



# VARIANT 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:	CT45-L1N-G
FCC ID:	HD5-CT45L1NG
Date of tests:	Oct. 25, 2021 ~ Nov. 08, 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
Date: Nov. 09, 2021	Date: Nov. 09, 2021

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Test Report No.: W7L-P21110009RF15

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-P21080006RF15	Original release	Sep. 01, 2021
W7L-P21040030RF15	Based on the original report W7L-P21080006RF15 Changed LCM to screen HD(1280*720), removing a 2nd BLE and Supercap, Increase the RTC battery, Detail refer to Product Equality Declaration	Sep. 09, 2021
W7L-P21110009RF15	Based on the original report W7L-P21040030RF15 Changing components, add a new screen , added band CA_41C by Software.	Nov. 09, 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	N.A
2.1055 22.355	Frequency Stability	N.A
2.1049 22.917 (b)	Occupied Bandwidth	N.A
22.913 (d)	Peak to average ratio*	N.A
22.917	Band Edge Measurements	N.A
2.1051 22.917	Conducted Spurious Emissions	N.A
2.1053 22.917	Radiated Spurious Emissions	Compliance

**NOTE:**

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

Per the change notice provide by manufactory, the difference is changing components, add a new screen, added band CA\_41C by Software. All the change no effect any RF parameter, Therefore only verify the radiated emission worse case and show the verify test data on this report. More test details please refer from the original report.

## 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. 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. 02,21	Jun. 01,22
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_V 7.6.15.9.2	N/A	N/A	N/A
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



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Power Sensor	Anritsu	MA2411B	1339352	May. 07,21	May. 06,22
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

<b>PRODUCT</b>	Mobile Computer	
<b>BRAND NAME</b>	Honeywell	
<b>MODEL NAME</b>	CT45-L1N-G	
<b>NOMINAL VOLTAGE</b>	3.85Vdc (Lithium-ion cell, battery)	
<b>MODULATION TYPE</b>	<b>GSM/GPRS/EDGE</b>	GMSK, 8PSK
	<b>WCDMA</b>	BPSK,QPSK
	<b>LTE</b>	QPSK, 16QAM, 64QAM
<b>FREQUENCY RANGE</b>	<b>GSM/GPRS/EDGE</b>	824.2MHz ~ 848.8MHz
	<b>WCDMA</b>	826.4MHz ~ 846.6MHz
	<b>LTE Band 5 (Channel Bandwidth: 1.4MHz)</b>	824.7MHz ~ 848.3MHz
	<b>LTE Band 5 (Channel Bandwidth: 3MHz)</b>	825.5MHz ~ 847.5MHz
	<b>LTE Band 5 (Channel Bandwidth: 5MHz)</b>	826.5MHz ~ 846.5MHz
	<b>LTE Band 5 (Channel Bandwidth: 10MHz)</b>	829MHz ~ 844MHz
	<b>LTE Band 26 (Channel Bandwidth: 1.4MHz)</b>	814.7MHz ~ 848.3MHz
	<b>LTE Band 26 (Channel Bandwidth: 3MHz)</b>	815.5MHz ~ 847.5MHz
	<b>LTE Band 26 (Channel Bandwidth: 5MHz)</b>	816.5MHz ~ 846.5MHz
	<b>LTE Band 26 (Channel Bandwidth: 10MHz)</b>	819MHz ~ 844MHz
	<b>LTE Band 26 (Channel Bandwidth: 15MHz)</b>	821.5MHz ~ 841.5MHz
<b>MAX. ERP POWER</b>	<b>GSM</b>	835.60mW
	<b>EDGE</b>	214.78mW
	<b>WCDMA</b>	119.12mW
	<b>LTE Band 5 (Channel Bandwidth: 1.4MHz)</b>	111.43mW
	<b>LTE Band 5 (Channel Bandwidth: 3MHz)</b>	110.41mW
	<b>LTE Band 5 (Channel Bandwidth: 5MHz)</b>	110.66mW
	<b>LTE Band 5 (Channel Bandwidth: 10MHz)</b>	111.94mW



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<b>MAX. ERP POWER</b>	<b>LTE Band 26 (Channel Bandwidth: 1.4MHz)</b>	215.77mW	
	<b>LTE Band 26 (Channel Bandwidth: 3MHz)</b>	213.30mW	
	<b>LTE Band 26 (Channel Bandwidth: 5MHz)</b>	215.28mW	
	<b>LTE Band 26 (Channel Bandwidth: 10MHz)</b>	215.77mW	
	<b>LTE Band 26 (Channel Bandwidth: 15MHz)</b>	218.27mW	
<b>EMISSION DESIGNATOR GOGN</b>	<b>GSM</b>	240KGXW	
	<b>EDGE</b>	240KG7W	
	<b>WCDMA</b>	4M15F9W	
	<b>LTE Band 5 (Channel Bandwidth: 1.4MHz)</b>	QPSK: 1M09G7D	
		16QAM: 1M09W7D	
		64QAM: 1M09W7D	
	<b>LTE Band 5 (Channel Bandwidth: 3MHz)</b>	QPSK: 2M70G7D	
		16QAM: 2M68W7D	
		64QAM: 2M69W7D	
	<b>LTE Band 5 (Channel Bandwidth: 5MHz)</b>	QPSK: 4M49G7D	
		16QAM: 4M48W7D	
		64QAM: 4M58W7D	
	<b>LTE Band 5 (Channel Bandwidth: 10MHz)</b>	QPSK: 8M95G7D	
		16QAM: 8M95W7D	
		64QAM: 8M95W7D	
	<b>LTE Band 26 (Channel Bandwidth: 1.4MHz)</b>	QPSK: 1M08G7D	
		16QAM: 1M09W7D	
		64QAM: 1M09W7D	
	<b>LTE Band 26 (Channel Bandwidth: 3MHz)</b>	QPSK: 2M70G7D	
		16QAM: 2M69W7D	
		64QAM: 2M69W7D	
<b>LTE Band 26 (Channel Bandwidth: 5MHz)</b>	QPSK: 4M47G7D		
	16QAM: 4M48W7D		
	64QAM: 4M49W7D		
<b>LTE Band 26 (Channel Bandwidth: 10MHz)</b>	QPSK: 8M95G7D		
	16QAM: 8M94W7D		
	64QAM: 8M94W7D		
<b>LTE Band 26 (Channel Bandwidth: 15MHz)</b>	QPSK: 13M4G7D		
	16QAM: 13M4W7D		
	64QAM: 13M5W7D		
<b>ANTENNA TYPE</b>	PIFA Antenna with -0.56dBi gain for GSM850/ WCDMA5/LTE band 5 PIFA Antenna with 2.67dBi gain for LTE band 26		
<b>HW VERSION</b>	V1.0		





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

**NOTE:**

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- This product includes the following six 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-27D120G ,Assembled Scanner Imager: <a href="#">7-S0703</a>
2	SKU ID:CT45-L1N-28D120G ,Assembled Scanner Imager: <a href="#">8 - N6803/S0803</a>
3	SKU ID: CT45-L1N-28D120T, Assembled with Scanner: 8 - N6803/S0803 for Turkey Only
4	SKU ID: CT45-L1N-27D120T, Assembled with Scanner: 7-S0703 for Turkey Only
5	SKU ID:CT45-L1N-28D220C, Assembled with Scanner: 8 - N6803/S0803 for China Only with Android non-GMS
6	SKU ID:CT45-L1N-27D220C, Assembled with Scanner: 7-S0703 for China Only with Android non-GMS

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

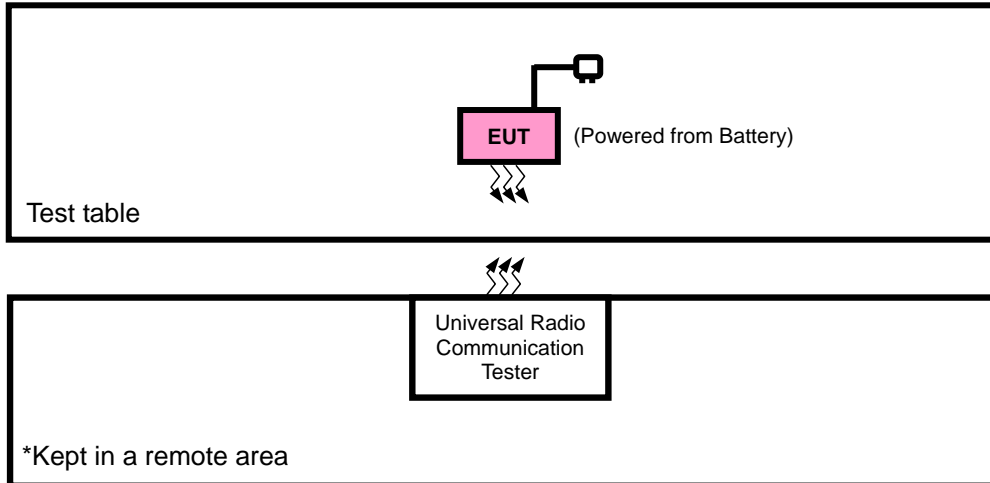
**List of Accessory:**

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 1	TZD	TS5099	5.0" HD(1280*720)
LCD Panel 2	TIANMA	TM050JVZG53	5.0" HD(1280*720)



## 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



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**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**

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	



CONDCUDED 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	
CONDCUDED 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.



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**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
CONDCUDED 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





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## 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 RADIATED EMISSION MEASUREMENT

##### 3.1.1 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  $-13\text{dBm}$ .

##### 3.1.2 TEST PROCEDURES

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G
- c.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ .
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  
 $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}$ .

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

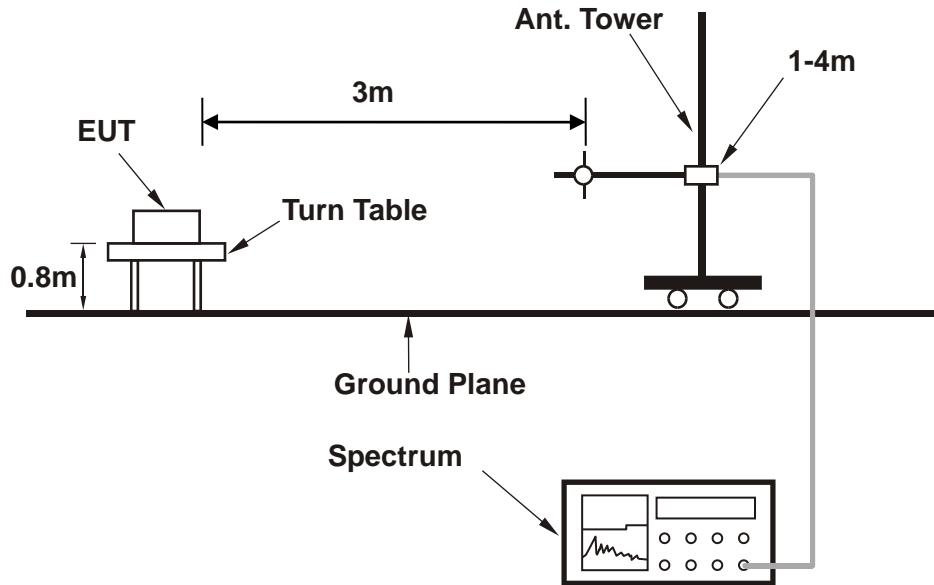
##### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

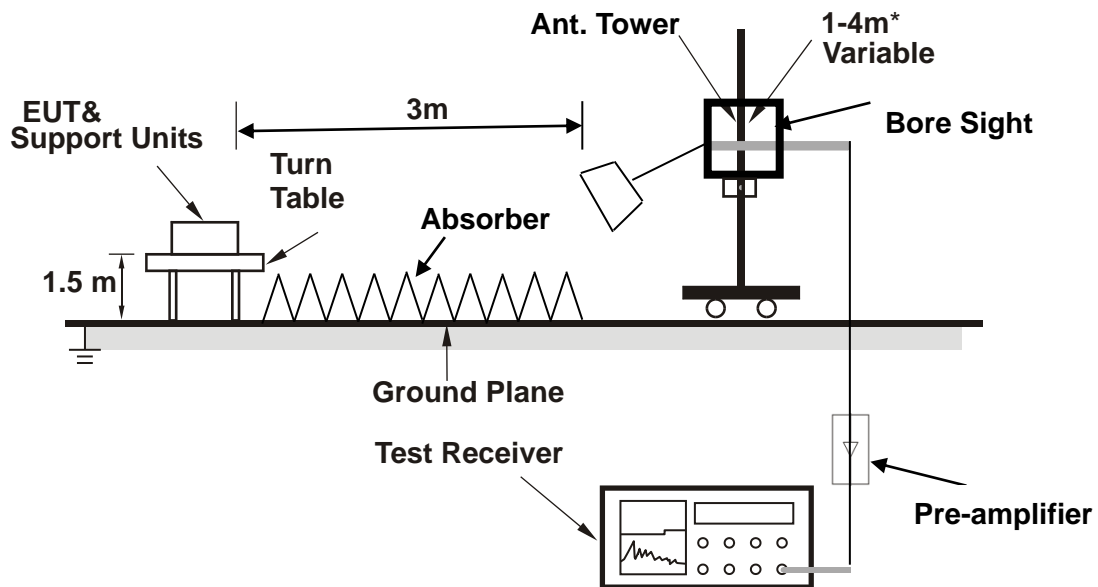


### 3.1.4 TEST SETUP

#### < 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).



### 3.1.5 TEST RESULTS

#### BELOW 1GHz WORST-CASE DATA

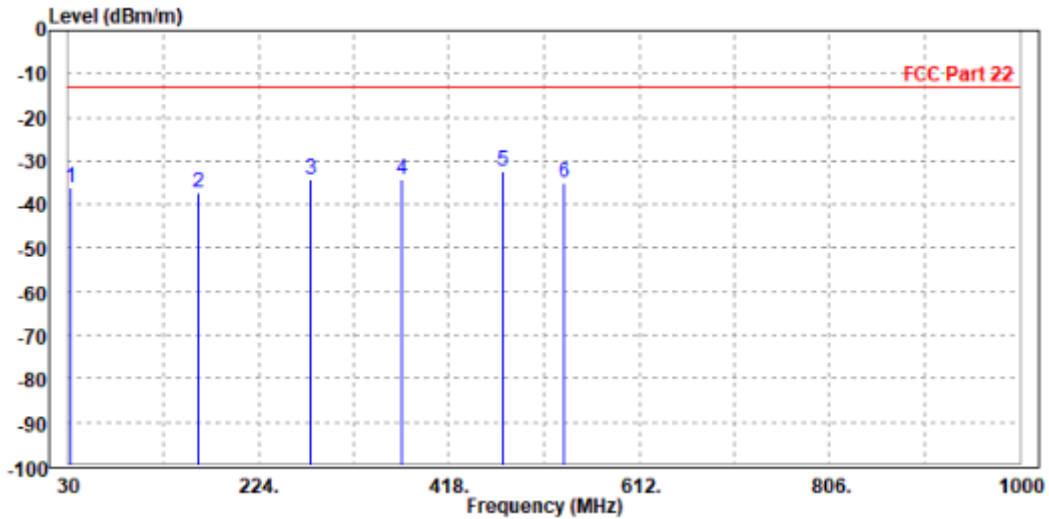
30 MHz – 1GHz data:

GSM 850

CHANNEL BANDWIDTH: 128 ~ 251

<b>MODE</b>	TX channel 128	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	AC 120V/60Hz
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	32.910	-36.15	-55.58	-13.00	-23.15	19.43	Peak	Horizontal
2	161.920	-37.27	-48.10	-13.00	-24.27	10.83	Peak	Horizontal
3	277.350	-34.09	-47.73	-13.00	-21.09	13.64	Peak	Horizontal
4	370.470	-34.20	-50.24	-13.00	-21.20	16.04	Peak	Horizontal
5 PP	472.320	-32.16	-50.36	-13.00	-19.16	18.20	Peak	Horizontal
6	535.370	-34.86	-54.27	-13.00	-21.86	19.41	Peak	Horizontal



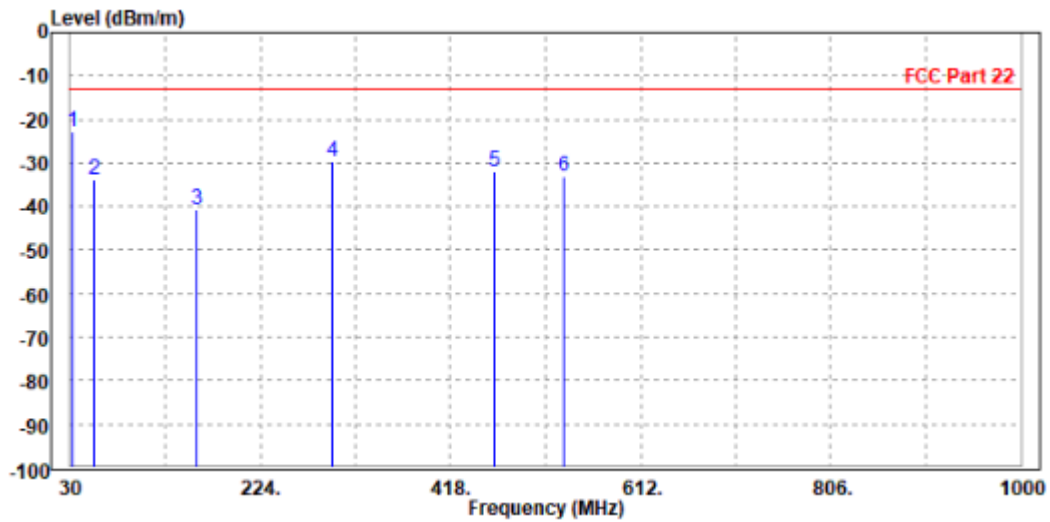


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<b>MODE</b>	TX channel 128	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	AC 120V/60Hz
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	32.910	-22.66	-41.58	-13.00	-9.66	18.92	Peak	Vertical
2	54.250	-33.95	-42.48	-13.00	-20.95	8.53	Peak	Vertical
3	159.010	-40.63	-51.98	-13.00	-27.63	11.35	Peak	Vertical
4	297.720	-29.48	-44.43	-13.00	-16.48	14.95	Peak	Vertical
5	462.620	-31.91	-50.30	-13.00	-18.91	18.39	Peak	Vertical
6	533.430	-32.93	-52.63	-13.00	-19.93	19.70	Peak	Vertical





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**ABOVE 1GHz DATA**

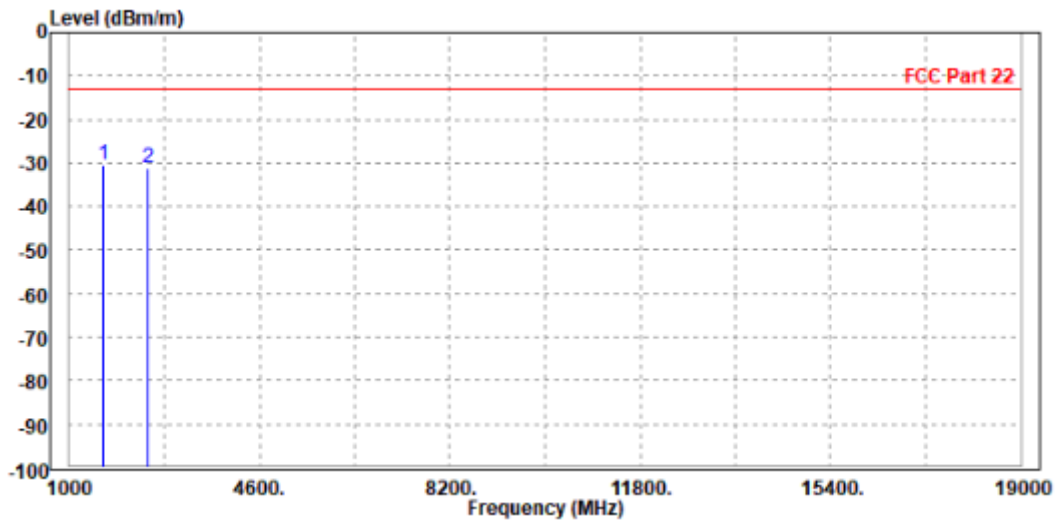
**Note:** For higher frequency, the emission is too low to be detected.

**GSM 850**

**CH 128:**

<b>MODE</b>	TX channel 128	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	AC 120V/60Hz
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1648.400	-30.60	-33.86	-13.00	-17.60	3.26	Peak	Horizontal
2	2476.000	-31.01	-39.04	-13.00	-18.01	8.03	Peak	Horizontal



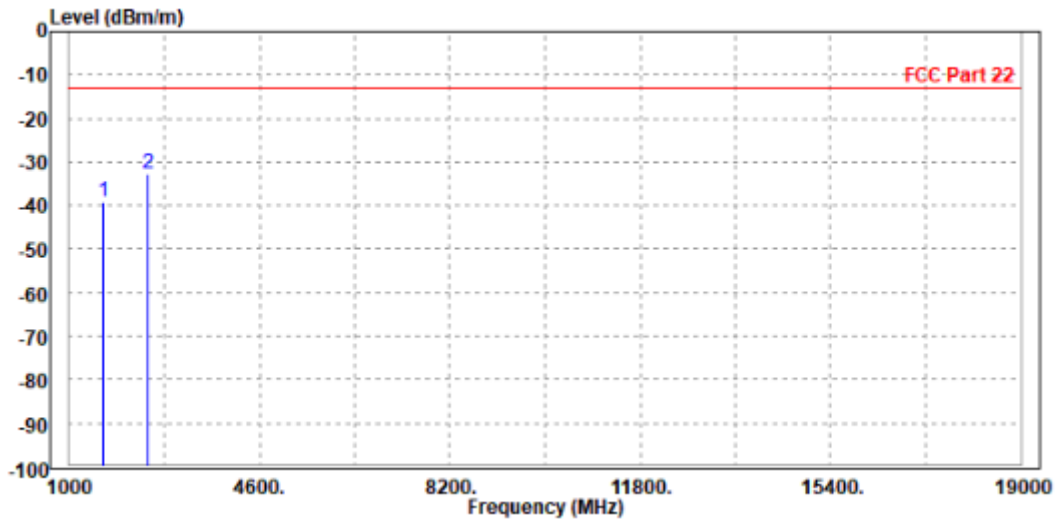


**BUREAU  
VERITAS**

**Test Report No.: W7L-P21110009RF15**

<b>MODE</b>	TX channel 128	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	AC 120V/60Hz
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1648.000	-39.12	-42.50	-13.00	-26.12	3.38	Peak	Vertical
2 PP	2476.000	-32.60	-39.64	-13.00	-19.60	7.04	Peak	Vertical





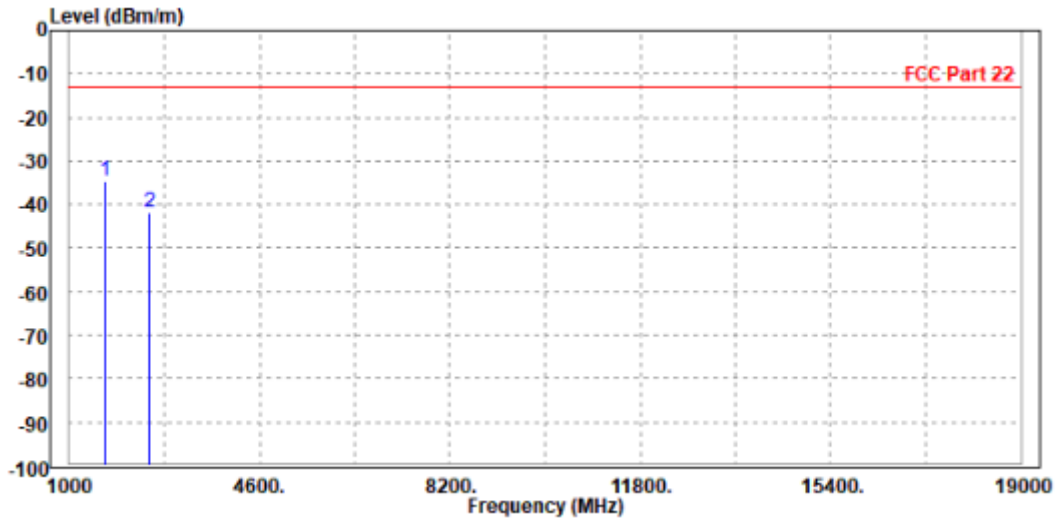
**BUREAU  
VERITAS**

Test Report No.: W7L-P21110009RF15

**CH 189:**

<b>MODE</b>	TX channel 189	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	AC 120V/60Hz
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

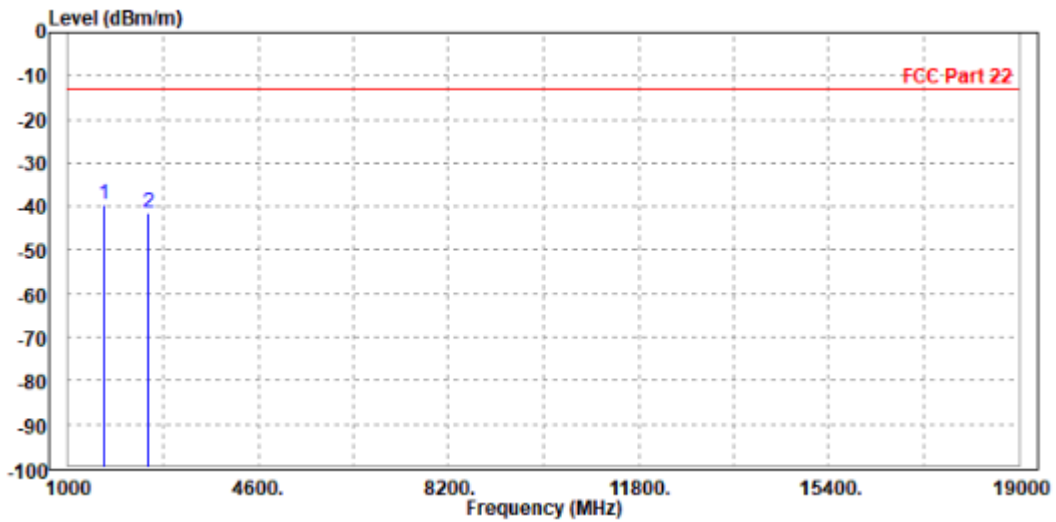
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1672.800	-34.65	-38.20	-13.00	-21.65	3.55	Peak	Horizontal
2	2512.000	-41.68	-49.74	-13.00	-28.68	8.06	Peak	Horizontal





<b>MODE</b>	TX channel 189	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	AC 120V/60Hz
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1666.000	-39.70	-43.24	-13.00	-26.70	3.54	Peak	Vertical
2	2509.200	-41.53	-48.63	-13.00	-28.53	7.10	Peak	Vertical





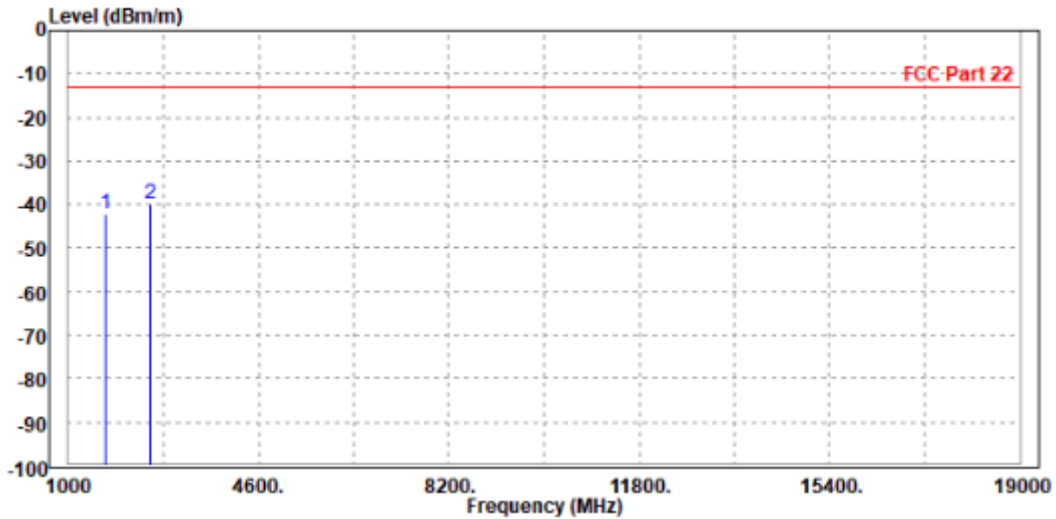
**BUREAU  
VERITAS**

Test Report No.: W7L-P21110009RF15

CH 251:

<b>MODE</b>	TX channel 251	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	AC 120V/60Hz
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1702.000	-42.32	-46.23	-13.00	-29.32	3.91	Peak	Horizontal
2 PP	2546.400	-40.10	-48.21	-13.00	-27.10	8.11	Peak	Horizontal



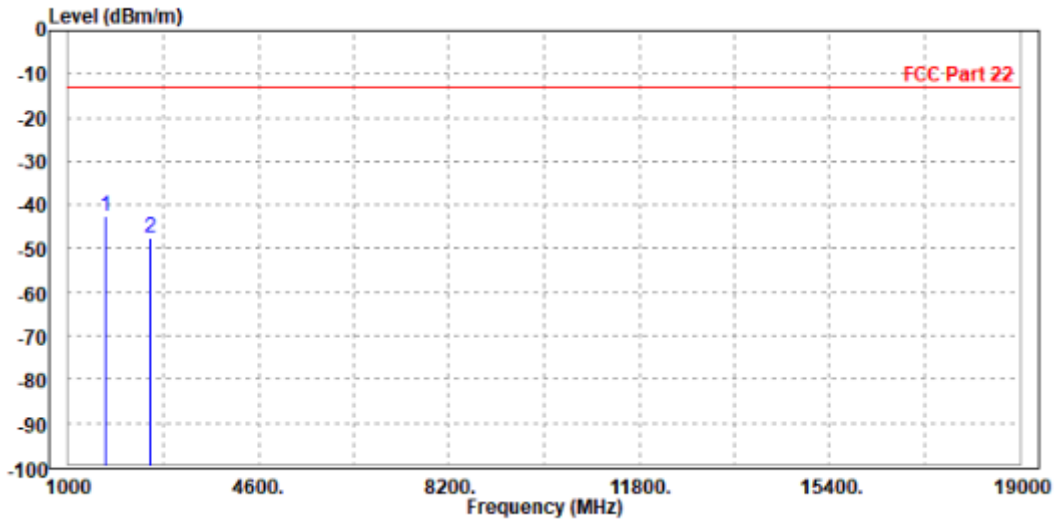


**BUREAU  
VERITAS**

**Test Report No.: W7L-P21110009RF15**

<b>MODE</b>	TX channel 251	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	AC 120V/60Hz
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1702.000	-42.55	-46.42	-13.00	-29.55	3.87	Peak	Vertical
2	2546.400	-47.44	-54.66	-13.00	-34.44	7.22	Peak	Vertical





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## 4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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## 5 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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

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**Email:** [customerservice.sw@cn.bureauveritas.com](mailto:customerservice.sw@cn.bureauveritas.com)

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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



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## 6 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---