ACCREDITED
Certificate # 3939.01

FCC TEST REPORT

(PART 24)

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

Manufacturer or Supplier	HMD Global Oy
Address	Bertel Jungin aukio 9, 02600 Espoo, Finland
Product	GSM/WCDMA/LTE Mobile Phone
Brand Name	Nokia
Model Name	TA-1280
FCC ID	2AJOTTA-1280
Date of tests	Jul. 3, 2020 ~ Jul. 27, 2020

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

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

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

Prepared by Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
Alex Date: Jul. 29, 2020	Luke Lu Date: Jul. 29, 2020

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF200629W001-3	Original release	Jul. 21, 2020
RF200701W006-3	Based on the original report RF200629W001-3 remove back camera and 2pcs keymat LED, change Keypad materials and FCC ID, HW version and model name. In this report verify power and RSE worst case.	Jul. 29, 2020

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
2.1046 24.232	Equivalent Isotropic Radiated Power	Compliance	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	N.A	See note
2.1049 24.238(b)	Occupied Bandwidth	N.A	See note
24.232(d)	Peak to average ratio	N.A	See note
24.238(b)	Band Edge Measurements	N.A	See note
2.1051 24.238	Conducted Spurious Emissions	N.A	See note
2.1053 24.238	Radiated Spurious Emissions	Compliance	Meet the requirement of limit.

* Refer to KDB 971168 D01 Power Meas License Digital Systems v03r01.
Note:
Per the change notice provide by manufactory, the difference is remove back camera and 2pcs keymat LED, change Keypad materials and FCC ID, HW version and model name., all the change no effect any RF parameter, Therefore only verify the radiated emission worse case, power and show the verify test data on this report.
Other test data re-use from test report RF200629W001-3, more details please refer test report RF200629W001-3 (FCC ID: 2AJOTTA-1282)

1.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	UNCERTAINTY
Frequency Stability	±76.97Hz
Radiated emissions & Radiated Power (30MHz~1GMHz)	±4.98dB
Radiated emissions & Radiated Power (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
Conducted Output power	±2.06dB
Band Edge Measurements	±4.70dB
Peak to average ratio	±0.76dB

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

1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Apr. 27,20	Apr. 26,21
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 26,20	Feb. 25,21
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Mar. 27,20	Mar. 26,21
Horn Antenna (1GHz-18GHz)	ETS-LINDGREN	3117	00168692	Mar. 27,20	Mar. 26,21
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Nov. 24, 19	Nov. 23, 20
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 27,20	Feb. 26,21
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 02,20	Jun. 01,21
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 02,20	Jun. 01,21
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Apr. 30,20	Apr. 29,21
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. 03,20	Jun. 02,21
Power Meter	Anritsu	ML2495A	1506002	Feb. 26,20	Feb. 25,21
Power Sensor	Anritsu	MA2411B	1339352	Feb. 26,20	Feb. 25,21
Humid & Temp Programmable Tester	Juyi	ITH-120-45-CP-AR	IAA1504-001	Jun. 02,20	Jun. 01,21
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Mar. 11,20	Mar. 10,21
Power Divider	MCLI/USA	PS2-15	24880	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 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	GSM/WCDMA/LTE Mobile Phone	
BRAND NAME	Nokia	
MODEL NAME	TA-1280	
NOMINAL VOLTAGE	5.0Vdc (adapter or host equipment) 3.7Vdc (Li-ion, battery)	
MODULATION TYPE	**GSM, GPRS:** GMSK **EDGE:** 8PSK **WCDMA :** BPSK, QPSK **LTE Band 2:** QPSK, 16QAM	
FREQUENCY RANGE	**GSM, GPRS, EDGE**	1850.2MHz ~ 1909.8MHz
	WCDMA	1852.4MHz ~ 1907.6MHz
	LTE Band 2 Channel Bandwidth: 1.4MHz	1850.7MHz ~ 1909.3MHz
	LTE Band 2 Channel Bandwidth: 3MHz	1851.5MHz ~ 1908.5MHz
	LTE Band 2 Channel Bandwidth: 5MHz	1852.5MHz ~ 1907.5MHz
	LTE Band 2 Channel Bandwidth: 10MHz	1855.0MHz ~ 1905.0MHz
	LTE Band 2 Channel Bandwidth: 15MHz	1857.5MHz ~ 1902.5MHz
	LTE Band 2 Channel Bandwidth: 20MHz	1860.0MHz ~ 1900.0MHz
MAX. EIRP POWER	**GSM**	367mW
	EDGE	141mW
	WCDMA	100mW
	LTE Band 2 Channel Bandwidth: 1.4MHz	88mW
	LTE Band 2 Channel Bandwidth: 3MHz	88mW
	LTE Band 2 Channel Bandwidth: 5MHz	88mW
	LTE Band 2 Channel Bandwidth: 10MHz	88mW
	LTE Band 2 Channel Bandwidth: 15MHz	88mW
	LTE Band 2 Channel Bandwidth: 20MHz	89mW

EMISSION DESIGNATOR	**GSM**	240KGXW
	EDGE	240KG7W
	WCDMA	4M16F9W
	LTE Band 2 Channel Bandwidth: 1.4MHz	QPSK: 1M09G7D
		16QAM: 1M09W7D
	LTE Band 2 Channel Bandwidth: 3MHz	QPSK: 2M70G7D
		16QAM: 2M69W7D
	LTE Band 2 Channel Bandwidth: 5MHz	QPSK: 4M49G7D
		16QAM: 4M48W7D
	LTE Band 2 Channel Bandwidth: 10MHz	QPSK: 8M96G7D
		16QAM: 8M96W7D
	LTE Band 2 Channel Bandwidth: 15MHz	QPSK: 13M5G7D
		16QAM: 13M4W7D
	LTE Band 2 Channel Bandwidth: 20MHz	QPSK: 17M9G7D
		16QAM: 17M9W7D
ANTENNA TYPE	Fixed Internal Antenna with -3.51dBi gain for GSM 1900/WCDMA B2/LTE Band 2	
HW VERSION	0144	
SW VERSION	0.2025.11.05	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	USB cable: non-shielded, detachable,1meter Earphone: non-shielded, detachable, 1.5meter	

NOTE:

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

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

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

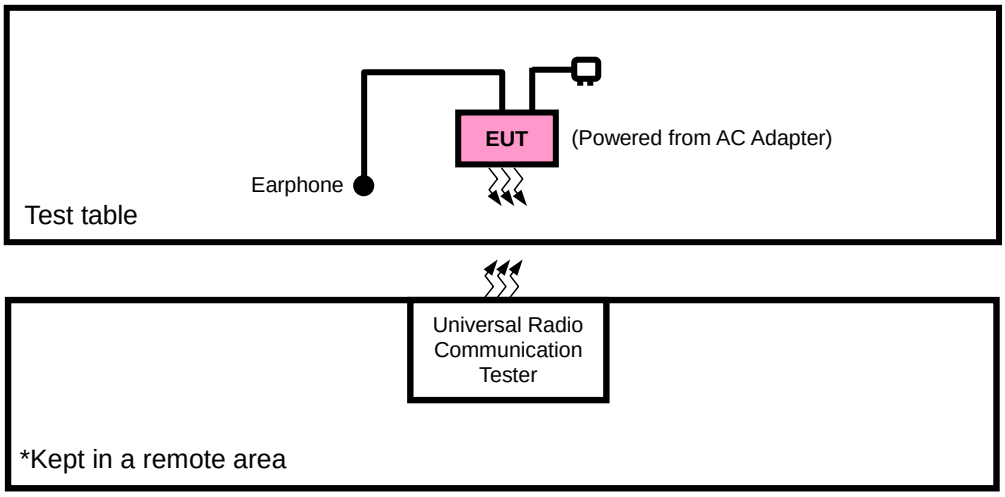
3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

List of Accessory:

ACCESSORIES	BRAND	MODEL	MANUFACTURER	SPECIFICATION
Battery 1	Nokia	BL-4WL	TM	Power Rating:3.7 Vdc, 1150 mAh
AC Adapter 1	Nokia	AC-18U	DVE	I/P: 100 - 240 Vac, 100mA, O/P: 5Vdc, 550 mA
AC Adapter 2	Nokia	AC-18U	Aohai	I/P: 100 - 240 Vac, 100mA, O/P: 5Vdc, 550 mA
Earphone 1	Nokia	WH-108	RTF	1.5m non-shielded cable w/ core
USB Cable 1	Nokia	CA-190CD	RTF	1m non-shielded cable w/ core

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



2.3 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC source	LONG WEI	PS-6403D	010934269	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.8m

2.4 TEST ITEM AND TEST CONFIGURATION

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

EUT CONFIGURE MODE	DESCRIPTION
A	**EUT + Adapter + USB Cable with GSM ,WCDMA or LTE link**
B	EUT + Battery with **GSM ,WCDMA or LTE link**

GSM MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	EIRP	512 to 810	512, 661, 810	GSM, EDGE
A	RADIATED EMISSION	512 to 810	512, 661, 810	GSM, EDGE

WCDMA MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
A	RADIATED EMISSION	9262 to 9538	9262, 9400, 9538	WCDMA

LTE BAND 2

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	RADIATED EMISSION	18650 to 19150	18900	10MHz	QPSK	1 RB / 0 RB Offset
B	EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM	1 RB / 0 RB Offset

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RADIATED EMISSION	23deg. C, 70%RH	DC 5V By Adapter	Star Le
EIRP	25deg. C, 57%RH	DC 3.7V By Battery	Star Le

2.5 EUT OPERATING CONDITIONS

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

2.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2

FCC 47 CFR Part 24

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

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

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile and portable stations are limited to 2 watts EIRP.

3.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

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

ERP or EIRP = $P_{Meas} + G_T – L_C$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively

(expressed in the same units as P_{Meas}, typically dBW or dBm);

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

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

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

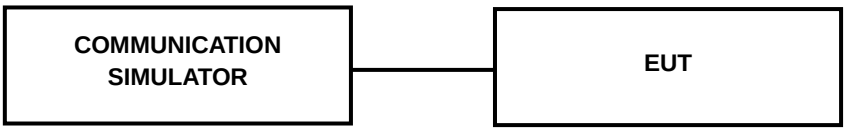
CONDUCTED POWER MEASUREMENT:

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

3.1.3 TEST SETUP

EIRP / ERP Measurement:

CONDUCTED POWER MEASUREMENT:



3.1.1 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

Band	GSM1900			Max. Tune-up Power
Channel	512	661	810	
Frequency	1850.2	1880	1909.8	
GSM (GMSK, 1Tx-slot)	29.02	29.08	**29.16**	30.5
GPRS (GMSK, 1Tx-slot)	28.99	29.09	29.14	30.5
GPRS (GMSK, 2Tx-slot)	26.64	26.59	26.57	27.5
GPRS (GMSK, 3Tx-slot)	25.14	25.06	25.18	25.7
GPRS (GMSK, 4Tx-slot)	23.00	22.97	23.01	24.5
EDGE (8PSK, 1Tx-slot)	24.52	24.80	24.05	25.5
EDGE (8PSK, 2Tx-slot)	22.73	23.48	22.38	23.5
EDGE (8PSK, 3Tx-slot)	19.77	20.51	19.18	21.0
EDGE (8PSK, 4Tx-slot)	16.75	17.46	16.28	18.0

Band	WCDMA II			Max. Tune-up Power
Channel	9262	9400	9538	
Rx Channel	9662	9800	9938	
Frequency	1852.4	1880	1907.6	
RMC 12.2K	23.37	23.45	**23.52**	24.3
HSDPA Subtest-1	23.17	22.42	22.55	23.3
HSDPA Subtest-2	22.18	22.38	22.49	23.3
HSDPA Subtest-3	22.15	21.83	21.98	22.8
HSDPA Subtest-4	21.62	21.78	21.95	22.8
HSUPA Subtest-1	22.29	22.40	22.50	23.3
HSUPA Subtest-2	20.36	20.37	20.46	21.3
HSUPA Subtest-3	21.31	21.38	21.48	22.3
HSUPA Subtest-4	20.34	20.41	20.45	21.3
HSUPA Subtest-5	22.29	22.39	22.43	23.3

Band/BW	Modulation	RB Size	RB Offset	Low CH 18607 Frequency 1850.7 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19193 Frequency 1909.3 MHz	MPR
2/ 1.4	QPSK	1	0	22.76	22.88	22.89	0
		1	2	22.85	22.90	22.96	0
		1	5	22.73	22.76	22.80	0
		3	0	22.80	22.86	22.94	0
		3	1	22.82	22.89	22.85	0
		3	3	22.79	22.84	22.88	0
		6	0	21.84	21.87	21.93	1
	16QAM	1	0	21.89	21.95	21.99	1
		1	2	21.90	21.92	22.00	1
		1	5	21.84	21.89	21.98	1
		3	0	21.89	21.96	21.98	1
		3	1	21.84	21.99	21.97	1
		3	3	21.86	21.93	21.99	1
		6	0	20.91	21.03	21.02	2

Band/BW	Modulation	RB Size	RB Offset	Low CH 18615 Frequency 1851.5 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19185 Frequency 1908.5 MHz	MPR
2/ 3	QPSK	1	0	22.78	22.90	22.88	0
		1	7	22.81	22.91	22.96	0
		1	14	22.69	22.76	22.80	0
		8	0	21.79	21.89	21.94	1
		8	3	21.75	21.89	21.87	1
		8	7	21.76	21.91	21.92	1
		15	0	21.81	21.88	21.87	1
	16QAM	1	0	21.86	22.01	22.02	1
		1	7	21.87	21.95	21.98	1
		1	14	21.87	21.89	21.98	1
		8	0	20.85	20.97	20.98	2
		8	3	20.89	20.94	21.00	2
		8	7	20.88	20.91	20.95	2
		15	0	20.91	20.97	21.05	2

Band/BW	Modulation	RB Size	RB Offset	Low CH 18625 Frequency 1852.5 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19175 Frequency 1907.5 MHz	MPR
2/ 5	QPSK	1	0	22.79	22.85	22.89	0
		1	12	22.86	22.88	22.96	0
		1	24	22.70	22.75	22.84	0
		12	0	21.82	21.89	21.91	1
		12	6	21.75	21.90	21.88	1
		12	13	21.80	21.87	21.93	1
		25	0	21.79	21.91	21.90	1
	16QAM	1	0	21.87	21.97	22.02	1
		1	12	21.84	21.98	21.97	1
		1	24	21.87	21.89	21.97	1
		12	0	20.85	20.95	20.95	2
		12	6	20.86	20.98	20.96	2
		12	13	20.83	20.93	20.98	2
		25	0	20.91	20.98	21.02	2

Band/BW	Modulation	RB Size	RB Offset	Low CH 18650 Frequency 1855 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19150 Frequency 1905 MHz	MPR
2/ 10	QPSK	1	0	22.76	22.88	22.89	0
		1	24	22.86	22.88	22.97	0
		1	49	22.67	22.79	22.80	0
		25	0	21.83	21.88	21.94	1
		25	12	21.81	21.84	21.88	1
		25	25	21.78	21.84	21.92	1
		50	0	21.84	21.91	21.87	1
	16QAM	1	0	21.87	21.94	21.98	1
		1	24	21.89	21.94	22.00	1
		1	49	21.87	21.90	21.94	1
		25	0	20.87	20.93	21.01	2
		25	12	20.90	20.92	21.01	2
		25	25	20.82	20.94	20.95	2
		50	0	20.95	20.97	21.06	2

Band/BW	Modulation	RB Size	RB Offset	Low CH 18675 Frequency 1857.5 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19125 Frequency 1902.5 MHz	MPR
2/ 15	QPSK	1	0	22.83	22.88	22.86	0
		1	37	22.84	22.93	22.92	0
		1	74	22.73	22.82	22.81	0
		36	0	21.80	21.89	21.95	1
		36	19	21.82	21.89	21.88	1
		36	39	21.76	21.85	21.92	1
		75	0	21.84	21.89	21.92	1
	16QAM	1	0	21.91	22.01	21.98	1
		1	37	21.88	21.95	22.00	1
		1	74	21.83	21.95	21.96	1
		36	0	20.91	20.93	21.02	2
		36	19	20.84	20.96	20.97	2
		36	39	20.87	20.92	20.98	2
		75	0	20.96	21.00	20.99	2

Band/BW	Modulation	RB Size	RB Offset	Low CH 18700 Frequency 1860 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19100 Frequency 1900 MHz	MPR
2/ 20	QPSK	1	0	22.84	22.92	22.94	0
		1	50	22.88	22.96	22.98	0
		1	99	22.75	22.83	22.85	0
		50	0	21.86	21.94	21.96	1
		50	25	21.83	21.91	21.93	1
		50	50	21.84	21.92	21.94	1
		100	0	21.85	21.93	21.95	1
	16QAM	1	0	21.94	22.02	22.04	1
		1	50	21.92	22.00	22.02	1
		1	99	21.89	21.97	21.99	1
		50	0	20.93	21.01	21.03	2
		50	25	20.92	21.00	21.02	2
		50	50	20.90	20.98	21.00	2
		100	0	20.97	21.05	21.07	2

EIRP POWER (dBm)

GSM 1900

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
512	1850.2	29.02	-3.51	25.51	355.63	2
661	1880.0	29.09	-3.51	25.58	361.41	2
810	1909.8	29.16	-3.51	25.65	367.28	2

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

EDGE 1900

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
512	1850.2	24.52	-3.51	21.01	126.18	2
661	1880.0	25.00	-3.51	21.49	140.93	2
810	1909.8	24.05	-3.51	20.54	113.24	2

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

WCDMA II

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
9262	1852.4	23.37	-3.51	19.86	96.83	2
9400	1880.0	23.45	-3.51	19.94	98.63	2
9538	1907.6	23.52	-3.51	20.01	100.23	2

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

LTE BAND 2

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18607	1850.7	22.85	-3.51	19.34	85.9	2
18900	1880.0	22.90	-3.51	19.39	86.9	2
19193	1909.3	22.96	-3.51	19.45	88.1	2

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18607	1850.7	21.90	-3.51	18.39	69.02	2
18900	1880.0	21.95	-3.51	18.44	69.82	2
19193	1909.3	22.00	-3.51	18.49	70.63	2

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18615	1851.5	22.81	-3.51	19.30	85.11	2
18900	1880.0	22.91	-3.51	19.40	87.1	2
19185	1908.5	22.96	-3.51	19.45	88.1	2

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18615	1851.5	21.87	-3.51	18.36	68.55	2
18900	1880.0	22.01	-3.51	18.50	70.79	2
19185	1908.5	22.02	-3.51	18.51	70.96	2

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18625	1852.5	22.86	-3.51	19.35	86.1	2
18900	1880.0	22.88	-3.51	19.37	86.5	2
19175	1907.5	22.96	-3.51	19.45	88.1	2

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18625	1852.5	21.87	-3.51	18.36	68.55	2
18900	1880.0	21.98	-3.51	18.47	70.31	2
19175	1907.5	22.02	-3.51	18.51	70.96	2

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18650	1855.0	22.86	-3.51	19.35	86.1	2
18900	1880.0	22.88	-3.51	19.37	86.5	2
19150	1905.0	22.97	-3.51	19.46	88.31	2

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18650	1855.0	21.89	-3.51	18.38	68.87	2
18900	1880.0	21.94	-3.51	18.43	69.66	2
19150	1905.0	22.00	-3.51	18.49	70.63	2

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18675	1857.5	22.84	-3.51	19.33	85.70	2
18900	1880.0	22.93	-3.51	19.42	87.50	2
19125	1902.5	22.92	-3.51	19.41	87.30	2

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18675	1857.5	21.91	-3.51	18.40	69.18	2
18900	1880.0	22.01	-3.51	18.50	70.79	2
19125	1902.5	22.00	-3.51	18.49	70.63	2

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18675	1860.0	22.88	-3.51	19.37	86.5	2
18900	1880.0	22.96	-3.51	19.45	88.1	2
19125	1900.0	22.98	-3.51	19.47	88.51	2

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G_T-L_C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18675	1860.0	21.94	-3.51	18.43	69.66	2
18900	1880.0	22.02	-3.51	18.51	70.96	2
19125	1900.0	22.04	-3.51	18.53	71.29	2

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

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

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

3.2.2 TEST PROCEDURE

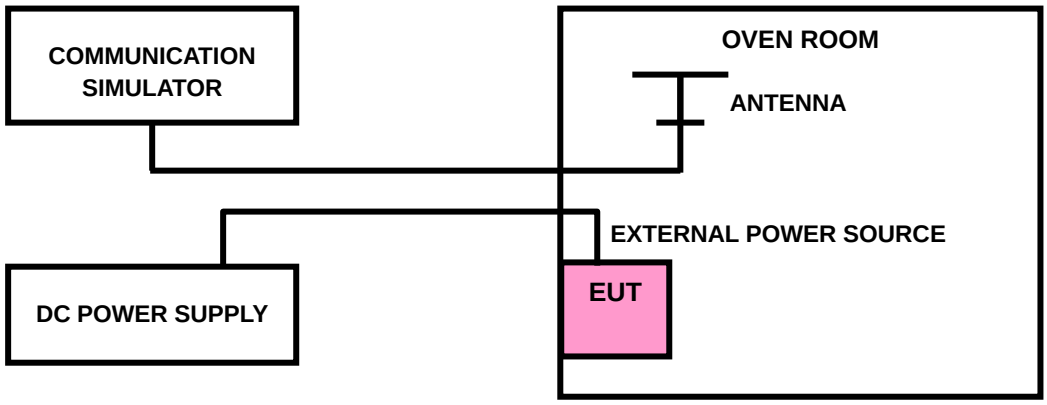
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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

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

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

3.2.3 TEST SETUP



3.2.4 TEST RESULTS

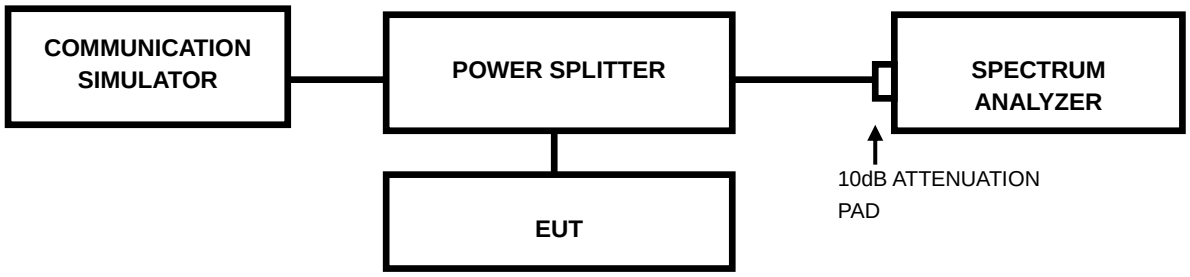
N/A

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

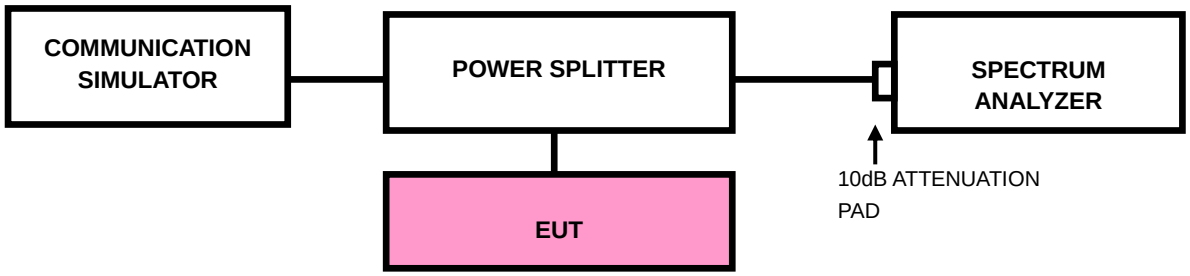
N/A

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. The center frequency of spectrum is the band edge frequency and span is 1.5 MHz. RBW of the spectrum is 10kHz and VBW of the spectrum is 30kHz (GSM/GPRS/ EDGE).

c. The center frequency of spectrum is the band edge frequency and span is 10MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz (WCDMA).

d. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 20kHz and VBW of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz)

e. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100kHz. (LTE bandwidth 3MHz)

f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 50kHz and VBW of the spectrum is 200kHz. (LTE bandwidth 5MHz)

g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz. (LTE bandwidth 10MHz)

h. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 15MHz)

i. he center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 20MHz)

j. Record the max trace plot into the test report.

3.4.4. TEST RESULTS

N/A

3.5 CONDUCTED SPURIOUS EMISSIONS

3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

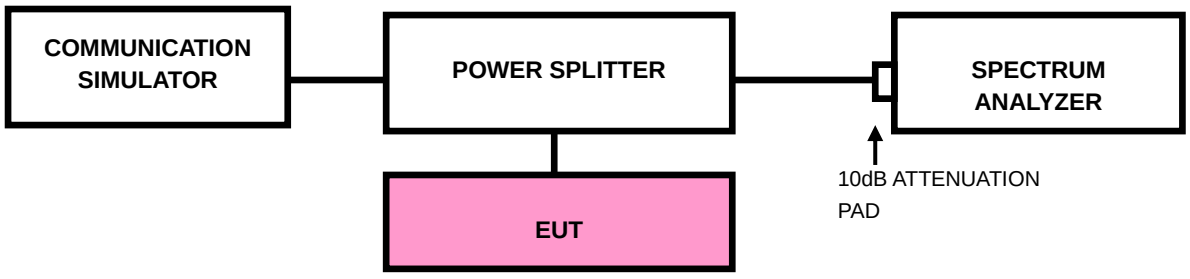
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

3.5.2 TEST PROCEDURE

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

b. Measuring frequency range is from 30 MHz to 19.1GHz. 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

N/A

3.6 RADIATED EMISSION MEASUREMENT

3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

3.6.2 TEST PROCEDURES

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

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

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

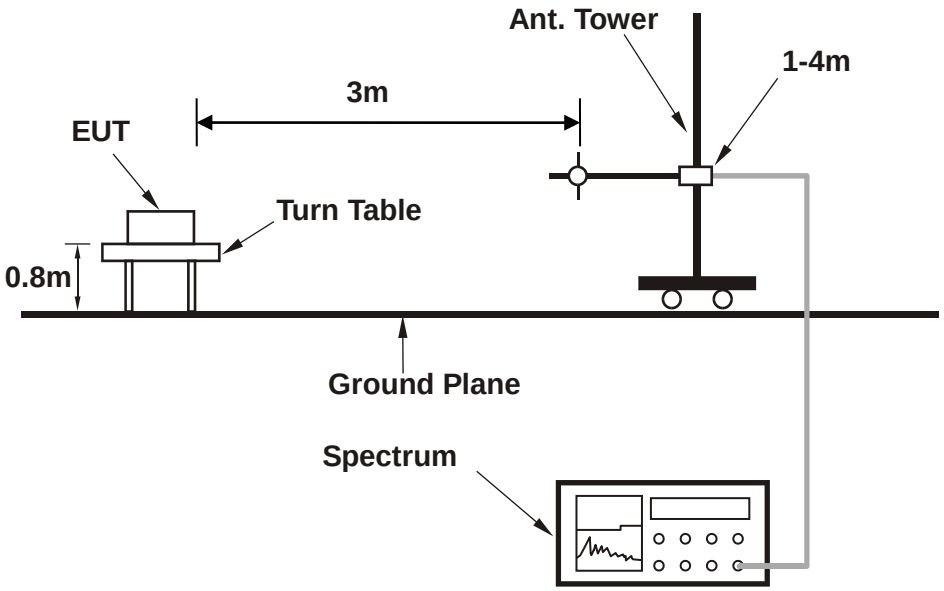
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.6.3 DEVIATION FROM TEST STANDARD

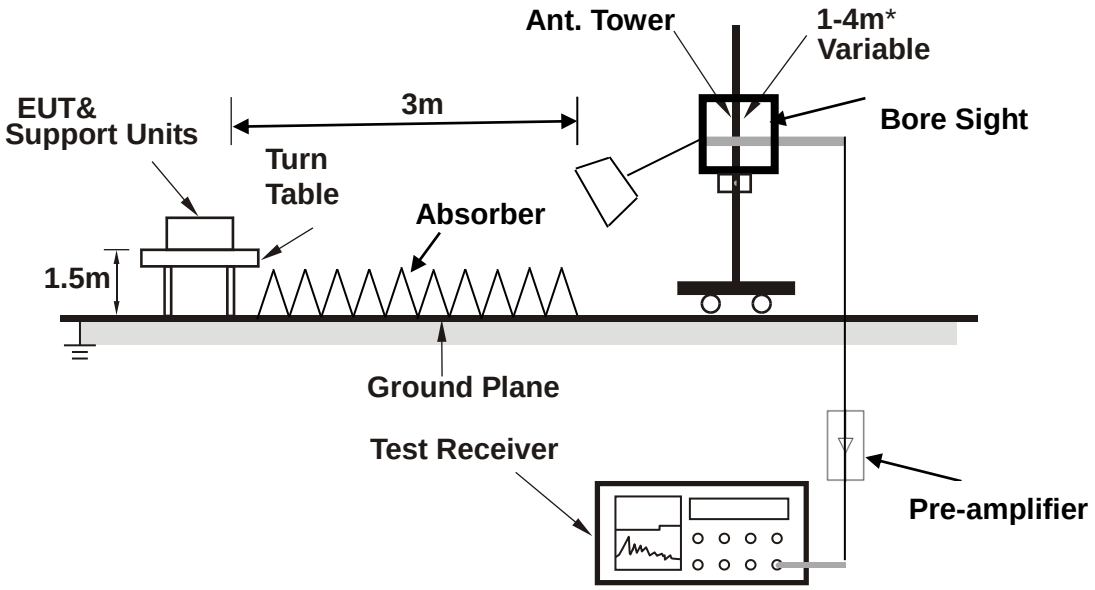
No deviation

3.6.4 TEST SETUP

< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna

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

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

3.6.5 TEST RESULTS

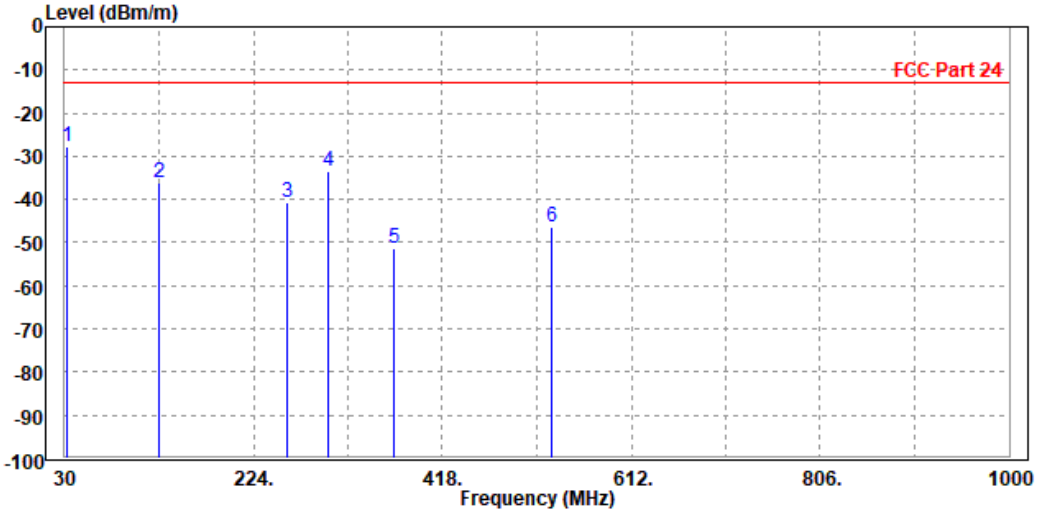
BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

PCS 1900:

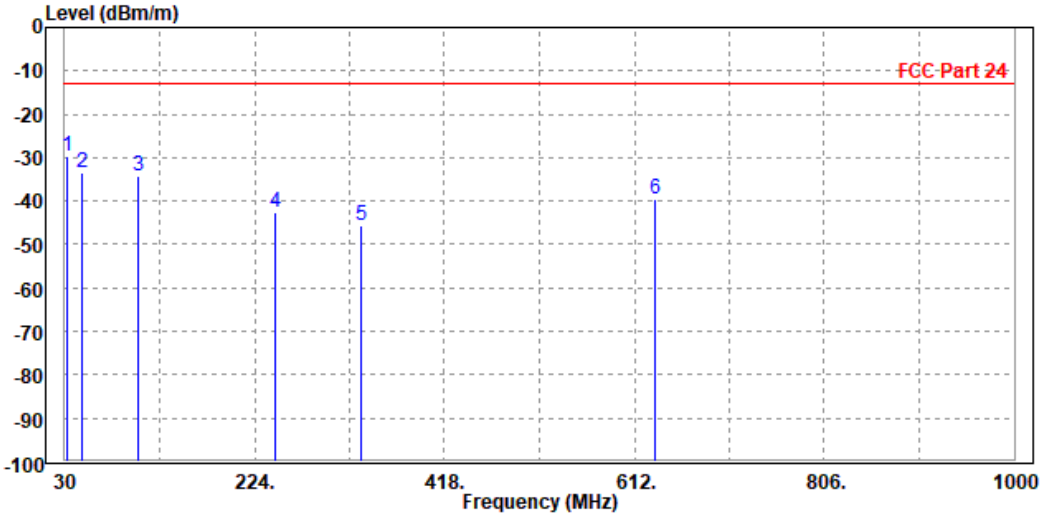
MODE	TX channel 661	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	33.020	-27.60	-46.99	-13.00	-14.60	19.39	Peak	Horizontal
2	127.240	-36.31	-43.62	-13.00	-23.31	7.31	Peak	Horizontal
3	258.140	-40.73	-54.25	-13.00	-27.73	13.52	Peak	Horizontal
4	300.010	-33.39	-46.99	-13.00	-20.39	13.60	Peak	Horizontal
5	368.170	-51.38	-67.16	-13.00	-38.38	15.78	Peak	Horizontal
6	530.170	-46.37	-65.78	-13.00	-33.37	19.41	Peak	Horizontal



MODE	TX channel 661	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	32.110	-29.81	-49.65	-13.00	-16.81	19.84	Peak	Vertical
2	47.250	-33.43	-43.17	-13.00	-20.43	9.74	Peak	Vertical
3	104.650	-34.24	-42.99	-13.00	-21.24	8.75	Peak	Vertical
4	245.770	-42.65	-55.85	-13.00	-29.65	13.20	Peak	Vertical
5	332.770	-45.58	-60.23	-13.00	-32.58	14.65	Peak	Vertical
6	632.740	-39.70	-60.55	-13.00	-26.70	20.85	Peak	Vertical



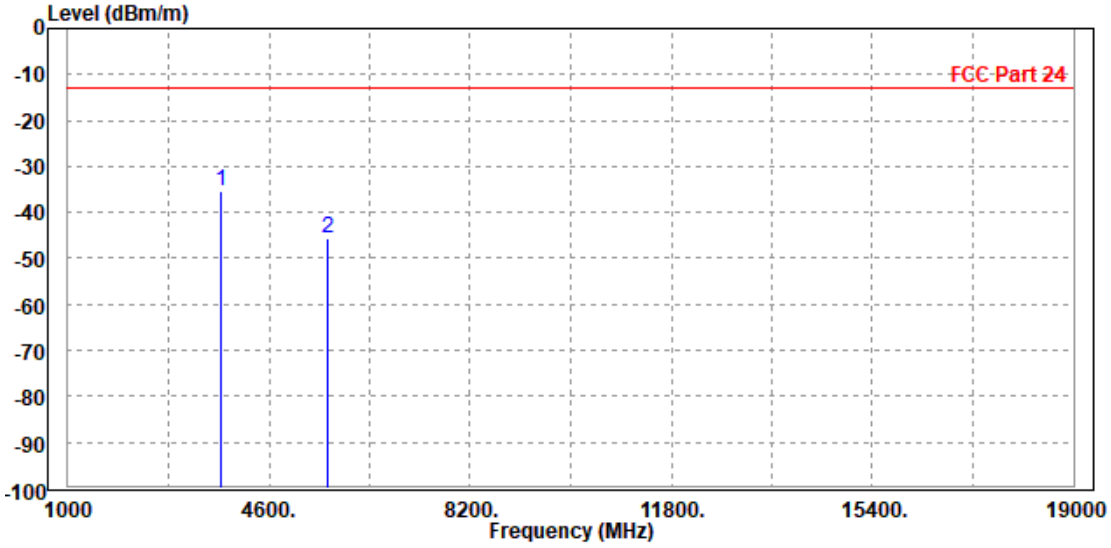
ABOVE 1GHz WORST-CASE DATA

PCS 1900:

CH 661

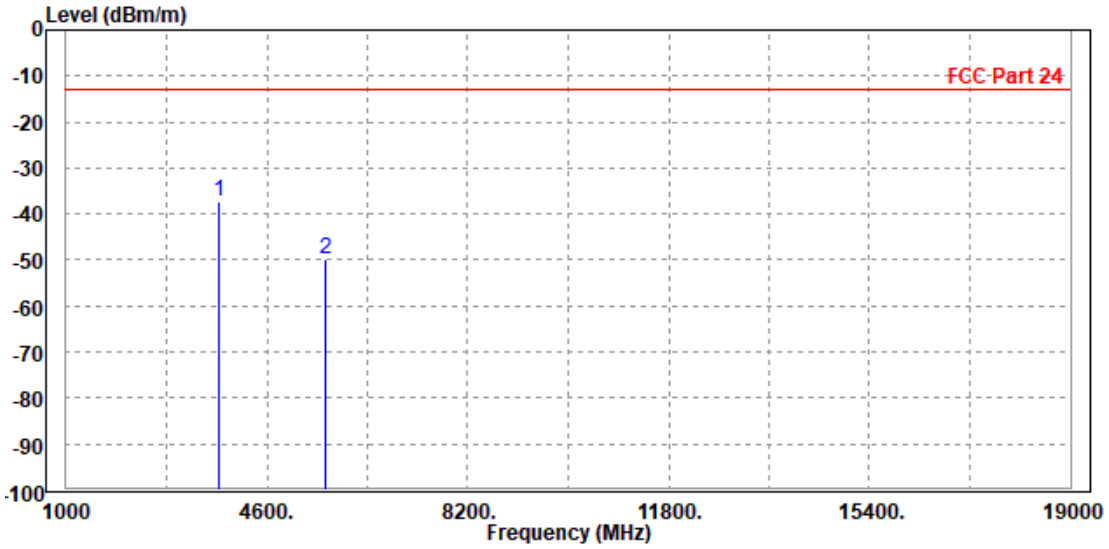
MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3754.000	-35.52	-44.36	-13.00	-22.52	8.84	Peak	Horizontal
2		5640.000	-45.78	-56.26	-13.00	-32.78	10.48	Peak	Horizontal



MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	3754.000	-37.09	-46.36	-13.00	-24.09	9.27	Peak	Vertical
2	5640.000	-49.63	-59.88	-13.00	-36.63	10.25	Peak	Vertical

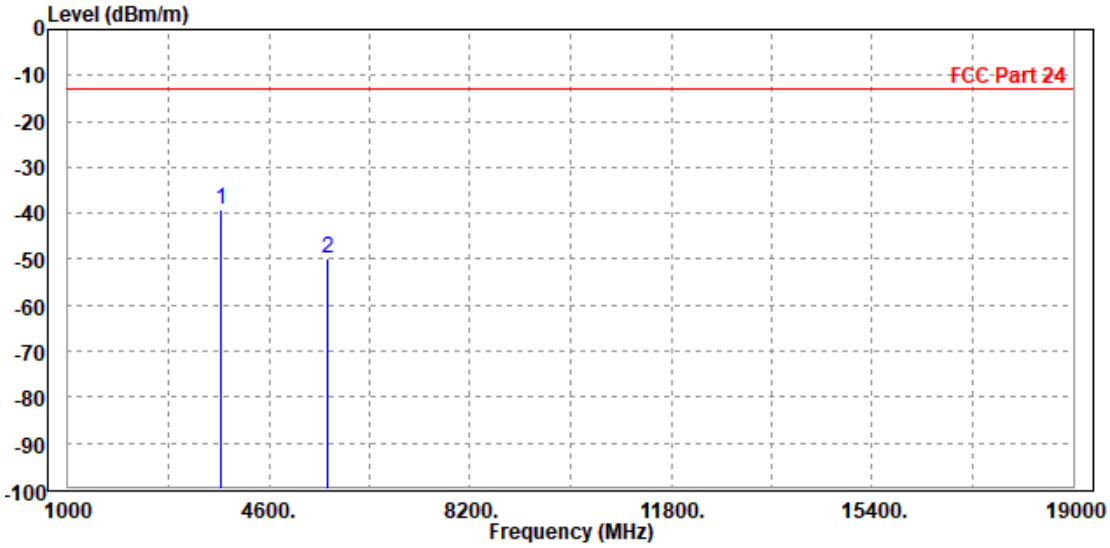


EDGE 1900:

CH 661

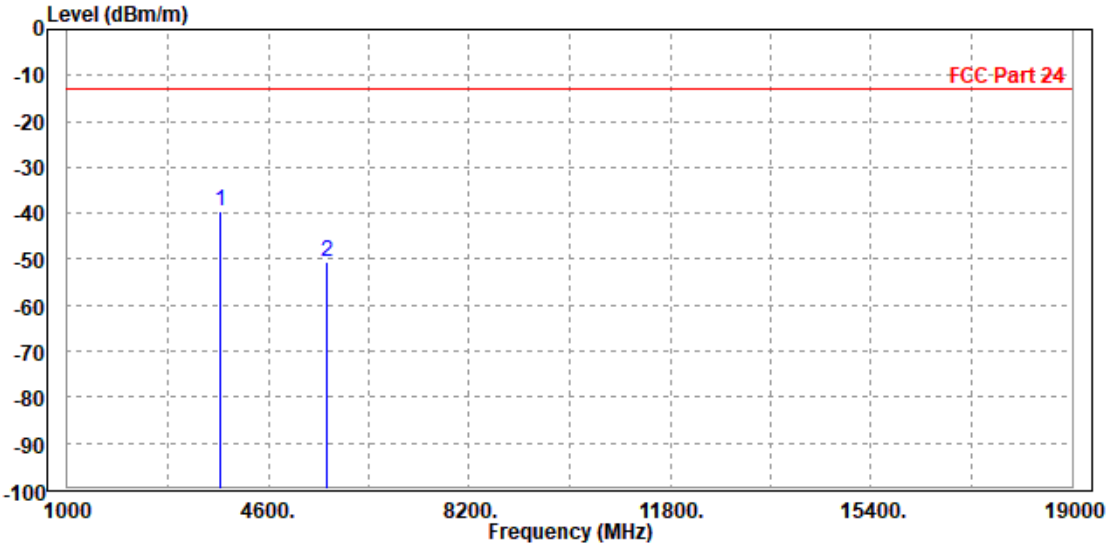
MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 3754.000	-39.15	-47.99	-13.00	-26.15	8.84	Peak	Horizontal
2	5640.000	-49.85	-60.33	-13.00	-36.85	10.48	Peak	Horizontal



MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	3754.000	-39.42	-48.69	-13.00	-26.42	9.27	Peak	Vertical
2	5640.000	-50.73	-60.98	-13.00	-37.73	10.25	Peak	Vertical

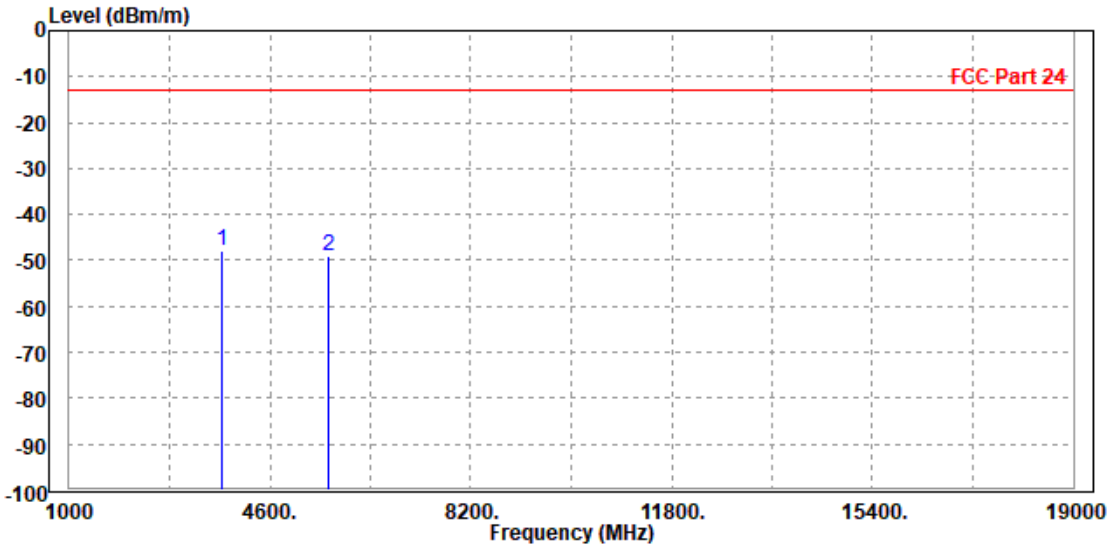


WCDMA Band II

CH 9400

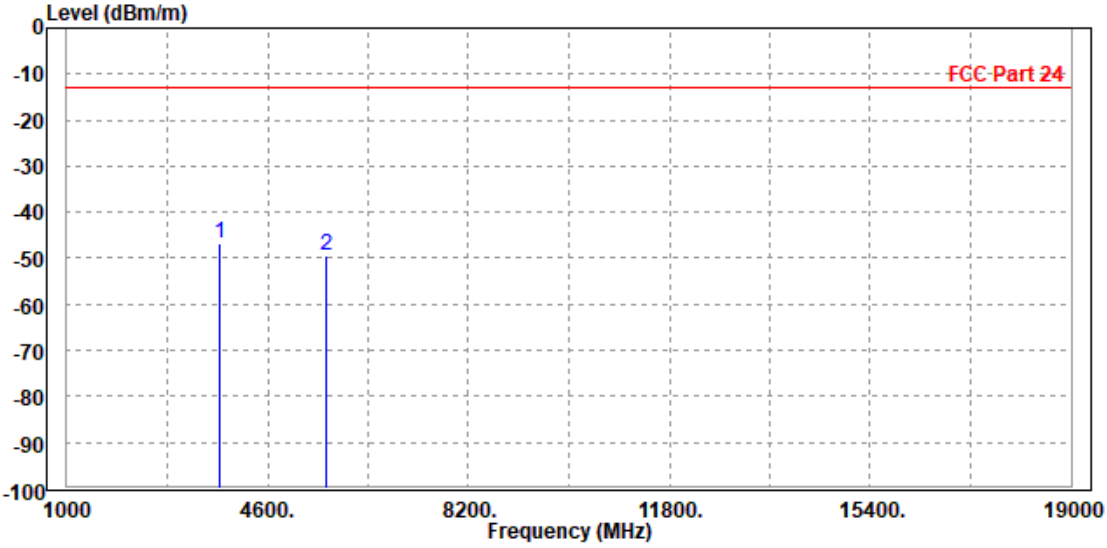
MODE	TX channel 9400	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	3754.000	-47.95	-56.79	-13.00	-34.95	8.84	Peak	Horizontal
2	5640.000	-49.14	-59.62	-13.00	-36.14	10.48	Peak	Horizontal



MODE	TX channel 9400	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	3754.000	-46.75	-56.02	-13.00	-33.75	9.27	Peak	Vertical
2	5640.000	-49.43	-59.68	-13.00	-36.43	10.25	Peak	Vertical



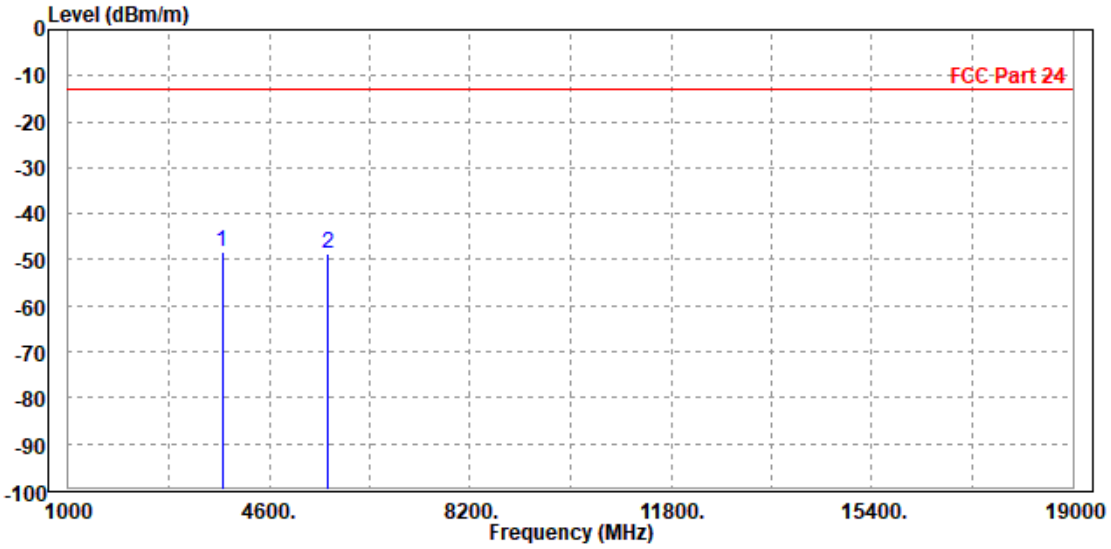
LTE Band 2

CHANNEL BANDWIDTH: 10MHz / QPSK

CH18900

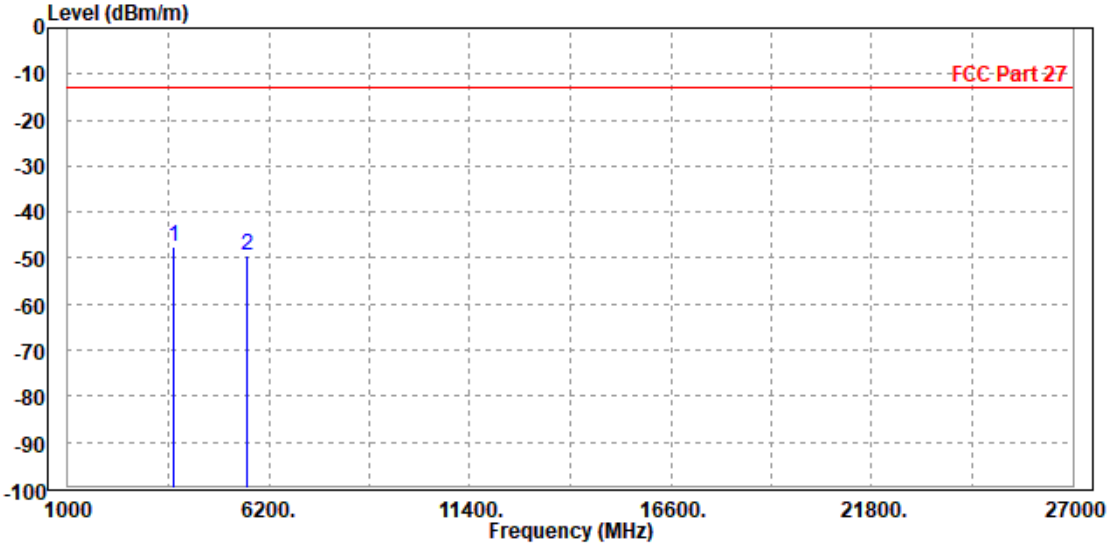
MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 3756.000	-48.20	-57.05	-13.00	-35.20	8.85	Peak	Horizontal
2	5640.000	-48.83	-59.31	-13.00	-35.83	10.48	Peak	Horizontal



MODE	TX channel 18900	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 3756.000	-47.37	-56.64	-13.00	-34.37	9.27	Peak	Vertical
2	5640.000	-49.34	-59.59	-13.00	-36.34	10.25	Peak	Vertical

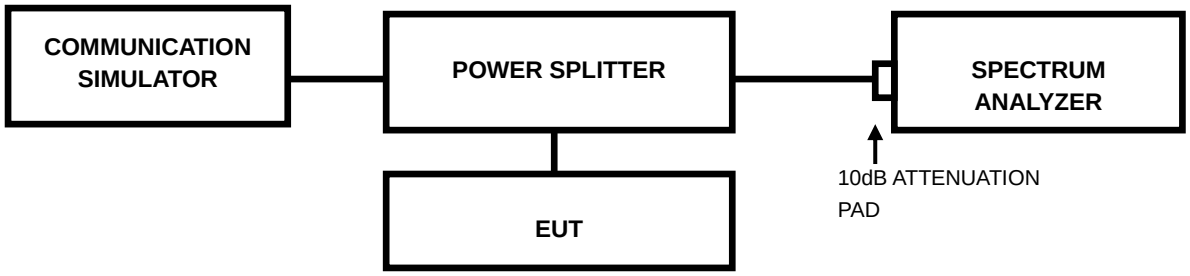


3.7 PEAK TO AVERAGE RATIO

3.7.1 LIMITS OF peak to average ratio MEASUREMENT

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

3.7.2 TEST SETUP



3.7.3 TEST PROCEDURES

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

3.7.4 TEST RESULTS

N/A

4 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:

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Tel: +86-755-88696566
Fax: +86-755-88696577

Email: customerservice.dg@cn.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.

5 APPENDIX A – 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.

---END---