TEST REPORT

Report number	:	**KR23-SRT0040**
Issue date	:	**2023.08.09**

Applicant	:	THINKWARE CORPORATION A, 9FL., Samwhan Hipex, 240, Pangyoyeok-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, South Kore TEL : +82 2-589-9425 FAX : +82 2-589-9600
Equipment under test (EUT)	:	THINKWARE DASHCAM
Model name	:	U3000
Test procedure	:	特小移動体検知センサー （24.15GHz） 特定無線設備の技術基準適合証明等に関する規則 第2条第1項第8号の無線設備
Test method	:	総務省告示第88号別表第22第16（告示13項）
Date of test	:	2023-07-24 ~ 2023-07-26
Test place	:	Eurofins KCTL Co., Ltd. 65 Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea
Test results	:	PASS

The results in this report are applicable only to the equipment tested.
This report shall not be re-produced except in full without the written approval of ***Eurofins KCTL Co., Ltd.***
Eurofins KCTL Co., Ltd. is in compliance with KS Q ISO 17025.

Tested by; Jungwon Seo

Approved by; Hoesu Ahn

1. Summary of Test

1. Purpose of test
Ordinance on Technical Standards Conformity Certification of Specified Radio Equipment
24.15 GHz Band Moving object detection sensor

2. Standards
Certification Ordinance 23 証明規則第2条第1項第8号に掲げる無線設備, 同号第13項に該当する無線設備

1) Test Methods
Ministry of Internal Affairs and Communications Notification Article 23 Appendix 22-16

2) Deviation from standards
None

3. List of applied test to the EUT

Article 23 Appendix 22-16	Classification of EUT	Condition	Result
4	Frequency Tolerance	Radiated	PASS
4	Occupied Bandwidth	Radiated	PASS
6	RF Output Power Tolerance	Radiated	PASS
5	Unwanted (Spurious) Emission Strength	Radiated	PASS
7	Secondarilly Emitted Radio Wave Strength	Radiated	N/T

1) Note : If you can not only received in the operational state of the device, and are not tested.

2) Test set up
Table-Top

3) Modification to the EUT by laboratory
None

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1. Test Information

1. Applicant
THINKWARE CORPORATION
A, 9FL., Samwhan Hipex, 240, Pangyoyeok-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, South Korea

2. Equipment under test
THINKWARE DASHCAM

3. Model number
U3000

4. Serial number
N/A

5. Size
(W) 69.8 mm x (D) 98.1 mm x (H) 55.5 mm

6. Terminal limitation
-10˚C to 60˚C

7. RF Specification Frequency range
24.05 to 24.25 GHz

8. Number of RF Channels
3Channels

9. Modulation method
CW

10. Data rate
None

11. Variation of the family model(s)
None

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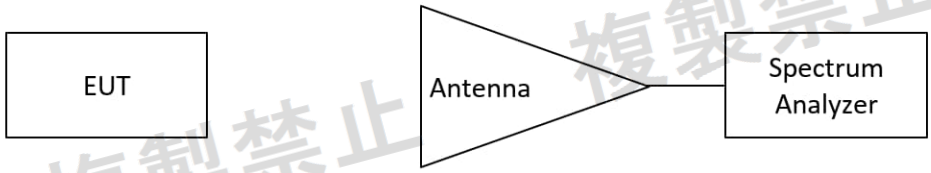
2. Configuration of equipment

1. Frequency tolerance, Occupied bandwidth, Unwanted(Spurious) Emission Strength, RF Output Power



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3. Test results (Rated voltage)

S/N : N/A

Environment of test room	Date of test	2023-07-24	2023-07-25	2023-07-26
	Temperature	23.3 °C	23.5 °C	22.9 °C
	Humidity	50.3 %	49.4 %	55.5 %

Peak Antenna Gain	2.00	dBi
Declaration Output Power	0.85	mW
	-0.71	dBm
E.I.R.P.	**1.29**	**dBm**
Input Power Voltage	12.00	VDC

Tested Circit Insertion Loss		0	dB
Transmission Time	ON TIME (1sec or less)	-Not applicable-	sec
	OFF TIME (0.1sec or more)	-Not applicable-	sec
	Ratio	-Not applicable-	%
Packet Type (Mode)		-Not applicable-	mode

Test category ;	Specified low power radio equipment (Moving body detection sensors)
The reason why the tests are performed only at rated voltage;	The fluctuation of input voltage to the circuit of the radio part of the equipment to be tested is identified as being less than ±1 % when input voltage from an external supply into the equipment fluctuates ±10 %.

Channel Number			Ch.	1	2	3	Result	Limit	Note
Frequency Measurements			GHz	24.06	24.15	24.24	---	---	
Frequency Tolerance	Normal state	Lower	GHz	24.0545	24.1443	24.2335	**PASS**	24.05GHz or more	
		Upper		24.0643	24.1541	24.2437	**PASS**	24.25GHz or below	
	After the vibration test	Lower	GHz	24.0546	24.1440	24.2338	**PASS**	24.05GHz or more	
		Upper		24.0638	24.1543	24.2435	**PASS**	24.25GHz or below	
	After the test temperature (-10 °C)	Lower	GHz	24.0545	24.1440	24.2334	**PASS**	24.05GHz or more	
		Upper		24.0643	24.1540	24.2437	**PASS**	24.25GHz or below	
	After the test temperature (60 °C)	Lower	GHz	24.0543	24.1437	24.2335	**PASS**	24.05GHz or more	
		Upper		24.0651	24.1544	24.2434	**PASS**	24.25GHz or below	
	After the humidity test 35 °C、 -95%	Lower	GHz	24.0553	24.1448	24.2346	**PASS**	24.05GHz or more	
		Upper		24.0629	24.1534	24.2426	**PASS**	24.25GHz or below	
Occupied Bandwidth			MHz	9.801	9.849	10.186	**PASS**	200MHz or below	
RF Output Power			mW	0.845	0.782	0.826	**PASS**	20mW or below	
RF Output Power Tolerance			%	-0.555	-8.044	-2.819	**PASS**	+50 to -50%	

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Unwanted (Spurious) Emission Strength	30 to 1000MHz	uW	0.015	0.013	0.016	**PASS**	2.5uW or below	
		MHz	38.109	38.158	34.925	-----		
	1 to 18GHz	uW	0.008	0.007	0.009	**PASS**	2.5uW or below	
		MHz	17278.990	16495.200	17992.150	-----		
	18 to 23.65GHz	uW	0.003	0.003	0.004	**PASS**	2.5uW or below	
		MHz	18757.100	18836.200	19582.000	-----		
	24.65GHz to 40GHz	uW	0.008	0.007	0.005	**PASS**	2.5uW or below	
		MHz	36086.000	36408.000	36761.000	-----		
	40GHz to 49GHz *4	uW				**PASS**	2.5uW or below	
		MHz				-----		
	23.65 to 24.65GHz *1	uW	0.482	0.007	0.234	**PASS**	2.5uW or below	
		MHz	24049.000	24011.000	24251.000	-----		
Secondarilly Emitted Radio Wave Strength (RX Spurious Emission)	30 to 1000MHz *3	uW				**PASS**	2.5uW or below	
		MHz				-----		
	1 to 18GHz *3	uW				**PASS**	2.5uW or below	
		MHz				-----		
	18 to 40GHz *3	uW				**PASS**	2.5uW or below	
		MHz				-----		
	40 to 49GHz *3, *4	uW				**PASS**	2.5uW or below	
		MHz				-----		

*1: Except to 24.25GHz from 24.05GH z .

*2: If not the state of the non-modulated continuous wave in the operational state of the device does not perform the measurement.

*3: If you can not only received in the operational state of the device, and are not tested.

*4: No spurious detected.

*5 The test was performed in the Fully-Anechoic Chamber(FAC) to which the substitution method was applied.

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4. Measurement equipment list

USE	Equipment	Company	Model No.	Serial No.	Calibrated by	Cal. Method	Cal. Due	Cal. Date
X	Bilog Antenna	ETS.LINDGREN	3143B	00228420	HCT	ノ\(c)	Sep.28.2023	Sep.28.2022
X	Bilog Antenna	Teseq GmbH	CBL 6143A	35039	HCT	ノ\(c)	May.10.2024	May.10.2023
X	Horn Antenna	ETS.lindgren	3117	161225	HCT	ノ\(c)	May.04.2024	May.04.2023
X	Horn Antenna	ETS.lindgren	3117	227509	HCT	ノ\(c)	Sep.20.2023	Sep.20.2022
X	Horn Antenna	ETS.lindgren	3116	00086632	HCT	ノ\(c)	Jan.25.2024	Jan.25.2023
X	Horn Antenna	ETS-lindgren	3116C	251516	HCT	ノ\(c)	Feb.02.2024	Feb.02.2023
X	Attenuator	WeinschelENGINEERING	10	AJ1239	HCT	ノ\(c)	Apr.25.2024	Apr.25.2023
X	Broadband Amplifier	SONOMA INSTRUMENT	315	300314	HCT	ノ\(c)	Jan.19.2024	Jan.19.2023
X	Amplifier	Narda-MITEQ	LNAS-55-01001800-22-10p	2265312	HCT	ノ\(c)	Feb.03.2024	Feb.03.2023
X	Low Noise Amplifier	L-3 Narda-MITEQ	LNAS-50-18004000-33-5p	2210092	HCT	ノ\(c)	Jul.04.2024	Jul.04.2023
X	Signal Generator	R&S	SMB100A	176206	HCT	ノ\(c)	Jan.19.2024	Jan.19.2023
X	PXA Signal Analyzer	KEYSIGHT	N9040B	US55230151	HCT	ノ\(c)	Jul.03.2024	Jul.03.2023
X	DC Power Supply	AGILENT	E3632A	MY40006352	HCT	ノ\(c)	Apr.25.2024	Apr.25.2023
X	Antenna Mast	MATURO	EAS 1.5	042/8941211	HCT	ノ\(c)	N/A	N/A
X	Antenna Mast	MATURO	EAS 1.5	043/8941211	HCT	ノ\(c)	N/A	N/A
X	Turn Table	MATURO	TT 0.8 PF	041/8941211	HCT	ノ\(c)	N/A	N/A
X	Temp & Humid Chamber	Myeongseong R&P	CTHC-50P-DT	20150824-1	HCT	ノ\(c)	Oct.14.2023	Oct.14.2022
X	Vibration Tester	gana	GNV-500	EMC-TES079	HCT	ノ\(c)	Jul.11.2024	Jul.11.2023
X	UXA Signal Analyzer	KEYSIGHT	N9041B	MY60100003	HCT	ノ\(c)	Jan. 29, 2024	Jan. 29, 2023
X	Millimeter Wave Source Module	OML, Inc.	S19MS-A	190725-1	HCT	ノ\(c)	Oct.26.2023	Oct.26.2022
X	Horn Antenna	OML, Inc.	M19RH	190621-1	HCT	ノ\(c)	Aug.18.2023	Aug.18.2022
X	Horn Antenna	OML, Inc.	M19RH	190621-1	HCT	ノ\(c)	Oct.28.2023	Oct.28.2022
X	Horn Antenna	OML, Inc.	M19RH	190621-2	HCT	ノ\(c)	Aug.18.2023	Aug.18.2022
X	Horn Antenna	OML, Inc.	M19RH	190621-2	HCT	ノ\(c)	Oct.28.2023	Oct.28.2022

Note1: "X" used equipment.

Note2: The validity of measurement equipment is one year from the first day of the following month of the calibration date.

Note3: Cal.Method …

a) : Calibration conducted by the National Institute of Information and Communications Technology～ NICT～ or a designated calibration agency under Article 102-18 paragraph (1)～ TELECOM Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc～.

b) : Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992)～Japan Calibration Service System～

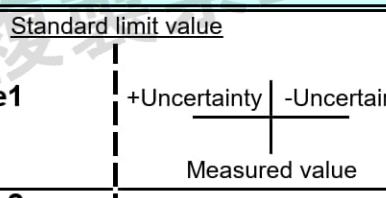
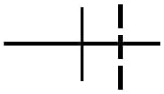
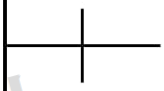
c) : Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1)～ TELECOM Engineering Center, Intertek Japan K.K., Keysight Technologies, Inc～.

d) : Calibration conducted by using other equipment that listed above from a) to c)

5. Uncertainty

About uncertainty of measured value

Parameter	Uncertainty
Total RF power radiated	±2.4dB
Spurious emissions radiated(Below 30MHz)	±2.3dB
Spurious emissions radiated(30MHz to 1000MHz)	±2.5dB
Spurious emissions radiated(1GHz to 18GHz)	±4.7dB
Spurious emissions radiated(Above 18GHz)	±4.8dB
Temperature	±0.8°C
Humidity	±3.3%

Judge	Measured value and standard limit value	
PASS	Case1	 Even if it takes uncertainty into consideration, a standard limit value is fulfilled.
	Case2	Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.
FAIL	Case3	 Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.
	Case4	 Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.

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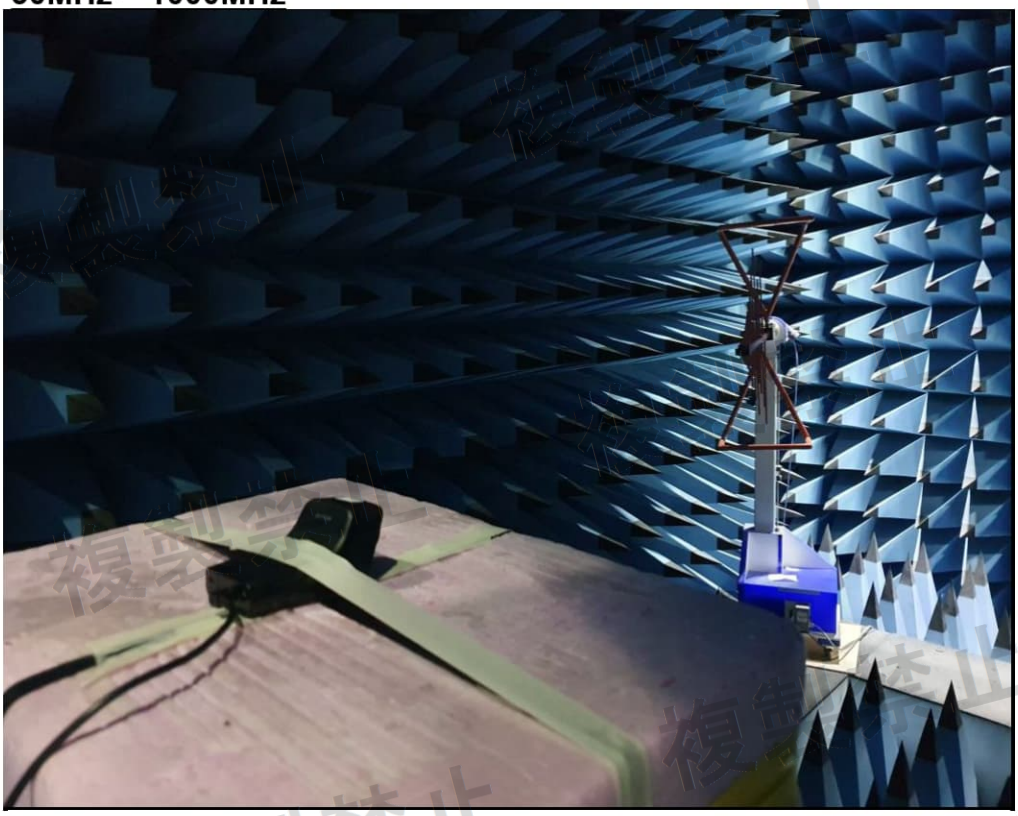
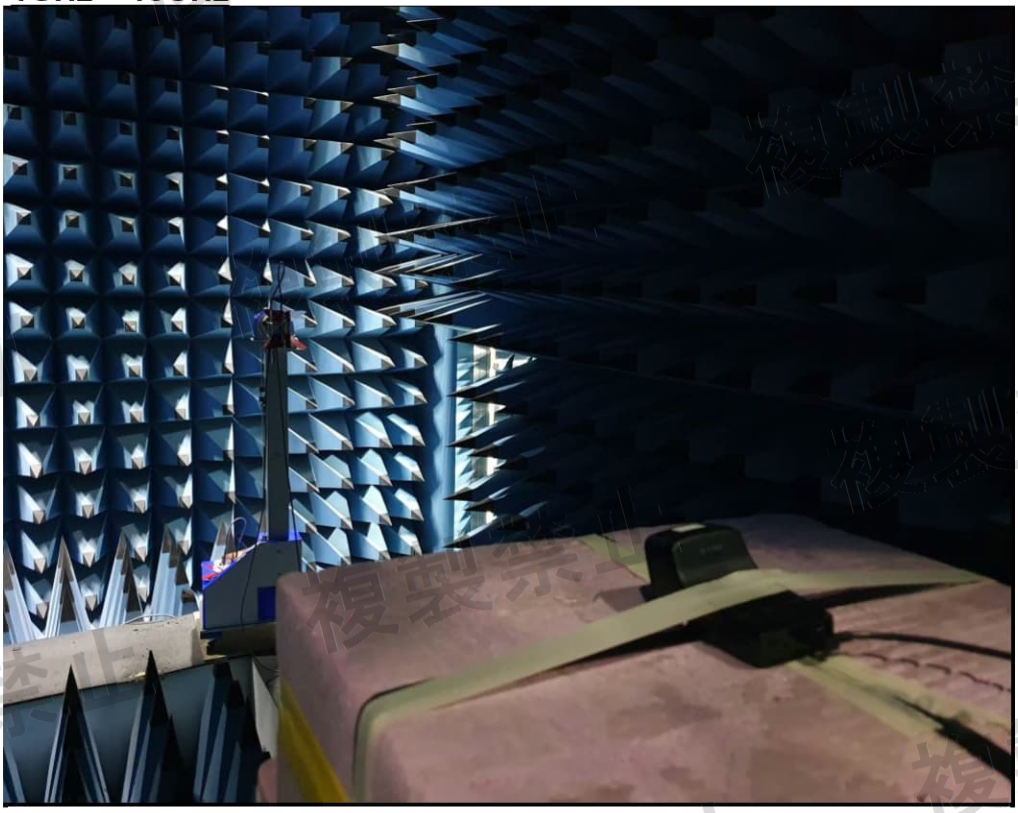
6. Photographs

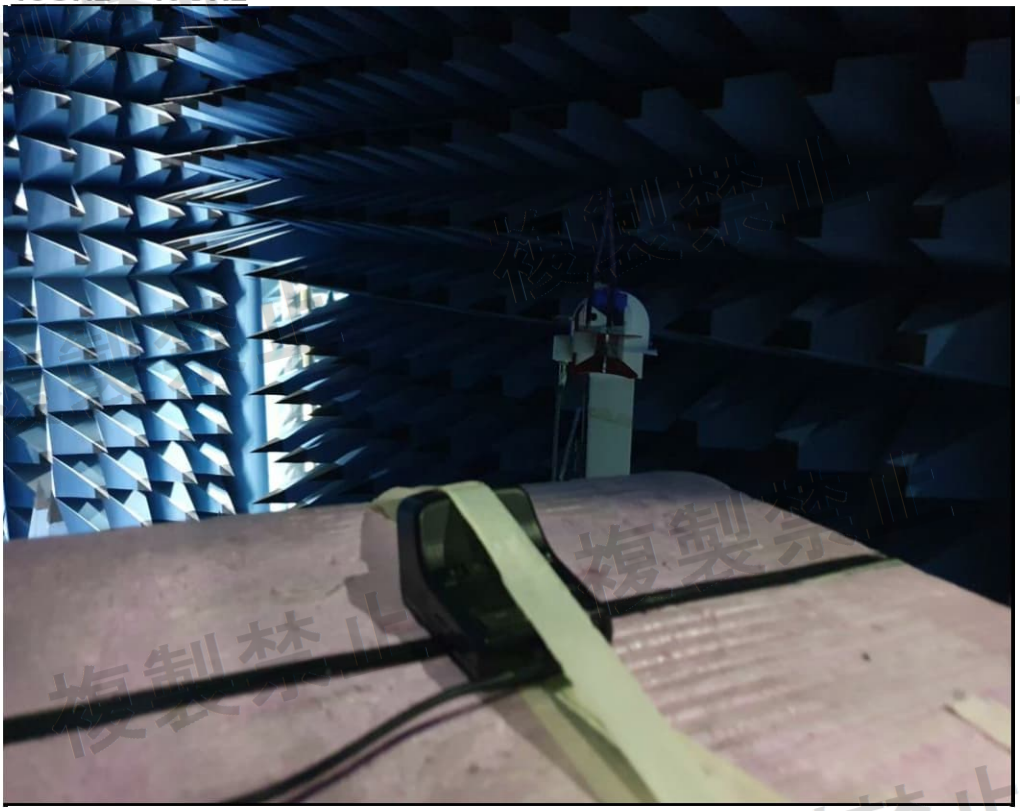
30MHz ~ 1000MHz



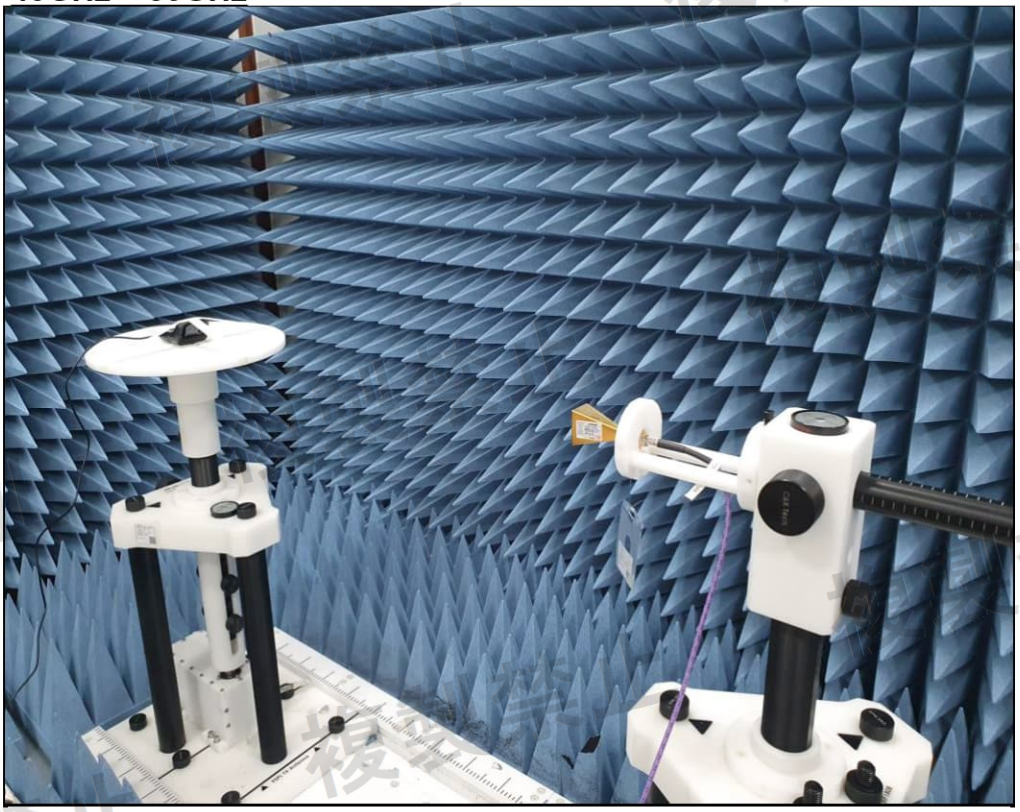
1GHz ~ 18GHz



18GHz ~ 40GHz



40GHz ~ 50GHz



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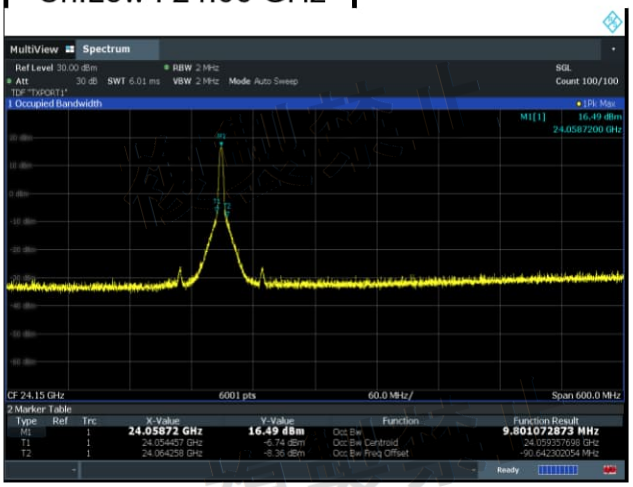
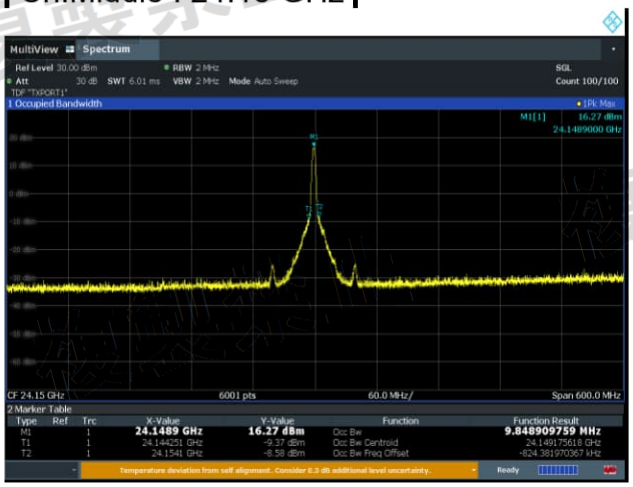
7. Test chart (12 V)

7.1.1 Frequency tolerance / Occupied Bandwidth (Rated voltage)

Ch.Low : 24.06 GHz



Ch.Middle : 24.15 GHz

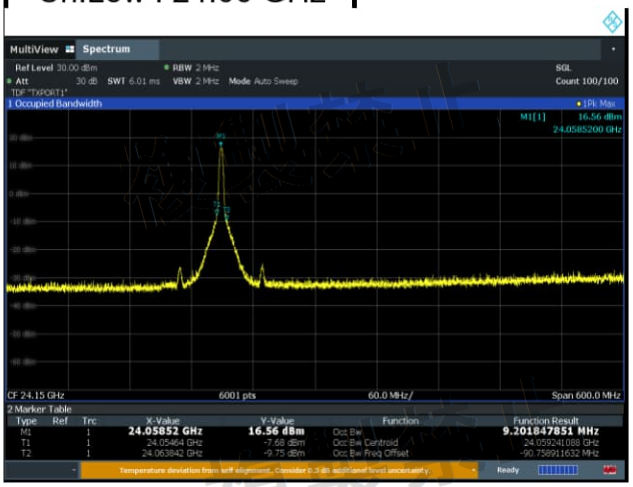


Ch.High : 24.24 GHz

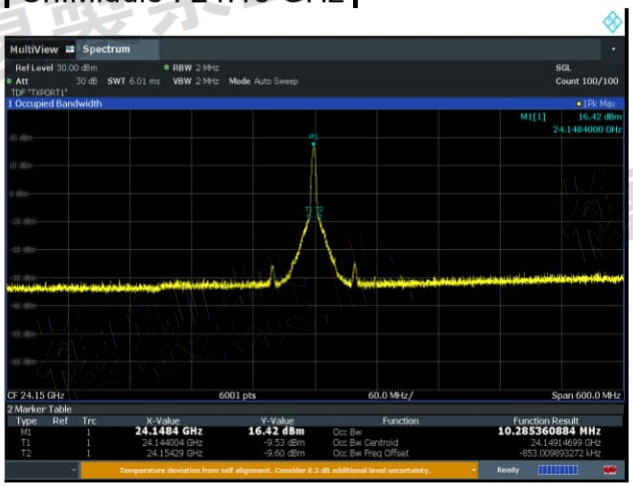
7. Test chart

7.1.2 Frequency Tolerance (After the vibration test)

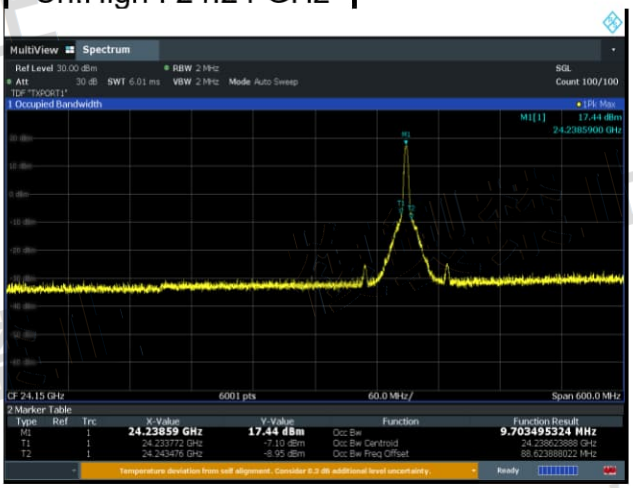
Ch.Low : 24.06 GHz



Ch.Middle : 24.15 GHz



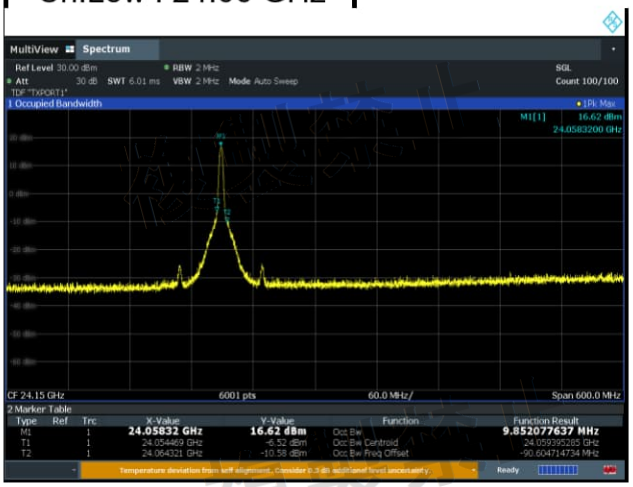
Ch.High : 24.24 GHz



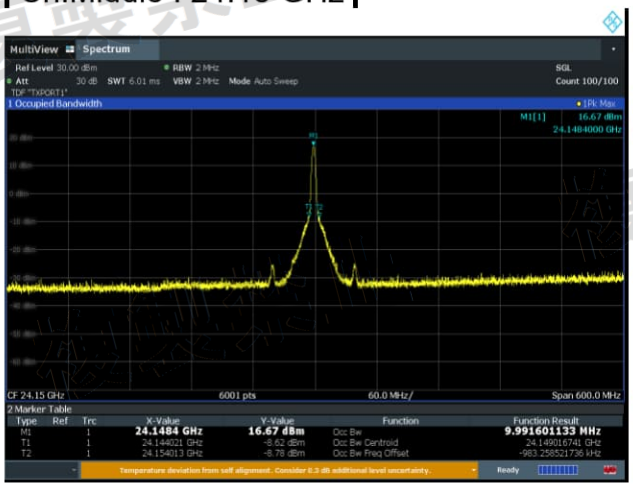
7. Test chart

7.1.3 Frequency Tolerance (After the test temperature (-20 °C))

Ch.Low : 24.06 GHz



Ch.Middle : 24.15 GHz

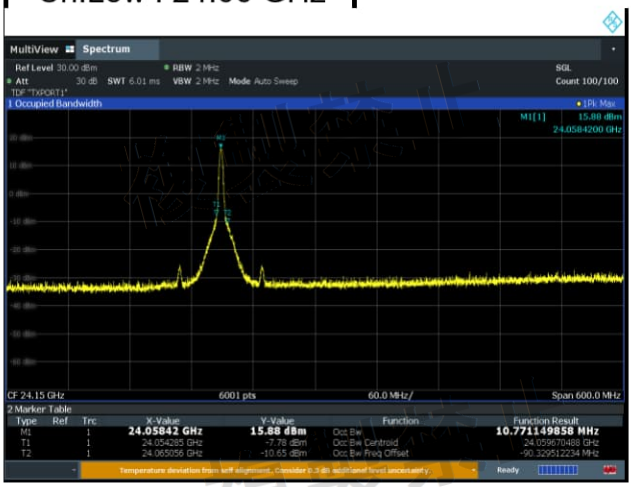


Ch.High : 24.24 GHz

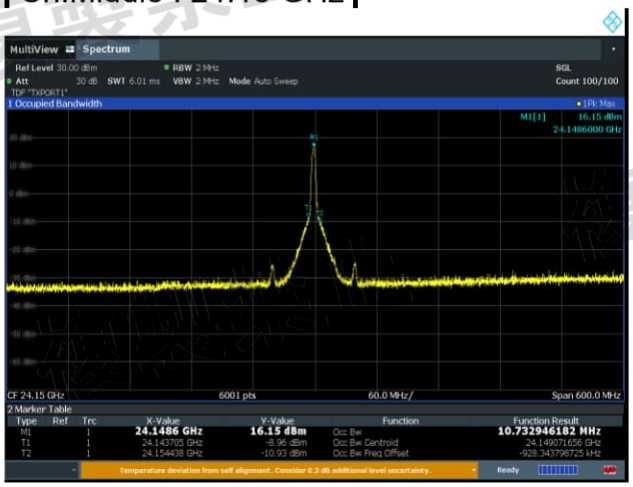
7. Test chart

7.1.4 Frequency Tolerance (After the test temperature (60 °C))

Ch.Low : 24.06 GHz



Ch.Middle : 24.15 GHz



Ch.High : 24.24 GHz

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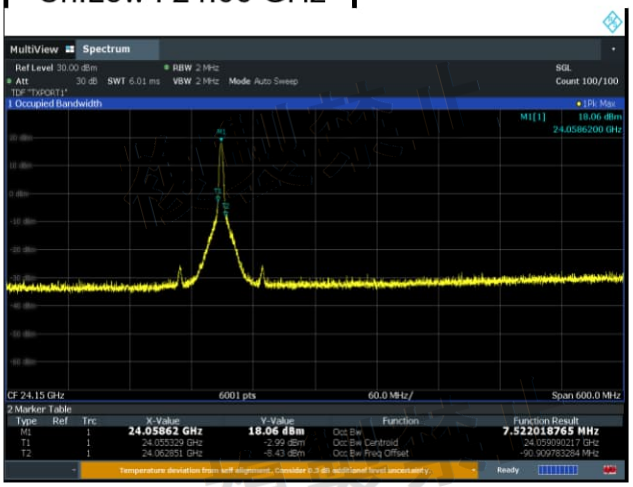
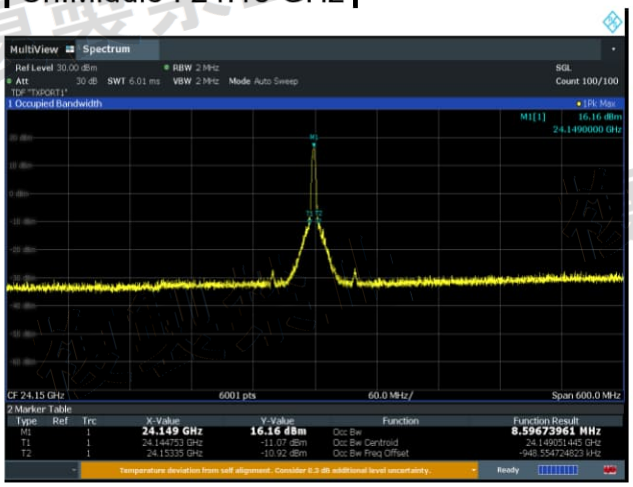
7. Test chart

7.1.5 Frequency Tolerance (After the humidity test (95%))

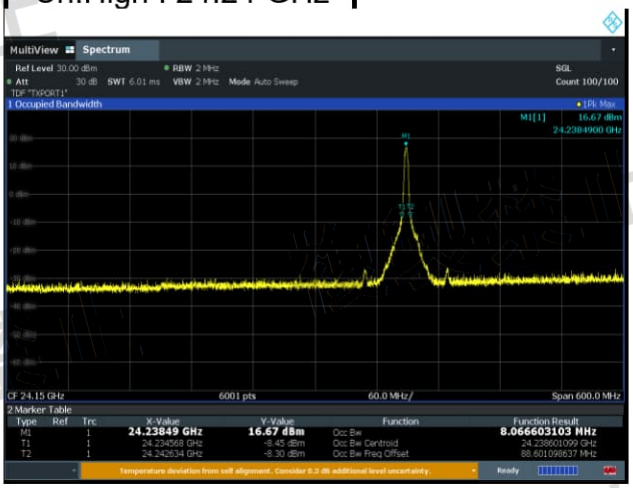
Ch.Low : 24.06 GHz



Ch.Middle : 24.15 GHz



Ch.High : 24.24 GHz

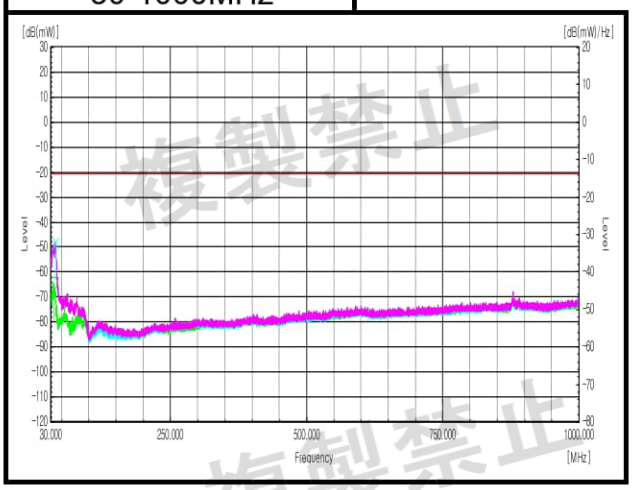


7. Test chart

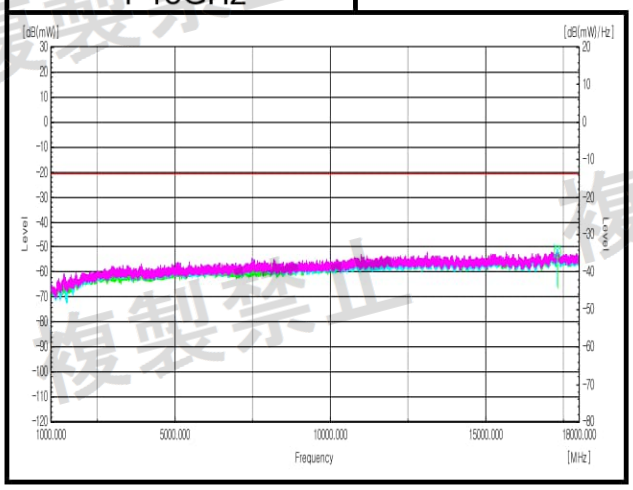
7.2 Unwanted(Spurious) emission strength

Ch.Low : 24.06 GHz

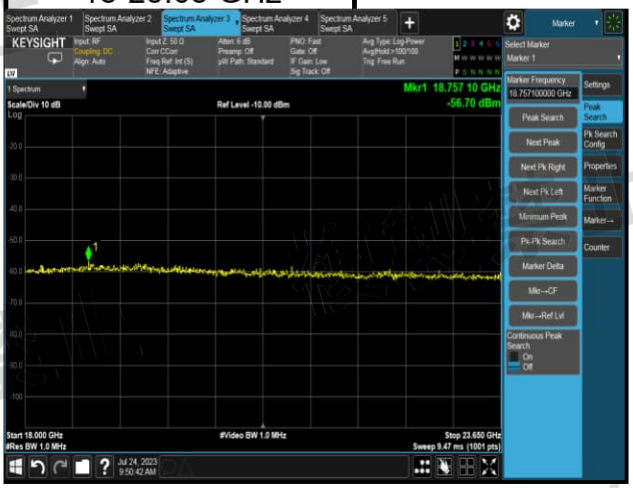
30-1000MHz



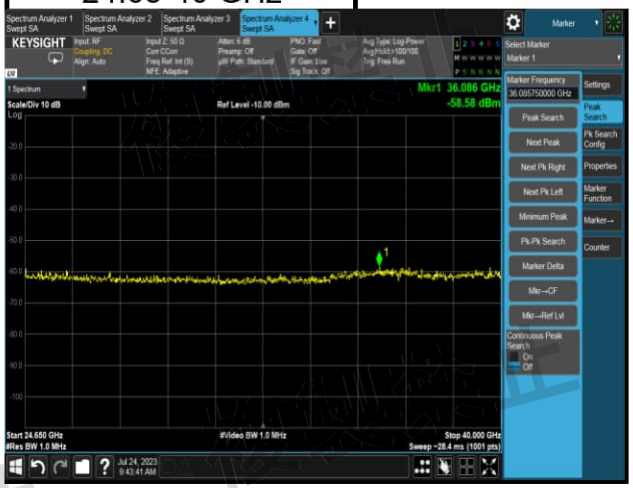
1-18GHz



18-23.65 GHz



24.65-40 GHz



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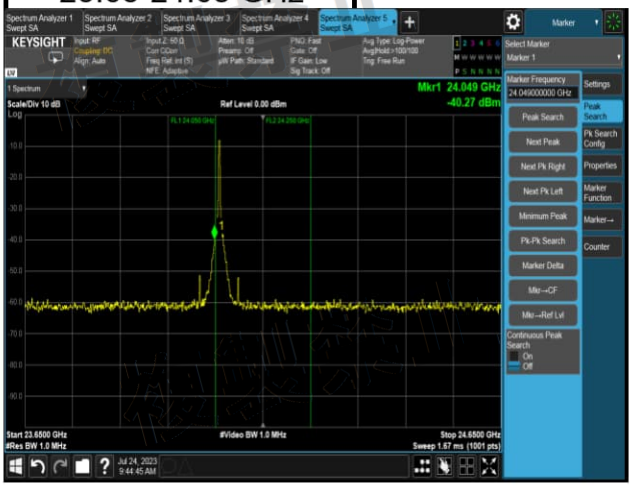
23.65-24.65 GHz



40-49 GHz *No spurious detected.

***NTNV Substitution Data**

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [μW]	Limit [μW]	Margin [μW]
			Amplifier [dB]	RX Cable Loss[dB]	RX Antenna Factor [dB]							
V	38.109	-49.70	32.21	0.72	19.06	-35.17	1.02	-10.11	2.00	0.014791	2.500	2.485
V	17278.990	-57.80	59.63	11.39	41.14	-44.31	18.99	14.20	2.00	0.007762	2.500	2.492
V	18757.100	-56.70	58.28	13.72	44.36	-43.86	19.98	11.24	2.00	0.003467	2.500	2.497
V	24049.000	-40.27	56.93	14.85	45.65	-21.04	22.58	12.45	2.00	0.481948	2.500	2.018
V	36086.000	-58.58	58.79	17.10	47.00	-35.67	26.22	12.99	2.00	0.008128	2.500	2.492

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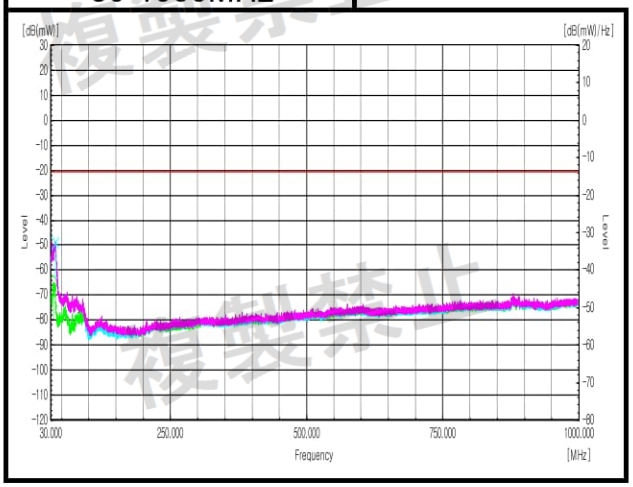
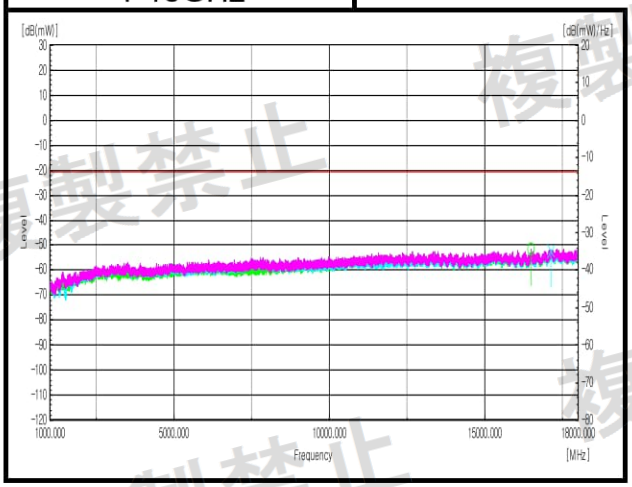
Ch.Middle : 24.15 GHz

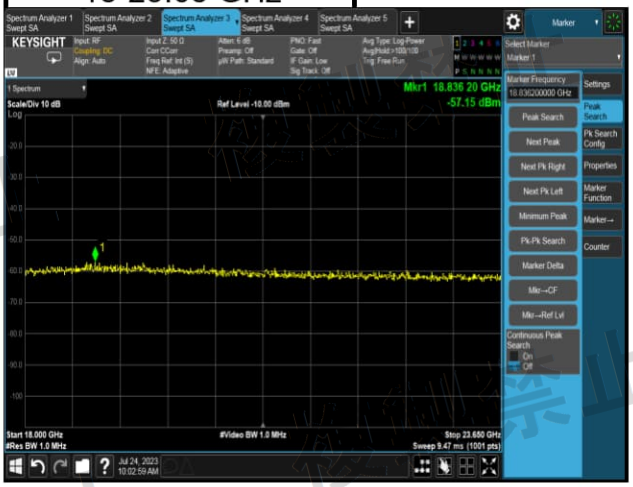
30-1000MHz



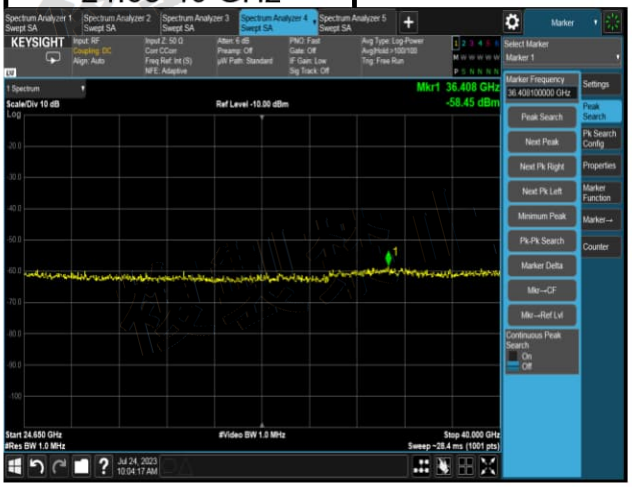
1-18GHz



18-23.65 GHz

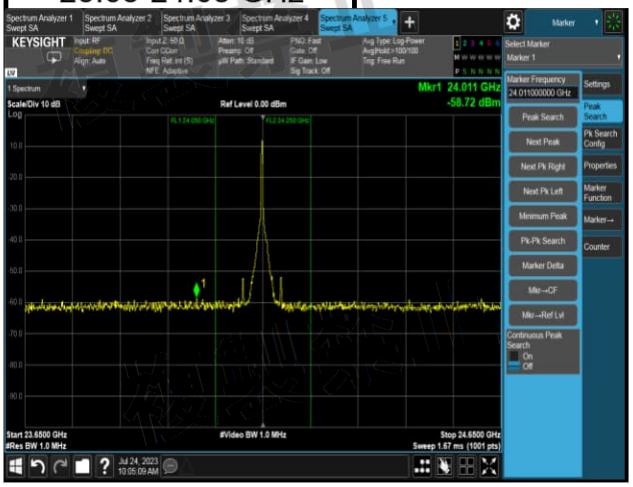


24.65-40 GHz



複製禁止

23.65-24.65 GHz



40-49 GHz *No spurious detected.

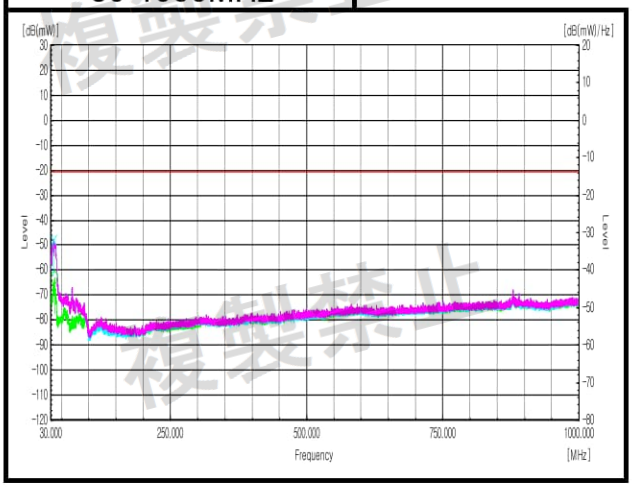
***NTNV Substitution Data**

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [μW]	Limit [μW]	Margin [μW]
			Amplifier [dB]	RX Cable Loss[dB]	RX Antenna Factor [dB]							
V	38.158	-50.10	32.21	0.72	19.04	-35.71	1.02	-10.07	2.00	0.013183	2.500	2.487
H	16495.200	-58.10	59.30	11.57	42.09	-44.75	18.46	13.51	2.00	0.006761	2.500	2.493
V	18836.200	-57.15	58.36	13.62	44.40	-44.38	20.00	11.16	2.00	0.003006	2.500	2.497
V	24011.000	-58.72	56.95	14.90	45.69	-39.47	22.58	12.41	2.00	0.006855	2.500	2.493
V	36408.000	-58.45	58.93	16.31	46.99	-35.84	26.83	12.97	2.00	0.006761	2.500	2.493

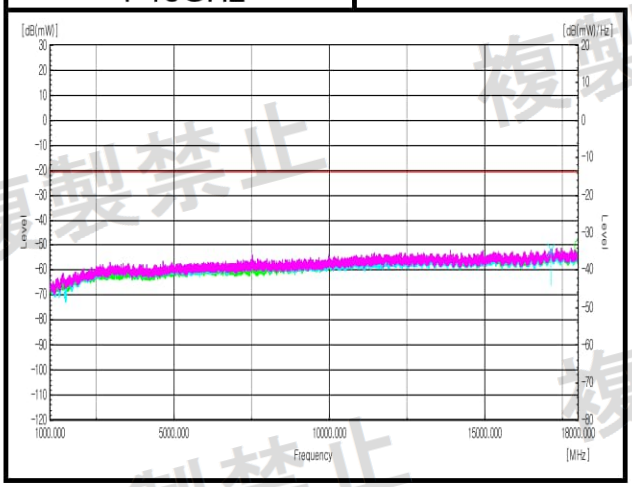
複製禁止

Ch.High : 24.24 GHz

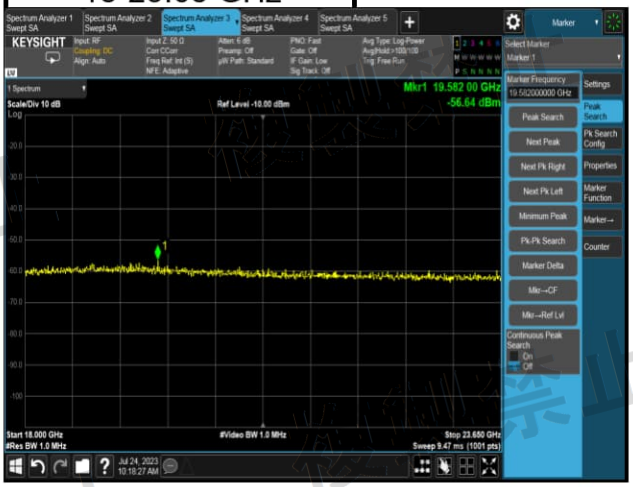
30-1000MHz



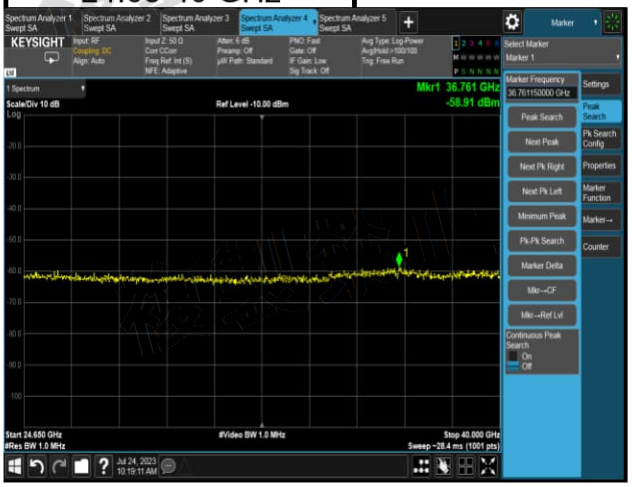
1-18GHz



18-23.65 GHz

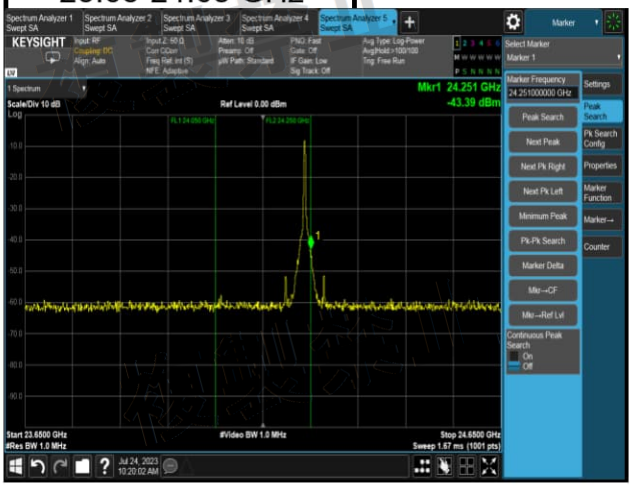


24.65-40 GHz



複製禁止

23.65-24.65 GHz



40-49 GHz *No spurious detected.

***NTNV Substitution Data**

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [μW]	Limit [μW]	Margin [μW]
			Amplifier [dB]	RX Cable Loss[dB]	RX Antenna Factor [dB]							
V	34.925	-53.20	32.21	0.66	20.63	-32.33	1.03	-12.54	2.00	0.016218	2.500	2.484
H	17992.150	-57.50	59.20	11.97	42.18	-43.02	19.68	14.10	2.00	0.008710	2.500	2.491
V	19582.000	-56.64	58.24	13.48	44.58	-42.28	21.15	11.28	2.00	0.003846	2.500	2.496
V	24251.000	-43.39	56.83	15.14	45.60	-23.91	22.80	12.40	2.00	0.233884	2.500	2.266
V	36761.000	-58.91	58.67	16.57	46.78	-35.49	28.32	13.12	2.00	0.005383	2.500	2.495

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7. Test chart

7.3 RF output power tolerance

Ch.Low : 24.06 GHz

Ch.Middle : 24.15 GHz

Ch.High : 24.24 GHz

ON/OFF Time

Ch.Low : 24.06 GHz

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [mW]
			Amplifier [dB]	RX Cable Loss [dB]	RX Antenna Factor [dB]					
V	24058.400	-7.83	56.93	14.83	45.64	11.38	22.57	12.46	2.00	0.84527885

Ch.Middle : 24.15 GHz

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [mW]
			Amplifier [dB]	RX Cable Loss [dB]	RX Antenna Factor [dB]					
V	24148.300	-8.21	56.88	14.99	45.60	11.05	22.62	12.50	2.00	0.7816278

Ch.High : 24.24 GHz

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [mW]
			Amplifier [dB]	RX Cable Loss [dB]	RX Antenna Factor [dB]					
V	24238.500	-8.01	56.84	15.16	45.60	11.52	22.77	12.42	2.00	0.82603795

3. Test results (Rated voltage)

S/N : N/A

Environment of test room	Date of test	2023-07-24	2023-07-25	2023-07-26
	Temperature	23.3 °C	23.5 °C	22.9 °C
	Humidity	50.3 %	49.4 %	55.5 %

Peak Antenna Gain	2.00	dBi
Declaration Output Power	0.85	mW
	-0.71	dBm
E.I.R.P.	**1.29**	**dBm**
Input Power Voltage	24.00	VDC

Tested Circit Insertion Loss		0	dB
Transmission Time	ON TIME (1sec or less)	-Not applicable-	sec
	OFF TIME (0.1sec or more)	-Not applicable-	sec
	Ratio	-Not applicable-	%
Packet Type (Mode)		-Not applicable-	mode

Test category ;	Specified low power radio equipment (Moving body detection sensors)
The reason why the tests are performed only at rated voltage;	The fluctuation of input voltage to the circuit of the radio part of the equipment to be tested is identified as being less than ±1 % when input voltage from an external supply into the equipment fluctuates ±10 %.

Channel Number			Ch.	1	2	3	Result	Limit	Note
Frequency Measurements			GHz	24.06	24.15	24.24	---	---	
Frequency Tolerance	Normal state	Lower	GHz	24.0553	24.1443	24.2332	**PASS**	24.05GHz or more	
		Upper		24.0631	24.1543	24.2438	**PASS**	24.25GHz or below	
	After the vibration test	Lower	GHz	24.0547	24.1440	24.2337	**PASS**	24.05GHz or more	
		Upper		24.0639	24.1541	24.2433	**PASS**	24.25GHz or below	
	After the test temperature (-10 °C)	Lower	GHz	24.0543	24.1439	24.2331	**PASS**	24.05GHz or more	
		Upper		24.0644	24.1541	24.2438	**PASS**	24.25GHz or below	
	After the test temperature (60 °C)	Lower	GHz	24.0540	24.1435	24.2334	**PASS**	24.05GHz or more	
		Upper		24.0653	24.1545	24.2435	**PASS**	24.25GHz or below	
	After the humidity test 35 °C、 -95%	Lower	GHz	24.0551	24.1443	24.2341	**PASS**	24.05GHz or more	
		Upper		24.0636	24.1537	24.2429	**PASS**	24.25GHz or below	
Occupied Bandwidth			MHz	7.773	9.991	10.561	**PASS**	200MHz or below	
RF Output Power			mW	0.798	0.771	0.794	**PASS**	20mW or below	
RF Output Power Tolerance			%	-6.118	-9.305	-6.550	**PASS**	+50 to -50%	

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Unwanted (Spurious) Emission Strength	30 to 1000MHz	uW	0.013	0.017	0.016	**PASS**	2.5uW or below	
		MHz	37.512	37.512	37.810	-----		
	1 to 18GHz	uW	0.007	0.008	0.008	**PASS**	2.5uW or below	
		MHz	17100.260	17309.500	17108.110	-----		
	18 to 23.65GHz	uW	0.003	0.003	0.003	**PASS**	2.5uW or below	
		MHz	18892.700	18824.900	18875.750	-----		
	24.65GHz to 40GHz	uW	0.014	0.007	0.012	**PASS**	2.5uW or below	
		MHz	35380.000	36792.000	35288.000	-----		
	40GHz to 49GHz *4	uW				**PASS**	2.5uW or below	
		MHz				-----		
	23.65 to 24.65GHz *1	uW	0.409	0.007	0.209	**PASS**	2.5uW or below	
		MHz	24049.000	24479.000	24251.000	-----		
Secondarilly Emitted Radio Wave Strength (RX Spurious Emission)	30 to 1000MHz *3	uW				**PASS**	2.5uW or below	
		MHz				-----		
	1 to 18GHz *3	uW				**PASS**	2.5uW or below	
		MHz				-----		
	18 to 40GHz *3	uW				**PASS**	2.5uW or below	
		MHz				-----		
	40 to 49GHz *3, *4	uW				**PASS**	2.5uW or below	
		MHz				-----		

*1: Except to 24.25GHz from 24.05GH z .

*2: If not the state of the non-modulated continuous wave in the operational state of the device does not perform the measurement.

*3: If you can not only received in the operational state of the device, and are not tested.

*4: No spurious detected.

*5 The test was performed in the Fully-Anechoic Chamber(FAC) to which the substitution method was applied.

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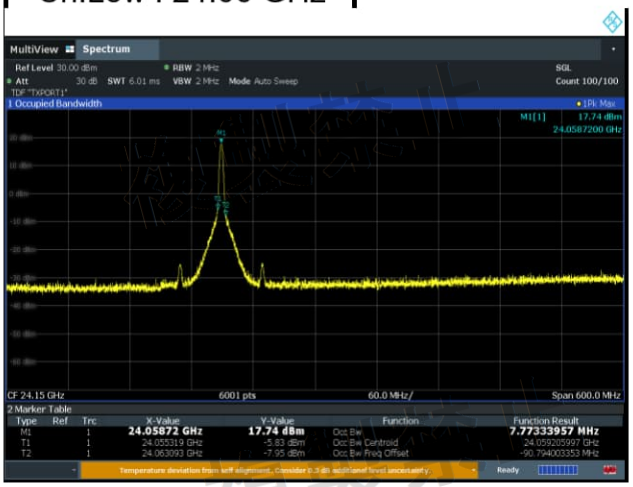
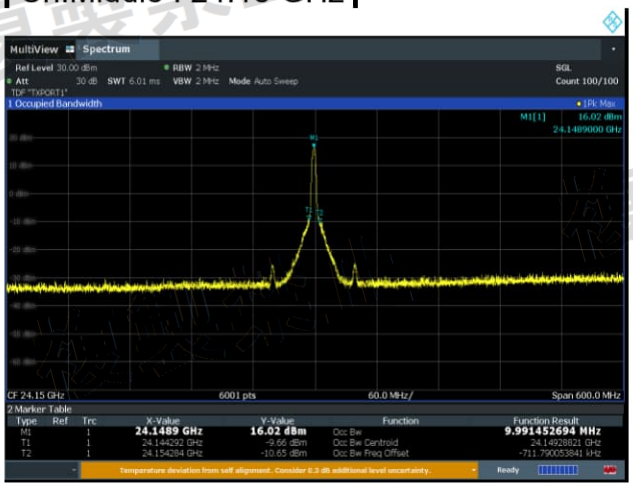
7. Test chart (24 V)

7.4.1 Frequency tolerance / Occupied Bandwidth (Rated voltage)

Ch.Low : 24.06 GHz



Ch.Middle : 24.15 GHz



Ch.High : 24.24 GHz

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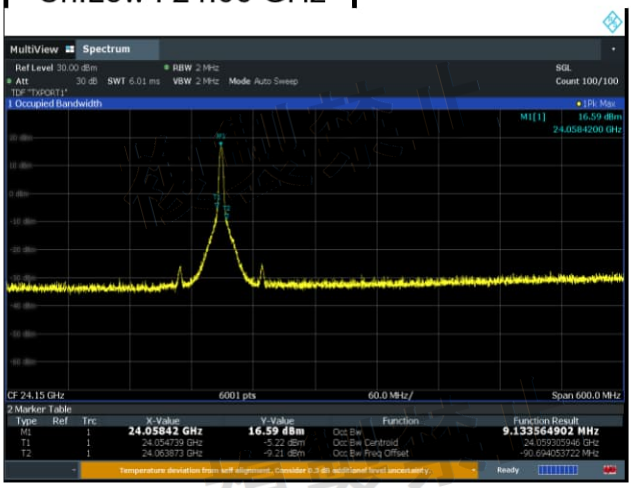
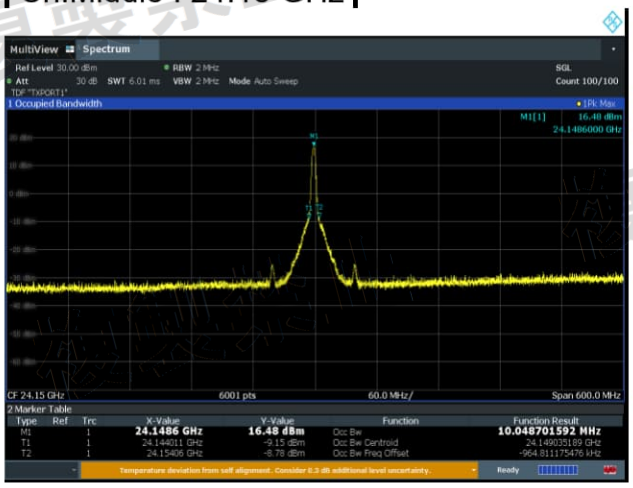
7. Test chart

7.4.2 Frequency Tolerance (After the vibration test)

Ch.Low : 24.06 GHz



Ch.Middle : 24.15 GHz

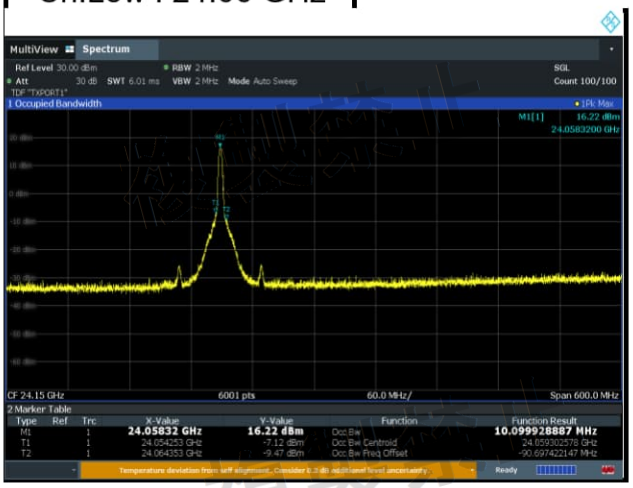


Ch.High : 24.24 GHz

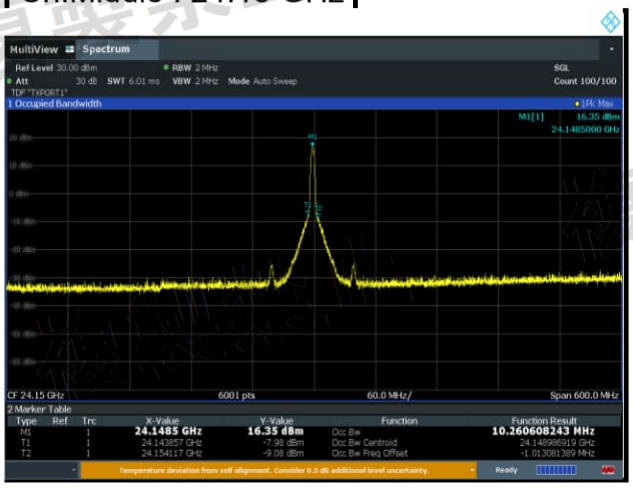
7. Test chart

7.4.3 Frequency Tolerance (After the test temperature (-20 °C))

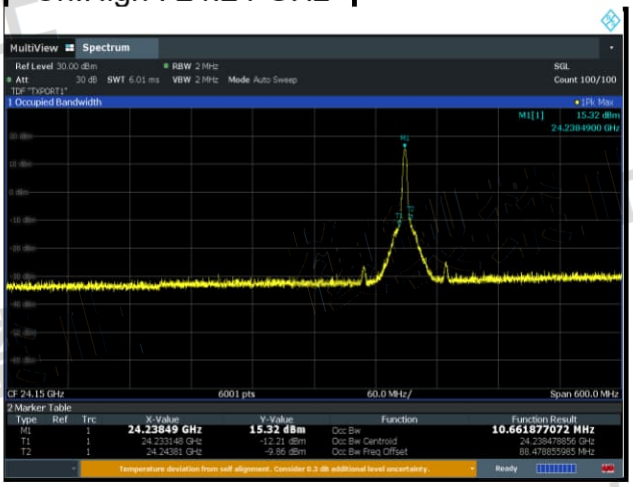
Ch.Low : 24.06 GHz



Ch.Middle : 24.15 GHz



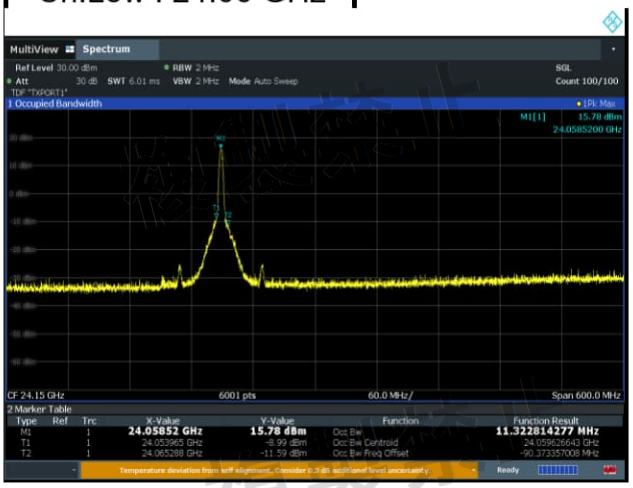
Ch.High : 24.24 GHz



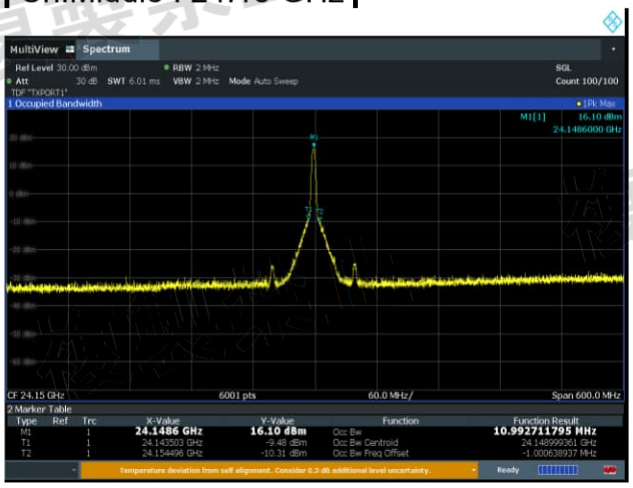
7. Test chart

7.4.4 Frequency Tolerance (After the test temperature (60 °C))

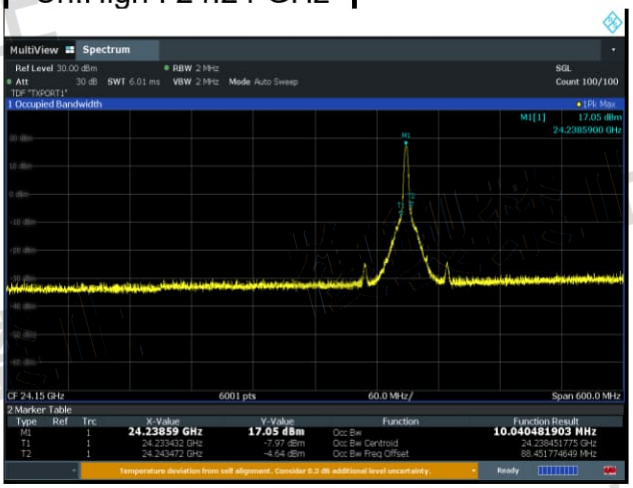
Ch.Low : 24.06 GHz



Ch.Middle : 24.15 GHz



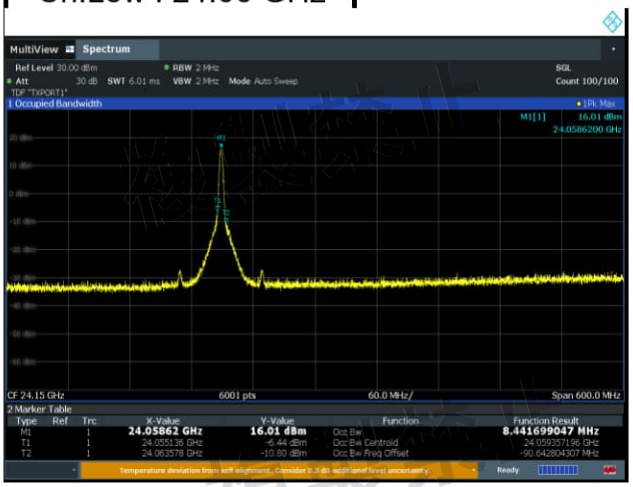
Ch.High : 24.24 GHz



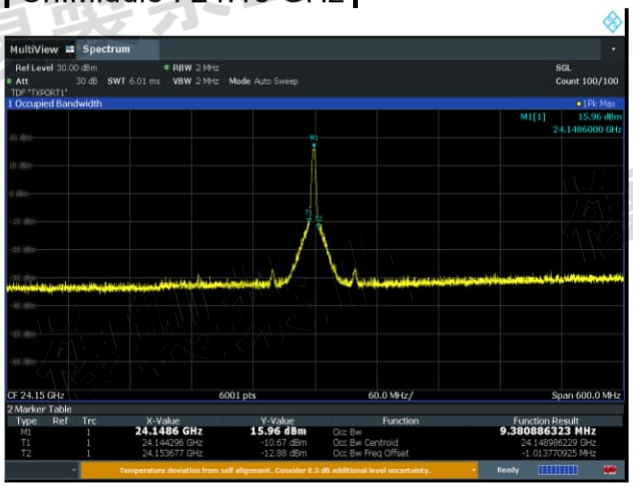
7. Test chart

7.4.5 Frequency Tolerance (After the humidity test (95%))

Ch.Low : 24.06 GHz



Ch.Middle : 24.15 GHz



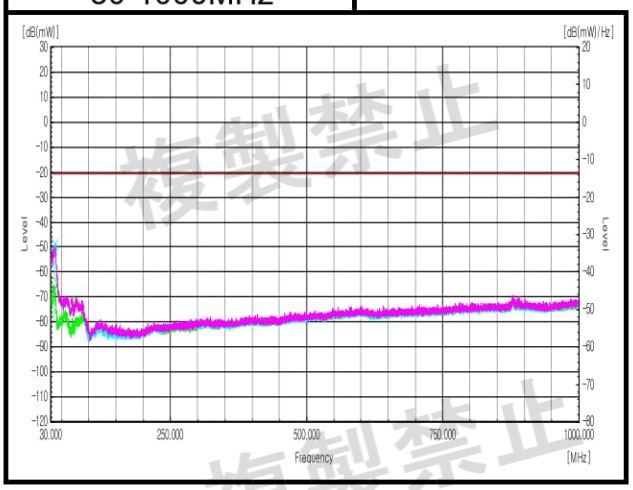
Ch.High : 24.24 GHz

7. Test chart

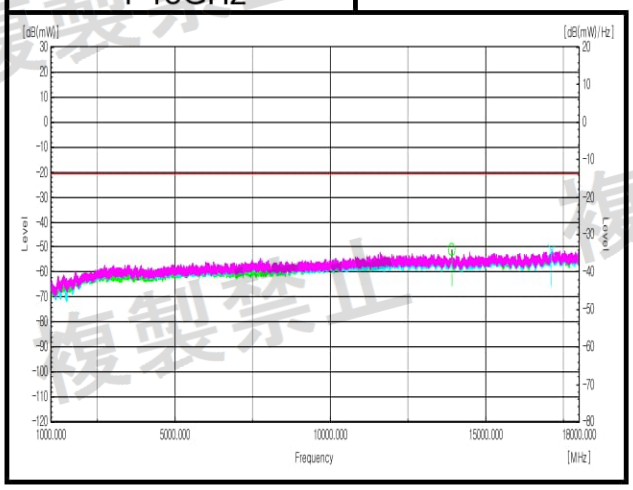
7.5 Unwanted(Spurious) emission strength

Ch.Low : 24.06 GHz

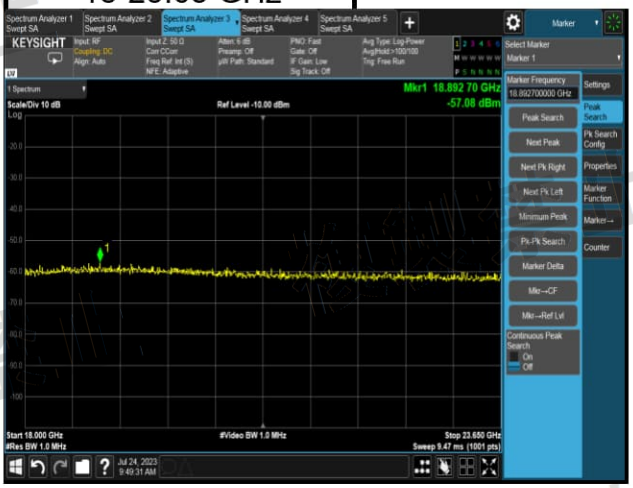
30-1000MHz



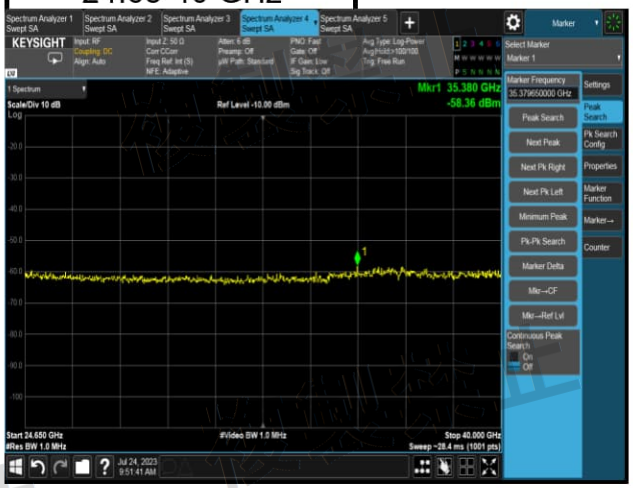
1-18GHz



18-23.65 GHz



24.65-40 GHz



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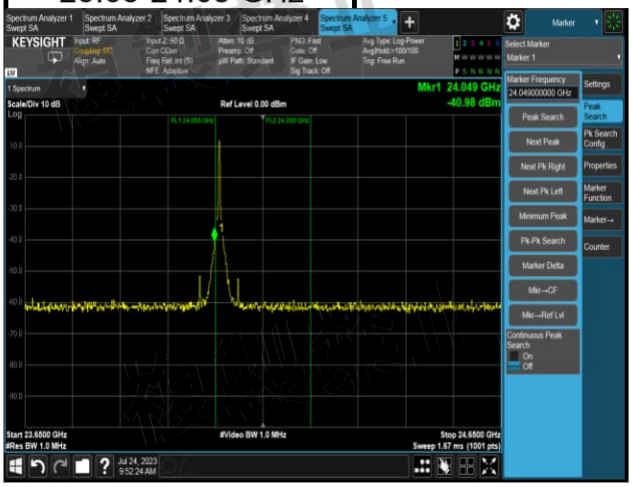
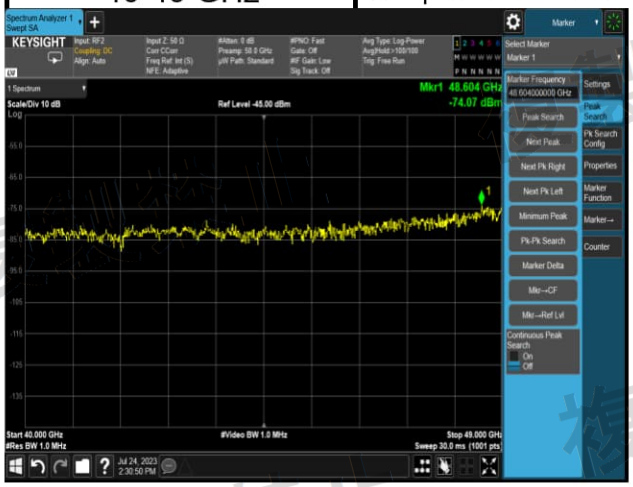
23.65-24.65 GHz



40-49 GHz *No spurious detected.



***NTNV Substitution Data**

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [μW]	Limit [μW]	Margin [μW]
			Amplifier [dB]	RX Cable Loss[dB]	RX Antenna Factor [dB]							
V	37.512	-51.10	32.21	0.67	20.10	-33.95	1.03	-11.72	2.00	0.013490	2.500	2.487
V	17100.260	-58.60	59.51	11.52	41.60	-44.27	18.93	13.90	2.00	0.007413	2.500	2.493
V	18892.700	-57.08	58.41	13.67	44.40	-44.40	19.97	11.11	2.00	0.002979	2.500	2.497
V	24049.000	-40.98	56.93	14.85	45.65	-21.75	22.58	12.45	2.00	0.409261	2.500	2.091
V	35380.000	-58.36	58.51	17.08	47.22	-33.69	26.13	13.36	2.00	0.014256	2.500	2.486

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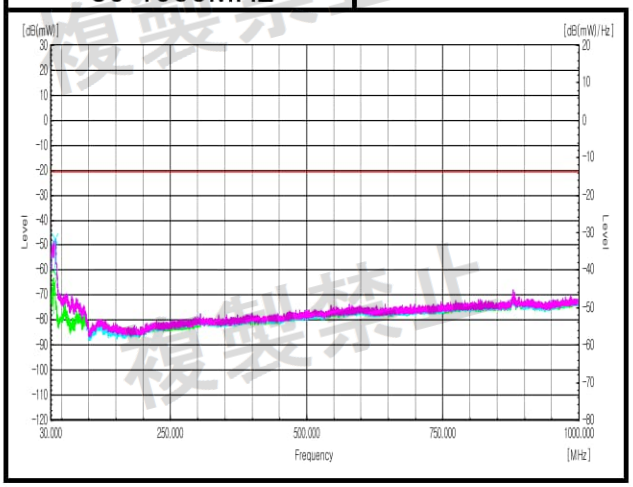
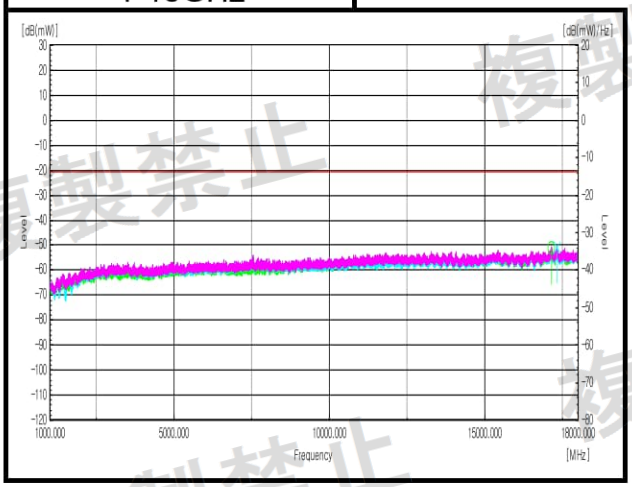
Ch.Middle : 24.15 GHz

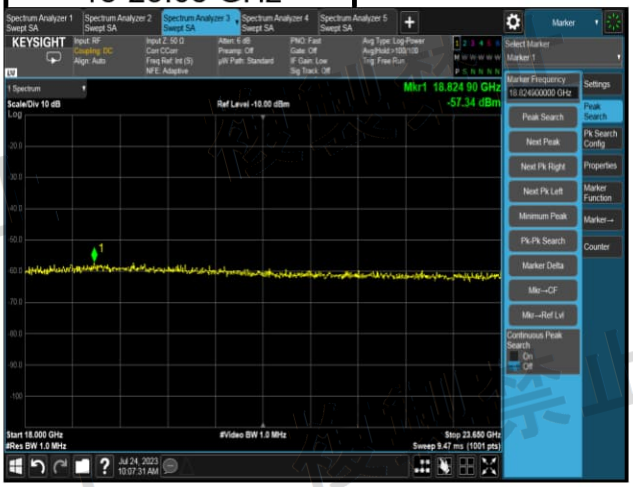
30-1000MHz



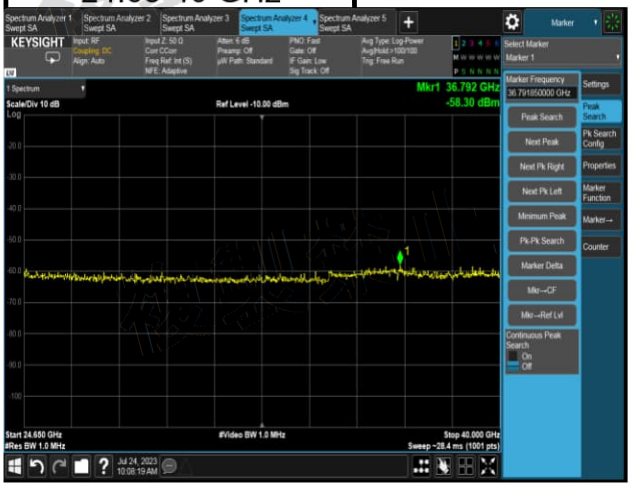
1-18GHz



18-23.65 GHz



24.65-40 GHz



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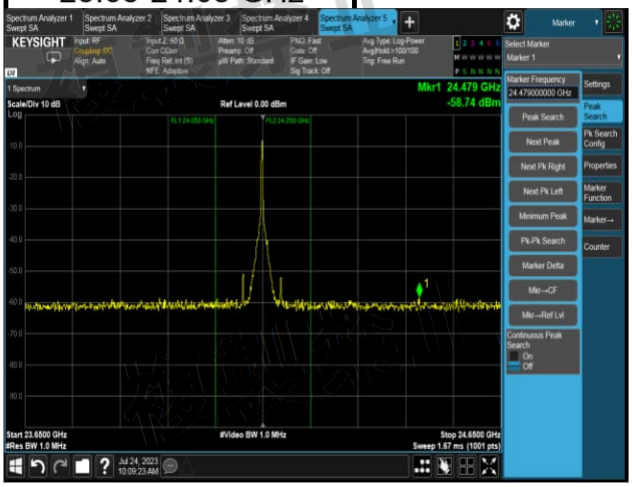
23.65-24.65 GHz



40-49 GHz *No spurious detected.

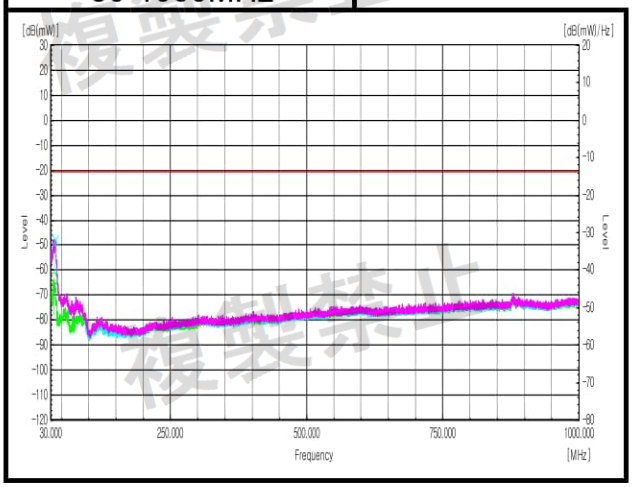
***NTNV Substitution Data**

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [μW]	Limit [μW]	Margin [μW]
			Amplifier [dB]	RX Cable Loss[dB]	RX Antenna Factor [dB]							
V	37.512	-50.00	32.21	0.67	20.10	-32.85	1.03	-11.72	2.00	0.017378	2.500	2.483
V	17309.500	-57.60	59.65	11.45	41.08	-44.05	18.95	14.20	2.00	0.008318	2.500	2.492
V	18824.900	-57.34	58.35	13.61	44.40	-44.55	20.01	11.18	2.00	0.002897	2.500	2.497
V	24479.000	-58.74	56.71	15.47	45.52	-38.85	22.99	12.38	2.00	0.007145	2.500	2.493
V	36792.000	-58.30	58.63	16.62	46.72	-33.97	28.76	13.18	2.00	0.006998	2.500	2.493

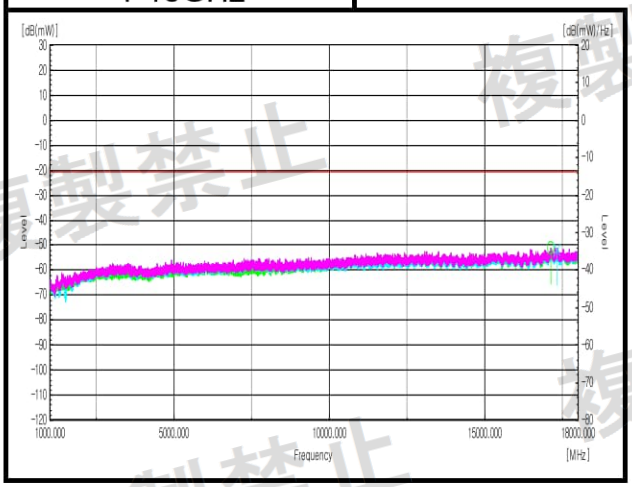
複製禁止

Ch.High : 24.24 GHz

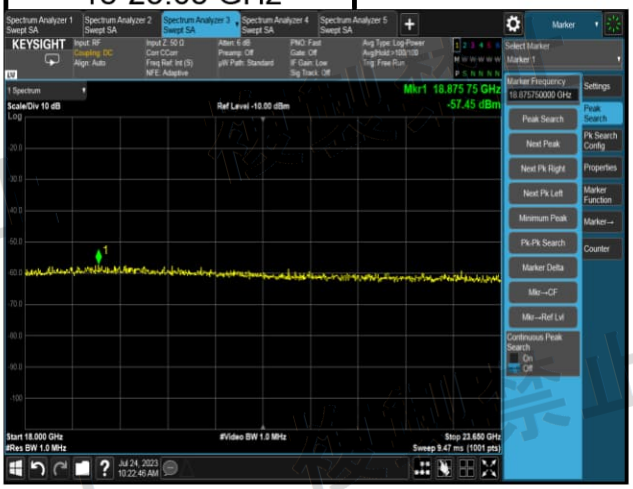
30-1000MHz



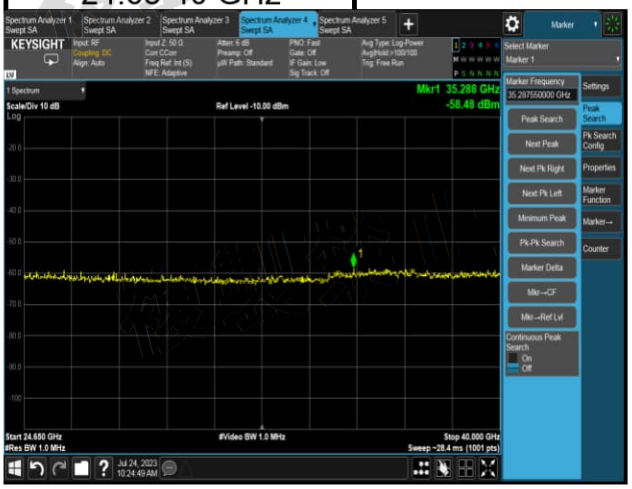
1-18GHz



18-23.65 GHz



24.65-40 GHz



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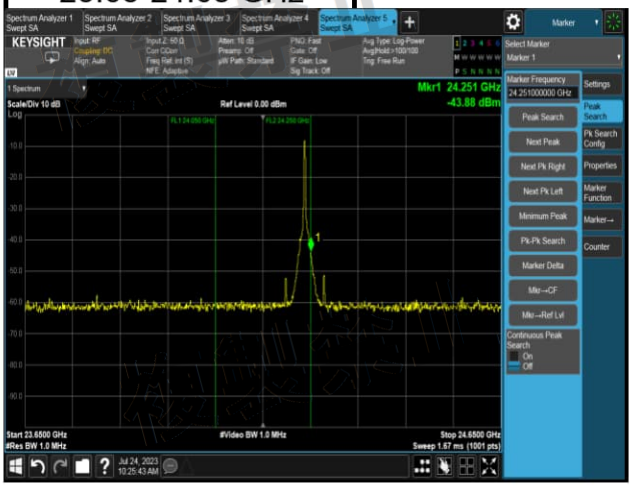
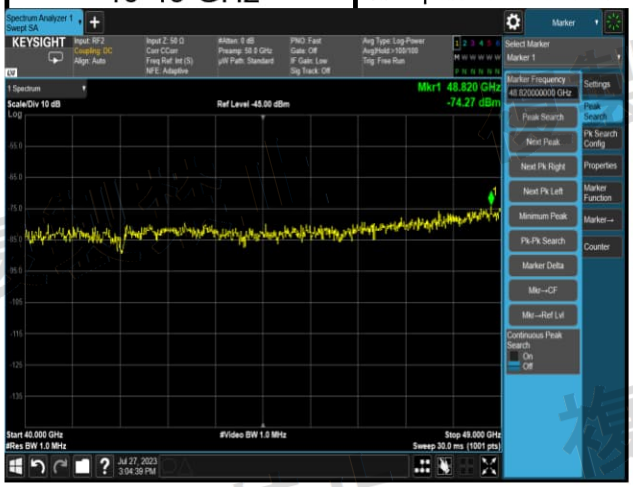
23.65-24.65 GHz



40-49 GHz *No spurious detected.



***NTNV Substitution Data**

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [μW]	Limit [μW]	Margin [μW]
			Amplifier [dB]	RX Cable Loss[dB]	RX Antenna Factor [dB]							
V	37.810	-49.90	32.21	0.71	19.21	-34.61	1.02	-10.37	2.00	0.015849	2.500	2.484
H	17108.110	-58.30	59.51	11.50	42.18	-44.07	18.95	13.92	2.00	0.007762	2.500	2.492
V	18875.750	-57.45	58.39	13.66	44.40	-44.10	19.98	11.12	2.00	0.003192	2.500	2.497
V	24251.000	-43.88	56.83	15.14	45.60	-24.40	22.80	12.40	2.00	0.208930	2.500	2.291
V	35288.000	-58.48	58.48	16.99	47.30	-34.45	26.12	13.20	2.00	0.011561	2.500	2.488

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7. Test chart

7.6 RF output power tolerance

Ch.Low : 24.06 GHz

Ch.Middle : 24.15 GHz

Ch.High : 24.24 GHz

ON/OFF Time

Ch.Low : 24.06 GHz

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [mW]
			Amplifier [dB]	RX Cable Loss [dB]	RX Antenna Factor [dB]					
V	24058.300	-8.08	56.93	14.83	45.64	11.13	22.57	12.46	2.00	0.797994687

Ch.Middle : 24.15 GHz

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [mW]
			Amplifier [dB]	RX Cable Loss [dB]	RX Antenna Factor [dB]					
V	24148.500	-8.27	56.88	14.99	45.60	10.99	22.62	12.50	2.00	0.770903469

Ch.High : 24.24 GHz

H/V	Frequency [MHz]	SA Reading [dBm]	Rx Factor [dB]			SG Reading [dBm]	Cable loss [dB]	Subs Ant. Gain [dBi]	EUT Ant. Gain [dBi]	Result [mW]
			Amplifier [dB]	RX Cable Loss [dB]	RX Antenna Factor [dB]					
V	24238.800	-8.18	56.84	15.16	45.60	11.35	22.77	12.42	2.00	0.794328235

8. Laboratory description

1. Location
Name: Eurofins KCTL Co., Ltd
65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Telephone Number: +82 31 285 0894
Facsimile Number: +82 505 299 8311

2. Accreditation and Registration

1) FCC
Site Designation No.: KR0040
Site Registration No.: 687132

2) VCCI
Registration No.: R-20080, G-20078, C-20059, T20056

3) Industry Canada
Registration No.: 8035A
Test Site No.: 8035A-2

4) KOLAS
Registration No.: KT231

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