



# CFR 47 FCC PART 15 SUBPART C

# **TEST REPORT**

For

## Rock Force 1/10 SCALE AWD OFF-ROAD VEHICLE

## MODEL NUMBER: VL-6228, NV-6065, GV-6282

FCC ID: 2ASK3VL-6228RW

## REPORT NUMBER: 4790053047.1-2

**ISSUE DATE: September 17, 2021** 

Prepared for

# AMAX INDUSTRIAL GROUP CHINA CO.,LTD NO.3 10/F WITTY COMMERCIAL BUILDING 1A-1L TUNG CHOI STREET MONGKOK KOWLOON HONGKONG China

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, 523808, People's Republic of China

> Tel: +86 769 22038881 Fax: +86 769 33244054 Website: www.ul.com

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## REPORT NO.: 4790053047.1-2 Page 2 of 50

Revision History				
Rev.	Issue Date	Revisions	Revised By	
V0	09/17/2021	Initial Issue		



Summary of Test Results					
Clause	Test Items	FCC Rules	Test Results		
1	20dB Bandwidth	CFR 47 FCC §15.215 (c)	Pass		
2	Radiated Emission	CFR 47 FCC §15.249 (a)(d)(e) CFR 47 FCC §15.205 and §15.209	Pass		
3	Conducted Emission Test for AC Power Port	FCC Part 15.207	Not Applicable (Note 3)		
4	4 Antenna Requirement CFR 47 FCC §15.203 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 &lt; CFR 47 FCC PART 15 SUBPART C &gt; when <accuracy method=""> decision rule is applied.</accuracy></pass>					

Note 3: The EUT was power by battery but can't be charged.



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# **1. ATTESTATION OF TEST RESULTS**

#### **Applicant Information**

Company Name:	AMAX INDUSTRIAL GROUP CHINA CO.,LTD
Address:	NO.3 10/F WITTY COMMERCIAL BUILDING 1A-1L TUNG
	CHOI STREET MONGKOK KOWLOON HONGKONG China

#### **Manufacturer Information**

Company Name:	AMAX INDUSTRIAL GROUP CHINA CO., LTD
Address:	NO.3 10/F WITTY COMMERCIAL BUILDING 1A-1L TUNG
	CHOI STREET MONGKOK KOWLOON HONGKONG China

### **EUT Information**

EUT Name: Model: Serial Model:	Rock Force 1/10 SCALE AWD OFF-ROAD VEHICLE VL-6228 NV-6065, GV-6282
Model Difference	Please refer to clause 5.1. Description of EUT
Sample Received Date:	August 6, 2021
Sample Status:	Normal
Sample ID:	4124028
Date of Tested:	August 6, 2021~ September 15, 2021

APPLICABLE STANDARDS		
STANDARD	TEST RESULTS	
CFR 47 FCC PART 15 SUBPART C	PASS	

Prepared By:

Jacky Jiang

Checked By:

Shawn Wen

Laboratory Leader

Sherry les

Jacky Jiang **Project Engineer** 

Approved By:

ephentus

Stephen Guo Laboratory Manager



# 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.

# 3. FACILITIES AND ACCREDITATION

	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)		
Accreditation	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.		
Certificate	has been registered and fully described in a report filed with ISED. The		
Continioato	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:		
	Chamber D, the VCCI registration No. is G-20019 and R-20004		
	Shielding Room B, the VCCI registration No. is C-20012 and T-20011		

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
- 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	Rock Force 1/10 SCALE AWD OFF-ROAD VEHICLE		
EUT Description	The device under test (EUT) is toy car with a 2.4GHz transceiver		
Model	VL-6228		
Serial Model NV-6065, GV-6282			
Model Difference	Their electrical circuit design, layout, components used and internal wiring are identical, only the color and model name is different. We select "VL-6228" as the representative model for compliance test		
Broduct Description	Operation Frequency	2405 MHz ~ 2475 MHz	
Product Description	Modulation Type	GFSK	
Battery DC 7.4V			

# 5.2. MAXIMUM FIELD STRENGTH

Frequency (MHz)	Channel Number	Max Peak field strength (dBµV/m)
2445	41[71]	97.72

# 5.3. CHANNEL LIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2405	32	2436
2	2406	33	2437
3	2407	34	2438
4	2408	35	2439
5	2409	36	2440
6	2410	37	2441
7	2411	38	2442
8	2412	39	2443
9	2413	40	2444
10	2414	41	2445
11	2415	42	2446
12	2416	43	2447
13	2417	44	2448
14	2418	45	2449
15	2419	46	2450
16	2420	47	2451

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17   2421   48   2452     18   2422   49   2453     19   2423   50   2454     20   2424   51   2455     21   2425   52   2456     22   2426   53   2457     23   2427   54   2458     24   2428   55   2459     25   2429   56   2460     26   2430   57   2461     27   2431   58   2462     28   2432   59   2463     29   2433   60   2464     30   2434   61   2465     31   2435   62   2466     63   2467   70   2474     64   2468   71   2475     65   2469   -   -     66   2470   -   -     67   2471   -   -     68   2472   -   -     69   2473 <t< th=""><th></th><th></th><th></th><th>. •</th></t<>				. •
192423502454202424512455212425522456222426532457232427542458242428552459252429562460262430572461272431582462282432592463292433602464302434612465312435622466632467702474642468712475652469662470682472	17	2421	48	2452
20   2424   51   2455     21   2425   52   2456     22   2426   53   2457     23   2427   54   2458     24   2428   55   2459     25   2429   56   2460     26   2430   57   2461     27   2431   58   2462     28   2432   59   2463     29   2433   60   2464     30   2434   61   2465     31   2435   62   2466     63   2467   70   2474     64   2468   71   2475     65   2469   -   -     66   2470   -   -     67   2471   -   -     68   2472   -   -	18	2422	49	2453
212425522456222426532457232427542458242428552459252429562460262430572461272431582462282432592463292433602464302434612465312435622466632467702474642468712475652469662470682472	19	2423	50	2454
222426532457232427542458242428552459252429562460262430572461272431582462282432592463292433602464302434612465312435622466632467702474642468712475652469662470682472	20	2424	51	2455
23   2427   54   2458     24   2428   55   2459     25   2429   56   2460     26   2430   57   2461     27   2431   58   2462     28   2432   59   2463     29   2433   60   2464     30   2434   61   2465     31   2435   62   2466     63   2467   70   2474     64   2468   71   2475     65   2469	21	2425	52	2456
242428552459252429562460262430572461272431582462282432592463292433602464302434612465312435622466632467702474642468712475652469662470682472	22	2426	53	2457
25   2429   56   2460     26   2430   57   2461     27   2431   58   2462     28   2432   59   2463     29   2433   60   2464     30   2434   61   2465     31   2435   62   2466     63   2467   70   2474     64   2468   71   2475     65   2469	23	2427	54	2458
26   2430   57   2461     27   2431   58   2462     28   2432   59   2463     29   2433   60   2464     30   2434   61   2465     31   2435   62   2466     63   2467   70   2474     64   2468   71   2475     65   2469	24	2428	55	2459
272431582462282432592463292433602464302434612465312435622466632467702474642468712475652469672471682472	25	2429	56	2460
28   2432   59   2463     29   2433   60   2464     30   2434   61   2465     31   2435   62   2466     63   2467   70   2474     64   2468   71   2475     65   2469	26	2430	57	2461
29   2433   60   2464     30   2434   61   2465     31   2435   62   2466     63   2467   70   2474     64   2468   71   2475     65   2469       66   2470       67   2471       68   2472	27	2431	58	2462
30   2434   61   2465     31   2435   62   2466     63   2467   70   2474     64   2468   71   2475     65   2469   -   -     66   2470   -   -     67   2471   -   -     68   2472   -   -	28	2432	59	2463
31   2435   62   2466     63   2467   70   2474     64   2468   71   2475     65   2469   -   -     66   2470   -   -     67   2471   -   -     68   2472   -   -	29	2433	60	2464
63   2467   70   2474     64   2468   71   2475     65   2469   -   -     66   2470   -   -     67   2471   -   -     68   2472   -   -	30	2434	61	2465
64   2468   71   2475     65   2469   -   -     66   2470   -   -     67   2471   -   -     68   2472   -   -	31	2435	62	2466
65   2469     66   2470     67   2471     68   2472	63	2467	70	2474
66     2470       67     2471       68     2472	64	2468	71	2475
67     2471       68     2472	65	2469		
68 2472	66	2470		
	67	2471		
69 2473	68	2472		
	69	2473		



# 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

1 2405 ~ 2475 integral antenna 0	Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
	1	2405 ~ 2475	integral antenna	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, CH 41, CH 71	2405 MHz, 2445 MHz, 2475 MHz

# 5.6. THE WORSE CASE POWER SETTING PARAMETER

The Wors	The Worse Case Power Setting Parameter under 2405 MHz ~ 2475 MHz Band					
Test Software Version /						
Modulation Type	Transmit Antenna	Test Channel				
Modulation Type	Number	CH 1	CH 36	CH 71		
GFSK	1	Default	Default	Default		

# 5.7. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests			
Relative Humidity	55 ~ 65 %			
Atmospheric Pressure:	1	025 Pa		
Temperature	TN	22 ~ 28 °C		
	VL	/		
Voltage:	VN	DC 7.4V		
	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
/	/	/	/	/

#### I/O CABLES

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

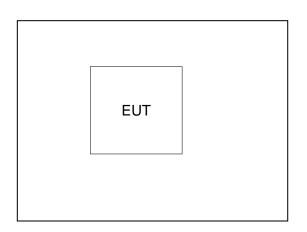
### ACCESSORY

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.



# 5.9. MEASURING INSTRUMENT AND SOFTWARE USED

Radiated Emissions							
				Instrume	nt		
Used	Equipment	Manufacturer	Mode	el No.	Serial No.	Last Cal.	Next Cal.
	MXE EMI Receiver	KESIGHT	N90	)38A	MY56400036	Nov. 12, 2020	Nov. 11, 2021
	Hybrid Log Periodic Antenna	TDK	HLP-:	3003C	130960	Aug. 02, 2021	Aug. 01, 2023
$\checkmark$	Preamplifier	HP	844	47D	2944A09099	Nov. 12, 2020	Nov. 11, 2021
V	EMI Measurement Receiver	R&S	ES	R26	101377	Nov. 12, 2020	Nov. 11, 2021
$\checkmark$	Horn Antenna	TDK	HRN	-0118	130939	Aug. 02, 2021	Aug. 01, 2023
	Preamplifier	TDK	PA-02-0118		TRS-305- 00067	Nov. 20, 2020	Nov. 19, 2021
$\checkmark$	Horn Antenna	Schwarzbeck	BBHA9170		#691	Jul. 20, 2021	Jul. 19, 2023
	Preamplifier	TDK	PA-02-2		TRS-307- 00003	Nov. 12, 2020	Nov. 11, 2021
	Preamplifier	TDK	PA-	02-3	TRS-308- 00002	Nov. 12, 2020	Nov. 11, 2021
$\checkmark$	Loop antenna	Schwarzbeck	15	19B	00008	Jan.17, 2019	Jan.17,2022
V	Preamplifier	TDK	PA-02-0	001-3000	TRS-302- 00050	Nov. 12, 2020	Nov. 11, 2021
$\checkmark$	Preamplifier	Mini-Circuits	ZX60-8	3LN-S+	SUP0120194	1 Nov. 20, 2020	Nov. 19, 2021
V	High Pass Filter	Wi	3000-	10-2700- 18000- ISS	23	Nov. 12, 2020	Nov. 11, 2021
V	Band Reject Filter	Wainwright	WRCJV8-2350- 2400-2483.5- 2533.5-40SS		4	Nov. 12, 2020	Nov. 11, 2021
$\checkmark$	Signal Analyzer	R&S	FS	V40	101118	Nov.20, 2020	Nov.19, 2021
				Software	e		
Used	De	escription		Manufa	cturer	Name	Version
$\checkmark$		vare for Radiat sturbance	ed	Fara	ad	EZ-EMC	Ver. UL-3A1



# 6. ANTENNA PORT TEST RESULTS

# 6.1. ON TIME AND DUTY CYCLE

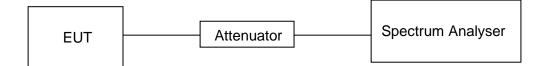
## LIMITS

None; for reporting purposes only

## PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

## TEST SETUP



### TEST ENVIRONMENT

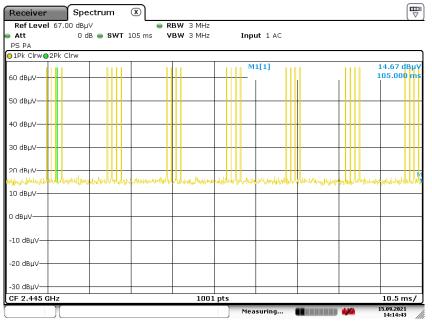
Temperature	24.3 °C	Relative Humidity	61 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 7.4V

### **RESULTS**

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)
GFSK	4.851	100	0.04851	4.62	-26.28

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

## ON TIME AND DUTY CYCLE MID CH PLOT



Date: 15.SEP.2021 14:14:43

## ON TIME AND DUTY CYCLE MID CH PLOT-2



Date: 15.SEP.2021 14:15:49



# ON TIME AND DUTY CYCLE MID CH PLOT-3

Recei	ver	5	pectrum	×							
Ref L	evel	67.00 (	dBµ∨		RBW 3 MHz						
🛛 Att			O dB 👄 SWT	2.3 ms	VBW 3 MHz	Inp	out 1 AG	0			
SGL PS	5 PA										
⊖1Pk C	rw 🔵 2	Pk Clrw	/								
	<b>N</b> I1	· · · · · ·	01				<b>211</b>	-n			-0.14 dB
60 dBµ\	/										.16550 ms
50 dBµ\							M1[1]				i4.32 dBµV
SO UBH							1	1			173.25 μs
40 dBu\	,										
io app	·										
30 dBµ\	/			_			-				
20 dBµ\	v <del></del> -						-	_			
a, made	<b>.</b>		Republic Republic	والمتعاد الملال	Mudadhamilakatala	the filled of the	u .	And the states	liaaaa	unhadaaaa	and a state of the
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0 dBuV-											
υ αθμν-											
-10 dBL	~										
-10 00	~										
-20 dBµ	N-										
-30 dBµ	N-			-			-				
CF 2.4	45 G⊦	lz			1001	pts					225.0 µs/
Marker											
Туре	Ref	Trc	X-valu	e	Y-value	Fun	ction	1	Func	tion Result	
M1		1	17	3.25 µs	64.32 dBj	IV .					
D1	M1	1		4.25 µs	0.02 0						
D2	M1	1	1.:	.655 ms	-0.14 (	JB					
							Ready			<b>440</b> 1	5.09.2021
								-			14:17:04

Date: 15.SEP.2021 14:17:04

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



# 6.2. 20 dB BANDWIDTH OCCUPIED BANDWIDTH

### LIMITS

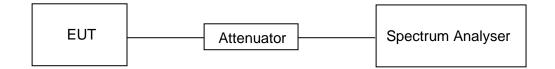
CFR 47 FCC Part15 (15.249) Subpart C						
Section	Test Item	Limit	Frequency Range (MHz)			
CFR 47 FCC §15.215 (c)	20dB Bandwidth	for reporting purposes only	2400-2483.5			

#### 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	approximately 3×RBW
Trace	Max hold
Sweep	Auto couple

### TEST SETUP



### TEST ENVIRONMENT

Temperature	24.3 °C	Relative Humidity	61 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 7.4V

#### RESULTS

Frequency (MHz)	20dB bandwidth (MHz)	Result
2405	1.1748	PASS

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	2	0 dB B	ANDW	IDTH I	_OW C	СН		
Receiver	Spectrum	×						
Ref Level 67.0	00 dBµ∨	🔵 RB	W 30 kHz					
Att PS PA	0 dB 👄 SWT	20 ms 🖷 VB	W 100 kHz	Mode Au	ito FFT II	nput 1 AC		
⊖1Pk Max								
limit1Limit Check		PA	8 <b>8</b>	M	1[1]		1	51.38 dBµV
limit2 <sup>BHVe Mrm1</sup>		PA	55	Ma	IB		2.405	25170 GHz 20.00 dB
50 dBµV			0 m 0	~~~~ Q	n factor\		1.1748	00000 MHz 2047.3
40 dBµV		TI				T2		
30 dBµV	$\sim$	m					L ~~~	

20 dBuV	.			had					In m	2
20 08µV	$\overline{\Lambda}$	_	<u></u>	1						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
10 dBµV		h								V
0 dBµV-										
-10 dBµ'										
-10 000	۲ I									
-20 dBµ	v+									
-30 dBµ	v——									
CF 2.40	05 G⊦	Iz			1001	. pts			Spa	n 3.0 MHz
Marker										
Туре	Ref	Trc	X-value	.	Y-value	Fund	tion 📋	Fund	ction Result	
M1		1	2.40525	17 GHz	51.38 dBµ	JV ndB	3 down		1	.1748 MHz
T1		1	2.40467	93 GHz	31.44 dBµ	IV VI	ndB			20.00 dB
T2		1	2.40585	41 GHz	31.44 dBµ	IN D	factor			2047.3
		)[]				Me	asuring		<b>440</b> 1	15.09.2021 14:02:08

Date: 15.SEP.2021 14:02:08

Frequency (MHz)		20dB bandwidth (MHz)			Result	
2445		1.1	838		PASS	5
	20 dB I	BANDWI	OTH MID (	СН		
Receiver Spect	rum 🗵					
Ref Level     67.00     dBµ∨       ● Att     0     dB       PS PA     0     dB	● <b>SWT</b> 20 ms ● V	RBW 30 kHz /BW 100 kHz M	1ode Auto FFT	Input 1 A	с	
O1Pk Max	I					
limit1Limit Check		ASS	M1[1]		61.57 c 2.44525470	
50 dBuV		m		m	20.0 1.183800000	
50 UBHV		T1	Q factor			65.6
40 dBµV		×		+	1 h	
30 dBµV	<u>~~h-</u> /					
20-0180						$\sim$
20-dBpv						
10 dBµV						
0 dBµV				_		
-10 dBµV						
-20 dBµV				+		
-30 dBuV						
CF 2.445 GHz		1001 pt:	5		Span 3.0 M	1Hz
Marker						
Type Ref Trc	2.4452547 GHz	Y-value 61.57 dBµV	Function ndB down	F	unction Result 1.1838 N	147
T1 1	2.4446763 GHz	41.50 dBµV	ndB		20.00	
T2 1	2.4458601 GHz	41.62 dBµV	Q factor		2065	5.6
			Measuring		15.09.202 14:13:3	1

Date: 15.SEP.2021 14:13:36

Frequency (MHz)		20dB bandwidth (MHz)			Result	
2475		1.1	928		Р	ASS
	20 dB	BANDWI	OTH HIG	СН		
Receiver Spectr	um 🗵					
PS PA	● SWT 20 ms ● 1	RBW 30 kHz VBW 100 kHz N	1ode Auto FFT	Input 1 A	с	
●1Pk Max limit1Limit ¢heck		PASS	M1[1]			57.56 dBµV
limit2Buver mmr.1		PASS	X			525770 GHz
50 dBµV			Q factor	$\sim \sim$	1.1928	20.00 dB 00000 MHz 2075.2
40 dBµV	^	7			V.	~
30 dBµV /				_		
20 dBµV				_		J.
10 dвµV						
0 dBuV						
-10 dBµV						
-20 dBµV						
-30 dBµV				_	_	
CF 2.475 GHz		1001 pt	5		Spa	in 3.0 MHz
Marker Type   Ref   Trc	X-value	Y-value	Function	F	unction Result	+ 1
M1 1	2.4752577 GHz	57.56 dBµV	ndB down			.1928 MHz
T1 1 T2 1	2.4746733 GHz 2.4758661 GHz	37.67 dBµV 37.39 dBµV	ndB Q factor			20.00 dB 2075.2
			Measuring			15.09.2021 14:36:05

Date: 15.SEP.2021 14:36:05



# 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)

The field strength of emissions 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 radiated outside of the specified frequency bands above 30MHz							
Frequency Range	Field Strength Limit	Field Strength Limit					
(MHz)	(uV/m) at 3 m	(dBuV/m	n) at 3 m				
()	(2.1,) at c	Quasi-Peak					
30 - 88	100	40					
88 - 216	150	43.5					
216 - 960	200	46					
Above 960	500	54					
Above 1000	500	Peak	Average				
	300	74	54				

FCC Emissions radiated outside of the specified frequency 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					

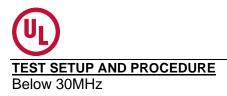
FCC Restricted bands of operation:

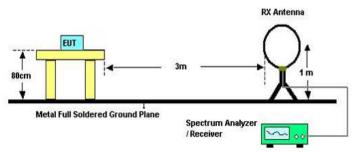


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MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	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: <sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz. <sup>2</sup>Above 38.6c





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.

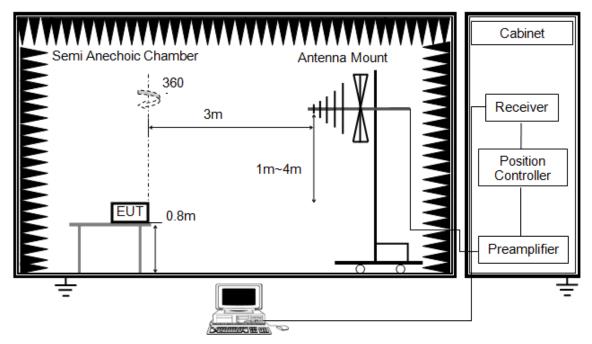
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site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

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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.

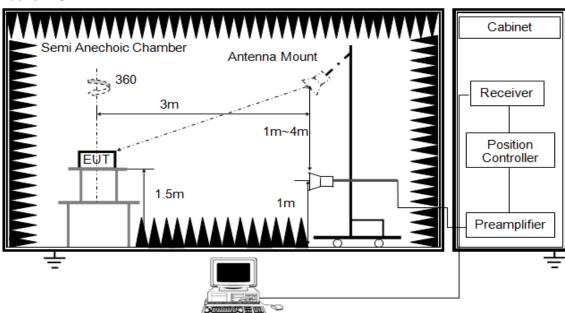
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations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





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

RBW	≥ OBW (3MHz)
IV BWV	PEAK: ≥ 3×RBW AVG: see note 5
Sweep	Auto
Detector	Peak
Trace	Max hold

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

RBW	1MHz
IV BWV	PEAK: 3MHz 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.

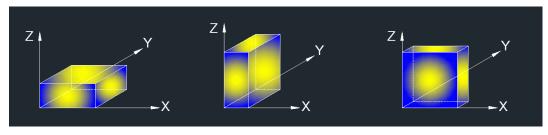
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5. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements. Where necessary, average emission are determined by applying the Duty Cycle Correction Factor to the peak measurements. 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 3 MHz, then the video bandwidth is set to  $\ge$  3×RBW for peak measurements. This test results are worse than using 1MHz 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.

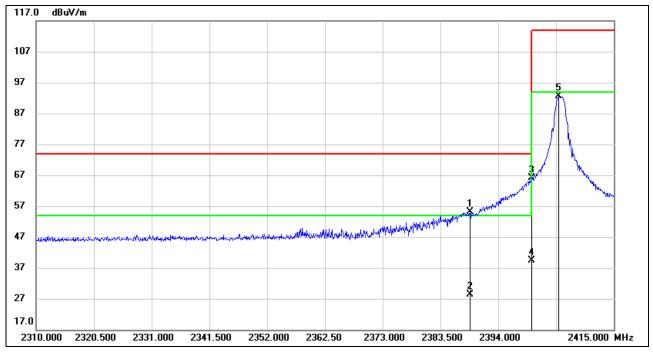
#### TEST ENVIRONMENT

Temperature	24.3 °C	Relative Humidity	61 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 7.4V



# 7.2. RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS

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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	2388.855	21.88	33.34	55.22	74.00	-18.78	peak
2	2388.855	/	/	28.94	54.00	-25.06	AVG
3	2400.000	32.80	33.43	66.23	74.00	-7.77	peak
4	2400.000	/	/	39.95	54.00	-14.05	AVG
5	2405.025	59.10	33.45	92.55	114.00	-21.45	peak

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

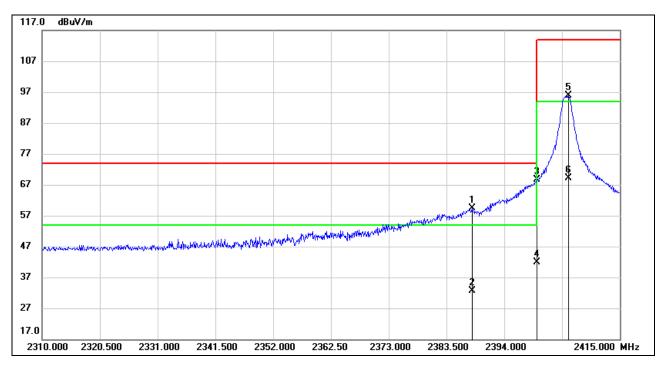
If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
Peak: Peak detector.

4. AVG Result=Peak Result + Duty 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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	2388.120	26.03	33.34	59.37	74.00	-14.63	peak
2	2388.120	/	/	33.09	54.00	-20.91	AVG
3	2400.000	35.10	33.43	68.53	74.00	-5.47	peak
4	2400.000	/	/	42.25	54.00	-11.75	AVG
5	2405.655	62.33	33.45	95.78	114.00	-18.22	peak
6	2405.655	/	/	69.50	94.00	-24.50	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.

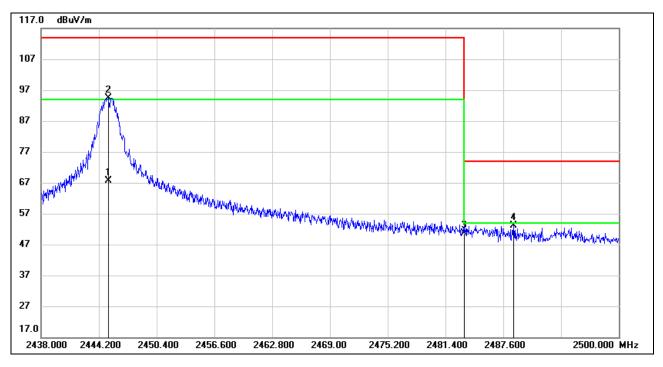
3. Peak: Peak detector.

4. AVG Result=Peak Result + Duty 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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	2445.192	/	/	68.22	94.00	-25.78	AVG
2	2445.192	60.92	33.58	94.50	114.00	-19.50	peak
3	2483.500	17.01	33.71	50.72	74.00	-23.28	peak
4	2488.716	19.39	33.72	53.11	74.00	-20.89	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.

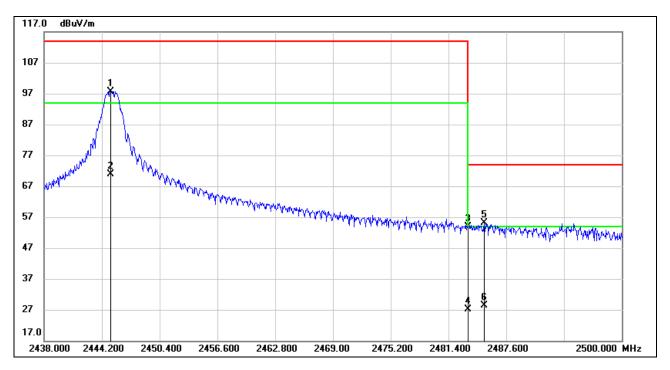
3. Peak: Peak detector.

4. AVG Result=Peak Result + Duty 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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	2445.130	64.14	33.58	97.72	114.00	-16.28	peak
2	2445.130	/	/	71.44	94.00	-22.56	AVG
3	2483.500	20.13	33.71	53.84	74.00	-20.16	peak
4	2483.500	/	/	27.56	54.00	-26.44	AVG
5	2485.244	21.37	33.71	55.08	74.00	-18.92	peak
6	2485.244	/	/	28.80	54.00	-25.20	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.

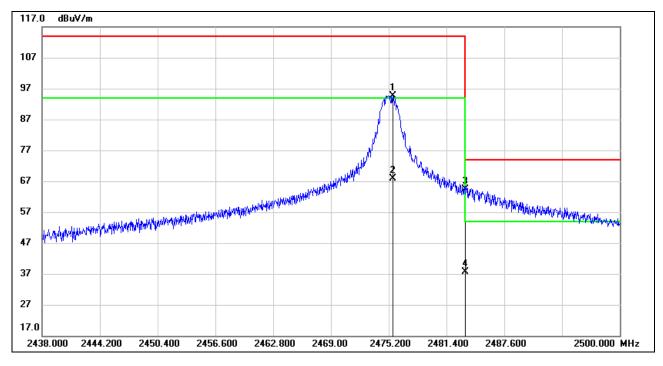
3. Peak: Peak detector.

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

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







No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	2475.634	60.93	33.68	94.61	114.00	-19.39	peak
2	2475.634	/	/	68.33	94.00	-25.67	AVG
3	2483.500	30.63	33.71	64.34	74.00	-9.66	peak
4	2483.500	/	/	38.06	54.00	-15.94	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.

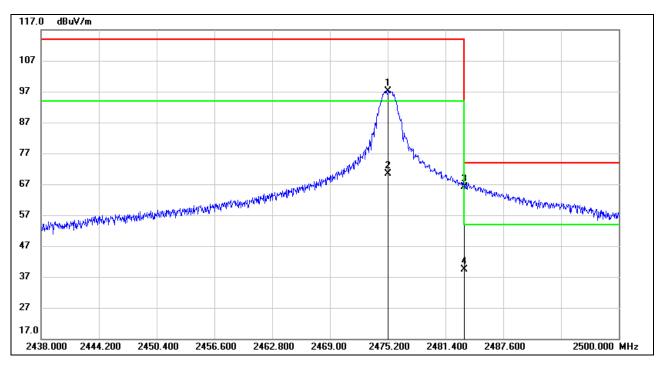
3. Peak: Peak detector.

4. AVG Result=Peak Result + Duty 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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	2475.262	63.43	33.68	97.11	114.00	-16.89	peak
2	2475.262	/	/	70.83	94.00	-23.17	AVG
3	2483.500	32.39	33.71	66.10	74.00	-7.90	peak
4	2483.500	/	/	39.82	54.00	-14.18	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.

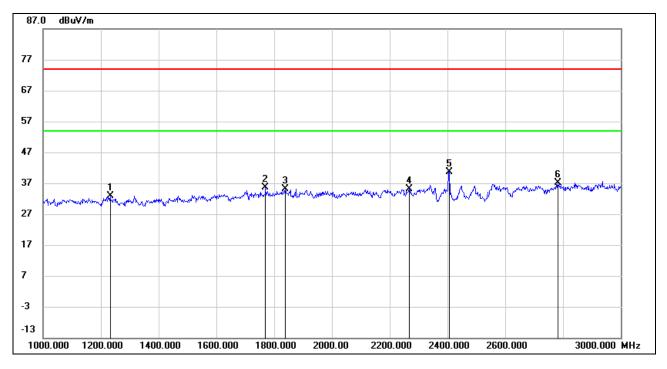
4. AVG Result=Peak Result + Duty Correction Factor.

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)

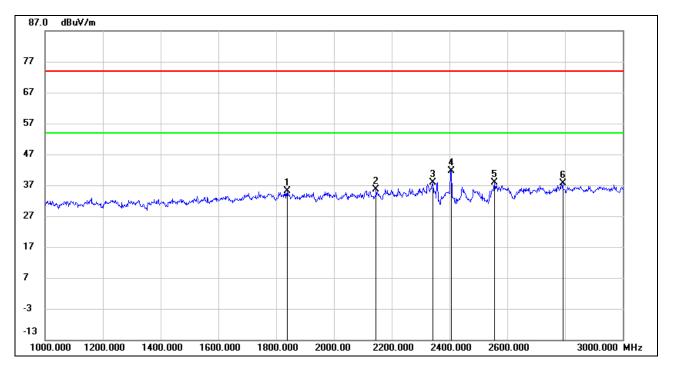


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	1233.000	45.86	-12.95	32.91	74.00	-41.09	peak
2	1770.000	45.82	-10.27	35.55	74.00	-38.45	peak
3	1838.000	45.24	-10.08	35.16	74.00	-38.84	peak
4	2269.000	43.95	-8.83	35.12	74.00	-38.88	peak
5	2406.000	49.09	-8.39	40.70	74.00	-33.30	peak
6	2782.000	43.70	-6.68	37.02	74.00	-36.98	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)

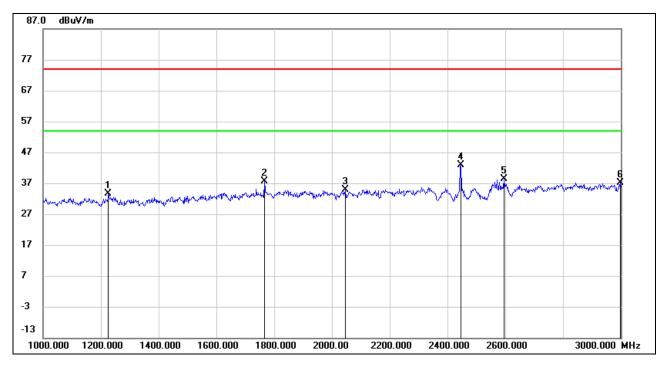


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	1839.000	45.19	-10.08	35.11	74.00	-38.89	peak
2	2146.000	45.07	-9.36	35.71	74.00	-38.29	peak
3	2342.000	46.58	-8.58	38.00	74.00	-36.00	peak
4	2406.000	50.11	-8.39	41.72	74.00	-32.28	peak
5	2557.000	46.02	-8.02	38.00	74.00	-36.00	peak
6	2793.000	44.11	-6.60	37.51	74.00	-36.49	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)

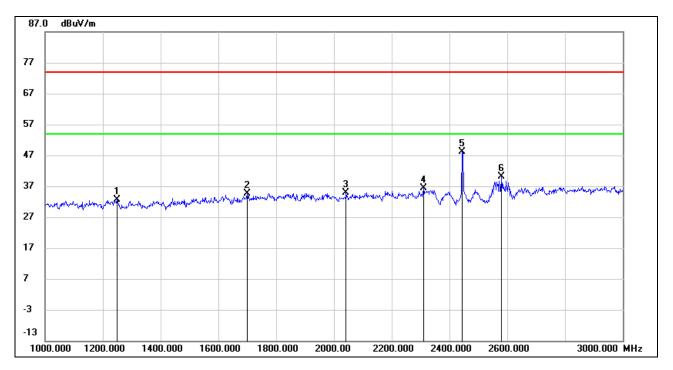


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	1226.000	46.54	-12.95	33.59	74.00	-40.41	peak
2	1767.000	47.94	-10.30	37.64	74.00	-36.36	peak
3	2046.000	44.93	-9.93	35.00	74.00	-39.00	peak
4	2446.000	51.16	-8.32	42.84	74.00	-31.16	peak
5	2596.000	46.31	-7.88	38.43	74.00	-35.57	peak
6	2998.000	42.66	-5.60	37.06	74.00	-36.94	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)

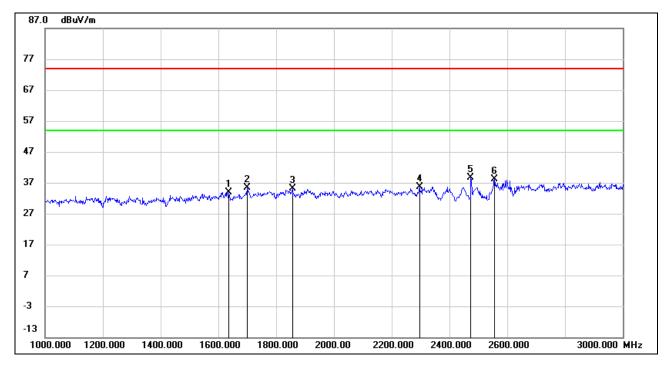


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	1248.000	45.43	-12.92	32.51	74.00	-41.49	peak
2	1701.000	45.37	-10.80	34.57	74.00	-39.43	peak
3	2043.000	44.72	-9.94	34.78	74.00	-39.22	peak
4	2310.000	45.04	-8.69	36.35	74.00	-37.65	peak
5	2445.000	56.53	-8.31	48.22	74.00	-25.78	peak
6	2580.000	48.16	-7.93	40.23	74.00	-33.77	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)

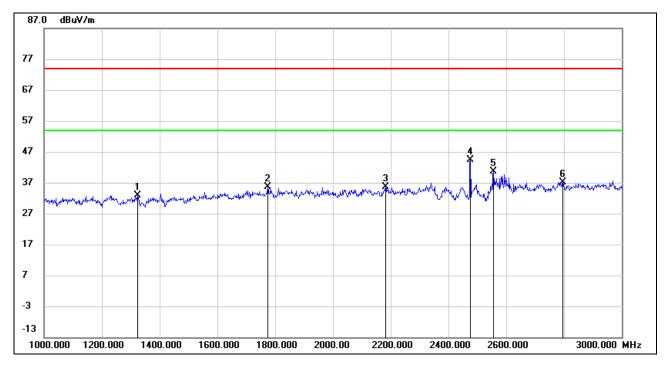


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	1636.000	45.10	-11.28	33.82	74.00	-40.18	peak
2	1700.000	46.17	-10.80	35.37	74.00	-38.63	peak
3	1856.000	45.16	-10.09	35.07	74.00	-38.93	peak
4	2297.000	44.48	-8.73	35.75	74.00	-38.25	peak
5	2475.000	46.98	-8.26	38.72	74.00	-35.28	peak
6	2556.000	46.20	-8.03	38.17	74.00	-35.83	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)



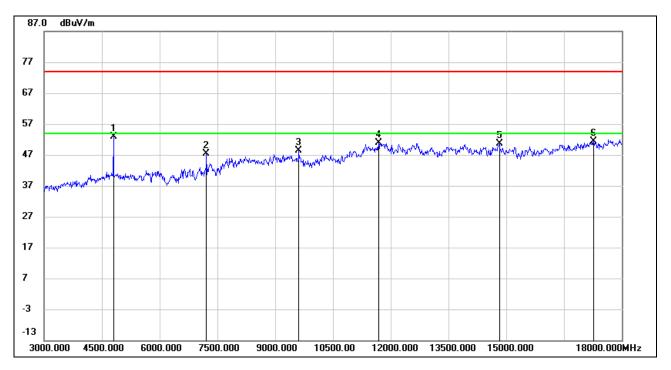
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	1325.000	45.76	-12.82	32.94	74.00	-41.06	peak
2	1774.000	45.76	-10.24	35.52	74.00	-38.48	peak
3	2183.000	44.76	-9.14	35.62	74.00	-38.38	peak
4	2476.000	52.59	-8.26	44.33	74.00	-29.67	peak
5	2556.000	48.73	-8.03	40.70	74.00	-33.30	peak
6	2797.000	43.82	-6.57	37.25	74.00	-36.75	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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	4807.500	52.33	0.60	52.93	74.00	-21.07	peak
2	7215.000	40.34	7.03	47.37	74.00	-26.63	peak
3	9622.500	37.94	10.41	48.35	74.00	-25.65	peak
4	11692.500	35.88	15.02	50.90	74.00	-23.10	peak
5	14820.000	33.91	16.81	50.72	74.00	-23.28	peak
6	17265.000	30.34	20.94	51.28	74.00	-22.72	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.

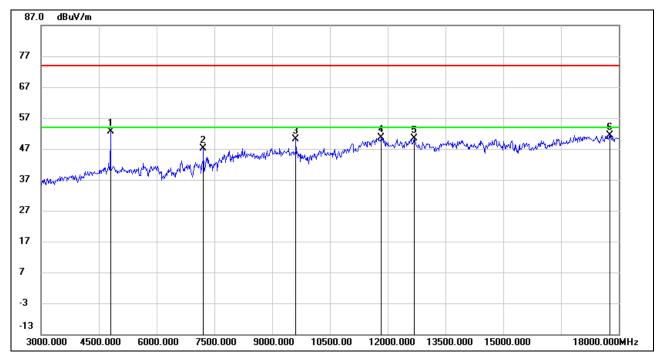
5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.

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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	4807.500	52.04	0.60	52.64	74.00	-21.36	peak
2	7215.000	40.06	7.03	47.09	74.00	-26.91	peak
3	9622.500	39.79	10.41	50.20	74.00	-23.80	peak
4	11842.500	35.10	15.55	50.65	74.00	-23.35	peak
5	12690.000	34.89	15.45	50.34	74.00	-23.66	peak
6	17760.000	28.99	22.41	51.40	74.00	-22.60	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.

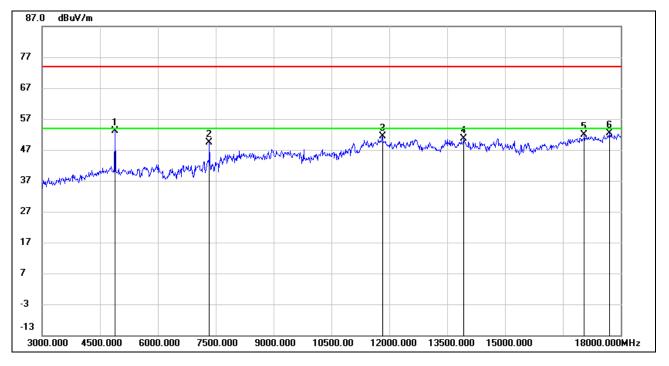
3. Peak: Peak detector.

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)



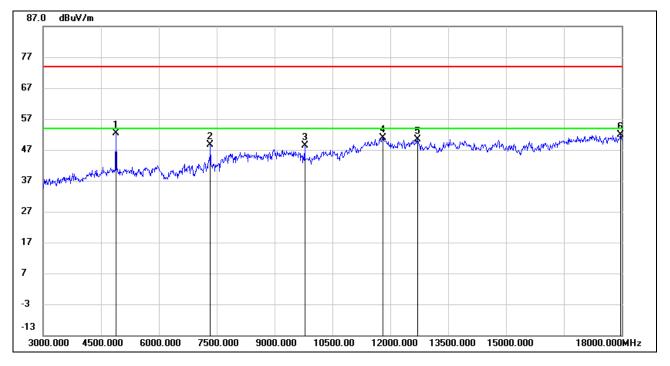
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	4890.000	52.50	0.73	53.23	74.00	-20.77	peak
2	7335.000	41.99	7.49	49.48	74.00	-24.52	peak
3	11827.500	35.73	15.57	51.30	74.00	-22.70	peak
4	13942.500	33.86	16.89	50.75	74.00	-23.25	peak
5	17062.500	31.45	20.48	51.93	74.00	-22.07	peak
6	17707.500	30.47	21.99	52.46	74.00	-21.54	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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	4890.000	51.67	0.73	52.40	74.00	-21.60	peak
2	7335.000	41.21	7.49	48.70	74.00	-25.30	peak
3	9780.000	38.46	10.01	48.47	74.00	-25.53	peak
4	11812.500	35.28	15.59	50.87	74.00	-23.13	peak
5	12705.000	34.96	15.48	50.44	74.00	-23.56	peak
6	17977.500	29.19	22.68	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.

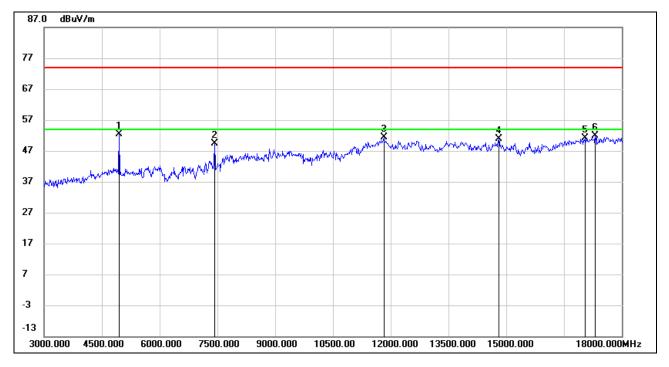
3. Peak: Peak detector.

4. 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 (HIGH CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	4950.000	51.59	0.82	52.41	74.00	-21.59	peak
2	7425.000	41.69	7.70	49.39	74.00	-24.61	peak
3	11820.000	35.76	15.58	51.34	74.00	-22.66	peak
4	14805.000	33.97	16.80	50.77	74.00	-23.23	peak
5	17055.000	30.71	20.45	51.16	74.00	-22.84	peak
6	17310.000	31.12	20.88	52.00	74.00	-22.00	peak

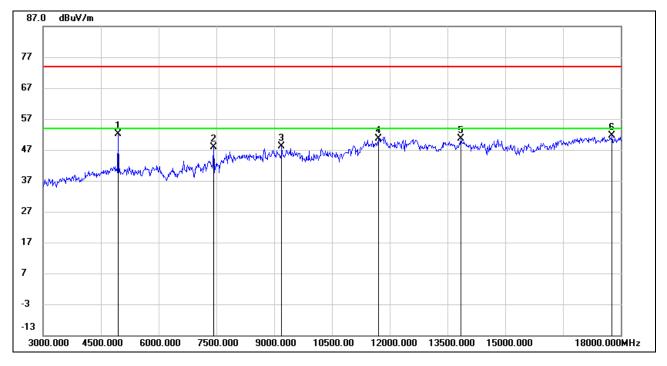
Note: 1. Measurement = Reading Level + Correct Factor.

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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	4950.000	51.29	0.82	52.11	74.00	-21.89	peak
2	7425.000	40.11	7.70	47.81	74.00	-26.19	peak
3	9195.000	38.93	9.32	48.25	74.00	-25.75	peak
4	11715.000	35.47	15.15	50.62	74.00	-23.38	peak
5	13852.500	33.79	16.93	50.72	74.00	-23.28	peak
6	17775.000	29.08	22.53	51.61	74.00	-22.39	peak

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

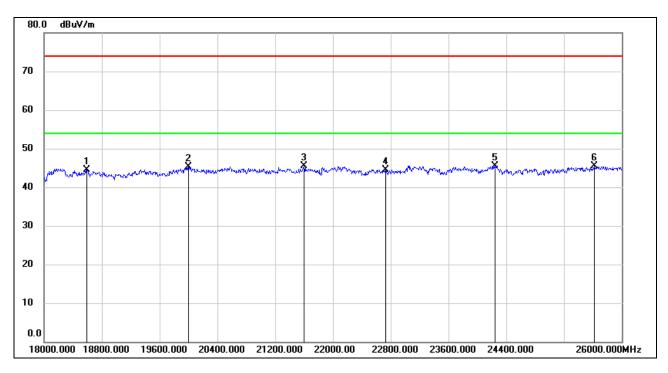
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

- 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)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	18592.000	49.75	-5.31	44.44	74.00	-29.56	peak
2	20000.000	50.81	-5.45	45.36	74.00	-28.64	peak
3	21600.000	50.02	-4.54	45.48	74.00	-28.52	peak
4	22728.000	48.27	-3.71	44.56	74.00	-29.44	peak
5	24248.000	48.32	-2.83	45.49	74.00	-28.51	peak
6	25616.000	46.68	-1.24	45.44	74.00	-28.56	peak

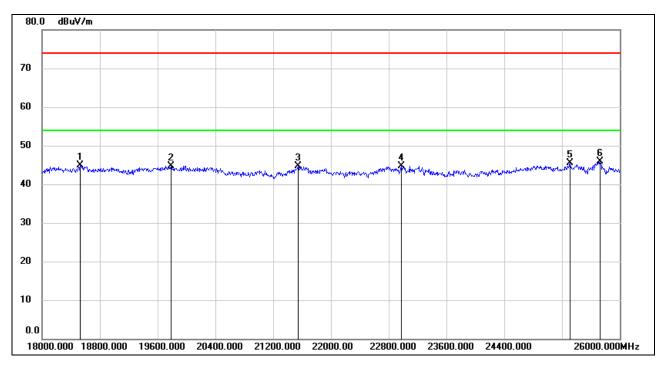
Note: 1. Measurement = Reading Level + Correct Factor.

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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	18528.000	50.11	-5.26	44.85	74.00	-29.15	peak
2	19784.000	50.07	-5.28	44.79	74.00	-29.21	peak
3	21544.000	49.26	-4.63	44.63	74.00	-29.37	peak
4	22976.000	48.26	-3.46	44.80	74.00	-29.20	peak
5	25312.000	47.20	-1.70	45.50	74.00	-28.50	peak
6	25728.000	46.61	-0.72	45.89	74.00	-28.11	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.

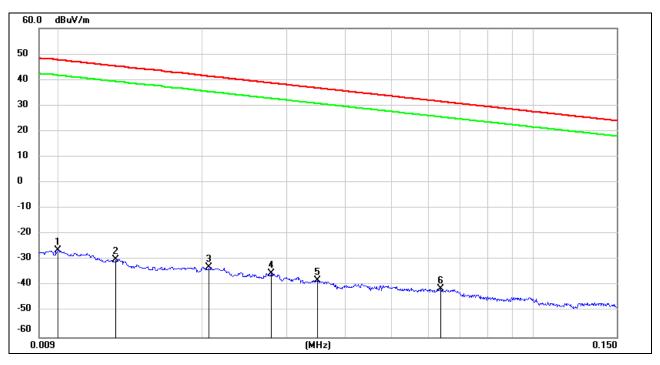
3. Peak: Peak detector.

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	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	0.0100	75.22	-101.40	-26.18	47.60	-73.78	peak
2	0.0131	71.47	-101.38	-29.91	45.25	-75.16	peak
3	0.0206	68.42	-101.35	-32.93	41.32	-74.25	peak
4	0.0279	66.17	-101.38	-35.21	38.69	-73.90	peak
5	0.0349	63.53	-101.41	-37.88	36.75	-74.63	peak
6	0.0636	60.31	-101.54	-41.23	31.53	-72.76	peak

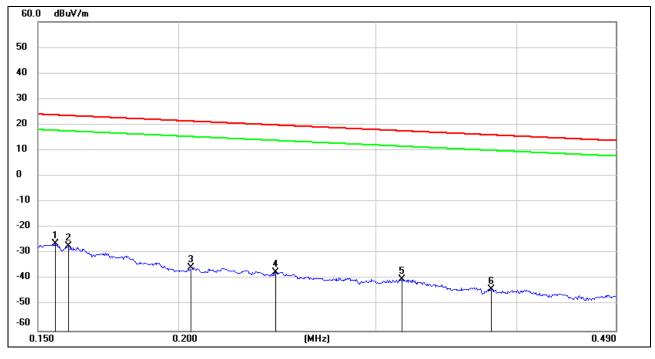
Note: 1. Measurement = Reading Level + Correct Factor.

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.



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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	0.1554	75.27	-101.65	-26.38	23.77	-50.15	peak
2	0.1595	74.36	-101.65	-27.29	23.55	-50.84	peak
3	0.2053	66.29	-101.73	-35.44	21.35	-56.79	peak
4	0.2442	64.53	-101.79	-37.26	19.85	-57.11	peak
5	0.3163	61.70	-101.87	-40.17	17.60	-57.77	peak
6	0.3800	58.02	-101.94	-43.92	16.01	-59.93	peak

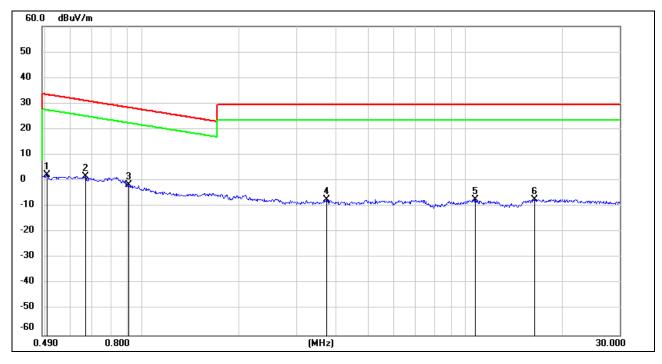
Note: 1. Measurement = Reading Level + Correct Factor.

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.



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



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	0.5080	64.35	-62.07	2.28	33.49	-31.21	peak
2	0.6671	63.75	-62.10	1.65	31.12	-29.47	peak
3	0.9082	60.65	-62.21	-1.56	28.44	-30.00	peak
4	3.7100	54.20	-61.41	-7.21	29.54	-36.75	peak
5	10.7299	53.48	-60.83	-7.35	29.54	-36.89	peak
6	16.3959	53.67	-60.96	-7.29	29.54	-36.83	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.

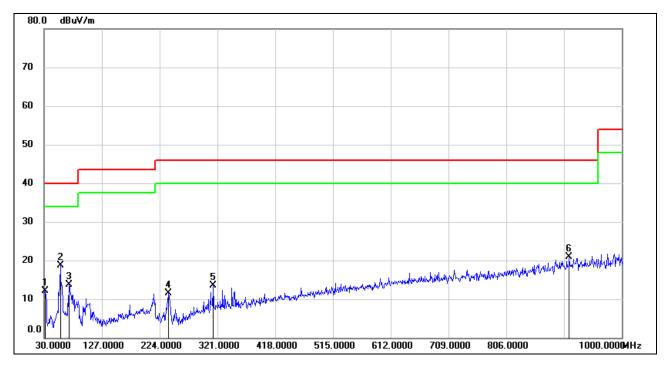
3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	31.9400	31.27	-19.13	12.14	40.00	-27.86	QP
2	57.1600	39.38	-20.58	18.80	40.00	-21.20	QP
3	71.7100	34.37	-20.70	13.67	40.00	-26.33	QP
4	238.5500	30.59	-19.10	11.49	46.00	-34.51	QP
5	314.2100	28.56	-14.96	13.60	46.00	-32.40	QP
6	911.7300	25.77	-4.93	20.84	46.00	-25.16	QP

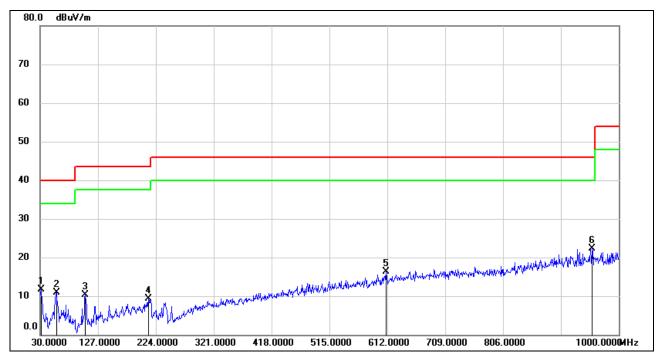
Note: 1. Result Level = Read Level + Correct Factor.

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)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	31.9400	30.90	-19.13	11.77	40.00	-28.23	QP
2	57.1600	31.50	-20.58	10.92	40.00	-29.08	QP
3	105.6600	31.10	-20.70	10.40	43.50	-33.10	QP
4	211.3900	26.73	-17.40	9.33	43.50	-34.17	QP
5	610.0600	25.67	-9.40	16.27	46.00	-29.73	QP
6	955.3800	26.68	-4.47	22.21	46.00	-23.79	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**