
FCC Test Report

Report No.: AGC02X130602F1

FCC ID : PH3-DR138HT
TYPE OF AUTHORIZATION : Declaration of Conformity
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : VHF FM MOBILE TRANSCEIVER
BRAND NAME : ALINCO
TEST MODEL : DR-138HT
CLIENT : Alinco, Inc. Electronics Division
DATE OF ISSUE : July 18, 2013
STANDARD(S) : FCC Part 15 Rules
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	/	July 18, 2013	Valid	Original Report

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1. VERIFICATION OF COMPLIANCE

Applicant	Alinco, Inc. Electronics Division
Address	Yodoyabashi Dai-Bldg 13F, 4-4-9 Koraibashi, Chuo-Ku, Osaka 541-0043, Japan
Manufacturer	Alinco, Inc. Electronics Division
Address	Yodoyabashi Dai-Bldg 13F, 4-4-9 Koraibashi, Chuo-Ku, Osaka 541-0043, Japan
Product Designation	VHF FM MOBILE TRANSCEIVER
Brand name:	ALINCO
Test Model	DR-138HT
Hardware Version:	V1.0
Software Version:	V1.0
Measurement Procedure	ANSI C63.4: 2003
Date of test:	July 11, 2013 to July 16, 2013
Deviation:	None
Condition of Test Sample	Normal

The above equipment was tested by Attestation Of Global Compliance 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.

Test By:

Wall Huang

Wall Huang July 18, 2013

Reviewed By:

Forrest Lei

Forrest Lei July 18, 2013

Authorized By:

Solger Zhang

Solger Zhang July 18, 2013

2. PRODUCT INFORMATION

The EUT is a VHF FM MOBILE 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
Emission Type	11KφF3E
Antenna Designation	Detachable
Power Supply	DC 13.8V by DC source

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
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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	Standby Mode + (Charging)

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

6. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.107	Conduction Emission	N/A
§15.109	Radiated Emission	Compliant

7. FCC 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	07/18/2012	07/17/2013
EMI Test Receiver	Rohde & Schwarz	ESCI	100694	07/18/2012	07/17/2013
LISN	Rohde & Schwarz	ESH2-Z5	862060/020	07/18/2012	07/17/2013

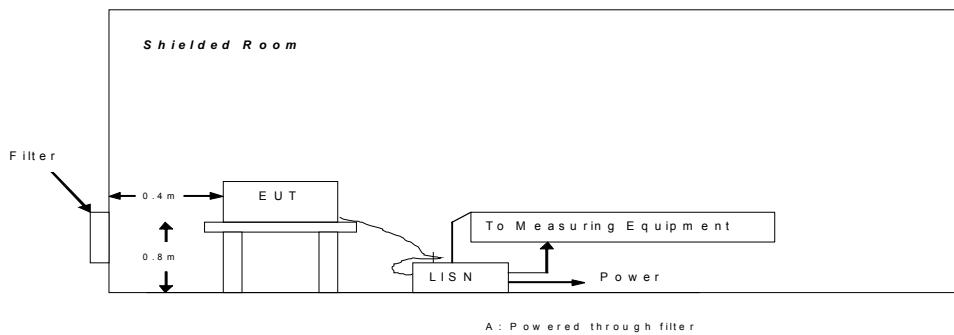
7.2 .LIMITS OF LINE CONDUCTED EMISSION TEST

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 2) was reported on the following Data page.

7.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST

N/A

8. FCC RADIATED EMISSION TEST

8.1. TEST EQUIPMENT OF RADIATED EMISSION

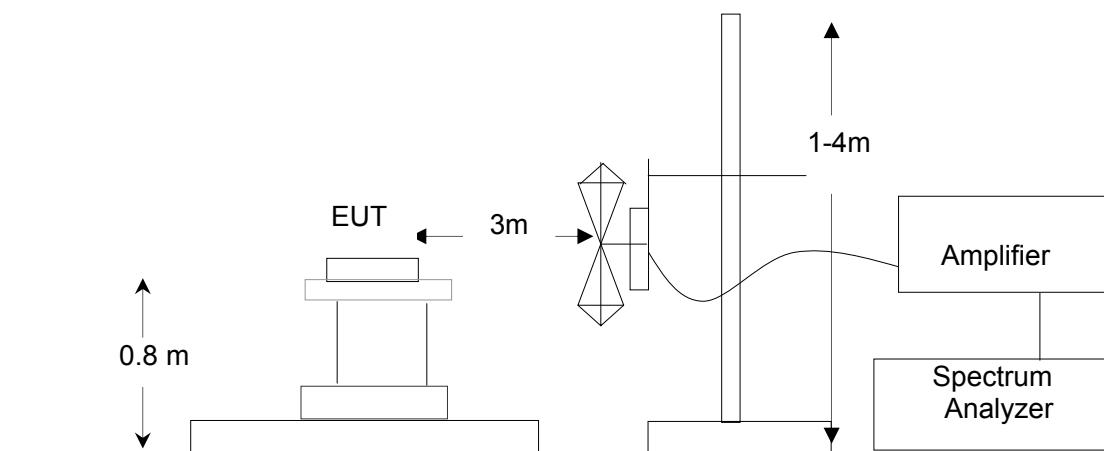
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	US41421290	07/18/2013	07/17/2014
ANTENNA	A.H.	SAS-521-4	26	07/18/2013	07/17/2014
HORN ANTENNA	EM	EM-AH-10180	67	04/21/2013	04/20/2014
AMPLIFIER	EM	EM30180	0607030	07/18/2013	07/17/2014
POSITIONING CONTROLLER	MF	MF-7802	MF780208147	07/18/2013	07/17/2014

8.2. LIMITS OF RADIATED EMISSION TEST

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



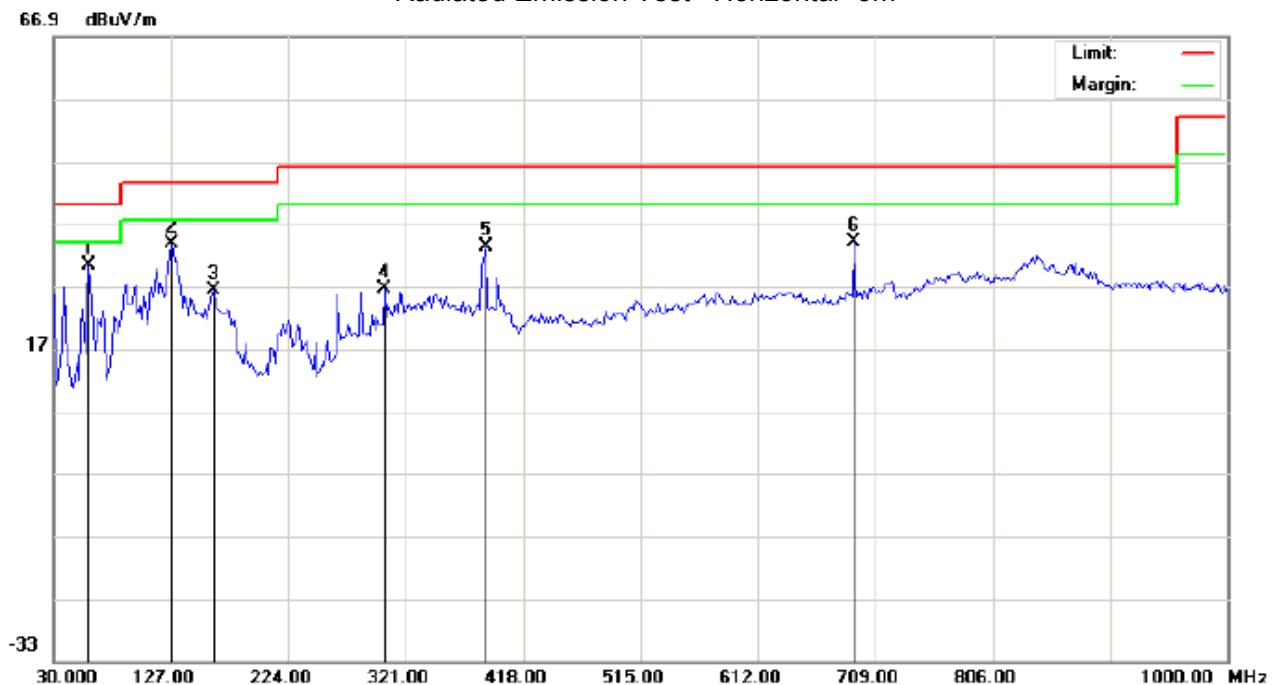
8.4 PROCEDURE OF RADIATED EMISSION TEST

- 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 13.8V 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

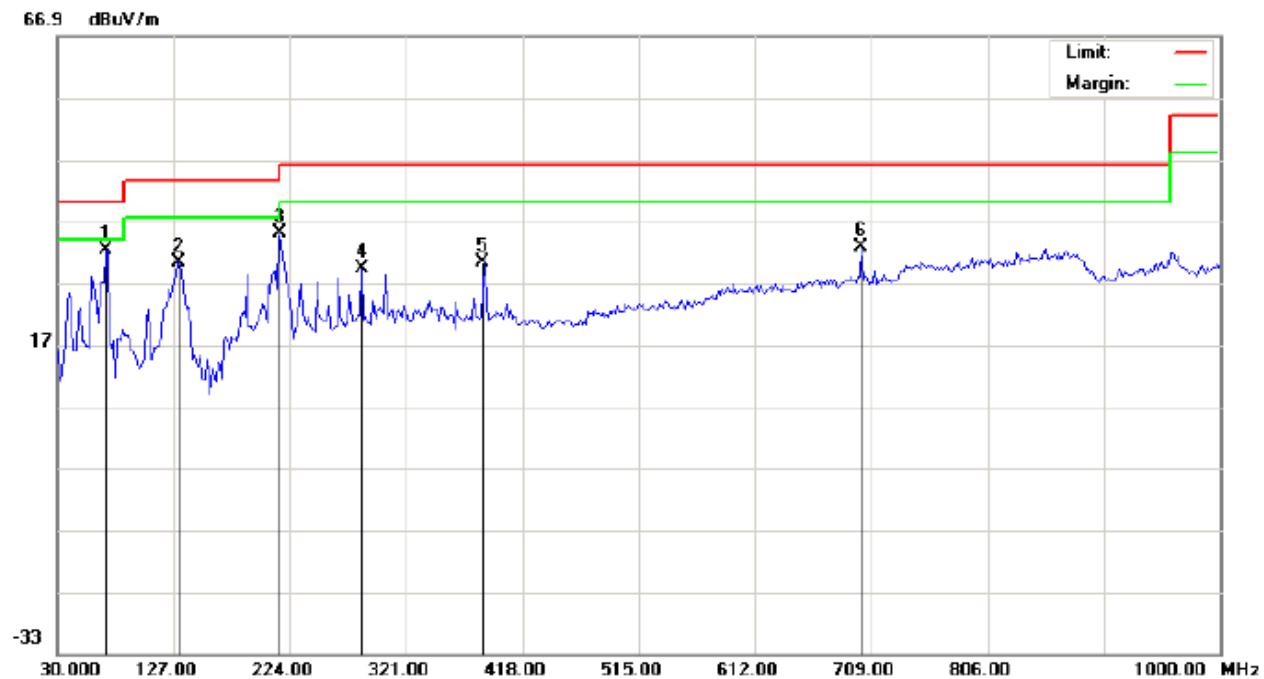
Radiated Emission Test –Horizontal -3m



Site: site #1 Polarization: **Horizontal** Temperature: 26
 Limit: FCC Class B 3M Radiation Power: Humidity: 60 %
 EUT: VHF FM MOBILE TRANSCEIVER Distance: 3m
 M/N: DR-138HT
 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		59.1000	26.72	3.63	30.35	40.00	-9.65	peak			
2	*	127.0000	20.58	13.30	33.88	43.50	-9.62	peak			
3		162.5666	13.11	13.20	26.31	43.50	-17.19	peak			
4		303.2167	9.31	17.21	26.52	46.00	-19.48	peak			
5		387.2832	15.16	18.00	33.16	46.00	-12.84	peak			
6		691.2166	11.00	23.15	34.15	46.00	-11.85	peak			

Radiated Emission Test –Vertical -3m

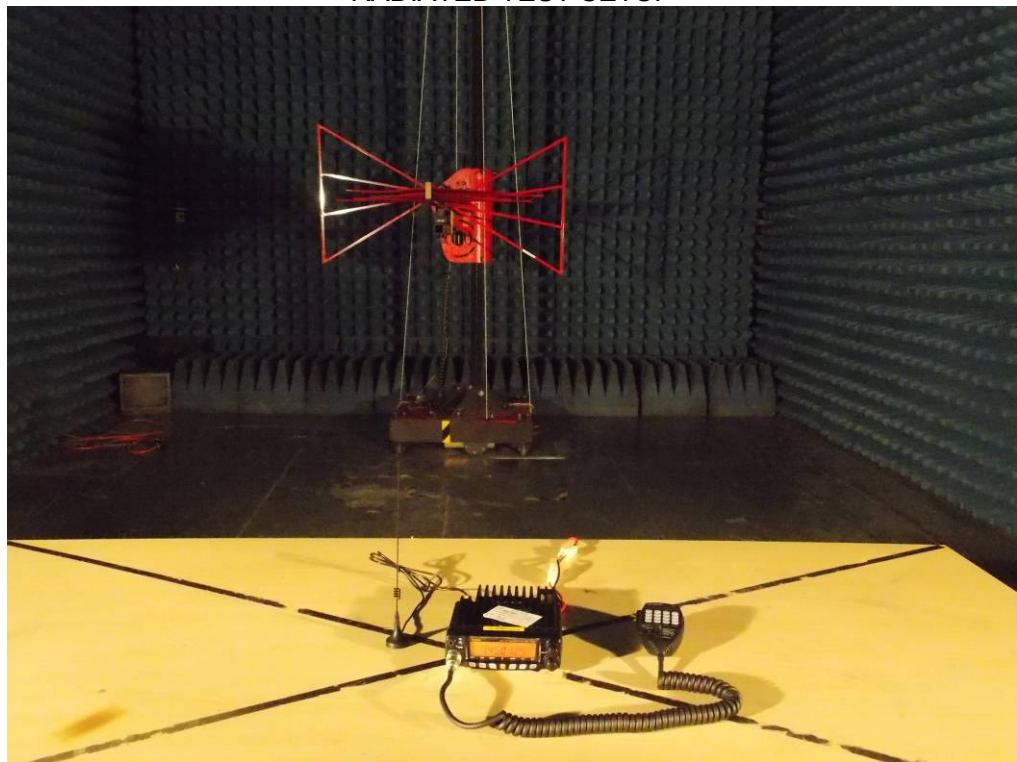


Site: site #1 Polarization: **Vertical** Temperature: 26
 Limit: FCC Class B 3M Radiation Power: Humidity: 60 %
 EUT: VHF FM MOBILE TRANSCEIVER Distance: 3m
 M/N: DR-138HT
 Mode: Mode 1
 Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna	Table	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	Degree	
1	*	70.4167	28.02	4.34	32.36	40.00	-7.64	peak			
2		131.8499	20.40	9.93	30.33	43.50	-13.17	peak			
3		215.9166	27.54	7.56	35.10	43.50	-8.40	peak			
4		283.8167	12.05	17.16	29.21	46.00	-16.79	peak			
5		385.6666	11.27	19.12	30.39	46.00	-15.61	peak			
6		700.9166	6.24	26.61	32.85	46.00	-13.15	peak			

APPENDIX 1
PHOTOGRAPHS OF TEST SETUP

RADIATED TEST SETUP



APPENDIX 2 PHOTOGRAPHS OF EUT

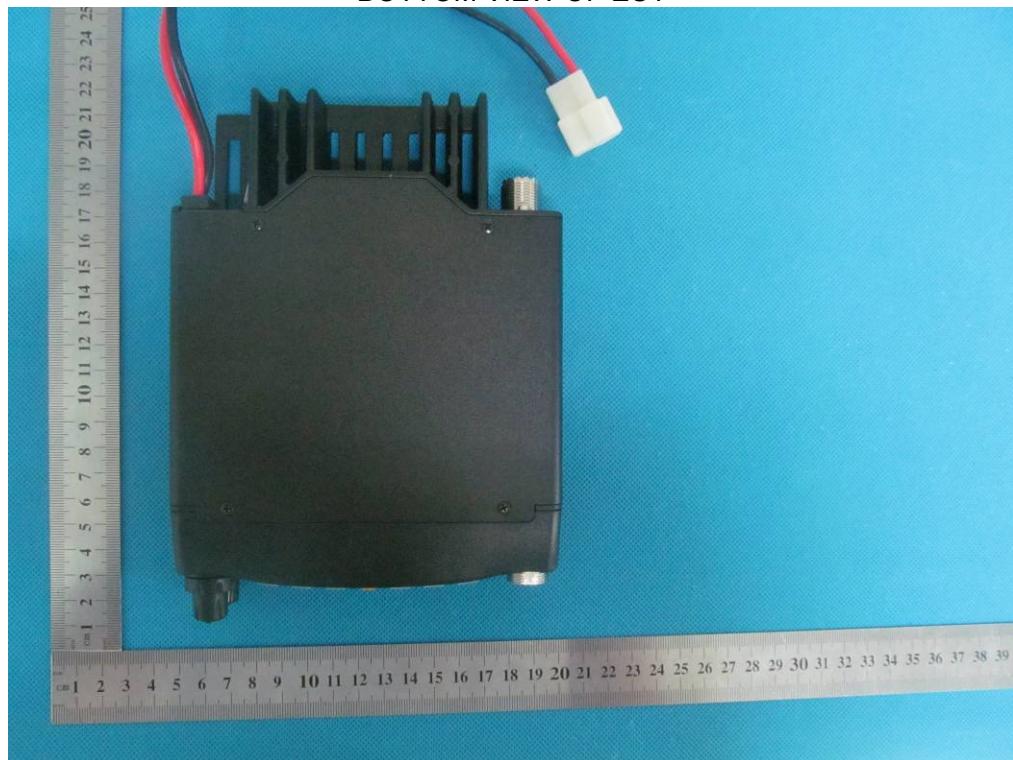
WHOLE VIEW OF EUT



TOP VIEW OF EUT



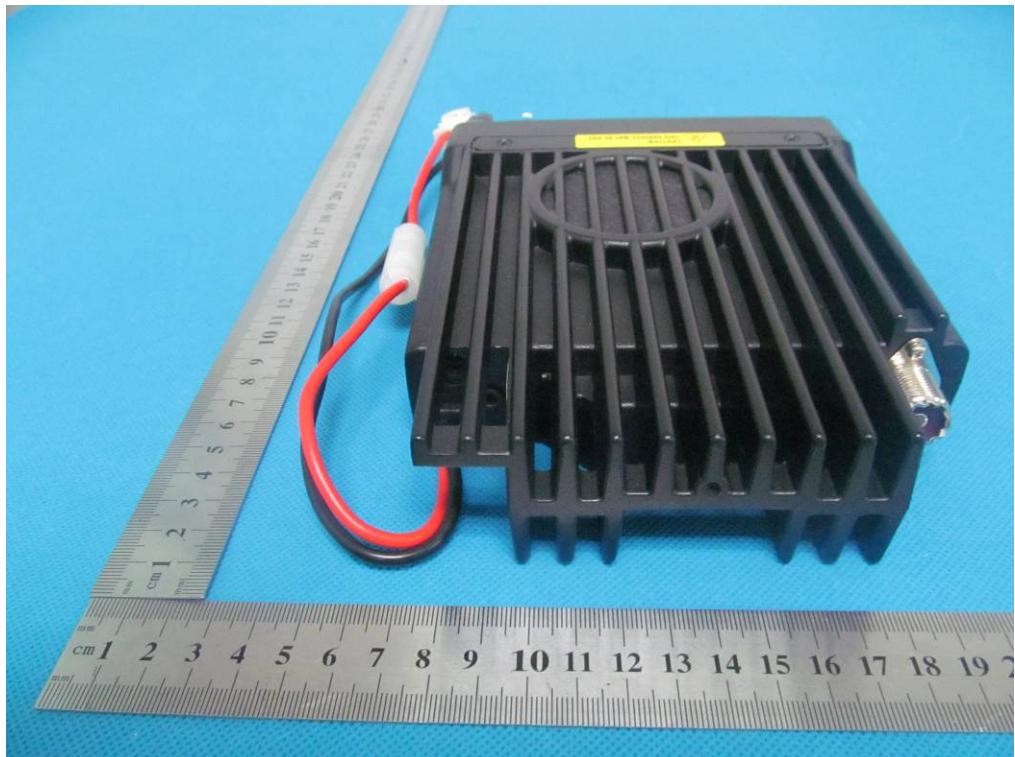
BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



BACK VIEW OF EUT



LEFT VIEW OF EUT



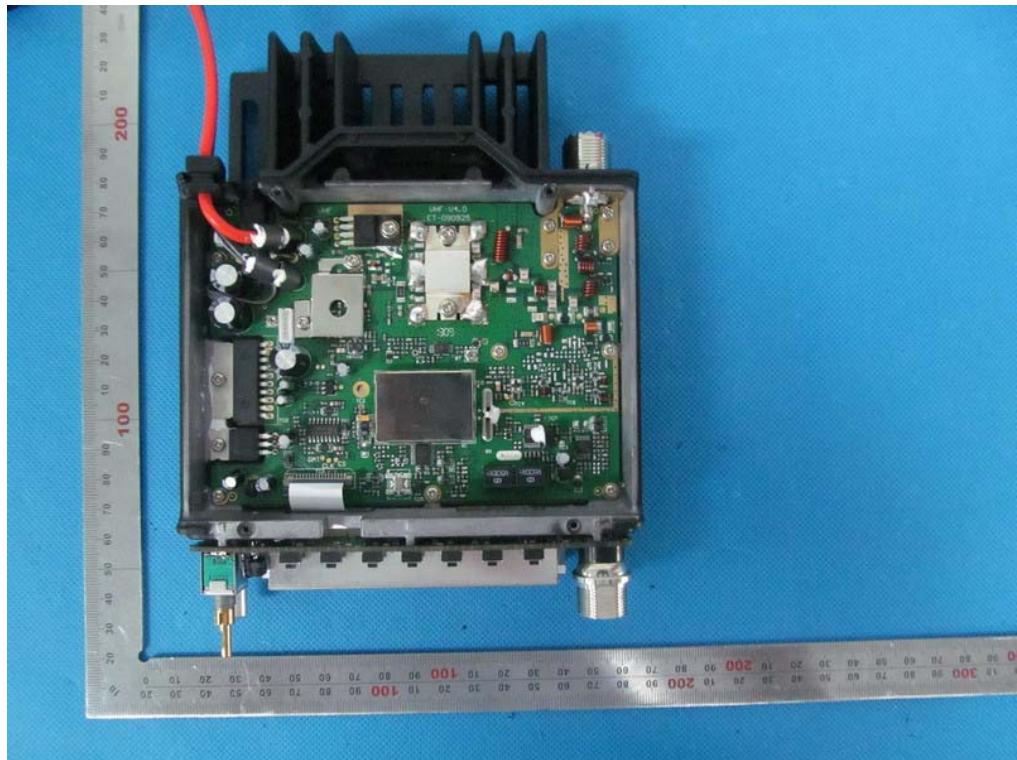
RIGHT VIEW OF EUT



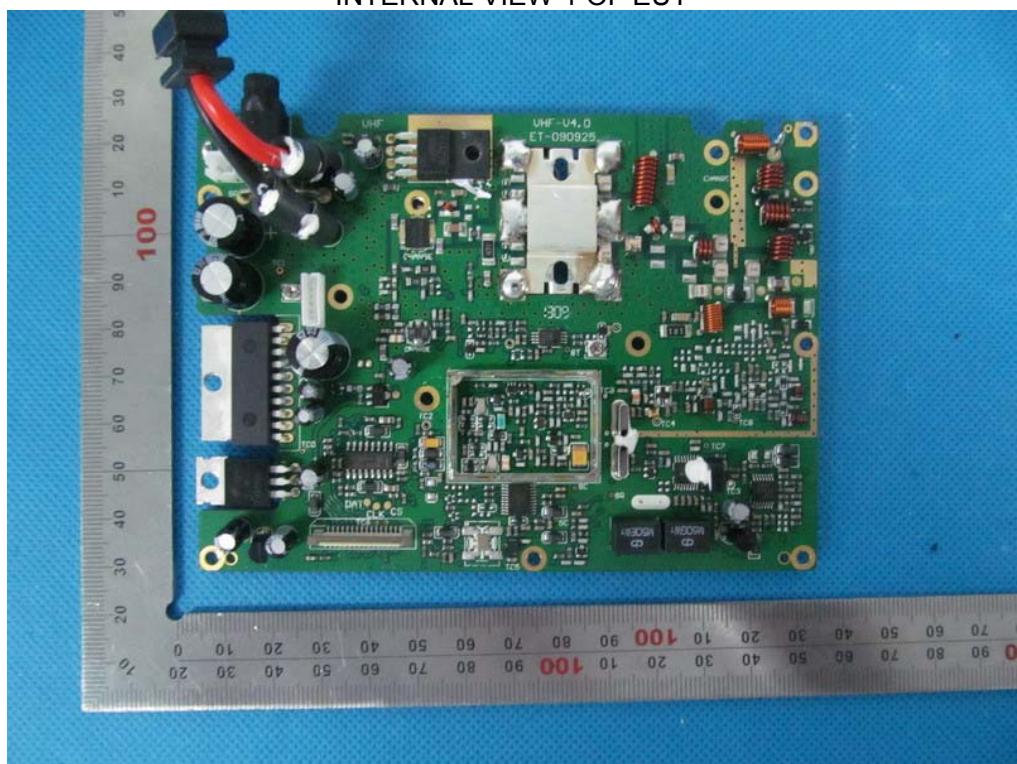
OPEN VIEW-1 OF EUT



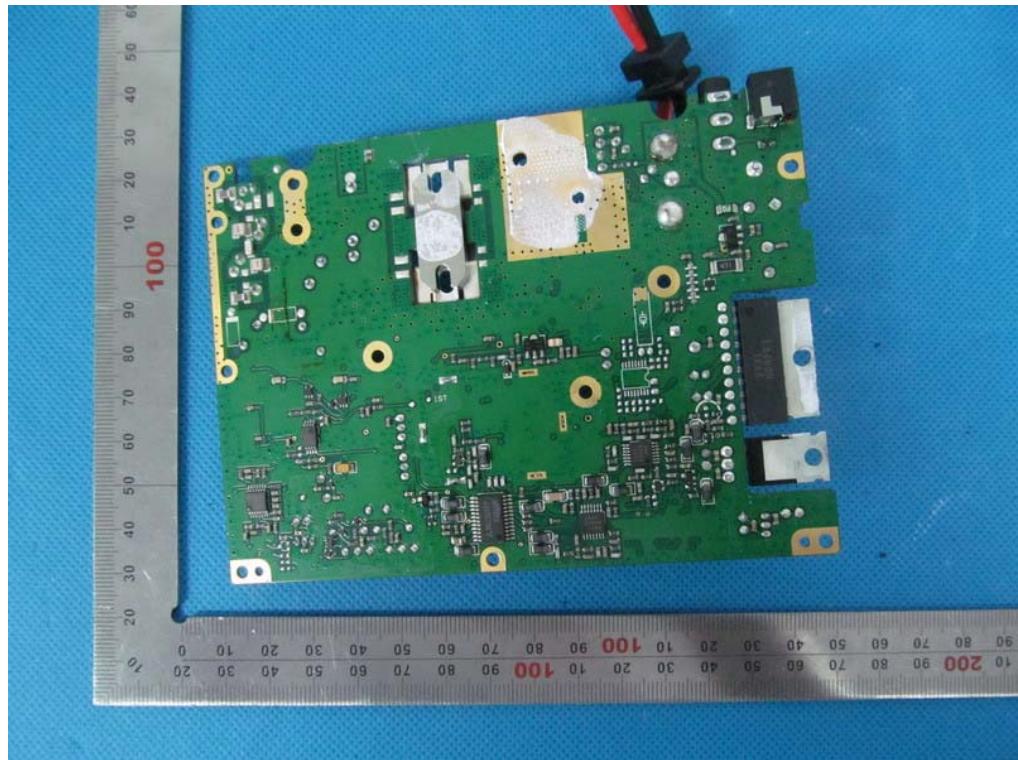
OPEN VIEW-2 OF EUT



INTERNAL VIEW-1 OF EUT



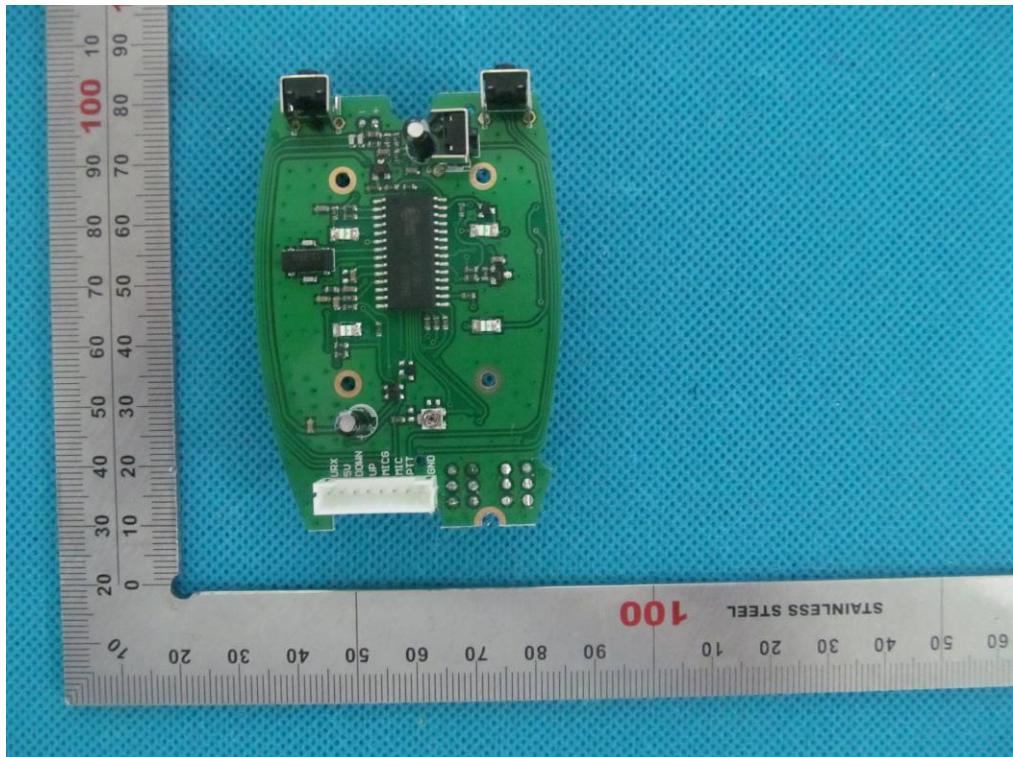
INTERNAL VIEW-2 OF EUT



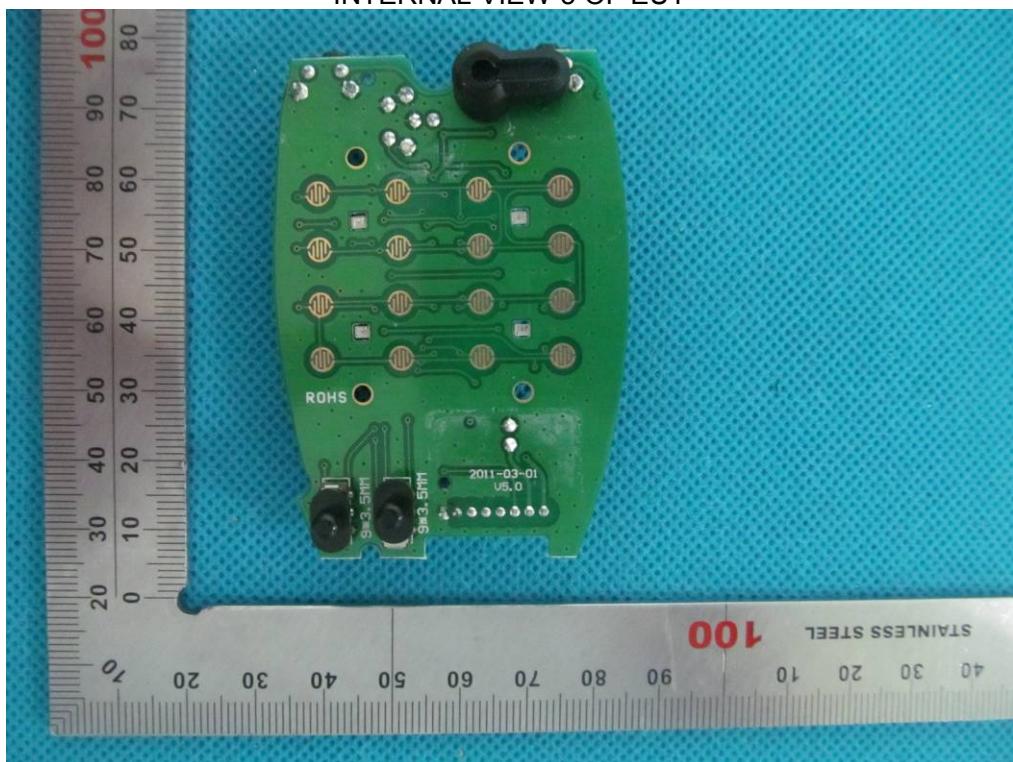
INTERNAL VIEW-3 OF EUT



INTERNAL VIEW-4 OF EUT



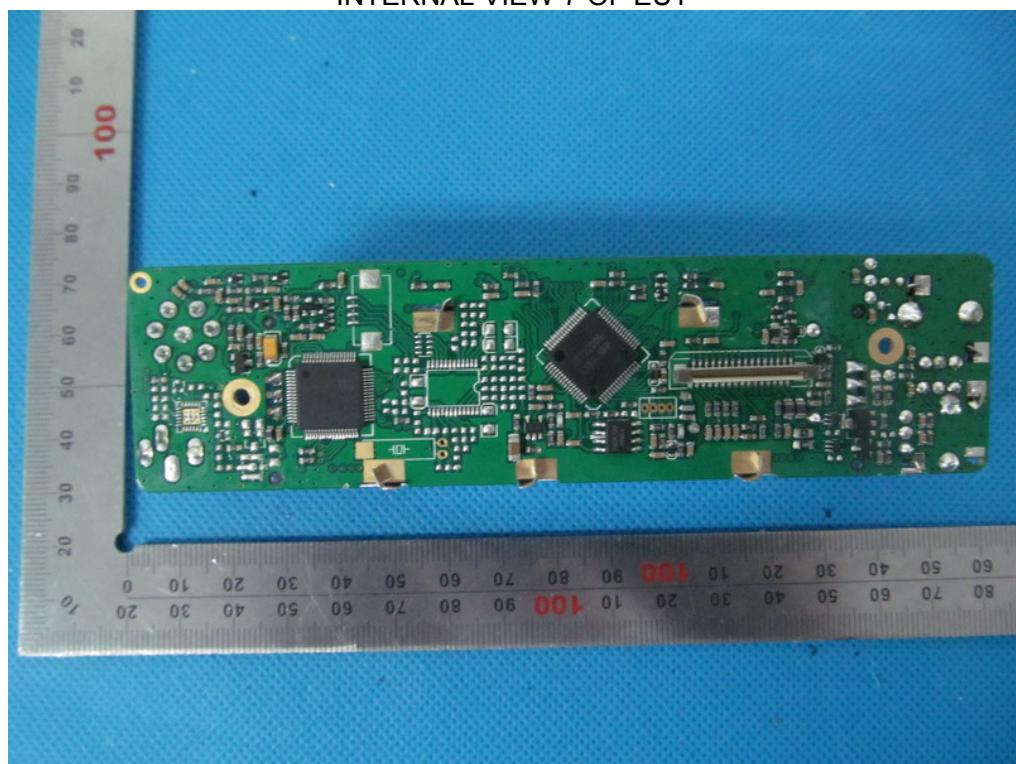
INTERNAL VIEW-5 OF EUT



INTERNAL VIEW-6 OF EUT



INTERNAL VIEW-7 OF EUT



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