

TEST REPORT

Product Name : CM-SRC&CM-SMT
Model Number : CM-SRC&CM-SMT
FCC ID : 2AM3B-CM-SMT

Prepared for : NINGBO CHIMA WINCH CO., LTD
Address : Wangjiaqiao Village, Dongqiao town, Yinzhou District, Ningbo, Zhejiang Province

Prepared by : EMTEK (NINGBO) CO., LTD.
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Date(s) of Tests : March 05, 2022 to April 14, 2022
Date of issue : April 15, 2022

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TEST REPORT DESCRIPTION

Applicant : NINGBO CHIMA WINCH CO., LTD
Manufacturer : NINGBO CHIMA WINCH CO., LTD
Trade Mark : N/A
EUT : CM-SRC&CM-SMT
Model No. : CM-SRC&CM-SMT
Power Supply : DC 12V

Measurement Procedure Used:

FCC CFR Title 47, Part 15, Subpart B
ANSI C63.4-2014

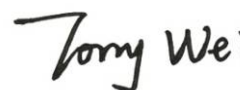
The device described above is tested by EMTEK (NINGBO) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (NINGBO) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (NINGBO) CO., LTD.

Date of Test : March 05, 2022 to April 14, 2022

Prepared by : 
June Gao/Engineer

Reviewer : 
Ade Wang/Supervisor

Approved & Authorized Signer : 
Tony Wei/Manager



Modified Information

Version	Report No.	Revision date	Summary
	ENB2202280211W00301R	/	Original Report



1. SUMMARY OF TEST RESULTS

EMISSION		
Description of Test Item	Standard & Limits	Results
Conducted Emission at Mains Terminals	FCC CFR Title 47, Part 15, Subpart B, Class B ANSI C63.4-2014	N/A
Radiated Emission	FCC CFR Title 47, Part 15, Subpart B, Class B ANSI C63.4-2014	Pass
Note: N/A is an abbreviation for Not Applicable.		



2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Characteristics	Description
Product:	CM-SRC&CM-SMT
Model Number:	CM-SRC&CM-SMT
Sample Number:	1#
Modulation:	FSK modulation
Operating Frequency:	Receive:314-316 MHz
Number of Channels:	1 channel
Antenna Type :	External Antenna
Antenna Gain:	0.0 dBi
Power supply:	DC 12V
Temperature Range:	-15°C ~ +50°C
Date of Received:	February 28, 2022

2.2. Input / Output Ports

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
1	Enclosure	N/E	--	--	None
2	DC Port	DC	/	/	/

* Note: Use abbreviations:

AC= AC Power Port

DC= DC Power Port

N/E= Non-Electrical

I/O= Signal Input or Output Port (Not Involved in Process Control)

TP= Telecommunication Ports

2.3. Independent Operation Modes

A. Receive

2.4. Test Manner

Test Items	Test Voltage	Operation Modes	Worst case
Radiated Emission(Up to 1 GHz)	DC 12V	Mode A	Mode A
Radiated Emission(Above 1 GHz)	DC 12V	Mode A	Mode A

2.5. Description of Test Facility

Site Description

EMC Lab.

: **Accredited by CNAS**

The Certificate Registration Number is L6666.

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2018 (identical to ISO/IEC 17025:2017)

Accredited by FCC

Designation Number: CN1302

Test Firm Registration Number: 436491

Accredited by A2LA

The certificate is valid until May 31, 2023

Accredited by Industry Canada

The Conformity Assessment Body Identifier is CN0114

Name of Firm : EMTEK (NINGBO) CO., LTD.

Site Location : 1F Building 4, 1177#, Lingyun Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang, China.

2.6. Test Software

Item

Software

Conducted Emission : EZ-EMC (Ver. CON-03A1)

Radiated Emission : EZ-EMC (Ver. EMEC-3A1)

2.7. Description of Support Device

N/A

2.8. Measurement Uncertainty

Test Item

Uncertainty

Radiated Emission Uncertainty : 4.06 dB (Polarize: H) (30MHz-1000MHz)

(3m Chamber) 4.04 dB (Polarize: V) (30MHz-1000MHz)

4.82 dB (Polarize: H) (1~18GHz)

4.80 dB (Polarize: V) (1~18GHz)

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Power Line Conducted Emission Measurement

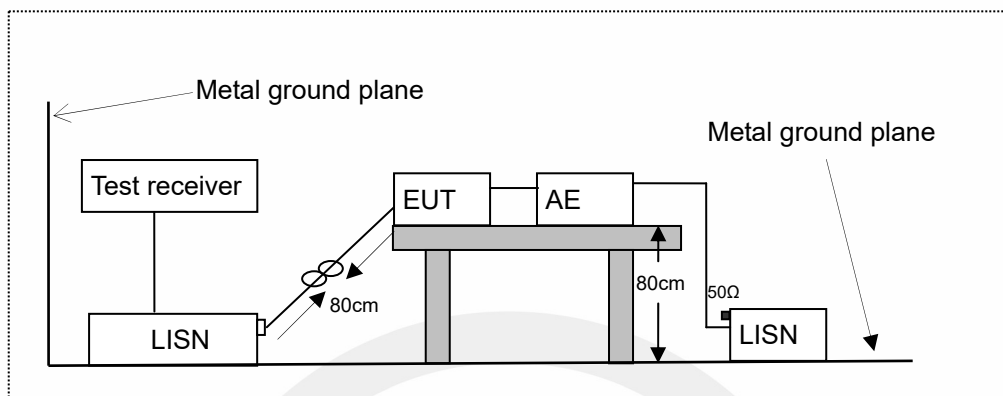
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☐	Test Receiver	Rohde & Schwarz	ESCI	101108	July 08, 2021	1 Year
☐	L.I.S.N	Rohde & Schwarz	ENV216	101193	July 08, 2021	1 Year
☐	L.I.S.N	Schwarzbeck	NSLK 8126	8126-462	July 08, 2021	1 Year
☐	Pulse Limiter	MTS-systemtechnik	IMP-136	2611115-001-0033	July 08, 2021	1 Year
☐	RF Switching unit	Compliance Direction Systems Inc.	RSU-M2	38400	July 08, 2021	1 Year

3.2. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☒	Spectrum Analyzer	Rohde & Schwarz	ESCI	101107	July 08, 2021	1 Year
☒	EMI Test Receiver	Rohde & Schwarz	ESCI	101107	July 08, 2021	1 Year
☒	Pre-Amplifier	CD	PAP-0203	22015	July 08, 2021	1 Year
☒	Bilog Antenna	Schwarzbeck	VULB9163	9163-467	July 12, 2020	2 Year
☒	Cable	HUBER + SUHNER	CBL3-NN-0.5M	101216-2140500-2	July 08, 2021	1 Year
☒	Cable	HUBER + SUHNER	CBL3-NN-3.0M	101216-2143000-2	July 08, 2021	1 Year
☒	Cable	HUBER + SUHNER	CBL3-NN-9.0M	101216-2149000	July 08, 2021	1 Year
☒	EXA Signal Analyzer	KEYSIGHT	N9010B	MY60242457	March 01, 2022	1 Year
☒	Pre-Amplifier	Connphy Microwave Inc.	GLN-1G40G-4165-K	0319104	Nov 22, 2021	1 Year
☒	Horn Antenna	Schwarzbeck	BBHA 9120	9120D-707	April 13, 2021	2 Year
☒	Cable	SMAMSMAM	A50-0.5M	N/A	July 08, 2021	1 Year
☒	Cable	SMAMSMAM	A50-3M	N/A	July 08, 2021	1 Year
☒	Cable	SMAMSMAM	A50-6M	N/A	July 08, 2021	1 Year

4. POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



LISN: Line Impedance Stabilization Network

AE: Associated equipment

EUT: Equipment under test

4.2. Conducted Limit

FCC CFR Title 47, Part 15, Subpart B, Class B

Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.
NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

4.3. Test Procedure

The EUT was placed on a desk 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface. The size of the table will nominally be 1.5 m x1.0 m.

The rear of the arrangement shall be flush with the back of the supporting tabletop unless that would not be possible or typical of normal use.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a line impedance stabilization network (LISN). Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other LISN.

The LISN provides 50 ohm coupling impedance for the measuring instrument.

Both sides of AC line were checked for maximum conducted interference.

The frequency range from 150 kHz to 30 MHz was sweep.

Set the test-receiver system to quasi peak detect function and average detect function, and to measure the conducted emissions values.

Test results were obtained from the following equation:
Measurement (dBμV) = Correct Factor (dB) + Reading (dBμV)
Over (dB) = Measurement (dBμV) - Limit (dBμV)

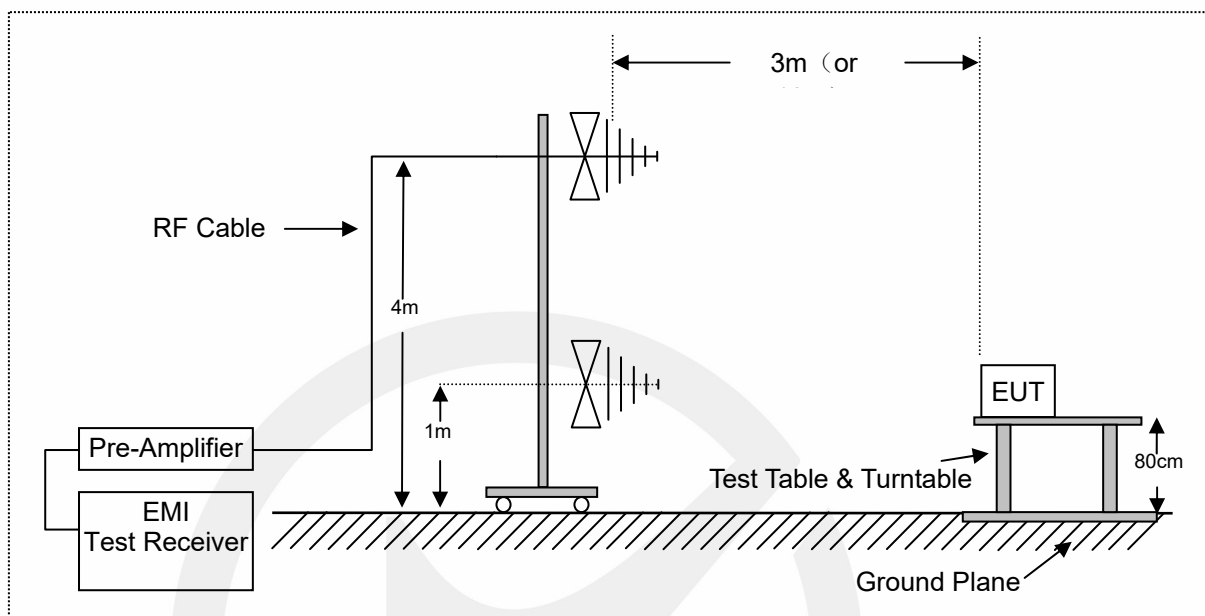
4.4. Measuring Results

N/A.



5. RADIATED EMISSION MEASUREMENT(UP TO 1GHz)

5.1. Block Diagram of Test Setup



5.2. Radiated Limit

FCC CFR Title 47, Part 15, Subpart B, Class B

Frequency MHz	Distance Meters	Field Strengths Limit	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

5.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The bandwidth of the Receiver is set at 120 kHz.

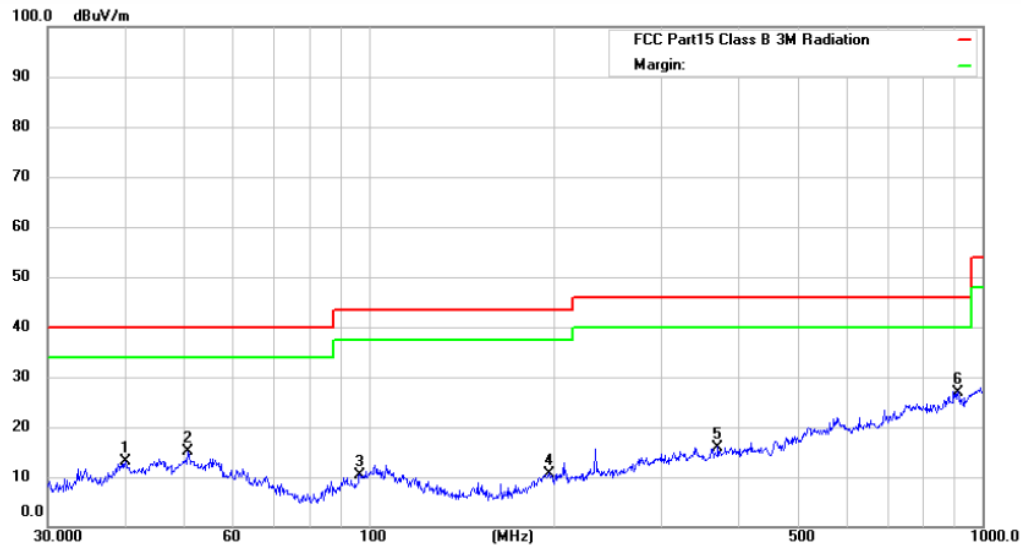
Test results were obtained from the following equation:
Measurement (dBμV) = Correct Factor (dB) + Reading (dBμV)
Over (dB) = Measurement (dBμV) - Limit (dBμV)

5.4. Measuring Results

Pass.

Please refer to following pages.





Site Radiated Emission 3m #1

Polarization: **Horizontal**

Temperature: 24

Limit: FCC Part15 Class B 3M Radiation

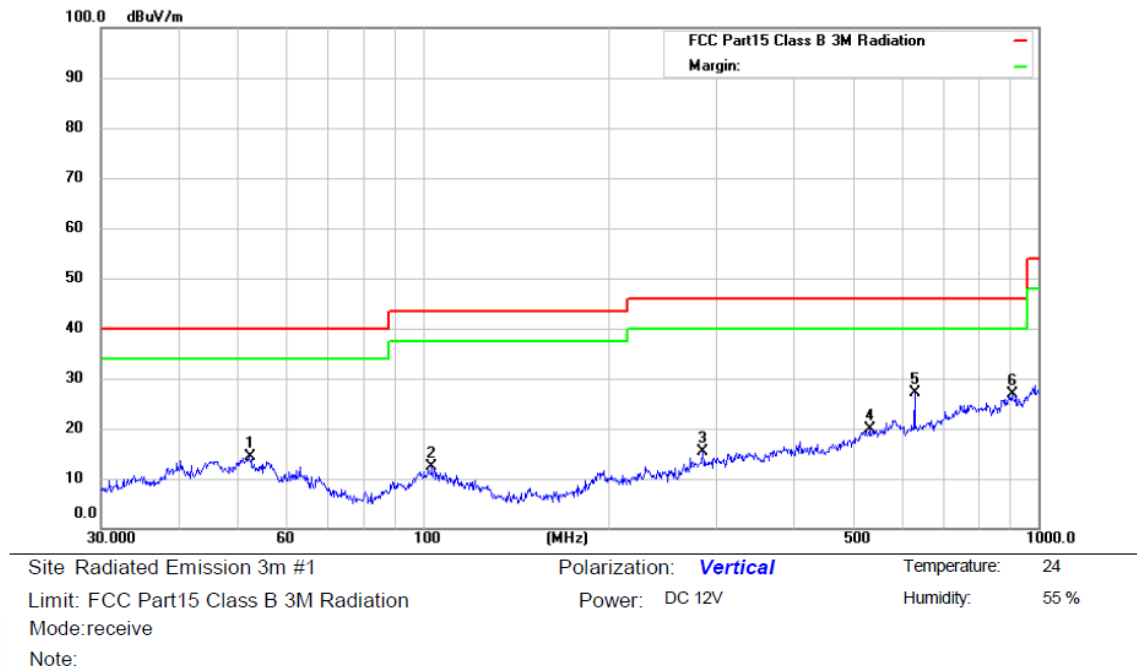
Power: DC 12V

Humidity: 55 %

Mode: receive

Note:

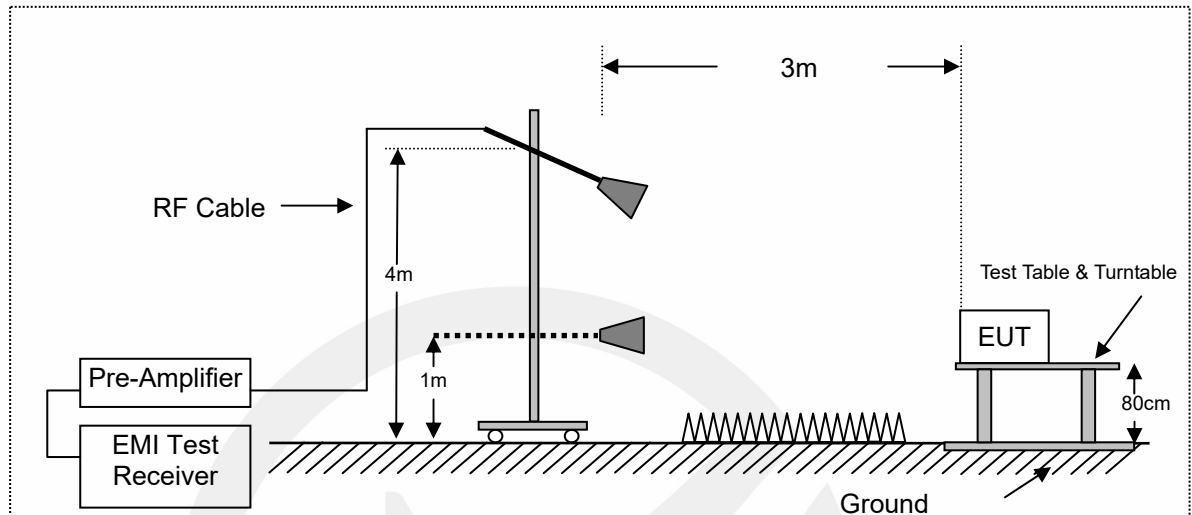
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		40.1347	35.15	-22.05	13.10	40.00	-26.90	QP		
2		50.7636	35.94	-20.84	15.10	40.00	-24.90	QP		
3		96.7749	34.39	-23.89	10.50	43.50	-33.00	QP		
4		196.5098	34.01	-23.31	10.70	43.50	-32.80	QP		
5		370.7023	34.75	-18.75	16.00	46.00	-30.00	QP		
6	*	912.8620	34.96	-7.96	27.00	46.00	-19.00	QP		



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		52.2079	35.32	-21.02	14.30	40.00	-25.70	QP			
2		103.4421	34.95	-22.65	12.30	43.50	-31.20	QP			
3		284.9767	35.76	-20.46	15.30	46.00	-30.70	QP			
4		531.9635	34.28	-14.48	19.80	46.00	-26.20	QP			
5	*	629.4772	40.95	-13.75	27.20	46.00	-18.80	QP			
6		906.4824	34.59	-7.79	26.80	46.00	-19.20	QP			

6. RADIATED EMISSION MEASUREMENT (ABOVE 1GHz)

6.1. Block Diagram of Test Setup



6.2. Radiated Limit

FCC CFR Title 47, Part 15, Subpart B, Class B

Frequency range GHz	Average limit dB(μ V/m)	Peak limit dB(μ V/m)
Above 1000	54	74

Note: The highest internal source of an EUT is defined as the highest frequency generated or used in the device or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 1.705 MHz, the measurement shall only be made up to 30 MHz. If the highest frequency of the internal sources of the EUT is between 1.705 MHz and 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less.

6.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

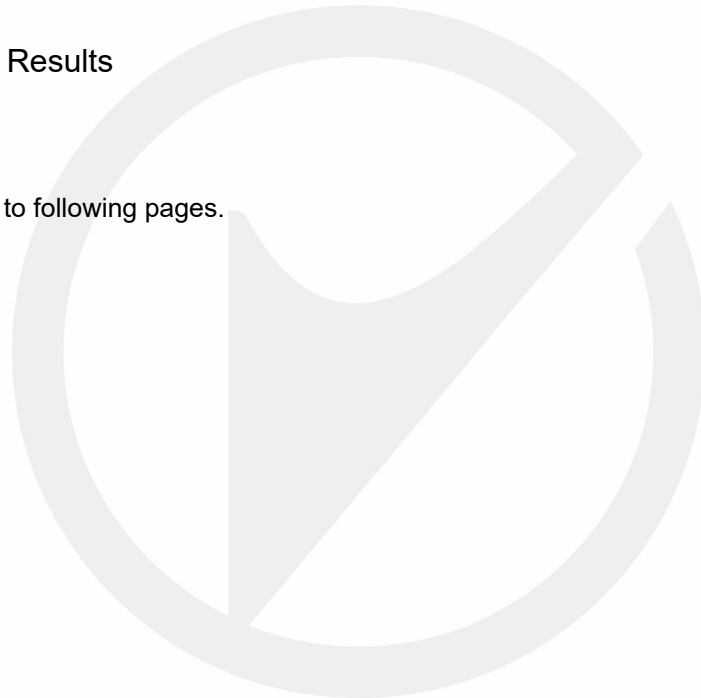
The frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with peak detector for peak values, and use RBW=1 MHz and VBW=10 Hz with peak detector for Average Values.

Test results were obtained from the following equation:
Measurement (dBμV) =Correct Factor (dB) + Reading (dBμV)
Over (dB) = Measurement (dBμV) - Limit (dBμV)

6.4. Measuring Results

Pass.

Please refer to following pages.



■ Radiated Emission Above 1GHz

Test mode: receive
Temperature: 24°C
Test Date: 2022-04-08

Humidity: 55%
Test Voltage: DC 12V

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1995.098	V	42.03	32.03	74.00	54.00	-31.97	-21.97
2284.314	V	41.99	31.99	74.00	54.00	-32.01	-22.01
2759.804	V	42.44	32.44	74.00	54.00	-31.56	-21.56
3245.098	V	47.28	37.28	74.00	54.00	-26.72	-16.72
4122.549	V	45.31	35.31	74.00	54.00	-28.69	-18.69
4642.157	V	44.84	34.84	74.00	54.00	-29.16	-19.16
1495.098	H	41.95	29.14	74.00	54.00	-32.05	-24.86
1960.784	H	42.05	30.10	74.00	54.00	-31.95	-23.90
2887.255	H	43.77	31.84	74.00	54.00	-30.23	-22.16
3637.255	H	43.56	32.10	74.00	54.00	-30.44	-21.90
4044.118	H	45.73	33.58	74.00	54.00	-28.27	-20.42
5053.922	H	47.62	35.19	74.00	54.00	-26.38	-18.81

*** End of Report ***

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