TEST REPORT

Product	:	8" CM with Internal Antenna - XR, 8" CM with External Antenna - XR
Trade mark	:	N/A
Model/Type reference	:	7X-CC-C11K-IA, 7X-CC-K10K-XA
Serial Number	:	N/A
Report Number	:	EED32P80329501
FCC ID	:	2AVZO-MT
Date of Issue	:	Nov. 05, 2023
Test Standards	:	47 CFR Part 15 Subpart C
Test result	:	PASS

Prepared for:

75F, Inc.
1650 W 82nd St, Suite 200
Bloomington, Minnesota 55431, United States

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
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Compiled by: Frazer Li — Reviewed by: Tom Chen

Approved by: Aaron Ma — Date of issue: Nov. 05, 2023

Check No.: 7405181122

2 Content

3 Version

Version No.	Date	Description
00	Nov. 05, 2023	Original

4 Test Summary

Test Item	Test Requirement	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203/15.247 (c)	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	PASS
DTS Bandwidth	47 CFR Part 15 Subpart C Section 15.247 (a)(2)	PASS
Maximum Conducted Output Power & EIRP	47 CFR Part 15 Subpart C Section 15.247 (b)(3)	PASS
Maximum Power Spectral Density	47 CFR Part 15 Subpart C Section 15.247 (e)	PASS
Band Edge Measurements	47 CFR Part 15 Subpart C Section 15.247(d)	PASS
Radiated Spurious Emission & Restricted bands	47 CFR Part 15 Subpart C Section 15.205/15.209	PASS

Remark:
Company Name and Address shown on Report, the sample(s) and sample Information were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

Model No.: 7X-CC-C11K-IA, 7X-CC-K10K-XA
Both of the models are tested. Their electrical circuit design, layout, components used and internal wiring are identical. Only the antennas are different.

5 General Information

5.1 Client Information

Applicant:	75F, Inc.
Address of Applicant:	1650 W 82nd St, Suite 200 Bloomington, Minnesota 55431, United States
Manufacturer:	Estone Technology LTD
Address of Manufacturer:	2F, Building No.1, Jia'an Industrial Park, No.2 Long Chang Road, Bao'an, Shenzhen 518101, China
Factory:	Estone Technology LTD
Address of Factory:	2F, Building No.1, Jia'an Industrial Park, No.2 Long Chang Road, Bao'an, Shenzhen 518101, China

5.2 General Description of EUT

Product Name:	8" CM with Internal Antenna - XR, 8" CM with External Antenna - XR
Model No.:	7X-CC-C11K-IA, 7X-CC-K10K-XA
Trade mark:	N/A
Product Type:	Fix Location
Operation Frequency:	906MHz~924MHz
Modulation Type:	PSK
Transfer Bandwidth:	1MHz
Number of Channel:	10
Antenna Type:	Internal Antenna, External Antenna
Antenna Gain:	Internal antenna: 0.31dBi External Antenna: 1.20dBi
Power Supply:	DC 24.0V or AC 24.0V
Sample Received Date:	Mar. 14, 2023
Sample tested Date:	Mar. 14, 2023 to Nov. 05, 2023

Operation Frequency each of channel of TX:	
Channel	Frequency
1	906MHz
2	908MHz
3	910MHz
4	912MHz
5	914MHz
6	916MHz
7	918MHz
8	920MHz
9	922MHz
10	924MHz

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel (CH1)	906MHz
The middle channel (CH5)	914MHz
The highest channel (CH10)	924MHz

5.3 Test Configuration

EUT Test Software Settings:				
Software:	teraterm-4.106.exe			
EUT Power Grade:	Default (Power level is built-in set parameters and cannot be changed and selected)			
Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.				
Test Mode	Modulation	Bandwidth	Channel	Frequency(MHz)
Mode a	PSK	2MHz	CH1	906
Mode b	PSK	2MHz	CH5	914
Mode c	PSK	2MHz	CH10	924

5.4 Test Environment

Operating Environment:		
Radiated Spurious Emissions:		
Temperature:	22~25.0 °C	
Humidity:	50~55 % RH	
Atmospheric Pressure:	1010mbar	
RF Conducted:		
Temperature:	22~25.0 °C	
Humidity:	50~55 % RH	
Atmospheric Pressure:	1010mbar	

5.5 Description of Support Units

The EUT has been tested with associated equipment below.

support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
Netbook	DELL	Latitude 3490	FCC&CE	CTI
Transformer	Shenzhen Caixing Electronics Co., Ltd.	CX-4826	CCC	Client

5.6 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd
Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China
Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385
No tests were sub-contracted.
FCC Designation No.: CN1164

5.7 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-40GHz)
3	Radiated Spurious emission test	3.3dB (9kHz-30MHz)
		4.3dB (30MHz-1GHz)
		4.5dB (1GHz-18GHz)
		3.4dB (18GHz-40GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

6 Equipment List

RF test system					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. Date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Communication tset set	R&S	CMW500	107929	07-06-2022 06-28-2023	07-05-2023 06-27-2024
Signal Generator	R&S	SMBV100A	1407.6004K02-262149-CV	09-09-2022 09-05-2023	09-08-2023 09-04-2024
Spectrum Analyzer	R&S	FSV40	101200	08-01-2022 07-25-2023	07-31-2023 07-24-2024
RF control unit(power unit)	MWRF-test	MW100-RFCB	MW220620CTI-42	07-06-2022 06-28-2023	07-05-2023 06-27-2024
high-low temperature test chamber	Dong Guang Qin Zhuo	LK-80GA	QZ20150611879	12-19-2022	12-18-2023
Temperature/ Humidity Indicator	biaozhi	HM10	1804186	06-16-2022 06-01-2023	06-15-2023 05-31-2024
BT&WI-FI Automatic test software	MWRF-test	MTS 8310	2.0.0.0	---	---

3M Semi-anechoic Chamber (2)- Radiated disturbance Test					
Equipment	Manufacturer	Model	Serial No.	Cal. Date	Due Date
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05/22/2022	05/21/2025
Receiver	R&S	ESCI7	100938-003	09/28/2022 09/22/2023	09/27/2023 09/21/2024
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-618	05/22/2022	05/21/2025
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04/15/2021	04/14/2024
Microwave Preamplifier	Tonscend	EMC051845SE	980380	12/23/2022	12/23/2023
Multi device Controller	maturo	NCD/070/10711112	---	---	---
Horn Antenna	ETS-LINGREN	BBHA 9120D	9120D-1869	04/15/2021	04/14/2024
Microwave Preamplifier	Agilent	8449B	3008A02425	06/20/2022 06/20/2023	06/19/2023 06/29/2024

Conducted Emissions Test					
Equipment	Manufacturer	Model	Serial No.	Cal. Date	Due Date
Receiver	R&S	ESCI	100435	04-25-2023	04-24-2024
LISN	R&S	ENV216	100098	09-27-2022 09-22-2023	09-26-2023 09-21-2024
Capacitive voltage probe	Schwarzbeck	CVP 9222C	00124	07-13-2022 06-29-2023	07-12-2023 06-28-2024
ISN	TESEQ	ISN T800	30297	12-29-2022	12-28-2023
Barometer	changchun	DYM3	1188	---	---
Temperature/ Humidity Indicator	Defu	TH128	---	---	---
Test software	Fara	EZ-EMC	EMC-CON 3A1.1	---	---

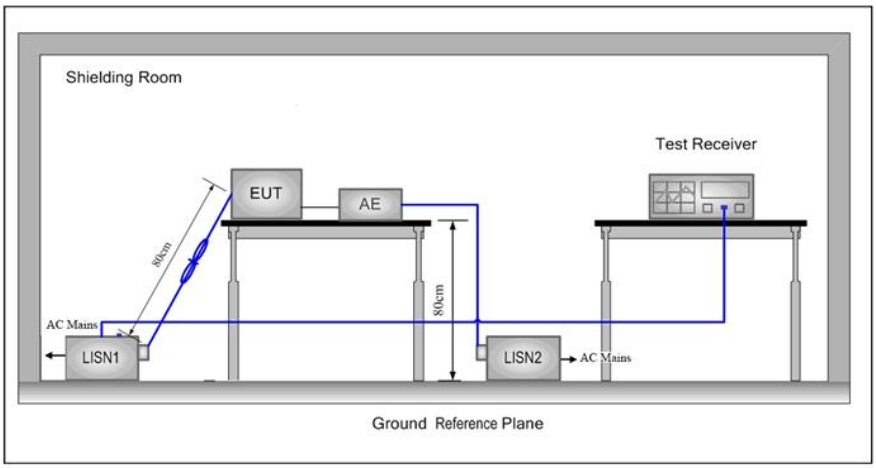
3M full-anechoic Chamber					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. Date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
RSE Automatic test software	JS Tonscend	JS36-RSE	10166	---	---
Receiver	Keysight	N9038A	MY57290136	02-27-2023	02-26-2024
Spectrum Analyzer	Keysight	N9020B	MY57111112	02-21-2023	02-20-2024
Spectrum Analyzer	Keysight	N9030B	MY57140871	02-21-2023	02-20-2024
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-28-2021	04-27-2024
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-15-2021	04-14-2024
Horn Antenna	ETS-LINDGREN	3117	57407	07-04-2021	07-03-2024
Preamplifier	EMCI	EMC184055SE	980597	04-20-2022 04-13-2023	04-19-2023 04-12-2024
Preamplifier	EMCI	EMC001330	980563	04-13-2022 03-28-2023	04-12-2023 03-27-2024
Preamplifier	JS Tonscend	TAP-011858	AP21B806112	07-29-2022 07-25-2023	07-28-2023 07-24-2024
Communication test set	R&S	CMW500	102898	12-23-2022	12-22-2023
Temperature/ Humidity Indicator	biaozhi	GM1360	EE1186631	04-11-2022 04-11-2023	04-10-2023 04-10-2024
Fully Anechoic Chamber	TDK	FAC-3	---	01-09-2021	01-08-2024
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	---	---
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	---	---
Cable line	Times	EMC104-NMNM-1000	SN160710	---	---
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	---	---
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	---	---
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	---	---
Cable line	Times	HF160-KMKM-3.00M	393493-0001	---	---

7 Test results and Measurement Data

7.1 Antenna Requirement

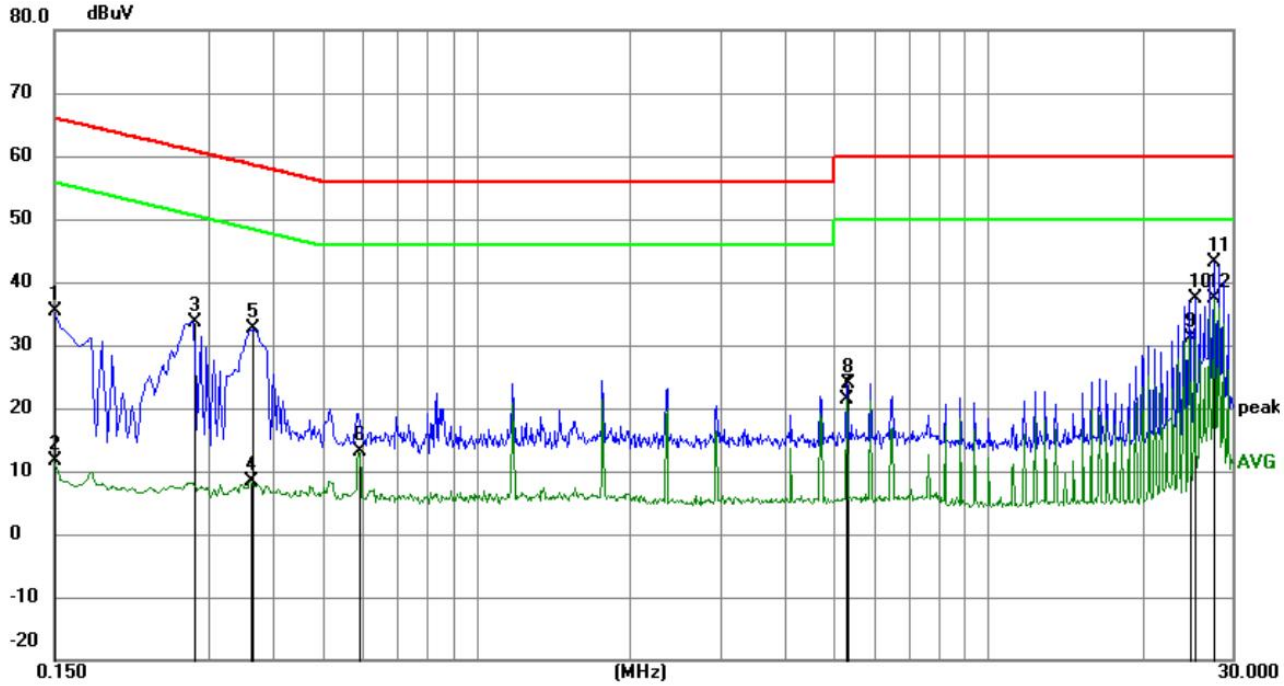
Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, 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. 15.247(b) (4) requirement: 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.	
EUT Antenna:	Please see Internal photos
The antenna are Internal antenna and External antenna. The best case gain of the antenna are Internal antenna: 0.31dBi and External Antenna: 1.20dBi	

7.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207
Test Method:	ANSI C63.10: 2013
Test Frequency Range:	150kHz to 30MHz
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto
Limit:	Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 * Decreases with the logarithm of the frequency.
Test Setup:	
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.
Test Mode:	All modes were tested, only the worse case mode a of external antenna was recorded in the report.
Test Results:	Pass

Measurement Data

Live line:

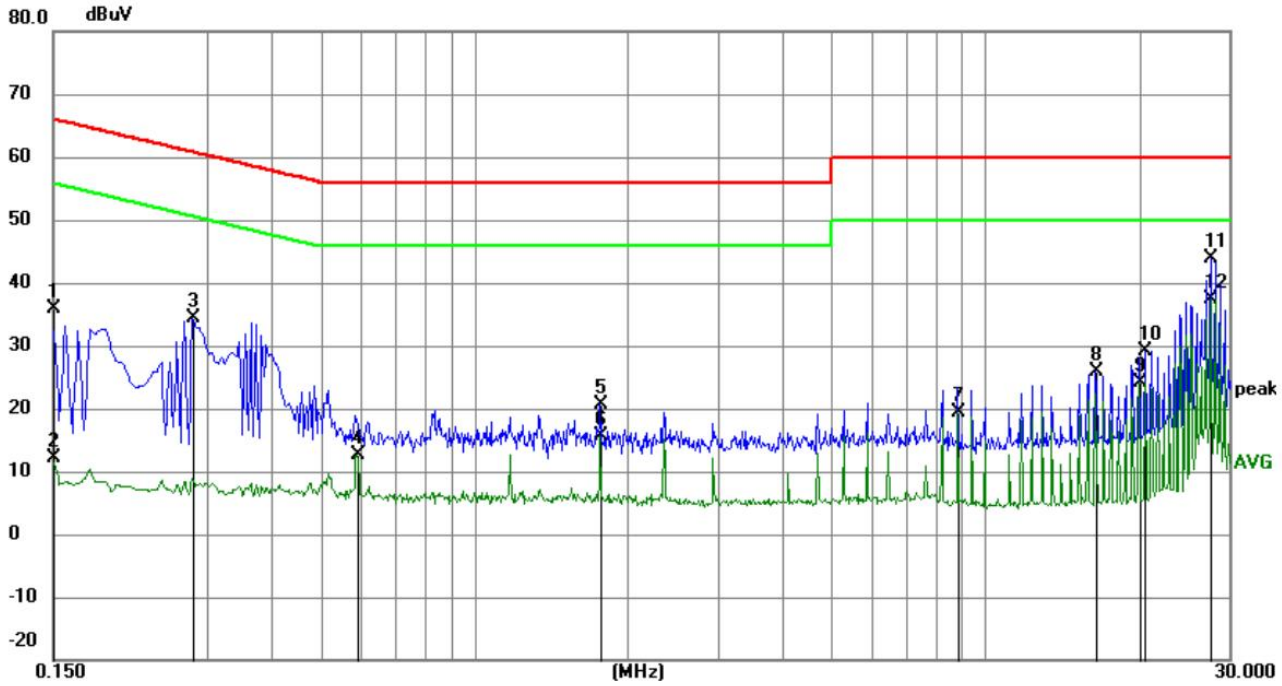


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	25.63	9.87	35.50	66.00	-30.50	QP	
2		0.1500	1.78	9.87	11.65	56.00	-44.35	AVG	
3		0.2805	23.72	10.03	33.75	60.80	-27.05	QP	
4		0.3615	-1.58	10.01	8.43	48.69	-40.26	AVG	
5		0.3660	22.60	10.00	32.60	58.59	-25.99	QP	
6		0.5909	3.01	10.06	13.07	46.00	-32.93	AVG	
7		5.3024	11.65	9.78	21.43	50.00	-28.57	AVG	
8		5.3070	14.20	9.78	23.98	60.00	-36.02	QP	
9		24.7650	21.21	10.00	31.21	50.00	-18.79	AVG	
10		25.3410	27.40	10.00	37.40	60.00	-22.60	QP	
11		27.7035	33.21	10.02	43.23	60.00	-16.77	QP	
12	*	27.7035	27.48	10.02	37.50	50.00	-12.50	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:

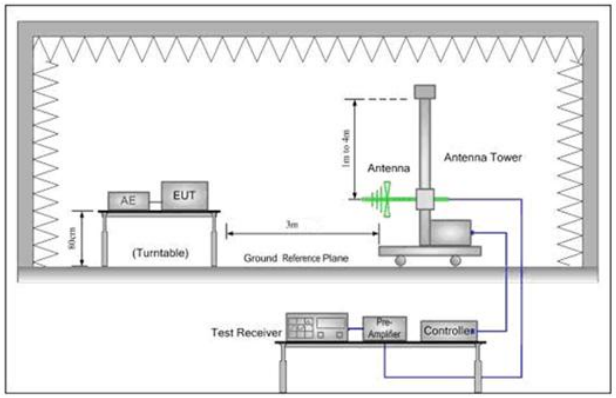


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	26.07	9.87	35.94	66.00	-30.06	QP	
2		0.1500	2.16	9.87	12.03	56.00	-43.97	AVG	
3		0.2805	24.41	10.03	34.44	60.80	-26.36	QP	
4		0.5910	2.52	10.06	12.58	46.00	-33.42	AVG	
5		1.7655	10.71	9.80	20.51	56.00	-35.49	QP	
6		1.7655	5.85	9.80	15.65	46.00	-30.35	AVG	
7		8.8350	9.61	9.78	19.39	50.00	-30.61	AVG	
8		16.4805	16.00	9.94	25.94	60.00	-34.06	QP	
9		20.0085	14.20	9.97	24.17	50.00	-25.83	AVG	
10		20.5935	19.10	9.97	29.07	60.00	-30.93	QP	
11		27.6675	33.96	10.02	43.98	60.00	-16.02	QP	
12	*	27.6675	27.31	10.02	37.33	50.00	-12.67	AVG	

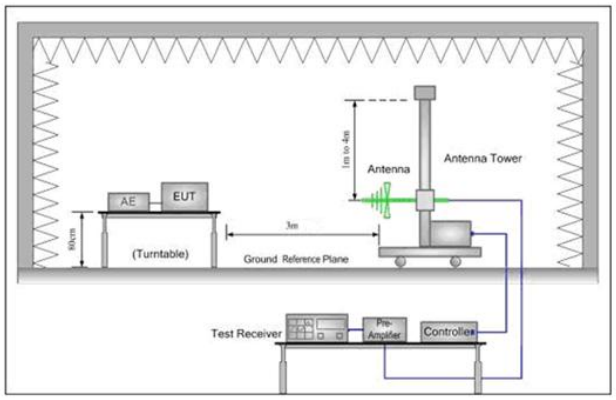
Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

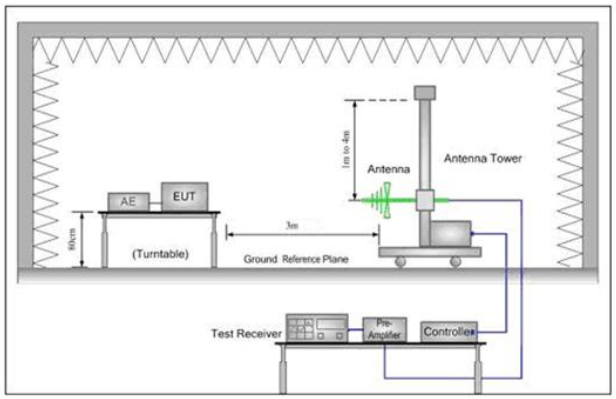
7.3 Maximum Conducted Output Power & EIRP

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10 2013
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	a) Set the RBW ⩾ DTS bandwidth. b) Set VBW ⩾ 3 × RBW. c) Set span ⩾ 3 x RBW d) Sweep time = auto couple. e) Detector = peak. f) Trace mode = max hold. g) Allow trace to fully stabilize. h) Use peak marker function to determine the peak amplitude level.
Limit:	Conducted output power limit: 30dBm; EIRP limit: 36dBm;
Test Mode:	Refer to clause 5.3
Test Results:	Refer to Appendix DTS

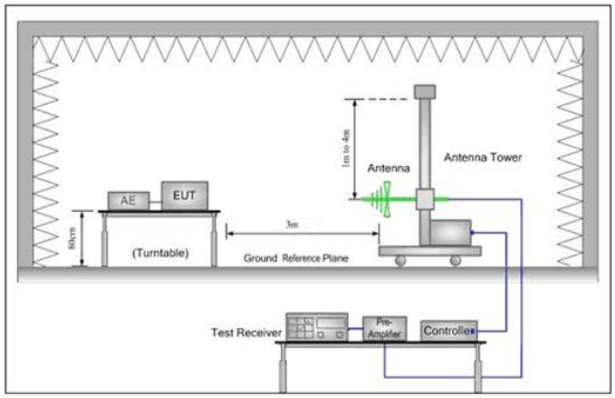
7.4 DTS Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10 2013
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	a) Set RBW = 100 kHz. b) Set the VBW ⩾[3 × RBW]. c) Detector = peak. d) Trace mode = max hold. e) Sweep = auto couple. f) Allow the trace to stabilize. g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
Limit:	≥ 500 kHz
Test Mode:	Refer to clause 5.3
Test Results:	Refer to Appendix DTS

7.5 Maximum Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 2013
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	Method PKPSD (peak PSD) The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance: a) Set analyzer center frequency to DTS channel center frequency. b) Set the span to 1.5 times the DTS bandwidth. c) Set the RBW to 3 kHz RBW 100 kHz. d) Set the VBW [3 × RBW]. e) Detector = peak. f) Sweep time = auto couple. g) Trace mode = max hold. h) Allow trace to fully stabilize. i) Use the peak marker function to determine the maximum amplitude level within the RBW. j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.
Limit:	≤8.00dBm/3kHz
Test Mode:	Refer to clause 5.3
Test Results:	Refer to Appendix DTS

7.6 Band Edge measurements

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10 2013
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Procedure:	a) Set RBW =100KHz. b) Set VBW = 300KHz. c) Sweep time = auto couple. d) Detector = RMS. e) Trace mode = max hold. f) Allow trace to fully stabilize. g) Use peak marker function to determine the peak amplitude level.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.
Test Mode:	Refer to clause 5.3
Test Results:	Refer to Appendix DTS

7.7 Radiated Spurious Emission & Restricted bands

<table>
<tr><td>Test Requirement:</td><td>47 CFR Part 15C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10 2013</td></tr>
<tr><td>Test Site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>0.009MHz-0.090MHz</td><td>Peak</td><td>10kHz</td><td>30kHz</td><td>Peak</td></tr>
<tr><td>0.009MHz-0.090MHz</td><td>Average</td><td>10kHz</td><td>30kHz</td><td>Average</td></tr>
<tr><td>0.090MHz-0.110MHz</td><td>Quasi-peak</td><td>10kHz</td><td>30kHz</td><td>Quasi-peak</td></tr>
<tr><td>0.110MHz-0.490MHz</td><td>Peak</td><td>10kHz</td><td>30kHz</td><td>Peak</td></tr>
<tr><td>0.110MHz-0.490MHz</td><td>Average</td><td>10kHz</td><td>30kHz</td><td>Average</td></tr>
<tr><td>0.490MHz -30MHz</td><td>Quasi-peak</td><td>10kHz</td><td>30kHz</td><td>Quasi-peak</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100 kHz</td><td>300kHz</td><td>Quasi-peak</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10kHz</td><td>Average</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Field strength (microvolt/meter)</th><th>Limit (dBuV/m)</th><th>Remark</th><th>Measurement distance (m)</th></tr>
<tr><td>0.009MHz-0.490MHz</td><td>2400/F(kHz)</td><td>-</td><td>-</td><td>300</td></tr>
<tr><td>0.490MHz-1.705MHz</td><td>24000/F(kHz)</td><td>-</td><td>-</td><td>30</td></tr>
<tr><td>1.705MHz-30MHz</td><td>30</td><td>-</td><td>-</td><td>30</td></tr>
<tr><td>30MHz-88MHz</td><td>100</td><td>40.0</td><td>Quasi-peak</td><td>3</td></tr>
<tr><td>88MHz-216MHz</td><td>150</td><td>43.5</td><td>Quasi-peak</td><td>3</td></tr>
<tr><td>216MHz-960MHz</td><td>200</td><td>46.0</td><td>Quasi-peak</td><td>3</td></tr>
<tr><td>960MHz-1GHz</td><td>500</td><td>54.0</td><td>Quasi-peak</td><td>3</td></tr>
<tr><td>Above 1GHz</td><td>500</td><td>54.0</td><td>Average</td><td>3</td></tr>
</table>
Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.
</td></tr>
</table>

Test Setup:	

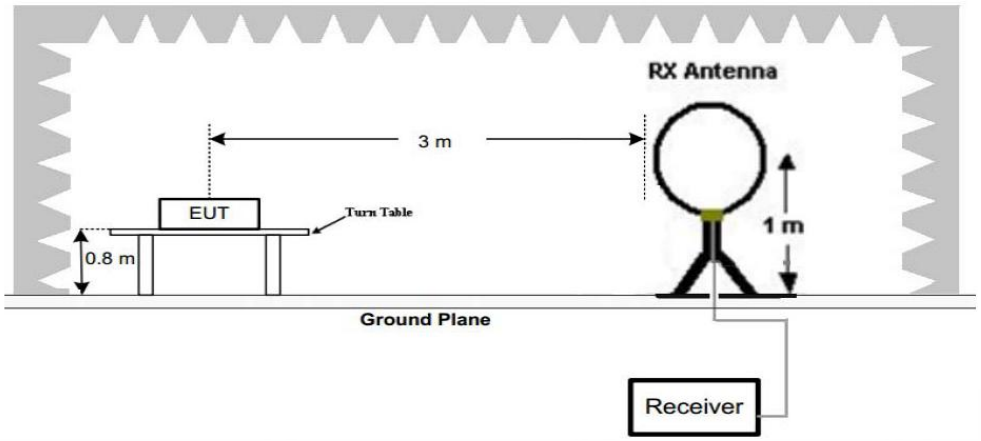


Figure 1. Below 30MHz

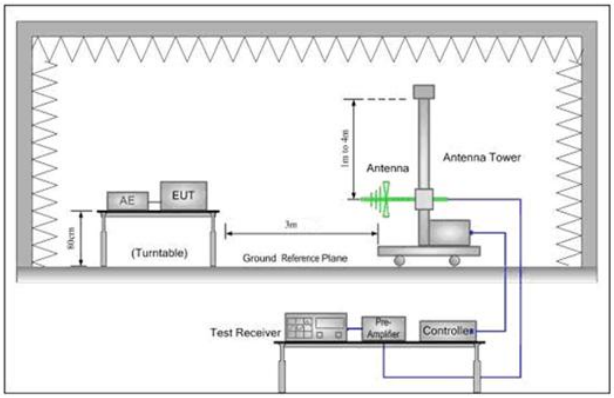


Figure 2. 30MHz to 1GHz

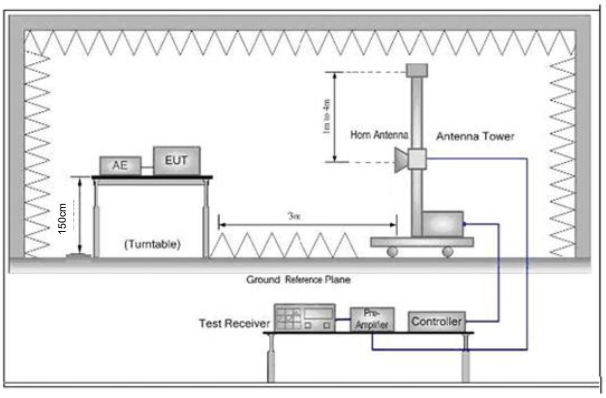


Figure 3. Above 1 GHz

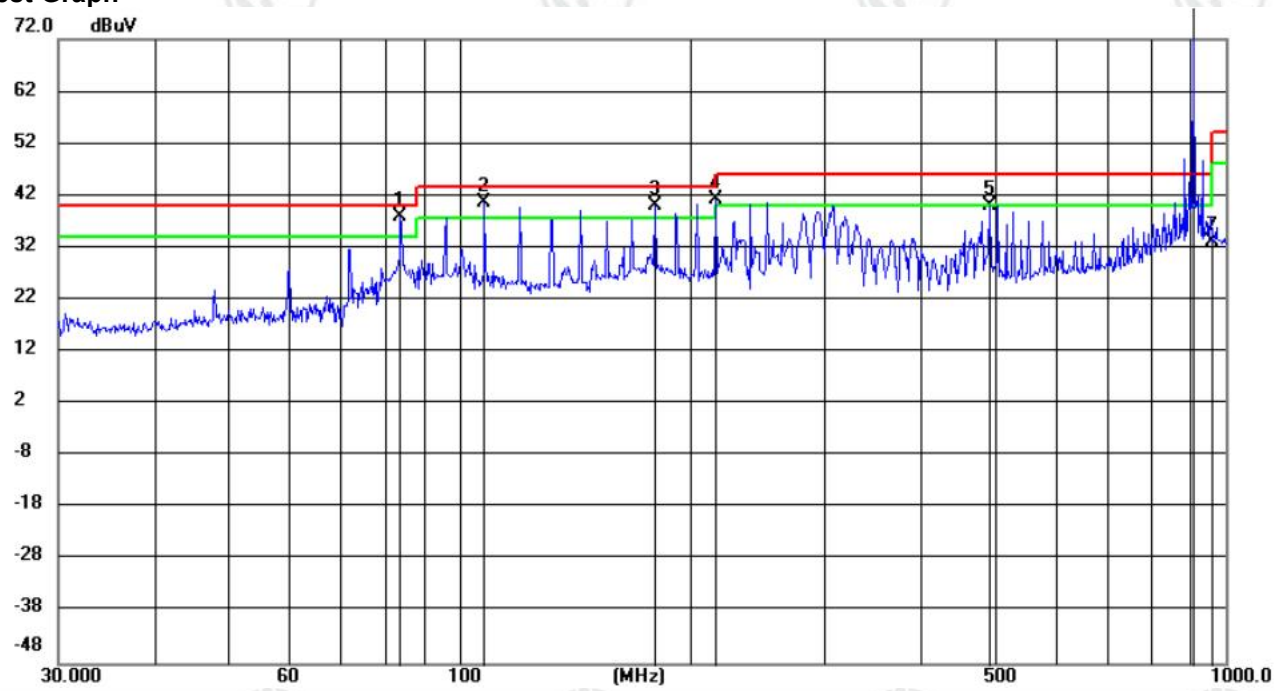
Test Procedure:	a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. Note: For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. 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. g. Test the EUT in the lowest channel ,the middle channel ,the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. i. Repeat above procedures until all frequencies measured was complete.
Test Mode:	Refer to clause 5.3
Test Results:	Pass

Radiated Spurious Emission below 1GHz:

During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes, only the worst case mode a of External Antenna worked in DC 24V was recorded in the report.

Horizontal：

Test Graph



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	83.8155	26.93	10.95	37.88	40.00	-2.12	peak	200	3	
2	!	107.8877	27.12	13.54	40.66	43.50	-2.84	peak	200	356	
3	!	180.0164	29.95	10.20	40.15	43.50	-3.35	peak	200	356	
4	!	216.0239	27.71	13.52	41.23	46.00	-4.77	peak	200	356	
5	!	492.4685	19.62	20.56	40.18	46.00	-5.82	peak	200	220	
6	*	906.4824	76.89	28.22	105.11	46.00	59.11	peak	100	280	
7		960.0000	4.90	28.15	33.05	46.00	-12.95	peak	100	290	

Remark：

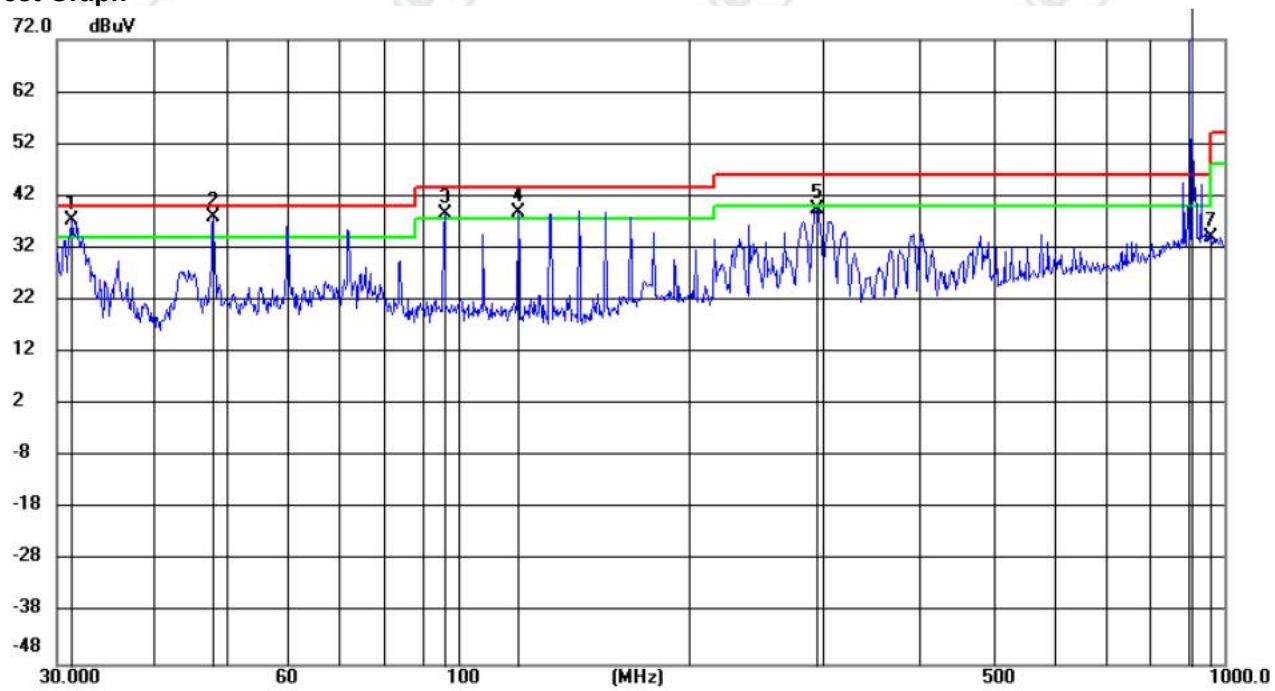
1.Margin=Measurement-Limit;

2.The emission levels of other frequencies are very lower than the limit and not show in test report.

3.The test data of NO. 6 point is fundamental wave.

Vertical：

Test Graph



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	31.3992	24.58	12.74	37.32	40.00	-2.68	peak	100	253	
2	!	47.9940	23.35	14.46	37.81	40.00	-2.19	peak	100	356	
3	!	96.0986	25.81	12.76	38.57	43.50	-4.93	peak	200	278	
4	!	119.8556	26.31	12.67	38.98	43.50	-4.52	peak	200	267	
5		294.1137	22.93	16.62	39.55	46.00	-6.45	peak	100	356	
6	*	906.4824	70.62	28.22	98.84	46.00	52.84	peak	100	231	
7		960.0000	5.84	28.15	33.99	46.00	-12.01	peak	100	263	

Remark：

1.Margin=Measurement-Limit;

4.The emission levels of other frequencies are very lower than the limit and not show in test report.

5.The test data of NO. 6 point is fundamental wave.

Radiated Spurious Emission above 1GHz:

Internal Antenna:

Mode:		Transmitting				Channel:		906 MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1331.3554	-26.72	69.67	42.95	74.00	31.05	Pass	H	PK
2	1812.0541	-24.63	64.64	40.01	74.00	33.99	Pass	H	PK
3	2717.4478	-22.20	69.92	47.72	74.00	26.28	Pass	H	PK
4	3623.7749	-20.49	64.39	43.90	74.00	30.10	Pass	H	PK
5	5389.7593	-14.41	53.19	38.78	74.00	35.22	Pass	H	PK
6	8754.6503	-9.78	52.08	42.30	74.00	31.70	Pass	H	PK
7	1329.4886	-26.72	71.54	44.82	74.00	29.18	Pass	V	PK
8	1996.8665	-23.63	70.10	46.47	74.00	27.53	Pass	V	PK
9	2718.3812	-22.19	64.55	42.36	74.00	31.64	Pass	V	PK
10	3623.7749	-20.49	61.97	41.48	74.00	32.52	Pass	V	PK
11	4791.4528	-16.34	58.82	42.48	74.00	31.52	Pass	V	PK
12	5988.9993	-12.98	56.83	43.85	74.00	30.15	Pass	V	PK

Mode:		Transmitting				Channel:		914 MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1332.2888	-26.72	66.82	40.10	74.00	33.90	Pass	H	PK
2	1981.9321	-23.72	62.43	38.71	74.00	35.29	Pass	H	PK
3	2490.6327	-22.87	62.99	40.12	74.00	33.88	Pass	H	PK
4	3765.651	-19.72	56.13	36.41	74.00	37.59	Pass	H	PK
5	6736.6491	-12.63	53.18	40.55	74.00	33.45	Pass	H	PK
6	9498.5666	-8.19	51.97	43.78	74.00	30.22	Pass	H	PK
7	1330.422	-26.72	69.54	42.82	74.00	31.18	Pass	V	PK
8	2097.6732	-23.11	64.98	41.87	74.00	32.13	Pass	V	PK
9	2999.3333	-21.41	61.91	40.50	74.00	33.50	Pass	V	PK
10	4992.1328	-15.92	58.82	42.90	74.00	31.10	Pass	V	PK
11	5994.5996	-12.94	56.96	44.02	74.00	29.98	Pass	V	PK
12	8986.1324	-8.40	53.63	45.23	74.00	28.77	Pass	V	PK

Mode:		Transmitting				Channel:		924 MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1327.6218	-26.71	65.87	39.16	74.00	34.84	Pass	H	PK
2	1969.798	-23.79	63.63	39.84	74.00	34.16	Pass	H	PK
3	2494.3663	-22.84	61.88	39.04	74.00	34.96	Pass	H	PK
4	3875.7917	-19.35	55.03	35.68	74.00	38.32	Pass	H	PK
5	5770.5847	-13.44	51.96	38.52	74.00	35.48	Pass	H	PK
6	8618.3746	-10.28	51.61	41.33	74.00	32.67	Pass	H	PK
7	1332.2888	-26.72	73.04	46.32	74.00	27.68	Pass	V	PK
8	1913.7943	-24.11	71.99	47.88	74.00	26.12	Pass	V	PK
9	2998.3999	-21.41	62.16	40.75	74.00	33.25	Pass	V	PK
10	4992.1328	-15.92	58.79	42.87	74.00	31.13	Pass	V	PK
11	5996.4664	-12.92	58.53	45.61	74.00	28.39	Pass	V	PK
12	8991.7328	-8.34	53.59	45.25	74.00	28.75	Pass	V	PK

External Antenna:

Mode:		Transmitting				Channel:		906MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1812.0541	-24.63	70.93	46.30	74.00	27.70	Pass	H	PK
2	2717.4478	-22.20	70.66	48.46	74.00	25.54	Pass	H	PK
3	3623.7749	-20.49	67.52	47.03	74.00	26.97	Pass	H	PK
4	4529.1686	-17.10	56.24	39.14	74.00	34.86	Pass	H	PK
5	6465.031	-12.86	52.62	39.76	74.00	34.24	Pass	H	PK
6	8309.4206	-11.15	53.69	42.54	74.00	31.46	Pass	H	PK
7	1327.6218	-26.71	74.07	47.36	74.00	26.64	Pass	V	PK
8	1812.0541	-24.63	70.39	45.76	74.00	28.24	Pass	V	PK
9	2717.4478	-22.20	67.23	45.03	74.00	28.97	Pass	V	PK
10	3623.7749	-20.49	65.65	45.16	74.00	28.84	Pass	V	PK
11	4992.1328	-15.92	58.79	42.87	74.00	31.13	Pass	V	PK
12	7486.1657	-11.27	53.20	41.93	74.00	32.07	Pass	V	PK

Mode:		Transmitting				Channel:		914MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1329.4886	-26.72	68.85	42.13	74.00	31.87	Pass	H	PK
2	1994.0663	-23.65	63.74	40.09	74.00	33.91	Pass	H	PK
3	2741.7161	-22.10	65.88	43.78	74.00	30.22	Pass	H	PK
4	4369.558	-16.85	53.92	37.07	74.00	36.93	Pass	H	PK
5	6448.2299	-12.87	54.29	41.42	74.00	32.58	Pass	H	PK
6	9276.4184	-7.95	51.42	43.47	74.00	30.53	Pass	H	PK
7	1333.2222	-26.73	72.06	45.33	74.00	28.67	Pass	V	PK
8	1978.1985	-23.73	65.79	42.06	74.00	31.94	Pass	V	PK
9	2499.9667	-22.78	63.52	40.74	74.00	33.26	Pass	V	PK
10	4797.0531	-16.31	58.78	42.47	74.00	31.53	Pass	V	PK
11	5991.7995	-12.95	56.87	43.92	74.00	30.08	Pass	V	PK
12	7478.6986	-11.31	53.96	42.65	74.00	31.35	Pass	V	PK

Mode:		Transmitting				Channel:		924 MHz	
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1329.4886	-26.72	68.33	41.61	74.00	32.39	Pass	H	PK
2	1999.6666	-23.61	62.58	38.97	74.00	35.03	Pass	H	PK
3	3695.6464	-20.18	63.65	43.47	74.00	30.53	Pass	H	PK
4	5432.6955	-14.37	52.84	38.47	74.00	35.53	Pass	H	PK
5	7401.2267	-11.64	52.61	40.97	74.00	33.03	Pass	H	PK
6	9310.0207	-7.99	51.39	43.40	74.00	30.60	Pass	H	PK
7	1331.3554	-26.72	72.22	45.50	74.00	28.50	Pass	V	PK
8	1992.1995	-23.65	72.23	48.58	74.00	25.42	Pass	V	PK
9	2771.5848	-21.98	65.49	43.51	74.00	30.49	Pass	V	PK
10	4797.9865	-16.31	59.32	43.01	74.00	30.99	Pass	V	PK
11	5990.8661	-12.96	57.70	44.74	74.00	29.26	Pass	V	PK
12	8991.7328	-8.34	54.66	46.32	74.00	27.68	Pass	V	PK

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

   Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 25GHz, the disturbance above 10GHz and below 30MHz was very low. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

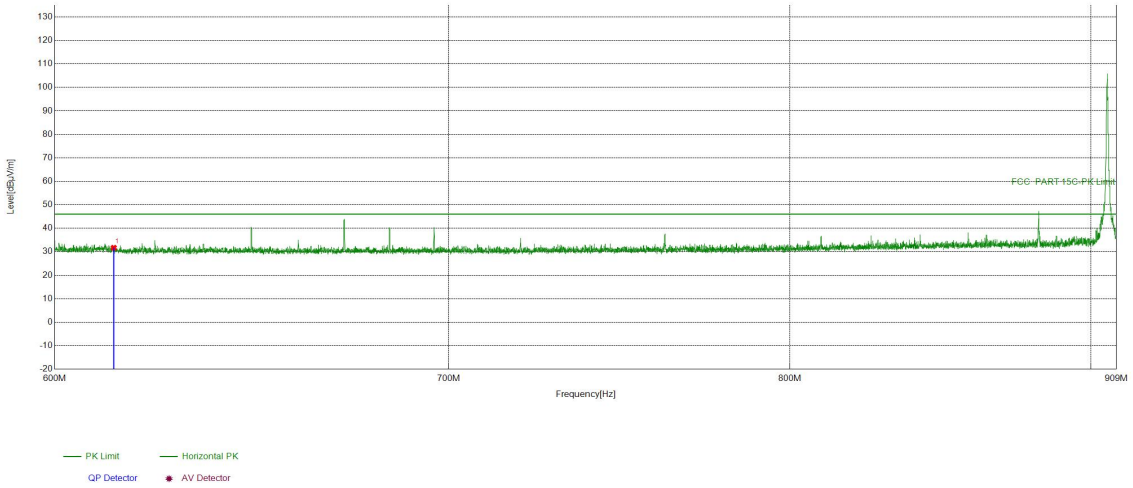
3) All modes were tested, only the worse case mode of powered by DC24V recorded in the report.

Restricted bands:

Test plot as follows:

Test_Mode		Test_Frequency	906MHz
Remark	Internal antenna		

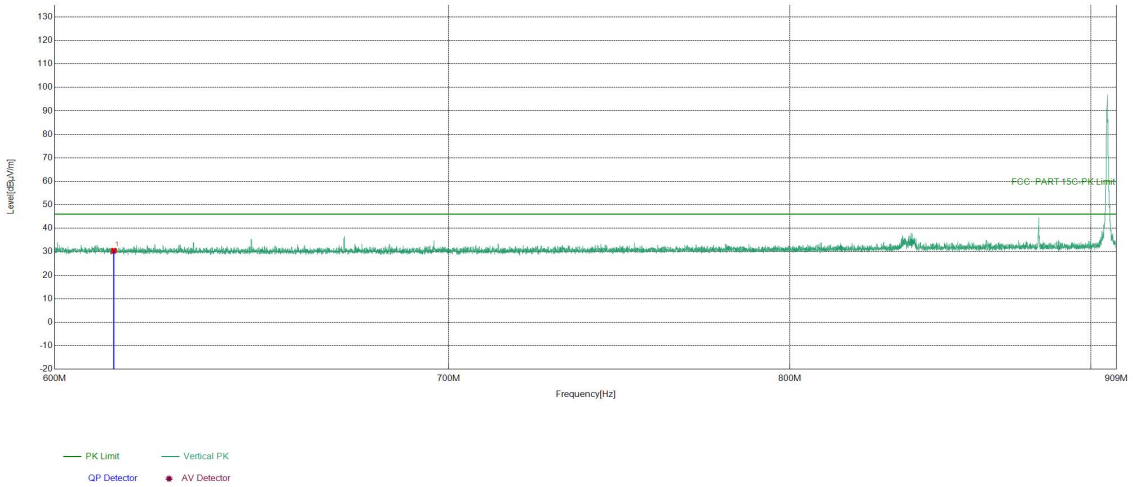
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	40.17	31.68	46.00	14.32	PASS	Horizontal	PK

Test_Mode		Test_Frequency	906MHz
Remark	Internal antenna		

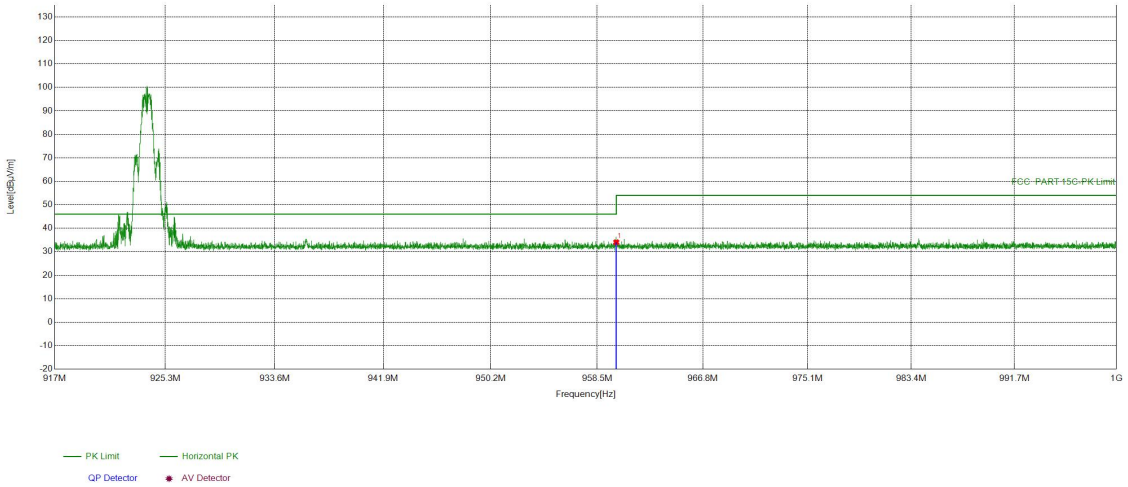
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	614	-8.49	38.92	30.43	46.00	15.57	PASS	Vertical	PK

Test_Mode		Test_Frequency	924MHz
Remark	Internal antenna		

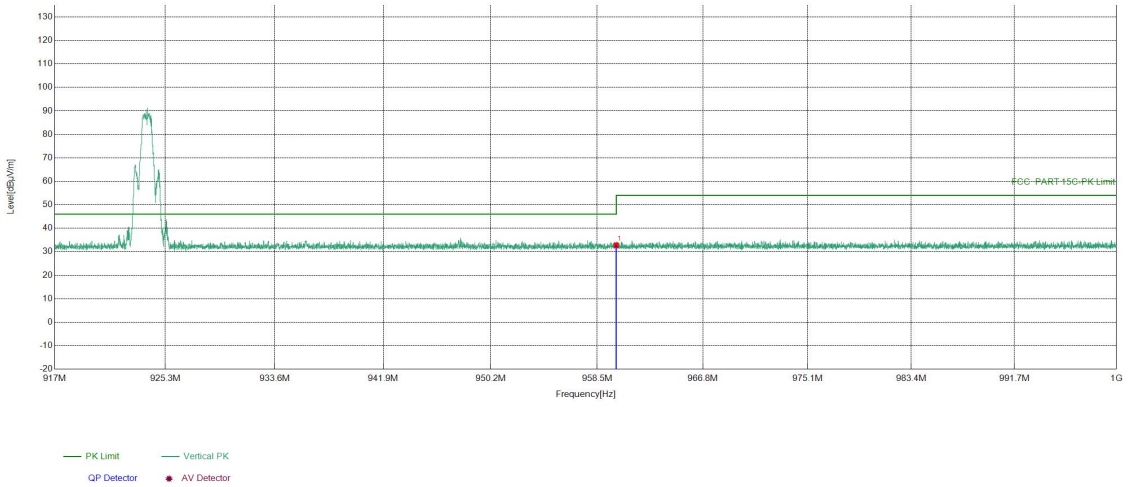
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	960	-4.37	38.40	34.03	54.00	19.97	PASS	Horizontal	PK

Test_Mode		Test_Frequency	924MHz
Remark	Internal antenna		

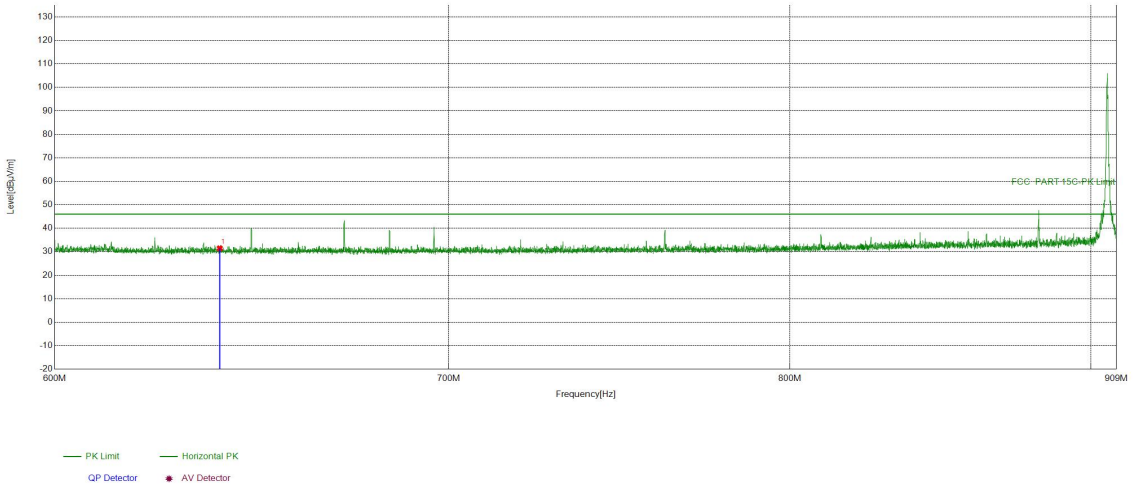
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	960	-4.37	37.15	32.78	54.00	21.22	PASS	Vertical	PK

Test_Mode		Test_Frequency	906MHz
Remark	External Antenna		

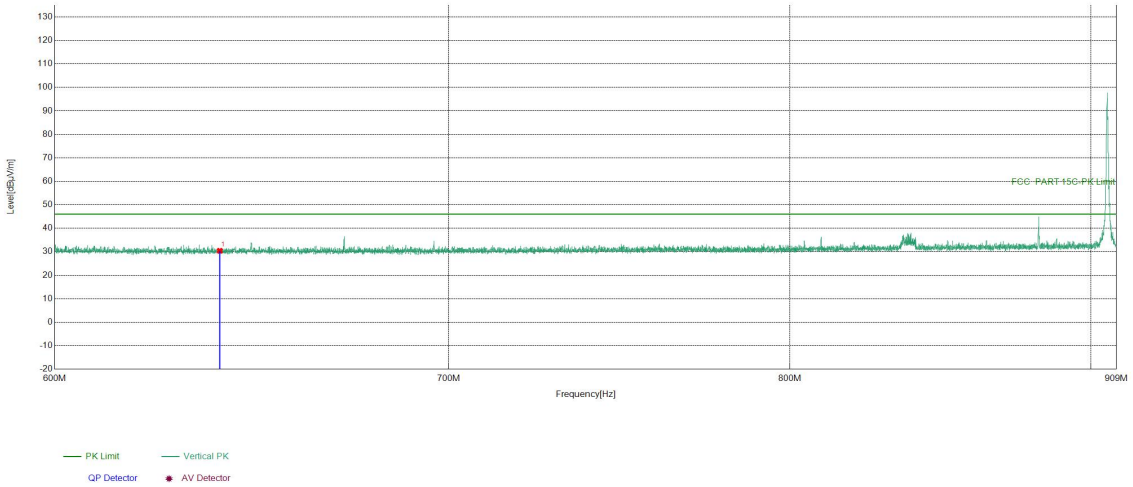
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	640	-8.33	39.80	31.47	46.00	14.53	PASS	Horizontal	PK

Test_Mode		Test_Frequency	906MHz
Remark	External Antenna		

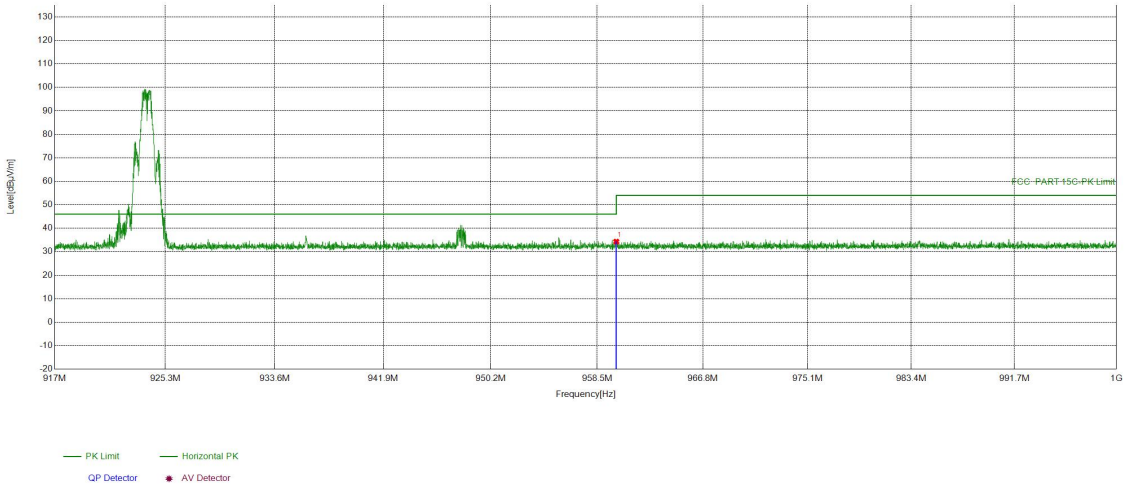
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	640	-8.33	38.74	30.41	46.00	15.59	PASS	Vertical	PK

Test_Mode		Test_Frequency	924MHz
Remark	External Antenna		

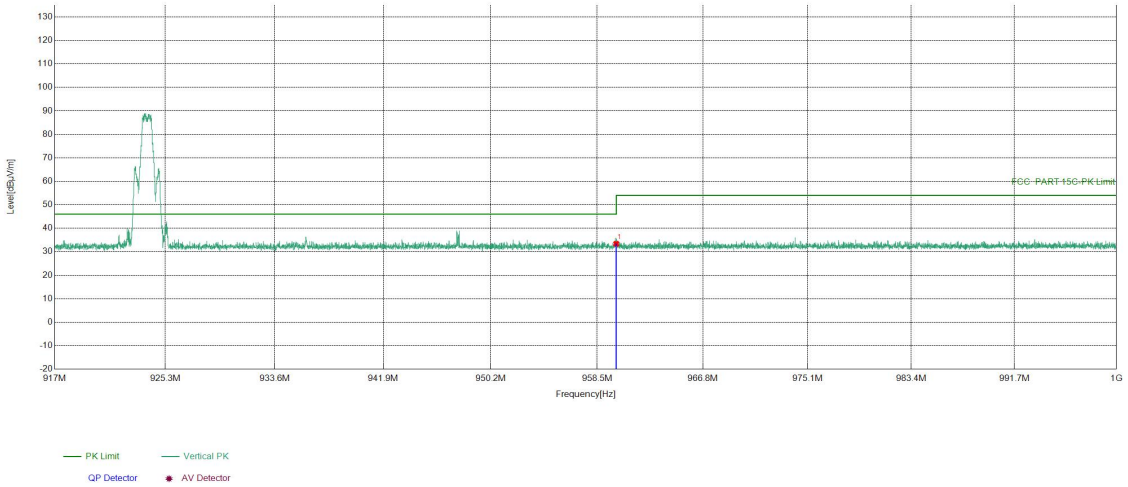
Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	960	-4.37	38.68	34.31	54.00	19.69	PASS	Horizontal	PK

Test_Mode		Test_Frequency	924MHz
Remark	External Antenna		

Test Graph



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	960	-4.37	37.78	33.41	54.00	20.59	PASS	Vertical	PK

Note:
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading -Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

All modes were tested, only the worse case mode of powered by DC24V recorded in the report.

8 Appendix :DTS

Refer to Appendix: DTS of EED32P80329501