



FCC Part 15C Test Report

FCC ID: 2BKP5-ESPFBD

Applicant: Ember Sky LLC

Address: 21552 Yucatan Ave. Woodland Hills, CA. 91364 USA

Manufacturer: TIGERSNIFF TECHNOLOGY CO., LTD

Address: Chenghai District, Shantou City, Guangdong Province, China

EUT: Remote controller for Play Forward Build N Drive RC Trucks

Trade Mark: Play Forward

Model Number: ESPFBD-Con1, ESPFBD-Con2, ESPFBD-City, ESPFBD-Sani, ESPFBD-Farm, ESPFRC-1, ESPFRC-2, ESPFRC-3, ESPFRC-4, ESPFRC-5, ESPFRC-6, ESPFRC-7, ESPFRC-8, ESPFRC-9, ESPFRC-10, ESPFRC-11, ESPFRC-12, ESPFRC-13, ESPFRC-14, ESPFRC-15

Date of Receipt: Aug. 28, 2024

Test Date: Aug. 28, 2024 - Sep. 11, 2024

Date of Report: Sep. 11, 2024

Prepared By: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

Applicable Standards: FCC CFR47 Part 15 Section 15.227, ANSI C63.10:2013

Test Result: Pass

Report Number: DL-240828011ER

Prepared (Test Engineer): Alisa Song

Reviewer (Supervisor): Jack Bu

Approved (Manager): Jade Yang



This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.



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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.227) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	
15.205(a), 15.209 15.227(a),15.227(b)	Fundamental &Radiated Spurious Emission Measurement	PASS	
15.215(c)	20dB Bandwidth	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

Test lab: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

FCC Test Firm Registration Number: 854456

Designation Number: CN1307

IC Registered No.: 27485

CAB ID.: CN0118

1.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$,providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 2.56\text{dB}$
2	RF power,conducted	$\pm 0.42\text{dB}$
3	Spurious emissions,conducted	$\pm 2.76\text{dB}$
4	All emissions,radiated(<1G)	$\pm 3.65\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name:	Remote controller for Play Forward Build N Drive RC Trucks
Trademark	Play Forward
Model No.:	ESPFBD-Con1 ESPFBD-Con2, ESPFBD-City, ESPFBD-Sani, ESPFBD-Farm, ESPFRC-1, ESPFRC-2, ESPFRC-3, ESPFRC-4, ESPFRC-5, ESPFRC-6, ESPFRC-7, ESPFRC-8, ESPFRC-9, ESPFRC-10, ESPFRC-11, ESPFRC-12, ESPFRC-13, ESPFRC-14, ESPFRC-15
Model Difference	The product's different for model number and appearance color.
Operation Frequency:	27.145MHz
Channel numbers:	1 Channels
Modulation technology:	FSK
Antenna Type:	External Antenna
Antenna gain:	0dBi
Power supply:	DC 3V

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. The EUT's all information provided by client.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode
For Conducted & Radiated Emission	
Final Test Mode	Description
Mode 1	TX Mode

Note:

- (1) New battery is used during the test



2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Model/Type No.	Series No.	Note
E-1	Remote controller for Play Forward Build N Drive RC Trucks	ESPFBD-Con1	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

None.



2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation test, Band-edge test and 20db bandwidth test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 04, 2023	Nov. 03, 2024
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 04, 2023	Nov. 03, 2024
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 04, 2023	Nov. 03, 2024
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 04, 2023	Nov. 03, 2024
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 04, 2023	Nov. 03, 2024
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 04, 2023	Nov. 03, 2024
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 04, 2023	Nov. 03, 2024
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 04, 2023	Nov. 03, 2024
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 04, 2023	Nov. 03, 2024
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 04, 2023	Nov. 03, 2024
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 04, 2023	Nov. 03, 2024
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 04, 2023	Nov. 03, 2024
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 04, 2023	Nov. 03, 2024
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 04, 2023	Nov. 03, 2024
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 04, 2023	Nov. 03, 2024
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 04, 2023	Nov. 03, 2024

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	YIHENG	843 Room	843	Nov. 06, 2023	Nov. 05, 2026
2	EMI Receiver	R&S	ESR	101421	Nov. 04, 2023	Nov. 03, 2024
3	LISN	R&S	ENV216	102417	Nov. 04, 2023	Nov. 03, 2024
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 04, 2023	Nov. 03, 2024

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ_EMC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ_EMC	FA-03A2
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

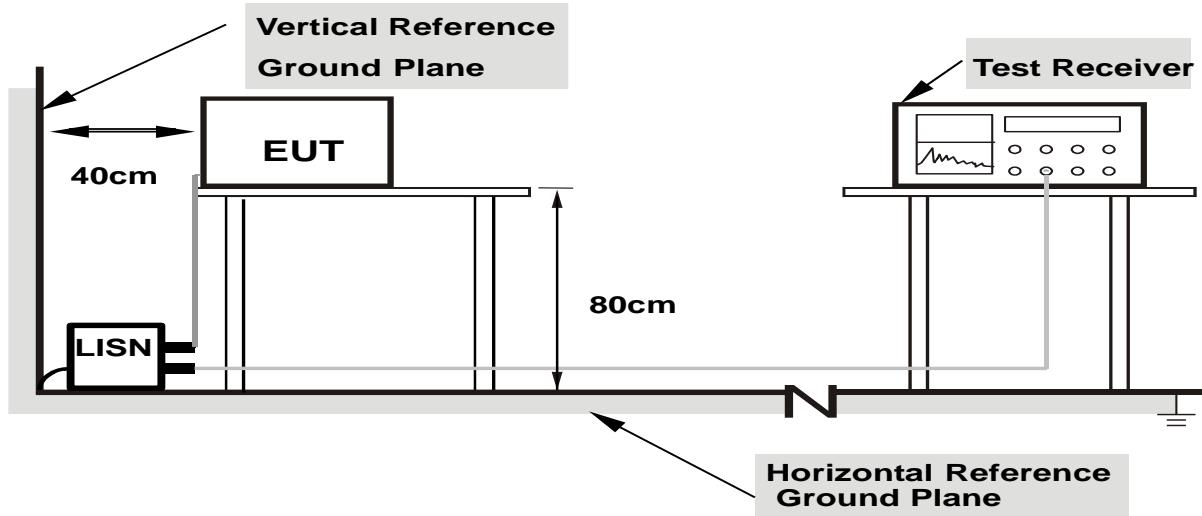
- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation



3.1.4 TEST SETUP



Note:

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

The EUT is powered by DC, no requirements for this item.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.227(a), then the 15.209(a) limit in the table below has to be followed.

(a) The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

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
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Receiver setup:

Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

3.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

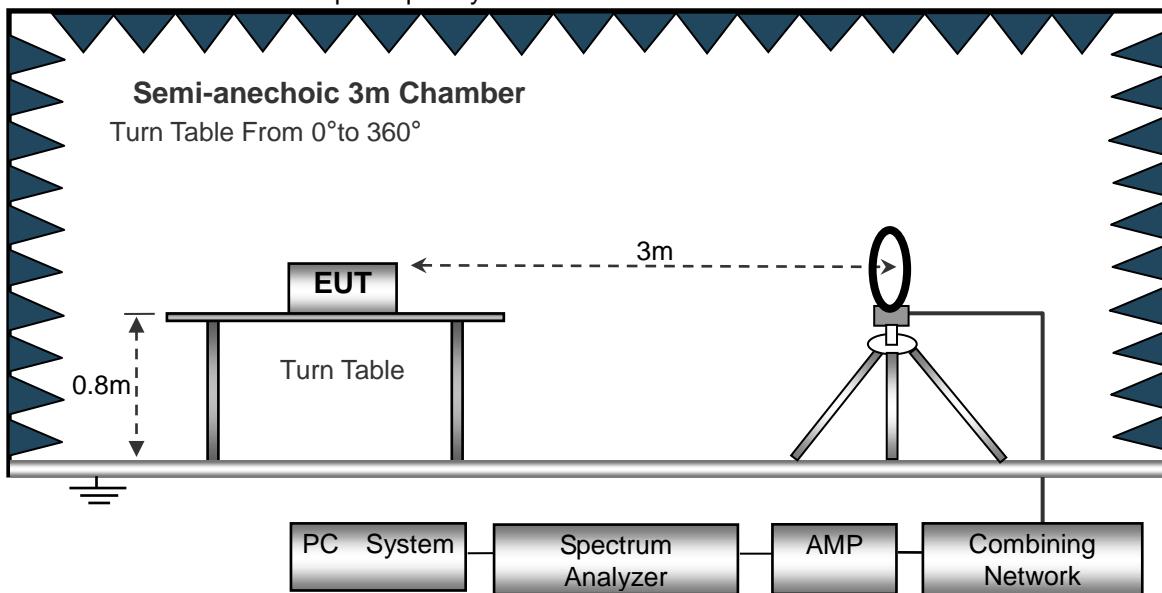


3.2.3 DEVIATION FROM TEST STANDARD

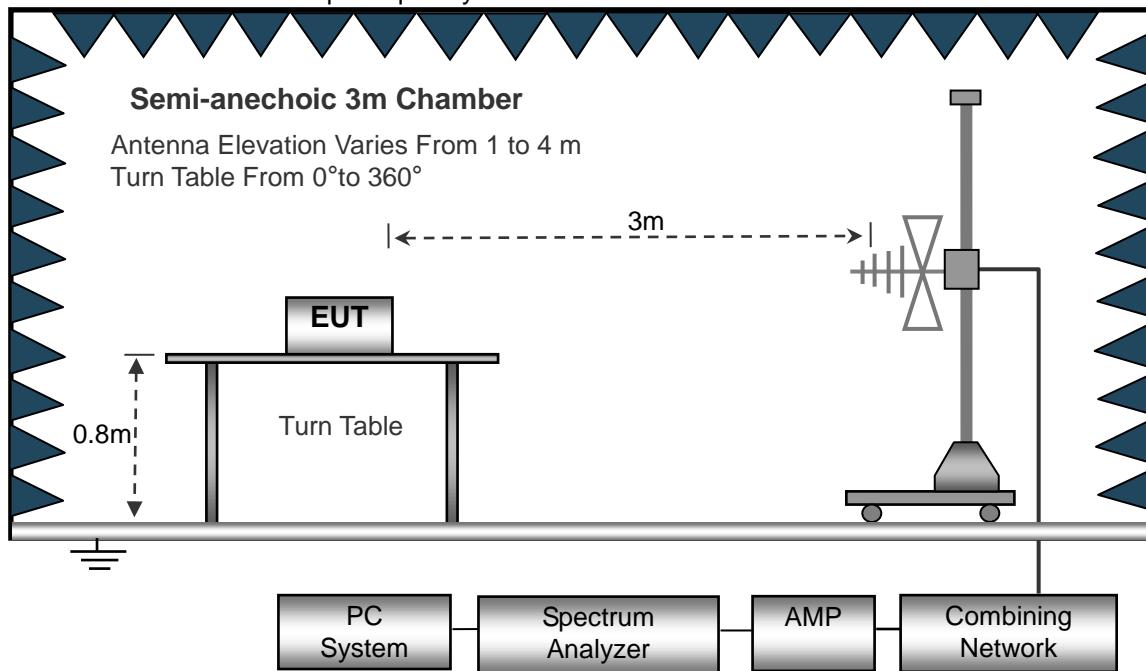
No deviation

3.2.4 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



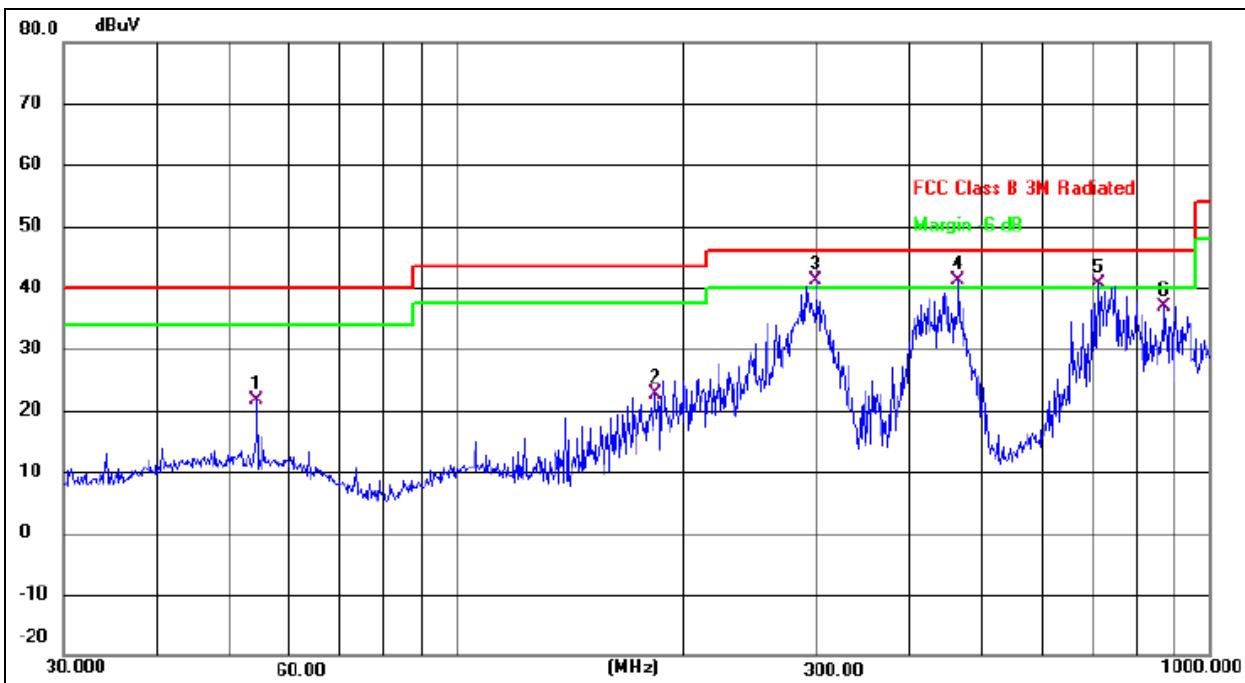
3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



3.2.6 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

Temperature:	26°C	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Horizontal
Test Voltage :	DC 3V		
Test Mode :	Mode 1		



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin
			Level	Factor	ment		
		MHz	dBuV	dB	dBuV	dB	dB
1		54.2608	35.05	-13.37	21.68	40.00	-18.32
2		183.2005	38.78	-16.24	22.54	43.50	-20.96
3	*	300.3672	52.88	-11.64	41.24	46.00	-4.76
4	!	463.9696	49.24	-8.05	41.19	46.00	-4.81
5	!	711.6734	44.64	-4.01	40.63	46.00	-5.37
6		872.1832	38.39	-1.45	36.94	46.00	-9.06

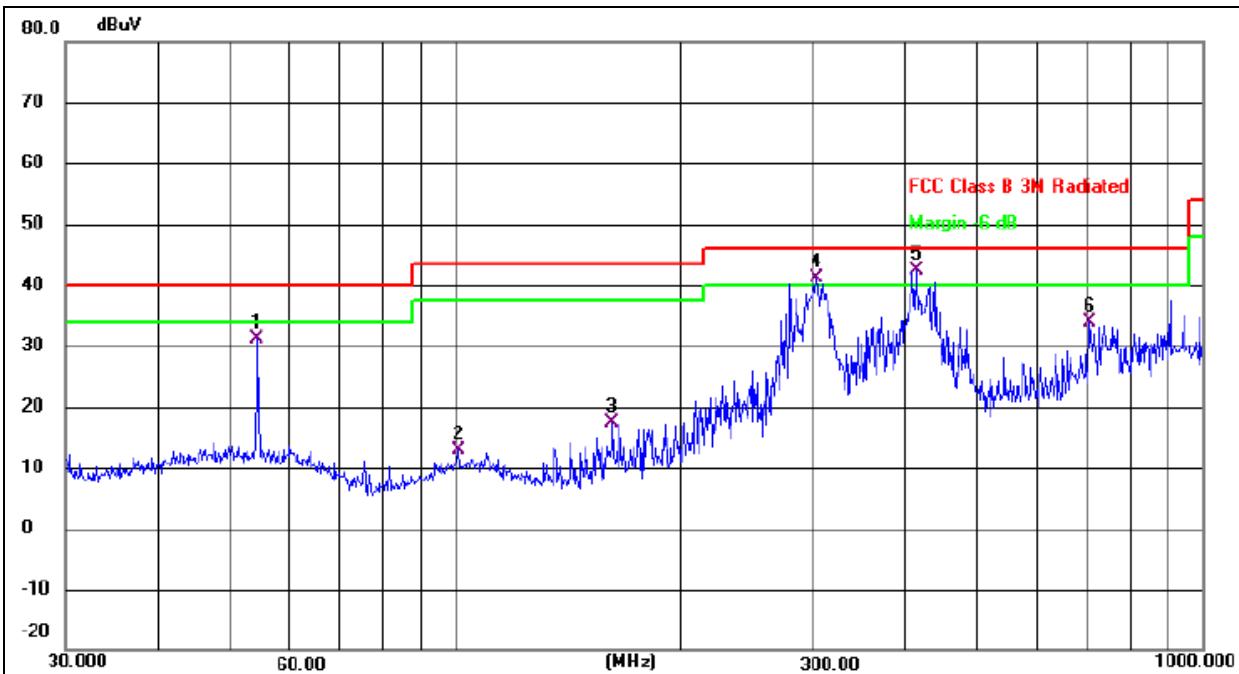
Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Level - Limit;



Temperature:	26°C	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Vertical
Test Voltage :	DC 3V		
Test Mode :	Mode 1		

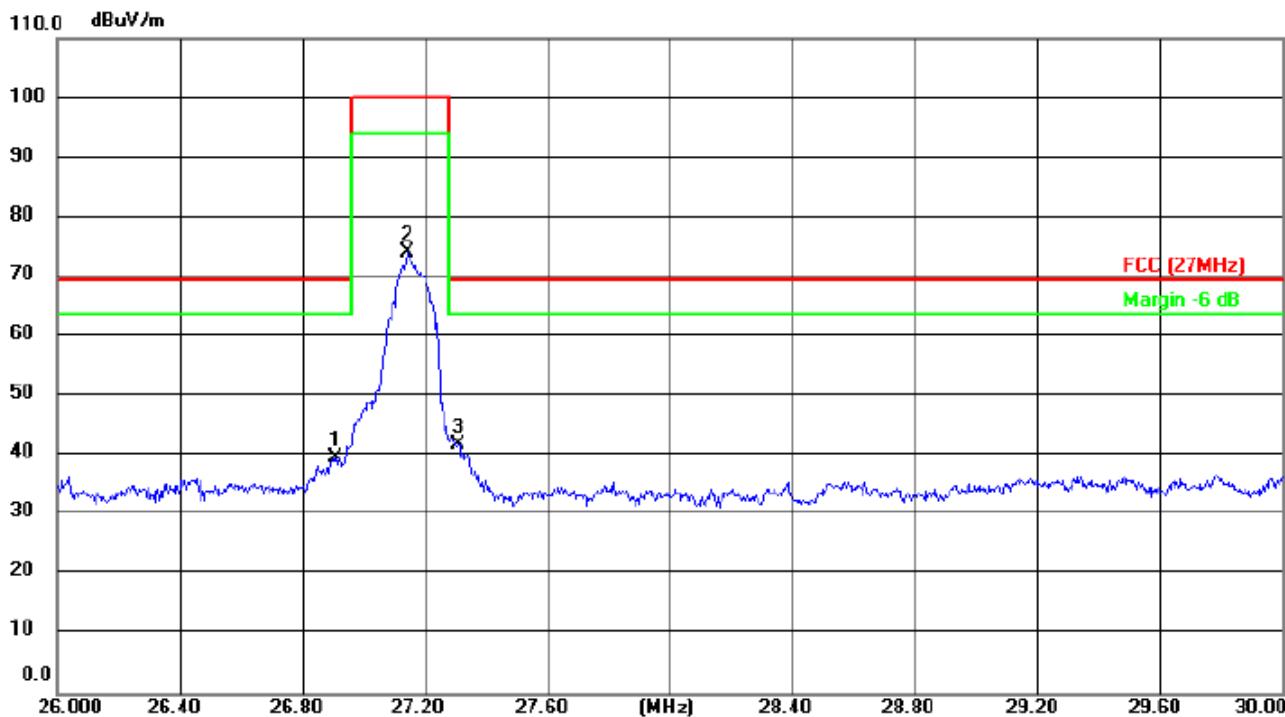


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dB	Margin dB	Detector
1		54.2610	44.41	-13.37	31.04	40.00	-8.96	QP
2		100.9339	27.72	-14.72	13.00	43.50	-30.50	QP
3		162.0414	35.06	-17.67	17.39	43.50	-26.11	QP
4	!	303.5437	52.92	-11.68	41.24	46.00	-4.76	QP
5	*	413.2706	51.88	-9.47	42.41	46.00	-3.59	QP
6		706.6999	37.90	-4.06	33.84	46.00	-12.16	QP

Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Level - Limit;

**SPURIOUS EMISSION IN RESTRICTED BAND****Polarity: Horizontal**

Frequency (MHz)	Meter Reading (dB μ V/m)	Factor (dB/m)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
26.9080	12.20	27.49	39.69	69.54	-29.85	
27.1436	46.21	27.95	74.16	100	-25.84	PK
27.3079	13.64	28.28	41.92	69.54	-27.62	PK

Remark: Emission Level=Reading+Factor

**Polarity: Vertical**

Frequency (MHz)	Meter Reading (dB μ V/m)	Factor (dB/m)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
26.9160	16.50	27.51	44.01	69.54	-25.53	PK
27.0915	44.76	27.85	72.61	100	-27.39	PK
27.2835	9.71	28.22	37.93	69.54	-31.61	PK

Remark: Emission Level = Reading + Factor



3.2.7 TEST RESULTS (9KHZ-30MHZ)

Frequency (kHz)	Meter Reading (dB μ V/m)	Factor (dB/m)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
16.32	37.24	20.03	57.27	143.36	-86.09	PK
16.32	38.66	20.03	58.69	123.36	-64.67	AV
31.94	56.18	20.07	76.25	137.52	-61.27	PK
31.94	38.41	20.07	58.48	117.52	-59.04	AV
75.59	36.33	20.11	56.44	130.23	-73.79	PK
75.59	34.85	20.11	54.96	110.03	-55.07	AV
2330.83	32.34	20.89	53.23	69.54	-16.31	QP
5396.14	30.73	21.57	52.3	69.54	-17.24	QP
8327.53	31.88	22.49	54.37	69.54	-15.17	QP



4. BANDWIDTH TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.227) , Subpart C	
Section	Description
15.215(c)	<p>Operation within the band 26.960 – 27.280 MHz</p> <p>The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.</p> <p>The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to –10dB per division. The horizontal scale is set to 5KHz per division.</p>

4.1.1 TEST PROCEDURE

1. Set RBW = 300Hz.
2. Set VBW = 1KHz.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. 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 20 dB relative to the maximum level measured in the fundamental emission.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



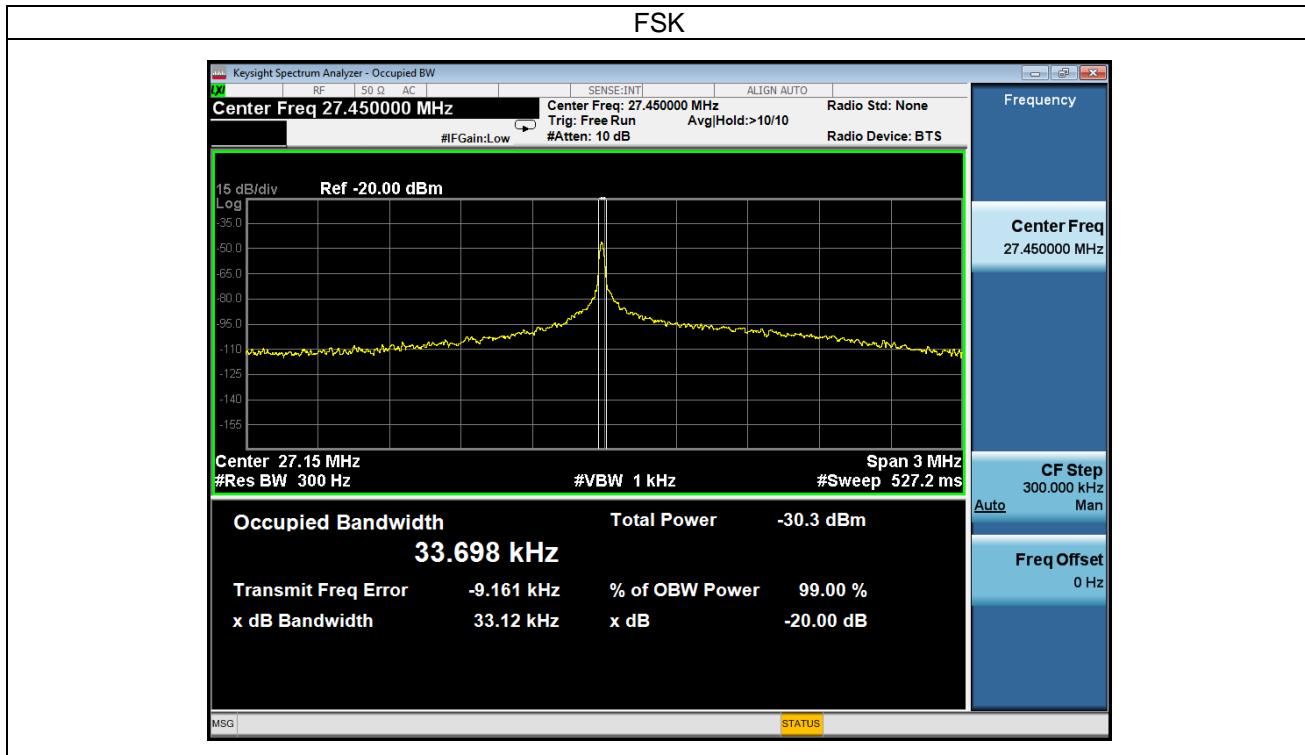
4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



4.1.5 TEST RESULTS

Frequency (MHz)	20dB Bandwidth (KHz)	Result
27.145	33.12	Pass





5. ANTENNA REQUIREMENT

5.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

5.2 EUT ANTENNA

The EUT antenna is External antenna, It comply with the standard requirement.



6. TEST SEUUP PHOTO

Reference to the appendix I for details.

7. EUT PHOTO

Reference to the appendix II for details.

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