



TESTING LABORATORY
CERTIFICATE #4820.01



FCC PART 15 B TEST REPORT

For

SZ DJI TECHNOLOGY CO., LTD

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Nanshan, Shenzhen, Guangdong, China

FCC ID: SS3-RMS11902

Report Type:	Product Type:
Original Report	RoboMaster S1
Report Number:	RDG190215001-00A
Report Date:	2019-03-06
Reviewed By:	Jerry Zhang EMC Manager
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

EUT Name:	RoboMaster S1
EUT Model:	RMS1
Highest Operating Frequency:	5825MHz
Rated Input Voltage:	DC 10.8V from battery
External Dimension:	320mm(L)* 240mm(W)* 270mm(H)
Serial Number:	190215001
EUT Received Date:	2019-02-08

Objective

This test report is prepared on behalf of *SZ DJI TECHNOLOGY CO., LTD* in accordance with Part 2, Subpart J, and Part 15-Subparts A and B of the Federal Communications Commission's rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: SS3-RMS11902.
FCC Part 15E NII submissions with FCC ID: SS3-RMS11902.

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 radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB, 200M~1GHz: 5.92 dB, 1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB, 18G~26.5G: 5.47 dB, 26.5G~40G: 5.63 dB
Temperature	±1 °C
Humidity	±5%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier : CN0022.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in Operating mode, in this mode, the EUT was controlled by remote controller: C4, shooting Video, transmitting the video data to C4 and recording the data to the SD card.

EUT Exercise Software

The software “DJI RoboMaster.app” installed in the phone was used during test.

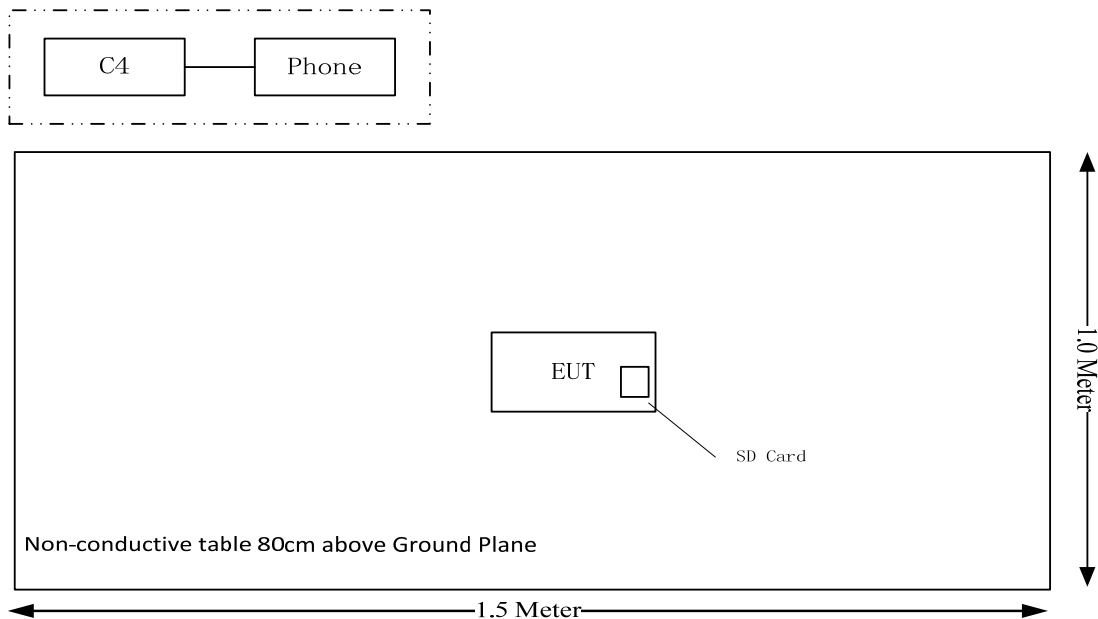
Equipment Modifications

No modification was made to the EUT tested.

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DJI	Remote Controller C4	GD0MA	/
APPLE	Phone	MGAA2CG/A	FK1R96UYG5QT

Configuration of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Not Aplicable*
§15.109	Radiated Emissions	Compliance

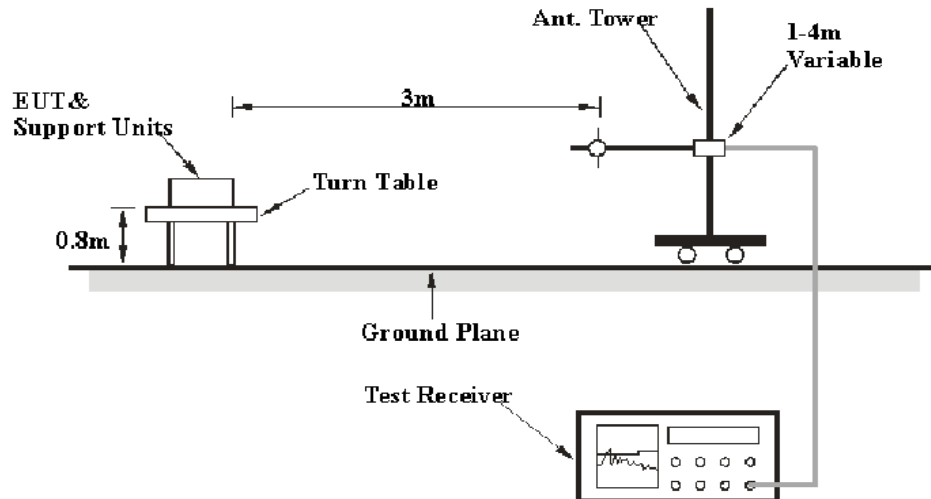
Note:

Not Aplicable*: The EUT was powered by battery.

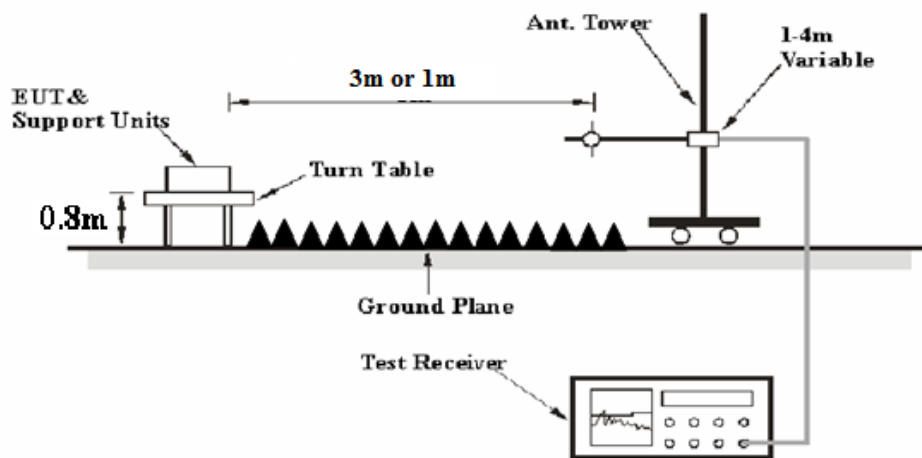
FCC §15.109 - RADIATED SPURIOUS EMISSIONS

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission below 1GHz tests were performed in the 3 meters chamber test site A, above 1GHz tests were performed in the 3 meters chamber test site B, 1GHz-26.5GHz were performed at the 3 m distance and 26.5-40 GHz was performed at 1 m distance, using the setup accordance with the ANSI C63.4-2014. The specification used was with the FCC Part 15 B Class B limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 40 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	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	Reduced video bandwidth	/	AVG

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

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

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

According to C63.4, the above 1G test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1 m

Distance extrapolation factor = $20 \log (\text{specific distance [3m]}/\text{test distance [1m]})$ dB = 9.54 dB

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading+ Corrected

Note:

Corrected = Antenna Factor + Cable Loss - Amplifier Gain

or

Corrected = Antenna Factor + Cable Loss + Distance extrapolation factor - 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:

$$\text{Margin} = \text{Limit} - \text{Result}$$

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2018-12-10	2019-12-10
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2018-05-06	2019-05-06
HP	Amplifier	8447D	2727A05902	2018-09-05	2019-09-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-01-04	2020-01-04
R&S	Spectrum Analyzer	FSP 38	100478	2018-12-10	2019-12-10
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2016-11-18	2019-11-18
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1302	2016-11-18	2019-11-18
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-2.4J2.4J-50	C-0700-02	2018-06-27	2019-06-27
MITEQ	Amplifier	AFS42-00101800-2 5-S-42	2001271	2018-09-05	2019-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2018-06-27	2019-06-27

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

Test Data**Environmental Conditions**

Temperature:	23.5 °C
Relative Humidity:	60 %
ATM Pressure:	100.5 kPa

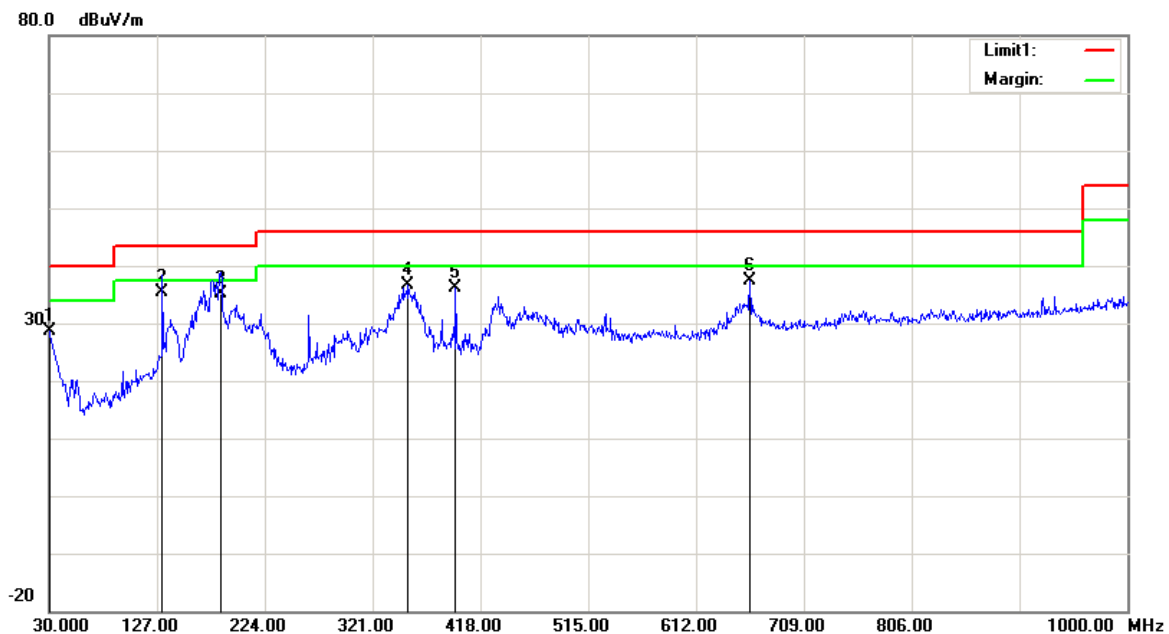
* The testing was performed by Kami Zhou & Tyler Pan on 2019-02-28.

Test Result: Compliance

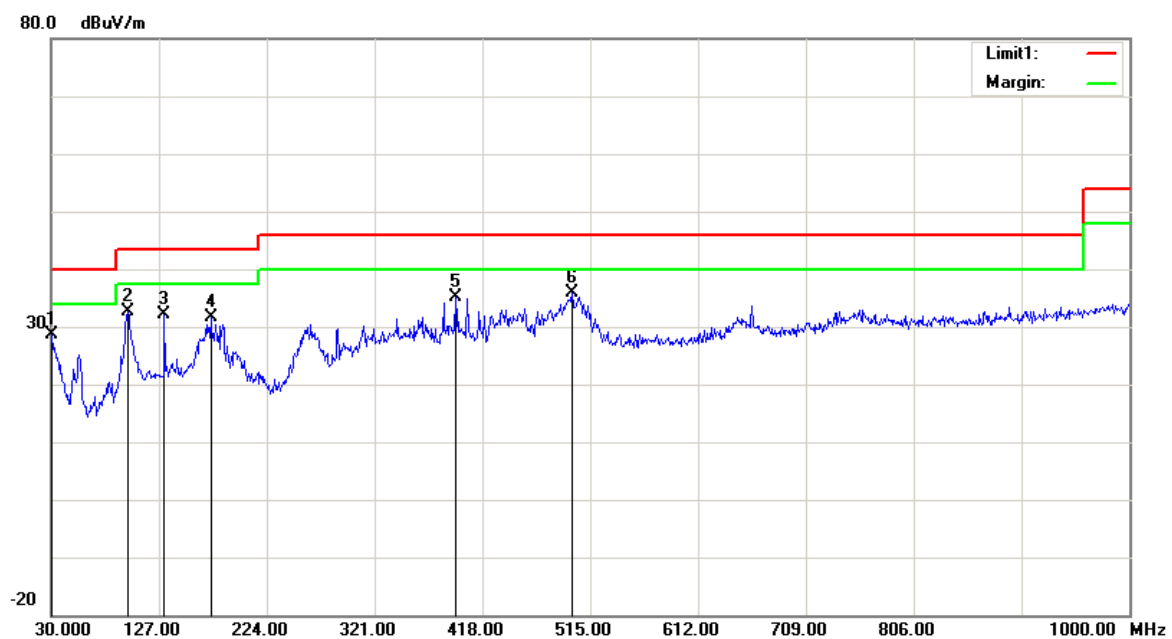
Test Mode: Operating

1) Below 1GHz:

Horizontal



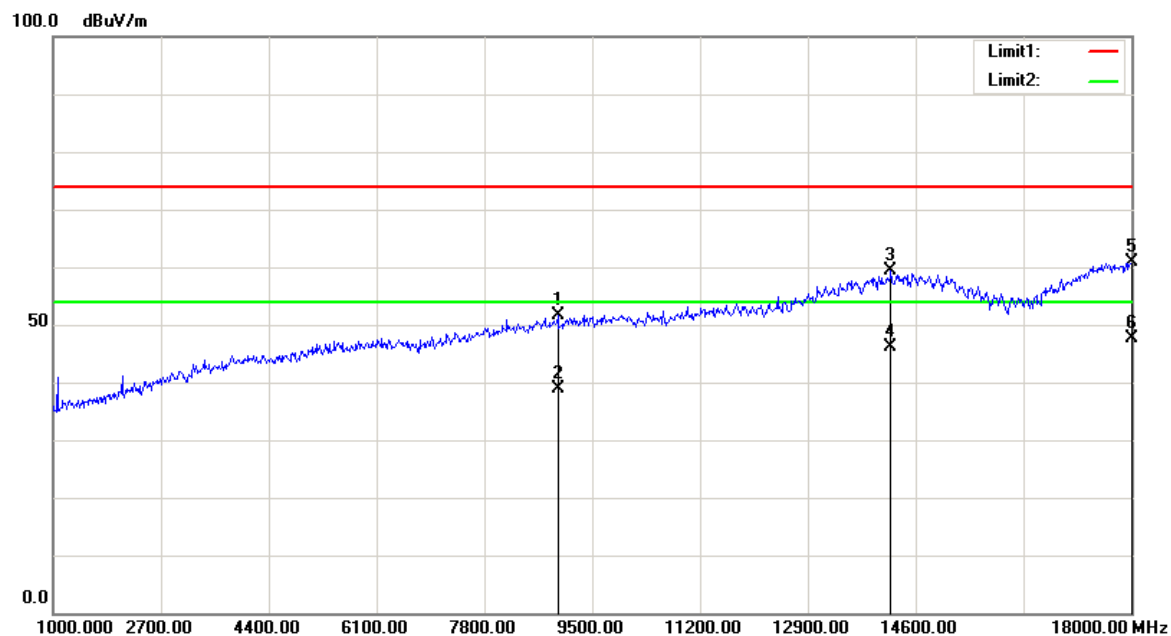
Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.9700	27.83	peak	0.91	28.74	40.00	11.26
131.8500	40.15	QP	-4.89	35.26	43.50	8.24
184.2300	42.60	QP	-7.38	35.22	43.50	8.28
353.0100	39.50	peak	-2.93	36.57	46.00	9.43
395.6900	38.26	peak	-2.07	36.19	46.00	9.81
660.5000	35.35	peak	2.15	37.50	46.00	8.50

Vertical

Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.9700	27.66	peak	0.91	28.57	40.00	11.43
98.8700	41.80	peak	-9.20	32.60	43.50	10.90
131.8500	36.94	peak	-4.89	32.05	43.50	11.45
173.5600	38.47	peak	-6.85	31.62	43.50	11.88
393.7500	37.31	peak	-2.14	35.17	46.00	10.83
498.5100	36.12	peak	-0.31	35.81	46.00	10.19

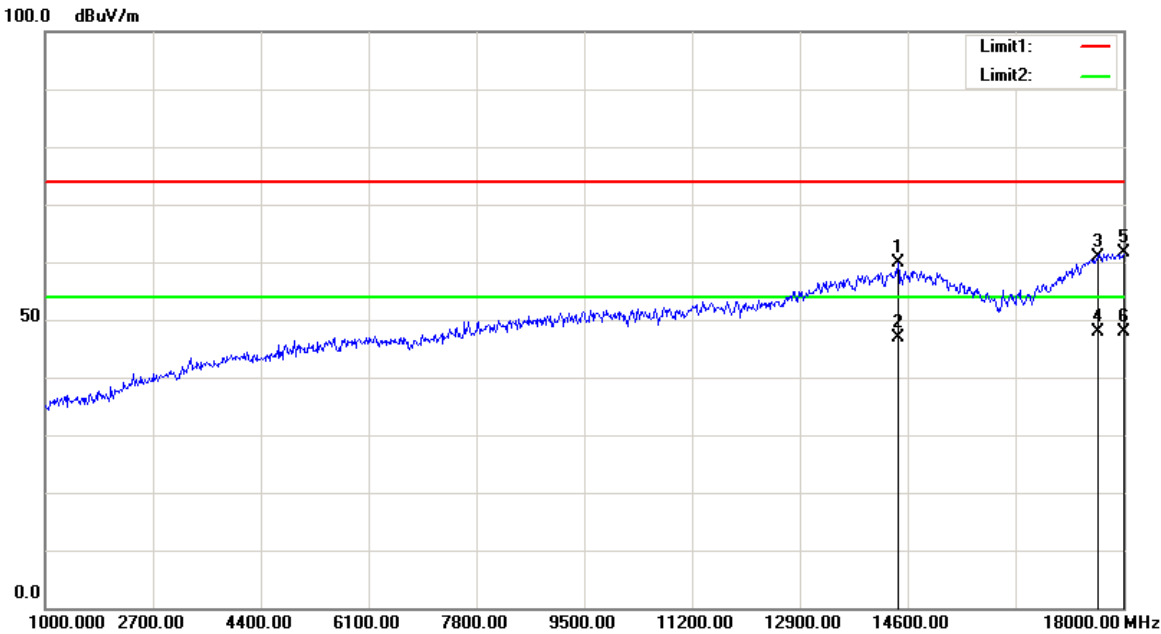
2) Above 1GHz:

Horizontal



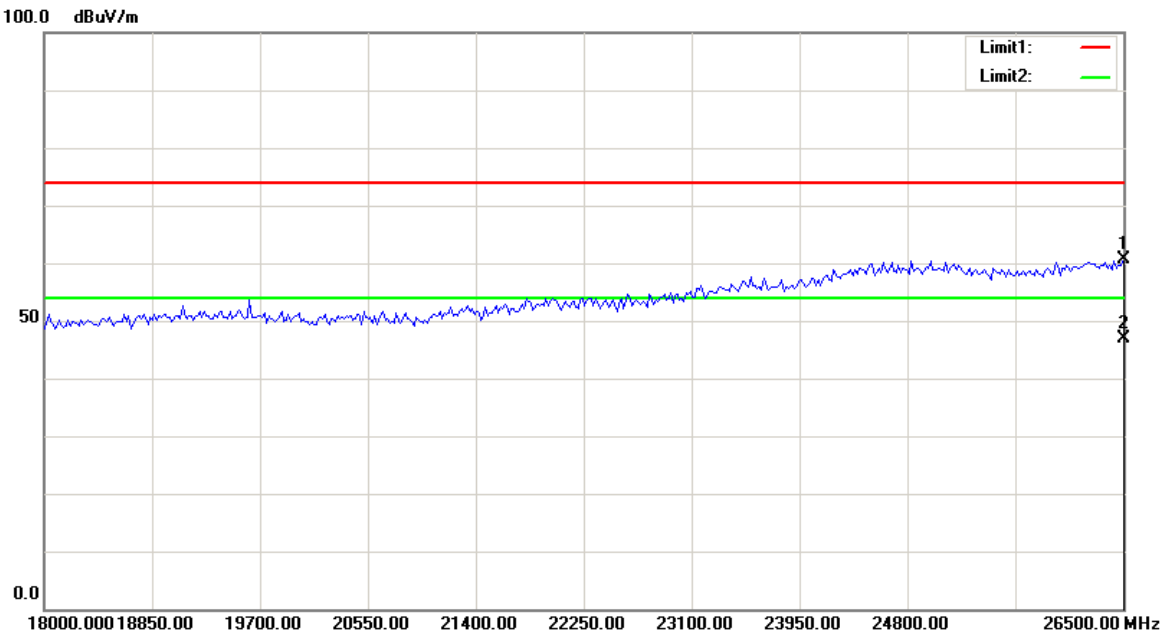
Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
8956.000	45.55	peak	6.18	51.73	74.00	22.27
8956.000	32.72	AVG	6.18	38.90	54.00	15.10
14209.000	49.53	peak	9.74	59.27	74.00	14.73
14209.000	36.27	AVG	9.74	46.01	54.00	7.99
18000.000	43.63	peak	17.15	60.78	74.00	13.22
18000.000	30.57	AVG	17.15	47.72	54.00	6.28

Vertical



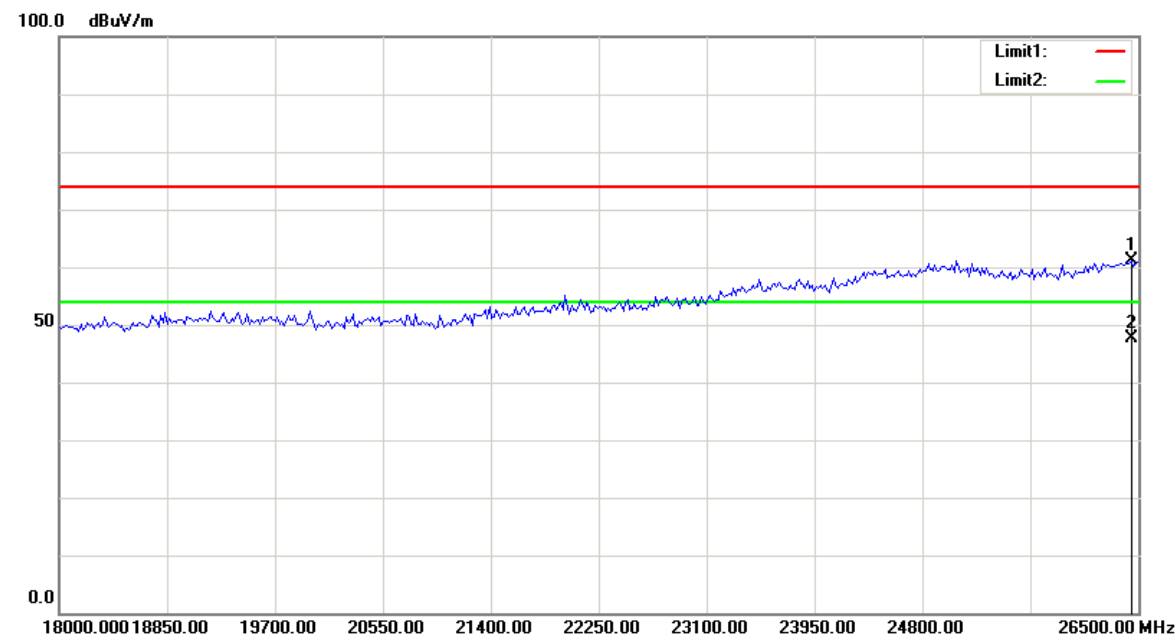
Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
14447.000	49.65	peak	10.21	59.86	74.00	14.14
14447.000	36.58	AVG	10.21	46.79	54.00	7.21
17617.500	46.45	peak	14.39	60.84	74.00	13.16
17617.500	33.42	AVG	14.39	47.81	54.00	6.19
18000.000	44.43	peak	17.15	61.58	74.00	12.42
18000.000	30.75	AVG	17.15	47.90	54.00	6.10

Horizontal



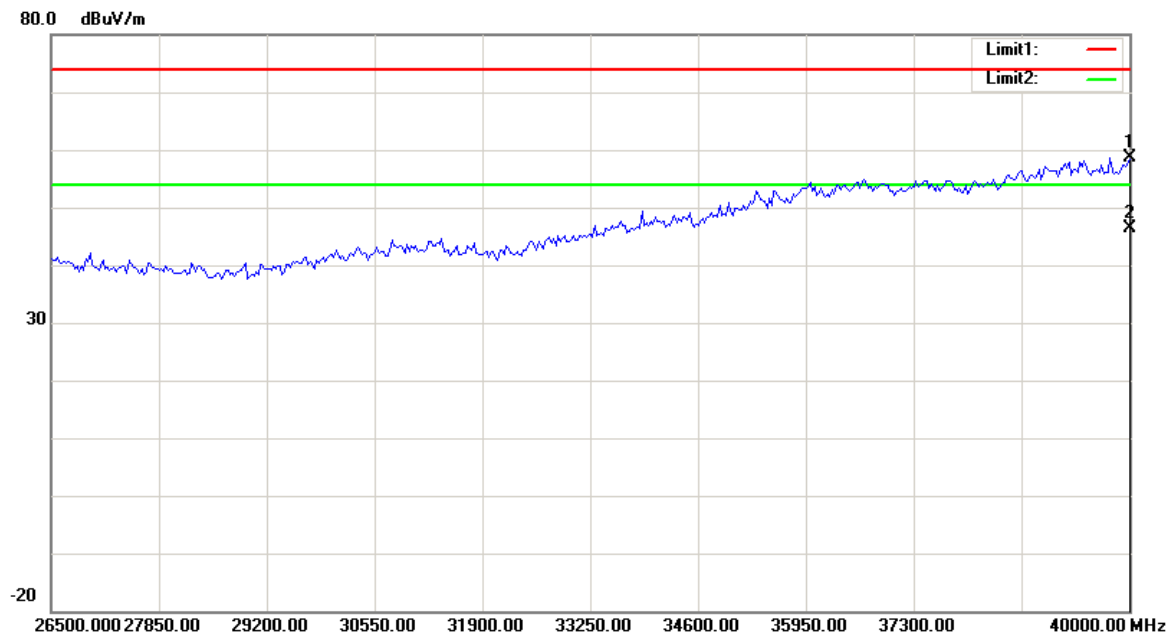
Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
26500.000	38.77	peak	21.84	60.61	74.00	13.39
26500.000	25.14	AVG	21.84	46.98	54.00	7.02

Vertical



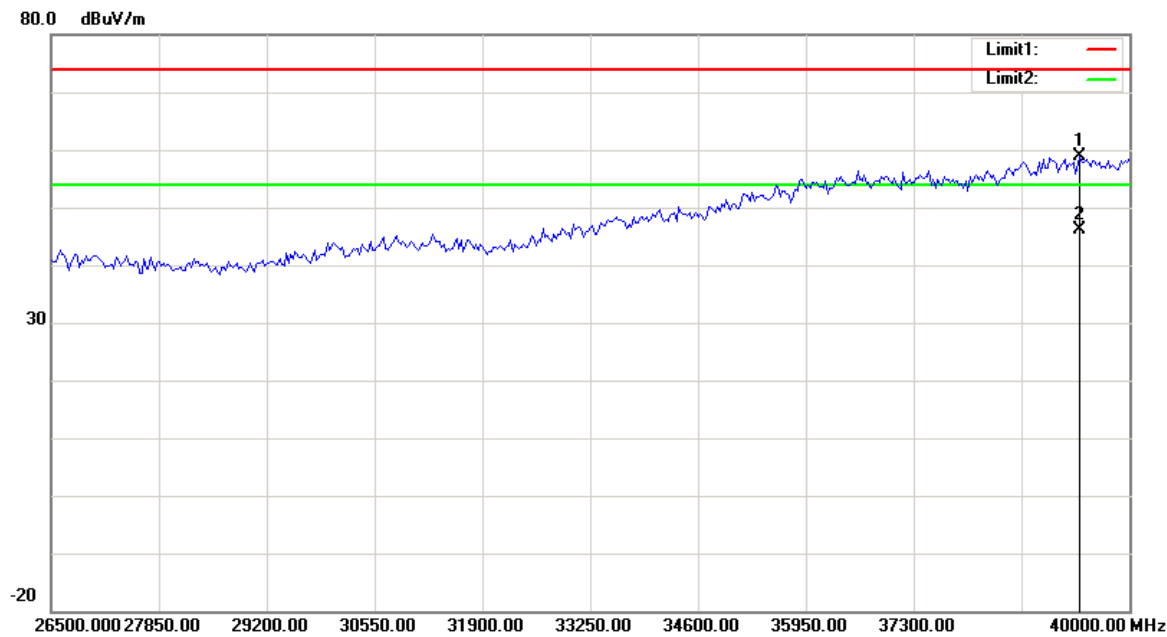
Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
26448.898	39.57	peak	21.61	61.18	74.00	12.82
26448.898	26.12	AVG	21.61	47.73	54.00	6.27

Horizontal



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
40000.000	42.77	peak	15.97	58.74	74.00	15.26
40000.000	30.41	AVG	15.97	46.38	54.00	7.62

Vertical



Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB/m)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
39379.000	42.83	peak	16.02	58.85	74.00	15.15
39379.000	30.15	AVG	16.02	46.17	54.00	7.83

****END OF REPORT****