



RADIO TEST REPORT

FCC ID : ZPNUNIVERSALTABSD
Equipment : 77GHz TA BSD Radar Module
Brand Name : Cub
Model Name : A009-007
Applicant : CUB ELECPARTS INC
No.6,Lane 546, Sec. 6, Changlu Road, Fuhsin Township,
Changhua County, Taiwan 506
Manufacturer : CUB ELECPARTS INC
No.6,Lane 546, Sec. 6, Changlu Road, Fuhsin Township,
Changhua County, Taiwan 506
Standard : 47 CFR FCC Part 95M

The product was received on Oct. 11, 2023, and testing was started from Nov. 29, 2023 and completed on Nov. 30, 2023. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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Appendix A. Test Photos

Photographs of EUT v01



History of this test report

Report No.	Version	Description	Issued Date
FR001350-01	01	Initial issue of report	Dec. 26, 2023



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	95.3367	Radiated E.I.R.P Power	PASS	-
3.2	95.3379	Transmitter Radiated Unwanted Emissions	PASS	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: **Sam Chen**

Report Producer: **Cathy Chiu**



1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information			
Frequency Range (GHz)	Operating Frequency Range (GHz)	Test Frequency (GHz)	Modulation
76-81	76.15-76.75	76.45	FMCW

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					TX	RX
1	Cub	CUBT76500	Microstrip Antenna	N/A	11.71	-
2	Cub	CUBT76500	Microstrip Antenna	N/A	-	13.9

Note: The above information was declared by manufacturer.

1.1.3 EUT Operational Condition

EUT Power Type	Host System (Host: 12V or 24V)		
Supply Voltage	<input type="checkbox"/>	AC	State AC voltage
Supply Voltage	<input checked="" type="checkbox"/>	DC	State DC voltage
			12V or 24V

1.1.4 Test Signal Duty Cycle

Test Signal Duty Cycle
<input checked="" type="checkbox"/> Continuous transmission - 15.3%
<input type="checkbox"/> Transmissions occur regularly in time - ...%

1.1.5 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR001350

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Adding mobile host 5 ~ 8 and its accessories set. (Please refer to section 2.3 for detail information.)	1. Radiated E.I.R.P Power test 2. Transmitter Radiated Unwanted Emissions below 40GHz test
2. Adding accessories set 2 for mobile host 1 ~ 4. (Please refer to section 2.7 for detail information.)	Transmitter Radiated Unwanted Emissions below 1GHz test



1.2 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR FCC Part 95M
- ♦ ANSI C63.10 - Testing Unlicensed Wireless Devices
- ♦ KDB653005 D01 76-81 GHz Radars v01r01

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ FCC KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.) TEL: 886-3-656-9065 FAX: 886-3-656-9085 Test site Designation No. TW3787 with FCC. Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
Radiated	03CH06-CB	Jackson Peng	22.4-23.5 / 55-58	Nov. 29, 2023~ Nov. 30, 2023

1.4 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))

Test Items	Uncertainty	Remark
Radiated Emission (9kHz ~ 30MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.1 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.1 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.2 dB	Confidence levels of 95%



2 Test Configuration of EUT

2.1 Test Channel Frequencies Configuration

Test Frequencies (GHz)	76.45
Software Setting	Default

2.2 Conformance Tests and Related Test Frequencies

Test Item	Test Frequencies (GHz)
Radiated E.I.R.P Power	76.45
Transmitter Spurious Emissions (below 1 GHz)	76.45
Transmitter Spurious Emissions (1 GHz-40 GHz)	76.45

2.3 Host Information

Host No.	Model Name of Host	Amount of Module	Accessories	Description
1	B122-009NA1-A3	1	Equip with the same accessories.	All the models are identical except for the exterior of EUT, the housing of EUT, amount of modules, and accessories.
2	B122-010NA1-A3	2		
3	B122-009NA1-A2	1		
4	B122-010NA1-A2	2		
5	B122-073NA1-A0	1	Equip with the same accessories.	
6	B122-072NA1-A0	2		
7	B122-075NA1-A0	1		
8	B122-074NA1-A0	2		

Note 1: The EUT is a limited module. The EUT was installed to the above host to perform all the tests.

Note 2: The above information was declared by manufacturer.



2.4 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	Radiated E.I.R.P Power
Test Condition	Radiated measurement
1	EUT with Host 5
2	EUT with Host 6
3	EUT with Host 7
4	EUT with Host 8

The Worst Case Mode for Following Conformance Tests	
Tests Item	Transmitter Radiated Unwanted Emissions
Test Condition	Radiated measurement Voltage: 12DC
Operating Mode < 1GHz	CTX
The EUT was performed at DC 12V and DC 24V, and the worst case was found at DC 12V. So the measurement will follow this same test configuration.	
1	EUT with Host 1 + Host 2 + Host 3 + Host 4 + accessories set 2 / DC 12V
2	EUT with Host 5 + Host 6 + Host 7 + Host 8 + accessories set 3 / DC 12V
For operating mode 2 is the worst case and it was record in this test report.	
Operating Mode > 1GHz	CTX
Host 7 has been evaluated to be the worst case from Radiated E.I.R.P Power, thus measurement will follow this same test mode.	
1	EUT with Host 7

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation
Operating Mode	
1	Host 2 (module*2)
2	Host 4 (module*2)
3	Host 6 (module*2)
4	Host 8 (module*2)
Refer to Sporton Test Report No.: FA001350-01 for Co-location RF Exposure Evaluation.	

Note: The EUT can only be used at Y axis position.

2.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.



2.6 Accessories

N/A

2.7 Accessories of Host

Item	Equipment Name	Brand	Model	Remark
1	Controller 1	Cub	C001-007NA1	*1
2	Controller 2	Cub	C001-025NA1-A0	*1
3	Controller 3	Cub	C001-022NA1-A0	*1
4	Info cable 1	Cub	25-300065-01	Non-shielded*1, 0.5m
5	Info cable 2	Cub	25-360139-01	Non-shielded*1, 0.5m
6	Cable 1	Cub	25-360	Non-shielded*1, 4.5m
7	Cable 2	Cub	25-360047-01	Non-shielded*1, 6m
8	Cable 3	Cub	25-300066-01	Non-shielded*1, 4.5m
9	Cable 4	Cub	25-360287	Non-shielded*1, 4.5m
10	Cable 5	Cub	25-360286	Non-shielded*1, 4.5m
11	Cable 6	Cub	25-360302-00	Non-shielded*1, 3m
12	Cable 7	Cub	25-360301-20	Non-shielded*1, 12m
13	Cable 8	Cub	25-360276	Non-shielded*1, 4.5m
14	Cable 9	Cub	TA25-300032	Non-shielded*1, 4.2m
15	Cable 10	Cub	25-300657-00	Non-shielded*1, 0.2m
16	Cable 11	Cub	25-360277	Non-shielded*1, 3m
17	Cable 12	Cub	250360278	Non-shielded*1, 3.5m
18	Cable 13	Cub	TA25-360003	Non-shielded*1, 12m
19	Buzzer 1	Cub	44-1000	Non-shielded*1, 4m
20	Buzzer 2	Cub	44-100008-01	Non-shielded*1, 0.1m
21	Switch	Cub	A009-004NA1-A2	Non-shielded*1, 0.2m
22	Indicator_BSD 1	Cub	C200-00	Non-shielded*2, 1.5m
23	Indicator_BSD 2	Cub	C200-012NA1-A0	Non-shielded*2, 2m
24	Indicator_BSD 3	Cub	C200-0010NA-A1	Non-shielded*1, 1.5m
25	Indicator_BSD 4	Cub	C200-0010NA-A2	Non-shielded*1, 1.5m
26	Indicator_turn 1	Cub	C200-006NA1-A0	Non-shielded*1, 1.5m
27	Indicator_turn 2	Cub	C200-006NA4-A0	Non-shielded*1, 2.5m
28	Light sensor	Cub	C901-001NA1-A0	Non-shielded*1, 2m

Note: For accessories set 1: The difference between info cable 1 & info cable 2 is only I/O port, there is only info cable 2 tested and recorded in this report.



Accessories Set	Content of Accessories	Remark
1	Controller 1, Info cable 1, Info cable 2, Cable 1, Cable 2, Cable 3, Buzzer 1, Switch, Indicator_BSD 1 and Indicator_turn 1	Used for Host 1~4
2	Controller 2, Cable 4, Cable 5, Cable 6, Cable 7 and Indicator_BSD 2	Used for Host 1~4
3	Controller 3, Info cable 1, Cable 8, Cable 9, Cable 10, Cable 11, Cable 12, Cable 13, Buzzer 2, Switch, Indicator_BSD 3, Indicator_BSD 4, Indicator_turn 2 and Light sensor	Used for Host 5~8

2.8 Support Equipment

For Radiated Emissions below 1GHz test:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	DC Power Supply	MOTECH	LPS-305	N/A

For Radiated Emissions above 1GHz test:

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	DC Power Supply	MOTECH	LPS-305	N/A
B	Client	Cub	B122-073NA1-A0	N/A

2.9 Far Field Boundary Calculations

The far-field boundary is given as:

$$\text{far field} = (2 * L^2) / \lambda$$

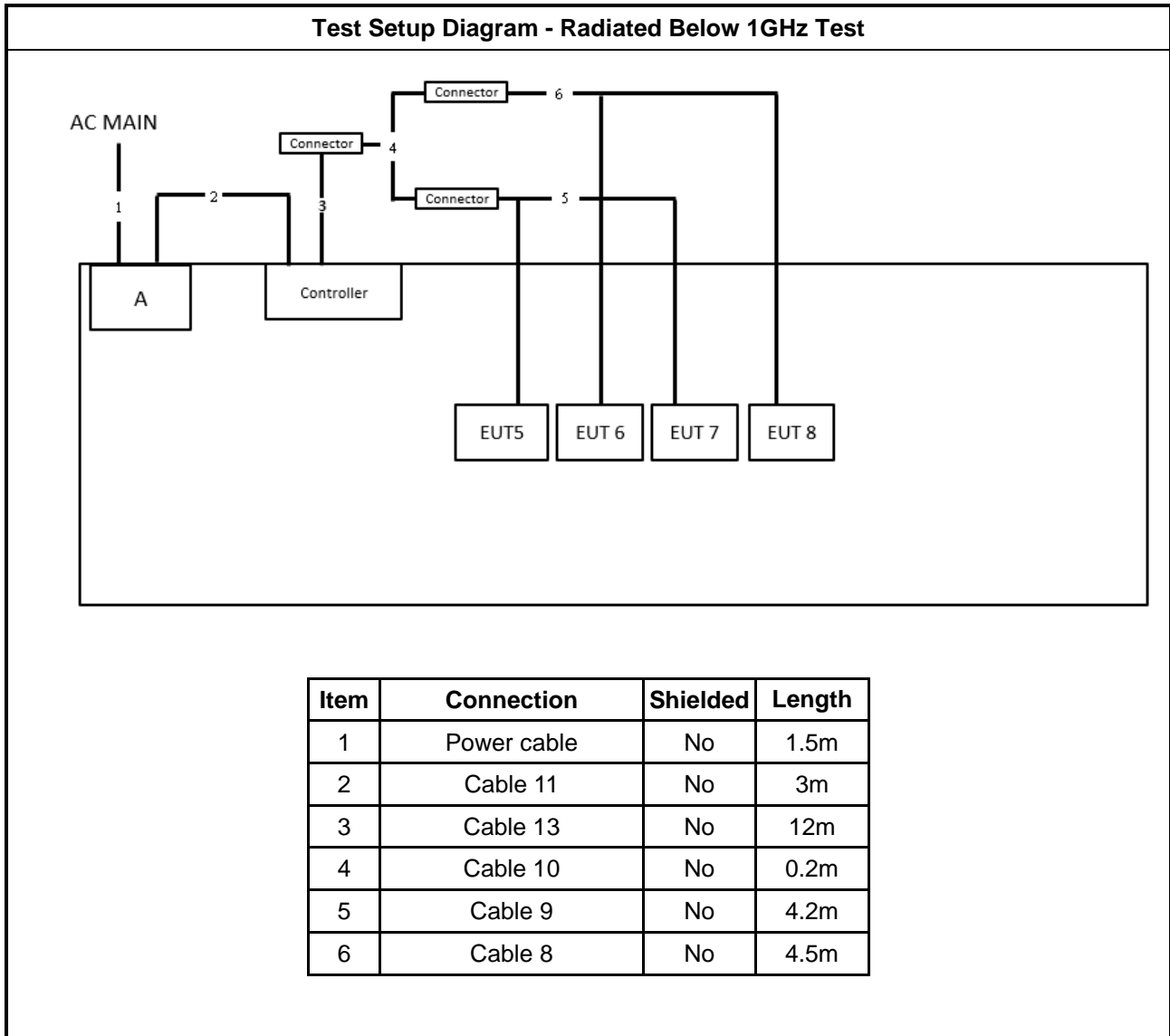
where:

L = Largest Antenna Dimension, including the reflector, in meters

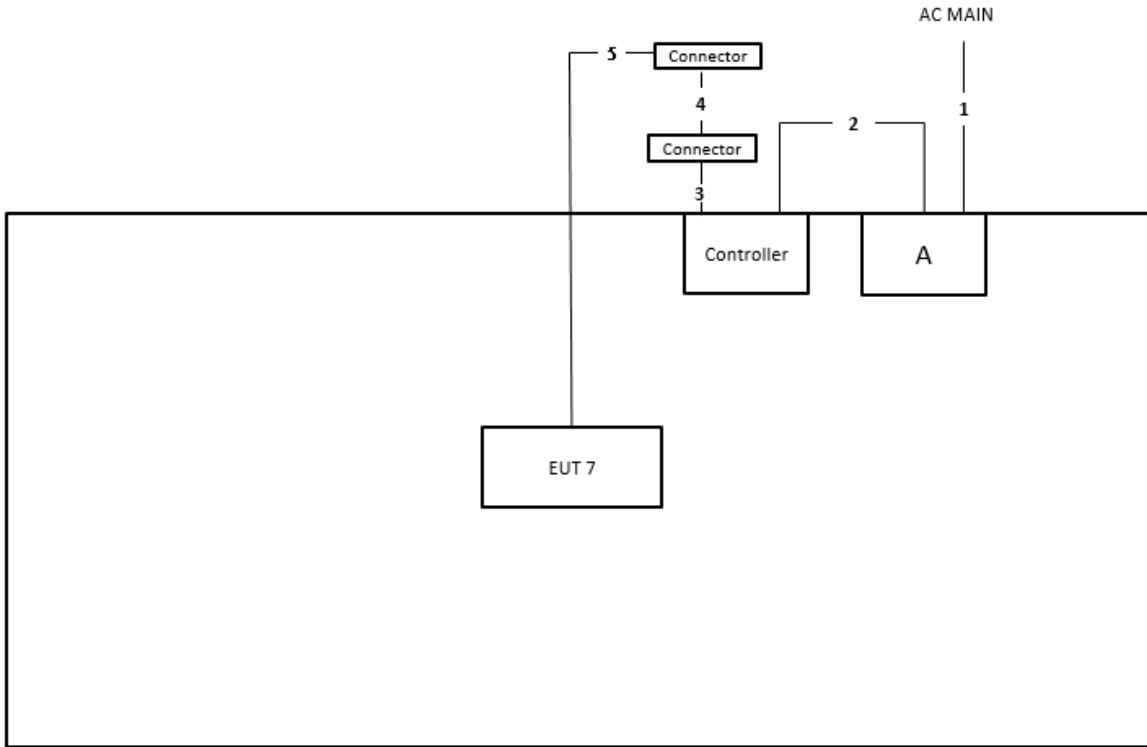
λ= wavelength in meters

Far Field (m)				
Frequency (GHz)	L (m)	Lambda (m)	d(Far Field) (m)	d(Far Field) (cm)
76.45	0.026	0.0039241	0.345	34.45

2.10 Test Setup Diagram



Test Setup Diagram - Radiated Above 1GHz Test



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	Cable 11	No	3m
3	Cable 13	No	12m
4	Cable 10	No	0.2m
5	Cable 9	No	4.2m



3 Transmitter Test Result

3.1 Radiated E.I.R.P Power

3.1.1 Radiated E.I.R.P Power Limit

Radiated E.I.R.P Power	
<input checked="" type="checkbox"/>	76-81 GHz Band:
<input checked="" type="checkbox"/>	Peak: EIRP 55 dBm [279uW/cm ² at 3m] Average: EIRP 50 dBm [88uW/cm ² at 3m]

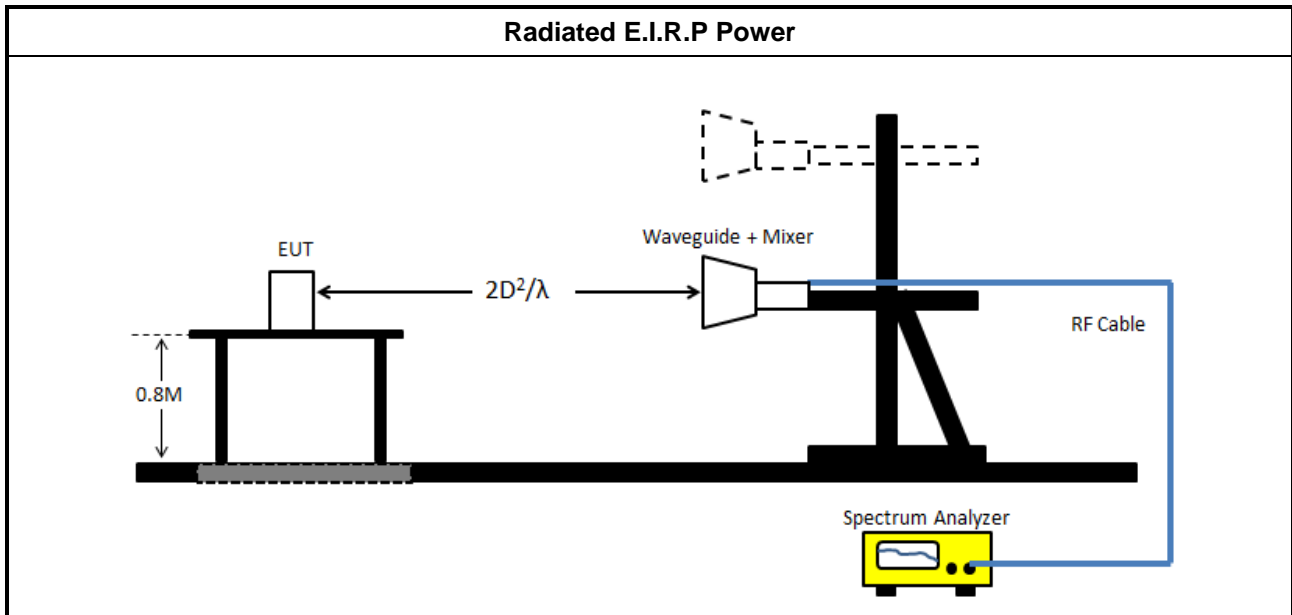
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method	
<input checked="" type="checkbox"/>	For the Occupied bandwidth shall be measured using one of the options below:
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 9 for radiated measurement.
<input checked="" type="checkbox"/>	Radiated test was conducted at far-field distance. the distance from the radiating element of the EUT to the edge of the far field may be calculated from $[r \geq 2D^2/\lambda]$ r is the distance from the radiating element of the EUT to the edge of the far field, in m D is the largest dimension of both the radiating element and the test antenna (horn), in m λ is the wavelength of the emission under investigation $[300/f \text{ (MHz)}]$, in m
<input checked="" type="checkbox"/>	The measured power level is converted to EIRP using the Friis equation: $E \text{ Meas} = 126.8 - 20\log(\lambda) + P - G$ where E is the field strength of the emission at the measurement distance, in dB μ V/m P is the power measured at the output of the test antenna, in dBm λ is the wavelength of the emission under investigation $[300/f\text{MHz}]$, in m G is the gain of the test antenna, in dBi $EIRP = E \text{ Meas} + 20 \log(d \text{ Meas}) - 104.7$ where EIRP : is the equivalent isotropically radiated power, in dBm. E Meas : is the field strength of the emission at the measurement distance, in dB μ V/m. d Meas : is the measurement distance, in m.

3.1.4 Test Setup



3.1.5 Measurement Results Calculation

The measured Level is calculated using:

$$EIRP = \text{Read Level} - \text{Rx Gain} + 20 \cdot \text{LOG} \left(\frac{4 \cdot 3.14159 \cdot \text{Distance}}{300 \cdot (\text{Test Freq.} \cdot 1000)} \right)$$

$$\text{Power Density} = \left(\frac{10^{(EIRP/10)}}{1000} \right) / \left(4 \cdot 3.14159 \cdot (\text{Specification Distance} \cdot 100)^2 \right) \cdot 1000000000000$$



3.1.6 Test Result of Radiated E.I.R.P Power

EUT with Host 5

Freq. (GHz)	Rx Gain (dBi)	P-Peak (dBm)	P-Average (dBm)	E-Meas-Peak (dBuV/m)	E-Meas-Average (dBuV/m)	Distance (m)	EIRP-Peak (dBm)	EIRP-Average (dBm)
76.45	23.9	-13.15	-32.19	137.88	118.84	0.50	27.05	8.01
EIRP Limit							55	50

EUT with Host 6

Freq. (GHz)	Rx Gain (dBi)	P-Peak (dBm)	P-Average (dBm)	E-Meas-Peak (dBuV/m)	E-Meas-Average (dBuV/m)	Distance (m)	EIRP-Peak (dBm)	EIRP-Average (dBm)
76.45	23.9	-12.13	-32.2	138.90	118.83	0.50	28.07	8.00
EIRP Limit							55	50

EUT with Host 7

Freq. (GHz)	Rx Gain (dBi)	P-Peak (dBm)	P-Average (dBm)	E-Meas-Peak (dBuV/m)	E-Meas-Average (dBuV/m)	Distance (m)	EIRP-Peak (dBm)	EIRP-Average (dBm)
76.45	23.9	-11.82	-32.04	139.21	118.99	0.50	28.38	8.16
EIRP Limit							55	50

EUT with Host 8

Freq. (GHz)	Rx Gain (dBi)	P-Peak (dBm)	P-Average (dBm)	E-Meas-Peak (dBuV/m)	E-Meas-Average (dBuV/m)	Distance (m)	EIRP-Peak (dBm)	EIRP-Average (dBm)
76.45	23.9	-13.1	-32.96	137.93	118.07	0.50	27.10	7.24
EIRP Limit							55	50



3.2 Transmitter Radiated Unwanted Emissions

3.2.1 Transmitter Radiated Unwanted Emissions Limit

Transmitter Radiated Unwanted Emissions Limit (Below 40 GHz)			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960 - 40000	500	54	3

Frequency Range (GHz)	EIRP (dBm)	Power Density (pW/cm ² @ 3m)
40 - 200	-1.7	600
200 - 231	0.5	1000

3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

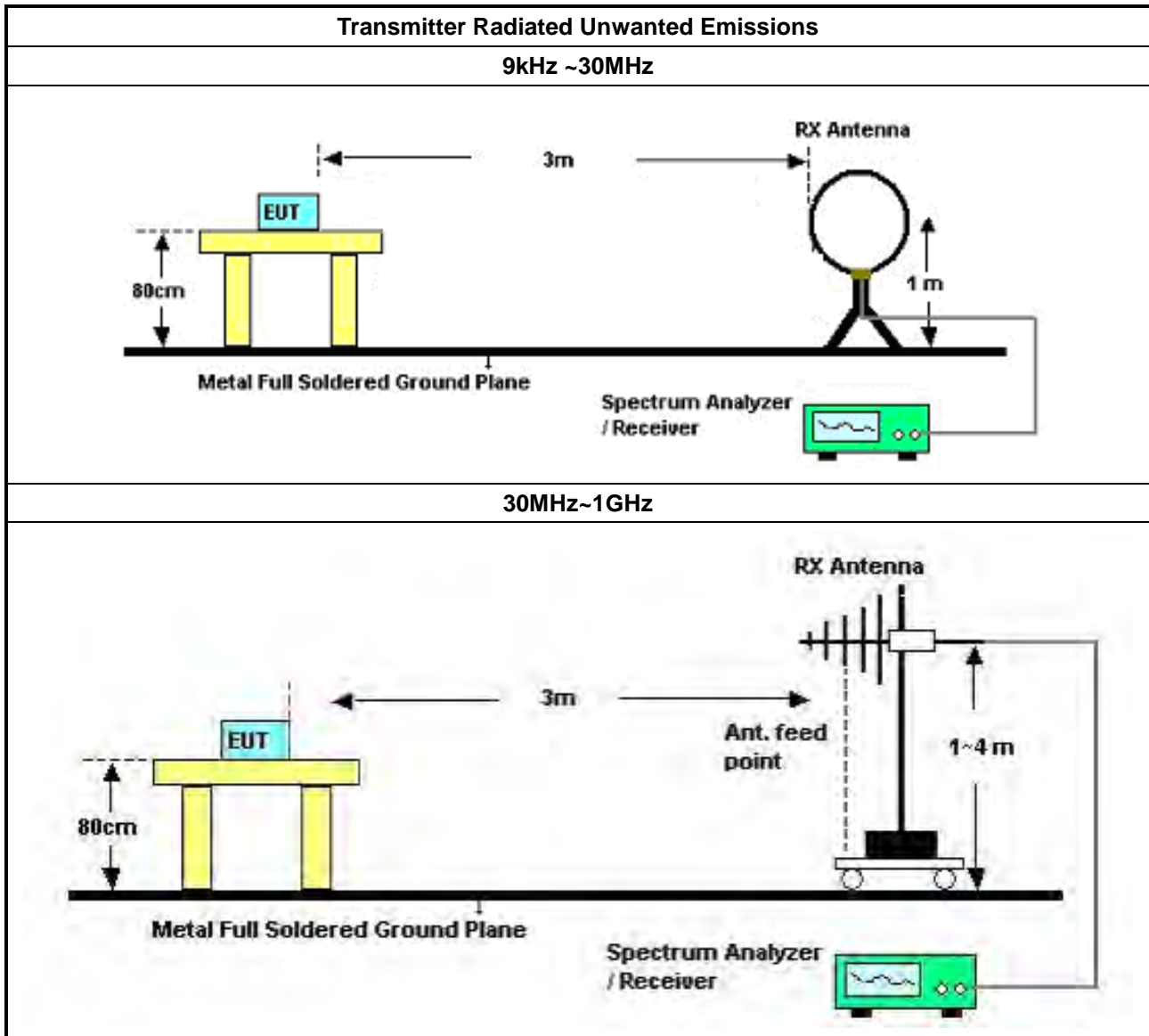


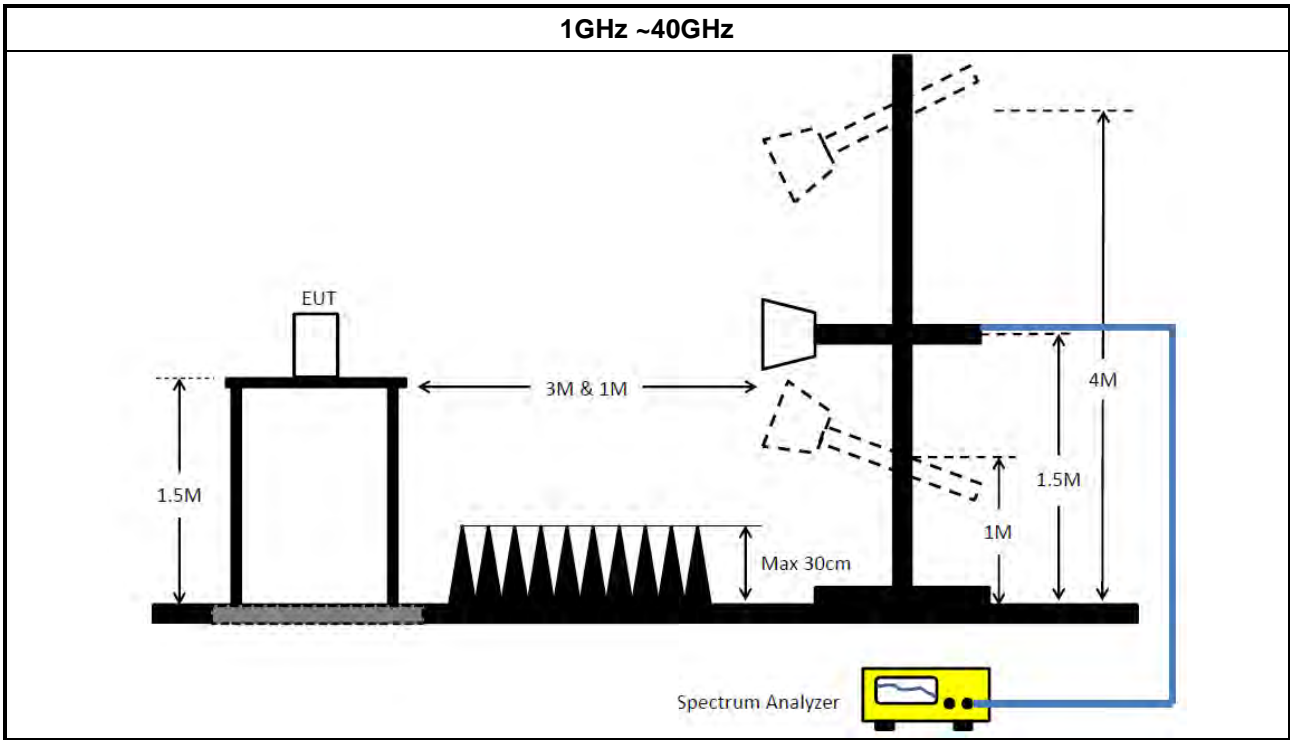
3.2.3 Test Procedures

Test Method – General Information	
<input checked="" type="checkbox"/> For the transmitter unwanted emissions shall be measured using following options below:	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.3 for unwanted emissions into non-restricted bands.
<input checked="" type="checkbox"/>	For unwanted emissions below 40GHz bands.
<input checked="" type="checkbox"/>	Radiated emissions below 40 GHz shall not exceed the general limits in LP0002 Section 2.8
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 4.1.4.2.3 (Video Averaging) average measurements using spectrum reduced video bandwidth (VBW≥10Hz) - [duty cycle ≥ 98 or external power trigger].
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions.
<input type="checkbox"/>	Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.

Test Method	
<input checked="" type="checkbox"/> For radiated measurement below 40GHz.	
<input checked="" type="checkbox"/>	Refer as ANSI C63.10, clause 6.3 through 6.6 for radiated emissions from below 40 GHz.
<input checked="" type="checkbox"/> For radiated measurement above 40GHz. Refer as ANSI C63.10, clause 9.12 for radiated measurement.	
<input checked="" type="checkbox"/>	Radiated test was conducted at far-field distance. the distance from the radiating element of the EUT to the edge of the far field may be calculated from $[r \geq 2D^2/\lambda]$ r is the distance from the radiating element of the EUT to the edge of the far field, in m D is the largest dimension of both the radiating element and the test antenna (horn), in m λ is the wavelength of the emission under investigation $[300/f \text{ (MHz)}]$, in m
<input checked="" type="checkbox"/>	The measured power level is converted to EIRP using the Friis equation: E Meas = 126.8 - 20log(λ) + P – G where E is the field strength of the emission at the measurement distance, in dB μ V/m P is the power measured at the output of the test antenna, in dBm λ is the wavelength of the emission under investigation $[300/f\text{MHz}]$, in m G is the gain of the test antenna, in dBi EIRP = E Meas + 20 log(d Meas) – 104.7 where EIRP : is the equivalent isotropically radiated power, in dBm. E Meas : is the field strength of the emission at the measurement distance, in dB μ V/m. d Meas : is the measurement distance, in m. Equations to calculate power density Calculate the power density at the distance specified by the limit from the EIRP in watts using Equation: $PD = \frac{EIRP_{Linear}}{4\pi d^2}$ where PD is the power density at the distance specified by the limit, in W/m ² EIRPLinear is the equivalent isotropically radiated power, in watts d is the distance at which the power density limit is specified, in m.

3.2.4 Test Setup







3.2.5 Measurement Results Calculation

The measured Level is calculated using:

For below 40GHz

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

For above 40GHz

EIRP = Read Level - Rx Gain +20*LOG(4*3.14159* Distance / (300/(Test Freq.*1000))).

Power Density = ((10^(EIRP/10)/1000)/(4*3.14159*(Specification Distance *100)^2))*1000000000000.

3.2.6 Test Result of Transmitter Radiated Unwanted Emissions (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

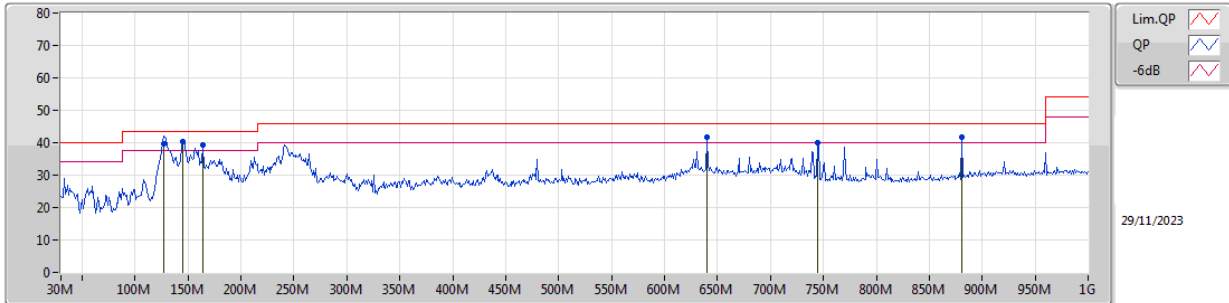
The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.



3.2.7 Test Result of Transmitter Radiated Unwanted Emissions (30MHz ~ 1GHz)

Test Range	30 MHz – 1000 MHz	Test Freq. (GHz)	76.45
Test Distance	3 m	Test Mode	Mode 2

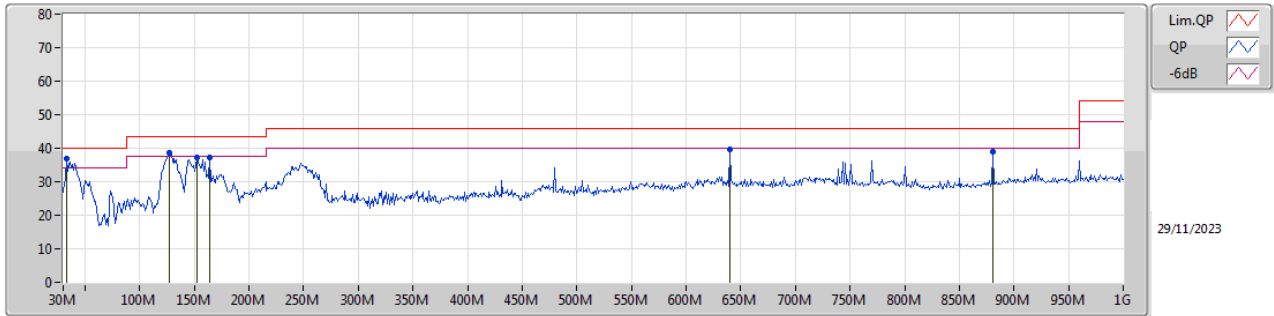
Horizontal



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
QP	127M	39.50	43.50	-4.00	-12.30	3	Horizontal	198	2.00	-	51.80	18.17	1.83	32.30
QP	145.43M	40.44	43.50	-3.06	-13.47	3	Horizontal	252	2.00	"Worst"	53.91	16.88	1.92	32.27
PK	163.86M	39.19	43.50	-4.31	-14.26	3	Horizontal	115	1.00	-	53.45	16.03	2.00	32.29
PK	640.13M	41.73	46.00	-4.27	-2.62	3	Horizontal	215	1.25	-	44.35	25.20	3.66	31.48
PK	744.89M	40.03	46.00	-5.97	-1.97	3	Horizontal	289	1.50	-	42.00	25.57	3.92	31.46
PK	880.69M	41.59	46.00	-4.41	-1.16	3	Horizontal	144	1.00	-	42.75	26.34	4.26	31.76



Vertical



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
PK	32.91M	36.85	40.00	-3.15	-8.66	3	Vertical	146	1.00	"Worst"	45.51	22.58	1.17	32.41
PK	127M	38.52	43.50	-4.98	-12.30	3	Vertical	219	1.00	-	50.82	18.17	1.83	32.30
PK	152.22M	37.39	43.50	-6.11	-13.84	3	Vertical	212	1.00	-	51.23	16.47	1.95	32.26
PK	163.86M	37.19	43.50	-6.31	-14.26	3	Vertical	266	1.25	-	51.45	16.03	2.00	32.29
PK	640.13M	39.74	46.00	-6.26	-2.62	3	Vertical	195	1.50	-	42.36	25.20	3.66	31.48
PK	880.69M	39.00	46.00	-7.00	-1.16	3	Vertical	178	1.50	-	40.16	26.34	4.26	31.76

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.

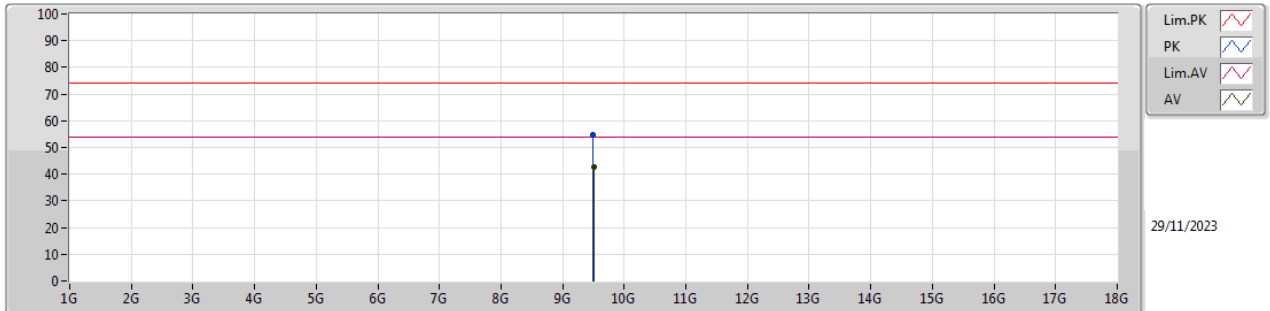
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)



3.2.8 Test Result of Transmitter Radiated Unwanted Emissions (1GHz – 40GHz)

Test Range	1GHz – 18GHz	Test Freq. (GHz)	76.45
Test Distance	3 m		

Horizontal

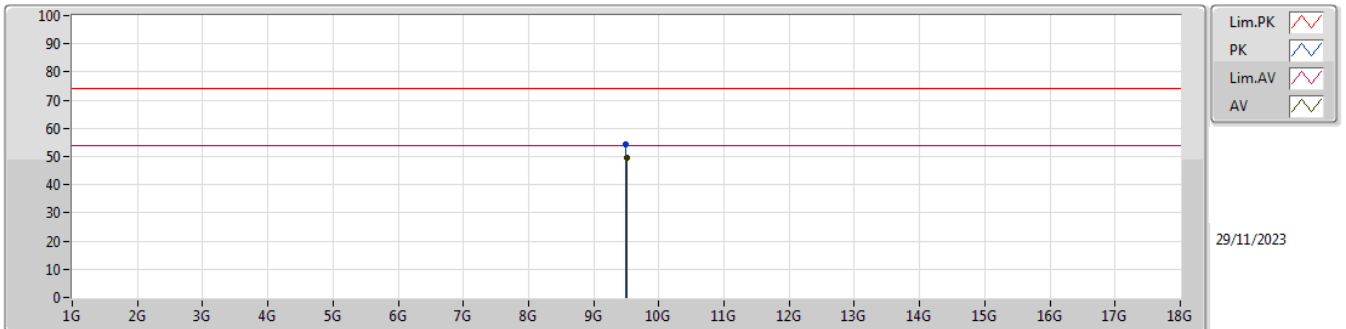


EUT Y
Power DC12V
06-K-G-4

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
PK	9.49916G	54.55	74.00	-19.45	5.62	3	Horizontal	167	2.71	-	48.93	38.90	9.55	42.83
AV	9.50005G	42.61	54.00	-11.39	5.63	3	Horizontal	167	2.71	-	36.98	38.90	9.56	42.83



Vertical



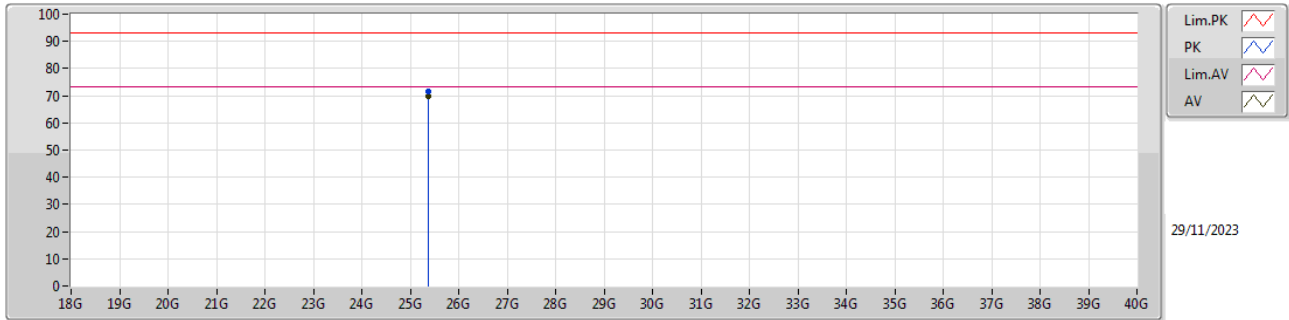
EUT Y
Power DC12V
06-K-G-4

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
PK	9.49854G	54.28	74.00	-19.72	5.62	3	Vertical	56	1.23	-	48.66	38.90	9.55	42.83
AV	9.50119G	49.51	54.00	-4.49	5.63	3	Vertical	56	1.23	-	43.88	38.90	9.56	42.83



Test Range	18GHz – 40GHz	Test Freq. (GHz)	76.45
Test Distance	1 m		

Horizontal

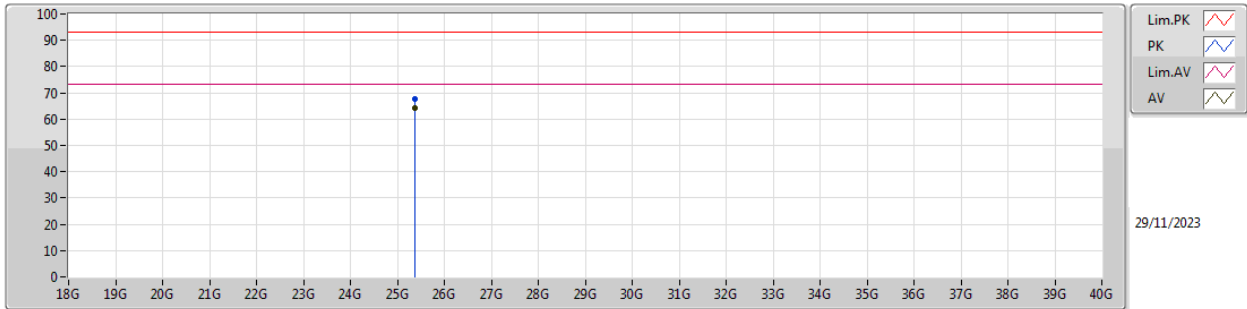


EUT Y
Power DC12V
06-K-J-8

Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV/m)	AF (dB/m)	CL (dB)	PA (dB)
PK	25.38437G	71.59	93.08	-21.49	14.43	1	Horizontal	269	1.50	-	57.16	39.29	21.59	46.45
AV	25.38442G	69.89	73.08	-3.19	14.43	1	Horizontal	269	1.50	-	55.46	39.29	21.59	46.45



Vertical



EUT Y
Power DC12V
06-K-J-8

Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV/m)	(dB/m)	(dB)	(dB)		
PK	25.38431G	67.63	93.08	-25.45	14.43	1	Vertical	185	1.50	-	53.20	39.29	21.59	46.45		
AV	25.38435G	64.16	73.08	-8.92	14.43	1	Vertical	185	1.50	-	49.73	39.29	21.59	46.45		

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)



4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Loop Antenna	Teseq	HLA 6121	65417	9kHz - 30 MHz	Oct. 13, 2023	Oct. 12, 2024	Radiation (03CH06-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH06-CB	30 MHz ~ 1 GHz	Aug. 03, 2023	Aug. 02, 2024	Radiation (03CH06-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH06-CB	1GHz ~18GHz 3m	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH06-CB)
Bilog Antenna with 6 dB attenuator	TESEQ & EMCI	CBL6112D & N-6-06	37878 & AT-N0606	20MHz ~ 2GHz	Jul. 30, 2023	Jul. 29, 2024	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1292	1GHz~18GHz	Jul. 31, 2023	Jul. 30, 2024	Radiation (03CH06-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Sep. 04, 2023	Sep. 03, 2024	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	310N	187290	0.1MHz ~ 1GHz	Nov. 03, 2023	Nov. 02, 2024	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	Aug. 01, 2023	Jul. 31, 2024	Radiation (03CH06-CB)
Pre-Amplifier	SGH	SGH184	20230109-3	18~40GHz	Jan. 13, 2023	Jan. 12, 2024	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSP40	100080	9kHz~40GHz	Dec. 21, 2022	Dec. 20, 2023	Radiation (03CH06-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 13, 2023	Jun. 12, 2024	Radiation (03CH06-CB)
RF Cable-low	Woken	RG402	Low Cable-24+68	30MHz~1GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-05+68	1GHz~18GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH06-CB)
High Cable	Woken	WCA0929M	40G#5+6	1GHz ~ 40 GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH06-CB)
High Cable	Woken	WCA0929M	40G#5	1GHz ~ 40 GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH06-CB)
High Cable	Woken	WCA0929M	40G#6	1GHz ~ 40 GHz	Oct. 02, 2023	Oct. 01, 2024	Radiation (03CH06-CB)
Test Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Radiation (03CH06-CB)

Note: Calibration Interval of instruments listed above is one year.

N.C.R. means Non-Calibration required.