



FCC Part 15 Rules & RSS-215 Test Report

Report No.: AGC00589131103FE08

FCC ID : PH3DJ-500
IC : 3070C-DJ500
TYPE OF AUTHORIZATION : Certification
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : VHF/UHF FM HANDHELD TRANSCEIVER
BRAND NAME : ALINCO
TEST MODEL : DJ-500T
CLIENT : Alinco Incorporated, Electronics Division
DATE OF ISSUE : Nov.14, 2013
STANDARD(S) : FCC Part 15 Rules&RSS-215
REPORT VERSION : V 1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov.14, 2013	Valid	Original Report

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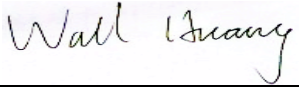
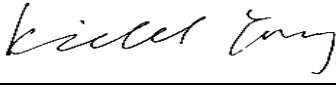
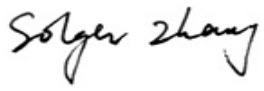
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1. VERIFICATION OF COMPLIANCE

Applicant	Alinco Incorporated, Electronics Division
Address	Yodoyabashi Dai-Bldg 13F, 4-4-9 Koraibashi, Chuo-Ku, Osaka 541-0043, Japan
Manufacturer	Alinco Incorporated, Electronics Division
Address	Yodoyabashi Dai-Bldg 13F, 4-4-9 Koraibashi, Chuo-Ku, Osaka 541-0043, Japan
Product Designation	VHF/UHF FM HANDHELD TRANSCEIVER
Brand name:	ALINCO
Test Model	DJ-500T
Hardware Version:	V1.0
Software Version:	V2.02
Measurement Procedure	ANSI C63.4: 2003
Date of test:	Nov.11, 2013 to Nov.13, 2013
Deviation:	None
Condition of Test Sample	Normal

The above equipment was tested by Attestation Of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, the measurement procedure according to ANSI C63.4:2003. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested by	
	Wall Huang Nov.14, 2013
Checked By	
	Kidd Yang Nov.14, 2013
Authorized By	
	Solger Zhang Nov.14, 2013

2. PRODUCT INFORMATION

The EUT is a VHF/UHF FM HANDHELD TRANSCEIVER designed for voice communication. It is designed by way of utilizing the FM modulation achieves the system operating.
A major technical description of EUT is described as following:

Communication Type	Voice / Tone only
Modulation	FM
RX Frequency Range	144MHz-148MHz&420MHz-450 MHz 136MHz-174MHz &400MHz-480MHz
Channel step	12.5KHz
Antenna Designation	Detachable
Power Supply	DC 7.4V by battery
Adapter Parameter	Input: 100-240V, 50/60HZ, 0.3A Output: 12V, 0.5A

I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	Q'TY	Cable	Tested with
DC Input Port	1	1.5m, Unshielded	
Antenna Connect Port	1	0	1
Hand-Operated Microphone Connect Port	1	0.5m, Unshielded	1

3. TEST FACILITY

Facility Attestation of Global Compliance (Shenzhen) Co., Ltd

Location: 2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu,
Xixiang, Bao'an District, Shenzhen, Guangdong, China

Description: The test site is constructed and calibrated to meet the FCC requirements in
documents ANSI C63.4:2003.

Site Filing: The FCC Registration Number is 259865

Instrument Tolerance: All measuring equipment is in accord with ANSI C63.4 requirements that meet
industry regulatory agency and accreditation agency requirement.

4. SUPPORT EQUIPMENT LIST

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
--	--	--	--	--	--

5. SYSTEM DESCRIPTION

EUT test procedure:

1. Connect EUT and peripheral devices.
2. Power on the EUT, the EUT begins to work.
3. Running data transmission and make sure the EUT normal working.

EMC TEST MODES

No.	TEST MODES
1	Scanning mode + Receiving mode

Note: Only the result of the worst case was recorded in the report.

6. SUMMARY OF TEST RESULTS

FCC Rules	RSS-215	Description Of Test	Result
§15.107	RSS-Gen	Conduction Emission	Compliant
§15.109	RSS-Gen	Radiated Emission	Compliant
§15.121	§4.1	Scanning receivers and frequency converters used with scanning receivers.	Compliant

7. FCC&RSS-215 LINE CONDUCTED EMISSION TEST

7.1. TEST EQUIPMENT OF LINE CONDUCTED EMISSION TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4440A	US41421290	07/17/2013	07/16/2014
EMI Test Receiver	Rohde & Schwarz	ESCI	100694	07/17/2013	07/16/2014
LISN	Rohde & Schwarz	ESH2-Z5	862060/020	07/17/2013	07/16/2014

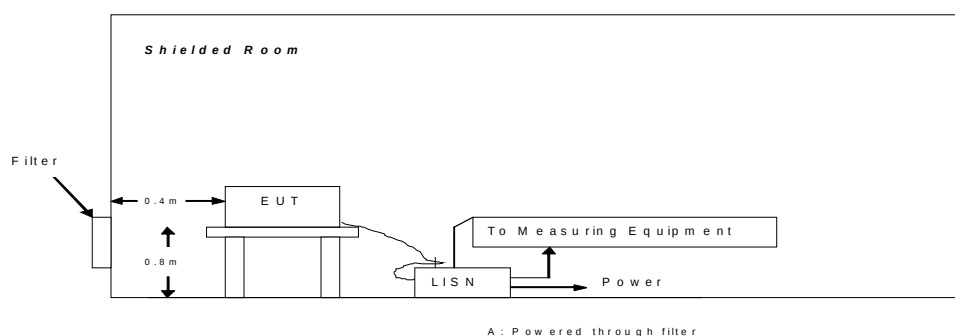
7.2 .LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

**Note: 1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

7.3. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



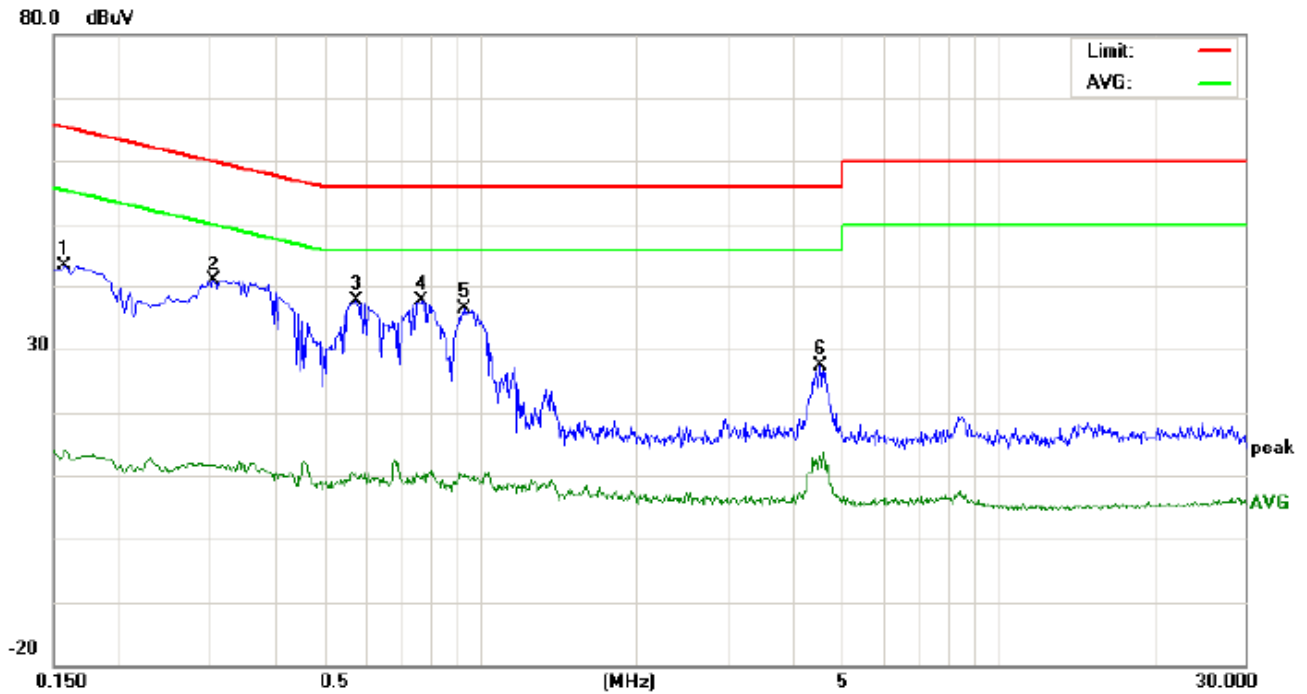
7.4. PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
The EUT received power through a Line Impedance Stabilization Network (LISN) that was grounded to the protect earth.
- 4) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 5) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 6) During the above scans, the emissions were maximized by cable manipulation.
- 7) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
- 8) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

The test data of the worst case condition (mode 1) was reported on the following Data page.

7.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST

Line Conducted Emission Test Line 1-L



Site: Conduction

Phase: **L1**

Temperature: 26

Limit: FCC Class B Conduction(QP)

Power:

Humidity: 60 %

EUT: VHF/UHF FM HANDHELD TRANSCEIVER

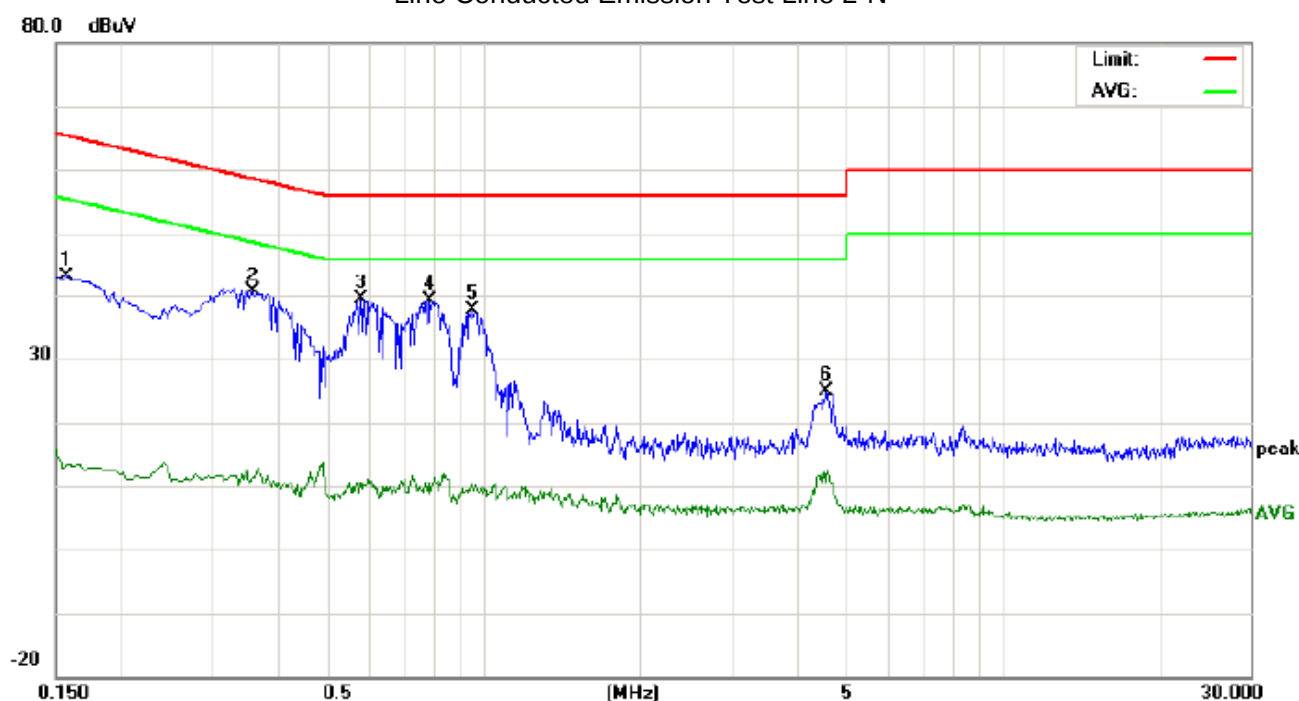
M/N: DJ-500T

Mode: Mode 1

Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1580	33.28		3.77	10.17	43.45		13.94	65.56	55.56	-22.11	-41.62	P	
2	0.3059	30.48		1.39	10.29	40.77		11.68	60.08	50.08	-19.31	-38.40	P	
3	0.5778	27.29		-0.43	10.33	37.62		9.90	56.00	46.00	-18.38	-36.10	P	
4	0.7740	27.45		-0.41	10.30	37.75		9.89	56.00	46.00	-18.25	-36.11	P	
5	0.9378	25.93		-0.37	10.39	36.32		10.02	56.00	46.00	-19.68	-35.98	P	
6	4.5339	17.23		2.98	10.21	27.44		13.19	56.00	46.00	-28.56	-32.81	P	

Line Conducted Emission Test Line 2-N



Site: Conduction Phase: **N** Temperature: 26
Limit: FCC Class B Conduction(QP) Power: Humidity: 60 %
EUT: VHF/UHF FM HANDHELD TRANSCEIVER
M/N: DJ-500T
Mode: Mode 1
Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1580	33.05		3.15	10.17	43.22		13.32	65.56	55.56	-22.34	-42.24	P	
2	0.3578	30.32		1.01	10.31	40.63		11.32	58.78	48.78	-18.15	-37.46	P	
3	0.5818	29.13		0.21	10.33	39.46		10.54	56.00	46.00	-16.54	-35.46	P	
4	0.7900	28.88		0.27	10.29	39.17		10.56	56.00	46.00	-16.83	-35.44	P	
5	0.9498	27.34		-0.05	10.39	37.73		10.34	56.00	46.00	-18.27	-35.66	P	
6	4.5777	14.54		1.49	10.21	24.75		11.70	56.00	46.00	-31.25	-34.30	P	

8. FCC&RSS-215 RADIATED EMISSION TEST

8.1. TEST EQUIPMENT OF RADIATED EMISSION

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	07/17/2013	07/16/2014
ANTENNA	A.H.	SAS-521-4	26	07/17/2013	07/16/2014
HORN ANTENNA	EM	EM-AH-10180	67	04/20/2013	04/19/2014
AMPLIFIER	EM	EM30180	0607030	07/18/2013	07/17/2014
POSITIONING CONTROLLER	MF	MF-7802	MF780208147	07/17/2013	07/16/2014

8.2. LIMITS OF RADIATED EMISSION TEST

PROVISIONS APPLICABLE

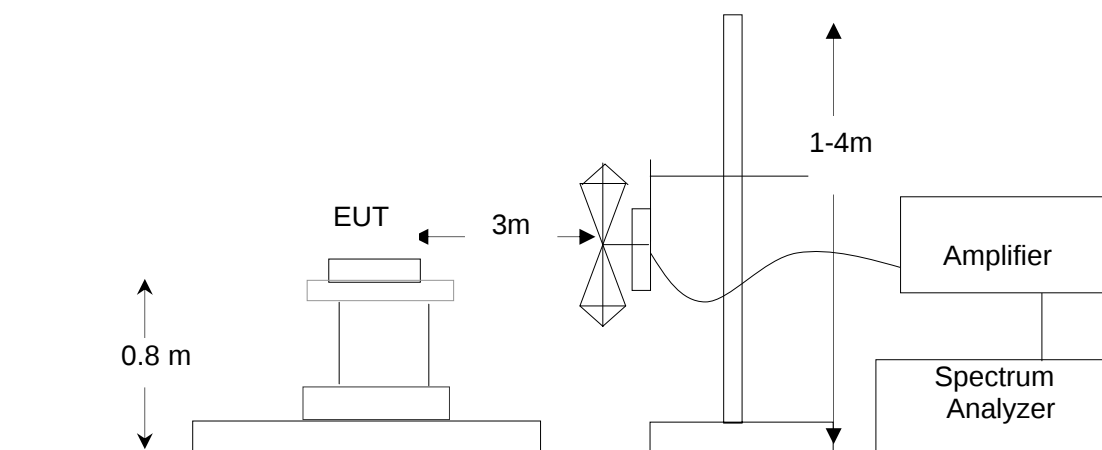
FCC Part 15 Subpart B Section 15.109

RSS-215 Section 5.1

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m/ Q.P.)
30~88	3	40.0
88~216	3	43.5
216~960	3	46.0
Above 960	3	54.0

**Note: The lower limit shall apply at the transition frequency.

8.3 BLOCK DIAGRAM OF RADIATED EMISSION TEST



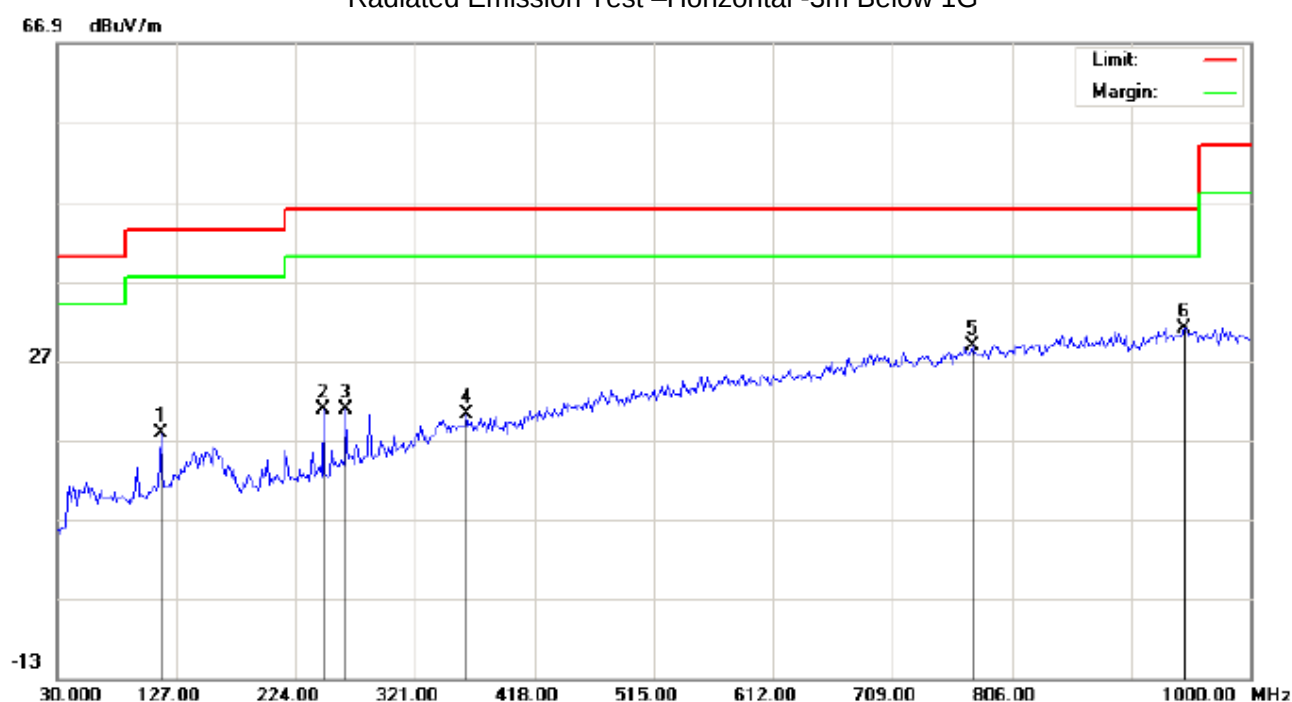
8.4 PROCEDURE OF RADIATED EMISSION TEST

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) The EUT received DC 7.4V by DC source. All support equipments received AC 120V/60Hz power from socket under the turntable, if any.
- 5) The antenna was placed at 3 meter away from the EUT as stated in FCC Part 15. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- 6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 7) The test mode(s) were scanned during the test:
- 8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

The test data of the worst case condition(mode 1) was reported on the following Data page

8.5 TEST RESULT OF RADIATED EMISSION TEST

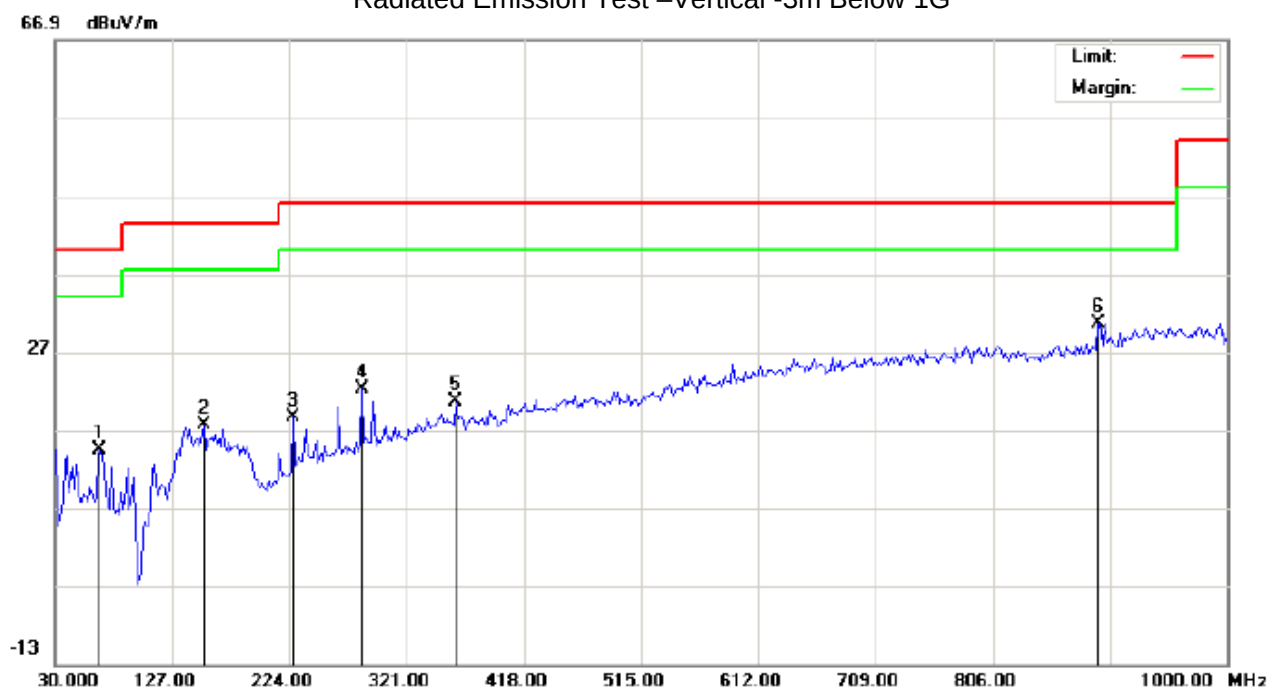
Radiated Emission Test –Horizontal -3m Below 1G



Site: site #1	Polarization: Horizontal	Temperature: 26
Limit: FCC Class B 3M Radiation	Power:	Humidity: 60 %
EUT: VHF/UHF FM HANDHELD TRANSCEIVER	Distance: 3m	
M/N: DJ-500T		
Mode: Mode 1		
Note:		

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		114.0667	6.45	11.45	17.90	43.50	-25.60	peak			
2		246.6333	7.03	13.77	20.80	46.00	-25.20	peak			
3		264.4167	6.53	14.34	20.87	46.00	-25.13	peak			
4		363.0333	1.31	18.83	20.14	46.00	-25.86	peak			
5		773.6667	1.86	26.96	28.82	46.00	-17.18	peak			
6	*	946.6500	1.13	29.91	31.04	46.00	-14.96	peak			

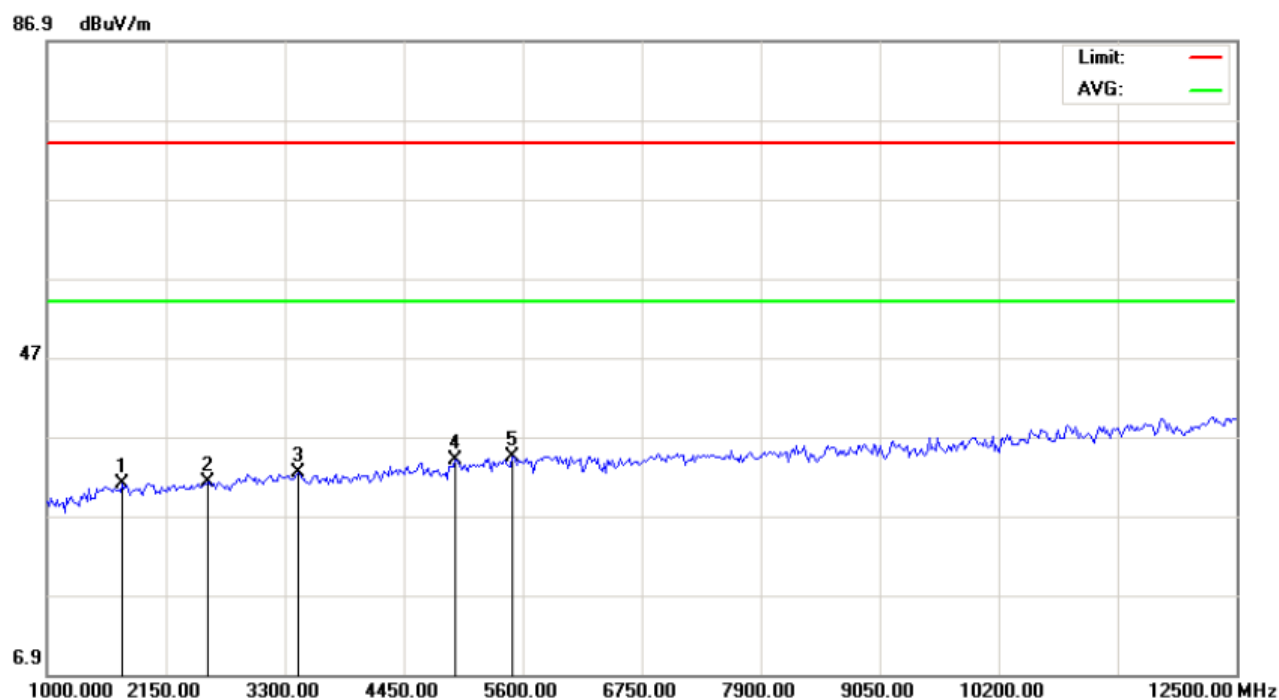
Radiated Emission Test –Vertical -3m Below 1G



Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation Power: Humidity: 60 %
EUT: VHF/UHF FM HANDHELD TRANSCEIVER Distance: 3m
M/N: DJ-500T
Mode: Mode 1
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		67.1833	9.04	5.36	14.40	40.00	-25.60	peak			
2		152.8667	2.29	15.28	17.57	43.50	-25.93	peak			
3		227.2333	6.86	11.67	18.53	46.00	-27.47	peak			
4		283.8167	7.29	14.92	22.21	46.00	-23.79	peak			
5		361.4167	1.86	18.82	20.68	46.00	-25.32	peak			
6	*	893.3000	2.25	28.44	30.69	46.00	-15.31	peak			

Radiated Emission Test –Horizontal -3m Above 1G



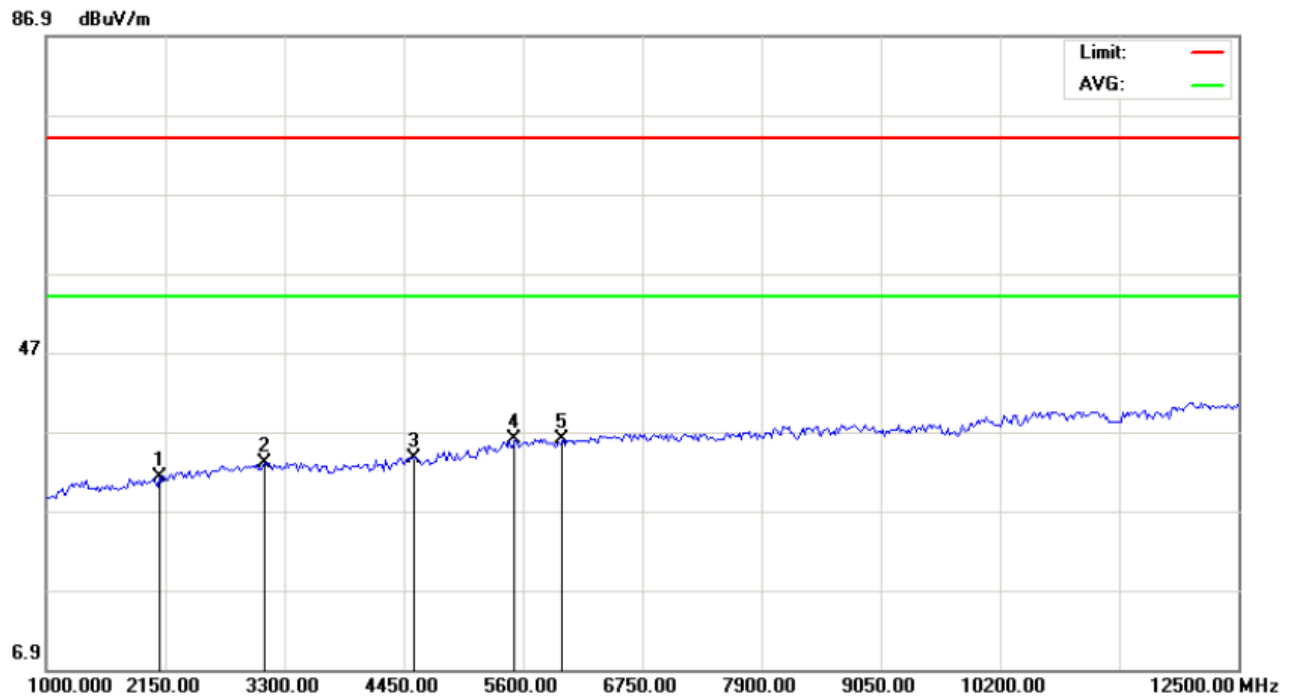
Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: VHF/UHF FM HANDHELD TRANSCEIVER
M/N: DJ-500T
Mode: Mode 1
Note:

Polarization: **Horizontal**
Power: DC 7.4V
Distance:

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		1728.333	43.93	-12.98	30.95	74.00	-43.05	peak			
2		2552.500	40.71	-9.44	31.27	74.00	-42.73	peak			
3		3434.167	40.33	-7.95	32.38	74.00	-41.62	peak			
4		4948.333	35.92	-1.94	33.98	74.00	-40.02	peak			
5	*	5504.167	36.19	-1.81	34.38	74.00	-39.62	peak			

Radiated Emission Test –Vertical -3m Above 1G

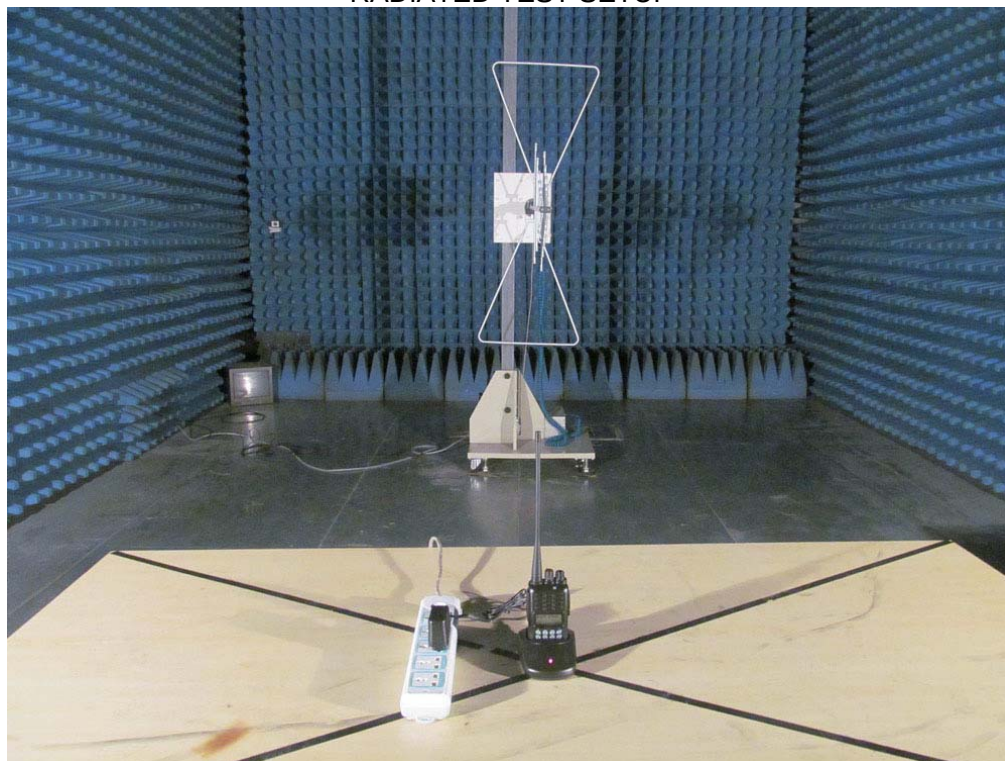


Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: DC 7.4V Humidity: 60 %
EUT: VHF/UHF FM HANDHELD TRANSCEIVER Distance:
M/N: DJ-500T
Mode: Mode 1
Note:

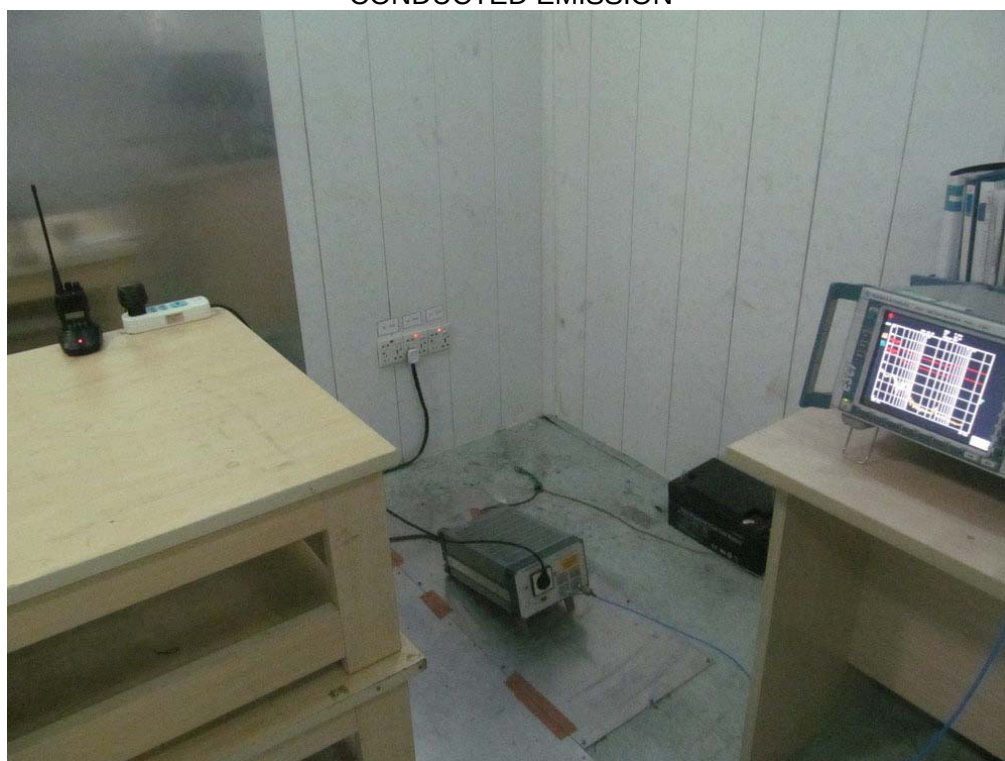
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2092.500	41.25	-10.02	31.23	74.00	-42.77	peak			
2		3108.333	41.25	-8.26	32.99	74.00	-41.01	peak			
3		4545.833	36.69	-2.99	33.70	74.00	-40.30	peak			
4	*	5523.333	37.78	-1.80	35.98	74.00	-38.02	peak			
5		5983.333	37.57	-1.59	35.98	74.00	-38.02	peak			

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

RADIATED TEST SETUP



CONDUCTED EMISSION



APPENDIX 2
PHOTOGRAPHS OF EUT
WHOLE VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



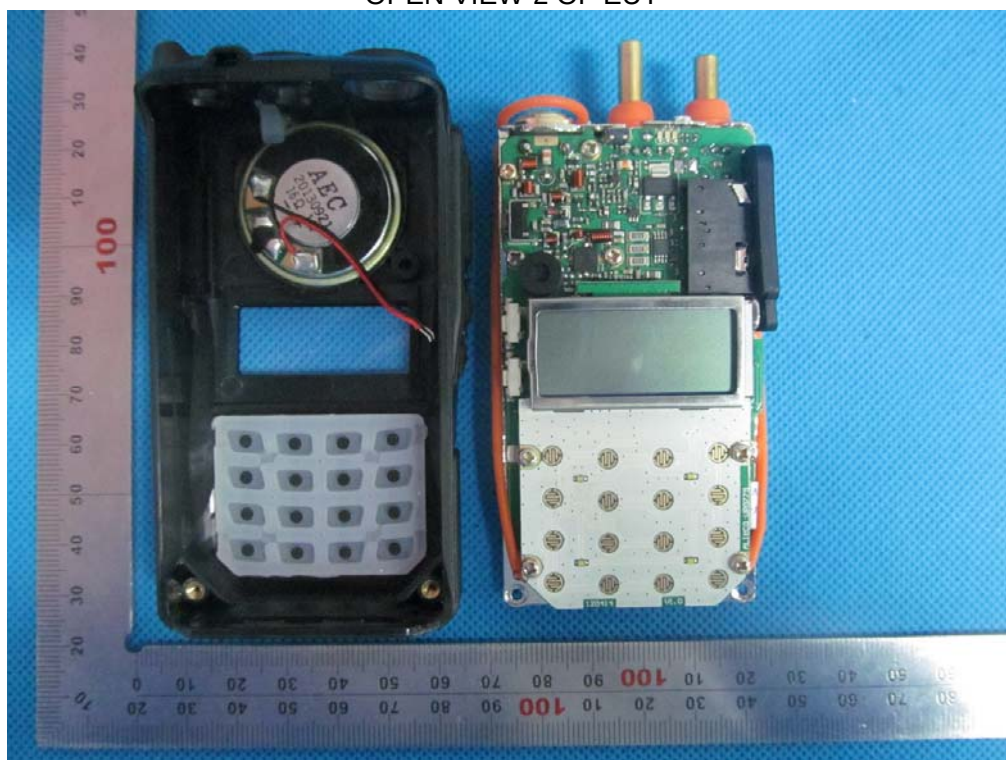
RIGHT VIEW OF EUT



OPEN VIEW-1 OF EUT



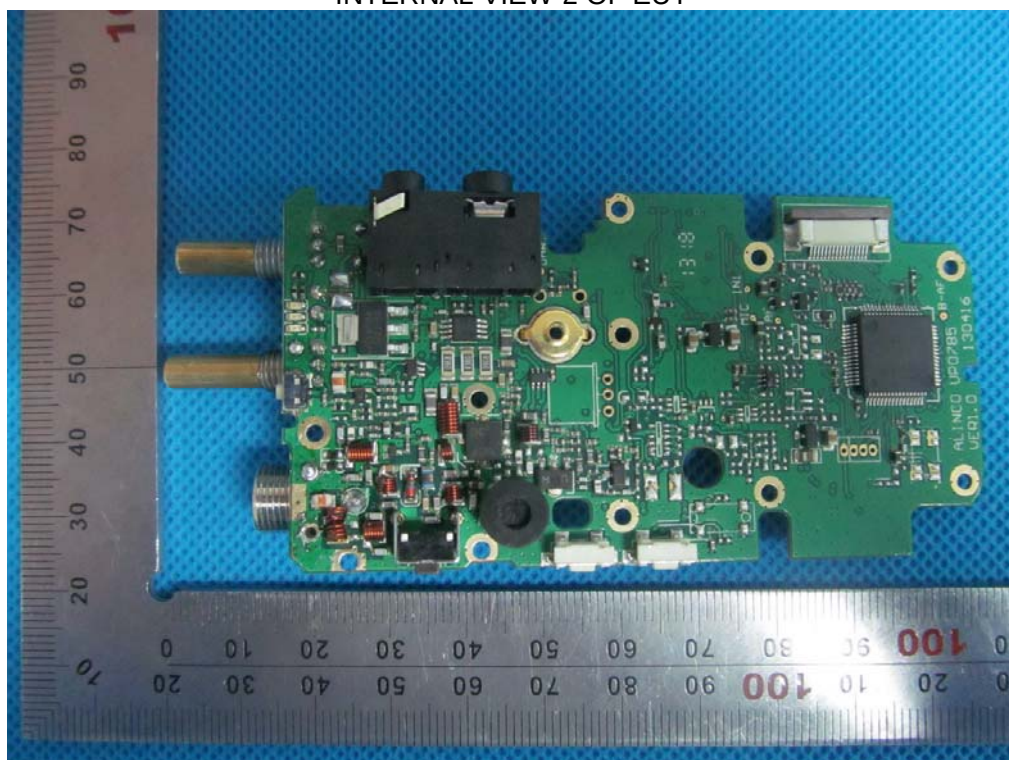
OPEN VIEW-2 OF EUT



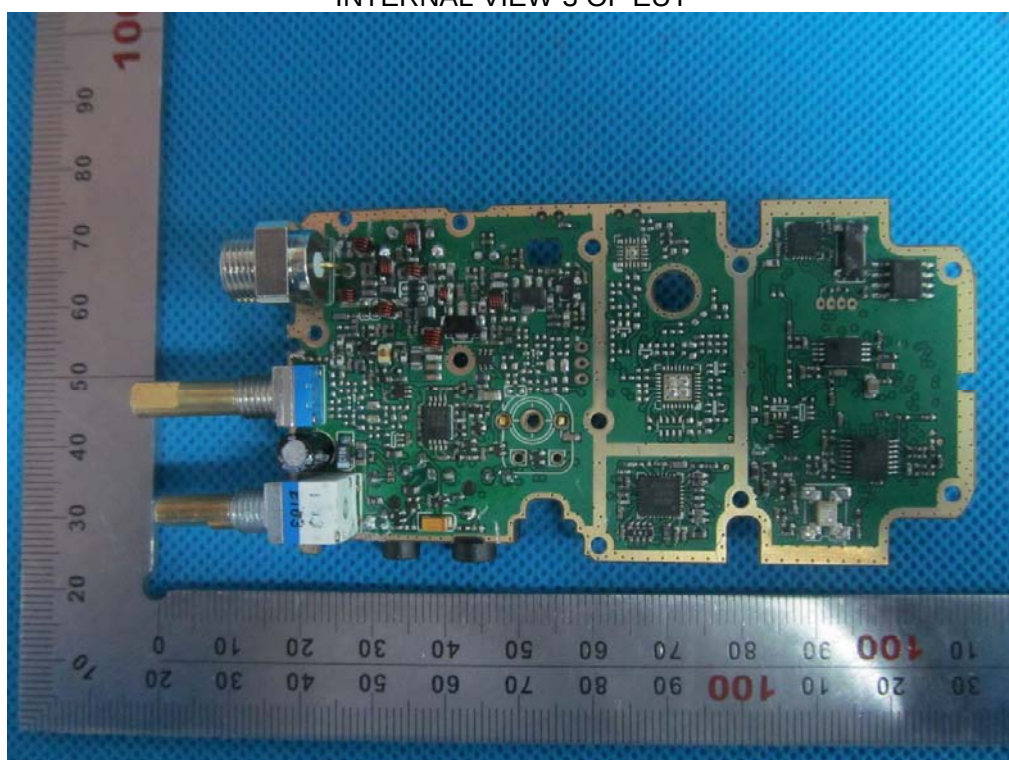
INTERNAL VIEW-1 OF EUT



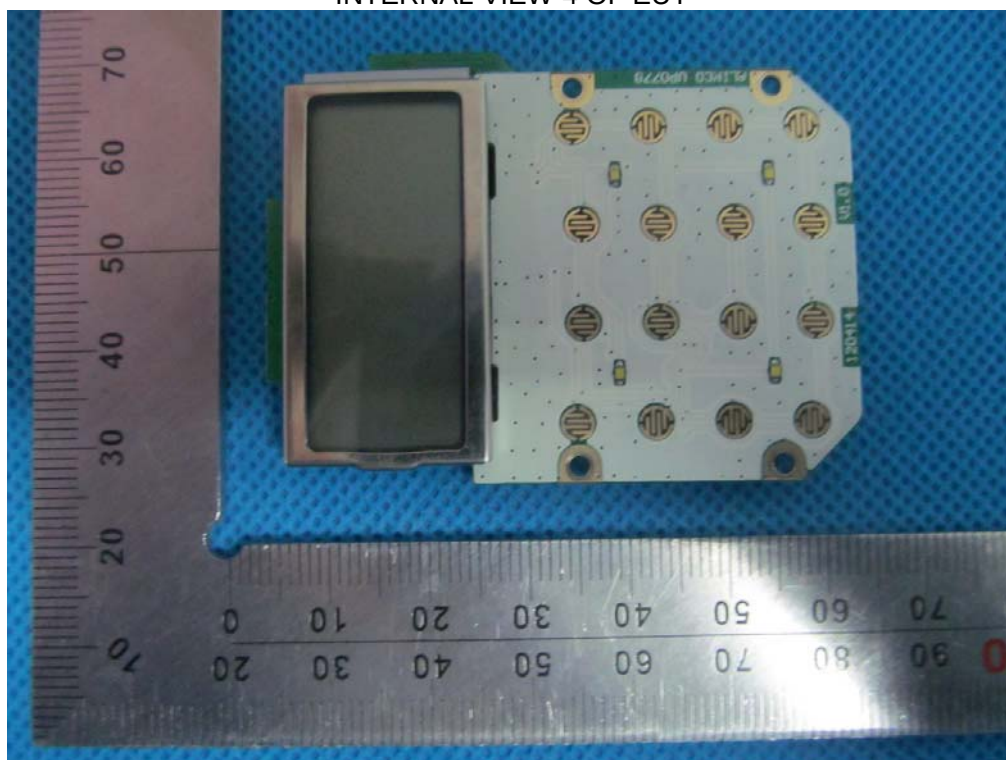
INTERNAL VIEW-2 OF EUT



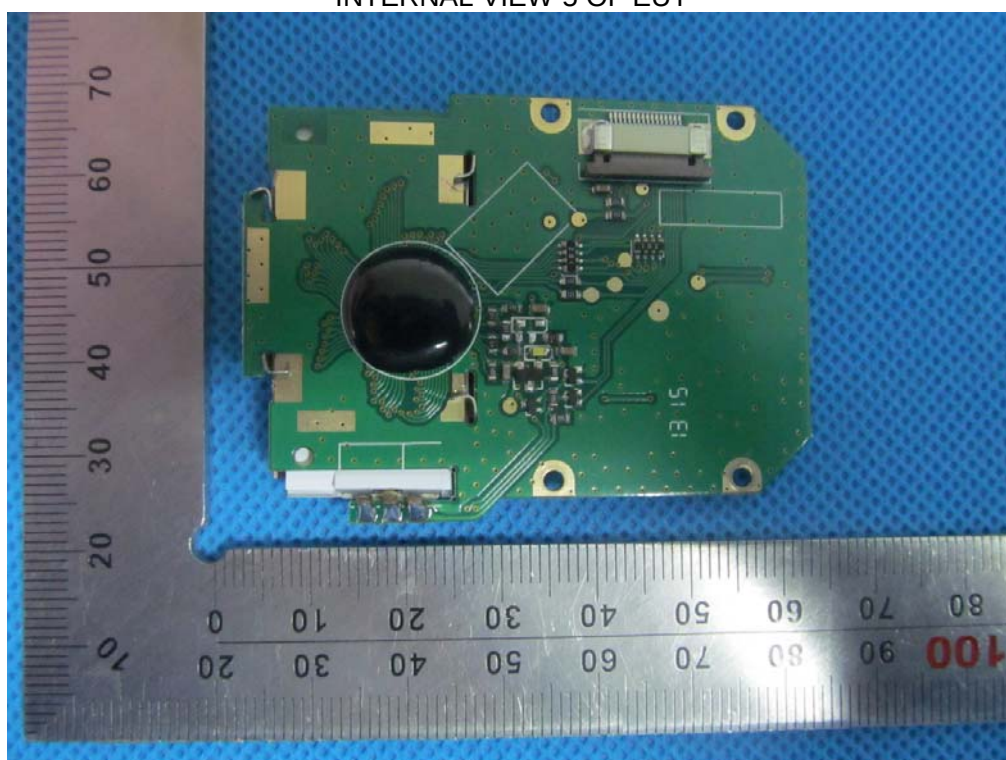
INTERNAL VIEW-3 OF EUT



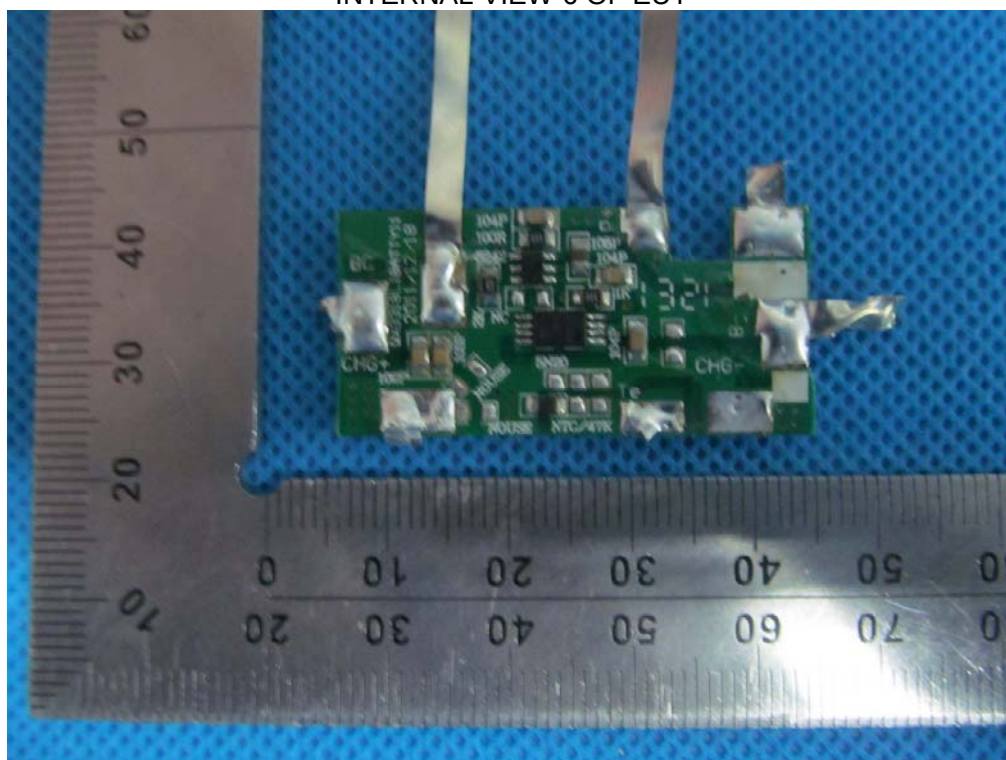
INTERNAL VIEW-4 OF EUT



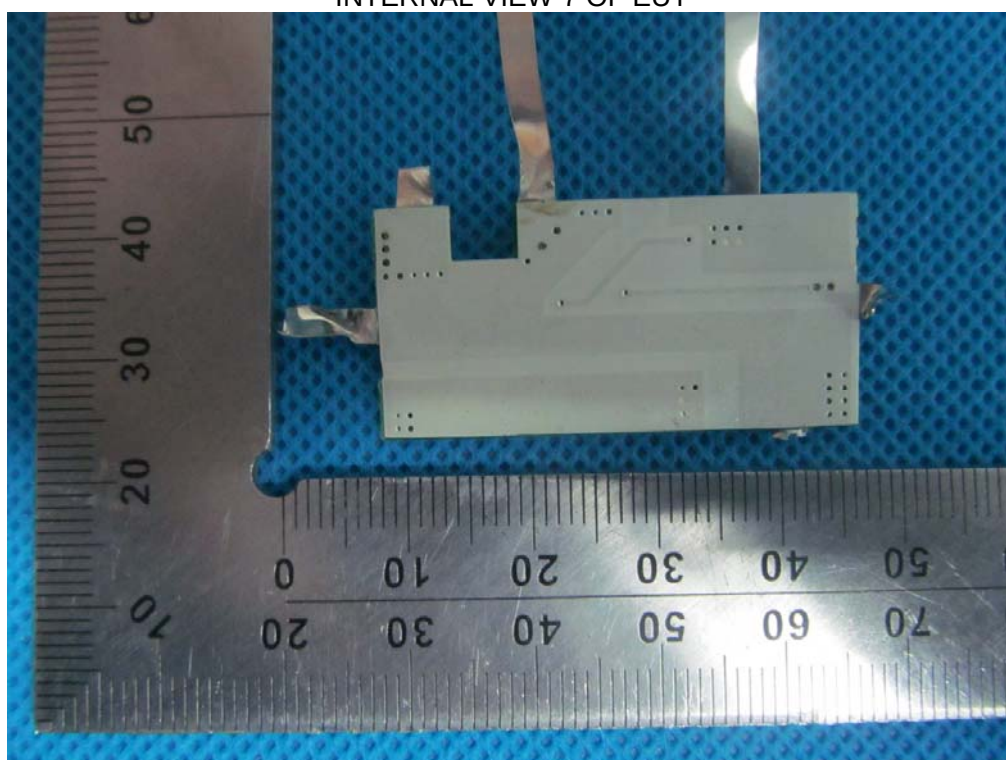
INTERNAL VIEW-5 OF EUT



INTERNAL VIEW-6 OF EUT



INTERNAL VIEW-7 OF EUT



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