



CFR 47 FCC PART 15 SUBPART C ISED RSS-210 ISSUE 10

TEST REPORT

For

TOY Transmitter

MODEL NUMBER: 31H5HW

FCC ID: G6D31H5HW

IC: 9650A-31H5HW

REPORT NUMBER: 4790404370-1

ISSUE DATE: May 17, 2022

Prepared for

NEW BRIGHT INDUSTRIAL CO., LTD 9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET ROAD, KOWLOON BAY, KOWLOON,HONG KONG

Prepared by

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The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products.



Revision History

Rev.	Issue Date	Revisions	Revised By
V0	5/17/2022	Initial Issue	



Summary of Test Results					
Clause	Test Items	FCC/ISED Rules	Test Results		
120dB Bandwidth and 99% Occupied Bandwidth2Radiated Emission3Conducted Emission Test for AC Power Port		CFR 47 FCC §15.215 (c) ISED RSS-Gen Clause 6.7	Pass		
		CFR 47 FCC §15.249 (a)(d)(e) ISED RSS-210 Annex B B.10 CFR 47 FCC §15.205 and §15.209 RSS-GEN Clause 8.9 RSS-GEN Clause 8.10	Pass		
		FCC Part 15.207 RSS-GEN Clause 8.8	N/A (see note 3)		
4	4 Antenna Requirement CFR 47 FCC §15.203 RSS-GEN Clause 6.8 Pass				
Note 1: This test report is only published to and used by the applicant, and it is not for evidence purpose in China. Note 2: The measurement result for the sample received is <pass> according to < CFR 47 FCC PART 15 SUBPART C, ISED RSS-210 Issue 10 and ISED RSS-GEN Issue 5 > when <accuracy method=""> decision rule is applied. Note 3: The EUT was power by battery.</accuracy></pass>					



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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	NEW BRIGHT INDUSTRIAL CO., LTD
Address:	9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET ROAD,
	KOWLOON BAY, KOWLOON,HONG KONG.

Manufacturer Information

Company Name:	NEW BRIGHT INDUSTRIAL CO., LTD
Address:	9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET ROAD,
	KOWLOON BAY, KOWLOON,HONG KONG.

EUT Information

EUT Name:	TOY Transmitter
Model:	31H5HW
Sample ID:	4966271
Sample Received Date:	May 11,2022
Sample Status:	Normal
Date of Tested:	May 11,2022~ May 16,2022

APPLICABLE STANDARDS				
STANDARD TEST RESULTS				
CFR 47 FCC PART 15 SUBPART C	PASS			
ISED RSS-210 Issue 10	PASS			
ISED RSS-GEN Issue 5	PASS			

Prepared By:

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Shawn Wen

Laboratory Leader



2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 414788 D01 Radiated Test Site v01r01, FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, ISED RSS-210 Issue 10 and RSS-GEN Issue 5.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	 A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules. ISED (Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046. VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name:
	1

Note:

- All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
- 2. The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.
- 3. For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz had been correlated to measurements performed on an OFS.



4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty		
Conduction emission	3.62 dB		
Radiation Emission test (include Fundamental emission) (9 kHz ~ 30 MHz)	2.2 dB		
Radiation Emission test (include Fundamental emission) (30 MHz ~ 1 GHz)	4.00 dB		
Radiation Emission test	5.78 dB (1 GHz ~ 18 GHz)		
(1 GHz ~ 26 GHz) (include Fundamental emission)	5.23 dB (18 GHz ~ 26 GHz)		
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.			

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	TOY Transmitter		
EUT Description	The EUT is a wireless remote controller		
Model	31H5HW		
Droduct Description	Operation Frequency	2420 MHz ~ 2462 MHz	
Product Description	Modulation Type GFSK		
	Data Rate 1Mbps		
Battery	DC 3V		

5.2. MAXIMUM FIELD STRENGTH

Frequency (MHz)	Channel Number	Max Peak field strength (dBµV/m)	Max AVG field strength (dBµV/m)	
2462	21[21]	93.20	37.02	

5.3. CHANNEL LIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2420	7	2434	13	2446	19	2458
2	2422	8	2436	14	2450	20	2460
3	2424	9	2438	15	2452	21	2462
4	2426	10	2440	16	2454		
5	2428	11	2442	17	2456		
6	2430	12	2444	18	2457		



5.4. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2420 ~ 2462	Line	0

Test Mode	Transmit and Receive Mode	Description
GFSK	⊠1TX	Antenna 1 can be used as transmitting antenna.

5.5. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
GFSK	CH 1(Low Channel), CH 10(MID Channel), CH 21(High Channel)	2420 MHz, 2440 MHz, 2462 MHz

5.6. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2420 MHz ~ 2462 MHz Band					
Test Soft	/				
Modulation Type Transmit Antenna		Test Channel			
	Number	CH 1	CH 10	CH 21	
GFSK	1	Default	Default	Default	

5.7. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests		
Relative Humidity	55 ~ 65 %		
Atmospheric Pressure:	1025 Pa		
Temperature	TN	22 ~ 28 °C	
	VL	/	
Voltage:	VN	DC 3 V	
	VH	/	

Note: VL= Lower Extreme Test Voltage VN= Nominal Voltage VH= Upper Extreme Test Voltage TN= Normal Temperature



5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
/	/	1	1	/

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
/	/	/	/	/	/

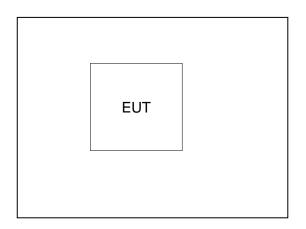
ACCESSORY

Item	Equipment	Mfr/Brand	Model/Type No.	Specification	Series No.
/	/	/	/	/	/

TEST SETUP

The EUT have the engineer mode inside.

SETUP DIAGRAM FOR TEST



Note: New battery was used during all tests.

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5.9. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date	
EMI Test Receiver	R&S	ESR3	101961	Oct.30, 2021	Oct.29, 2022	
Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Oct.30, 2021	Oct.29, 2022	
		So	ftware			
Description Manufacturer Name Version					Version	
Test Software	for Conducted	Emissions	Farad	EZ-EMC	Ver. UL-3A1	

		Radiatec	Emissions		
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Oct.30, 2021	Oct.29, 2022
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Aug.02, 2021	Aug.01, 2024
Preamplifier	HP	8447D	2944A09099	Oct.30, 2021	Oct.29, 2022
EMI Measurement Receiver	R&S	ESR26	101377	Oct.30, 2021	Oct.29, 2022
Horn Antenna	TDK	HRN-0118	130940	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-0118	TRS-305- 00067	Oct.30, 2021	Oct.29, 2022
Horn Antenna	Schwarzbeck	BBHA9170	697	July 20, 2021	July 19, 2024
Preamplifier	TDK	PA-02-2	TRS-307- 00003	Oct.31, 2021	Oct.30, 2022
Preamplifier	TDK	PA-02-3	TRS-308- 00002	Oct.31, 2021	Oct.30, 2022
Loop antenna	Schwarzbeck	1519B	00008	Jan.17, 2019	Jan.17,2022
Preamplifier	TDK	PA-02-001- 3000	TRS-302- 00050	Oct.31, 2021	Oct.30, 2022
High Pass Filter	Wi	WHKX10- 2700-3000- 18000-40SS	23	Oct.31, 2021	Oct.30, 2022
Band Reject Filter	Wainwright	WRCJV8- 2350-2400- 2483.5- 2533.5-40SS	4	Oct.31, 2021	Oct.30, 2022
Signal Analyzer	R&S	FSV40	101118	Oct.30, 2021	Oct.29, 2022
	•	So	ftware		
[Description		Manufacturer	Name	Version
Test Software	for Radiated E	missions	Farad	EZ-EMC	Ver. UL-3A1

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6. ANTENNA PORT TEST RESULTS

6.1. ON TIME AND DUTY CYCLE

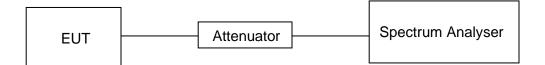
<u>LIMITS</u>

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



TEST ENVIRONMENT

Temperature	22.7°C	Relative Humidity	52 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3V

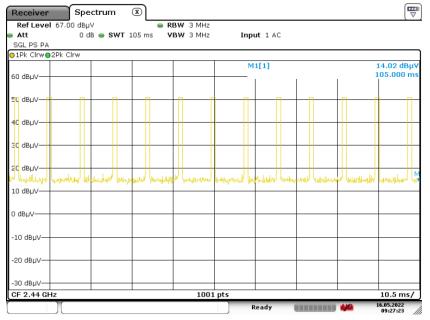
RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)
GFSK	12.744	100	0.12744	12.744	-17.89

Note: Duty Cycle Correction Factor=20log(x). Where: x is Duty Cycle

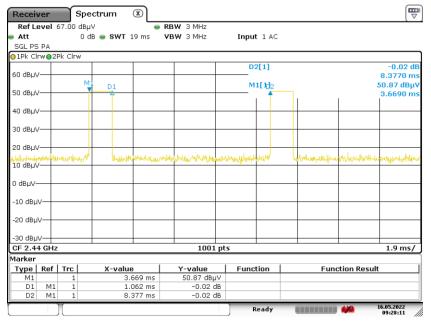


ON TIME AND DUTY CYCLE MID CH PLOT-1



Date: 16.MAY.2022 09:27:23

ON TIME AND DUTY CYCLE MID CH PLOT-2



Date: 16.MAY.2022 09:28:11

Note: All the modes had been tested, but only the worst duty cycle recorded in the report.

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6.2. 20 dB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

<u>LIMITS</u>

		t15 (15.249) Subpart C Gen Issue 5	
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC §15.215 (c)	20dB Bandwidth	for reporting purposes only	2400-2483.5
ISED RSS-Gen Clause 6.7 Issue 5	99% Occupied Bandwidth	For reporting purposes only.	2400-2483.5

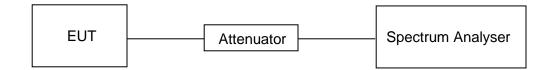
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	1% to 5% of the occupied bandwidth
VBW	Above 3×RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB/99% relative to the maximum level measured in the fundamental emission.

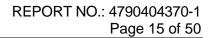
TEST SETUP



TEST ENVIRONMENT

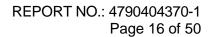
Temperature	22.7°C	Relative Humidity	52 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3V

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<u>RESULTS</u>

<figure></figure>	(MHz)	(MHz)	(MHz)	
Mate 0.08 SWT 100 Ht Mode Auto Sweep Input 1 AC 0.08 SWT 100 Ht Mode Auto Sweep Input 1 AC 0.08 SWT 100 Ht Mode Auto Sweep Input 1 AC 0.08 SWT 100 Ht Mode Auto Sweep Input 1 AC 0.08 SWT 100 Ht Mode Auto Sweep Input 1 AC 0.08 SWT 100 Ht SWT 100 Ht SWT 100 Ht 0.08 SWT 100 Ht SWT 100 Ht SWT 100 Ht 0.08 SWT 100 Ht SWT 100 Ht SWT 100 Ht 0.08 SWT 100 Ht SWT 100 Ht Mode Auto SWT 100 Ht 0.08 SWT 100 Ht Mode Auto FFT Input 1 AC SWT 100 Ht 0.08 SWT 100 Ht Mode Auto FFT Input 1 AC SWT 100 Ht 0.08 SWT 100 Ht Mode Auto FFT Input 1 AC SWT 100 Ht 0.08 SWT 100 Ht Mode Auto FFT Input 1 AC SWT 100 Ht 0.08 SWT 100 Ht Mode Auto FFT Input 1 AC SWT 100 Ht 0.08 SWT 50 Ht SWT 100 Ht Mode Auto FFT Input 1 AC 0.08 SWT 50 Ht SWT 100 Ht Mode Auto FFT Input	2420	1.1890	1.8881	PASS
Mate 0.08 SWT 100 Ht Mode Auto Sweep Input 1 AC 0.08 SWT 100 Ht Mode Auto Sweep Input 1 AC 0.08 SWT 100 Ht Mode Auto Sweep Input 1 AC 0.08 SWT 100 Ht Mode Auto Sweep Input 1 AC 0.08 SWT 100 Ht Mode Auto Sweep Input 1 AC 0.08 SWT 100 Ht SWT 100 Ht SWT 100 Ht 0.08 SWT 100 Ht SWT 100 Ht SWT 100 Ht 0.08 SWT 100 Ht SWT 100 Ht SWT 100 Ht 0.08 SWT 100 Ht SWT 100 Ht Mode Auto SWT 100 Ht 0.08 SWT 100 Ht Mode Auto FFT Input 1 AC SWT 100 Ht 0.08 SWT 100 Ht Mode Auto FFT Input 1 AC SWT 100 Ht 0.08 SWT 100 Ht Mode Auto FFT Input 1 AC SWT 100 Ht 0.08 SWT 100 Ht Mode Auto FFT Input 1 AC SWT 100 Ht 0.08 SWT 100 Ht Mode Auto FFT Input 1 AC SWT 100 Ht 0.08 SWT 50 Ht SWT 100 Ht Mode Auto FFT Input 1 AC 0.08 SWT 50 Ht SWT 100 Ht Mode Auto FFT Input	(Dereci	Spectrum (V)		
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0.00000000000000000000000000000000000	PS PA	U dB 🖷 SWI 10 ms 🖶 VBW 100 kHz Mo	de Auto Sweep Input 1 AC	_
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CF 2.42 GHz 1001 pts 1 1 Spon 10.0 MHz Marker Trppe Ref Trc X-value Function Function Result Mail 1 2.419931 GHz 38.10 dBµV 0.10 dBµV Function Result Det Mail 1 1.686 MHz 0.10 dBµV Function Result Function Result Det Mail 1 1.686 MHz 0.20 dBµV Function Result Function Result Det 16.MAY 2022 10.21:58 Measuring Function Result Function Result Function Result Ref Level 67.00 dBµV FRBW 30 kHz Mail 13 S4-59 dBµV S4-59 dBµV Att 0 dB © SWT 5 ms © VBW 100 kHz Mode Auto FFT Input 1 AC FS PA PS PA 0 dB © SWT 5 ms © VBW 100 kHz Mail 13 S4-59 dBµV 2.42011908 GHz 50 dBµV 0 dBµV T Occ Bw 1.686811686 MHz 1.686811686 MHz 90 dBµV T T T T T T T 10 dBµV T T T T T T T 10			F2	
Type Ref Trc X-value Function Function D1 1 2.419931 GHz 39.10 dBy 10.0 dB 10.0 dB 10.0 dB D2 M1 1 1.948 MHz 0.10 dB 19.73 dB 10.0 dB 10	CF 2.42 G	Hz 1001 pts	Span 10.0 M	IHz
D1 M1 1 1.048 MHz 0.10 db 19.73 db 19.73 db 10.73 db 10.01 db Measuring Date: 16.MAY.2022 10.21:58 Ref Level 67.00 dbp/ RBW 30 kHz Import 100 kHz Measuring M1[1] 54.59 dbp/ PS PA 0 db SWT 5 ms VBW 100 kHz M0de Auto FFT Input 1 AC PS PA 0 db WT 5 ms VBW 100 kHz M0de Auto FFT Input 1 AC 95 PA 0 db WT 5 ms VBW 100 kHz M0de Auto FFT Input 1 AC 90 db/v 0 db 0 db VT 5 ms VBW 100 kHz M0de Auto FFT Input 1 AC 90 db/v 0 db 0 db VT 5 ms VBW 100 kHz M0de Auto FFT Input 1 AC 90 db/v 0 db 0 db VT 5 ms VD 0cc Bw 1.0888111888 MHz 10 db/v 0 db VT 1 VT 1 VT 1 VT 1 VT 1 10 db/v 0 db/v VT 1 VT 1 VT 1 VT 1 VT 1 VT 1 10 db/v VT 1	Type R		Function Function Result	
Receiver Spectrum Image: Control of the system of the	D1	M1 1 1.848 MHz 0.10 dB		
Det: 18.MKY.2022 19.21.58 Reciever Spectrum Image: BBW 30 KH2 Ref Level 67.00 dBµV Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Disc Disc Disc Career Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image: BBW 30 KH2 Mode Auto FFT Input 1 AC Image:			Measuring 16.05.2022	
S0 dBµV Image: Constraint of the second of	Receive Ref Leve Att PS PA	r Spectrum () el 67.00 dBµV ● RBW 30 kHz	le Auto FFT Input 1 AC	₩
40 dBµV T1 T1 T1 T2 T2 30 dBµV T1 10 dBµV T1 T1 T1 T1 T1 T2 T1 T	Receive Ref Levi Att PS PA 01Pk Max	r Spectrum () el 67.00 dBµV ● RBW 30 kHz	M1[1] 54.59 d	вну
30 dBµV 20 dBµV 20 dBµV 40 dA 10 dBµV 40 dA 0 dBµV 40 dA -10 dBµV 40 dA -20 dBµV 40 dA -30 dBµV 40 dA -10 dBµV 40 dA -20 dBµV 40 dA -10 dBµV 40 dA -20 dBµV 40 dA -30 dBµV 40 dA T 1 2.4201199 GHz 54.59 dBµV T1 1 2.4201199 GHz 54.59 dBµV T1 1 2.4201199 GHz 54.74 dBµV 0cc Bw T2 1 2.4207592 GHz 38.68 dBµV 1.88811888 MHz	Receive: Ref Leve Att PS PA IPk Max 60 dBµV-	r Spectrum () el 67.00 dBµV ● RBW 30 kHz	M1[1] 54.59 d 	BµV GHz
10 dBμV M M M 0 dBμV Image: Constraint of the second secon	Receive Ref Levi Att PS PA IPk Max 60 dBµV- 50 dBµV-	r Spectrum el 67.00 dBµV 0 dB ● SWT 5 ms ● VBW 100 kHz Mod	M1[1] 54.59 d 2.42011988 Occ Bw 1.888111888 f	BµV GHz
Marker Type Ref Trc X-value Function Result M1 1 2.4201199 GHz 38.68 dBµV 1.888111888 MHz	Receive Ref Levi Att PS PA ● 1Pk. Max 60 dBµV— 50 dBµV— 40 dBµV—	r Spectrum el 67.00 dBµV 0 dB ● SWT 5 ms ● VBW 100 kHz Mod	M1[1] 54.59 d 2.42011988 Occ Bw 1.888111888 f	BµV GHz
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Att PS PA	0 dB 👄 SWT 10 m	s 👄 VBW 100 kHz 🛛 Mod	e Auto Sweep Input	1 AC	_
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limit2 ^{BIN}	rihriti.	PASS D2	M1[1]	849.00 k 30.91 dB	
50 dBµV	D1 50.660 dBµV	N		2.43928100 G	
40 dBµV		MIN			_
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-10 dBµ'	/				-
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5.4.1					
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		Hz -0.27 dB			_
D1	M1 1 1.459 M	Hz -0.27 dB	Measuring	16.05.2022 09:26:42	
D1 D2	M1 1 1.459 M	Hz -0.27 dB	Measuring	16.05.2022 09:26:42	
D1 D2	M1 1 1.459 M M1 1 849.0 k	Hz -0.27 dB	Measuring	16,05,2022 09:26:42	
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Date: 16.N	M1 1 1.459 M M1 1 849.0 k AY.2022 09:26:42 er Spectrum (X) vel 67.00 dBµV (X)	Hz -0.27 dB Hz 19.76 dB		09:26:42	
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DI D2 Date: 16.M Receiv Reft PS PA ● 1Pk Ma 60 dBµV 50 dBµV 40 dBµV 30 dBµV 20 dBµV 10 dBµV -10 dBµ' -20 dBµ' -30 dBµ'	M1 1 1.459 M M1 1 849.0 k M1 1 849.0 k AY.2022 09.26:42 er Spectrum (x) 0 dB ● SWT 0 dB ● SWT x	Hz -0.27 dB Hz 19.76 dB RBW 30 kHz S VBW 100 kHz Mod	e Auto Sweep Input	09:25:42	
Date: 16.N Receiv Ref Lt PS PA 9 1Pk M2 60 dBµV 50 dBµV 50 dBµV 20 dBµV 20 dBµV 10 dBµV -10 dBµV -20 dBµV -30 dBµV	M1 1 1.459 M M1 1 849.0 k M1 1 849.0 k AY.2022 09.26:42 er Spectrum (x) 0 dB ● SWT 0 dB ● SWT x	Hz -0.27 dB Hz 19.76 dB • RBW 30 kHz • VBW 100 kHz Mod	e Auto Sweep Input	09:25:42	
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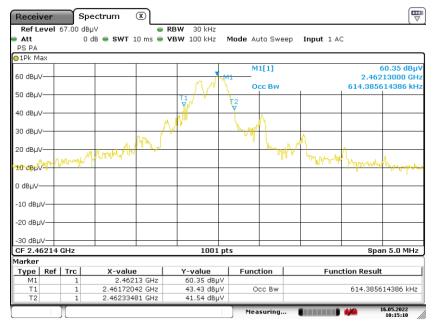
Date: 16.MAY.2022 09:23:28



Frequency	20dB bandwidth	99% bandwidth	Result
(MHz)	(MHz)	(MHz)	
2462	0.509	0.6144	PASS

	er		spectrum 🗷							
Ref Le	vel (1Вµ∨ 0 dB — SWT 20 ms (BRBW 10 kHz	M	ode Auto FF	T In	out 1 AC		
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		—D2	36.790 dBµV	M	1					
30 dBµV	+				+					-
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20 dBµV				54						
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-30 dBµ\				FI						
CF 2.46	2 GH	z		100	1 pt:	5			Spa	n 10.0 MH
1arker										
	Ref	Trc	X-value	Y-value		Function		Fun	ction Resu	t
M1 D1	M1	1	2.4618 GHz 330.0 kHz							
D1 D2	M1	1	509.0 kHz							
						Measuri	1			25.05.2022

Date: 25.MAY.2022 17:00:38



Date: 16.MAY.2022 10:15:10

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7. RADIATED TEST RESULTS

7.1. LIMITS AND PROCEDURE

<u>LIMITS</u>

CFR 47 FCC §15.205 and §15.209

CFR 47 FCC §15.249 (a)(d)(c)(e)

ISED RSS-210 Issue 10 Annex B B.10

RSS-GEN Clause 8.9

The field strength of en	nissions from intentional	radiators operated within	these frequency bands
Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3

Emissions radi	ated outside of the specified frequer	ncy bands above 3	80MHz
Frequency Range	Field Strength Limit	Field Stre	ngth Limit
(MHz)	(uV/m) at 3 m	(dBuV/m	n) at 3 m
(11112)		Quasi	-Peak
30 - 88	100	4	0
88 - 216	150	43	3.5
216 - 960	200	4	6
Above 960	500	5	4
Above 1000	500	Peak	Average
	500	74	54

FCC Emissi	ons radiated outside of the specified free	equency bands below 30MHz
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

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ISED General field strength limits at frequencies below 30 MHz

Table 6 – General field strength limits at frequencies below 30 MHz				
Frequency	Magnetic field strength (H-Field) (μA/m)	Measurement distance (m)		
9 - 490 kHz ^{Note 1}	6.37/F (F in kHz)	300		
490 - 1705 kHz	63.7/F (F in kHz)	30		
1.705 - 30 MHz	0.08	30		

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

IC Restricted bands please refer to ISED RSS-GEN Clause 8.10

Hz	MHz	GHz
290 - 0.110	149.9 - 150.05	9.0 - 9.2
95 - 0.505	156.52475 - 156.52525	9.3 - 9.5
735 - 2.1905	156.7 - 156.9	10.6 - 12.7
20 - 3.026	162.0125 - 167.17	13.25 - 13.4
25 - 4.128	167.72 - 173.2	14.47 - 14.5
7725 - 4.17775	240 - 285	15.35 - 16.2
0725 - 4.20775	322 - 335.4	17.7 - 21.4
177 - 5.683	399.9 - 410	22.01 - 23.12
215 - 6.218	608 - 614	23.6 - 24.0
26775 - 6.26825	960 - 1427	31.2 - 31.8
1175 - 6.31225	1435 - 1626.5	36.43 - 36.5
91 - 8.294	1645.5 - 1646.5	Above 38.6
362 - 8.366	1660 - 1710	
7625 - 8.38675	1718.8 - 1722.2	
11425 - 8.41475	2200 - 2300	
29 - 12.293	2310 - 2390	
51975 - 12.52025	2483.5 - 2500	
57675 - 12.57725	2655 - 2900	
36 - 13,41	3260 - 3267	
42 - 16.423	3332 - 3339	
69475 - 16.69525	3345.8 - 3358	
80425 - 16.80475	3500 - 4400	
5 - 25.67	4500 - 5150	
5 - 38.25	5350 - 5460	
- 74.6	7250 - 7750	
8 - 75.2	8025 - 8500	

Note 1: Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.



FCC Restricted bands of operation:

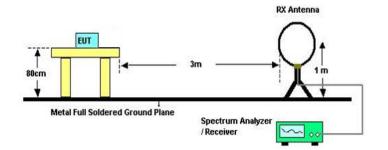
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

Note: ¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz. ²Above 38.6c



TEST SETUP AND PROCEDURE

Below 30MHz



The setting of the spectrum analyser

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Detector	Peak/QP/ Average
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80 cm above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.

5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

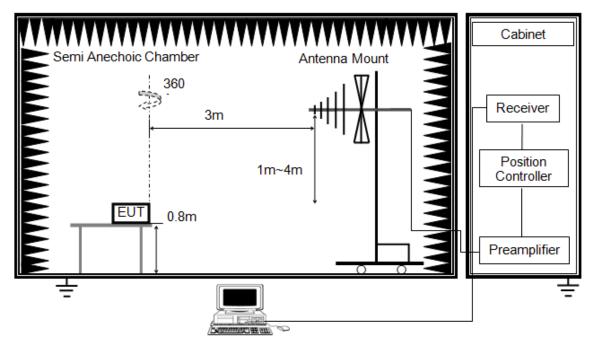
6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode remeasured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.

7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.

8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ω . For example, the measurement frequency X kHz resulted in a level of Y dBuV/m, which is equivalent to Y-51.5 = Z dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.



Below 1 GHz and Above 30 MHz



The setting of the spectrum analyser

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

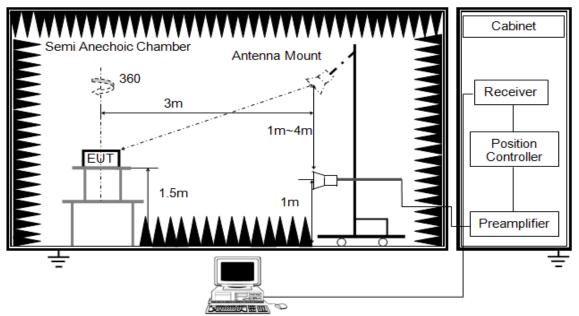
3. The EUT was placed on a turntable with 80cm above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured



Above 1 GHz



The setting of the spectrum analyser. (For Bandedge and Field strength)

RBW	≥ OBW (2 MHz)			
VBW PEAK: ≥ 3×RBW AVG: see note 6				
Sweep	Auto			
Detector	Peak			
Trace	Max hold			

The setting of the spectrum analyser. (For Spurious emissions)

RBW	1 MHz
IV BW	PEAK: 3 MHz AVG: see note 5
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (1.5 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter or band reject filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 150cm above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

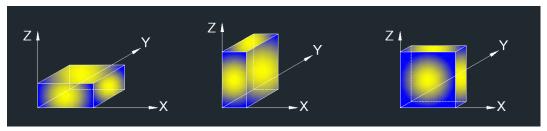
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5. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements. Where necessary, average emission are determined by applying the Duty Cycle Correction Factor to the peak measurements. For the Duty Cycle and Correction Factor please refer to clause 6.1. ON TIME AND DUTY CYCLE.

6. For measurements Bandedge above 1 GHz, the resolution bandwidth is set to 2 MHz, then the video bandwidth is set to $\ge 3 \times RBW$ for peak measurements. This test results are worse than using 1 MHz resolution bandwidth, so if the result is pass, the test is considered to meet the standard requirements.

X axis, Y axis, Z axis positions:



Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

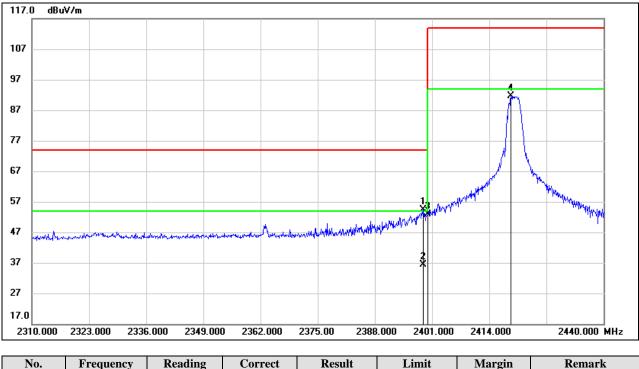
TEST ENVIRONMENT

Temperature	21.3 °C Relative Hum		61 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 3V



7.2. RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS





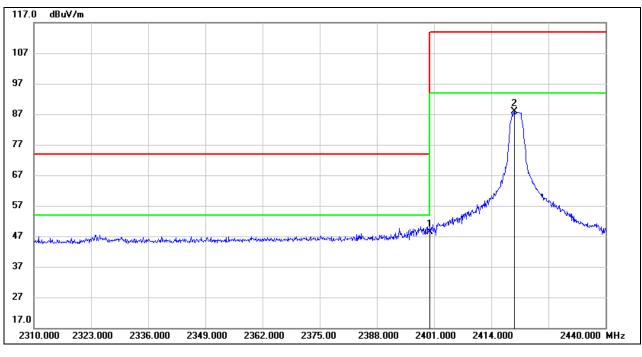
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2399.050	21.58	32.74	54.32	74.00	-19.68	peak
2	/	3.69	32.74	36.43	54.00	-17.57	AVG
3	2400.000	20.05	32.75	52.80	74.00	-21.20	peak
4	2418.940	58.87	32.83	91.70	114.00	-22.30	peak

Note: 1. Measurement = Reading Level + Correct Factor.

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG Result=Peak Result + Duty Cycle Correction Factor.
- 5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.



RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2400.000	15.61	32.75	48.36	74.00	-25.64	peak
2	2419.200	55.07	32.83	87.90	114.00	-26.10	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

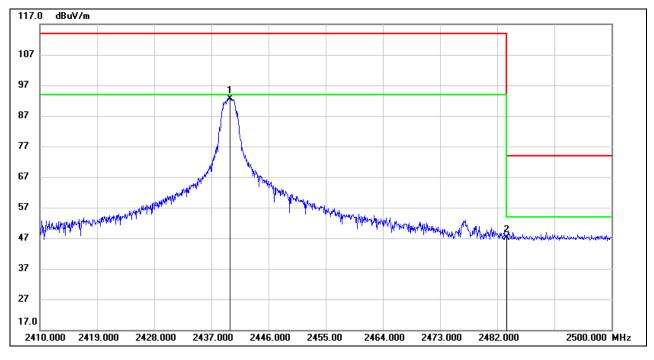
3. Peak: Peak detector.

4. AVG Result=Peak Result + Duty Cycle Correction Factor.

5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.



FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2439.880	59.61	32.91	92.52	114.00	-21.48	peak
2	2483.500	13.92	33.10	47.02	74.00	-26.98	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

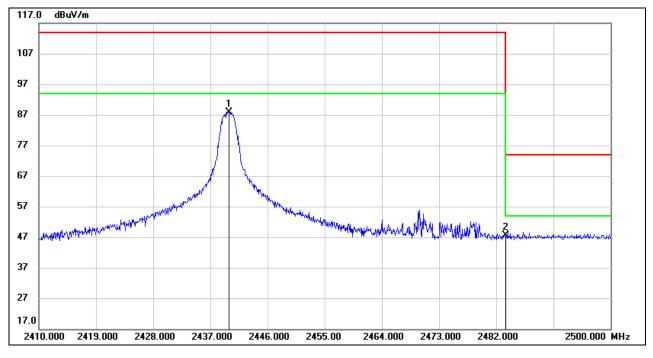
3. Peak: Peak detector.

4. AVG Result=Peak Result + Duty Cycle Correction Factor.

5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.



FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, VERTICAL)



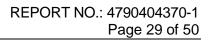
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2439.880	54.96	32.91	87.87	114.00	-26.13	peak
2	2483.500	14.45	33.10	47.55	74.00	-26.45	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

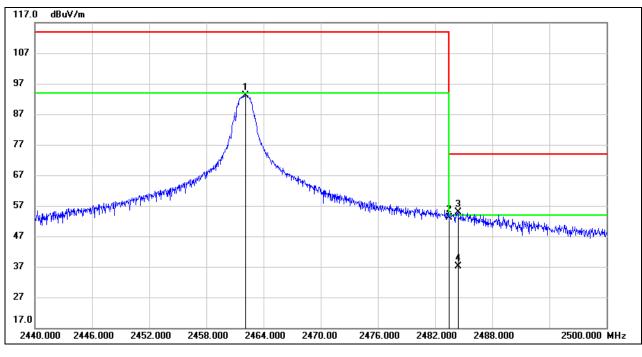
3. Peak: Peak detector.

- 4. AVG Result=Peak Result + Duty Cycle Correction Factor.
- 5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.





RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2462.140	60.20	33.00	93.20	114.00	-20.80	peak
2	2483.500	20.02	33.10	53.12	74.00	-20.88	peak
3	2484.400	21.81	33.10	54.91	74.00	-19.09	peak
4	/	3.92	33.10	37.02	54.00	-16.98	AVG

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

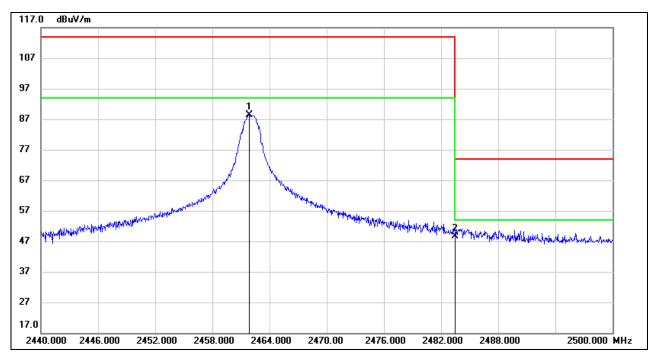
3. Peak: Peak detector.

4. AVG Result=Peak Result + Duty Cycle Correction Factor.

5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.



RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2461.900	55.46	33.00	88.46	114.00	-25.54	peak
2	2483.500	15.57	33.10	48.67	74.00	-25.33	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

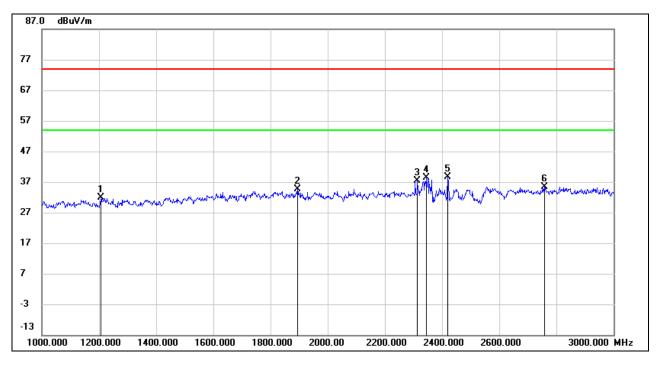
4. AVG Result=Peak Result + Duty Cycle Correction Factor.

5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.



7.3. SPURIOUS EMISSIONS (1 ~ 3 GHz)

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

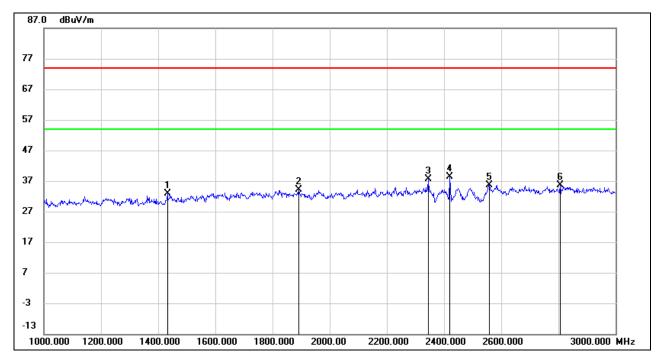


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1206.000	45.45	-13.69	31.76	74.00	-42.24	peak
2	1894.000	45.50	-10.75	34.75	74.00	-39.25	peak
3	2314.000	46.56	-9.27	37.29	74.00	-36.71	peak
4	2346.000	47.54	-9.16	38.38	74.00	-35.62	peak
5	2420.000	47.64	-8.91	38.73	/	/	Fundamental
6	2758.000	43.30	-7.86	35.44	74.00	-38.56	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

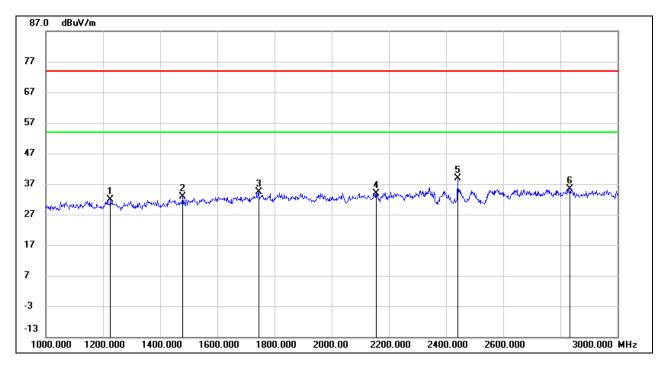


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1432.000	45.85	-12.85	33.00	74.00	-41.00	peak
2	1892.000	44.77	-10.76	34.01	74.00	-39.99	peak
3	2344.000	46.92	-9.17	37.75	74.00	-36.25	peak
4	2420.000	47.31	-8.91	38.40	/	/	Fundamental
5	2558.000	44.35	-8.64	35.71	74.00	-38.29	peak
6	2806.000	43.21	-7.66	35.55	74.00	-38.45	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

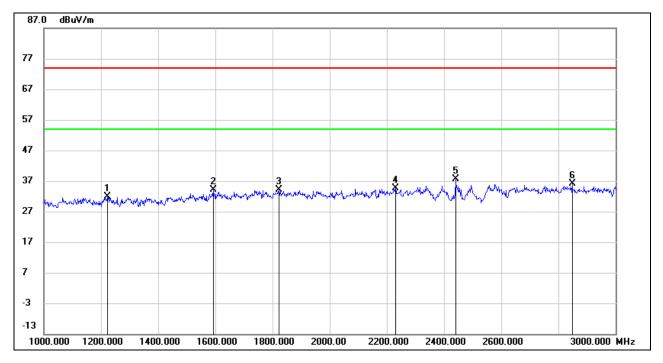


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1226.000	45.38	-13.62	31.76	74.00	-42.24	peak
2	1478.000	45.42	-12.54	32.88	74.00	-41.12	peak
3	1744.000	45.31	-10.93	34.38	74.00	-39.62	peak
4	2156.000	43.95	-9.98	33.97	74.00	-40.03	peak
5	2440.000	47.80	-8.86	38.94	/	/	Fundamental
6	2834.000	42.88	-7.58	35.30	74.00	-38.70	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

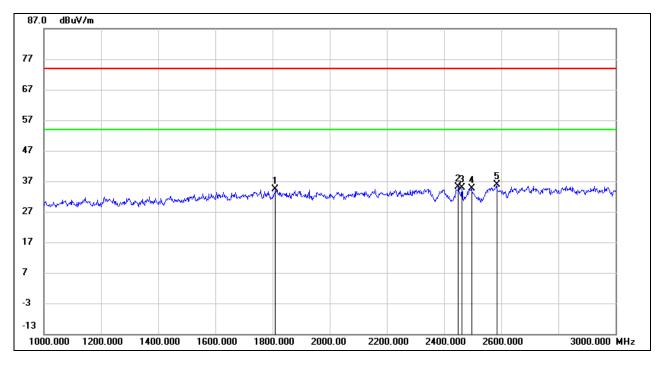


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1222.000	45.54	-13.64	31.90	74.00	-42.10	peak
2	1592.000	45.93	-11.90	34.03	74.00	-39.97	peak
3	1822.000	44.82	-10.62	34.20	74.00	-39.80	peak
4	2230.000	44.15	-9.60	34.55	74.00	-39.45	peak
5	2440.000	46.54	-8.86	37.68	/	/	Fundamental
6	2848.000	43.75	-7.54	36.21	74.00	-37.79	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

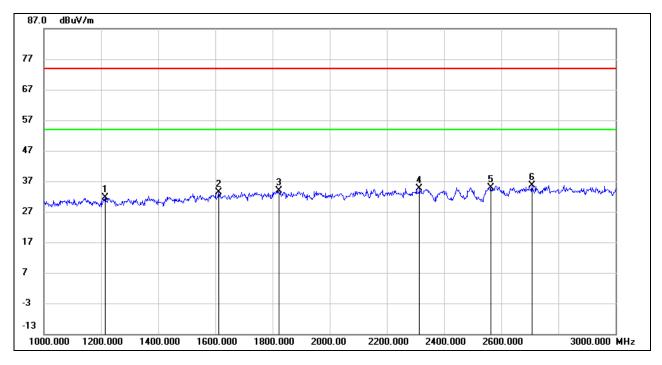


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1810.000	44.89	-10.60	34.29	74.00	-39.71	peak
2	2450.000	43.91	-8.83	35.08	74.00	-38.92	peak
3	2462.000	43.78	-8.81	34.97	/	/	Fundamental
4	2496.000	43.34	-8.73	34.61	74.00	-39.39	peak
5	2584.000	44.43	-8.59	35.84	74.00	-38.16	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



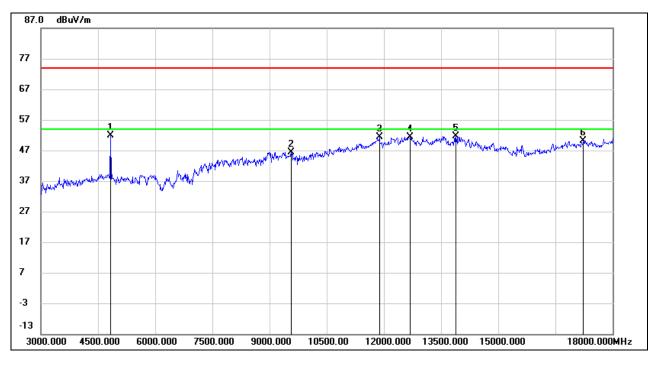
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1214.000	45.39	-13.66	31.73	74.00	-42.27	peak
2	1612.000	45.11	-11.77	33.34	74.00	-40.66	peak
3	1822.000	44.52	-10.62	33.90	74.00	-40.10	peak
4	2314.000	43.92	-9.27	34.65	74.00	-39.35	peak
5	2564.000	43.62	-8.62	35.00	74.00	-39.00	peak
6	2708.000	43.82	-8.08	35.74	74.00	-38.26	peak

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
- 5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



7.4. SPURIOUS EMISSIONS (3 ~ 18 GHz)

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



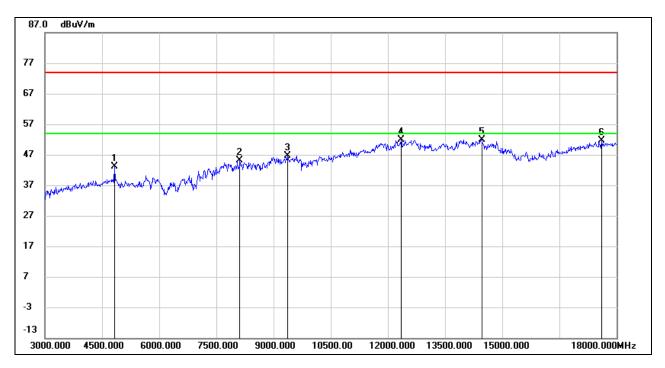
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4830.000	53.12	-1.14	51.98	74.00	-22.02	peak
2	9570.000	36.42	10.07	46.49	74.00	-27.51	peak
3	11880.000	34.21	17.17	51.38	74.00	-22.62	peak
4	12690.000	34.46	17.02	51.48	74.00	-22.52	peak
5	13890.000	31.04	20.56	51.60	74.00	-22.40	peak
6	17235.000	30.03	20.17	50.20	74.00	-23.80	peak

Note: 1. Measurement = Reading Level + Correct Factor.

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG Result=Peak Result + Duty Cycle Correction Factor.
- 5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.
- 6. The High Pass filter loss factor already add into the correct factor.
- 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4830.000	44.27	-1.14	43.13	74.00	-30.87	peak
2	8115.000	38.79	6.43	45.22	74.00	-28.78	peak
3	9375.000	37.10	9.53	46.63	74.00	-27.37	peak
4	12345.000	34.85	16.96	51.81	74.00	-22.19	peak
5	14460.000	33.40	18.60	52.00	74.00	-22.00	peak
6	17610.000	30.33	21.21	51.54	74.00	-22.46	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

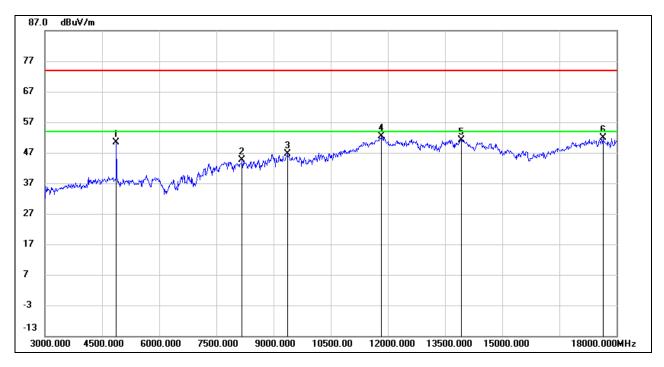
3. Peak: Peak detector.

4. The High Pass filter loss factor already add into the correct factor.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



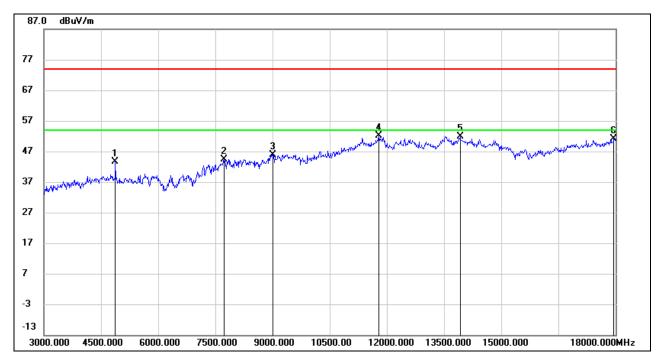
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4875.000	51.42	-1.13	50.29	74.00	-23.71	peak
2	8175.000	37.55	6.99	44.54	74.00	-29.46	peak
3	9360.000	37.08	9.43	46.51	74.00	-27.49	peak
4	11835.000	35.07	17.20	52.27	74.00	-21.73	peak
5	13920.000	30.56	20.58	51.14	74.00	-22.86	peak
6	17640.000	30.34	21.53	51.87	74.00	-22.13	peak

Note: 1. Measurement = Reading Level + Correct Factor.

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG Result=Peak Result + Duty Cycle Correction Factor.
- 5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.
- 6. The High Pass filter loss factor already add into the correct factor.
- 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4875.000	44.84	-1.13	43.71	74.00	-30.29	peak
2	7725.000	38.50	5.84	44.34	74.00	-29.66	peak
3	9015.000	36.50	9.45	45.95	74.00	-28.05	peak
4	11790.000	34.93	17.15	52.08	74.00	-21.92	peak
5	13920.000	31.37	20.58	51.95	74.00	-22.05	peak
6	17955.000	27.50	23.57	51.07	74.00	-22.93	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

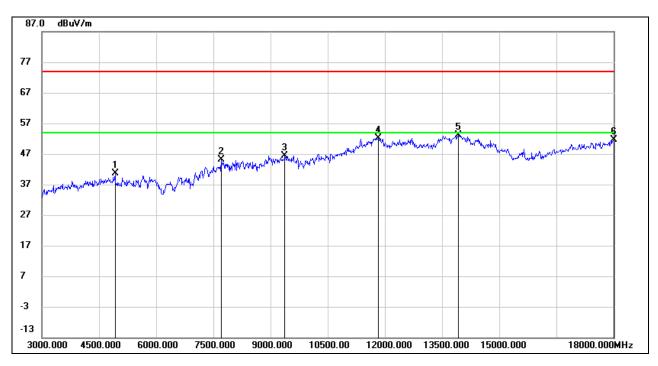
3. Peak: Peak detector.

4. The High Pass filter loss factor already add into the correct factor.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.







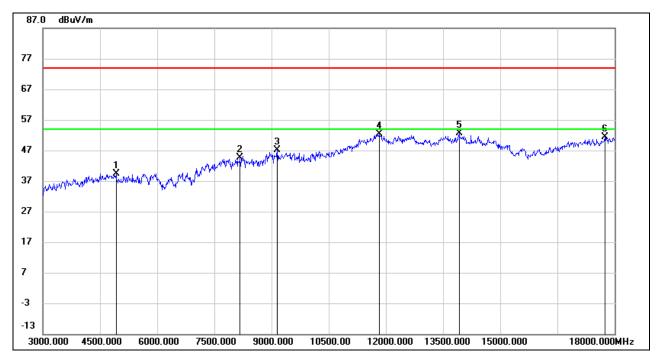
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4920.000	41.83	-1.13	40.70	74.00	-33.30	peak
2	7710.000	39.27	5.80	45.07	74.00	-28.93	peak
3	9375.000	36.92	9.53	46.45	74.00	-27.55	peak
4	11820.000	34.92	17.21	52.13	74.00	-21.87	peak
5	13920.000	32.47	20.58	53.05	74.00	-20.95	peak
6	18000.000	27.85	23.68	51.53	74.00	-22.47	peak

Note: 1. Measurement = Reading Level + Correct Factor.

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Peak: Peak detector.
- 4. AVG Result=Peak Result + Duty Cycle Correction Factor.
- 5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.
- 6. The High Pass filter loss factor already add into the correct factor.
- 7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4920.000	40.56	-1.13	39.43	74.00	-34.57	peak
2	8175.000	37.59	6.99	44.58	74.00	-29.42	peak
3	9150.000	38.32	8.70	47.02	74.00	-26.98	peak
4	11820.000	35.19	17.21	52.40	74.00	-21.60	peak
5	13920.000	32.08	20.58	52.66	74.00	-21.34	peak
6	17745.000	28.64	22.62	51.26	74.00	-22.74	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. AVG Result=Peak Result + Duty Cycle Correction Factor.

5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.

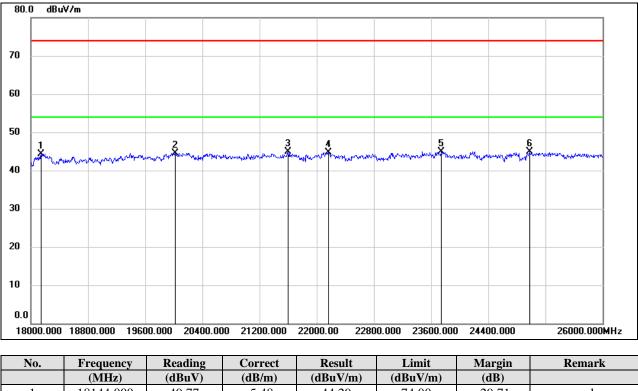
6. The High Pass filter loss factor already add into the correct factor.

7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



7.5. SPURIOUS EMISSIONS (18 ~ 26 GHz)

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	18144.000	49.77	-5.48	44.29	74.00	-29.71	peak
2	20016.000	50.06	-5.47	44.59	74.00	-29.41	peak
3	21600.000	49.52	-4.54	44.98	74.00	-29.02	peak
4	22160.000	49.08	-4.31	44.77	74.00	-29.23	peak
5	23744.000	48.15	-3.20	44.95	74.00	-29.05	peak
6	24976.000	46.99	-2.11	44.88	74.00	-29.12	peak

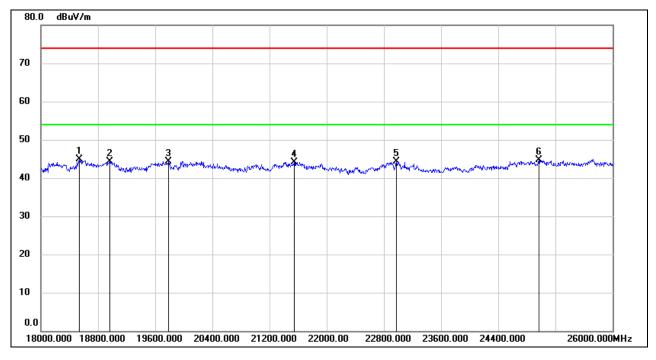
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.



HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	18536.000	50.10	-5.27	44.83	74.00	-29.17	peak
2	18960.000	49.51	-5.25	44.26	74.00	-29.74	peak
3	19784.000	49.57	-5.28	44.29	74.00	-29.71	peak
4	21544.000	48.76	-4.63	44.13	74.00	-29.87	peak
5	22976.000	47.76	-3.46	44.30	74.00	-29.70	peak
6	24968.000	46.76	-2.14	44.62	74.00	-29.38	peak

Note: 1. Measurement = Reading Level + Correct Factor.

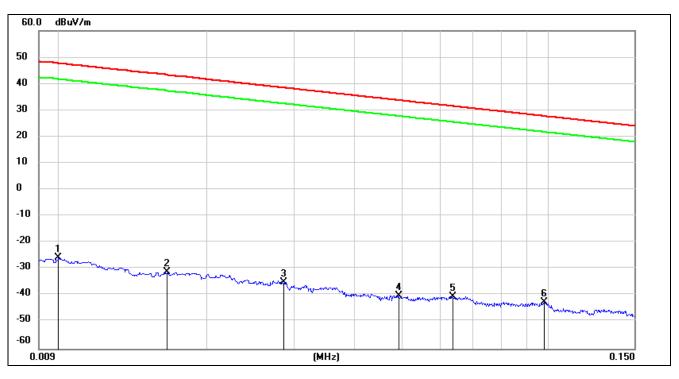
If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 Peak: Peak detector.

Note: All test modes had been tested, only the worst data record in the report.

7.6. SPURIOUS EMISSIONS BELOW 30 MHz

SPURIOUS EMISSIONS (HIGH CHANNEL, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

<u>9 kHz ~ 150 kHz</u>



No.	Frequency	Reading	Correct	FCC	FCC	ISED	ISED	Margin	Remark
				Result	Limit	Result	Limit		
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.0100	75.72	-101.40	-25.68	47.6	-77.18	-3.90	-73.28	peak
2	0.0165	70.34	-101.37	-31.03	43.25	-82.53	-8.25	-74.28	peak
3	0.0286	66.46	-101.38	-34.92	38.47	-86.42	-13.03	-73.39	peak
4	0.0492	61.55	-101.47	-39.92	33.76	-91.42	-17.74	-73.68	peak
5	0.0636	61.31	-101.54	-40.23	31.53	-91.73	-19.97	-71.76	peak
6	0.0981	59.27	-101.78	-42.51	27.77	-94.01	-23.73	-70.28	peak

Note: 1. Measurement = Reading Level + Correct Factor.

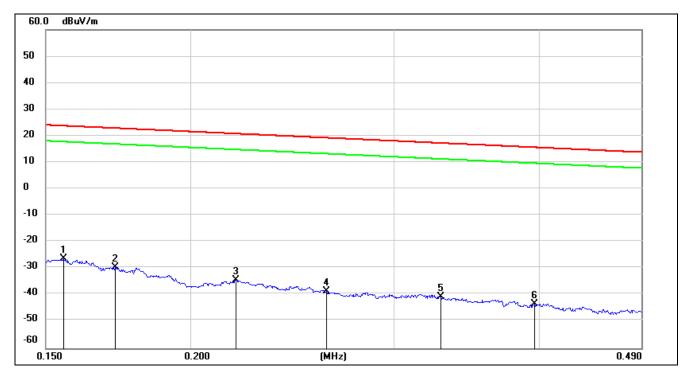
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

4. $dBuA/m = dBuV/m - 20log10(120\pi) = dBuV/m - 51.5$.



<u>150 kHz ~ 490 kHz</u>



No.	Frequency	Reading	Correct	FCC	FCC	ISED	ISED	Margin	Remark
				Result	Limit	Result	Limit		
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.1554	75.27	-101.65	-26.38	23.77	-77.88	-27.73	-50.15	peak
2	0.1720	72.19	-101.67	-29.48	22.9	-80.98	-28.60	-52.38	peak
3	0.2190	67.27	-101.75	-34.48	20.79	-85.98	-30.71	-55.27	peak
4	0.2620	63.31	-101.81	-38.5	19.24	-90.00	-32.26	-57.74	peak
5	0.3286	61.21	-101.88	-40.67	17.27	-92.17	-34.23	-57.94	peak
6	0.3966	58.68	-101.96	-43.28	15.63	-94.78	-35.87	-58.91	peak

Note: 1. Measurement = Reading Level + Correct Factor.

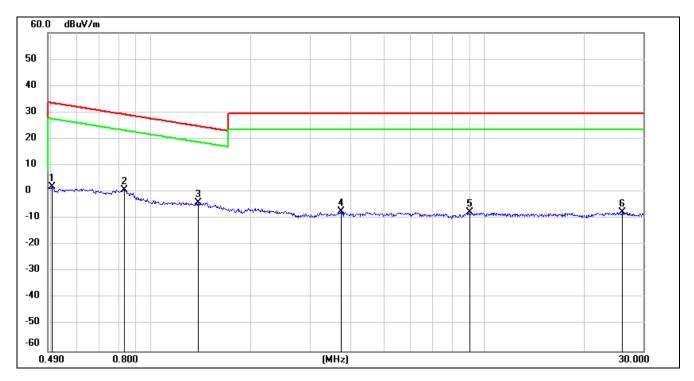
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

4. $dBuA/m = dBuV/m - 20log10(120\pi) = dBuV/m - 51.5$.



<u>490 kHz ~ 30 MHz</u>



No.	Frequency	Reading	Correct	FCC	FCC	ISED	ISED	Margin	Remark
				Result	Limit	Result	Limit		
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.5039	63.93	-62.07	1.86	33.56	-49.64	-17.94	-31.70	peak
2	0.8296	62.94	-62.17	0.77	29.23	-50.73	-22.27	-28.46	peak
3	1.3810	57.97	-62.10	-4.13	24.8	-55.63	-26.70	-28.93	peak
4	3.7100	54.20	-61.41	-7.21	29.54	-58.71	-21.96	-36.75	peak
5	9.0479	53.16	-60.93	-7.77	29.54	-59.27	-21.96	-37.31	peak
6	25.8978	52.76	-60.36	-7.6	29.54	-59.10	-21.96	-37.14	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

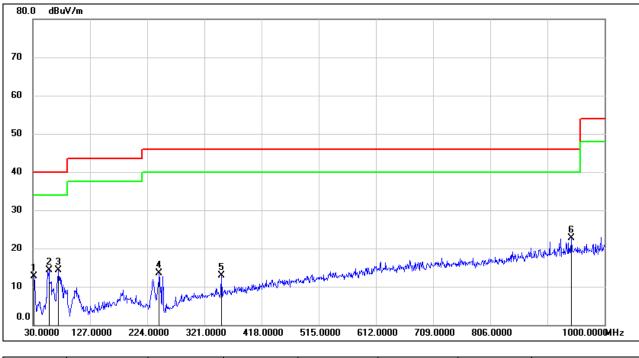
4. $dBuA/m = dBuV/m - 20log10(120\pi) = dBuV/m - 51.5$.

Note: All test modes had been tested, only the worst data record in the report.



7.7. SPURIOUS EMISSIONS BELOW 1 GHz AND ABOVE 30 MHz

SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	31.9400	31.85	-19.13	12.72	40.00	-27.28	QP
2	57.1600	34.92	-20.58	14.34	40.00	-25.66	QP
3	72.6800	35.12	-20.76	14.36	40.00	-25.64	QP
4	244.3700	32.61	-19.07	13.54	46.00	-32.46	QP
5	350.1000	27.13	-14.32	12.81	46.00	-33.19	QP
6	943.7400	27.12	-4.46	22.66	46.00	-23.34	QP

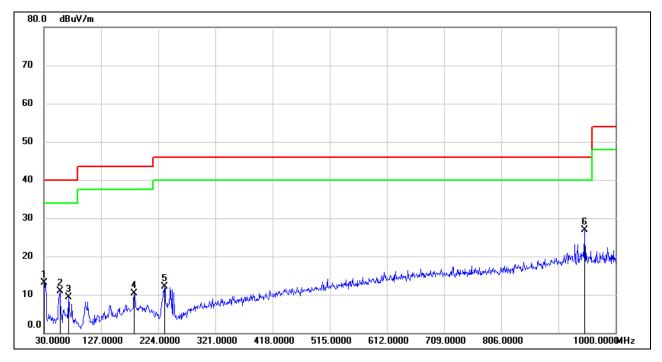
Note: 1. Result Level = Read Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.



SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB / m)	(dBuV/m)	(dBuV/m)	(dB)	
1	30.0000	32.02	-18.94	13.08	40.00	-26.92	QP
2	57.1600	31.52	-20.58	10.94	40.00	-29.06	QP
3	71.7100	29.97	-20.70	9.27	40.00	-30.73	QP
4	183.2600	27.14	-16.77	10.37	43.50	-33.13	QP
5	234.6700	31.01	-18.90	12.11	46.00	-33.89	QP
6	947.6200	31.24	-4.43	26.81	46.00	-19.19	QP

Note: 1. Result Level = Read Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

Note: All the channels have been tested, only the worst data was recorded in the report.



8. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS Complies

END OF REPORT