FCC TEST REPORT

(PART 22)

Applicant:	Honeywell International Inc Honeywell Safety and Productivity Solutions
Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States

Manufacturer or Supplier:	Honeywell International Inc Honeywell Safety and Productivity Solutions
Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States
Product:	Mobile Computer
Brand Name:	Honeywell
Model Name:	CT45P-L1N-2
FCC ID:	HD5-CT45PL1N2
Date of tests:	May. 08, 2021 ~ Aug. 31, 2021

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
Simon Date: Sep. 01, 2021	Luke Lu Date: Sep. 01, 2021

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-P21080006RF15	Original release	Sep. 01, 2021

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**
2.1046 22.913 (a)	Effective Radiated Power	Compliance
2.1055 22.355	Frequency Stability	Compliance
2.1049 22.917 (b)	Occupied Bandwidth	Compliance
22.913 (d)	Peak to average ratio*	Compliance
22.917	Band Edge Measurements	Compliance
2.1051 22.917	Conducted Spurious Emissions	Compliance
2.1053 22.917	Radiated Spurious Emissions	Compliance

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

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	±2.06dB
Frequency Stability	±76.97Hz
Radiated emissions (30MHz~1GMHz)	±4.98dB
Radiated emissions (1GMHz ~6GMHz)	±4.70dB
Radiated emissions (6GMHz ~18GMHz)	±4.60dB
Radiated emissions (18GMHz ~40GMHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
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.

1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Apr. 22,21	Apr. 21,22
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	Jun. 04,20	Jun. 03,21
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	Jun. 03,21	Jun. 02,22
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Mar. 05,21	Mar. 04,22
Horn Antenna	ETS-LINDGREN	3117	00168728	Apr. 02,21	Apr. 01,22
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Aug. 26, 20	Aug. 25, 21
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Aug. 25, 21	Aug. 24, 22
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 25,21	Feb. 24,22
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 03,20	Jun. 02,21
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 02,21	Jun. 01,22
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 04,20	Jun. 03,21
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 03,21	Jun. 02,22
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Apr. 22,21	Apr. 21,22
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	May. 19,20	May. 18,23
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	Jun. 04,20	Jun. 03,21
10dB Attenuator	JFW/USA	50HF-010-SMA	1505	Jun. 03,21	Jun. 02,22
Power Meter	Anritsu	ML2495A	1506002	Apr. 07,21	Apr. 06,22
Power Sensor	Anritsu	MA2411B	1339352	May. 07,21	May. 06,22
Temperature Chamber	ESPEC	SH-242	93000855	Jun. 03,20	Jun. 02,21
Temperature Chamber	ESPEC	SH-242	93000855	Jun. 02,21	Jun. 01,22
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Mar. 05,21	Mar. 04,22
Power Divider	MCLI/USA	PS2-15	24880	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 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 525120; The Designation No. is CN1171.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Mobile Computer	
BRAND NAME	Honeywell	
MODEL NAME	CT45P-L1N-2	
NOMINAL VOLTAGE	3.85Vdc (Lithium-ion cell, battery)	
MODULATION TYPE	**GSM/GPRS/EDGE**	GMSK, 8PSK
	WCDMA	BPSK,QPSK
	LTE	QPSK, 16QAM，64QAM
FREQUENCY RANGE	**GSM/GPRS/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**	712.85mW
	EDGE	211.35mW
	WCDMA	114.02mW
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	118.85mW
	LTE Band 5 (Channel Bandwidth: 3MHz)	117.76mW
	LTE Band 5 (Channel Bandwidth: 5MHz)	118.03mW
	LTE Band 5 (Channel Bandwidth: 10MHz)	119.40mW

MAX. ERP POWER	**LTE Band 26 (Channel Bandwidth: 1.4MHz)**	268.53mW
	LTE Band 26 (Channel Bandwidth: 3MHz)	266.69mW
	LTE Band 26 (Channel Bandwidth: 5MHz)	269.15mW
	LTE Band 26 (Channel Bandwidth: 10MHz)	269.77mW
	LTE Band 26 (Channel Bandwidth: 15MHz)	272.90mW
EMISSION DESIGNATORGOGN	**GSM**	240KGXW
	EDGE	240KG7W
	WCDMA	4M15F9W
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	QPSK: 1M09G7D
		16QAM: 1M09W7D
		64QAM: 1M09W7D
	LTE Band 5 (Channel Bandwidth: 3MHz)	QPSK: 2M70G7D
		16QAM: 2M68W7D
		64QAM: 2M69W7D
	LTE Band 5 (Channel Bandwidth: 5MHz)	QPSK: 4M49G7D
		16QAM: 4M48W7D
		64QAM: 4M58W7D
	LTE Band 5 (Channel Bandwidth: 10MHz)	QPSK: 8M95G7D
		16QAM: 8M95W7D
		64QAM: 8M95W7D
	LTE Band 26 (Channel Bandwidth: 1.4MHz)	QPSK: 1M08G7D
		16QAM: 1M09W7D
		64QAM: 1M09W7D
	LTE Band 26 (Channel Bandwidth: 3MHz)	QPSK: 2M70G7D
		16QAM: 2M69W7D
		64QAM: 2M69W7D
	LTE Band 26 (Channel Bandwidth: 5MHz)	QPSK: 4M47G7D
		16QAM:4M48W7D
		64QAM: 4M49W7D
	LTE Band 26 (Channel Bandwidth: 10MHz)	QPSK: 8M95G7D
		16QAM: 8M94W7D
		64QAM: 8M94W7D
	LTE Band 26 (Channel Bandwidth: 15MHz)	QPSK: 13M4G7D
		16QAM: 13M4W7D
		64QAM: 13M5W7D
ANTENNA TYPE	PIFA Antenna with -0.56dBi gain for GSM850/ WCDMA5/LTE band 5 PIFA Antenna with 2.67dBi gain for LTE band 26	
HW VERSION	V1.0	

SW VERSION	OS.11.002-HON.11.002
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB cable: unshielded without ferrite, 1.25 meter Earphone cable: unshielded without ferrite, 1.27 meter
EXTREME TEMPERATURE	-10-55 ℃
EXTREME VOLTAGE	3.4V- 4.4V

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. This product includes the following three SKU which hardware is exactly same, the difference is described as following, Sample 1 was full test, sample 2 verify the worst case,check worst case Radiated emission:

SAMPLE	EUT CONFIGURATION INFORMATION
1	SKU ID:CT45-L1N-37D120G ,Assembled Scanner Imager: 7-S0703
2	SKU ID:CT45-L1N-38D120G ,Assembled Scanner Imager: 8 - N6803/S0803
3	SKU ID: CT45-L1N-37D220G , Assembled with Scanner: 7-S0703 for China Only with Android non-GMS

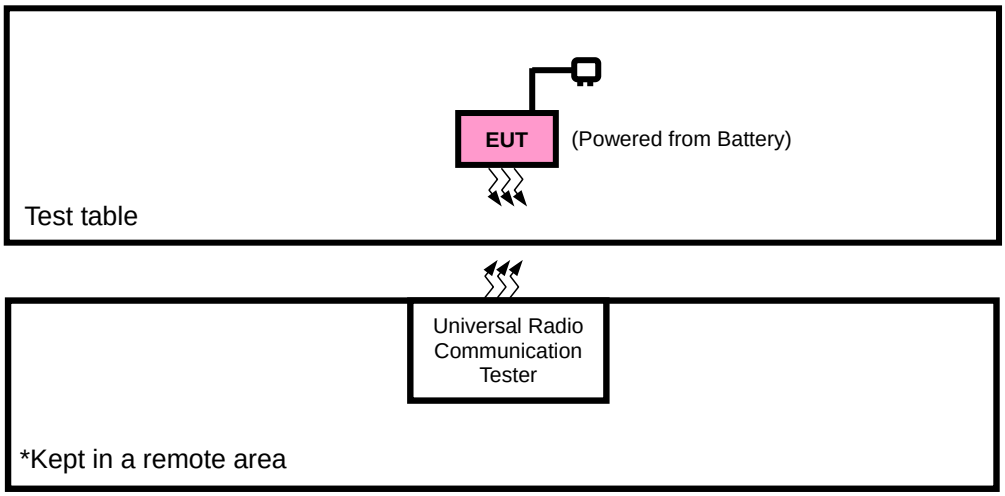
3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

List of Accessory:

ACCESSORIES	BRAND	MODEL	SPECIFICATION
Battery	Honeywell	CT50-BTSC	Capacity：3.85vdc 4020mAh
AC Adapter	HONOR	ADS-12B-06 05010E	I/P:100-240Vac, 0.3A O/P: 5Vdc, 2A
USB Cable	Honeywell	CT40-SN	Shielded, 1.25meter
Earphone	VIVO	N/A	Shielded, 1.27meter
LCD Panel	CASIL	CTM10801920T01	5.0" FHD(1928*1080)

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	DC source	Kikusui/JP	PMX18-5A	0000001	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 ERP 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 + DC Source with GSM or WCDMA or LTE link

GSM MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	ERP	128 to 251	128, 189, 251	GSM,EDGE
B	FREQUENCY STABILITY	128 to 251	128, 251	GSM,EDGE
B	OCCUPIED BANDWIDTH	128 to 251	128, 189, 251	GSM,EDGE
B	BAND EDGE	128 to 251	128, 251	GSM,EDGE
B	CONDCUDETED EMISSION	128 to 251	128, 189, 251	GSM,EDGE
A	RADIATED EMISSION	128 to 251	128, 189, 251	GSM,EDGE
B	PEAK TO AVERAGE RATIO	128 to 251	128, 189, 251	GSM,EDGE

WCDMA MODE

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

LTE BAND 5 MODE

TEST ITEM	Available Channel	Tested Channel	Channel bandwidth	modulation	mode
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
FREQUENCY STABILITY	20407 to 20643	20407, 20643	1.4MHz	QPSK	1 RB / 0 RB Offset
	20415 to 20635	20415, 20635	3MHz	QPSK	1 RB / 0 RB Offset
	20425 to 20625	20425, 20625	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20450, 20600	10MHz	QPSK	1 RB / 0 RB Offset
OCCUPIED BANDWIDTH	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK,16QAM,64QAM	6 RB / 0 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK,16QAM,64QAM	15 RB / 0 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK,16QAM,64QAM	25 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
BAND EDGE	20407 to 20643	20407	1.4 MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
					6 RB / 0 RB Offset
	20407 to 20643	20643	1.4 MHz	QPSK,16QAM,64QAM	1 RB / 5 RB Offset
					6 RB / 0 RB Offset
	20415 to 20635	20415	3 MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
					15 RB / 0 RB Offset
	20415 to 20635	20635	3 MHz	QPSK,16QAM,64QAM	1 RB / 14 RB Offset
					15 RB / 0 RB Offset
	20425 to 20625	20425	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
					25 RB / 0 RB Offset
	20425 to 20625	20625	5MHz	QPSK,16QAM,64QAM	1 RB / 24 RB Offset
					25 RB / 0 RB Offset
	20450 to 20600	20450	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
					50 RB / 0 RB Offset
	20450 to 20600	20600	10MHz	QPSK,16QAM,64QAM	1 RB / 49 RB Offset
					50 RB / 0 RB Offset

CONDCUDETED EMISSION	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK	1 RB / 0 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB / 0 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB / 0 RB Offset
RADIATED EMISSION	20407 to 20643	20525	1.4MHz	QPSK	1 RB / 0 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB / 0 RB Offset
	20425 to 20625	20525	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20525	10MHz	QPSK	1 RB / 0 RB Offset
PEAK TO AVERAGE RATIO	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

LTE BAND 26 MODE

TEST ITEM	Available Channel	Tested Channel	Channel bandwidth	modulation	mode
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
FREQUENCY STABILITY	26797 to 27033	26797, 27033	1.4MHz	QPSK	1 RB / 0 RB Offset
	26805 to 27025	26805, 27025	3MHz	QPSK	1 RB / 0 RB Offset
	26815 to 27015	26815, 27015	5MHz	QPSK	1 RB / 0 RB Offset
	26840 to 26990	26840, 26990	10MHz	QPSK	1 RB / 0 RB Offset
	26865 to 26965	26865, 26965	15MHz	QPSK	1 RB / 0 RB Offset
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

BAND EDGE	26797 to 27033	26797	1.4 MHz	QPSK	1 RB / 0 RB Offset
					6 RB / 0 RB Offset
	26797 to 27033	27033	1.4 MHz	QPSK	1 RB / 5 RB Offset
					6 RB / 0 RB Offset
	26805 to 27025	26805	3 MHz	QPSK	1 RB / 0 RB Offset
					15 RB / 0 RB Offset
	26805 to 27025	27025	3 MHz	QPSK	1 RB / 14 RB Offset
					15 RB / 0 RB Offset
	26815 to 27015	26815	5MHz	QPSK	1 RB / 0 RB Offset
					25 RB / 0 RB Offset
	26815 to 27015	27015	5MHz	QPSK	1 RB / 24 RB Offset
					25 RB / 0 RB Offset
	26840 to 26990	26840	10MHz	QPSK	1 RB / 0 RB Offset
					50 RB / 0 RB Offset
	26840 to 26990	26990	10MHz	QPSK	1 RB / 49 RB Offset
					50 RB / 0 RB Offset
	26865 to 26965	26865	15MHz	QPSK	1 RB / 0 RB Offset
					75 RB / 0 RB Offset
	26865 to 26965	26965	15MHz	QPSK	1 RB / 74 RB Offset
					75 RB / 0 RB Offset
CONDCUDETED EMISSION	26797 to 27033	26797, 26915, 27033	1.4MHz	QPSK	1 RB / 0 RB Offset
	26805 to 27025	26805, 26915, 27025	3MHz	QPSK	1 RB / 0 RB Offset
	26815 to 27015	26815, 26915, 27015	5MHz	QPSK	1 RB / 0 RB Offset
	26840 to 26990	26840, 26915, 26990	10MHz	QPSK	1 RB / 0 RB Offset
	26865 to 26965	26865, 26915, 26965	15MHz	QPSK	1 RB / 0 RB Offset
RADIATED EMISSION	26797 to 27033	26797, 26915, 27033	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	26915	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 3.85V By Battery	Jace Hu
FREQUENCY STABILITY	23deg. C, 70%RH	DC 3.85V By Battery	James Fu
OCCUPIED BANDWIDTH	23deg. C, 70%RH	DC 3.85V By Battery	James Fu
BAND EDGE	23deg. C, 70%RH	DC 3.85V By Battery	James Fu
CONDCUDETED EMISSION	23deg. C, 70%RH	DC 3.85V By Battery	James Fu
RADIATED EMISSION	23deg. C, 70%RH	DC 3.85V By Battery	Jace Hu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	DC 3.85V 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 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.

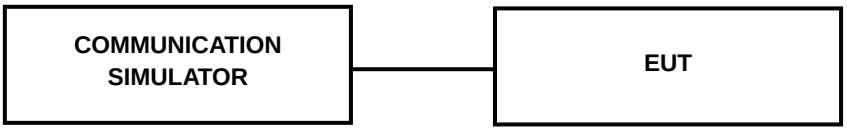
CONDUCTED POWER MEASUREMENT:

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	GSM850			Max. Tune-up Power
Channel	128	189	251	
Frequency	824.2	836.4	848.8	
GSM (GMSK, 1Tx-slot)	31.04	31.06	**31.24**	32.0
GPRS (GMSK, 1Tx-slot)	31.01	31.05	31.19	32.0
GPRS (GMSK, 2Tx-slot)	29.98	29.99	30.05	30.5
GPRS (GMSK, 3Tx-slot)	27.75	27.67	27.90	28.0
GPRS (GMSK, 4Tx-slot)	25.06	25.16	25.30	25.5
EDGE (8PSK, 1Tx-slot)	25.59	25.68	25.96	26.5
EDGE (8PSK, 2Tx-slot)	23.84	24.02	24.27	25.0
EDGE (8PSK, 3Tx-slot)	21.76	21.98	22.20	23.0
EDGE (8PSK, 4Tx-slot)	19.53	19.72	19.86	20.5

Band	WCDMA V			Max. Tune-up Power
Channel	4132	4182	4233	
Frequency	826.4	836.4	846.6	
RMC 12.2K	22.75	23.26	**23.28**	24.0
HSDPA Subtest-1	21.78	22.20	22.34	23.0
HSDPA Subtest-2	21.74	22.15	22.31	23.0
HSDPA Subtest-3	21.21	21.74	21.88	22.5
HSDPA Subtest-4	21.24	21.67	21.82	22.5
DC-HSDPA Subtest-1	21.79	22.22	22.42	23.0
DC-HSDPA Subtest-2	21.81	22.23	22.37	23.0
DC-HSDPA Subtest-3	21.23	21.75	21.92	22.5
DC-HSDPA Subtest-4	21.26	21.75	21.83	22.5
HSUPA Subtest-1	21.78	22.22	22.37	23.0
HSUPA Subtest-2	19.76	22.15	20.33	21.0
HSUPA Subtest-3	20.23	21.71	20.92	22.0
HSUPA Subtest-4	19.24	21.71	19.82	21.0
HSUPA Subtest-5	21.81	22.22	22.40	23.0

LTE Band 5

Band/BW	Modulation	RB Size	RB Offset	Low CH 20407	Mid CH 20525	High CH 20643	MPR
				Frequency 824.7 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz	
5/ 1.4	QPSK	1	0	23.35	23.17	23.12	0
		1	2	23.03	22.78	22.78	0
		1	5	23.46	23.19	23.17	0
		3	0	23.21	22.97	22.99	0
		3	1	23.25	23.02	22.92	0
		3	3	23.18	22.93	22.91	0
		6	0	22.33	22.06	22.06	1
	16QAM	1	0	22.64	22.40	22.38	1
		1	2	22.32	22.04	22.06	1
		1	5	22.53	22.28	22.31	1
		3	0	22.16	21.93	21.89	1
		3	1	22.17	22.02	21.94	1
		3	3	22.24	22.01	22.01	1
		6	0	21.36	21.18	21.11	2
	64QAM	1	0	21.50	21.30	21.29	2
		1	2	21.35	21.19	21.12	2
		1	5	21.58	21.30	21.32	2
		3	0	21.13	20.93	20.87	2
		3	1	21.18	21.00	20.92	2
		3	3	21.24	20.99	21.02	2
		6	0	20.34	20.11	20.07	3

Band/BW	Modulation	RB Size	RB Offset	Low CH 20415 Frequency 825.5 MHz	Mid CH 20525 Frequency 836.5 MHz	High CH 20635 Frequency 847.5 MHz	MPR
5/ 3	QPSK	1	0	23.37	23.19	23.11	0
		1	7	22.99	22.79	22.78	0
		1	14	23.42	23.19	23.17	0
		8	0	22.20	22.00	21.99	1
		8	3	22.18	22.02	21.94	1
		8	7	22.15	22.00	21.95	1
		15	0	22.30	22.07	22.00	1
	16QAM	1	0	22.61	22.46	22.41	1
		1	7	22.29	22.07	22.04	1
		1	14	22.56	22.28	22.31	1
		8	0	21.12	20.94	20.89	2
		8	3	21.22	20.97	20.97	2
		8	7	21.26	20.99	20.97	2
		15	0	21.36	21.12	21.14	2
	64QAM	1	0	21.56	21.33	21.23	2
		1	7	21.38	21.13	21.11	2
		1	14	21.59	21.32	21.32	2
		8	0	20.16	19.97	19.88	3
		8	3	20.22	19.94	19.97	3
		8	7	20.21	20.03	19.98	3
		15	0	20.36	20.08	20.11	3

Band/BW	Modulation	RB Size	RB Offset	Low CH 20425 Frequency 826.5 MHz	Mid CH 20525 Frequency 836.5 MHz	High CH 20625 Frequency 846.5 MHz	MPR
5/ 5	QPSK	1	0	23.38	23.14	23.12	0
		1	12	23.04	22.76	22.78	0
		1	24	23.43	23.18	23.21	0
		12	0	22.23	22.00	21.96	1
		12	6	22.18	22.03	21.95	1
		12	13	22.19	21.96	21.96	1
		25	0	22.28	22.10	22.03	1
	16QAM	1	0	22.62	22.42	22.41	1
		1	12	22.26	22.10	22.03	1
		1	24	22.56	22.28	22.30	1
		12	0	21.12	20.92	20.86	2
		12	6	21.19	21.01	20.93	2
		12	13	21.21	21.01	21.00	2
		25	0	21.36	21.13	21.11	2
	64QAM	1	0	21.50	21.30	21.29	2
		1	12	21.35	21.19	21.11	2
		1	24	21.52	21.37	21.32	2
		12	0	20.17	19.94	19.87	3
		12	6	20.16	20.01	19.96	3
		12	13	20.25	20.02	19.95	3
		25	0	20.32	20.14	20.09	3

Band/BW	Modulation	RB Size	RB Offset	Low CH 20450 Frequency 829 MHz	Mid CH 20525 Frequency 836.5 MHz	High CH 20600 Frequency 844 MHz	MPR
5/ 10	QPSK	1	0	23.43	23.21	23.17	0
		1	24	23.06	22.84	22.80	0
		1	49	**23.48**	23.26	23.22	0
		25	0	22.27	22.05	22.01	1
		25	12	22.26	22.04	22.00	1
		25	25	22.23	22.01	21.97	1
		50	0	22.34	22.12	22.08	1
	16QAM	1	0	22.69	22.47	22.43	1
		1	24	22.34	22.12	22.08	1
		1	49	22.58	22.36	22.32	1
		25	0	21.20	20.98	20.94	2
		25	12	21.25	21.03	20.99	2
		25	25	21.28	21.06	21.02	2
		50	0	21.42	21.20	21.16	2
	64QAM	1	0	21.57	21.35	21.31	2
		1	24	21.43	21.21	21.17	2
		1	49	21.60	21.38	21.34	2
		25	0	20.21	19.99	19.95	3
		25	12	20.24	20.02	19.98	3
		25	25	20.29	20.07	20.03	3
		50	0	20.38	20.16	20.12	3

LTE BAND 26

Band/BW	Modulation	RB Size	RB Offset	Low CH 26797	Mid CH 26915	High CH 27033	MPR
				Frequency 824.7 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz	
26/ 1.4	QPSK	1	0	23.18	23.48	23.56	0
		1	2	23.08	23.11	23.40	0
		1	5	23.42	23.63	23.74	0
		3	0	23.42	23.52	23.77	0
		3	1	23.23	23.30	23.39	0
		3	3	23.08	23.19	23.44	0
		6	0	22.43	22.54	22.57	1
	16QAM	1	0	22.43	22.57	22.74	1
		1	2	22.42	22.48	22.73	1
		1	5	22.74	22.77	22.91	1
		3	0	22.43	22.56	22.79	1
		3	1	22.25	22.38	22.59	1
		3	3	22.03	22.28	22.41	1
		6	0	21.34	21.44	21.66	2
	64QAM	1	0	21.43	21.71	21.83	2
		1	2	21.45	21.63	21.79	2
		1	5	21.57	21.59	21.80	2
		3	0	21.47	21.63	21.84	2
		3	1	21.52	21.72	21.67	2
		3	3	21.47	21.56	21.78	2
		6	0	20.60	20.67	20.86	3

Band/BW	Modulation	RB Size	RB Offset	Low CH 26805	Mid CH 26915	High CH 27025	MPR
				Frequency 825.5 MHz	Frequency 836.5 MHz	Frequency 847.5 MHz	
26/ 3	QPSK	1	0	23.20	23.50	23.55	0
		1	7	23.04	23.12	23.40	0
		1	14	23.38	23.63	23.74	0
		8	0	22.41	22.55	22.77	1
		8	3	22.16	22.30	22.41	1
		8	7	22.05	22.26	22.48	1
		15	0	22.40	22.55	22.51	1
	16QAM	1	0	22.40	22.63	22.77	1
		1	7	22.39	22.51	22.71	1
		1	14	22.77	22.77	22.91	1
		8	0	21.39	21.57	21.79	2
		8	3	21.30	21.33	21.62	2
		8	7	21.05	21.26	21.37	2
		15	0	21.34	21.38	21.69	2
	64QAM	1	0	21.49	21.74	21.77	2
		1	7	21.48	21.57	21.78	2
		1	14	21.58	21.61	21.80	2
		8	0	20.50	20.67	20.85	3
		8	3	20.56	20.66	20.72	3
		8	7	20.44	20.60	20.74	3
		15	0	20.62	20.64	20.90	3

Band/BW	Modulation	RB Size	RB Offset	Low CH 26815	Mid CH 26915	High CH 27015	MPR
				Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz	
26/ 5	QPSK	1	0	23.21	23.45	23.56	0
		1	12	23.09	23.09	23.40	0
		1	24	23.39	23.62	23.78	0
		12	0	22.44	22.55	22.74	1
		12	6	22.16	22.31	22.42	1
		12	13	22.09	22.22	22.49	1
		25	0	22.38	22.58	22.54	1
	16QAM	1	0	22.41	22.59	22.77	1
		1	12	22.36	22.54	22.70	1
		1	24	22.77	22.77	22.90	1
		12	0	21.39	21.55	21.76	2
		12	6	21.27	21.37	21.58	2
		12	13	21.00	21.28	21.40	2
		25	0	21.34	21.39	21.66	2
	64QAM	1	0	21.43	21.71	21.83	2
		1	12	21.45	21.63	21.78	2
		1	24	21.51	21.66	21.80	2
		12	0	20.51	20.64	20.84	3
		12	6	20.50	20.73	20.71	3
		12	13	20.48	20.59	20.71	3
		25	0	20.58	20.70	20.88	3

Band/BW	Modulation	RB Size	RB Offset	Low CH 26840	Mid CH 26915	High CH 26990	MPR
				Frequency 829 MHz	Frequency 836.5 MHz	Frequency 844 MHz	
26/10	QPSK	1	0	23.26	23.52	23.61	0
		1	24	23.11	23.17	23.42	0
		1	49	23.44	23.70	23.79	0
		25	0	22.48	22.60	22.79	1
		25	12	22.24	22.32	22.47	1
		25	25	22.13	22.27	22.50	1
		50	0	22.44	22.60	22.59	1
	16QAM	1	0	22.48	22.64	22.79	1
		1	24	22.44	22.56	22.75	1
		1	49	22.79	22.85	22.92	1
		25	0	21.47	21.61	21.84	2
		25	12	21.33	21.39	21.64	2
		25	25	21.07	21.33	21.42	2
		50	0	21.40	21.46	21.71	2
	64QAM	1	0	21.50	21.76	21.85	2
		1	24	21.53	21.65	21.84	2
		1	49	21.59	21.67	21.82	2
		25	0	20.55	20.69	20.92	3
		25	12	20.58	20.74	20.73	3
		25	25	20.52	20.64	20.79	3
		50	0	20.64	20.72	20.91	3

Band/BW	Modulation	RB Size	RB Offset	Low CH 26865	Mid CH 26915	High CH 26965	MPR
				Frequency 831.5 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz	
26/ 15	QPSK	1	0	23.59	23.56	23.66	0
		1	37	23.28	23.25	23.43	0
		1	74	23.77	23.74	**23.84**	0
		36	0	22.69	22.66	22.81	1
		36	19	22.42	22.39	22.52	1
		36	39	22.38	22.35	22.52	1
		75	0	22.65	22.62	22.67	1
	16QAM	1	0	22.75	22.72	22.85	1
		1	37	22.65	22.62	22.77	1
		1	74	22.95	22.92	22.97	1
		36	0	21.72	21.69	21.86	2
		36	19	21.50	21.47	21.65	2
		36	39	21.40	21.37	21.47	2
		75	0	21.57	21.54	21.72	2
	64QAM	1	0	21.83	21.80	21.90	2
		1	37	21.74	21.71	21.86	2
		1	74	21.77	21.74	21.87	2
		36	0	20.80	20.77	20.94	3
		36	19	20.79	20.76	20.81	3
		36	39	20.75	20.72	20.85	3
		75	0	20.81	20.78	20.93	3

ERP POWER (dBm)

GSM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
128	824.2	31.04	-0.56	28.33	680.77	7
189	836.4	31.06	-0.56	28.35	683.91	7
251	848.8	31.24	-0.56	28.53	**712.85**	7

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

EDGE

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
128	824.2	25.59	-0.56	22.88	194.09	7
189	836.4	25.68	-0.56	22.97	198.15	7
251	848.8	25.96	-0.56	23.25	**211.35**	7

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

WCDMA

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
4132	826.4	22.75	-0.56	20.04	100.93	7
4182	836.4	23.26	-0.56	20.55	113.50	7
4233	846.6	23.28	-0.56	20.57	**114.02**	7

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

LTE BAND 5

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	23.46	-0.56	20.75	**118.85**	7
20525	836.5	23.19	-0.56	20.48	111.69	7
20643	848.3	23.17	-0.56	20.46	111.17	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	22.64	-0.56	19.93	98.4	7
20525	836.5	22.40	-0.56	19.69	93.11	7
20643	848.3	22.38	-0.56	19.67	92.68	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	21.58	-0.56	18.87	77.09	7
20525	836.5	21.30	-0.56	18.59	72.28	7
20643	848.3	21.32	-0.56	18.61	72.61	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	23.42	-0.56	20.71	**117.76**	7
20525	836.5	23.19	-0.56	20.48	111.69	7
20635	847.5	23.17	-0.56	20.46	111.17	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	22.61	-0.56	19.9	97.72	7
20525	836.5	22.46	-0.56	19.75	94.41	7
20635	847.5	22.41	-0.56	19.70	93.33	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	21.59	-0.56	18.88	77.27	7
20525	836.5	21.33	-0.56	18.62	72.78	7
20635	847.5	21.32	-0.56	18.61	72.61	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	23.43	-0.56	20.72	**118.03**	7
20525	836.5	23.18	-0.56	20.47	111.43	7
20625	846.5	23.21	-0.56	20.50	112.20	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	22.62	-0.56	19.91	97.95	7
20525	836.5	22.42	-0.56	19.71	93.54	7
20625	846.5	22.41	-0.56	19.70	93.33	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	21.52	-0.56	18.81	76.03	7
20525	836.5	21.37	-0.56	18.66	73.45	7
20625	846.5	21.32	-0.56	18.61	72.61	7

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829.0	23.48	-0.56	20.77	**119.40**	7
20525	836.5	23.26	-0.56	20.55	113.50	7
20600	844.0	23.22	-0.56	20.51	112.46	7

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829.0	22.69	-0.56	19.98	99.54	7
20525	836.5	22.47	-0.56	19.76	94.62	7
20600	844.0	22.43	-0.56	19.72	93.76	7

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829	21.6	-0.56	18.89	77.45	7
20525	836.5	21.38	-0.56	18.67	73.62	7
20600	844	21.34	-0.56	18.63	72.95	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	23.45	2.67	23.97	249.46	7
26915	836.5	23.66	2.67	24.18	261.82	7
27033	848.3	23.77	2.67	24.29	**268.53**	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	22.77	2.67	23.29	213.30	7
26915	836.5	22.80	2.67	23.32	214.78	7
27033	848.3	22.91	2.67	23.43	220.29	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	21.60	2.67	22.12	162.93	7
26915	836.5	21.75	2.67	22.27	168.66	7
27033	848.3	21.84	2.67	22.36	172.19	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	23.41	2.67	23.93	247.17	7
26915	836.5	23.66	2.67	24.18	261.82	7
27025	847.5	23.74	2.67	24.26	**266.69**	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	22.80	2.67	23.32	214.78	7
26915	836.5	22.80	2.67	23.32	214.78	7
27025	847.5	22.91	2.67	23.43	220.29	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	21.61	2.67	22.13	163.31	7
26915	836.5	21.77	2.67	22.29	169.43	7
27025	847.5	21.80	2.67	22.32	170.61	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	23.42	2.67	23.94	247.74	7
26915	836.5	23.65	2.67	24.17	261.22	7
27015	846.5	23.78	2.67	24.30	**269.15**	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	22.80	2.67	23.32	214.78	7
26915	836.5	22.80	2.67	23.32	214.78	7
27015	846.5	22.90	2.67	23.42	219.79	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	21.54	2.67	22.06	160.69	7
26915	836.5	21.74	2.67	22.26	168.27	7
27015	846.5	21.83	2.67	22.35	171.79	7

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26840	829	23.47	2.67	23.99	250.61	7
26915	836.5	23.73	2.67	24.25	266.07	7
26990	844	23.79	2.67	24.31	**269.77**	7

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26840	829	22.82	2.67	23.34	215.77	7
26915	836.5	22.88	2.67	23.40	218.78	7
26990	844	22.92	2.67	23.44	220.80	7

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26840	829	21.62	2.67	22.14	163.68	7
26915	836.5	21.79	2.67	22.31	170.22	7
26990	844	21.85	2.67	22.37	172.58	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	23.55	2.67	24.07	255.27	7
26915	836.5	23.77	2.67	24.29	268.53	7
26965	848.3	23.84	2.67	24.36	**272.90**	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	22.84	2.67	23.36	216.77	7
26915	836.5	22.95	2.67	23.47	222.33	7
26965	848.3	22.97	2.67	23.49	223.36	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	21.64	2.67	22.16	164.44	7
26915	836.5	21.83	2.67	22.35	171.79	7
26965	848.3	21.90	2.67	22.42	174.58	7

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

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

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

3.2.2 TEST PROCEDURE

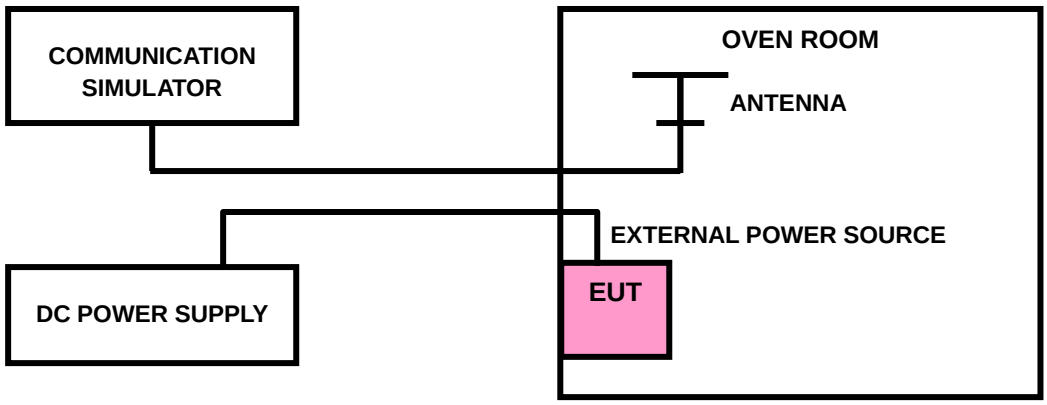
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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

GSM 850

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
V_{nor}	0.0018	0.0022	2.5
V_{min}	-0.0014	-0.0024	2.5
V_{max}	0.0012	0.0024	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max}.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-10	-0.0076	-0.0065	2.5
0	-0.0059	-0.0061	2.5
10	-0.0043	-0.0057	2.5
20	-0.015	-0.0032	2.5
30	-0.0024	-0.0012	2.5
40	-0.0017	-0.0021	2.5
55	-0.0009	-0.0053	2.5

EDGE 850

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
V_{nor}	0.0021	0.0025	2.5
V_{min}	-0.0026	-0.0027	2.5
V_{max}	0.0019	0.0021	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max}.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-10	-0.0086	-0.0076	2.5
0	-0.0077	-0.0057	2.5
10	-0.0045	-0.004	2.5
20	-0.004	-0.0031	2.5
30	-0.0026	-0.0019	2.5
40	-0.0017	-0.001	2.5
55	-0.0004	-0.0058	2.5

WCDMA Band V

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
V_{nor}	0.0015	0.0014	2.5
V_{min}	-0.0026	-0.0026	2.5
V_{max}	0.0013	0.0019	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max}.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-10	0.0103	-0.0097	2.5
0	-0.0092	-0.0079	2.5
10	-0.0074	-0.0036	2.5
20	-0.0055	-0.0051	2.5
30	0.0054	-0.0092	2.5
40	-0.0036	-0.0045	2.5
55	0.0004	-0.0008	2.5

LTE Band 5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V_{nor}	0.002	0.0024	2.5
V_{min}	-0.0031	-0.003	2.5
V_{max}	0.0021	0.0021	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max}.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-10	-0.0086	-0.0083	2.5
0	-0.0078	-0.0072	2.5
10	-0.0046	-0.0049	2.5
20	-0.0042	-0.004	2.5
30	-0.004	-0.0038	2.5
40	-0.0023	-0.0018	2.5
55	-0.0003	-0.0005	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V_{nor}	0.0021	0.0021	2.5
V_{min}	-0.0022	-0.0025	2.5
V_{max}	0.0019	0.0017	2.5

NOTE: The applicant defined the normal working voltage of the battery is V_{min} to V_{max}.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-10	-0.0083	-0.008	2.5
0	-0.0074	-0.0074	2.5
10	-0.0056	-0.0044	2.5
20	-0.004	-0.0043	2.5
30	-0.0038	-0.0027	2.5
40	-0.0016	-0.002	2.5
55	-0.0002	-0.0005	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V_{nor}	0.0021	0.0025	2.5
V_{min}	-0.0023	-0.003	2.5
V_{max}	0.0021	0.002	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max}.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-10	-0.0086	-0.008	2.5
0	-0.0075	-0.0073	2.5
10	-0.0054	-0.0045	2.5
20	-0.0041	-0.004	2.5
30	-0.0028	-0.0039	2.5
40	-0.0022	-0.0015	2.5
55	-0.0004	-0.0003	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V_{nor}	0.0025	0.0025	2.5
V_{min}	-0.003	-0.003	2.5
V_{max}	0.0025	0.0026	2.5

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} to V_{max}.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-10	-0.0081	-0.0084	2.5
0	-0.0073	-0.0073	2.5
10	-0.005	-0.0053	2.5
20	-0.0039	-0.004	2.5
30	-0.0038	-0.0039	2.5
40	-0.0016	-0.0016	2.5
55	-0.0002	-0.0004	2.5

LTE Band 26

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V_{nor}	0.002	0.0024	2.5
V_{min}	-0.0031	-0.003	2.5
V_{max}	0.0021	0.0021	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.4Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-10	-0.0084	-0.0082	2.5
0	-0.0078	-0.0076	2.5
10	-0.005	-0.0052	2.5
20	-0.0038	-0.0037	2.5
30	-0.0026	-0.0033	2.5
40	-0.0022	-0.0021	2.5
55	-0.0001	-0.0004	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V_{nor}	0.0021	-0.0019	2.5
V_{min}	-0.0022	-0.0025	2.5
V_{max}	0.0018	0.0018	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.4Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-10	-0.0081	-0.0082	2.5
0	-0.0076	-0.0073	2.5
10	-0.0052	-0.0045	2.5
20	-0.0042	-0.0042	2.5
30	-0.0041	-0.0028	2.5
40	-0.0023	-0.0017	2.5
55	-0.0005	-0.0004	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V_{nor}	0.0021	0.0024	2.5
V_{min}	-0.0023	-0.003	2.5
V_{max}	0.0022	0.0021	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.4Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-10	-0.0084	-0.0082	2.5
0	-0.0076	-0.0072	2.5
10	-0.0046	-0.0048	2.5
20	-0.0044	-0.0039	2.5
30	-0.0041	-0.0033	2.5
40	-0.0022	-0.0015	2.5
55	-0.0004	-0.0002	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V_{nor}	0.0026	0.0024	2.5
V_{min}	-0.0031	-0.0031	2.5
V_{max}	0.0026	0.0023	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.4Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-10	-0.0084	-0.0083	2.5
0	-0.0075	-0.0076	2.5
10	-0.0051	-0.0051	2.5
20	-0.0042	-0.0038	2.5
30	-0.0032	-0.0031	2.5
40	-0.0023	-0.002	2.5
55	-0.0004	-0.0004	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V_{nor}	0.0028	0.0029	2.5
V_{min}	-0.0032	-0.0029	2.5
V_{max}	0.0025	0.0022	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.4Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

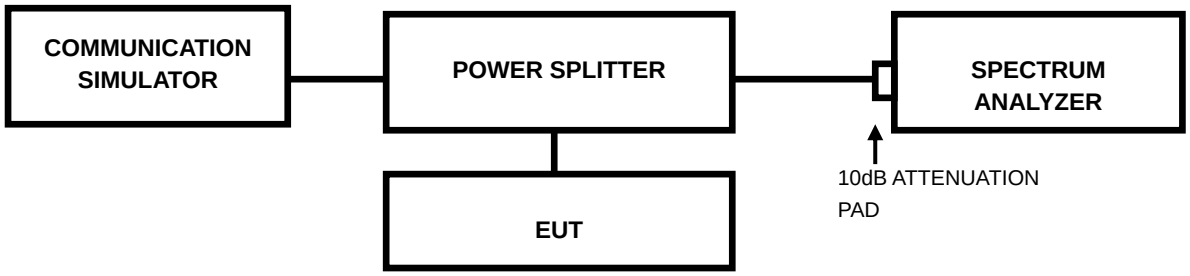
TEMP. (℃)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-10	-0.0062	-0.0082	2.5
0	-0.0065	-0.0079	2.5
10	-0.0019	-0.0058	2.5
20	-0.0041	-0.0035	2.5
30	-0.0032	-0.0027	2.5
40	-0.0018	-0.0014	2.5
55	-0.0011	-0.0009	2.5

3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 TEST PROCEDURES

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

3.3.2 TEST SETUP



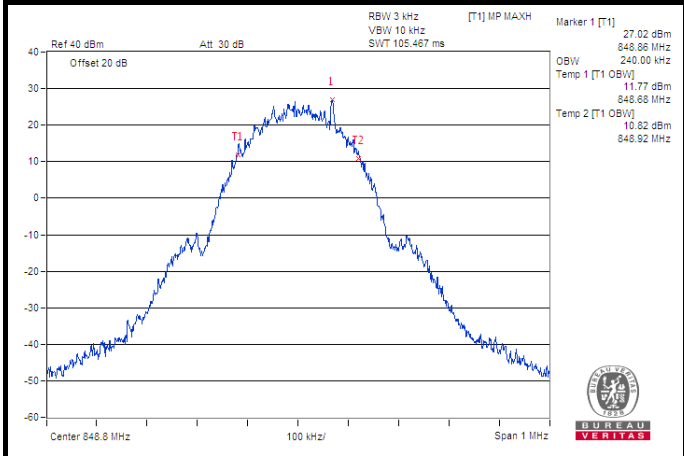
3.3.3 TEST RESULTS

GSM&EDGE

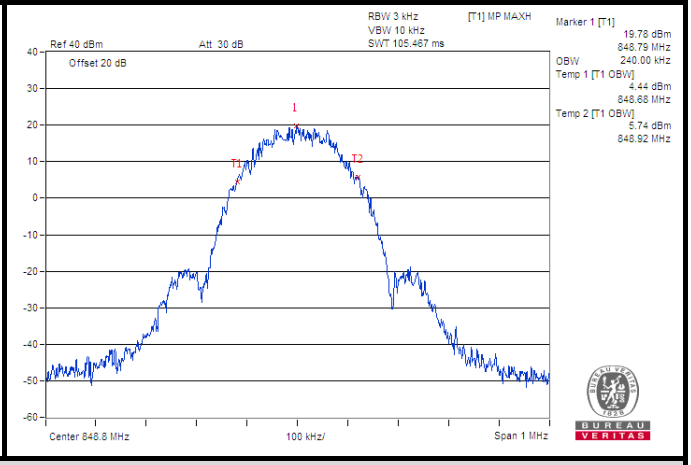
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		GSM	EDGE			GSM	EDGE
128	824.2	240.000	240.000	128	824.2	322.700	313.800
189	836.4	240.000	240.000	189	836.4	318.600	315.600
251	848.8	240.000	240.000	251	848.8	317.200	318.400

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

GPRS

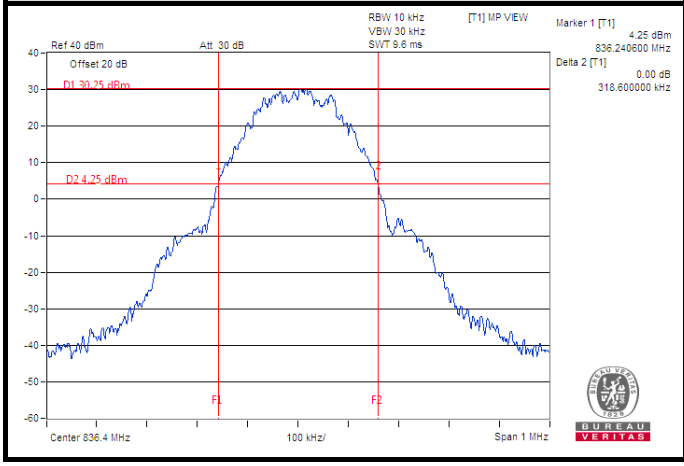


EDGE

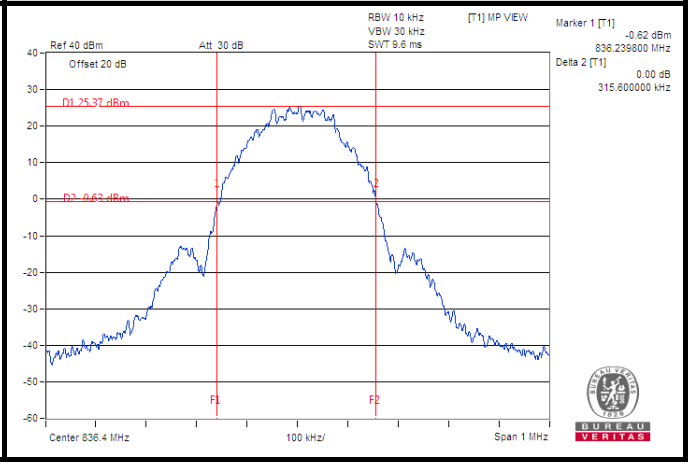


SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

GPRS

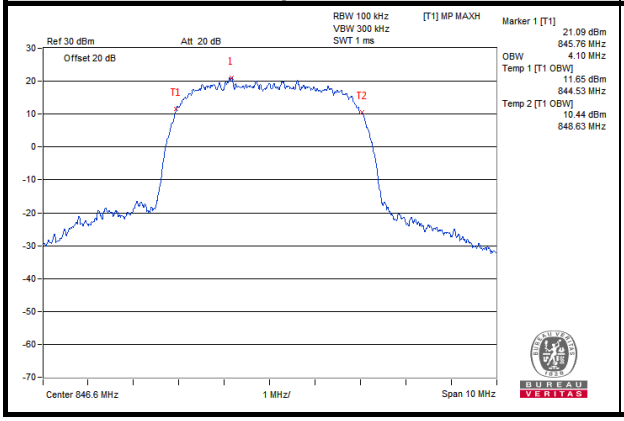
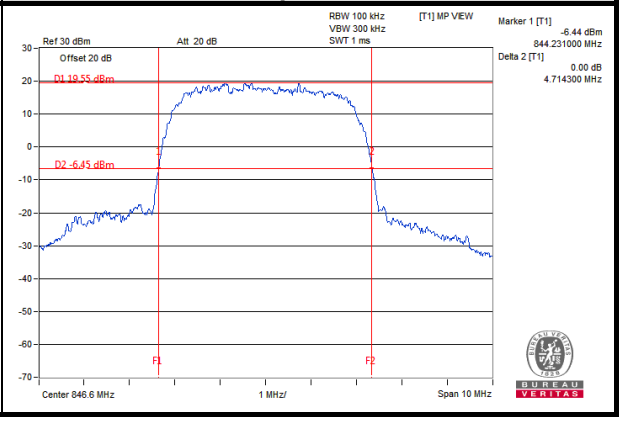


EDGE



WCDMA

CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)	CHANNEL	Frequency (MHz)	26dB Bandwidth (MHz)
		WCDMA V			WCDMA V
4132	826.4	4.150	4132	826.4	4.749
4182	836.4	4.140	4182	836.4	4.717
4233	846.6	4.100	4233	846.6	4.714

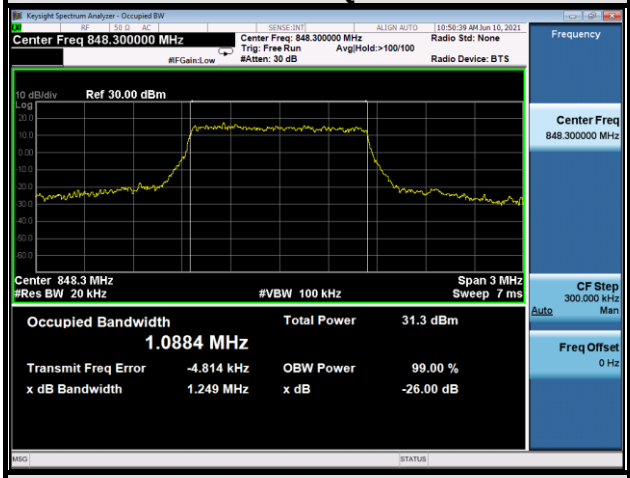
SPECTRUM PLOT OF WORST VALUE	
WCDMA V	
99% Occupied Bandwidth	26dB Occupied Bandwidth
	

LTE BAND 5

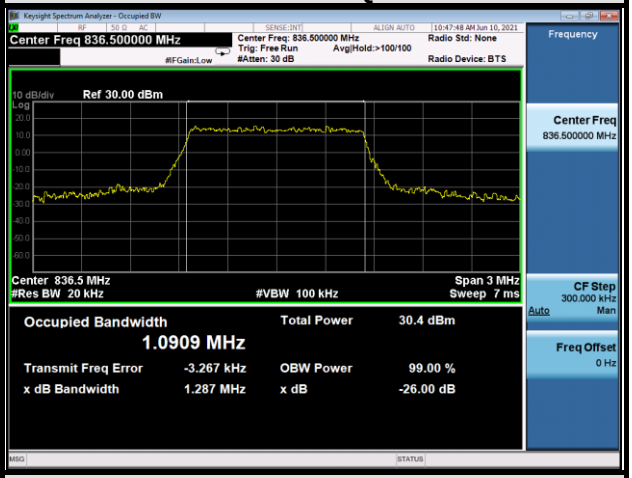
CHANNEL BANDWIDTH: 1.4MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)			26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20407	824.7	1.09	1.08	1.09	1.27	1.23	1.25
20525	836.5	1.09	1.09	1.09	1.27	1.29	1.28
20643	848.3	1.09	1.09	1.09	1.25	1.26	1.27

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth/26 dB Occupied Bandwidth

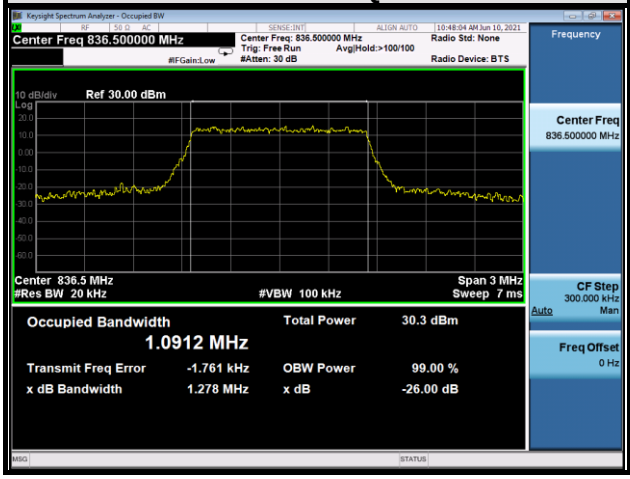
1.4MHz / QPSK



1.4MHz / 16QAM



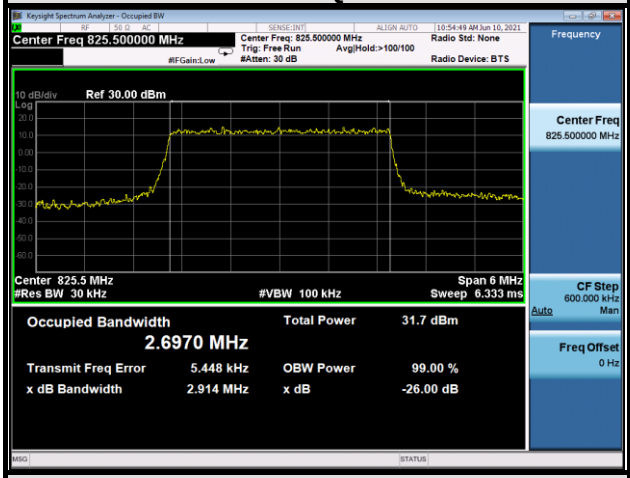
1.4MHz / 64QAM



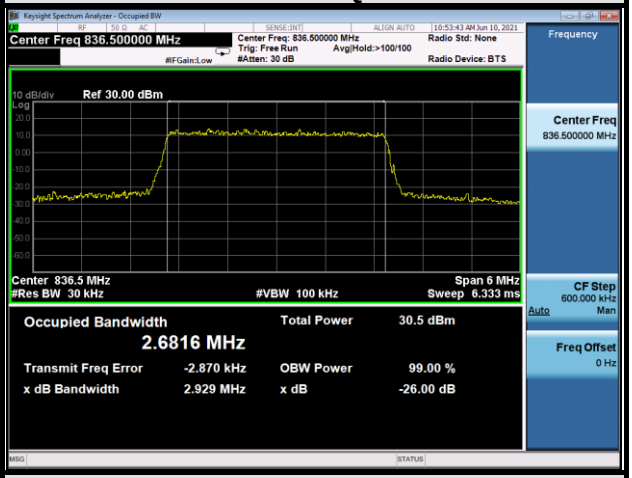
CHANNEL BANDWIDTH: 3MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)			26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20415	825.5	2.70	2.68	2.69	2.91	2.94	2.94
20525	836.5	2.68	2.68	2.68	2.91	2.93	2.94
20635	847.5	2.68	2.67	2.68	2.93	2.92	2.91

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth/26 dB Occupied Bandwidth

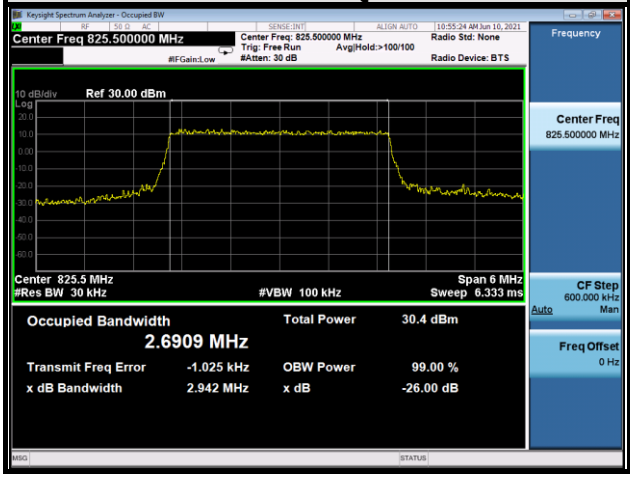
3MHz / QPSK



3MHz / 16QAM



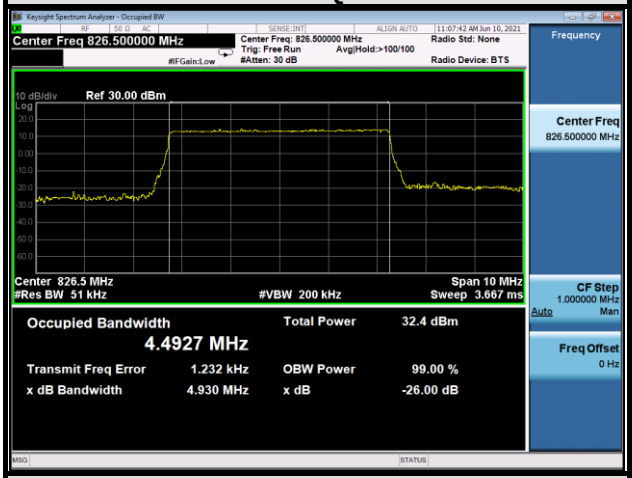
3MHz / 64QAM



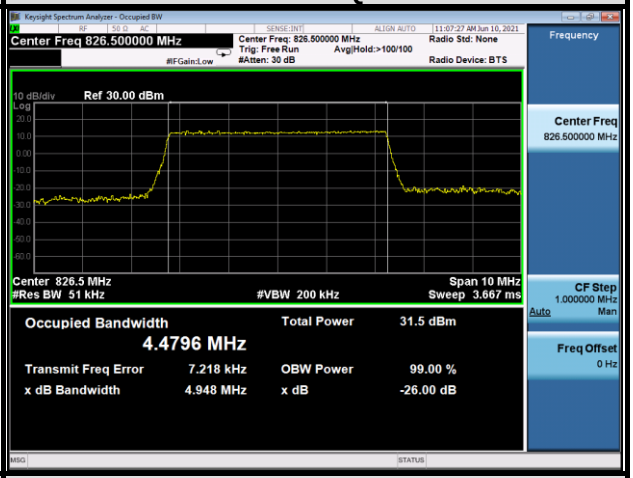
CHANNEL BANDWIDTH: 5MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)			26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20425	826.5	4.49	4.48	4.47	4.93	4.95	4.94
20525	836.5	4.48	4.46	4.46	4.89	4.89	4.82
20625	846.5	4.44	4.46	4.58	4.87	4.93	4.88

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth/26 dB Occupied Bandwidth

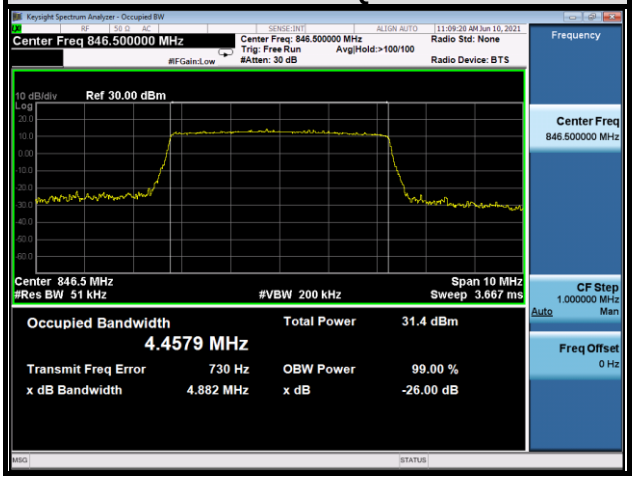
5MHz / QPSK



5MHz / 16QAM



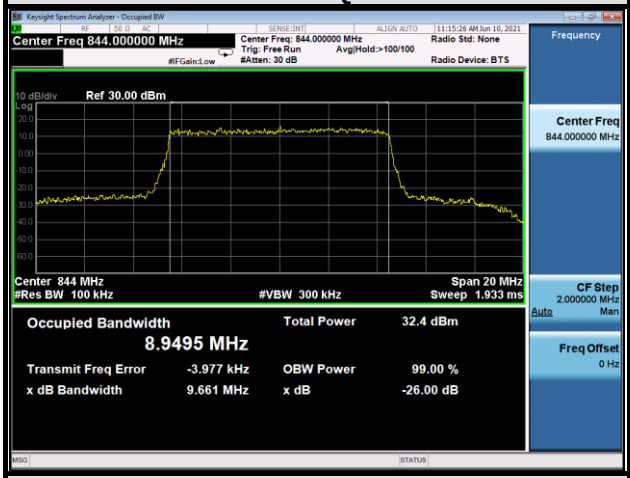
5MHz / 64QAM



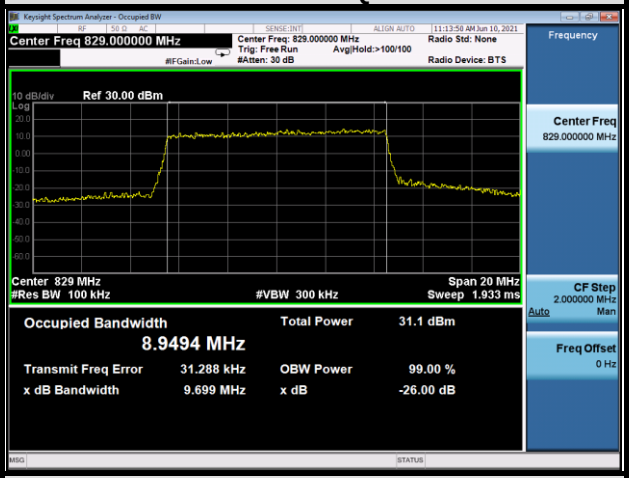
CHANNEL BANDWIDTH: 10MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)			26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20450	829	8.95	8.95	8.95	9.68	9.70	9.66
20525	836.5	8.93	8.92	8.93	9.62	9.58	9.68
20600	844	8.95	8.94	8.94	9.66	9.66	9.66

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth/26 dB Occupied Bandwidth

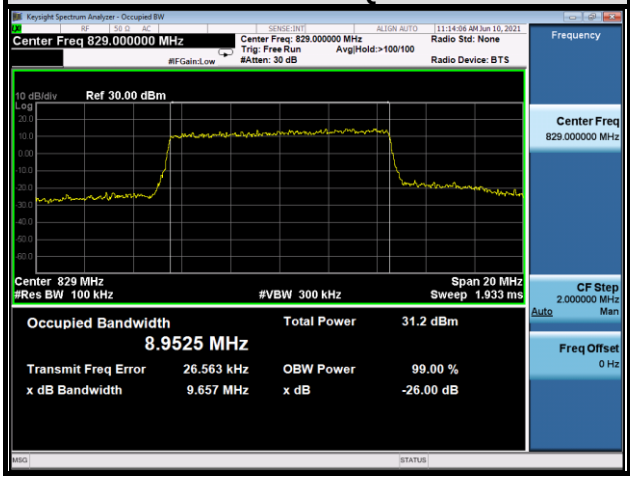
10MHz / QPSK



10MHz / 16QAM



10MHz / 64QAM

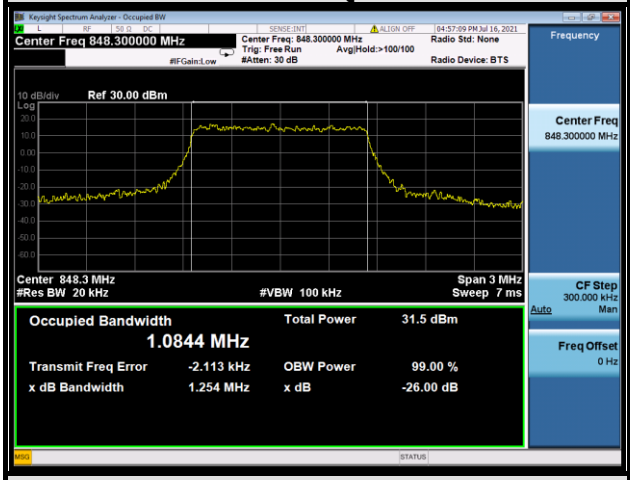


LTE BAND 26

CHANNEL BANDWIDTH: 1.4MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)			26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
26797	824.7	1.08	1.09	1.09	1.25	1.26	1.28
26915	836.5	1.08	1.09	1.09	1.27	1.28	1.30
27033	848.3	1.08	1.09	1.09	1.25	1.28	1.30

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth/26 dB Occupied Bandwidth

1.4MHz / QPSK



1.4MHz / 16QAM

1.4MHz / 64QAM