

VARIANT FCC TEST REPORT

(PART 24)

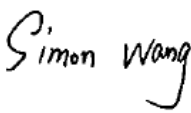
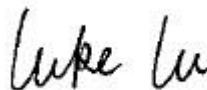
Applicant:	Continental Automotive Systems, Inc.
Address:	21440 W Lake Cook Rd., Deer Park, IL 60010, USA

Manufacturer or Supplier:	Continental Automotive Systems, Inc.
Address:	21440 W Lake Cook Rd., Deer Park, IL 60010, USA
Product:	FE3NA0031
Brand Name:	Continental
Model Name:	FE3NA0031
FCC ID:	LHJ-FE3NA0031
Date of tests:	Jun. 19, 2023 ~ Jun. 28, 2023

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 Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
	
Date: Jun. 28, 2023	Date: Jun. 28, 2023

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

TABLE OF CONTENTS

RELEASE CONTROL RECORD	3
1 SUMMARY OF TEST RESULTS	4
1.1 MEASUREMENT UNCERTAINTY	5
1.2 TEST SITE AND INSTRUMENTS	6
2 GENERAL INFORMATION	7
2.1 GENERAL DESCRIPTION OF EUT	7
2.2 CONFIGURATION OF SYSTEM UNDER TEST	9
2.3 DESCRIPTION OF SUPPORT UNITS	10
2.4 TEST ITEM AND TEST CONFIGURATION.....	10
2.5 EUT OPERATING CONDITIONS	12
2.6 GENERAL DESCRIPTION OF APPLIED STANDARDS	12
3 TEST TYPES AND RESULTS	13
3.1 OUTPUT POWER MEASUREMENT	13
3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT	13
3.1.2 TEST PROCEDURES.....	13
3.1.3 TEST SETUP	14
3.1.4 TEST RESULTS	14
3.2 RADIATED EMISSION MEASUREMENT	22
3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	22
3.2.2 TEST PROCEDURES.....	22
3.2.3 DEVIATION FROM TEST STANDARD	22
3.2.4 TEST SETUP	23
3.2.5 TEST RESULTS	25
4 INFORMATION ON THE TESTING LABORATORIES	29
5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	30

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-211220W001RF02	Original release	Jan. 17, 2022
W7L-230619W001RF02	Based on the original product changing the hardware version and software version, The new Sample only verify RSE worst case and conducted power, So this report only replaces conducted Power and the low frequency data and the high frequency data (WCDMA Band2 CH9538) of RSE.	Jun. 28, 2023

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
§2.1046	Conducted Output Power	Compliance
§24.232(c)	Equivalent Isotropic Radiated Power	Compliance
§2.1055 §24.235	Frequency Stability	See Note
§2.1049	Occupied Bandwidth	See Note
§24.232(d)	Peak to average ratio	See Note
§24.238(a)(b)	Band Edge Measurements	See Note
§2.1051 §24.238(a)(b)	Conducted Spurious Emissions	See Note
§2.1053 §24.238(a)(b)	Radiated Spurious Emissions	Compliance

NOTE: Please refer to the original report W7L-211220W001RF02, FCC ID: LHJ-FE3NA0031.

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	$\pm 76.97\text{Hz}$
Radiated emissions (9KHz~30MHz)	$\pm 2.68\text{dB}$
Radiated emissions & Radiated Power (30MHz~1GHz)	$\pm 4.98\text{dB}$
Radiated emissions & Radiated Power (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	$\pm 43.58\text{KHz}$
Conducted Output power	$\pm 2.06\text{dB}$
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.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 28,23	Mar. 27,24
EXA Signal Analyzer	KEYSIGHT	N9010A-544	MY54510355	May.13,23	May.12,24
Loop Antenna	Schwarzbeck	FMZB 1519B	00173	Sep.03,22	Sep.02,23
Bilog Antenna	ETS-LINDGRE N	3143B	00161965	Feb. 18,23	Feb. 17,24
Horn Antenna	ETS-LINDGRE N	3117	00168692	Feb. 18,23	Feb. 17,24
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40-K-SG/QMS-00361	15433	Sep.04, 22	Sep.03, 23
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 14,23	Feb. 13,24
Signal Pre-Amplifier	EMSI	EMC 9135	980249	May. 06,23	May. 05,24
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	May.11,23	May.10,24
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Feb. 17,23	Feb.16,24
3m Semi-anechoic Chamber	ETS-LINDGRE N	9m*6m*6m	Euroshieldpn-CT0001143-1216	May. 18,23	May. 17,26
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	JS1120	3.1.36	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SMA	50HF-010-SMA	May. 06,23	May. 05,24
Power Meter	Anritsu	ML2495A	1506002	Feb. 14,23	Feb. 13,24
Power Sensor	Anritsu	MA2411B	1339352	Feb. 14,23	Feb. 13,24
Temperature Chamber	ESPEC	SH-242	93000855	May. 06,23	May. 05,24
MXG Analog Microwave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 14,23	Feb. 13,24
Base station R&S CMW500	Rohde&Schwarz	CMW500	153085	May.11,23	May.10,24
DC Source	Kikusui/JP	PMX18-5A	N/A	Aug. 12,22	Aug. 11,23

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	FE3NA0031	
BRAND NAME	Continental	
MODEL NAME	FE3NA0031	
NOMINAL VOLTAGE	EUT 4.0V	
MODULATION TYPE	GSM/GPRS: GMSK EDGE: 8PSK WCDMA: 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/GPRS	1161.45mW
	EDGE	459.2mW
	WCDMA	316.96mW
	LTE Band 2 Channel Bandwidth: 1.4MHz	261.82mW
	LTE Band 2 Channel Bandwidth: 3MHz	263.63mW
	LTE Band 2 Channel Bandwidth: 5MHz	261.82mW
	LTE Band 2 Channel Bandwidth: 10MHz	262.42mW
	LTE Band 2 Channel Bandwidth: 15MHz	262.42mW



	LTE Band 2 Channel Bandwidth: 20MHz	264.24mW
EMISSION DESIGNATOR	GSM/GPRS	242KGXW
	EDGE	244KG7W
	WCDMA	4M17F9W
	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: 4M50G7D
		16QAM: 4M50W7D
	LTE Band 2 Channel Bandwidth: 10MHz	QPSK: 8M98G7D
		16QAM: 8M99W7D
	LTE Band 2 Channel Bandwidth: 15MHz	QPSK: 13M5G7D
		16QAM: 13M5W7D
	LTE Band 2 Channel Bandwidth: 20MHz	QPSK: 18M0G7D
		16QAM: 18M0W7D
ANTENNA TYPE	Dipole Antenna with 1.52dBi gain for GSM1900 Dipole Antenna with 1.52dBi gain for WCDMA II/LTE B2	
HW VERSION	P2	
SW VERSION	MODEMSA415M_01.16.34	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	N/A	
EXTREME TEMPERATURE	-30-75 °C	
EXTREME VOLTAGE	EUT 3.8V - EUT 4.2V	

NOTE:

- 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 receiver.

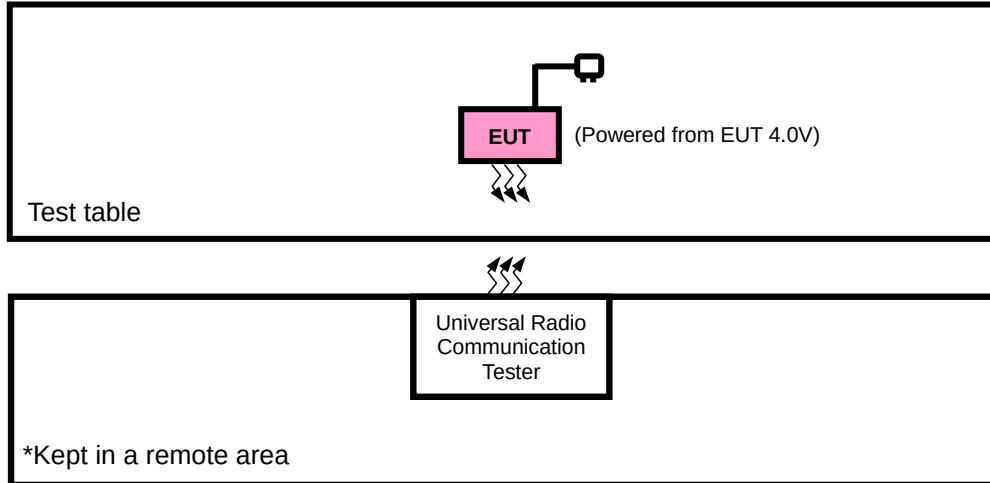
MODULATION MODE	TX FUNCTION
GSM/GPRS/EDGE	1TX/1RX
WCDMA	1TX/1RX
LTE	1TX/1RX

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



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	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 EIRP and radiated emission was found when positioned on X-plane for GSM/EDGE/ LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + DC Source with GSM or WCDMA or LTE link

GSM MODE

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



WCDMA

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

LTE BAND 2 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM	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 Report No.: W7L-230619W001RF02

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP	25deg. C, 57%RH	EUT 4.0V	Jace Hu
RADIATED EMISSION	23deg. C, 70%RH	EUT 4.0V	Jace Hu

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 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.

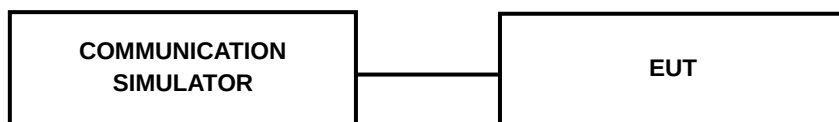
CONDUCTED POWER MEASUREMENT:

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	GSM1900		
Channel	512	661	810
Frequency	1850.2	1880	1909.8
GPRS (GMSK, 1Tx-slot)	29.11	29.13	29.04
GPRS (GMSK, 2Tx-slot)	27.34	27.39	27.38
GPRS (GMSK, 3Tx-slot)	25.58	25.54	25.44
GPRS (GMSK, 4Tx-slot)	24.40	24.34	24.29
EDGE (8PSK, 1Tx-slot)	25.06	25.06	25.10
EDGE (8PSK, 2Tx-slot)	23.69	23.64	23.41
EDGE (8PSK, 3Tx-slot)	22.67	22.48	22.37
EDGE (8PSK, 4Tx-slot)	21.46	21.53	21.32

Band	WCDMA II		
Channel	9262	9400	9538
Frequency	1852.4	1880	1907.6
RMC 12.2K	23.43	23.49	23.47
HSDPA Subtest-1	22.38	22.39	22.43
HSDPA Subtest-2	22.40	22.48	22.48
HSDPA Subtest-3	22.14	22.16	22.20
HSDPA Subtest-4	22.08	22.14	22.26
DC-HSDPA Subtest-1	22.43	22.39	22.51
DC-HSDPA Subtest-2	22.30	22.38	22.40
DC-HSDPA Subtest-3	22.05	22.08	22.17
DC-HSDPA Subtest-4	22.14	22.13	22.11
HSUPA Subtest-1	22.29	22.39	22.38
HSUPA Subtest-2	20.47	20.39	20.49
HSUPA Subtest-3	21.25	21.30	21.36
HSUPA Subtest-4	20.46	20.42	20.44
HSUPA Subtest-5	22.24	22.27	22.32



LTE BAND 2

Band/BW	Modulation	RB Size	RB Offset	Low CH 18607	Mid CH 18900	High CH 19193
				Frequency 1850.7 MHz	Frequency 1880 MHz	Frequency 1909.3 MHz
2/ 1.4	QPSK	1	0	22.55	22.60	22.64
		1	2	22.58	22.52	22.66
		1	5	22.59	22.61	22.65
		3	0	22.16	22.14	22.27
		3	1	22.26	22.23	22.22
		3	3	22.27	22.25	22.36
		6	0	21.82	21.79	21.80
	16QAM	1	0	21.87	21.87	21.94
		1	2	21.92	21.86	21.99
		1	5	21.88	21.83	21.95
		3	0	21.28	21.28	21.37
		3	1	21.34	21.38	21.44
		3	3	21.36	21.42	21.48
		6	0	20.73	20.74	20.81

Band/BW	Modulation	RB Size	RB Offset	Low CH 18615	Mid CH 18900	High CH 19185
				Frequency 1851.5 MHz	Frequency 1880 MHz	Frequency 1908.5 MHz
2/ 3	QPSK	1	0	22.54	22.59	22.67
		1	7	22.59	22.50	22.66
		1	14	22.56	22.60	22.69
		8	0	21.68	21.67	21.74
		8	3	21.69	21.74	21.75
		8	7	21.78	21.78	21.91
		15	0	21.77	21.83	21.77
	16QAM	1	0	21.85	21.89	21.97
		1	7	21.86	21.92	21.96
		1	14	21.91	21.83	21.94
		8	0	20.64	20.67	20.74
		8	3	20.76	20.77	20.83
		8	7	20.73	20.82	20.87
		15	0	20.73	20.69	20.81

Band/BW	Modulation	RB Size	RB Offset	Low CH 18625	Mid CH 18900	High CH 19175
				Frequency 1852.5 MHz	Frequency 1880 MHz	Frequency 1907.5 MHz
2/ 5	QPSK	1	0	22.54	22.65	22.63
		1	12	22.54	22.53	22.66
		1	24	22.55	22.61	22.65
		12	0	21.65	21.67	21.77
		12	6	21.69	21.73	21.74
		12	13	21.74	21.82	21.90
		25	0	21.79	21.80	21.74
	16QAM	1	0	21.84	21.93	21.97
		1	12	21.89	21.89	21.97
		1	24	21.91	21.83	21.95
		12	0	20.64	20.69	20.77
		12	6	20.79	20.73	20.87
		12	13	20.78	20.80	20.84
		25	0	20.73	20.68	20.84

Band/BW	Modulation	RB Size	RB Offset	Low CH 18650	Mid CH 18900	High CH 19150
				Frequency 1855 MHz	Frequency 1880 MHz	Frequency 1905 MHz
2/ 10	QPSK	1	0	22.59	22.63	22.61
		1	24	22.57	22.55	22.62
		1	49	22.59	22.67	22.66
		25	0	21.66	21.67	21.78
		25	12	21.76	21.73	21.75
		25	25	21.74	21.76	21.90
		50	0	21.82	21.81	21.79
	16QAM	1	0	21.89	21.93	21.93
		1	24	21.90	21.89	21.99
		1	49	21.87	21.89	21.93
		25	0	20.70	20.65	20.81
		25	12	20.74	20.75	20.84
		25	25	20.77	20.81	20.87
		50	0	20.78	20.71	20.78

Band/BW	Modulation	RB Size	RB Offset	Low CH 18675	Mid CH 18900	High CH 19125
				Frequency 1857.5 MHz	Frequency 1880 MHz	Frequency 1902.5 MHz
2/ 15	QPSK	1	0	22.52	22.63	22.64
		1	37	22.59	22.50	22.67
		1	74	22.53	22.64	22.65
		36	0	21.69	21.66	21.77
		36	19	21.75	21.68	21.75
		36	39	21.76	21.75	21.90
		75	0	21.82	21.83	21.74
	16QAM	1	0	21.85	21.86	21.93
		1	37	21.91	21.88	21.99
		1	74	21.91	21.84	21.91
		36	0	20.66	20.65	20.80
		36	19	20.80	20.71	20.88
		36	39	20.72	20.83	20.84
		75	0	20.77	20.68	20.85

Band/BW	Modulation	RB Size	RB Offset	Low CH 18700	Mid CH 18900	High CH 19100
				Frequency 1860 MHz	Frequency 1880 MHz	Frequency 1900 MHz
2/ 20	QPSK	1	0	22.60	22.67	22.69
		1	50	22.61	22.58	22.68
		1	99	22.61	22.68	22.70
		50	0	21.72	21.72	21.79
		50	25	21.77	21.75	21.80
		50	50	21.82	21.83	21.92
		100	0	21.83	21.85	21.82
	16QAM	1	0	21.92	21.94	21.99
		1	50	21.94	21.94	22.01
		1	99	21.93	21.91	21.96
		50	0	20.72	20.73	20.82
		50	25	20.82	20.79	20.89
		50	50	20.80	20.87	20.89
		100	0	20.79	20.76	20.86



**BUREAU
VERITAS**

Test Report No.: W7L-230619W001RF02

EIRP POWER (dBm)

GSM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
512	1850.2	29.11	1.52	30.63	1156.11	2
661	1880.0	29.13	1.52	30.65	1161.45	2
810	1909.8	29.04	1.52	30.56	1137.63	2

EDGE

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
512	1850.2	25.06	1.52	26.58	454.99	2
661	1880.0	25.06	1.52	26.58	454.99	2
810	1909.8	25.1	1.52	26.62	459.2	2

WCDMA

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
9662	1852.4	23.43	1.52	24.95	312.61	2
9800	1880	23.49	1.52	25.01	316.96	2
9938	1907.6	23.47	1.52	24.99	315.5	2

**LTE BAND 2****CHANNEL BANDWIDTH: 1.4MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18607	1850.7	22.59	1.52	24.11	257.63	2
18900	1880.0	22.61	1.52	24.13	258.82	2
19193	1908.3	22.66	1.52	24.18	261.82	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	21.92	1.52	23.44	220.8	2
18900	1880.0	21.87	1.52	23.39	218.27	2
19193	1908.3	21.99	1.52	23.51	224.39	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	22.59	1.52	24.11	257.63	2
18900	1880.0	22.6	1.52	24.12	258.23	2
19185	1908.5	22.69	1.52	24.21	263.63	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	21.91	1.52	23.43	220.29	2
18900	1880.0	21.92	1.52	23.44	220.8	2
19185	1908.5	21.97	1.52	23.49	223.36	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	22.55	1.52	24.07	255.27	2
18900	1880.0	22.65	1.52	24.17	261.22	2
19175	1907.5	22.66	1.52	24.18	261.82	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	21.91	1.52	23.43	220.29	2
18900	1880.0	21.93	1.52	23.45	221.31	2
19175	1907.5	21.97	1.52	23.49	223.36	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	22.59	1.52	24.11	257.63	2
18900	1880.0	22.67	1.52	24.19	262.42	2
19150	1905.0	22.66	1.52	24.18	261.82	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	21.9	1.52	23.42	219.79	2
18900	1880.0	21.93	1.52	23.45	221.31	2
19150	1905.0	21.99	1.52	23.51	224.39	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	22.59	1.52	24.11	257.63	2
18900	1880.0	22.64	1.52	24.16	260.62	2
19125	1902.5	22.67	1.52	24.19	262.42	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	1.52	23.43	220.29	2
18900	1880.0	21.88	1.52	23.4	218.78	2
19125	1902.5	21.99	1.52	23.51	224.39	2

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18700	1860	22.61	1.52	24.13	258.82	2
18900	1880	22.68	1.52	24.2	263.03	2
19100	1900	22.7	1.52	24.22	264.24	2

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18700	1860	21.94	1.52	23.46	221.82	2
18900	1880	21.94	1.52	23.46	221.82	2
19100	1900	22.01	1.52	23.53	225.42	2

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 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 .

3.2.2 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. $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

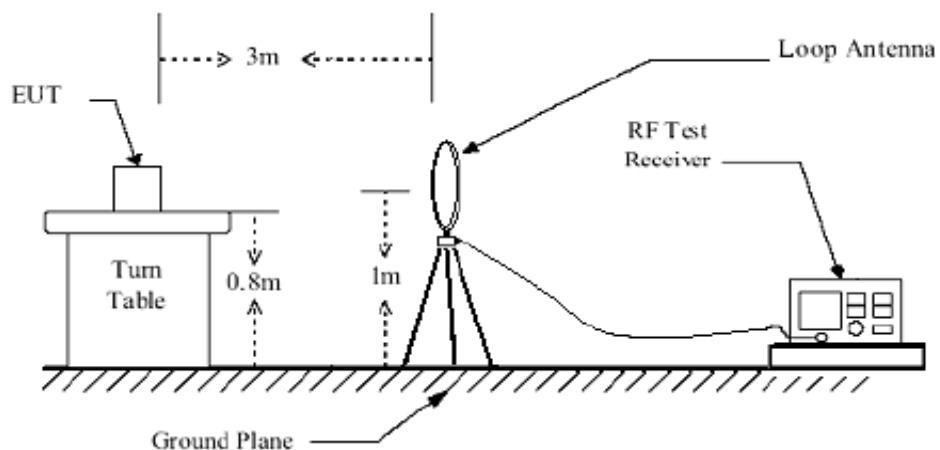
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.2.3 DEVIATION FROM TEST STANDARD

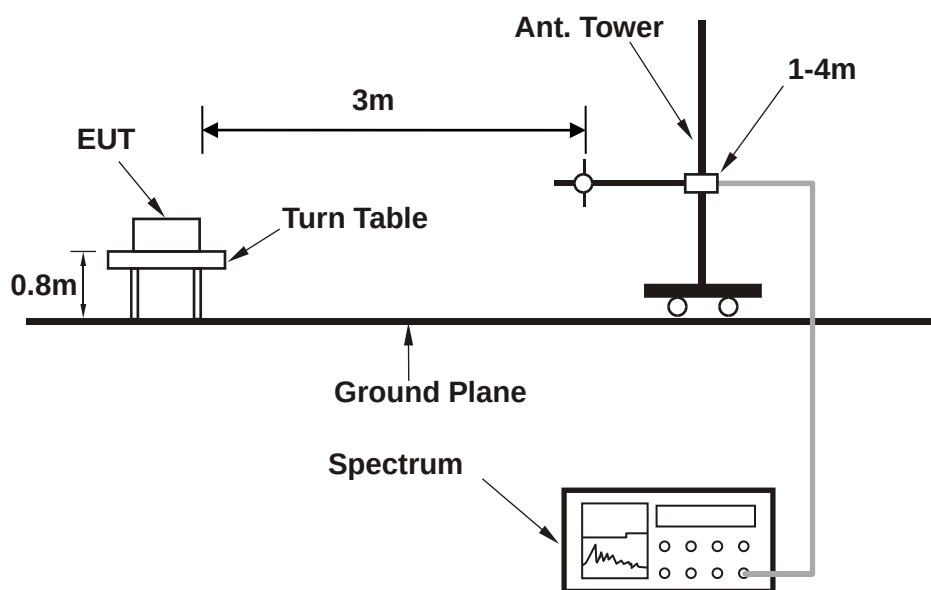
No deviation

3.2.4 TEST SETUP

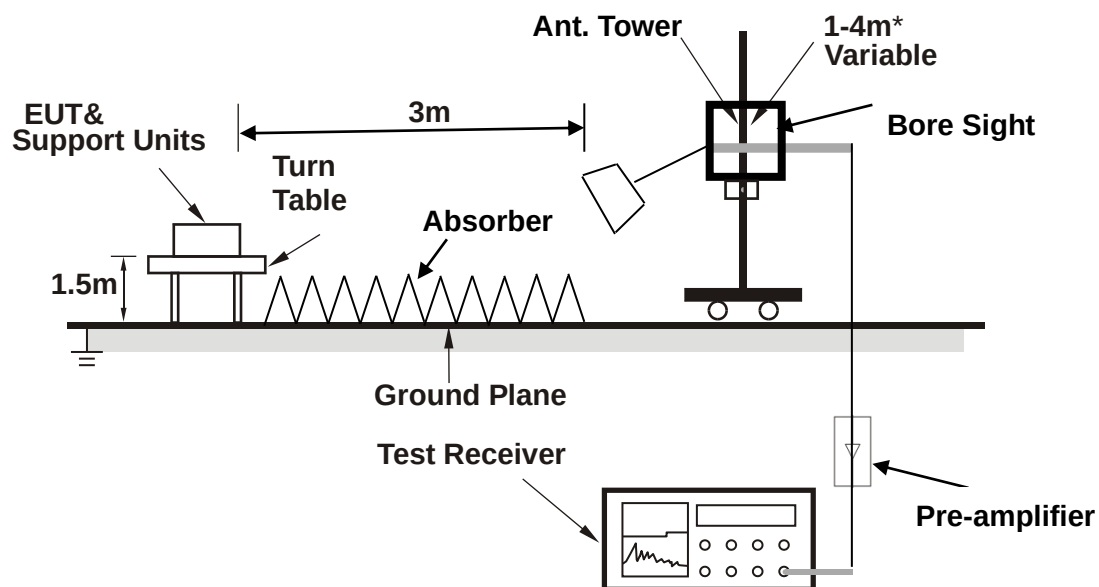
< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

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



**BUREAU
VERITAS**

Test Report No.: W7L-230619W001RF02

3.2.5 TEST RESULTS

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

BELOW 1GHz WORST-CASE DATA

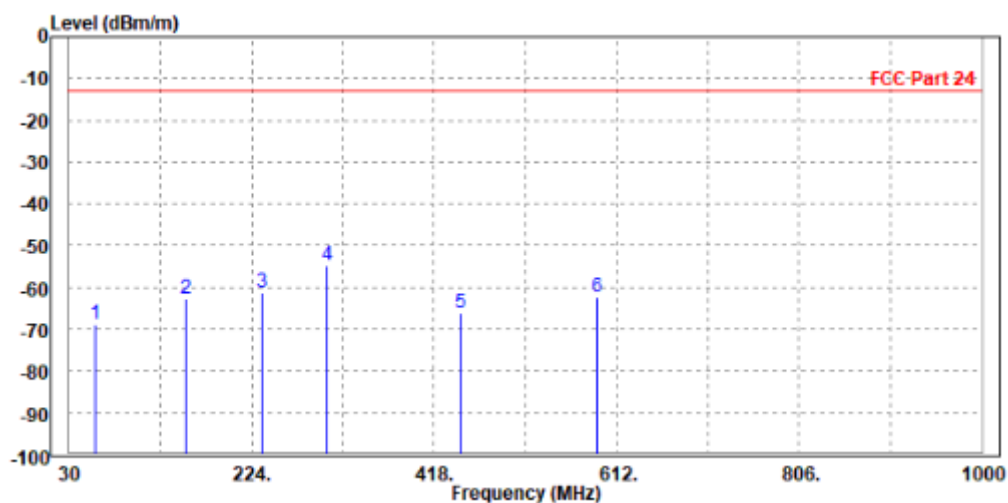
30 MHz – 1GHz data:

WCDMA Band II

CHANNEL BANDWIDTH: 9262 ~ 9538

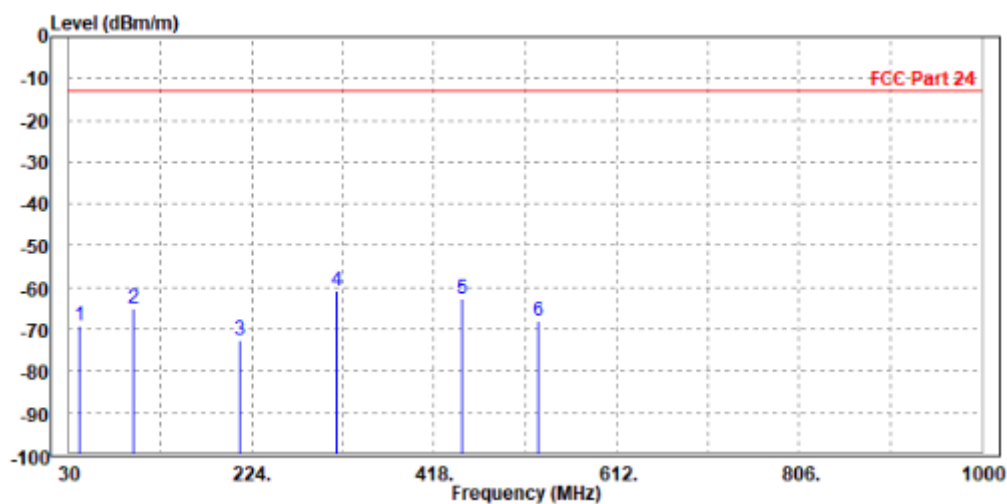
MODE	TX channel 9538	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	57.160	-68.89	-50.63	-13.00	-55.89	-18.26	Peak	Horizontal
2	154.160	-62.87	-45.12	-13.00	-49.87	-17.75	Peak	Horizontal
3	235.640	-61.11	-47.94	-13.00	-48.11	-13.17	Peak	Horizontal
4 PP	303.540	-54.73	-42.35	-13.00	-41.73	-12.38	Peak	Horizontal
5	445.160	-66.33	-57.11	-13.00	-53.33	-9.22	Peak	Horizontal
6	590.660	-62.24	-57.80	-13.00	-49.24	-4.44	Peak	Horizontal



MODE	TX channel 9538	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
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	40.670	-69.01	-44.09	-13.00	-56.01	-24.92	Peak	Vertical
2	97.900	-65.15	-56.81	-13.00	-52.15	-8.34	Peak	Vertical
3	211.390	-72.48	-55.46	-13.00	-59.48	-17.02	Peak	Vertical
4 PP	314.210	-60.80	-50.24	-13.00	-47.80	-10.56	Peak	Vertical
5	447.100	-62.75	-54.18	-13.00	-49.75	-8.57	Peak	Vertical
6	528.580	-68.17	-60.65	-13.00	-55.17	-7.52	Peak	Vertical



ABOVE 1GHz

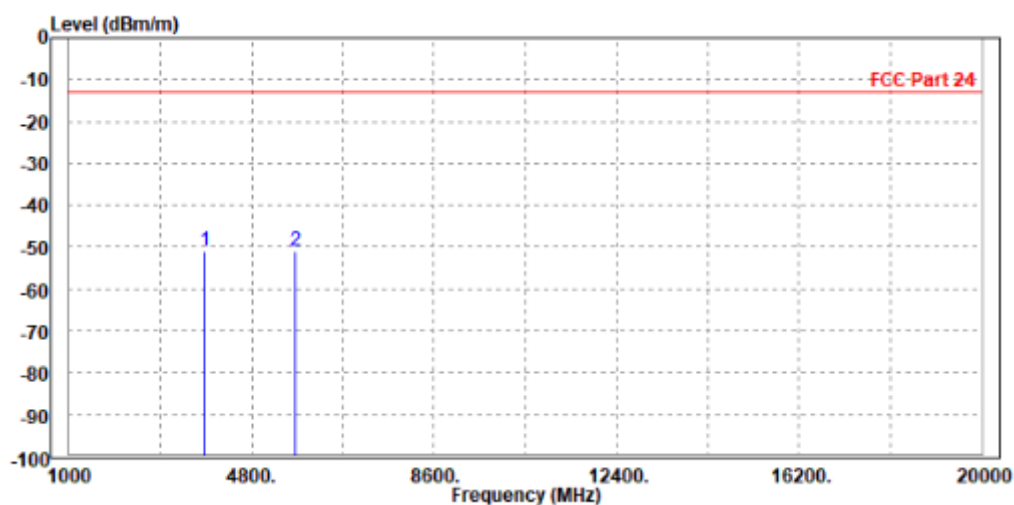
Note: For higher frequency, the emission is too low to be detected.

WCDMA Band II

CH 9538

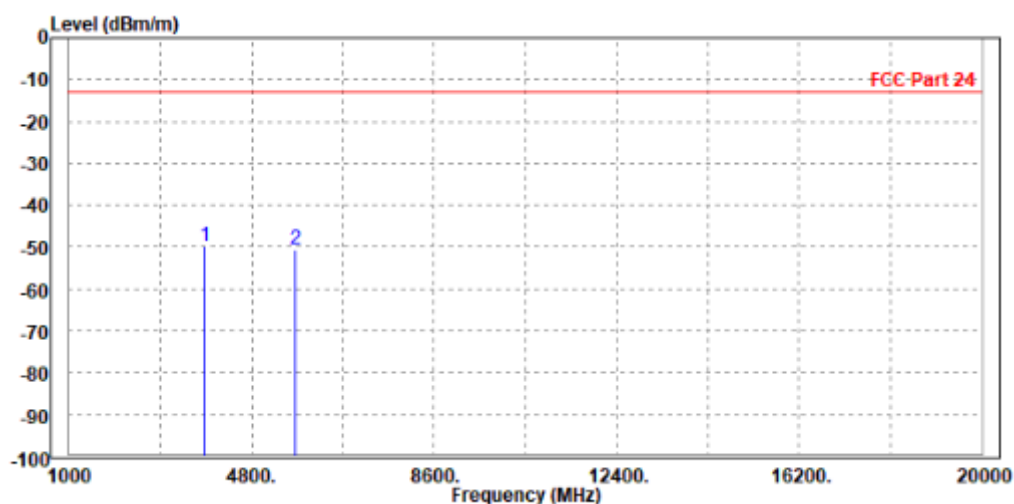
MODE	TX channel 9538	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	3815.200	-50.89	-59.02	-13.00	-37.89	8.13	Peak	Horizontal
2		5722.800	-51.14	-62.04	-13.00	-38.14	10.90	Peak	Horizontal



MODE	TX channel 9538	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	EUT 4.0V
TESTED BY	Jace Hu		
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 3815.200	-49.77	-57.55	-13.00	-36.77	7.78	Peak	Vertical
2	5722.800	-50.48	-61.84	-13.00	-37.48	11.36	Peak	Vertical





Test Report No.: W7L-230619W001RF02

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:

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.

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---