



FCC RADIO TEST REPORT

Applicant : ELO TOUCH SOLUTIONS, INC.

Address : 670 N. McCarthy Blvd., Suite 100 Milpitas, CA
95035 USA

Equipment : Computer Box

Model No. : ESY00I1E

Trade Name : Elo or **elo**

FCC ID : RBWESY00I1E

I HEREBY CERTIFY THAT :

The sample was received on Aug. 19, 2024 and the testing was completed on Oct. 26, 2024 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Mark Liao / Supervisor

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





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History of this test report

Report No.	Issued Date	Description
24080253-TRFCC01	Nov. 06, 2024	Original



1. Summary of Test Procedure and Test Results

1.1 Applicable Standards

ANSI C63.10:2013

FCC Rules and Regulations Part 15 Subpart C §15.247

FCC Rule	Description of Test	Result
15.203	. Antenna Requirement	PASS
15.247(a)(1)	.Pseudorandom Frequency Hopping Sequence	PASS
15.207	. AC Power Line Conducted Emission	PASS
15.209 15.205	. Radiated Spurious Emission	PASS
15.247(d)	. Conducted Spurious Emission	PASS
15.247(a)(1)	. Channel Carrier Frequencies Separation	PASS
15.247(a)(1)	. 20dB Bandwidth	PASS
15.247(a)(1)	. Dwell Time	PASS
15.247(b)	. Number of Hopping Channels	PASS
15.247(b)	. Output Power	PASS
2.1091	. Radio Frequency Exposure	PASS

*The lab has reduced the uncertainty risk factor from test equipment, environment and staff technicians which according to the standard on contract. Therefore, the test result will only be determined by standard requirement, measurement uncertainty evaluation is not considered.



2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Operation Frequency Range	BT / BLE: 2400-2483.5MHz WLAN:802.11b/g/n/ax: 2400-2483.5MHz 5GHz:802.11a/n/ac/ax:5150-5250MHz, 5250-5350MHz, 5470-5725MHz, 5725-5875MHz 6GHz: 802.11a/ax: 5925MHz~6425MHz, 6425MHz~6525MHz 6525MHz~6875MHz, 6875MHz~7125MHz
Center Frequency Range	BT / BLE: 2402MHz-2480MHz WLAN:802.11b/g/n/ax: 2412MHz-2462MHz 5GHz:802.11a/n/ac/ax:5180-5240MHz, 5260-5320MHz, 5500-5700MHz, 5745-5825MHz 6GHz: 802.11a/ax: 5955MHz~6415MHz, 6435MHz~6515MHz 6535MHz~6855MHz, 6895MHz~7115MHz
Modulation Type	BT: GFSK, $\pi/4$ -DQPSK, 8DPSK BLE: GFSK WLAN: 2.4GHz: 802.11b: CCK, DQPSK, DBPSK 802.11g/n: BPSK, QPSK, 16QAM, 64QAM 802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM 5GHz: 802.11a/n: BPSK, QPSK, 16QAM, 64QAM 802.11ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM 802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM 6GHz: 802.11a: BPSK, QPSK, 16QAM, 64QAM 802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Modulation Technology	DSSS, OFDM, FHSS, DTS, OFDMA
Data Rate	BT: GFSK: 1Mbps, $\pi/4$ -DQPSK: 2Mbps, 8DPSK: 3Mbps BLE: GFSK: 1Mbps, 2Mbps WLAN: 2.4GHz: 802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS15, HT20/40 802.11ax: MCS0 – MCS11, HE20/40 5GHz: 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS15, HT20/40 802.11ac: MCS0 – MCS9, VHT20/40/80/160 802.11ax: MCS0 – MCS11, HE20/40/80/160 6GHz: 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11ax: MCS0 – MCS11, HE20/40/80/160
Antenna Type	Dipole Antenna



Antenna Gain	For BT / BLE: 2402-2480MHz: ANT A: 3dBi For WLAN: 2412-2462MHz: ANT A: 3dBi, ANT B: 3dBi 5180-5240MHz: ANT A: 3.5dBi, ANT B: 3.5dBi 5260-5320MHz: ANT A: 3.5dBi, ANT B: 3.5dBi 5500-5700MHz: ANT A: 3.5dBi, ANT B: 3.5dBi 5745-5825MHz: ANT A: 3.5dBi, ANT B: 3.5dBi 5945-6425MHz: ANT A: 3.5dBi, ANT B: 3.5dBi 6425-6525MHz: ANT A: 3.5dBi, ANT B: 3.5dBi 6525-6875MHz: ANT A: 3.5dBi, ANT B: 3.5dBi 6875-7125MHz: ANT A: 3.5dBi, ANT B: 3.5dBi
Adapter	Brand: Billion Model: BA070-190342MBX
Adapter	Brand: Delta Model: ADP-65JH HB
Power cord (US)	Brand: I-SHENG Model: V44VS336T1218000-A01
Power cord (EU)	Brand: I-SHENG Model: EU85B300S121800

Note:

- 1.EUT support TPC Function.
- 2.WLAN and BT can simultaneously transmission.
- 3.EUT supports DFS Client Mode, without radar detection.
- 4.The device not support Channel Puncturing or Bandwidth Reduction mechanisms supported
- 5.802.11ax EUT only Support Full RU
- 6.EUT Operating mode: Indoor Client.
- 7.For more details, please refer to the User's manual of the EUT.



2.2 Carrier Frequency of Channes

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
*00	2402	20	2422	40	2442	60	2462
01	2403	21	2423	41	2443	61	2463
02	2404	22	2424	42	2444	62	2464
03	2405	23	2425	43	2445	63	2465
04	2406	24	2426	44	2446	64	2466
05	2407	25	2427	45	2447	65	2467
06	2408	26	2428	46	2448	66	2468
07	2409	27	2429	47	2449	67	2469
08	2410	28	2430	48	2450	68	2470
09	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	---	---

Note: Channels remarked * are selected to perform test.



2.3 Test Mode & Test Software

- During testing, the interface cables and equipment positions were varied according to ANSI C63.10
- The complete test system included Notebook and EUT for RF test.
- An executive program, "QRCT V4.0.211.0" under Windows OS system was executed to transmit and receive data via Bluetooth.
- The following test modes were performed for the test:

Conducted Emissions from the AC mains power ports	
Test Mode	Operating Description
1	GFSK (1Mbps), From Adapter (120V/60Hz)
2	$\pi/4$ -DQPSK (2Mbps), From Adapter (120V/60Hz)
3	8DPSK (3Mbps), From Adapter (120V/60Hz)
4	GFSK (1Mbps), From Adapter (240V/60Hz)
5	$\pi/4$ -DQPSK (2Mbps), From Adapter (240V/60Hz)
6	8DPSK (3Mbps), From Adapter (240V/60Hz)
caused "Test Mode 1" generated the worst case, it was reported as the final data.	
Radiation Emissions (9KHz ~ 30MHz and 30MHz ~ 1GHz)	
Test Mode	Operating Description
1	GFSK (1Mbps), From Adapter(120V/60Hz)
2	$\pi/4$ -DQPSK (2Mbps), From Adapter(120V/60Hz)
3	8DPSK (3Mbps), From Adapter(120V/60Hz)
4	GFSK (1Mbps), From Adapter(240V/60Hz)
5	$\pi/4$ -DQPSK (2Mbps), From Adapter(240V/60Hz)
6	8DPSK (3Mbps), From Adapter(240V/60Hz)
caused "Test Mode 1" generated the worst case, it was reported as the final data.	
Radiation Emissions (1GHz ~ 25GHz)	
Test Mode	Operating Description
1	GFSK (1Mbps), From Adapter(120V/60Hz)
2	$\pi/4$ -DQPSK (2Mbps), From Adapter(120V/60Hz)
3	8DPSK (3Mbps), From Adapter(120V/60Hz)
4	GFSK (1Mbps), From Adapter(240V/60Hz)
5	$\pi/4$ -DQPSK (2Mbps), From Adapter(240V/60Hz)
6	8DPSK (3Mbps), From Adapter(240V/60Hz)
caused "Test Mode1~3" generated the worst case, they were reported as the final data.	

Note:1. There are two kinds of test voltage: AC 120V / 60Hz and AC 240V / 60Hz.

worst case (V)

Test Item /test voltage	AC 120V / 60Hz	AC 240V / 60Hz.
AC Power Line Conducted Emission: SISO ANT/ MIMO ANT	V	
Radiation Emissions (Below 1GHz) : SISO ANT/ MIMO ANT	V	

2.The EUT has Two types of Adapters. After engineering evaluation,

For AC Power Line Conducted Emission, ADP-65JH HB is worst case.

For Radiated Spurious Emission(9kHz~30MHz,30MHz~1GHz), BA070-190342MBX is worst case.

For Radiated Spurious Emission(1GHz~40GHz), ADP-65JH HB is worst case., hence, are used at test report

Adapter	Brand: Billion Model: BA070-190342MBX
Adapter	Brand: Delta Model: ADP-65JH HB



Modulation Type	TX CONFIGURATION
GFSK	1TX
$\pi/4$ -DQPSK	1TX
8DPSK	1TX



2.4 Description of Test System

RF Conducted				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
Notebook	lenovo	S1GL2W	N/A	N/A
USB Cable (A to A)	BENEVO	E210567AWM	1m / NS	N/A

Radiated Emissions				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
Notebook	DELL	Latitude E5470	N/A	Adapter / 1.8m / NS
USB Cable (A to A)	BENEVO	E210567AWM	1m / NS	N/A
Flash*2	TranScend	USB3.0 16GB	N/A	N/A
Monitor	LG	24UD58	N/A	N/A
HDMI Cable	J5Create	HDMI 8K	1.8m / NS	N/A
TYPE-C(Blue)	kolin	KEX-DLCP08	1m / NS	N/A
RJ45 Cable	TE CONNECTIVITY	CAT5E	1.2m / NS	N/A
MicroSDHC	ADATA	8G	N/A	N/A
Mouse	DELL	MS116t	1.85m / NS	N/A

AC Power Line Conducted Emission				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
USB Cable (A to A)	BENEVO	E210567AWM	1m / NS	N/A
Notebook	Lenovo	S1GL2W	N/A	Adapter / 1.8m / NS
Monitor	LG	24UD58	N/A	N/A
HDMI Cable	YD-TECH	H1	1.8m / S	N/A
Mouse	Micsoft	MSK-1113	1.85m / S	N/A



2.5 General Information of Test

☒ Test Site	Cerpass Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel: +886-3-3226-888 Fax: +886-3-3226-881	
	FCC	TW1439, TW1079
	IC	4934E-1, 4934E-2
Frequency Range Investigated	Conducted: from 150kHz to 30 MHz Radiation: from 9kHz to 25,000MHz	
Test Distance	The test distance of radiated emission from antenna to EUT is 3 M.	

Test Item	Test Site	Test Period	Environmental Conditions	Tested By
RF Conducted	RFCON01-NK	2024/09/26	26.3°C / 42%	Leon Huang
RF Conducted	RFCON01-NK	2024/09/27	27.4°C / 45%	Leon Huang
Radiated Emissions	3M02-NK	2024/09/25	23.4°C / 48%	Park Chen
Radiated Emissions	3M02-NK	2024/10/26	23.1°C / 53%	Park Chen
AC Power Line Conducted Emission	CON02-NK	2024/09/30	25°C / 63%	Leon Huang



2.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Item	Uncertainty
AC Power Line Conduction(150K~30MHz)	$\pm 3.12\text{dB}$
Radiated Spurious Emission(9KHz~30MHz)	$\pm 3.5\text{dB}$
Radiated Spurious Emission(30MHz~1GHz)	$\pm 5.1\text{dB}$
Radiated Spurious Emission(1GHz~40GHz)	$\pm 5.2\text{dB}$
Conducted Spurious Emission	$\pm 2.1\text{dB}$
6dB Bandwidth	$\pm 5.4\%$
20dB Bandwidth	$\pm 4.4\%$
Occupied Bandwidth	$\pm 4.5\%$
Peak Output Power(Conducted Power Meter)	$\pm 1.1\text{dB}$
Dwell Time / Deactivation Time	$\pm 7.6\%$
Power Spectral Density	$\pm 2.0\text{dB}$
Duty Cycle	$\pm 3.5\%$



3. Test Equipment and Ancillaries Used for Tests

Test Item	Radiated Emissions				
Test Site	Semi Anechoic Room(3M02-NK) (2024/9/25)				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Bilog Antenna	Schwarzbeck	VULB9168	369	2024/02/19	2025/02/18
Active Loop Antenna	Schwarzbeck	FMZB 1513	414	2024/01/16	2025/01/15
Horn Antenna	EMCO	3115	31589	2024/02/26	2025/02/25
Horn Antenna	EMCO	3116	31974	2023/10/16	2024/10/15
EMI Receiver	ROHDE & SCHWARZ	ESR 7	101906	2024/05/13	2025/05/12
Spectrum Analyzer	ROHDE & SCHWARZ	FSV 40-N	101329	2024/07/16	2025/07/15
Preamplifier	Agilent	8449B	3008A01954	2024/03/01	2025/02/28
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2023/10/13	2024/10/12
Preamplifier	EM Electronics corp.	EM330	60659	2024/02/17	2025/02/16
Cable-4m(9k-3G)	EMEC	RG-223	18274M	2024/08/08	2025/08/07
Cable-3in1(30M-1G)	HARBOUR INDUSTRIES	LL142	CCE1315	2024/02/23	2025/02/22
Cable-0.5m(1G-40G)	HUBER SUHNER	SUCOFLEX 104	805443/4	2024/03/05	2025/03/04
Cable-3m(1G-40G)	HUBER SUHNER	SUCOFLEX 104	805796/4	2024/03/05	2025/03/04
Cable-8m(1G-26.5G)	WOKEN	WCBA-WCA203SM	CCE1374	2024/03/05	2025/03/04
Cable-1m(1G-40G)	HUBER SUHNER	HUBER SUHNER / SF102	804398/2	2023/10/12	2024/10/11
Cable-3m(1G-40G)	HUBER SUHNER	HUBER SUHNER / SF102	804619/2	2023/10/12	2024/10/11
E3	AUDIX	v8.2014-8-6	RK-000529	NA	NA
High Pass Filter	Warison	WFIL-H3000-18000F-03	WRJ5CFWC2J1	2024/07/03	2025/07/02
Notch Filter	Warison	WFIL-N5925-7125F-04	WRQ4BFWC4M1	2024/03/11	2025/03/10
Hipass Filter	Warison	WFIL-H7500-18000F	WRQ4BFWC2J1	2024/03/11	2025/03/10



Test Item	Radiated Emissions				
Test Site	Semi Anechoic Room(3M02-NK)(2024/10/26)				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Bilog Antenna	Schwarzbeck	VULB9168	369	2024/02/19	2025/02/18
Active Loop Antenna	Schwarzbeck	FMZB 1513	414	2024/01/16	2025/01/15
Horn Antenna	EMCO	3115	31589	2024/02/26	2025/02/25
Horn Antenna	EMCO	3116	31970	2024/02/23	2025/02/22
EMI Receiver	ROHDE & SCHWARZ	ESR 7	101906	2024/05/13	2025/05/12
Spectrum Analyzer	ROHDE & SCHWARZ	FSV 40-N	101329	2024/07/16	2025/07/15
Preamplifier	Agilent	8449B	3008A01954	2024/03/01	2025/02/28
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2024/10/15	2025/10/14
Preamplifier	EM Electronics corp.	EM330	60659	2024/02/17	2025/02/16
Cable-4m(9k-3G)	EMEC	RG-223	18274M	2024/08/08	2025/08/07
Cable-3in1(30M-1G)	HARBOUR INDUSTRIES	LL142	CCE1315	2024/02/23	2025/02/22
Cable-0.5m(1G-40G)	HUBER SUHNER	SUCOFLEX 104	805443/4	2024/03/05	2025/03/04
Cable-3m(1G-40G)	HUBER SUHNER	SUCOFLEX 104	805796/4	2024/03/05	2025/03/04
Cable-8m(1G-26.5G)	WOKEN	WCBA-WCA203SM	CCE1374	2024/03/05	2025/03/04
Cable-3m(10M-40G)	HUBER SUHNER	SF102	804619/2	2024/10/14	2025/10/13
Cable-1m(10M-40G)	HUBER SUHNER	SF102	804398/2	2024/10/14	2025/10/13
E3	AUDIX	v8.2014-8-6	RK-000529	NA	NA
High Pass Filter	Warison	WFIL-H3000-18000F-03	WRJ5CFWC2J1	2024/07/03	2025/07/02
Notch Filter	Warison	WFIL-N5925-7125F-04	WRQ4BFWC4M1	2024/03/11	2025/03/10
Hipass Filter	Warison	WFIL-H7500-18000F	WRQ4BFWC2J1	2024/03/11	2025/03/10

Test Item	RF Conducted				
Test Site	RFCON01-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
CAX Signal Analyzer	KEYSIGHT	N9000B	MY57100339	2023/11/06	2024/11/05
Power Meter	Anritsu	ML2495A	1224005	2024/02/17	2025/02/16
Power Sensor	Anritsu	MA2411B	1207295	2024/02/17	2025/02/16
Attenuator	KEYSIGHT	8491B	MY39250703	2024/02/20	2025/02/19



Test Item	AC Power Line Conducted Emission				
Test Site	CON02-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
EMI Receiver	ROHDE & SCHWARZ	ESR 7	101906	2024/05/13	2025/05/12
Cable-4m(9k-3G)	EMEC	RG-223	18274M	2024/08/08	2025/08/07
Line Impedance Stabilization Network	Schwarzbeck	NSLK 8127	8127740	2024/08/27	2025/08/26
Two-Line V-Network	ROHDE & SCHWARZ	ENV216	102185	2024/08/27	2025/08/26
E3	AUDIX	v8.2014-8-6	RK-000531	NA	NA



4. Antenna Requirements

4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.2 Antenna Construction and Directional Gain

Antenna Type	Dipole Antenna
Antenna Gain	3 dBi



5. Frequency Hopping System Requirements

5.1 Frequency Hopping Requirement

According to FCC Part 15.247(a)(1), The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(g) Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

(h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.



5.2 EUT Hopping System

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule.

This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each; centred from 2402 to 2480MHz) in the range 2,400-2,483.5 MHz. The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock.

Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no impact on the bandwidth used.

5.3 Pseudorandom Frequency Hopping Sequence

Pseudorandom Frequency Hopping Sequence Table as below:

Channel number:

72	79	17	51	57	48	50	37	67	72
38	77	16	29	56	8	24	53	41	62
14	66	8	58	4	42	60	2	36	30
28	52	40	69	21	42	59	10	12	51

etc.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.



6. Test of AC Power Line Conducted Emission

6.1 Test Limit

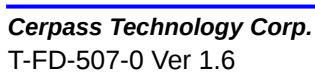
Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz, according to the methods defined in ANSI C63.10-2013. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

6.2 Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

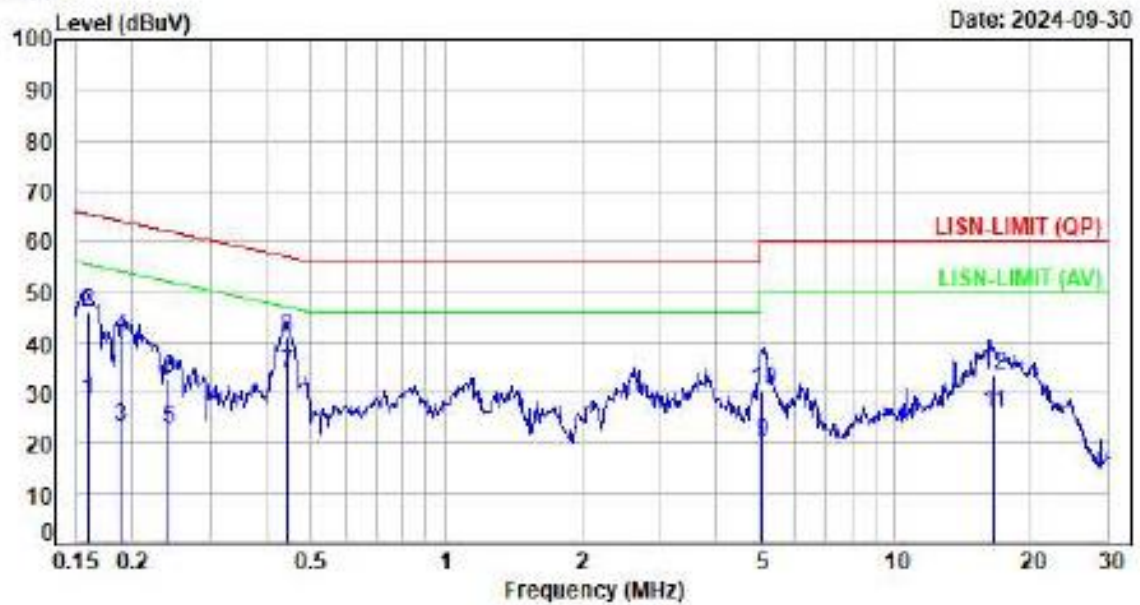




6.4 Test Result and Data

Test Mode : BT 1TX CH0 2402MHz 1Mbps
Voltage : From Adapter(AC 120V/60Hz)
Phase : Line

Data: 1



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1602	9.63	18.94	28.57	55.45	-26.88	Average	P
2	0.1602	9.63	36.45	46.08	55.45	-19.37	QP	P
3	0.1881	9.63	13.43	23.06	54.12	-31.06	Average	P
4	0.1881	9.63	31.51	41.14	54.12	-22.98	QP	P
5	0.2401	9.63	13.00	22.63	52.09	-29.46	Average	P
6	0.2401	9.63	23.00	32.63	52.09	-29.46	QP	P
7	0.4419	9.65	24.07	33.72	47.03	-13.31	Average	P
8	0.4419	9.65	31.49	41.14	57.03	-15.89	QP	P
9	5.0830	9.76	10.35	20.11	50.00	-29.89	Average	P
10	5.0830	9.76	20.74	30.50	60.00	-29.50	QP	P
11	16.5317	9.88	15.99	25.87	50.00	-24.13	Average	P
12	16.5317	9.88	23.56	33.44	60.00	-26.56	QP	P

Note: Level=Reading+Factor

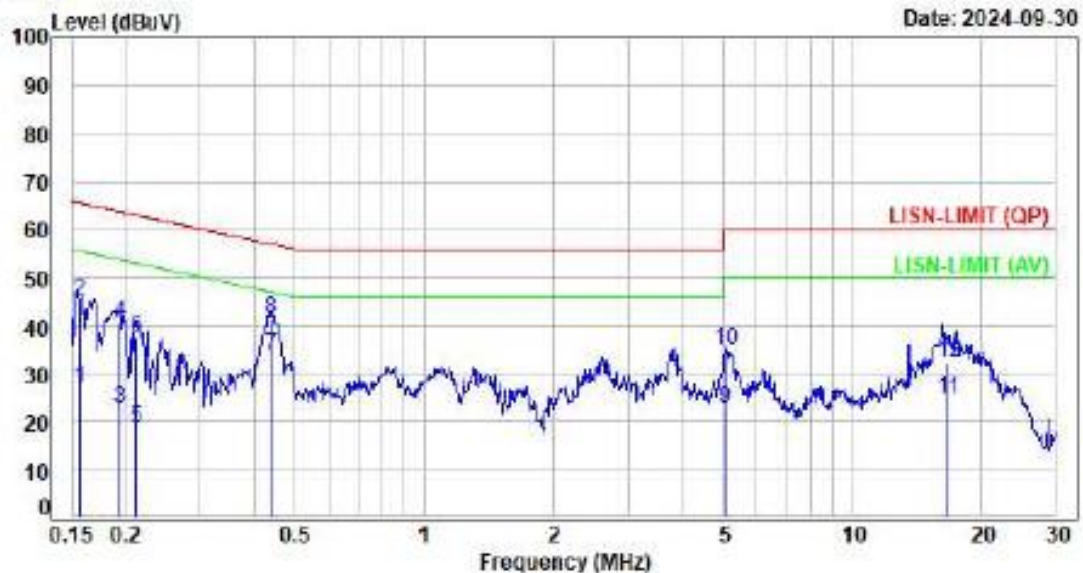
Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Test Mode : BT 1TX CH0 2402MHz 1Mbps
Voltage : From Adapter(AC 120V/60Hz)
Phase : Neutral

Data: 2



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1568	9.61	17.45	27.06	55.63	-28.57	Average	P
2	0.1568	9.61	35.59	45.20	65.63	-20.43	QP	P
3	0.1940	9.61	13.06	22.67	53.86	-31.19	Average	P
4	0.1940	9.61	30.95	40.56	63.86	-23.30	QP	P
5	0.2128	9.61	8.91	18.52	53.10	-34.58	Average	P
6	0.2128	9.61	27.85	37.46	63.10	-25.64	QP	P
7	0.4404	9.62	24.26	33.88	47.06	-13.18	Average	P
8	0.4404	9.62	31.67	41.29	57.06	-15.77	QP	P
9	5.0854	9.74	13.26	23.00	50.00	-27.00	Average	P
10	5.0854	9.74	25.29	35.03	60.00	-24.97	QP	P
11	16.7049	9.94	14.90	24.84	50.00	-25.16	Average	P
12	16.7049	9.94	22.39	32.33	60.00	-27.67	QP	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



7. Test of Radiated Spurious Emission

7.1 Test Limit

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/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



7.2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- i. "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

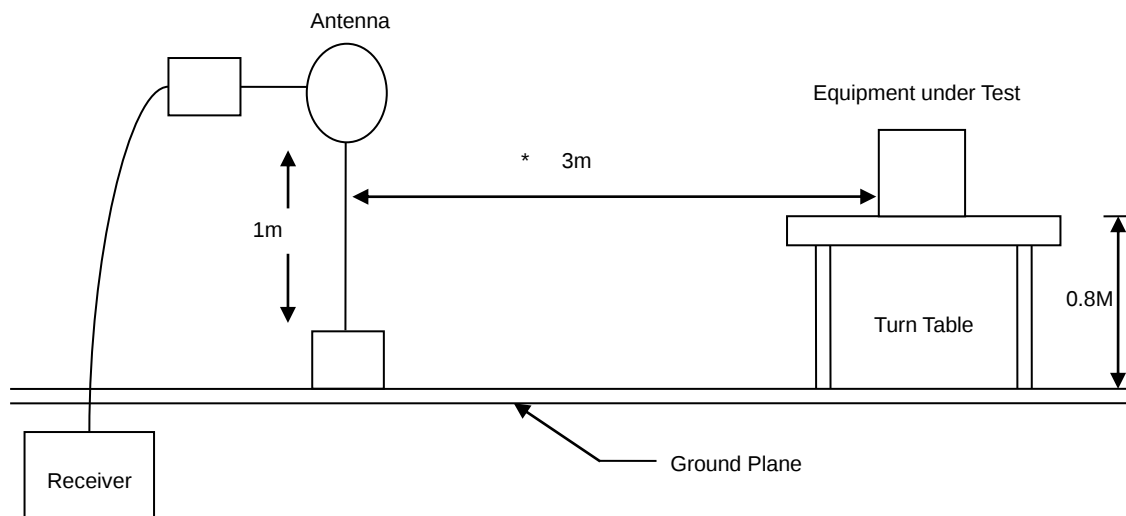
Note:

- 1.The supporting fixture shall permit orientation of the EUT in each of three orthogonal axis positions such that emissions from the EUT are maximized.
(Y-AXIS is the worst.)
- 2.Due to the test software function limit the operation band setting(200dBuV/m).
There's no corresponding limitation in the actual test item.

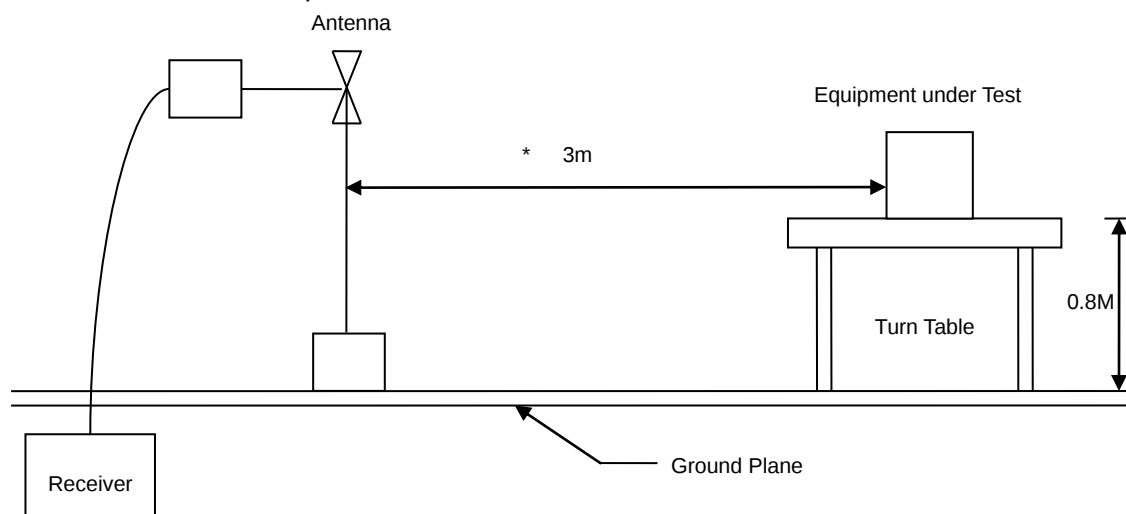


7.3 Typical Test Setup

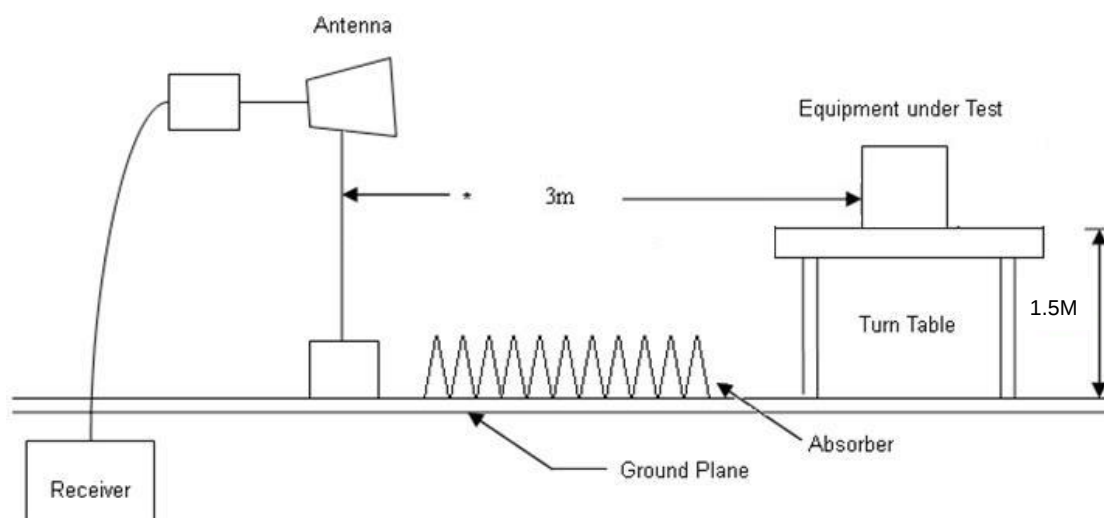
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



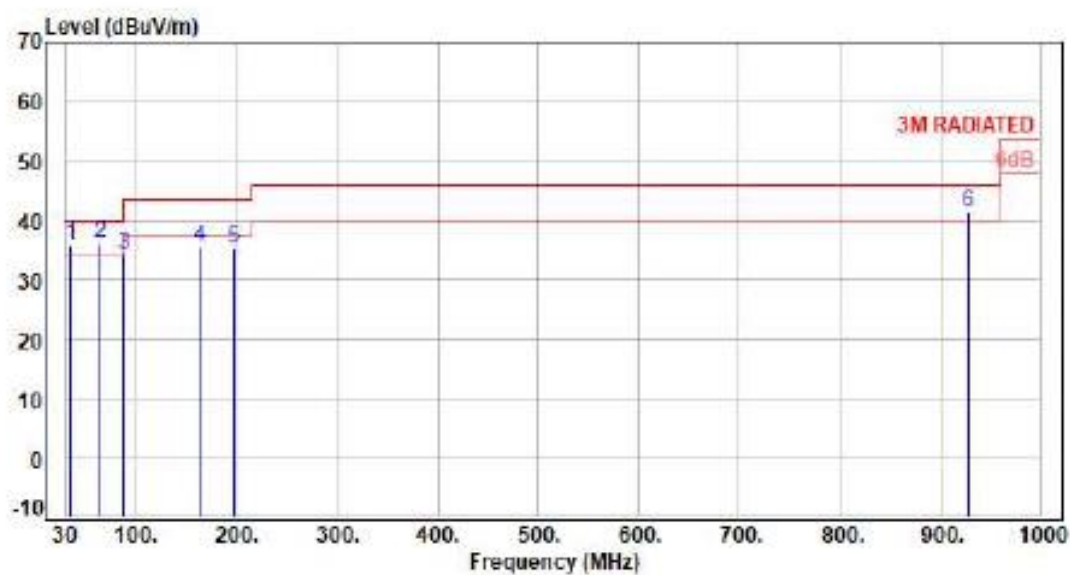


7.4 Test Result and Data (9kHz ~ 30MHz)

The 9kHz-30MHz spurious emission is under limit 20dB more.

7.5 Test Result and Data (30MHz ~ 1GHz)

Test Mode : BT 1TX CH00 1Mbps
Voltage : From Adapter(AC120V/60Hz)
Pol : Vertical



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	35.82	-10.22	46.00	35.78	40.00	-4.22	Peak	400	0	P
2	64.92	-10.48	46.62	36.14	40.00	-3.86	QP	100	220	P
3	87.23	-15.87	50.33	34.46	40.00	-5.54	Peak	400	0	P
4	163.86	-9.46	45.19	35.73	43.50	-7.77	Peak	400	0	P
5	196.84	-11.93	47.39	35.46	43.50	-8.04	Peak	400	0	P
6	928.22	4.41	36.93	41.34	46.00	-4.66	Peak	400	0	P

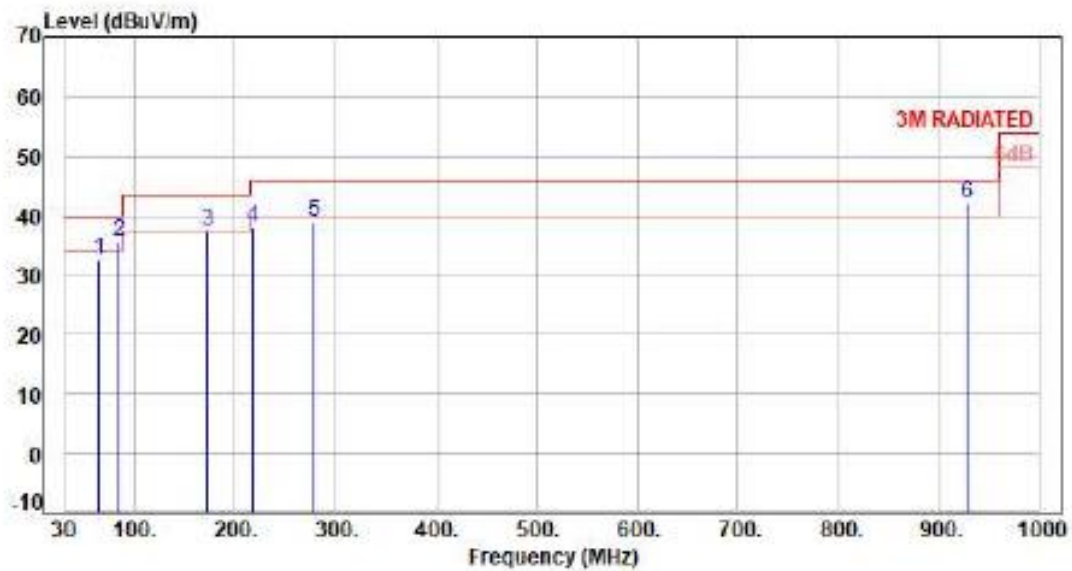
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : BT 1TX CH00 1Mbps
Voltage : From Adapter(AC120V/60Hz)
Pol : Horizontal



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	64.92	-10.48	42.95	32.47	40.00	-7.53	Peak	100	360	P
2	84.32	-15.52	51.26	35.74	40.00	-4.26	Peak	100	360	P
3	171.62	-9.79	47.16	37.37	43.50	-6.13	Peak	100	360	P
4	218.18	-11.92	50.01	38.09	46.00	-7.91	Peak	100	360	P
5	278.32	-9.27	48.25	38.98	46.00	-7.02	Peak	100	360	P
6	928.22	4.41	37.57	41.98	46.00	-4.02	Peak	100	360	P

Note: Level=Reading+Factor

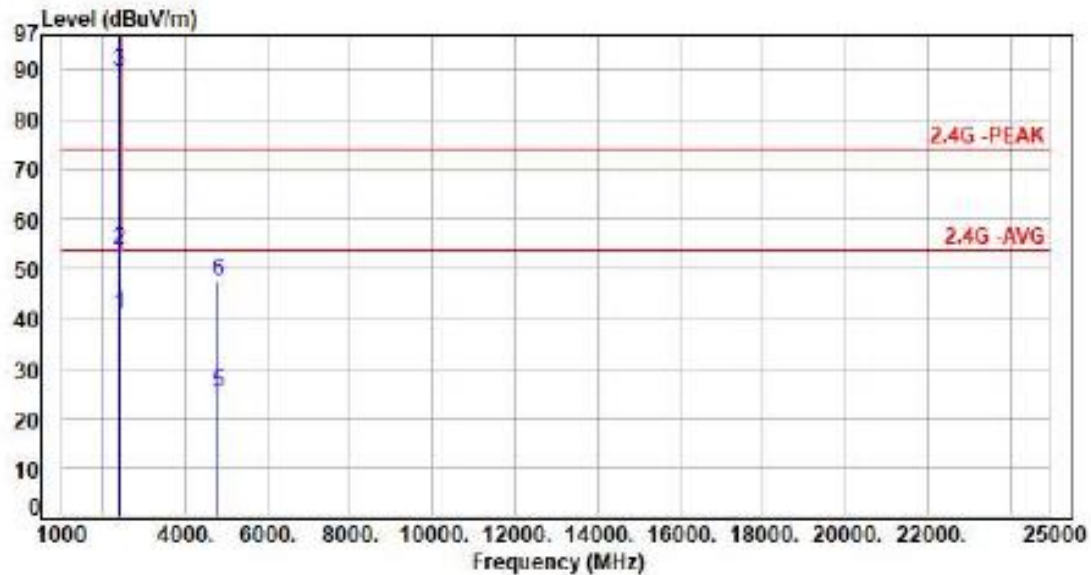
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



7.6 Test Result and Data (1GHz ~ 25GHz)

Test Mode : BT 1TX CH00 1Mbps
Voltage : From Adapter(AC120V/60Hz)
Pol : Vertical



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-2.33	43.32	40.99	54.00	-13.01	Average	186	107	P
2	2390.00	-2.33	56.06	53.73	74.00	-20.27	Peak	186	107	P
3	2402.00	-2.32	91.80	89.48	200.00	-110.52	Average	186	107	P
4	2402.00	-2.32	114.30	111.98	200.00	-88.02	Peak	186	107	P
5	4804.00	5.89	19.02	24.91	54.00	-29.09	Average	100	155	P
6	4804.00	5.89	41.52	47.41	74.00	-26.59	Peak	100	155	P

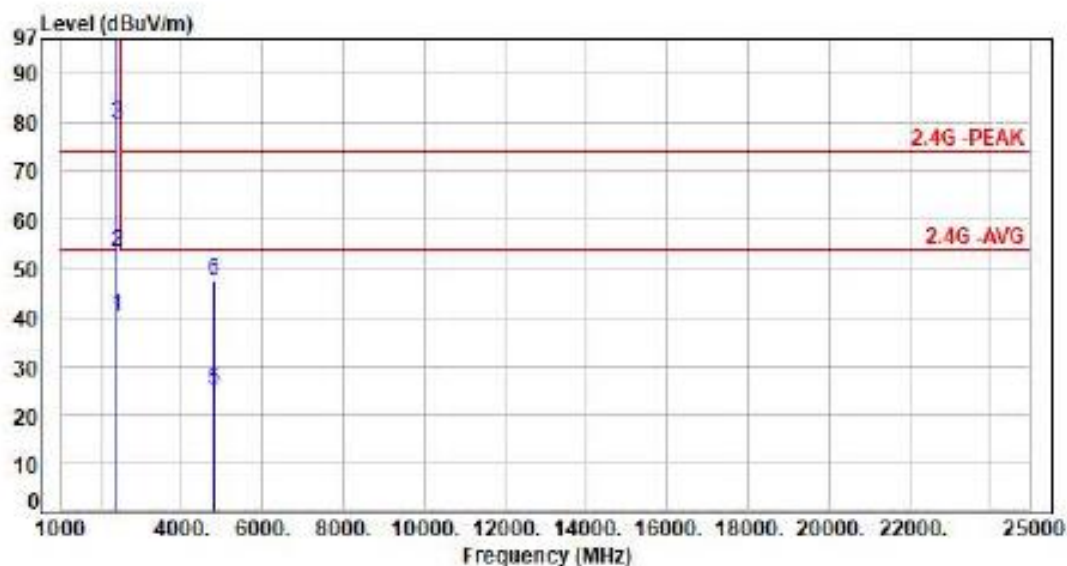
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : BT 1TX CH00 1Mbps
Voltage : From Adapter(AC120V/60Hz)
Pol : Horizontal



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-2.33	42.63	40.30	54.00	-13.70	Average	388	38	P
2	2390.00	-2.33	55.66	53.33	74.00	-20.67	Peak	388	38	P
3	2402.00	-2.32	82.16	79.84	200.00	-120.16	Average	388	38	P
4	2402.00	-2.32	104.66	102.34	200.00	-97.66	Peak	388	38	P
5	4804.00	5.88	19.14	25.03	54.00	-28.97	Average	100	253	P
6	4804.00	5.89	41.64	47.53	74.00	-26.47	Peak	100	253	P

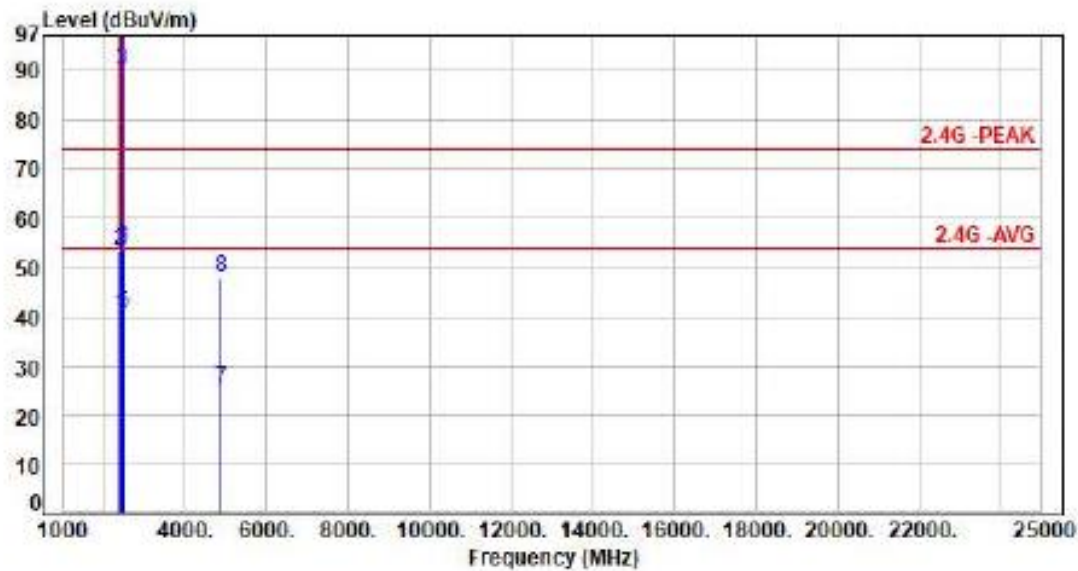
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : BT 1TX CH39 1Mbps
Voltage : From Adapter(AC120V/60Hz)
Pol : Vertical



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-2.33	42.91	40.58	54.00	-13.42	Average	214	196	P
2	2390.00	-2.33	55.97	53.64	74.00	-20.36	Peak	214	196	P
3	2441.00	-2.16	92.32	90.16	200.00	-109.84	Average	214	196	P
4	2441.00	-2.16	114.82	112.66	200.00	-87.34	Peak	214	196	P
5	2483.50	-2.01	42.67	40.66	54.00	-13.34	Average	214	196	P
6	2483.50	-2.01	55.71	53.70	74.00	-20.30	Peak	214	196	P
7	4882.00	6.13	19.29	25.42	54.00	-28.58	Average	100	150	P
8	4882.00	6.13	41.79	47.92	74.00	-26.08	Peak	100	150	P

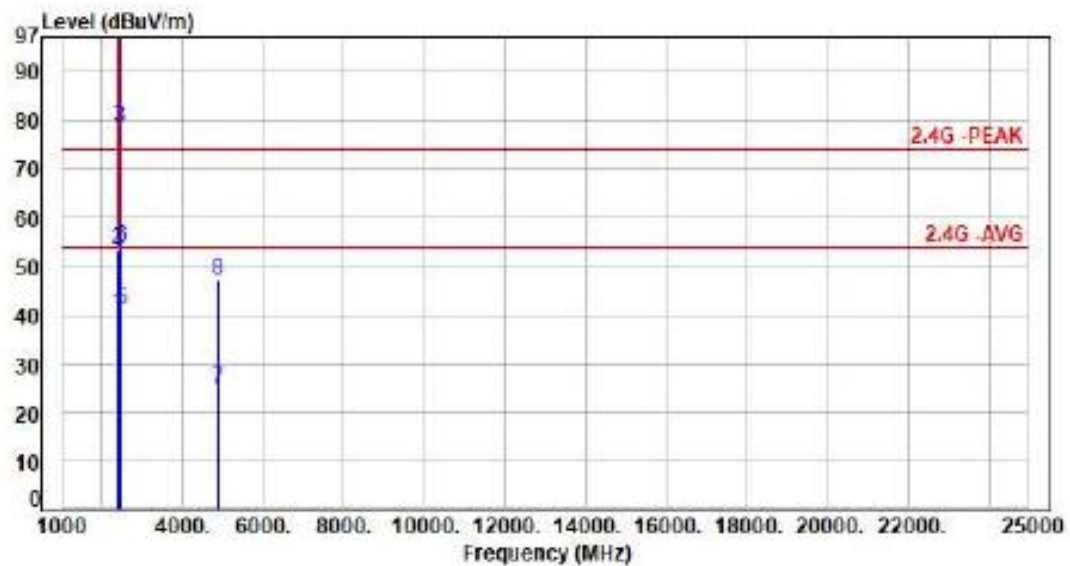
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : BT 1TX CH39 1Mbps
Voltage : From Adapter (AC120V/60Hz)
Pol : Horizontal



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2398.00	-2.33	42.42	40.09	54.00	-13.91	Average	100	49	P
2	2398.00	-2.33	55.67	53.34	74.00	-20.66	Peak	100	49	P
3	2441.00	-2.16	80.89	78.73	200.00	-121.27	Average	100	49	P
4	2441.00	-2.16	103.39	101.23	200.00	-98.77	Peak	100	49	P
5	2483.50	-2.01	42.81	40.80	54.00	-13.20	Average	100	49	P
6	2483.50	-2.01	56.01	54.00	74.00	-20.00	Peak	100	49	P
7	4882.00	6.13	18.50	24.63	54.00	-29.37	Average	100	254	P
8	4882.00	6.13	41.00	47.13	74.00	-26.87	Peak	100	254	P

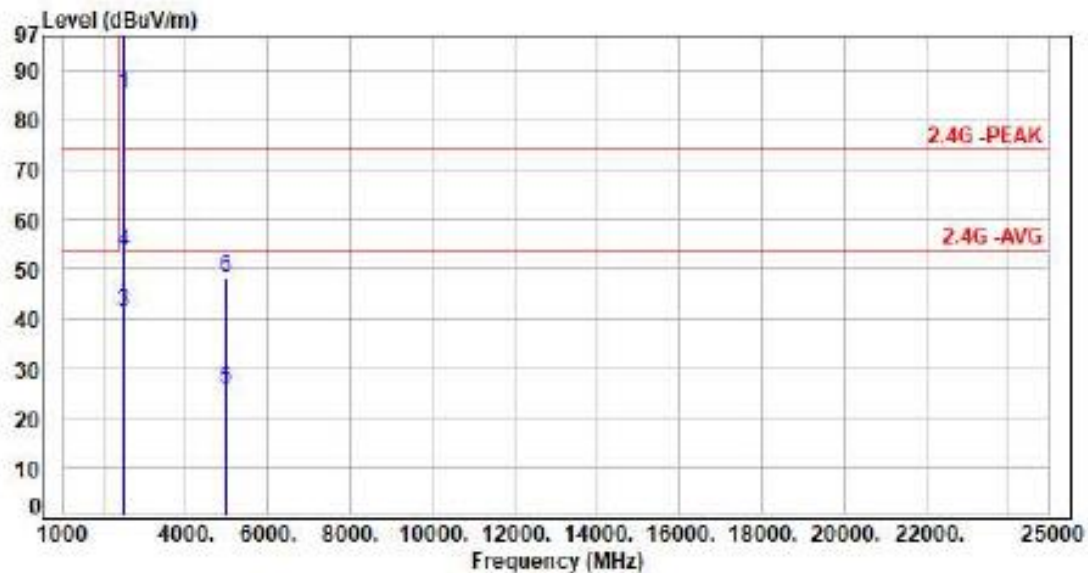
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : BT 1TX CH78 1Mbps
Voltage : From Adapter(AC120V/60Hz)
Pol : Vertical



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2480.00	-2.01	87.21	85.20	200.00	-114.80	Average	100	300	P
2	2480.00	-2.01	109.71	107.70	200.00	-92.30	Peak	100	300	P
3	2483.50	-2.01	43.44	41.43	54.00	-12.57	Average	100	300	P
4	2483.50	-2.01	55.56	53.55	74.00	-20.45	Peak	100	300	P
5	4960.00	6.37	19.28	25.65	54.00	-28.35	Average	100	155	P
6	4960.00	6.37	41.78	48.15	74.00	-25.85	Peak	100	155	P

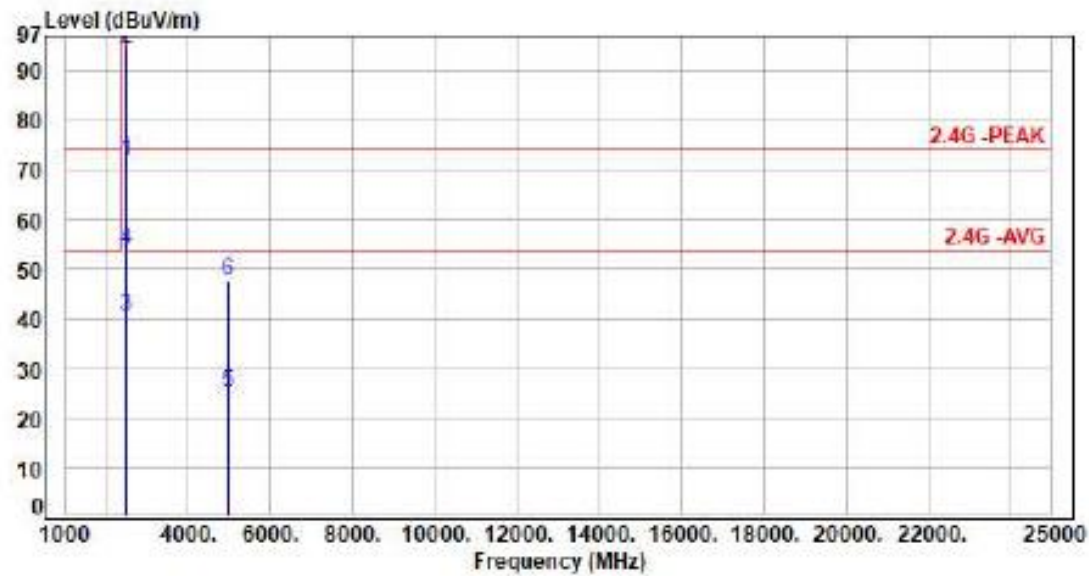
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : BT 1TX CH78 1Mbps
Voltage : From Adapter(AC120V/60Hz)
Pol : Horizontal



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2480.00	-2.01	73.94	71.93	200.00	-128.07	Average	103	50	P
2	2480.00	-2.01	96.44	94.43	200.00	-105.57	Peak	103	50	P
3	2483.50	-2.01	42.58	40.57	54.00	-13.43	Average	103	50	P
4	2483.50	-2.01	55.80	53.79	74.00	-20.21	Peak	103	50	P
5	4960.00	6.37	18.89	25.26	54.00	-28.74	Average	100	253	P
6	4960.00	6.37	41.39	47.76	74.00	-26.24	Peak	100	253	P

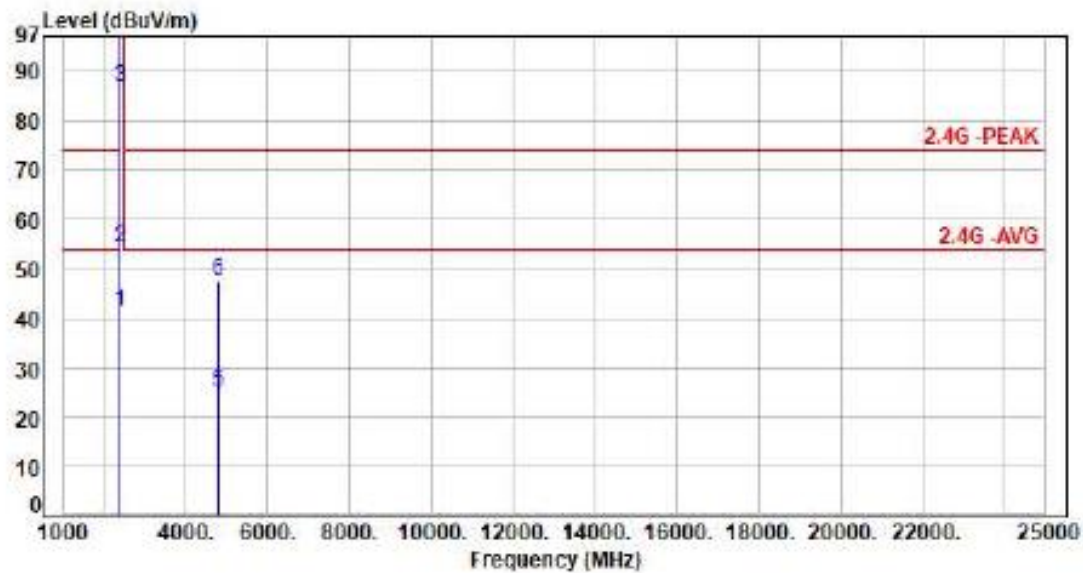
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Test Mode : BT 1TX CH00 2Mbps
Voltage : From Adapter(AC120V/60Hz)
Pol : Vertical



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-2.33	43.62	41.29	54.00	-12.71	Average	188	105	P
2	2390.00	-2.33	56.45	54.12	74.00	-19.88	Peak	188	105	P
3	2402.00	-2.32	89.07	86.75	200.00	-113.25	Average	188	105	P
4	2402.00	-2.32	111.57	109.25	200.00	-90.75	Peak	188	105	P
5	4804.00	5.89	19.13	25.02	54.00	-28.98	Average	100	152	P
6	4804.00	5.89	41.63	47.52	74.00	-26.48	Peak	100	152	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor