VARIANT FCC TEST REPORT

(Part 15, Subpart C)

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

Manufacturer or Supplier:	Honeywell International Inc Honeywell Safety and Productivity Solutions
Address:	9680 Old Bailes Road, Fort Mill, SC 29707 United States
Product:	Mobile Computer
Brand Name:	Honeywell
Model Name:	CT45P-L1N-E
FCC ID:	HD5-CT45PL1NE
Date of tests:	Oct. 14, 2021 ~ Nov. 04, 2021

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

☒ **FCC Part 15, Subpart C, Section 15.247**

☒ **ANSI C63.10-2013**

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

Prepared by Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
Simon Date: Nov. 05, 2021	Luke Lu Date: Nov. 05, 2021

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
W7L-P21080006RF12	Original release	Sep. 01, 2021
W7L-P21080009RF12	Based on the original report W7L-P21080006RF12 Changing the SIM to 1 Nano SIM and 1 E-SIM	Sep. 09, 2021
W7L-P21110007RF12	Based on the original report W7L-P21080009RF17 Changing components, added band CA_41C by Software.	Nov. 05, 2021

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C		
STANDARD	**TEST TYPE AND LIMIT**	**RESULT**
15.207	AC Power Conducted Emission	Compliance
15.247(a)(1)(iii)	Number of Hopping Frequency Used	N.A
15.247(a)(1)(iii)	Dwell Time on Each Channel	N.A
15.247(a)(1)	1. Hopping Channel Separation 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	N.A
15.247(b)	Maximum Peak Output Power	N.A
15.247(d)& 15.209	Transmitter Radiated Emissions	Compliance
15.247(d)	Out of band Measurement	N.A
15.203	Antenna Requirement	N.A

NOTE:

1. If the Frequency Hopping System operating in 2400-2483.5MHz band and the output power less than 125mW. The hopping channel carrier frequencies separated by a minimum of 25kHz or two-thirds of the 20dB bandwidth of hopping channel whichever is greater.
2. Per the change notice provide by manufactory, the difference is changing components, added band CA_41C by Software, all the change no effect any RF parameter, Therefore only verify the CE and radiated emission worse case and show the verify test data on this report. More test details please refer from the original report.
3. N/A Please refer to original report W7L- P21080009RF12

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
AC Power Conducted emissions	±2.70dB
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
Conducted Output power	±2.06dB
Power Spectral Density	±0.85 dB

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

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Mobile Computer
BRAND NAME	Honeywell
MODEL NAME	CT45P-L1N-E
NOMINAL VOLTAGE	3.85Vdc (Lithium-ion cell, battery)
MODULATION TECHNOLOGY	FHSS
MODULATION TYPE	GFSK, 8DPSK, π/4 DQPSK
OPERATING FREQUENCY	2402MHz~2480MHz
NUMBER OF CHANNEL	79
MAX. OUTPUT POWER	3.66mW (Max. Measured)
ANTENNA TYPE	PIFA Antenna with 0.51dBi gain
HW VERSION	V1.0
SW VERSION	OS.11.002-HON.11.002
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB cable: unshielded without ferrite, 1.25 meter Earphone cable: unshielded without ferrite, 1.27 meter

NOTE:

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

2. This product includes the following four 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-37D1E0G ,Assembled Scanner Imager: 7-S0703
2	SKU ID:CT45-L1N-38D1E0G ,Assembled Scanner Imager: 8 – N6803/S0803
3	SKU ID: CT45-L1N-38D1E0T , Assembled Scanner Imager: 8 – N6803/S0803 for Turkey Only
4	SKU ID: CT45-L1N-37D1E0T , Assembled with Scanner: 7-S0703 for Turkey Only

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

List of Accessory:

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

2.2 DESCRIPTION OF TEST MODES

79 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

2.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photograph of the test configuration for reference.

2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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 was found when positioned on X axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	APCM	
-	√	√	√	√	-

Where **RE<1G:** Radiated Emission below 1GHz **RE≥1G:** Radiated Emission above 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	78	FHSS	8DPSK	3DH5

RADIATED EMISSION TEST (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	0, 39, 78	FHSS	GFSK	DH5
-	0 to 78	0, 39, 78	FHSS	8DPSK	3DH5

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture) and packet type.

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	PACKET TYPE
-	0 to 78	78	FHSS	8DPSK	3DH5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RE<1G	23deg. C, 70%RH	DC 3.85V By Battery	Carl xie
RE≥1G	23deg. C, 70%RH	DC 3.85V By Battery	Carl xie
PLC	25deg. C, 52%RH	DC 3.85V By Battery	Lily Zhao

2.3 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 Part 15, Subpart C. Section 15.247
ANSI C63.10-2013

NOTE: 1. All test items have been performed and recorded as per the above standards.

2. The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.

2.4 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	Desktop	Lenovo	M73 SFF	PC04GRQV	N/A
2	Desktop	Lenovo	M73 SFF	PC06CS27	N/A
3	Laptop	Lenovo	Thnikpad L440	R90FTFKN	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line: Unshielded, Detachable 1.5m
2	AC Line: Unshielded, Detachable 1.5m
3	AC Line: Unshielded, Detachable 1.5m

3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE: 1.The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Mar. 03,21	Mar. 02,22
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Feb. 22,21	Feb. 21,22

NOTE: 1. The test was performed in CE shielded room.

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

3.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

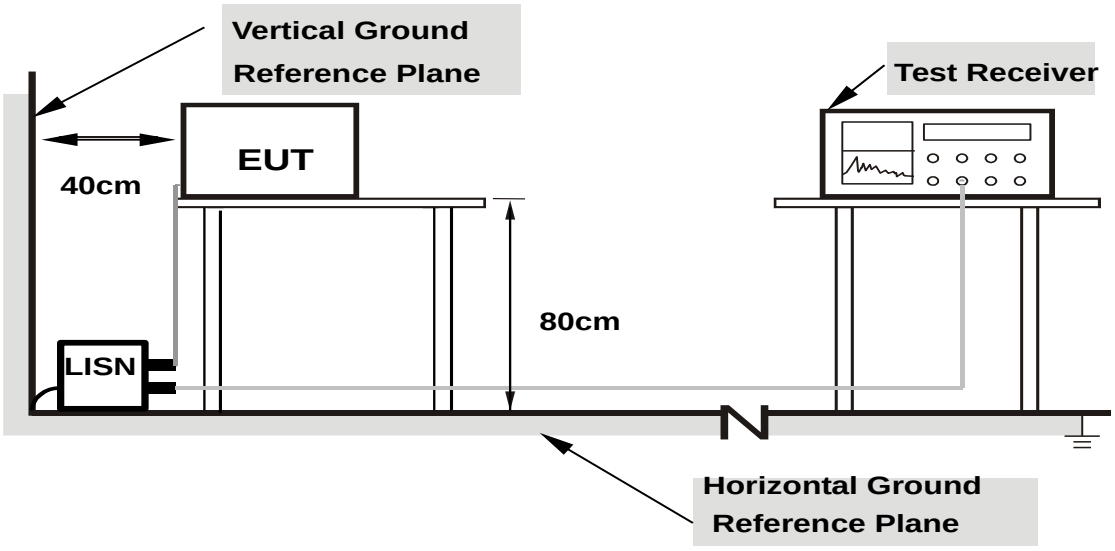
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.

3.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

3.1.6 EUT OPERATING CONDITIONS

a. Turned on the power and connected of all equipment.
b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

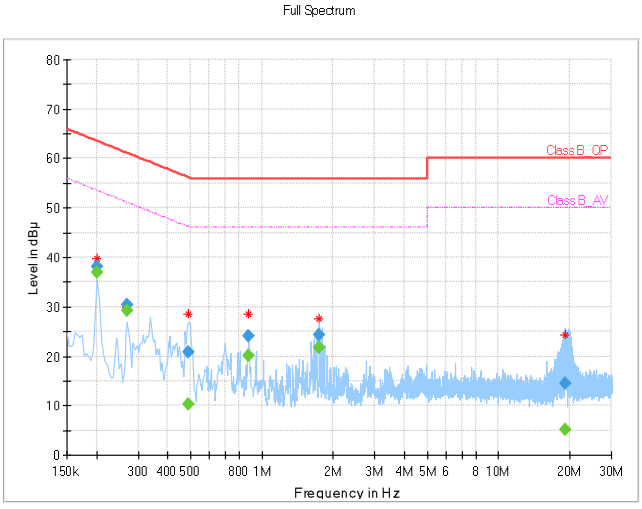
3.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA:

Frequency Range	150KHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	25deg. C, 55%RH
Tested By	Carl Xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.202000	---	37.06	53.53	16.47	L1	ON	9.7
0.202000	38.07	---	63.53	25.46	L1	ON	9.7
0.268000	---	29.23	51.18	21.95	L1	ON	9.7
0.268000	30.33	---	61.18	30.85	L1	ON	9.7
0.488000	---	10.28	46.20	35.93	L1	ON	9.7
0.488000	20.94	---	56.20	35.27	L1	ON	9.7
0.880000	---	20.09	46.00	25.91	L1	ON	9.7
0.880000	24.00	---	56.00	32.00	L1	ON	9.7
1.748000	---	21.67	46.00	24.33	L1	ON	9.7
1.748000	24.23	---	56.00	31.77	L1	ON	9.7
19.096000	---	5.14	50.00	44.86	L1	ON	9.8
19.096000	14.52	---	60.00	45.48	L1	ON	9.8

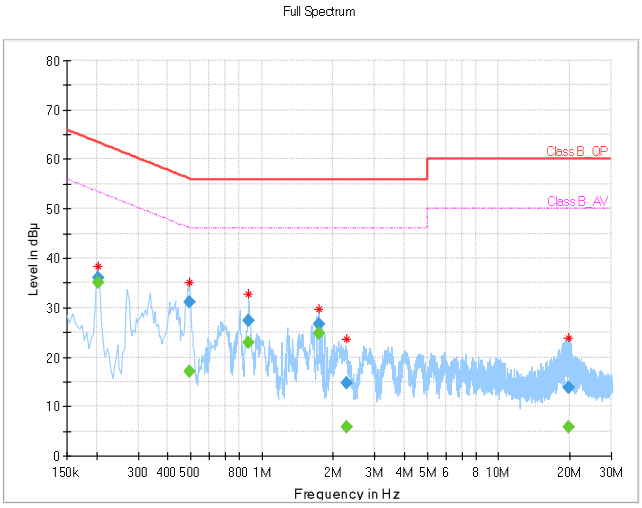
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value - Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



Frequency Range	150KHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25deg. C, 55%RH
Tested By	Carl Xie		

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.204000	---	35.07	53.45	18.38	N	ON	9.7
0.204000	36.14	---	63.45	27.31	N	ON	9.7
0.492000	---	17.06	46.13	29.08	N	ON	9.7
0.492000	31.11	---	56.13	25.02	N	ON	9.7
0.880000	---	22.83	46.00	23.17	N	ON	9.7
0.880000	27.33	---	56.00	28.67	N	ON	9.7
1.748000	---	24.88	46.00	21.12	N	ON	9.8
1.748000	26.61	---	56.00	29.39	N	ON	9.8
2.284000	---	5.96	46.00	40.04	N	ON	9.8
2.284000	14.70	---	56.00	41.30	N	ON	9.8
19.744000	---	5.81	50.00	44.19	N	ON	9.9
19.744000	13.81	---	60.00	46.19	N	ON	9.9

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Limit value - Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



3.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). Other emissions shall be at least 20dB below the highest level of the desired power.

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	May. 19,20	May. 18,23
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
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. 03,21	Jun. 02,22
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Apr. 22,21	Apr. 21,22
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

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 Chamber.

3. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

3.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

NOTE:

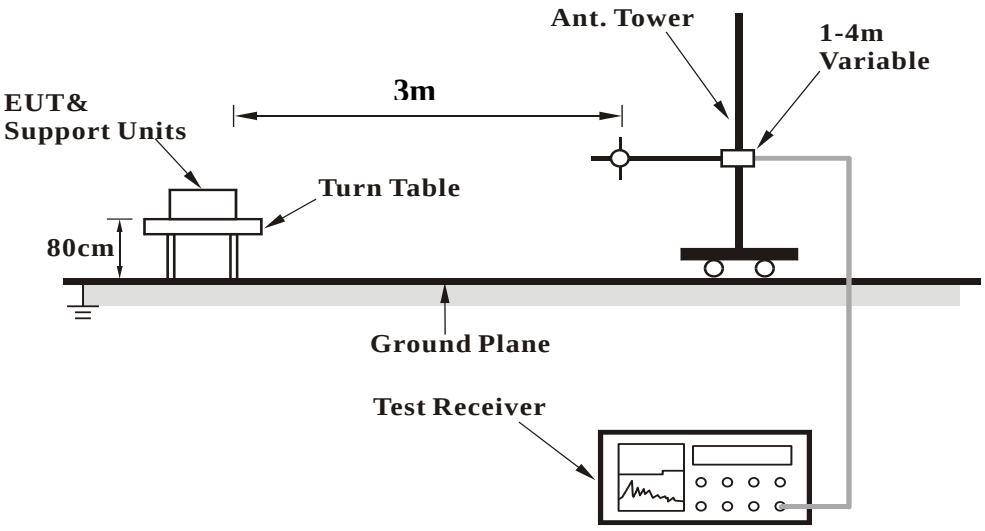
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit.
5. All modes of operation were investigated and the worst-case emissions are reported.

3.2.4 DEVIATION FROM TEST STANDARD

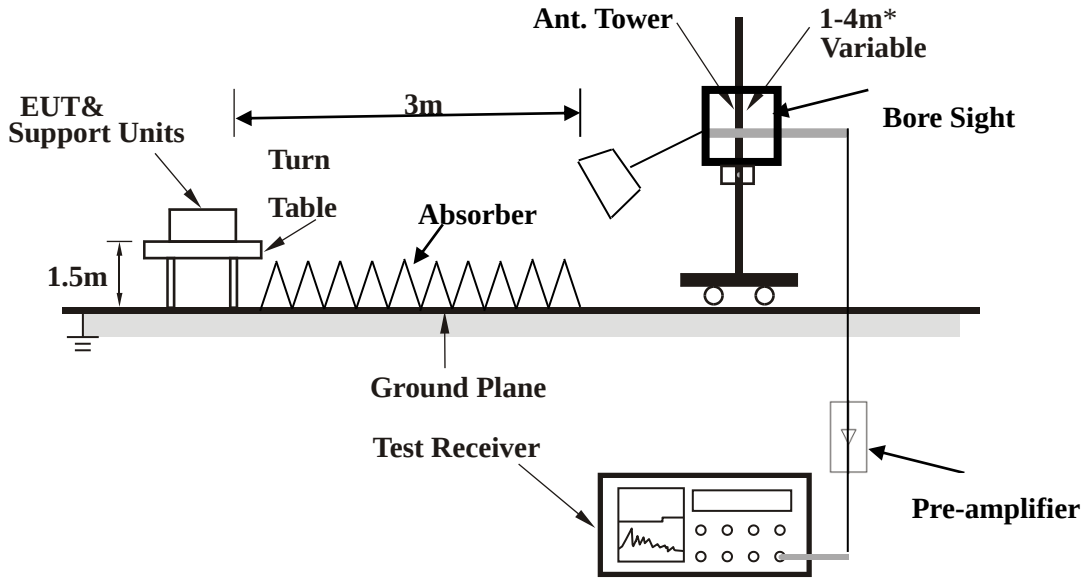
No deviation.

3.2.5 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).

3.2.6 EUT OPERATING CONDITIONS

a. Set the EUT under full load condition and placed them on a testing table.

b. Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

c. The necessary accessories enable the EUT in full functions.

3.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

30 MHz – 1GHz data:

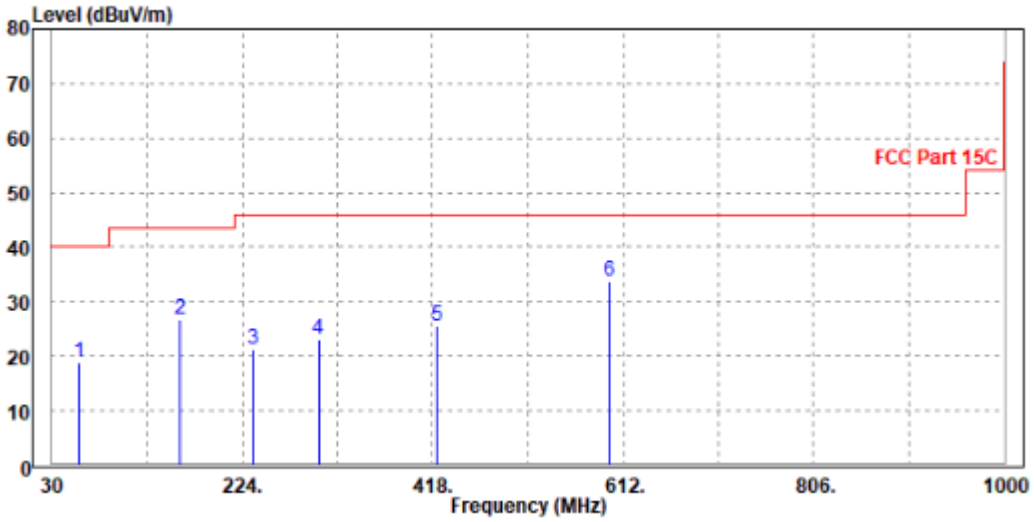
GFSK

CHANNEL	Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
58.13	18.8	47.36	40	-21.2	7.79	0.98	37.33	200	0	Peak
159.98	26.9	51.13	43.5	-16.6	10.9	1.6	36.73	200	0	Peak
234.67	21.24	43.38	46	-24.76	12.53	1.95	36.62	200	0	Peak
301.6	23.23	43.72	46	-22.77	14.05	2.21	36.75	200	0	Peak
422.85	25.44	42.36	46	-20.56	17.31	2.64	36.87	200	0	Peak
597.45	33.62	47.12	46	-12.38	20.65	3.21	37.36	200	0	Peak

REMARKS:

1. Emission Level(dBuV/m) = Read Level(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

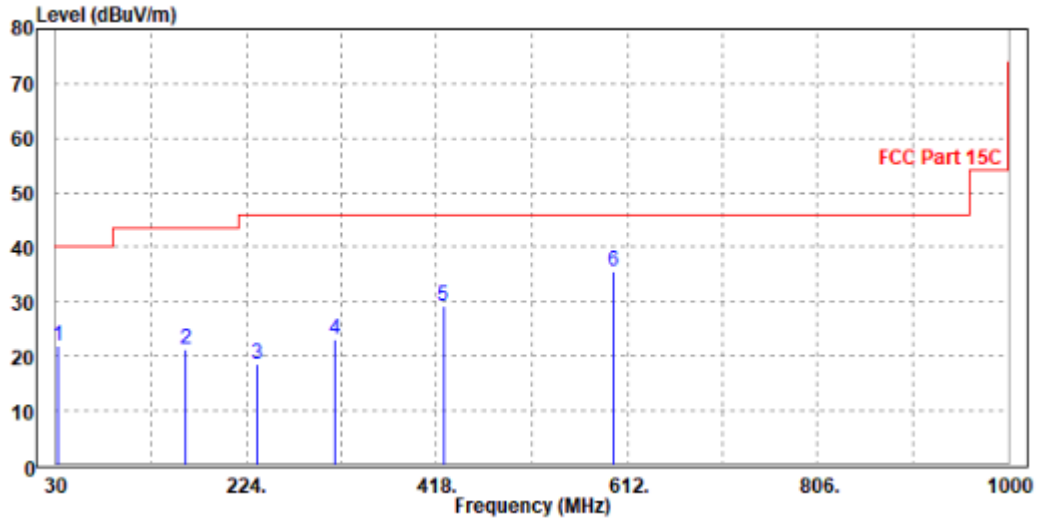


CHANNEL	Channel 39	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
32.91	21.83	39.65	40	-18.17	18.92	0.73	37.47	300	0	Peak
162.89	21.24	45.01	43.5	-22.26	11.33	1.62	36.72	300	0	Peak
234.67	18.65	40.23	46	-27.35	13.09	1.95	36.62	300	0	Peak
314.21	23.19	42.39	46	-22.81	15.31	2.25	36.76	300	0	Peak
424.79	29.21	45.76	46	-16.79	17.67	2.65	36.87	300	0	Peak
598.42	35.47	48.75	46	-10.53	20.87	3.21	37.36	300	0	Peak

REMARKS:

1. Emission Level(dBuV/m) = Read Level(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



ABOVE 1GHz WORST-CASE DATA:

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

GFSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	49.68	58.44	74	-24.32	31.75	5.86	46.37	165	205	Peak
2390	43.61	52.37	54	-10.39	31.75	5.86	46.37	165	205	Average
2402	100.16	108.86	-	-	31.79	5.88	46.37	165	205	Peak
2402	98.52	107.22	-	-	31.79	5.88	46.37	165	205	Average
2483.5	51.68	60.01	74	-22.32	32.05	5.99	46.37	165	205	Peak
2483.5	43.2	51.53	54	-10.8	32.05	5.99	46.37	165	205	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	51.02	59.39	74	-22.98	32.14	5.86	46.37	100	150	Peak
2390	42.9	51.27	54	-11.1	32.14	5.86	46.37	100	150	Average
2402	96.12	104.45	-	-	32.16	5.88	46.37	100	150	Peak
2402	94.27	102.6	-	-	32.16	5.88	46.37	100	150	Average
2483.5	50.65	58.67	74	-23.35	32.36	5.99	46.37	100	150	Peak
2483.5	42.86	50.88	54	-11.14	32.36	5.99	46.37	100	150	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2402MHz: Fundamental frequency.

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.08	60.84	74	-21.92	31.75	5.86	46.37	125	80	Peak
2390	42.22	50.98	54	-11.78	31.75	5.86	46.37	125	80	Average
2441	104.05	112.58	-	-	31.91	5.93	46.37	125	80	Peak
2441	102.72	111.25	-	-	31.91	5.93	46.37	125	80	Average
2483.5	53.24	61.57	74	-20.76	32.05	5.99	46.37	125	80	Peak
2483.5	43.19	51.52	54	-10.81	32.05	5.99	46.37	125	80	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.84	61.21	74	-21.16	32.14	5.86	46.37	100	180	Peak
2390	43.19	51.56	54	-10.81	32.14	5.86	46.37	100	180	Average
2441	106.2	114.38	-	-	32.26	5.93	46.37	100	180	Peak
2441	105.43	113.61	-	-	32.26	5.93	46.37	100	180	Average
2483.5	53.13	61.15	74	-20.87	32.36	5.99	46.37	100	180	Peak
2483.5	44.42	52.44	54	-9.58	32.36	5.99	46.37	100	180	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2441MHz: Fundamental frequency.

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	50.64	59.4	74	-23.36	31.75	5.86	46.37	130	205	Peak
2390	42.19	50.95	54	-11.81	31.75	5.86	46.37	130	205	Average
2480	99.26	107.61	-	-	32.04	5.98	46.37	130	205	Peak
2480	98.15	106.5	-	-	32.04	5.98	46.37	130	205	Average
2483.5	51.08	59.41	74	-22.92	32.05	5.99	46.37	130	205	Peak
2483.5	43.39	51.72	54	-10.61	32.05	5.99	46.37	130	205	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	49.7	58.07	74	-24.3	32.14	5.86	46.37	100	150	Peak
2390	42.72	51.09	54	-11.28	32.14	5.86	46.37	100	150	Average
2480	97.29	105.33	-	-	32.35	5.98	46.37	100	150	Peak
2480	96.58	104.62	-	-	32.35	5.98	46.37	100	150	Average
2483.5	49.06	57.08	74	-24.94	32.36	5.99	46.37	100	150	Peak
2483.5	42.35	50.37	54	-11.65	32.36	5.99	46.37	100	150	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2480MHz: Fundamental frequency.

BT_8DPSK

CHANNEL	TX Channel 0	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	49	57.76	74	-25	31.75	5.86	46.37	130	205	Peak
2390	42.26	51.02	54	-11.74	31.75	5.86	46.37	130	205	Average
2402	94.4	103.1	-	-	31.79	5.88	46.37	130	205	Peak
2402	94.35	103.05	-	-	31.79	5.88	46.37	130	205	Average
2483.5	51.15	59.48	74	-22.85	32.05	5.99	46.37	130	205	Peak
2483.5	42.32	50.65	54	-11.68	32.05	5.99	46.37	130	205	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	49.43	57.8	74	-24.57	32.14	5.86	46.37	100	150	Peak
2390	42.1	50.47	54	-11.9	32.14	5.86	46.37	100	150	Average
2402	92.18	100.51	-	-	32.16	5.88	46.37	100	150	Peak
2402	89.34	97.67	-	-	32.16	5.88	46.37	100	150	Average
2483.5	49.26	57.28	74	-24.74	32.36	5.99	46.37	100	150	Peak
2483.5	42.3	50.32	54	-11.7	32.36	5.99	46.37	100	150	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2402MHz: Fundamental frequency.

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	48.89	57.65	74	-25.11	31.75	5.86	46.37	100	190	Peak
2390	42.56	51.32	54	-11.44	31.75	5.86	46.37	100	190	Average
2441	93.12	101.65	-	-	31.91	5.93	46.37	100	190	Peak
2441	89.01	97.54	-	-	31.91	5.93	46.37	100	190	Average
2483.5	48.7	57.03	74	-25.3	32.05	5.99	46.37	100	190	Peak
2483.5	42.31	50.64	54	-11.69	32.05	5.99	46.37	100	190	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	50.07	58.44	74	-23.93	32.14	5.86	46.37	100	150	Peak
2390	42.14	50.51	54	-11.86	32.14	5.86	46.37	100	150	Average
2441	91.49	99.67	-	-	32.26	5.93	46.37	100	150	Peak
2441	88.26	96.44	-	-	32.26	5.93	46.37	100	150	Average
2483.5	49.09	57.11	74	-24.91	32.36	5.99	46.37	100	150	Peak
2483.5	42.3	50.32	54	-11.7	32.36	5.99	46.37	100	150	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2441MHz: Fundamental frequency.

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	50.97	59.73	74	-23.03	31.75	5.86	46.37	100	205	Peak
2390	42.26	51.02	54	-11.74	31.75	5.86	46.37	100	205	Average
2480	99.53	107.88	-	-	32.04	5.98	46.37	100	205	Peak
2480	95.24	103.59	-	-	32.04	5.98	46.37	100	205	Average
2483.5	52.61	60.94	74	-21.39	32.05	5.99	46.37	100	205	Peak
2483.5	43.36	51.69	54	-10.64	32.05	5.99	46.37	100	205	Average
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	49.75	58.12	74	-24.25	32.14	5.86	46.37	100	150	Peak
2390	42.85	51.22	54	-11.15	32.14	5.86	46.37	100	150	Average
2480	94.91	102.95	-	-	32.35	5.98	46.37	100	150	Peak
2480	92.37	100.41	-	-	32.35	5.98	46.37	100	150	Average
2483.5	51.32	59.34	74	-22.68	32.36	5.99	46.37	100	150	Peak
2483.5	42.42	50.44	54	-11.58	32.36	5.99	46.37	100	150	Average

REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Emission level – Limit value.
2. 2480MHz: Fundamental frequency.

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

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.

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