

## FCC PART 15B, CLASS B TEST REPORT

For

### Shenzhen HighGreat Innovation Technology Development Co., Ltd.

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Province, China

**FCC ID: 2ALYRHG-Z01B**

<b>Report Type:</b> Original Report	<b>Product Type:</b> HESPER
<b>Report Number:</b> RSZ180102003-00A	
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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

The *Shenzhen HighGreat Innovation Technology Development Co., Ltd.*'s product, model number: *HG-Z01B(FCC ID:2ALYRHG-Z01B)* in this report was a *HESPER*, which was measured approximately: 315 mm (L) × 288 mm (W) × 58 mm (H), rated with input voltage: DC 7.6 V from battery or DC 12V from adapter. The highest operating frequency is 5825MHz.

Adapter Information:

Model: SOY-1200250JP

Input: AC 100-240V, 50/60Hz, 0.9A

Output: DC 12V, 2.5A

*\*All measurement and test data in this report was gathered from production sample serial number: 1702933. (Assigned by BACL, shenzhen).The EUT supplied by the applicant was received on 2018-01-02.*

### Objective

This test report is prepared on behalf of *Shenzhen HighGreat Innovation Technology Development Co., Ltd.* in accordance with Part 2-Subpart J, Part 15-Subparts A, B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine the compliance of the EUT with FCC Part 15 B.

### Related Submittal(s)/Grant(s)

FCC Part 15.407 DSS Submittal with the plane control unit of a system with 2ALYRHG-Z01B.  
Submittal with the remote control unit of a system with FCC ID: 2ALYRHG-C02B.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

### Measurement Uncertainty

Parameter		uncertainty
Conducted Emissions		±1.95dB
Emissions, radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB

### **Test Facility**

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 342867, the FCC Designation No. : CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a manufacturer testing fashion.

EUT operation mode: Playing

### EUT Exercise Software

No exercise software was used.

### Special Accessories

No special accessory.

### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

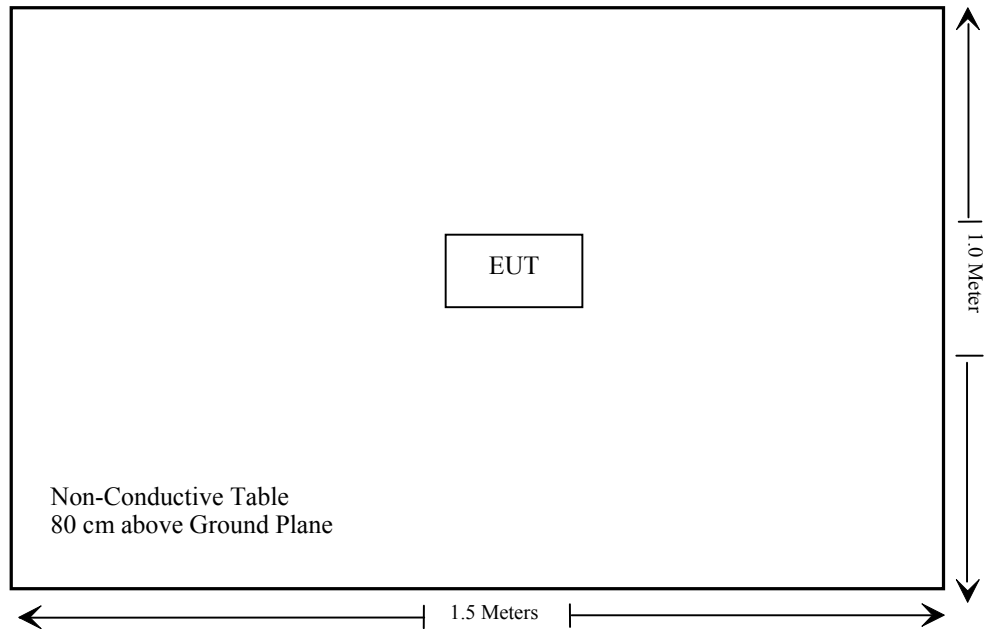
Manufacturer	Description	Model	Serial Number
/	/	/	/

### External I/O Cable

Cable Description	Length (m)	From Port	To
/	/	/	/

## Block Diagram of Test Setup

EUT operation mode: Playing



**SUMMARY OF TEST RESULTS**

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Not Applicable
§15.109	Radiated Spurious Emissions	Compliance

**Note:**

Not Applicable: The EUT is powered by battery and the battery can be removed to a charger while it's charging

**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Radiated Emission Test</b>					
A.H.System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2017-04-24	2018-04-24
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2017-12-17	2020-12-16
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2017-05-21	2018-05-21
HP	Amplifier	HP8447E	1937A01046	2017-11-19	2018-05-21
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2017-12-07	2018-12-07
Rohde & Schwarz	Auto test Software	EMC32	V9.10	NCR	NCR
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2017-12-07	2018-12-07
Ducommun technologies	RF Cable	104PEA	218124002	2017-11-19	2018-05-21
Ducommun technologies	RF Cable	RG-214	1	2017-11-19	2018-05-21
Ducommun technologies	RF Cable	RG-214	2	2017-11-22	2018-05-22
Agilent	Spectrum Analyzer	8564E	3943A01781	2018-01-04	2019-01-04
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-04	2017-12-29	2020-12-28
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-04	2017-12-29	2020-12-28

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).



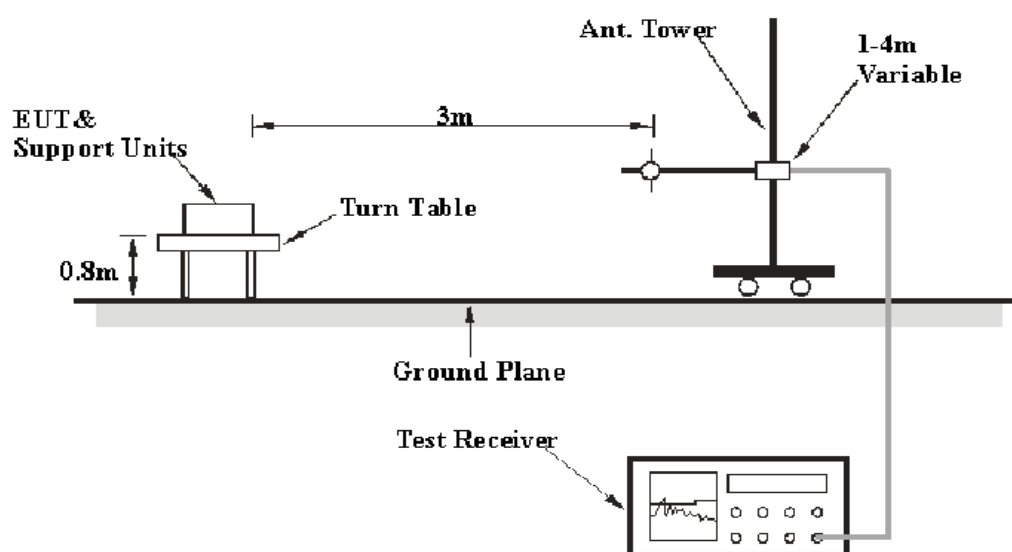
## FCC §15.109 - RADIATED SPURIOUS EMISSIONS

### Applicable Standard

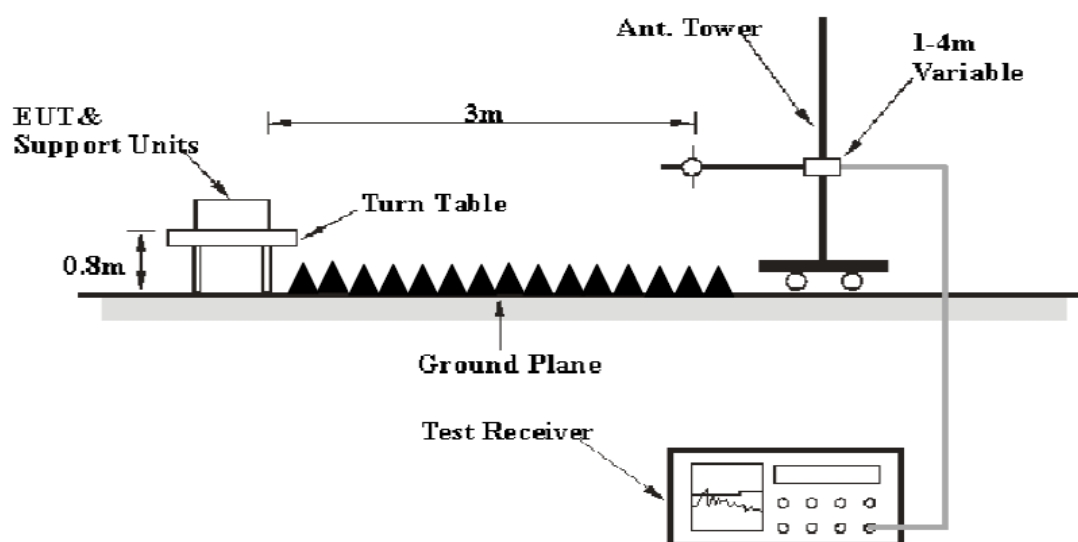
FCC §15.109

### EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

### EMI Test Receiver Setup

The system was investigated from 30 MHz to 30 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

### Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

### Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

### Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109 Class B,

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL,  $U_{(Lm)}$  is less than  $U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

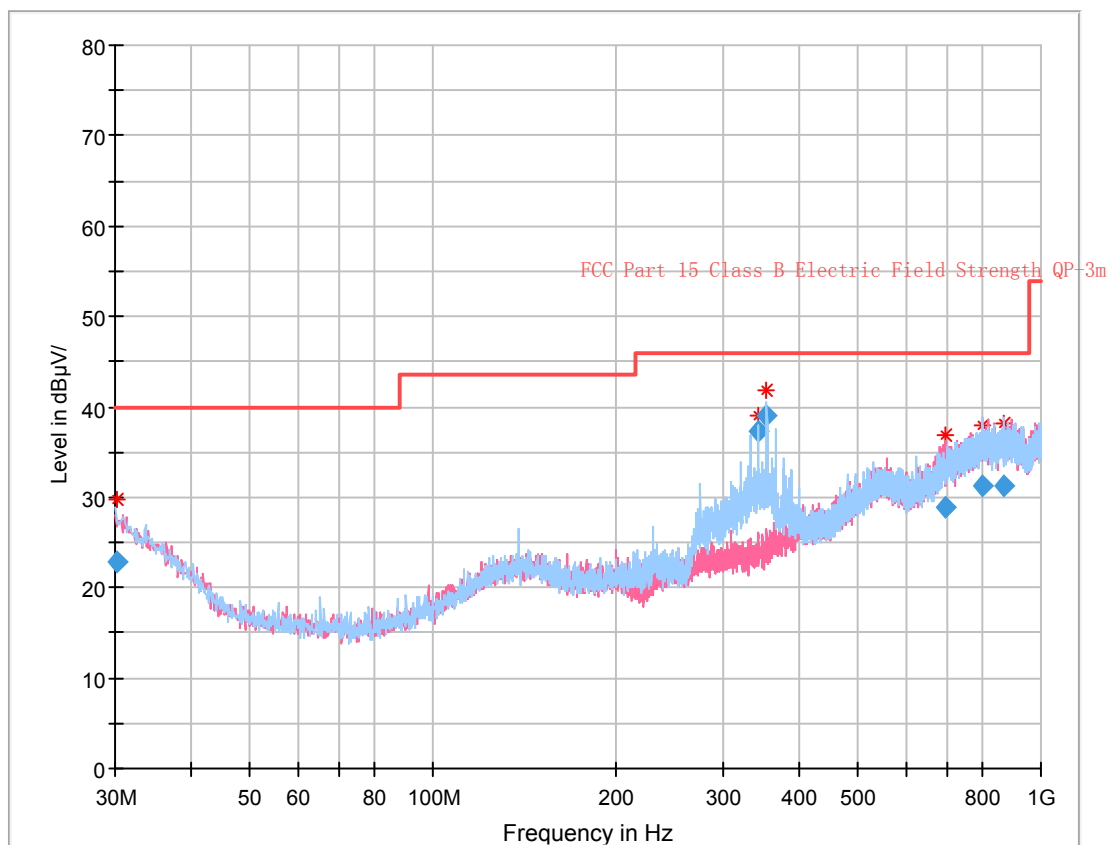
**Test Data****Environmental Conditions**

<b>Temperature:</b>	23~25 °C
<b>Relative Humidity:</b>	50~56 %
<b>ATM Pressure:</b>	100.0~101.0 kPa

*The testing was performed by Nancy Wang from 2018-01-26 to 2018-04-13.*

EUT Operation Mode: Playing

30 MHz~1 GHz:



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
30.146062	22.85	400.0	H	305.0	0.2	40.00	17.15
343.141375	37.40	105.0	H	88.0	-2.7	46.00	8.60
354.353000	38.99	108.0	H	241.0	-2.4	46.00	7.01
698.126500	28.86	157.0	V	0.0	6.6	46.00	17.14
802.877750	31.35	234.0	H	190.0	9.0	46.00	14.65
872.000250	31.21	157.0	H	95.0	9.3	46.00	14.79

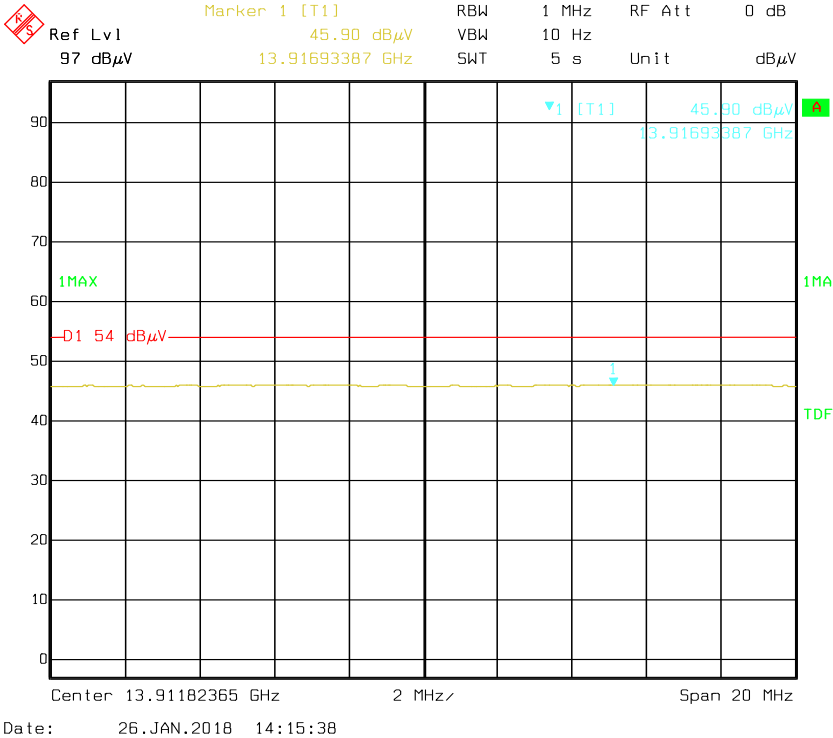
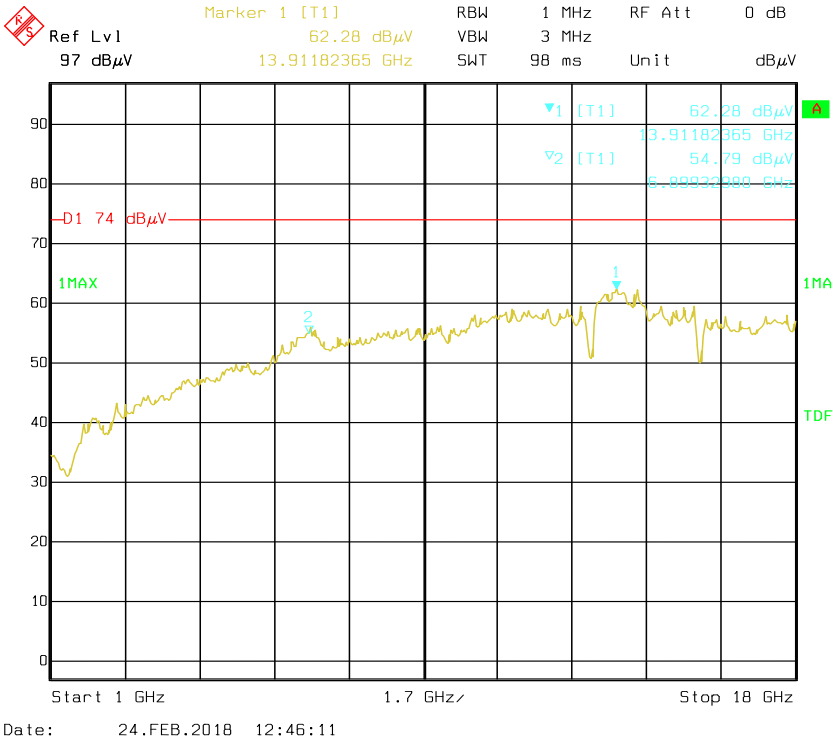
**1 GHz – 30 GHz:**

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBuV/m)	FCC Part 15B	
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
3963.92	43.07	PK	21	2.1	H	3.06	46.13	74	27.87
3963.92	28.96	Ave.	21	2.1	H	3.06	32.02	54	21.98
3963.92	45.04	PK	40	1.9	V	3.06	48.10	74	25.90
3963.92	29.62	Ave.	40	1.9	V	3.06	32.68	54	21.32
2769.35	43.87	PK	131	2.0	H	-0.57	43.30	74	30.70
2769.35	28.64	Ave.	131	2.0	H	-0.57	28.07	54	25.93
2769.35	42.56	PK	50	1.5	V	-0.57	41.99	74	32.01
2769.35	28.43	Ave.	50	1.5	V	-0.57	27.86	54	26.14

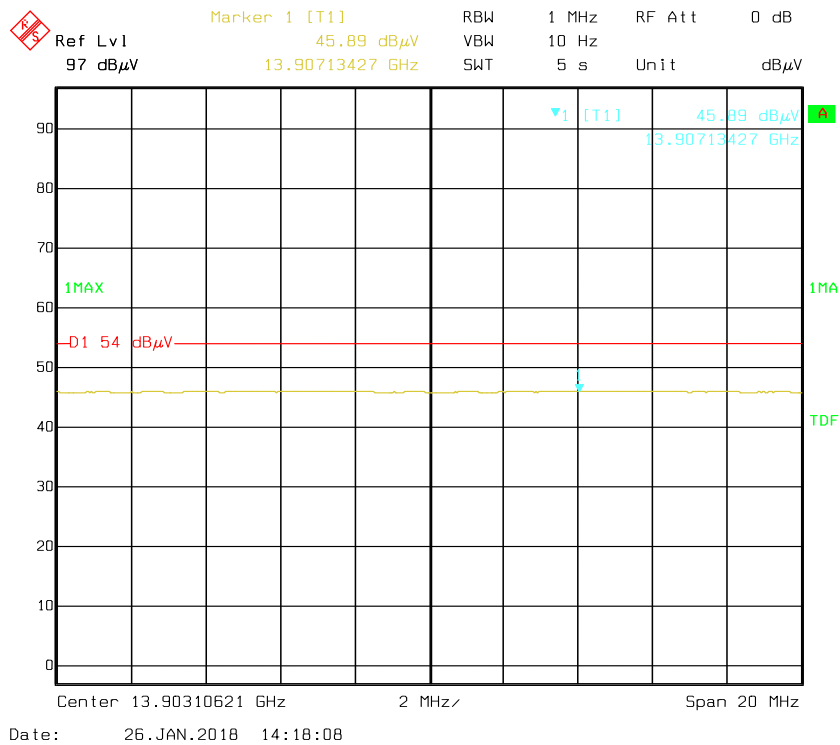
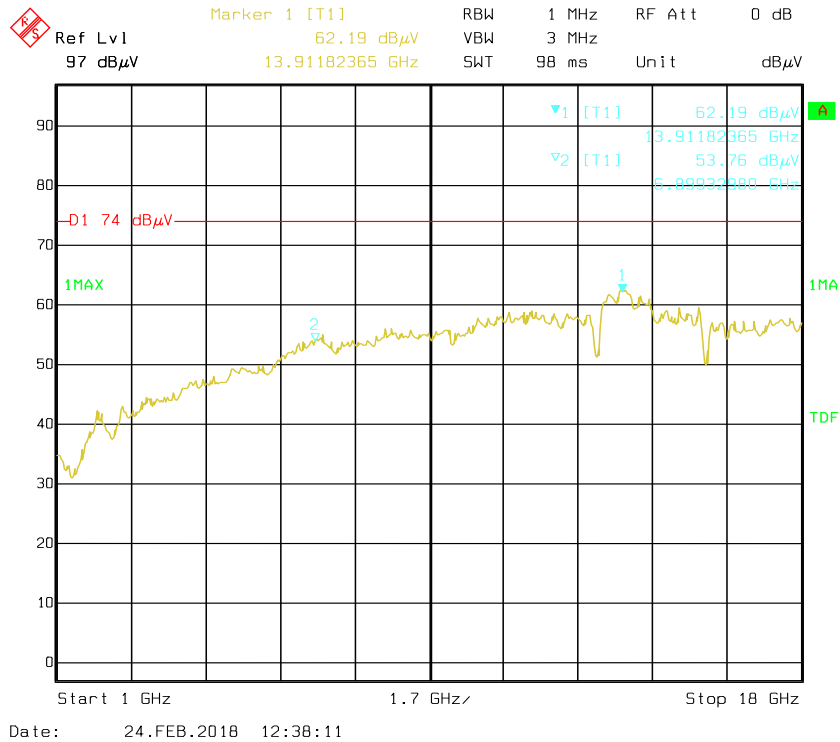
**Note:**

- 1) Correction Factor=Antenna factor (RX) + cable loss – amplifier factor
- 2) Corrected Amplitude = Correction Factor + Reading
- 3) Margin = Limit - Corrected Amplitude

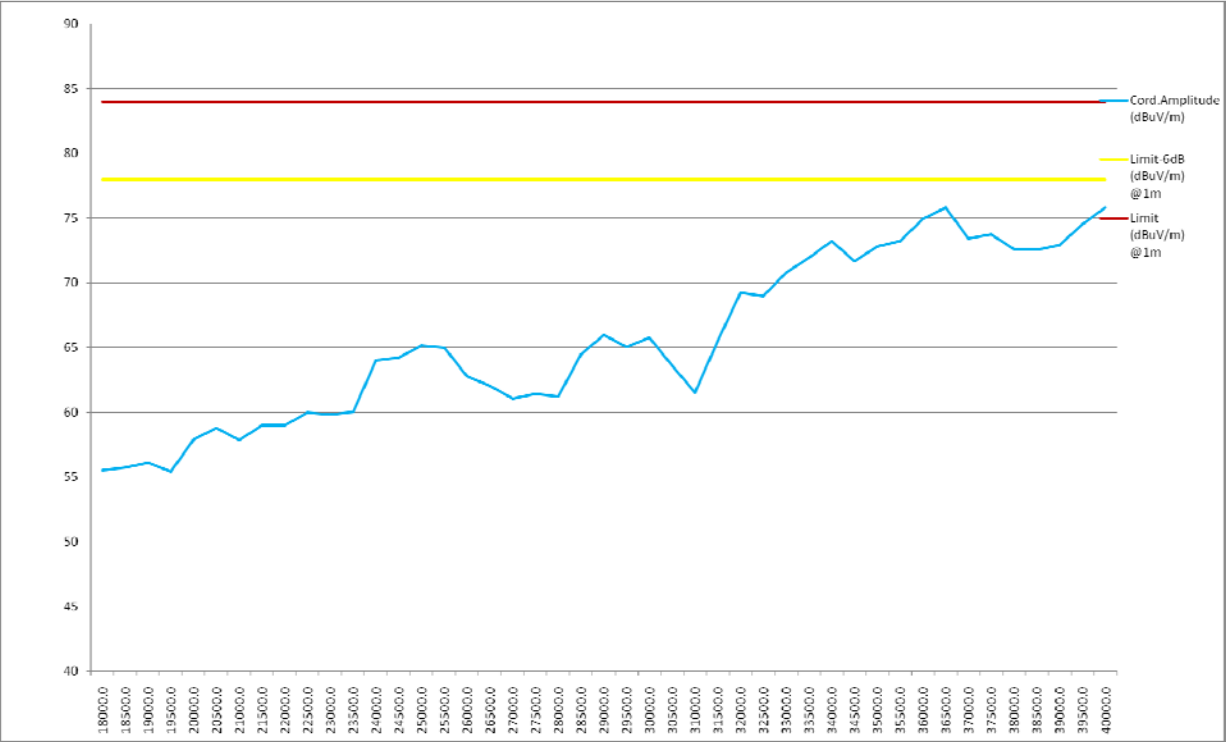
Pre-scan for 1~18 GHz, H



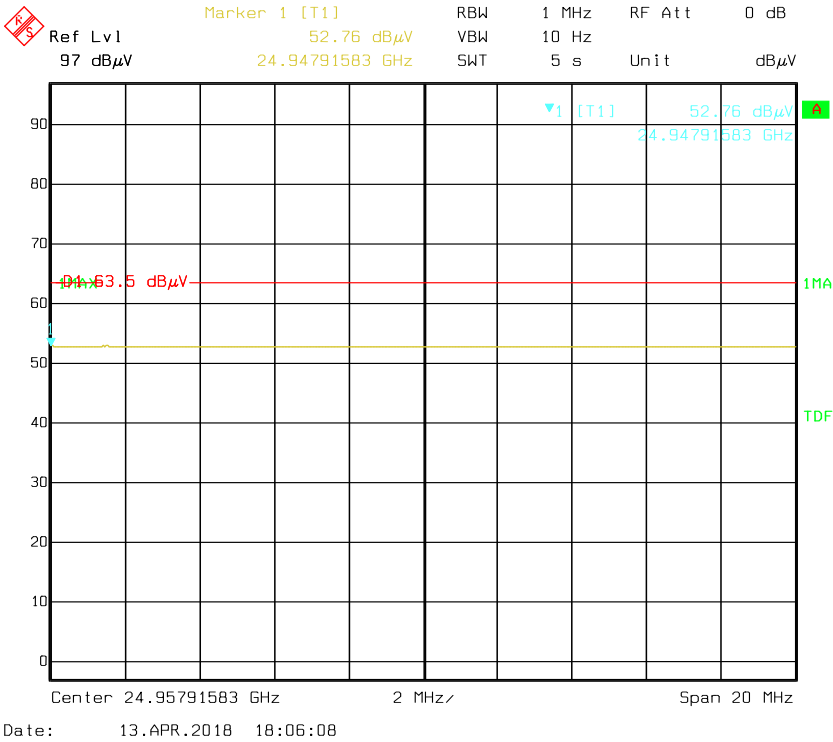
## Pre-scan for 1~18 GHz, V



Pre-scan for Above 18 GHz

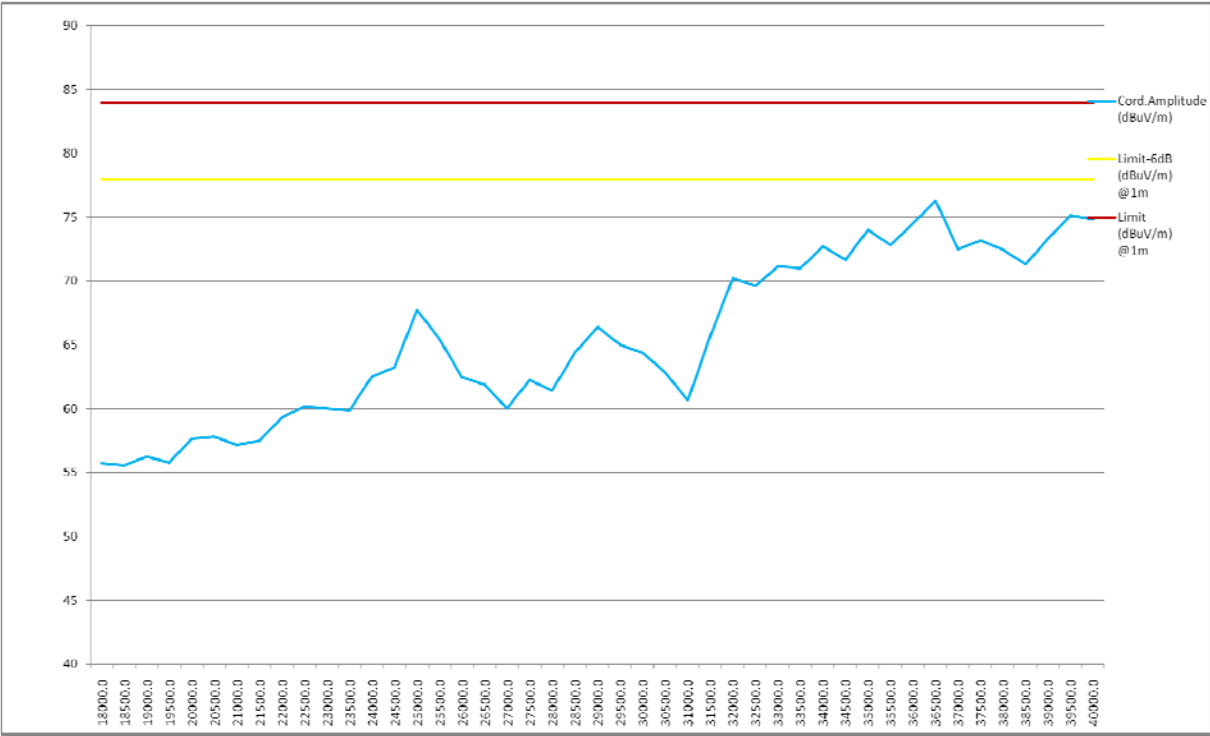


Scan average value at 1m

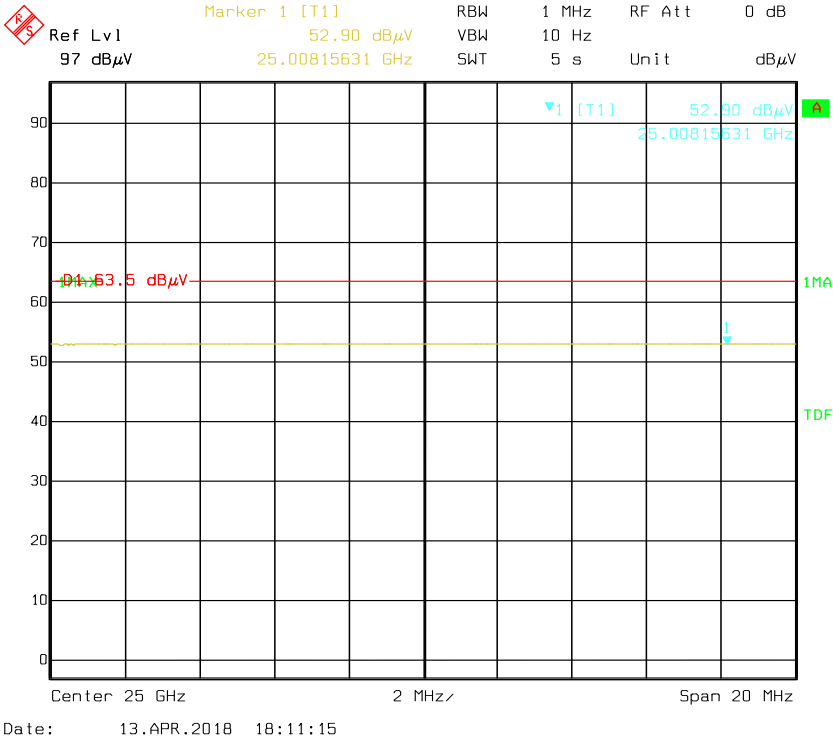




Pre-scan for Above 18 GHz V



Scan average value at 1m



\*\*\*\*\* END OF REPORT \*\*\*\*\*