

FCC Test Report

Report No.: RFCDVB-WTW-P23100016

FCC ID: QYLZ11WD

Contains FCC ID: QYLPN7150Z11

Test Model: ZX10

Series Model: ZX10Y (Y= 10 characters, Y can be 0-9, a-z, A-Z, “ - “, “ _ “, “ / “, “ \ “ or blank for marketing purpose and no impact safety related critical components and constructions.)

Received Date: Oct. 03, 2023

Test Date: Oct. 30, 2023

Issued Date: Nov. 08, 2023

Applicant: Getac Technology Corporation.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan

FCC Registration / 788550 / TW0003

Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
RFCDVB-WTW-P23100016	Original Release	Nov. 08, 2023

1 Certificate of Conformity

Product: Tablet

Brand: Getac

Test Model: ZX10

Series Model: ZX10Y (Y= 10 characters, Y can be 0-9, a-z, A-Z, “ - “, “ _ “, “ / “, “ \ “ or blank for marketing purpose and no impact safety related critical components and constructions.)

Sample Status: Engineering Sample


Applicant: Getac Technology Corporation.

Test Date: Oct. 30, 2023

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.209)
ANSI C63.10-2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by :  , **Date:** Nov. 08, 2023
Polly Chien / Specialist

Approved by :  , **Date:** Nov. 08, 2023
Jeremy Lin / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.209)			
FCC Clause	Test Item	Result	Remarks
15.207	Conducted emission test	Pass	Meet the requirement of limit. Minimum passing margin is -13.42 dB at 0.41000 MHz.
15.209	Radiated emission test	Pass	Meet the requirement of limit. Minimum passing margin is -8.9 dB at 162.90 MHz.
2.202	Bandwidth Measurement	Pass	Meet the requirement of limit.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 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	Frequency	Expanded Uncertainty (k=2) (\pm)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.44 dB
	30MHz ~ 200MHz	2.93 dB
	200MHz ~ 1000MHz	2.95 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Tablet
Brand	Getac
Test Model	ZX10
Series Model	ZX10Y (Y= 10 characters, Y can be 0-9, a-z, A-Z, “ - “, “ _ “, “ / “, “ \ “ or blank for marketing purpose and no impact safety related critical components and constructions.)
Status of EUT	Engineering Sample
Power Supply Rating	19Vdc (from adapter) 3.84Vdc (from battery)
Operating Frequency	511 kHz
Antenna Type	Loop antenna
Antenna Connector	NA
Field Strength	4.5dBuV/m (30m)
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	FSP	FSP065-RBBN3	I/P: 100-240 Vac, 50-60Hz, 1.5 A O/P: 19.0 Vdc, 3.42 A 1.47m non-shielded cable with 1 core
Battery	Getac	BP1S2P4990B	Power Rating: 3.84 Vdc, 37.4 Wh, 9740 mAh
Power cord	I-SHENG ELECTRIC WIRE & CABLE CO., LTD.	SP-305B+IS-034	1.7M
Touch pen	Getac	GT-090S	N/A

2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
3. Only radiated measurements are used to show compliance with FCC limits for fundamental and spurious emissions.

4. EUT has following configuration.

Part	Brand	Model	Note
CPU	Qualcomm	SDA 660	-
Memory	Samsung	KM3V6001CM-B705	4GB
VIDEO CONTROLLER	Qualcomm	Adreno GU 512	-
eMMC Storage	Samsung	-	64GB
DISPLAY	AUO	G101UAN2.0	-
Touch Screen	EETI	EXC80H60	-
Real Camera	Unison	MV21A6A1-TF5D	16M PLCC MIPI
Front Camera	Unison	MV2980A1-TF4R-P	8M PLCC MIPI
WLAN/BT	Qualcomm	WCN3990	-
HF-RFID	Getac	PN7150	-
Digitizer	EMRight	96-P28-20010	-
GPS	Locosys	MC-1010-V2B	-
Barcode Reader	Honeywell	N6703SR-W5-103	-
Smart Card Option Bay	Alcor	AU9560-GBS-GR	-
High capacity battery	Getac	BP1S2P4990B	-

5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

1 channel is provided to this EUT:

Channel	Frequency (kHz)
1	511

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To			Description
	RE<1G	PLC	BW	
-	√	√	√	-

Where **RE<1G**: Radiated Emission below 1 GHz
BW: 20dB Bandwidth
PLC: Power Line Conducted Emission

Radiated Emission Test (Below 1 GHz):

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

EUT Configure Mode	Available Channel	Tested Channel
-	1	1

Power Line Conducted Emission Test:

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

EUT Configure Mode	Available Channel	Tested Channel
-	1	1

Bandwidth Measurement:

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

EUT Configure Mode	Available Channel	Tested Channel
-	1	1

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE	23 deg. C, 66 % RH	120 Vac, 60 Hz	Vincent Chen
PLC	22 deg. C, 63 % RH	120 Vac, 60 Hz	Vincent Chen
BW	22 deg. C, 63 % RH	120 Vac, 60 Hz	Vincent Chen

3.3 Description of Support Units

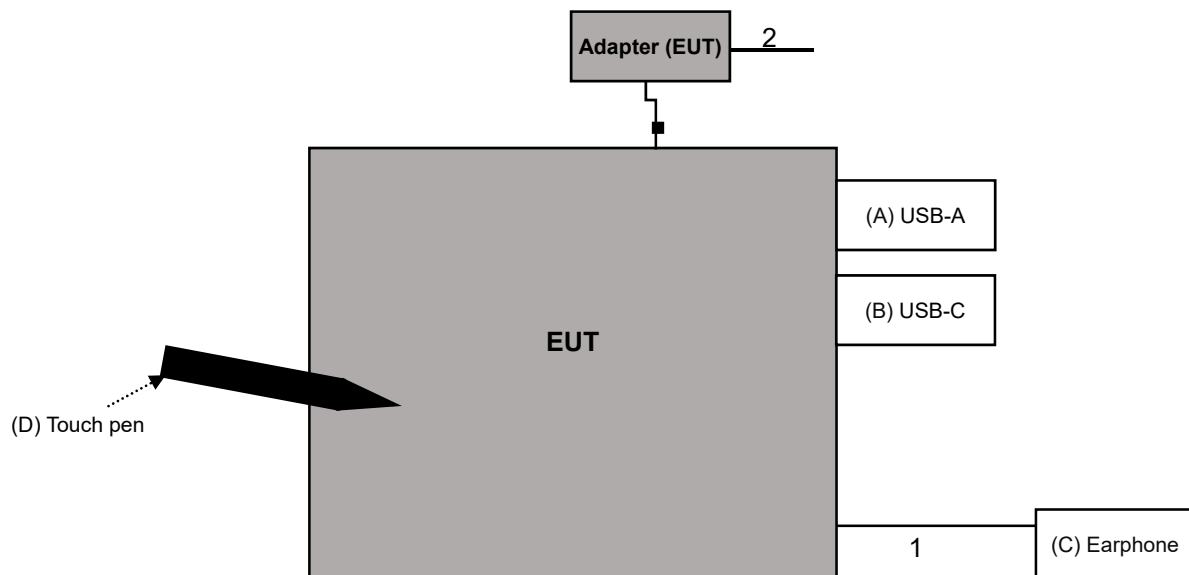
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	USB-A	SanDisk	SDDDC3-032G	N/A	N/A	Provided by Lab
B.	USB-C	SanDisk	SDDDC3-032G	N/A	N/A	Provided by Lab
C.	Earphone	HTC	MAX320	N/A	N/A	Provided by Lab
D.	Touch pen	Getac	GT-090S	340122800018	N/A	Supplied by applicant

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Audio Cable	1	1.2	No	0	Provided by Lab
2.	Power Cable	1	1.7	No	0	Supplied by applicant

3.3.1 Configuration of System under Test

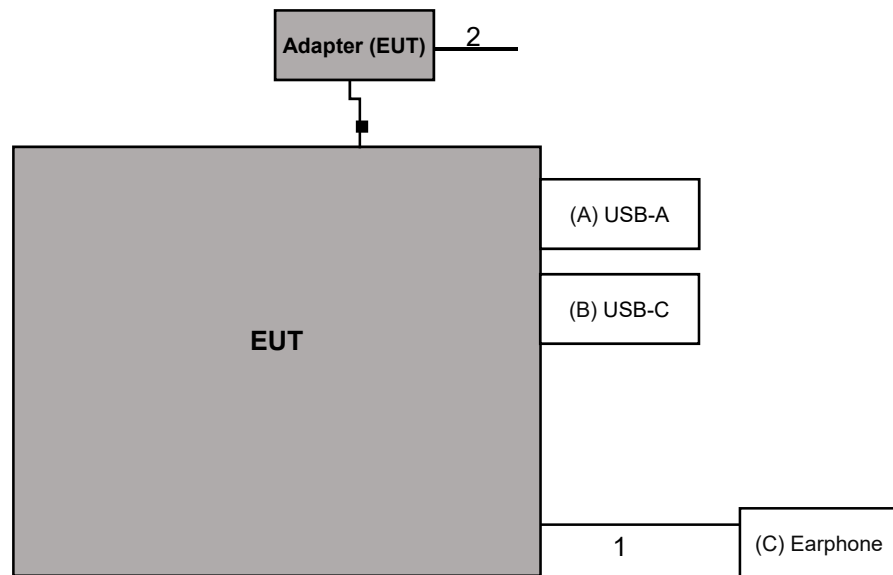
Operated Mode:



Under Table

Remote Site

Standby Mode:



Under Table

Remote Site

3.4 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 (15.209)

ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

For Frequency below 30MHz

Frequency (MHz)	Field Strength (dBuV/m)		Measurement Distance (meters)
	uV/m	dBuV/m	
0.009 – 0.490	2400 / F (kHz)	48.52-13.80	300
0.490 – 1.705	24000 / F (kHz)	33.80-22.97	30
1.705 – 30.0	30	29.54	30

For Frequency between 30-1000MHz

Frequency (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
30-88	90	39.1	100	40.0
88-216	150	43.5	150	43.5
216-960	210	46.4	200	46.0
Above 960	300	49.5	500	54.0

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Antenna Tower & Turn Max-Full	MFA-440H	AT93021705	N/A	N/A
Boresight antenna tower fixture BV	BAF-02	7	N/A	N/A
EXA Signal Analyzer Agilent	N9010A	MY52220207	Jan. 03, 2023	Jan. 02, 2024
Loop Antenna Electro-Metrics	EM-6879	269	Sep. 23, 2023	Sep. 22, 2024
Loop Antenna TESEQ	HLA 6121	45745	Aug. 08, 2023	Aug. 07, 2024
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-969	Nov. 13, 2022	Nov. 12, 2023
	BBHA 9170	148	Nov. 13, 2022	Nov. 12, 2023
MXE EMI Receiver Keysight	N9038A	MY55420137	May 03, 2023	May 02, 2024
Notch Filter Micro-Tronics	BRM17690	004	Jan. 11, 2023	Jan. 10, 2024
	BRM50716	060	Jan. 11, 2023	Jan. 10, 2024
Preamplifier EMCi	EMC 012645	980115	Sep. 27, 2023	Sep. 26, 2024
	EMC 184045	980116	Sep. 27, 2023	Sep. 26, 2024
RF Coaxial Cable EMCi	EMC102-KM-KM-600	150928	Jul. 8, 2023	Jul. 7, 2024
	EMC102-KM-KM-3000	150929	Jul. 8, 2023	Jul. 7, 2024
	EMC104-SM-SM-8000+3000	171005	Sep. 27, 2023	Sep. 26, 2024
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Sep. 27, 2023	Sep. 26, 2024
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower Max-Full	MFA-440H	AT93021705	NA	NA
Turn Table Max-Full	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller Max-Full	MF-7802	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa 966 Chamber 5.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Parallel, perpendicular, and Ground-Parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case 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 Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode, except for the frequency band (9kHz-90kHz, 110kHz-490kHz) set to average detect function and peak detect function.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz at frequency band (9 kHz~150 kHz) and 9 kHz or 10 kHz at frequency below 30MHz (except 9 kHz~150 kHz).
2. There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

Note:

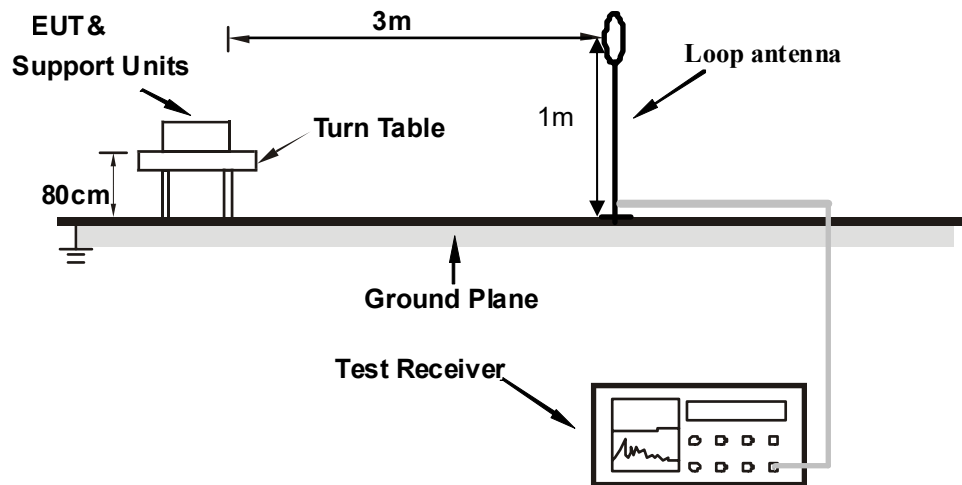
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

No deviation.

4.1.5 Test Setup

For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz

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

4.1.6 EUT Operating Conditions

Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

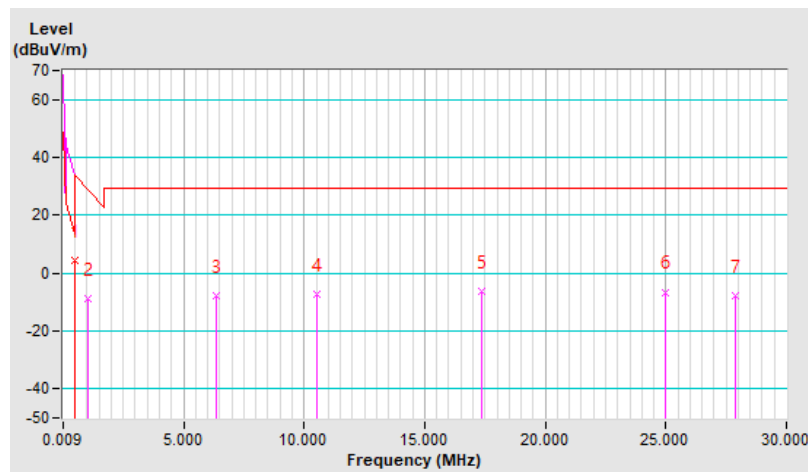
Operated Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		

Antenna Polarity & Test Distance: Loop antenna Parallel at 3m								
No	Frequency (MHz)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBUV)	Correction Factor (dB/m)
1	*0.511	4.5 QP	33.4	-28.9	1.00	135	24.9	-20.4
2	1.022	-8.7 QP	27.4	-36.1	1.00	211	11.6	-20.3
3	6.337	-8.0 QP	29.5	-37.5	1.00	211	10.8	-18.8
4	10.506	-7.4 QP	29.5	-36.9	1.00	146	11.1	-18.5
5	17.344	-6.2 QP	29.5	-35.7	1.00	203	11.8	-18.0
6	24.992	-6.5 QP	29.5	-36.0	1.00	18	10.9	-17.4
7	27.871	-8.0 QP	29.5	-37.5	1.00	321	9.9	-17.9

Remarks:

1. Emission Level(dBUV/m) = Raw Value(dBUV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) +Distance Factor
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. “ * “: Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. 0.009 ~ 0.49MHz, the measured field strength was extrapolated to distance 300 meters Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$

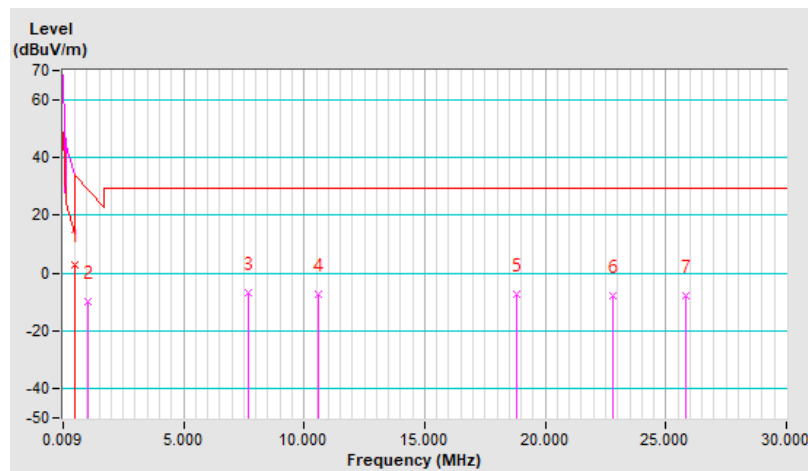


Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		

Antenna Polarity & Test Distance: Loop antenna Perpendicular at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.511	2.7 QP	33.4	-30.7	1.00	256	23.1	-20.4
2	1.022	-9.8 QP	27.4	-37.2	1.00	85	10.5	-20.3
3	7.687	-6.8 QP	29.5	-36.3	1.00	316	12.1	-18.9
4	10.566	-7.2 QP	29.5	-36.7	1.00	69	11.3	-18.5
5	18.813	-7.3 QP	29.5	-36.8	1.00	199	10.5	-17.8
6	22.802	-7.8 QP	29.5	-37.3	1.00	264	10.7	-18.5
7	25.801	-7.8 QP	29.5	-37.3	1.00	2	10.1	-17.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) + Distance Factor
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. “ * “: Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. 0.009 ~ 0.49MHz, the measured field strength was extrapolated to distance 300 meters Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$

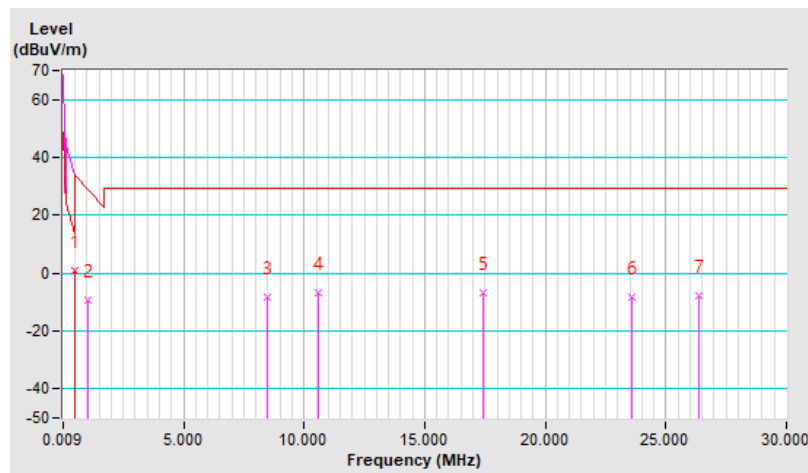


Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		

Antenna Polarity & Test Distance: Loop antenna Ground-Parallel at 3m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.511	1.1 QP	33.4	-32.3	1.00	125	21.5	-20.4
2	1.022	-9.2 QP	27.4	-36.6	1.00	2	11.1	-20.3
3	8.466	-8.1 QP	29.5	-37.6	1.00	40	10.8	-18.9
4	10.566	-7.0 QP	29.5	-36.5	1.00	288	11.5	-18.5
5	17.434	-6.8 QP	29.5	-36.3	1.00	222	11.2	-18.0
6	23.612	-8.5 QP	29.5	-38.0	1.00	2	10.0	-18.5
7	26.401	-7.7 QP	29.5	-37.2	1.00	48	10.2	-17.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) +Distance Factor
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. “ * “: Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. 0.009 ~ 0.49MHz, the measured field strength was extrapolated to distance 300 meters Distance factor@3m = $40 \cdot \log(3/300) = -80\text{dB}$
For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$



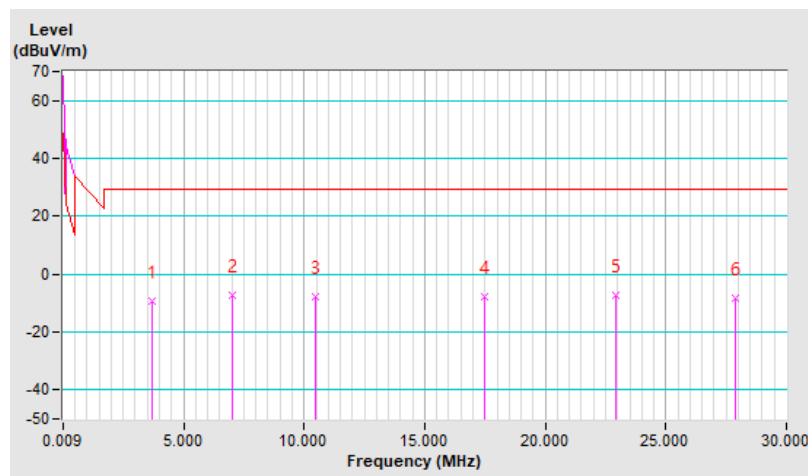
Standby Mode

Channel	Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		

Antenna Polarity & Test Distance: Loop antenna Parallel at 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3.668	-9.3 QP	29.5	-38.8	1.00	321	11.0	-20.3
2	6.997	-7.5 QP	29.5	-37.0	1.00	344	11.3	-18.8
3	10.476	-7.6 QP	29.5	-37.1	1.00	56	10.9	-18.5
4	17.494	-7.6 QP	29.5	-37.1	1.00	290	10.4	-18.0
5	22.952	-7.3 QP	29.5	-36.8	1.00	231	11.3	-18.6
6	27.871	-8.3 QP	29.5	-37.8	1.00	47	9.6	-17.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(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
5. Loop antenna was used for all radiated emission below 30MHz.
6. For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$

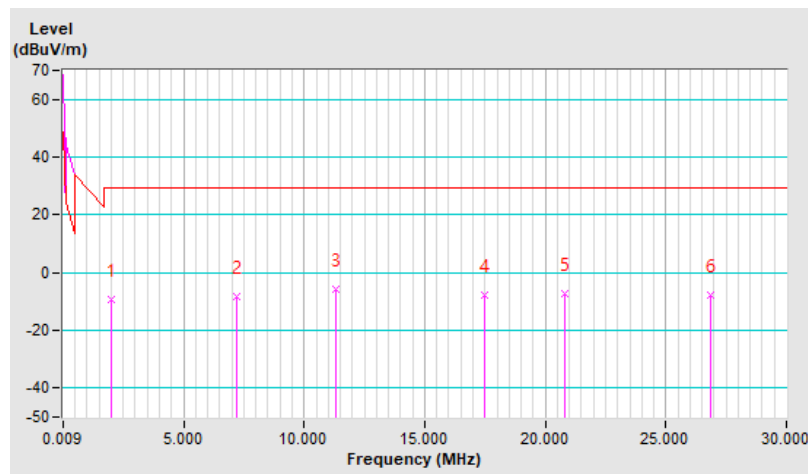


Channel	Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		

Antenna Polarity & Test Distance: Loop antenna Perpendicular at 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1.988	-9.2 QP	29.5	-38.7	1.00	272	11.2	-20.4
2	7.207	-8.4 QP	29.5	-37.9	1.00	165	10.4	-18.8
3	11.346	-5.9 QP	29.5	-35.4	1.00	183	12.5	-18.4
4	17.494	-7.9 QP	29.5	-37.4	1.00	240	10.1	-18.0
5	20.793	-7.3 QP	29.5	-36.8	1.00	239	10.8	-18.1
6	26.851	-8.0 QP	29.5	-37.5	1.00	297	9.8	-17.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(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
5. Loop antenna was used for all radiated emission below 30MHz.
6. For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$

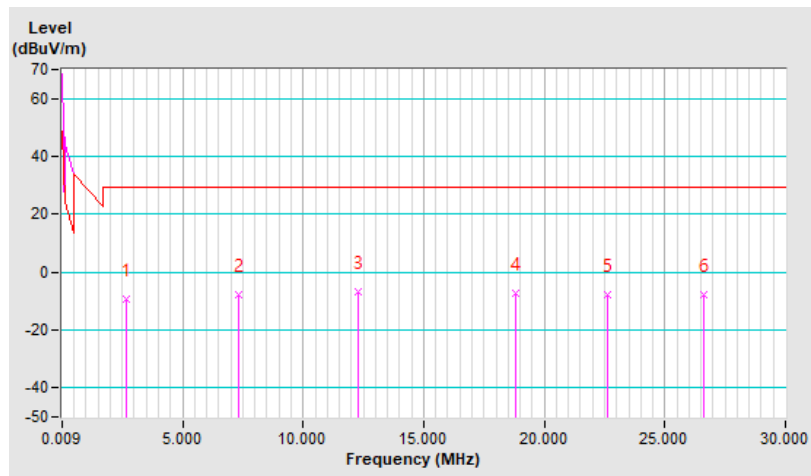


Channel	Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		

Antenna Polarity & Test Distance: Loop antenna Ground-Parallel at 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2.648	-9.5 QP	29.5	-39.0	1.00	125	11.0	-20.5
2	7.327	-8.0 QP	29.5	-37.5	1.00	88	10.8	-18.8
3	12.275	-6.7 QP	29.5	-36.2	1.00	278	11.7	-18.4
4	18.813	-7.2 QP	29.5	-36.7	1.00	261	10.6	-17.8
5	22.652	-7.7 QP	29.5	-37.2	1.00	223	10.8	-18.5
6	26.611	-7.7 QP	29.5	-37.2	1.00	224	10.2	-17.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(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
5. Loop antenna was used for all radiated emission below 30MHz.
6. For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = $40 \cdot \log(3/30) = -40\text{dB}$



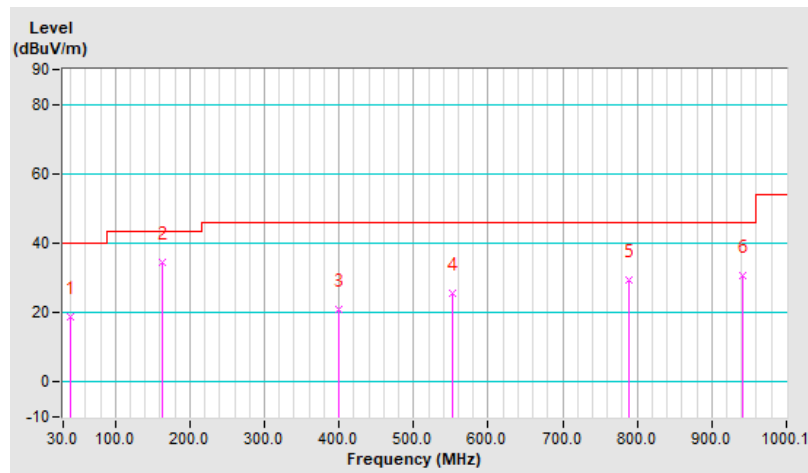
Below 1GHz Data:
Operated Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.67	19.0 QP	40.0	-21.0	1.00 H	111	31.7	-12.7
2	162.90	34.6 QP	43.5	-8.9	2.00 H	279	47.4	-12.8
3	400.58	20.8 QP	46.0	-25.2	1.00 H	36	30.4	-9.6
4	551.91	25.4 QP	46.0	-20.6	1.50 H	103	31.6	-6.2
5	789.59	29.2 QP	46.0	-16.8	1.00 H	94	30.2	-1.0
6	940.92	30.7 QP	46.0	-15.3	1.50 H	331	31.0	-0.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

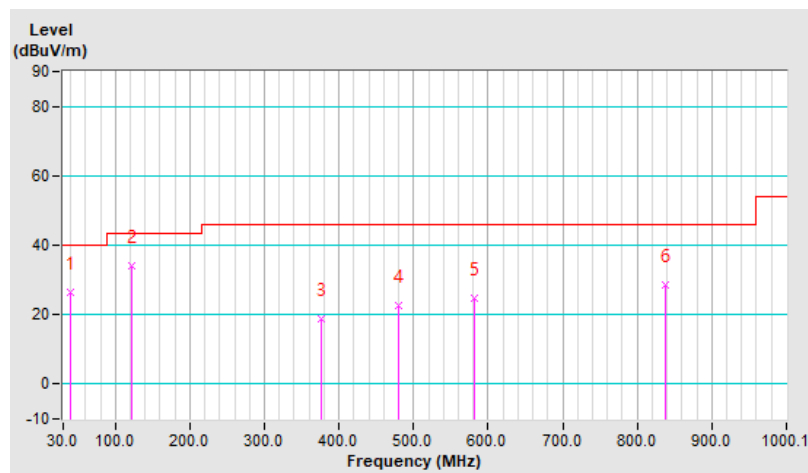


Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.67	26.4 QP	40.0	-13.6	1.00 V	18	39.1	-12.7
2	122.16	34.1 QP	43.5	-9.4	2.00 V	273	48.5	-14.4
3	376.33	19.0 QP	46.0	-27.0	1.00 V	2	29.2	-10.2
4	480.13	22.8 QP	46.0	-23.2	1.00 V	18	30.2	-7.4
5	581.02	24.6 QP	46.0	-21.4	2.00 V	173	30.1	-5.5
6	837.12	28.5 QP	46.0	-17.5	1.00 V	216	29.4	-0.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



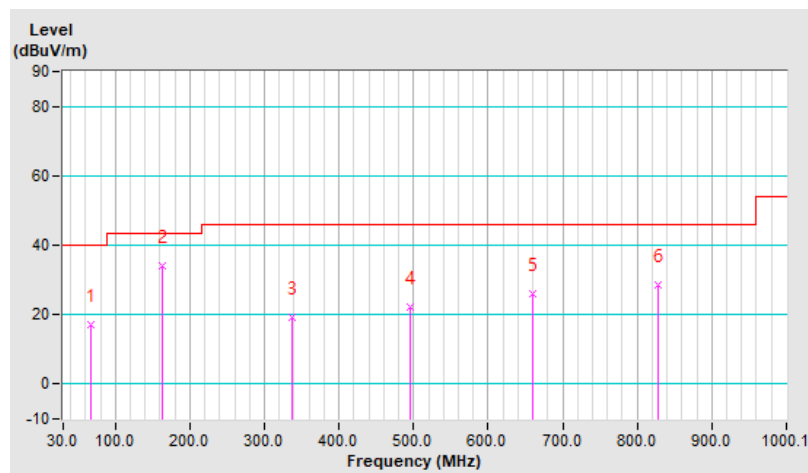
Standby Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	67.83	17.2 QP	40.0	-22.8	2.00 H	150	31.6	-14.4
2	162.90	34.2 QP	43.5	-9.3	2.00 H	280	47.0	-12.8
3	336.55	19.2 QP	46.0	-26.8	1.50 H	5	30.4	-11.2
4	495.65	22.2 QP	46.0	-23.8	1.00 H	12	29.2	-7.0
5	660.57	26.2 QP	46.0	-19.8	1.00 H	58	30.2	-4.0
6	828.39	28.4 QP	46.0	-17.6	1.00 H	344	29.3	-0.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

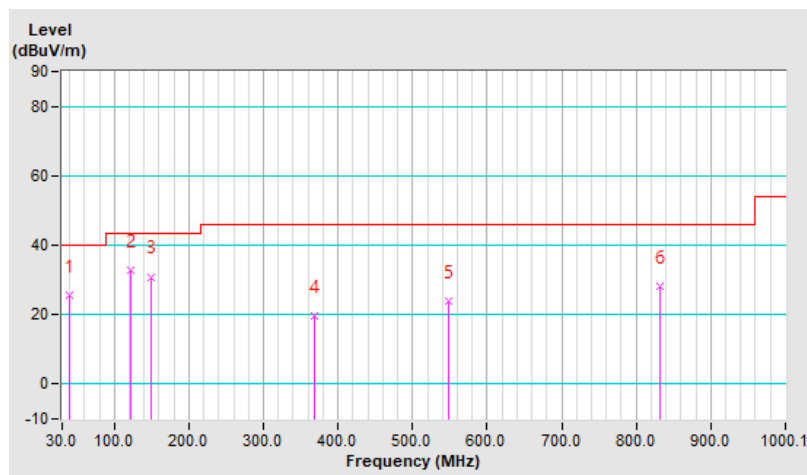


Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.67	25.8 QP	40.0	-14.2	1.00 V	351	38.5	-12.7
2	122.16	32.8 QP	43.5	-10.7	1.50 V	2	47.2	-14.4
3	149.32	30.9 QP	43.5	-12.6	1.00 V	262	43.6	-12.7
4	368.56	19.7 QP	46.0	-26.3	2.00 V	70	30.2	-10.5
5	549.00	23.9 QP	46.0	-22.1	1.00 V	18	30.1	-6.2
6	832.27	28.1 QP	46.0	-17.9	2.00 V	18	29.0	-0.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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 0.50 MHz.
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.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESR3	102783	Dec. 21, 2022	Dec. 20, 2023
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 02, 2023	Sep. 01, 2024
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Mar. 07, 2023	Mar. 06, 2024
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Sep. 12, 2023	Sep. 11, 2024
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

- Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 2 (Conduction 2).
 3. The VCCI Site Registration No. is C-12047.

4.2.3 Test Procedures

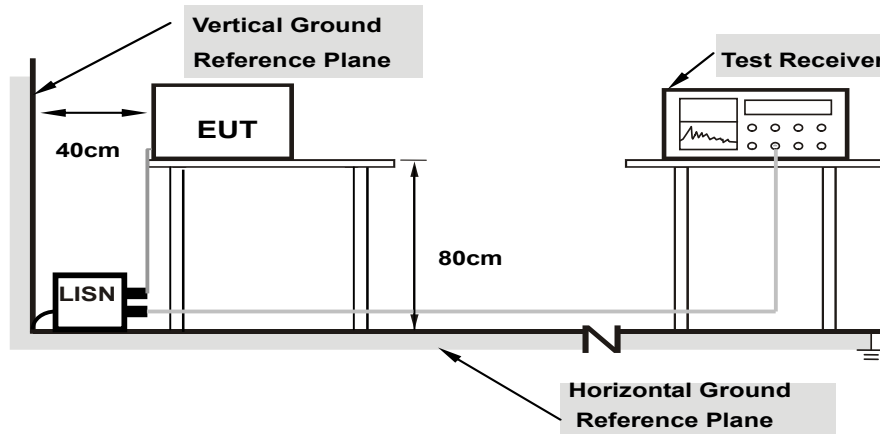
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling 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 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz - 30 MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

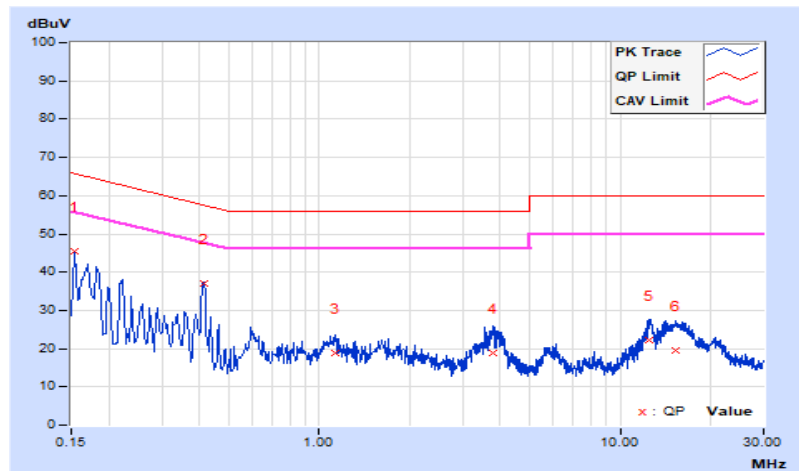
Operated Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.32	35.01	18.82	45.33	29.14	65.78	55.78	-20.45	-26.64
2	0.41400	10.42	26.45	23.67	36.87	34.09	57.57	47.57	-20.70	-13.48
3	1.12600	10.43	8.32	1.01	18.75	11.44	56.00	46.00	-37.25	-34.56
4	3.75800	10.51	8.44	0.33	18.95	10.84	56.00	46.00	-37.05	-35.16
5	12.45400	10.61	11.69	2.90	22.30	13.51	60.00	50.00	-37.70	-36.49
6	15.35800	10.67	8.80	3.54	19.47	14.21	60.00	50.00	-40.53	-35.79

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

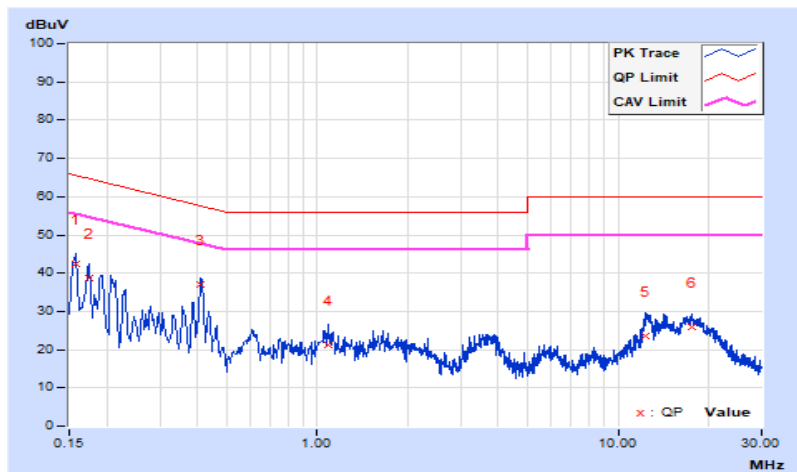


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15800	10.33	32.23	17.48	42.56	27.81	65.57	55.57	-23.01	-27.76
2	0.17400	10.34	28.34	18.40	38.68	28.74	64.77	54.77	-26.09	-26.03
3	0.41000	10.44	26.66	23.79	37.10	34.23	57.65	47.65	-20.55	-13.42
4	1.08600	10.45	10.63	4.43	21.08	14.88	56.00	46.00	-34.92	-31.12
5	12.40200	10.72	12.87	3.97	23.59	14.69	60.00	50.00	-36.41	-35.31
6	17.69400	10.86	14.99	9.21	25.85	20.07	60.00	50.00	-34.15	-29.93

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



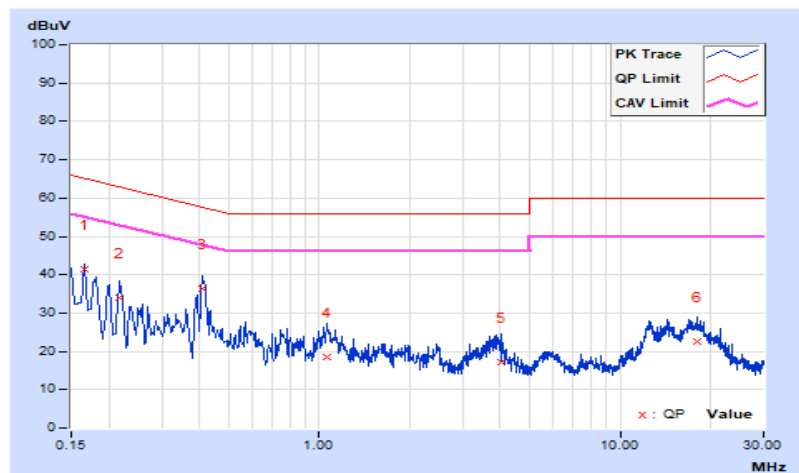
Standby Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16600	10.33	30.97	17.35	41.30	27.68	65.16
2	0.21800	10.35	23.64	8.73	33.99	19.08	62.89	52.89	-28.90	-33.81
3	0.41000	10.42	25.85	21.09	36.27	31.51	57.65	47.65	-21.38	-16.14
4	1.06600	10.43	8.14	2.02	18.57	12.45	56.00	46.00	-37.43	-33.55
5	4.00600	10.52	6.80	2.61	17.32	13.13	56.00	46.00	-38.68	-32.87
6	18.00200	10.71	11.88	6.45	22.59	17.16	60.00	50.00	-37.41	-32.84

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

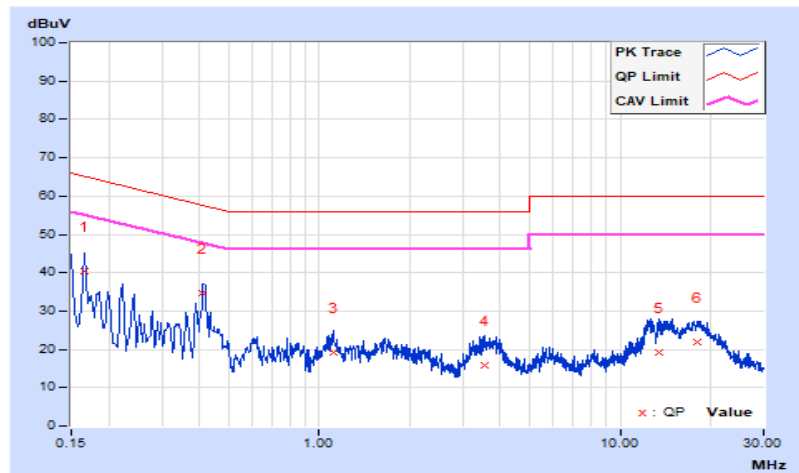


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16600	10.34	30.13	15.77	40.47	26.11	65.16
2	0.41143	10.44	24.38	21.19	34.82	31.63	57.62	47.62	-22.80	-15.99
3	1.11800	10.45	8.58	2.96	19.03	13.41	56.00	46.00	-36.97	-32.59
4	3.53400	10.52	5.37	1.62	15.89	12.14	56.00	46.00	-40.11	-33.86
5	13.41800	10.75	8.57	1.58	19.32	12.33	60.00	50.00	-40.68	-37.67
6	18.04600	10.87	11.03	5.87	21.90	16.74	60.00	50.00	-38.10	-33.26

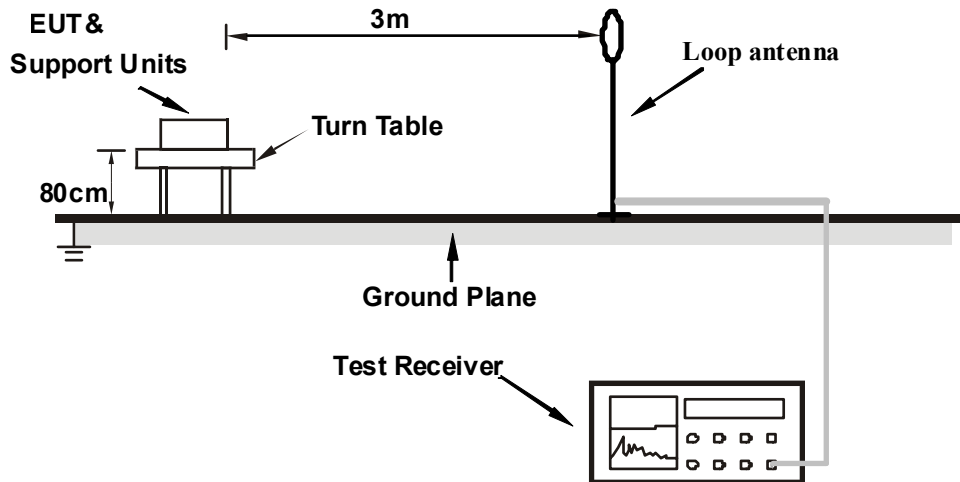
Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



4.3 20dB Bandwidth Measurement

4.3.1 Test Setup



4.3.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.3 Test Procedure

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter Semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation. Then the Loop antenna was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband loop antenna, which is fixed of a 1m height above the ground, and set away from 3m to the EUT to find the disturbance reading on each frequency.
- The test- spectrum system was set to Peak detect function and specified bandwidth.
- Measurement method refers to Section 6.9.2 of ANSI C63.10.

4.3.4 Deviation from Test Standard

No deviation.

4.3.5 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously.

4.3.6 Test Results

Frequency (kHz)	20dB Bandwidth (kHz)	Pass / Fail
511	2.030	Pass



Note: The signal look like CW signal, so RBW can't be match 1~5 % OBW.

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

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Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

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Email: service.adt@bureauveritas.com

Web Site: <http://ee.bureauveritas.com.tw>

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

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