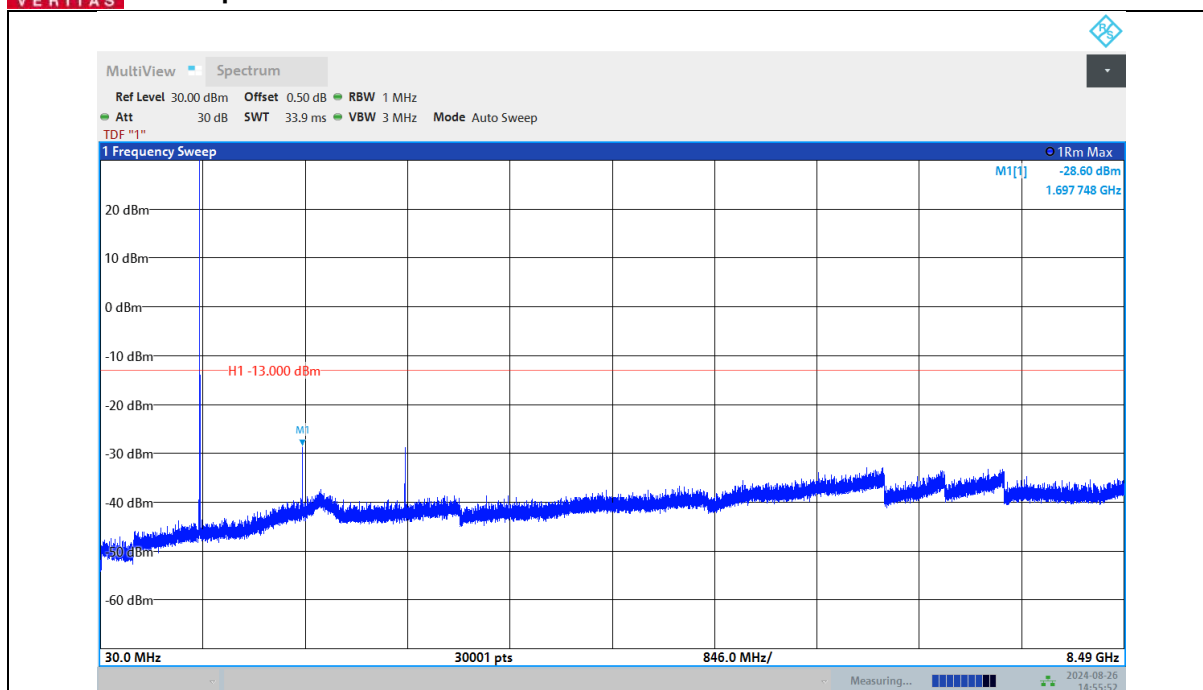
Test Result

Band	Channel	Frequency Range(MHz)	Max.Freq. (MHz)	Result (dBm)	Limit (dBm)	Verdict
GSM850	128	30~8490MHz	2472.402	-28.11	-13	PASS
GSM850	189	30~8490MHz	2509.626	-28.05	-13	PASS
GSM850	251	30~8490MHz	1697.748	-28.60	-13	PASS
EGPRS850	128	30~8490MHz	1648.398	-27.83	-13	PASS
EGPRS850	189	30~8490MHz	2509.908	-28.11	-13	PASS
EGPRS850	251	30~8490MHz	2546.568	-28.77	-13	PASS

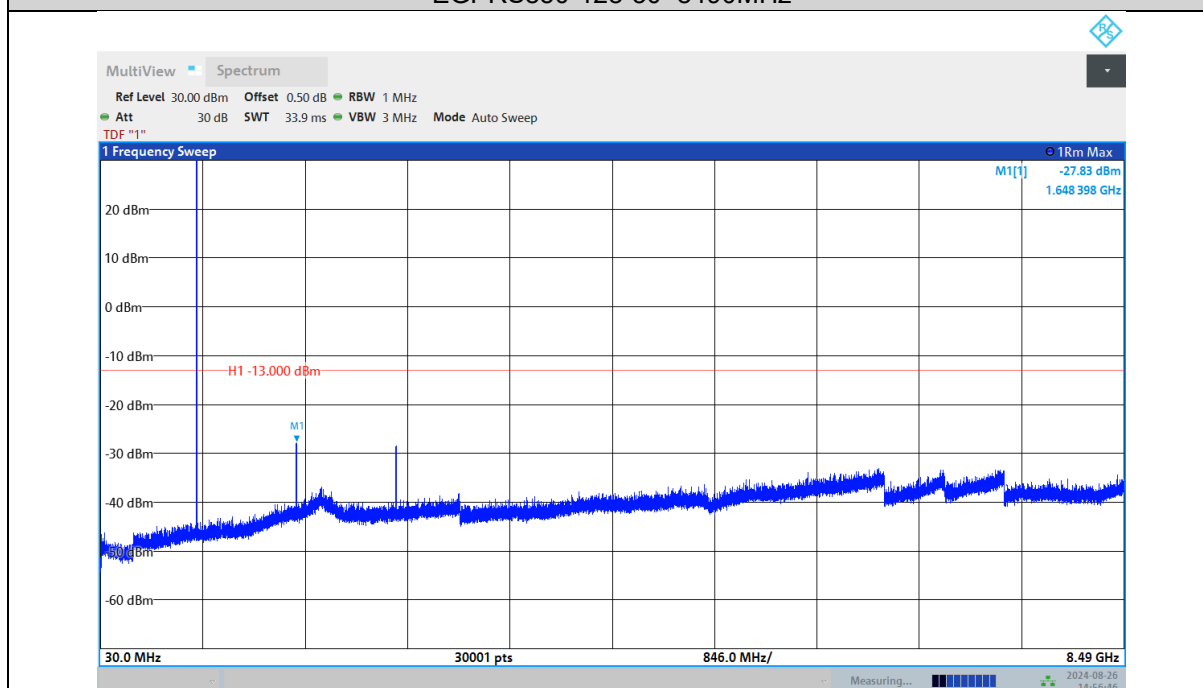


Test Graphs

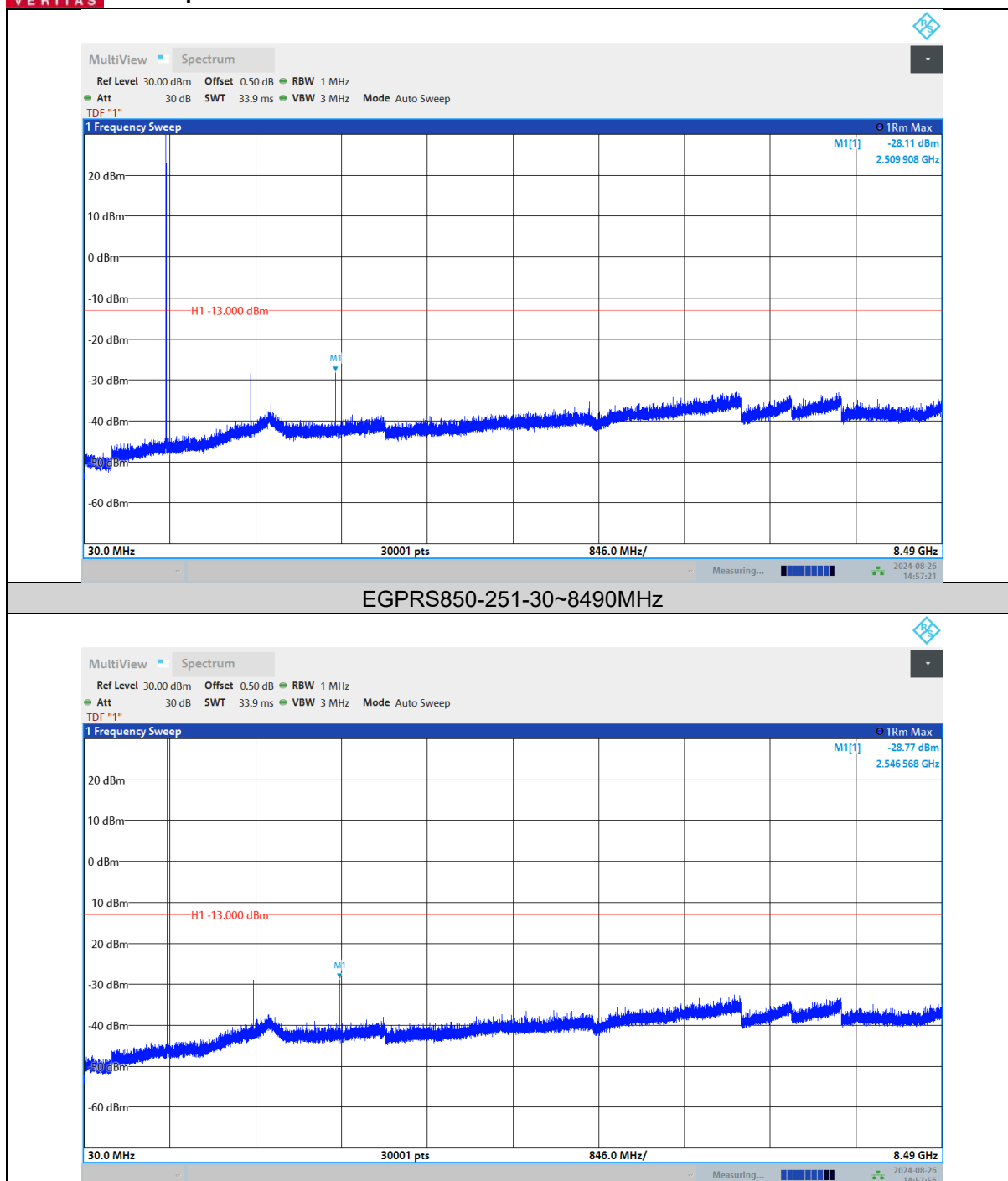




EGPRS850-128-30~8490MHz



EGPRS850-189-30~8490MHz





FREQUENCY STABILITY

Test Result

Voltage							
Band	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
GSM850	189	VL	NT	1.29	0.0031	±2.5	PASS
GSM850	189	VN	NT	-2.55	0.0061	±2.5	PASS
GSM850	189	VH	NT	0.66	0.0016	±2.5	PASS
EGPRS850	189	VL	NT	-1.83	0.0044	±2.5	PASS
EGPRS850	189	VN	NT	-2.58	0.0062	±2.5	PASS
EGPRS850	189	VH	NT	-2.03	0.0049	±2.5	PASS

Temperature							
Band	Channel	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
GSM850	189	NV	-30	-1.97	-0.0024	±2.5	PASS
GSM850	189	NV	-20	-4.99	-0.0060	±2.5	PASS
GSM850	189	NV	-10	3.19	0.0038	±2.5	PASS
GSM850	189	NV	0	4.79	0.0057	±2.5	PASS
GSM850	189	NV	10	9.01	0.0108	±2.5	PASS
GSM850	189	NV	20	-7.67	-0.0092	±2.5	PASS
GSM850	189	NV	30	2.52	0.0030	±2.5	PASS
GSM850	189	NV	40	-9.64	-0.0115	±2.5	PASS
GSM850	189	NV	50	-6.76	-0.0081	±2.5	PASS
EGPRS850	189	NV	-30	-2.00	-0.0011	±2.5	PASS
EGPRS850	189	NV	-20	-7.28	-0.0039	±2.5	PASS
EGPRS850	189	NV	-10	-2.65	-0.0014	±2.5	PASS
EGPRS850	189	NV	0	4.03	0.0021	±2.5	PASS
EGPRS850	189	NV	10	4.67	0.0025	±2.5	PASS
EGPRS850	189	NV	20	-5.00	-0.0027	±2.5	PASS
EGPRS850	189	NV	30	2.72	0.0014	±2.5	PASS
EGPRS850	189	NV	40	2.14	0.0011	±2.5	PASS
EGPRS850	189	NV	50	7.01	0.0037	±2.5	PASS

MAX Deviation calculation

Frequency Stability	Frequency(MHz)	Limit Line(MHz)	Result
$f_L - \text{MAX}(\Delta f) $	824.0390096	≥ 824	PASS
$f_H + \text{MAX}(\Delta f) $	848.6764904	≤ 849	

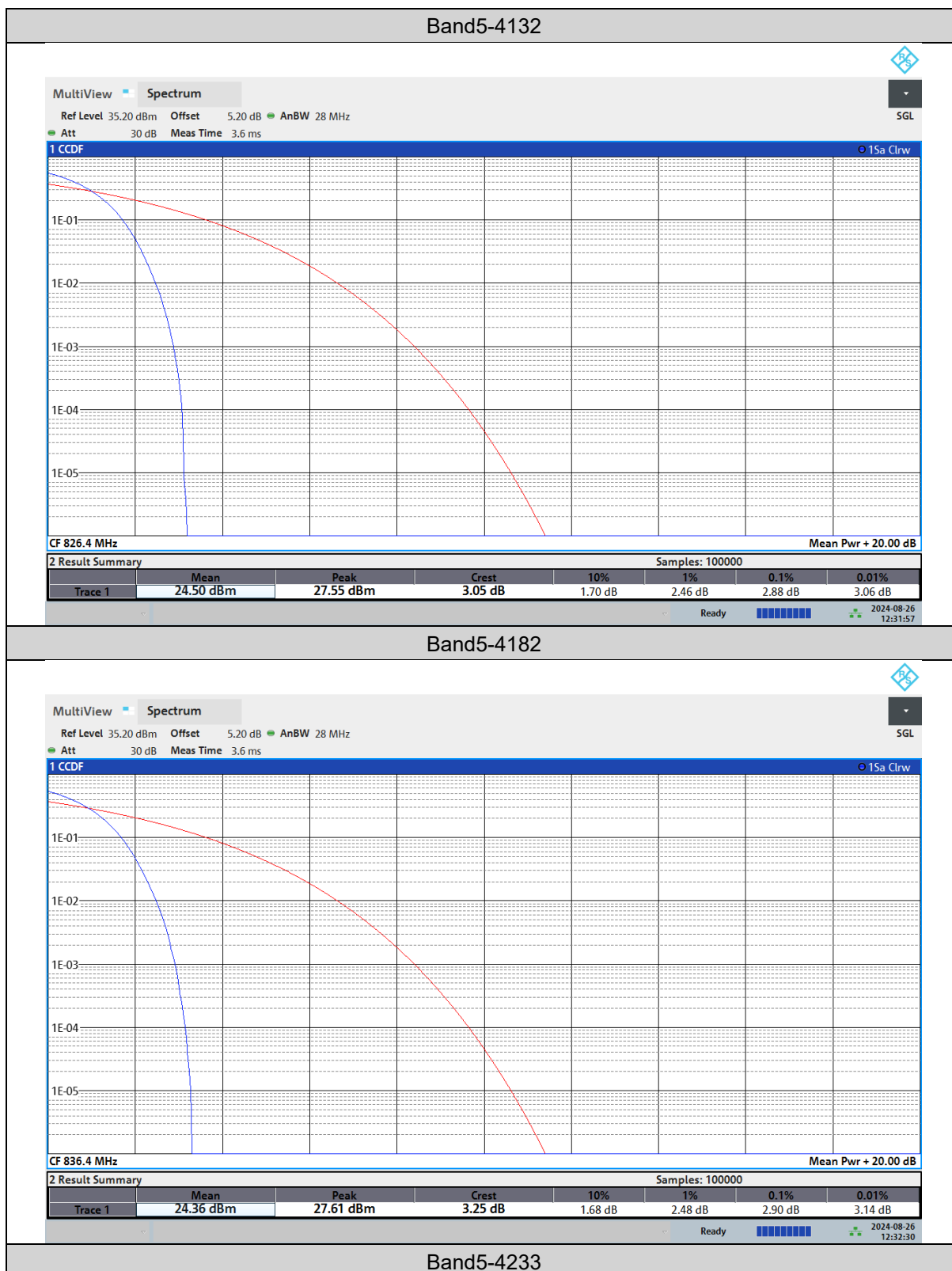
- Note: 1. $|\text{MAX}(\Delta f)|$ = Max Deviation
 2. f_L = Occ low channel f_L (-13dBm/MHz)
 3. f_H = Occ High channel f_H (-13dBm/MHz)
 4. $|\text{MAX}(\Delta f)|$ = 9.64Hz.

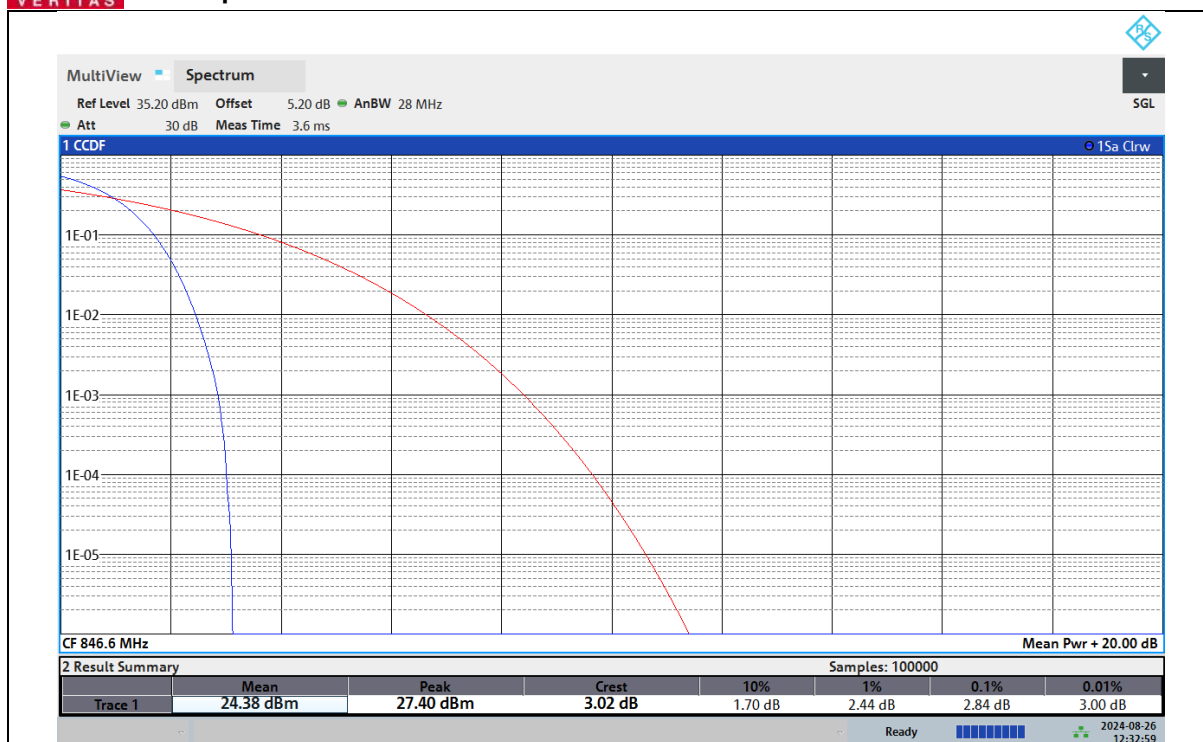
WCMDA BAND5**PEAK-TO-AVERAGE RATIO****Test Result**

Band	Channel	Peak-to-Average Ratio(dB)	Limit(dBm)	Verdict
Band5	4132	2.88	13	PASS
Band5	4182	2.90	13	PASS
Band5	4233	2.84	13	PASS



Test Graphs





26DB BANDWIDTH AND OCCUPIED BANDWIDTH

Test Result

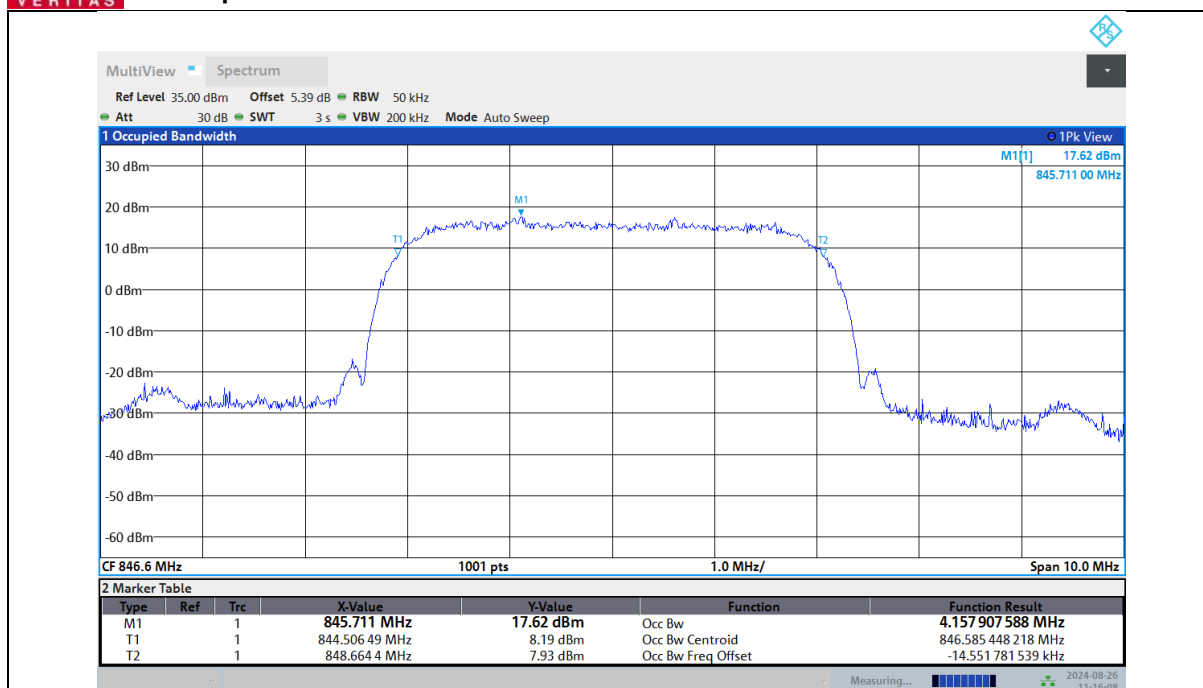
Band	Channel	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band5	4132	4.161	4.68	PASS
Band5	4182	4.162	4.68	PASS
Band5	4233	4.158	4.67	PASS



Test Graphs

Occupied Bandwidth





26dB Bandwidth

