



Shenzhen Certification Technology Service Co., Ltd
3F, Bldg27, Area A, Tanglang Industrial Zone, Xili Town,
Nanshan District, ShenZhen, Guang dong, P.R.
China.

TEST REPORT

FCC ID: ZYF-MV3

Applicant : 3M Cogent, Inc
Address : 639 N. Rosemead Blvd. Pasadena, CA 91107, USA

Equipment under Test (EUT):

Name : Mobile Verifier 3
Model : MV3
Standards : FCC PART 15, SUBPART B

Report No. : STE110916870
Date of Test : September 16-22, 2011
Date of Issue : September 23, 2011

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above

Authorized Signature

(Mark Zhu)
General Manager

The manufacture should ensure that all the products in series production are in conformity with the product sample detailed in this report.

If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Shenzhen Certification Technology Service Co., Ltd. Or test done by Shenzhen Certification Technology Service Co., Ltd. Approvals in connection with, distribution or use of the product described in this report must be approved by Shenzhen Certification Technology Service Co., Ltd. Approvals in writing.

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1 General Information

1.1 Description of Device (EUT)

Trade Name : 3M

EUT : Mobile Verifier 3

Model No. : MV3

Power Supply : DC 4.2V form battery or DC 5V from power adapter

Adapter : Manufacturer: PLPU
Model:GFP241DA-0540-1

Applicant : 3M Cogent, Inc

Address : 639 N. Rosemead Blvd. Pasadena, CA 91107, USA

Manufacturer : 3M Cogent, Inc

Address : #1706 Fiyta Hi-tech Building, Gaoxinnanyi Avenue,
Southern District of Hi-tech Park, Nanshan District,
Shenzhen, China

1.2 Description of Test Facility

Shenzhen Certification Technology Service Co.,Ltd.
3F, Bldg.27, Area A, Tanglang Industrial Zone, Xili Town, Nanshan
District, Shenzhen 518055, Guangdong, P.R. China
FCC Registered No.:305283

2 EMC Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	06/06/2011	1Year
Spectrum analyzer	Agilent	E4443A	MY46185649	06/06/2011	1Year
Receiver	R&S	ESCI	100492	04/06/2011	1Year
Receiver	R&S	ESCI	101202	04/06/2011	1Year
Bilog Antenna	Sunol	JB3	A121206	04/06/2011	1Year
Horn Antenna	EMCO	3115	640201028-06	04/06/2011	1Year
Power Meter	Anritsu	ML2487A	6K00001491	02/23/2011	1Year
ETS Horn Antenna	ETS	3160	SEL0076	12/08/2010	1Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	06/06/2011	1Year
Cable	Resenberger	N/A	No.1	04/06/2011	1Year
Cable	SCHWARZBECK	N/A	No.2	04/06/2011	1Year
Cable	SCHWARZBECK	N/A	No.3	04/06/2011	1Year
Pre-amplifier	R&S	AFS42-00101 800-25-S-42	SEL0081	04/06/2011	1Year
Pre-amplifier	R&S	AFS33-18002650 -30-8P-44	SEL0080	04/06/2011	1Year

3 Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The test procedure used was ANSI Standard C63.4-2003 using a 50 μ H LISN. Both Lines were observed. The bandwidth of the receiver was 10kHz with an appropriate sweep speed. The ambient temperature of the EUT was 25°C with a humidity of 58%.

RADIATION INTERFERENCE: The test procedure used was ANSI Standard C63.4-2003 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3MHz above 1 GHz. The ambient temperature of the EUT was 25°C with a humidity of 58%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF + CABLE = FS

33.20 dBuV + 10.36 dB + 0.9 dB= 44.46 dBuV/m @ 3m

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard C63.4-2003 10.1.7 with the EUT 40 cm from the vertical ground wall.

4 Summary of Measurement

4.1 Summary of test result

Test Item	Test Requirement	Standard Paragraph	Result
Spurious Emission	FCC PART 15 : 2010	FCC PART 15 B	Compliance
Conduction Emission	FCC PART 15: 2010	FCC PART 15 B	Compliance

Note: EUT can be powered with inside battery or power adapter from AC mains, according to exploratory test, when powered by power adapter from AC mains have worse emissions, and also can make sure EUT have enough power for wireless work, so all the final test were performed with power adapter.

4.2 Test mode

Tested mode	
Item	Model
1	Play Photo
2	Play MP4
3	Camera
4	Copy data with PC

5 Spurious Emission

5.1 Radiation Emission

5.1.1 Radiation Emission Limits(15.209)

Frequencies (MHz)	Field Strength (micorvolts/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

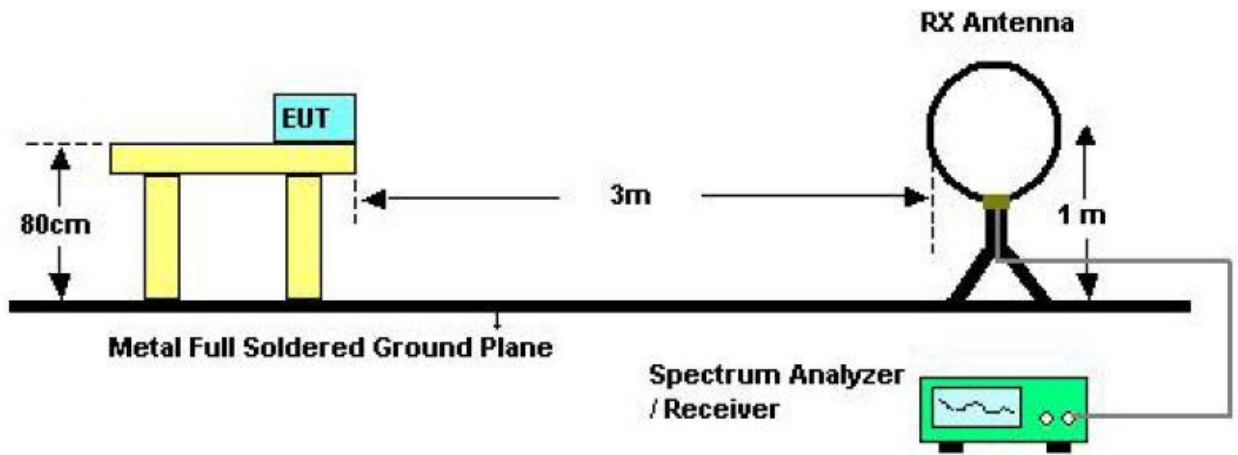
Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

NOTE:

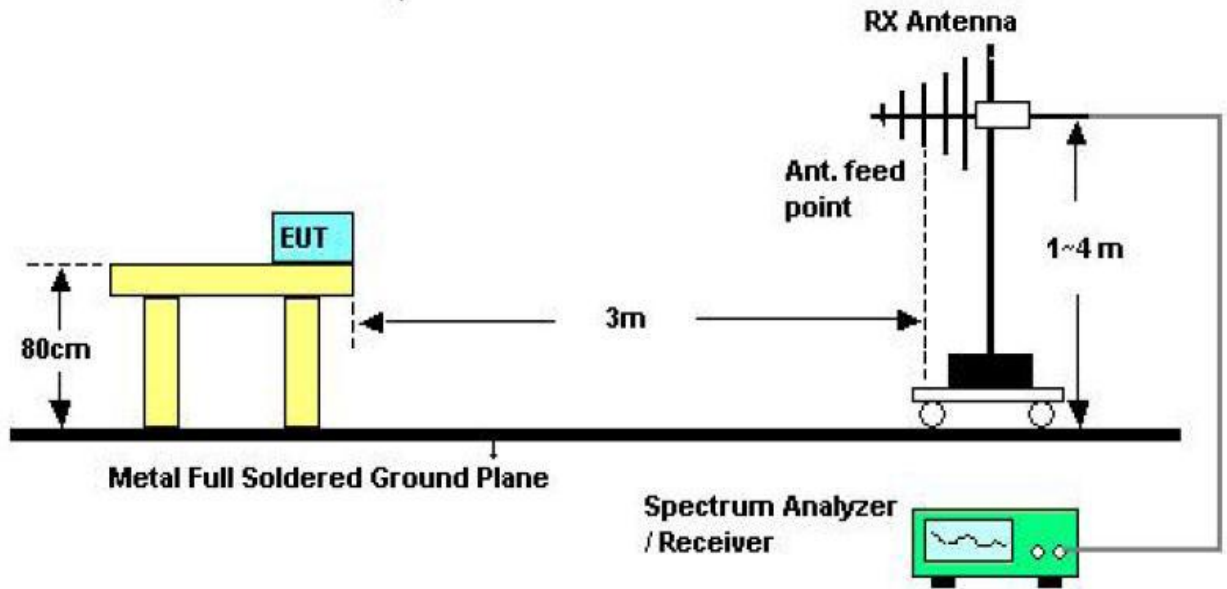
- a) The tighter limit applies at the band edges.
- b) Emission Level(dB uV/m)=20log Emission Level(Uv/m)

5.1.2 Test Setup

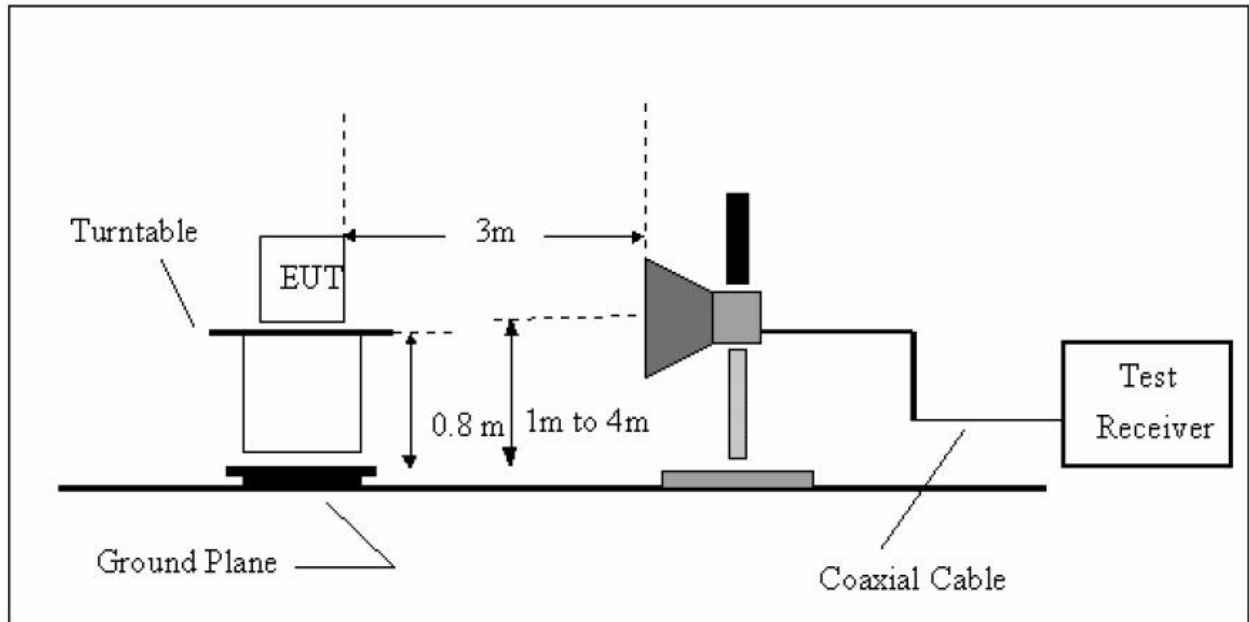
See the next page



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHZ Test Setup

5.1.3 Test Procedure

- a) The measuring distance of 3m shall be used for measurements at frequency up to 1GHZ and above 1GHZ, The EUT was placed on a rotating 0.8 m high above ground,The table was rotated 360 degrees to determine the position of the highest radiation
- b) The Test antenna shall vary between 1m and 4m,Both Horizontal and Vertical antenna are set ot make measurement.
- c) The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range.Significant Peaks are then marked.and then Qusia Peak Detector mode remeasured
- d) If Peak value comply with QP limit Below 1GHZ.The EUT deemed to comply with QP limit.But the Peak value and average value both need to comply with applicable limit above 1GHZ.
- e) For the actual test configuration,please see the test setup photo.

5.1.4 Test Equipment Setting For emission test.est Result

9KHZ~150KHZ	RBW 200HZ	VBW1KHZ
150KHZ~30MHZ	RBW 9KHZ	VBW 30KHZ
30MHZ~1GHZ	RBW 120KHZ	VBW 300KHZ
Above 1GHZ	RBW 1MHZ	VBW 3MHZ

5.1.5 Test Condition

In the worst operating mode for testing.

5.1.6 Test Result

PASS.

The Camera is the worse case.

Detailed information please see the following page.

EUT	Mobile Verifier 3	Model Name	MV3
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 5V supply by PC
Test Mode	Copy data with PC		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/OP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limits 3m (dBuV/m)	Margin (dBuV/m)
214.30	V	Peak	49.21	-17.27	31.94	43.50	-11.56
565.44	V	Peak	56.52	-18.97	37.55	46.00	-8.45
604.24	V	Peak	56.95	-18.22	38.73	46.00	-7.27
644.01	V	Peak	56.17	-15.48	40.69	46.00	-5.31
663.41	V	Peak	53.03	-13.19	39.84	46.00	-6.16
935.98	V	Peak	51.92	-11.71	40.21	46.00	-5.79

EUT	Mobile Verifier 3	Model Name	MV3
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 5V supply by PC
Test Mode	Copy data with PC		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/OP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limits 3m (dBuV/m)	Margin (dBuV/m)
565.44	H	Peak	60.92	-20.97	39.95	46.00	-6.05
644.01	H	Peak	59.87	-21.48	38.39	46.00	-7.61
663.41	H	Peak	60.15	-21.19	38.96	46.00	-7.04
682.81	H	Peak	57.71	-16.92	40.79	46.00	-5.21
702.21	H	Peak	56.12	-16.66	39.46	46.00	-6.54
780.78	H	Peak	58.23	-19.42	38.81	46.00	-7.19

EUT	Mobile Verifier 3	Model Name	MV3
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 5V supply by PC
Test Mode	Copy data with PC		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1174	V	55.47	---	-11.73	43.74	---	74.00	54.00	-10.26	Peak
1249	V	53.68	---	-11.52	42.16	---	74.00	54.00	-11.84	Peak
1485	V	51.74	---	-10.27	41.47	---	74.00	54.00	-12.53	Peak
1732	V	51.66	---	-9.53	42.13	---	74.00	54.00	-11.87	Peak
2486	V	48.72		-7.31	41.41		74.00	54.00	-12.59	Peak
3175	V	46.04		-5.52	40.52		74.00	54.00	-13.48	Peak
N/A										

EUT	Mobile Verifier 3	Model Name	MV3
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 5V supply by PC
Test Mode	Copy data with PC		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1359	H	54.85	---	-10.43	43.73	---	74.00	54.00	-10.27	Peak
1784	H	53.67	---	-9.27	42.16	---	74.00	54.00	-11.84	Peak
2658	H	53.81	---	-6.94	43.47	---	74.00	54.00	-10.53	Peak
3135	H	44.10	---	-5.63	41.44	---	74.00	54.00	-12.56	Peak
3972	H	44.44		-3.25	41.19		74.00	54.00	-12.81	Peak
4563	H	40.72		-0.48	40.24		74.00	54.00	-13.76	Peak
N/A										

Notes:AV Means AV detector test data,Peak Means Peak detector test data.
Emissions attenuated more than 20 dB below the permissible value are not reported.

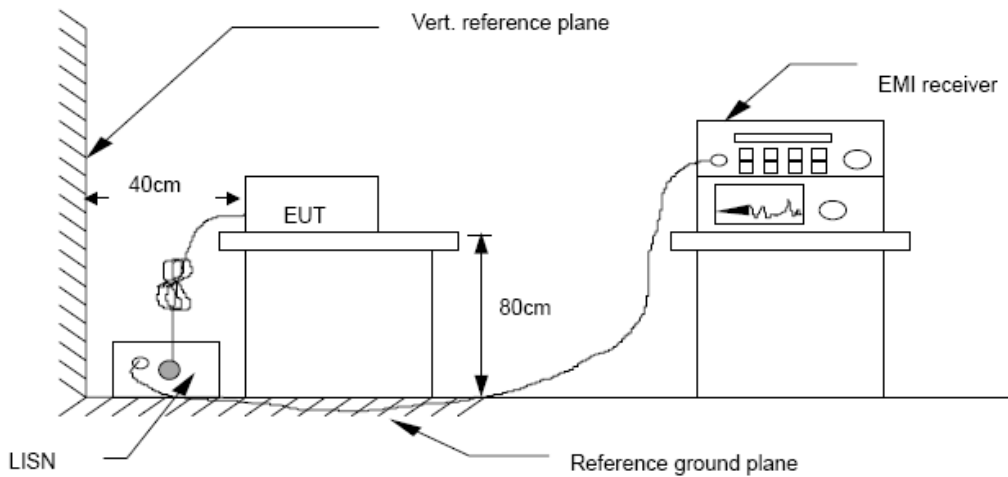
6 POWER LINE CONDUCTED EMISSION

6.1 Conducted Emission Limits(15.209&249)

Frequency MHz	Limits dB(μ V)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

- Notes: 1. *Decreasing linearly with logarithm of frequency.
 2. The lower limit shall apply at the transition frequencies.
 3.The limit decreases in line with the logarithm of the frequency in the rang of 0.15 to 0.50 MHz.

6.2 Test Setup



6.3 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4-2003 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

6.4 Test Results

PASS

Detailed information please see the following page.

EUT	Mobile Verifier 3	Model Name	MV3
Temperature	25°C	Relative Humidity	58%
Pressure	960hPa	Test voltage	DC 5V supply by adapter
Test Mode	Camera		

FREQ MHz	PEAK dBuV	Q.P. See Peak dBuV	AVG See Peak dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dBuV	AVG Margin dBuV	NOTE
0.15	50.99	---	---	66.00	56.00	-15.01	-5.01	L1
0.18	50.45	---	---	64.55	54.55	-14.10	-4.10	L1
0.22	44.19	---	---	62.74	54.55	-18.55	-8.55	L1
0.52	39.96	---	---	56.00	46.00	-16.04	-6.04	L1
0.99	33.44	---	---	56.00	46.00	-22.56	-12.56	L1
24.27	33.25	---	---	60.00	50.00	-26.75	-16.75	L1
0.19	49.68	---	---	64.15	54.15	-14.47	-4.47	L2
0.24	42.96	---	---	62.22	52.22	-19.26	-9.26	L2
0.52	39.84	---	---	56.00	46.00	-16.16	-6.16	L2
0.66	34.57	---	---	56.00	46.00	-21.43	-11.43	L2
0.99	33.50	---	---	56.00	46.00	-22.50	-12.50	L2
29.37	37.44	---	---	60.00	50.00	-22.56	-12.56	L2

Note: L1=Line One (Live Line) /L2= Line Two (Neutral Line)
 PEAK greater than QP greater than AVG

7 Photographs of Test Setup

Photographs-Radiated Emission Test Setup in Chamber

Below 1G





Above 1G



Photographs-Conducted Emission Test Setup



8 Photographs of EUT

Figure 1

Photo of EUT

Front View []

Rear View []

Full View []

Bottom View []

Left View []

Right View []

Full View []



The photograph shows the EUT components laid out on a light blue surface. At the top is a power adapter with a two-prong AC plug and a DC output cable. Below it is a black handheld device with a screen and a keypad. A wooden ruler is placed vertically to the left and horizontally below the device to provide a scale. The device is approximately 10 cm wide and 15 cm high.

Figure 2

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Full View []



The photograph shows the EUT handheld device from a top-down perspective. The device is black with a screen in the center and a keypad on the left. A wooden ruler is placed vertically to the left and horizontally below the device to provide a scale. The device is approximately 10 cm wide and 15 cm high.

Figure 3

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View[]

Left View []

Right View []

Full View []



Figure 4

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View[]

Left View []

Right View []

Internal View []



Figure 5

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View [✓]

Right View []

Internal View []



Figure 6

Photo of EUT

Front View []

Rear View [✓]

Top View []

Bottom View []

Left View []

Right View []

Internal View []



Figure 7

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View [✓]

Internal View []



Figure 8

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Internal View [✓]



Figure 9

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Internal View []

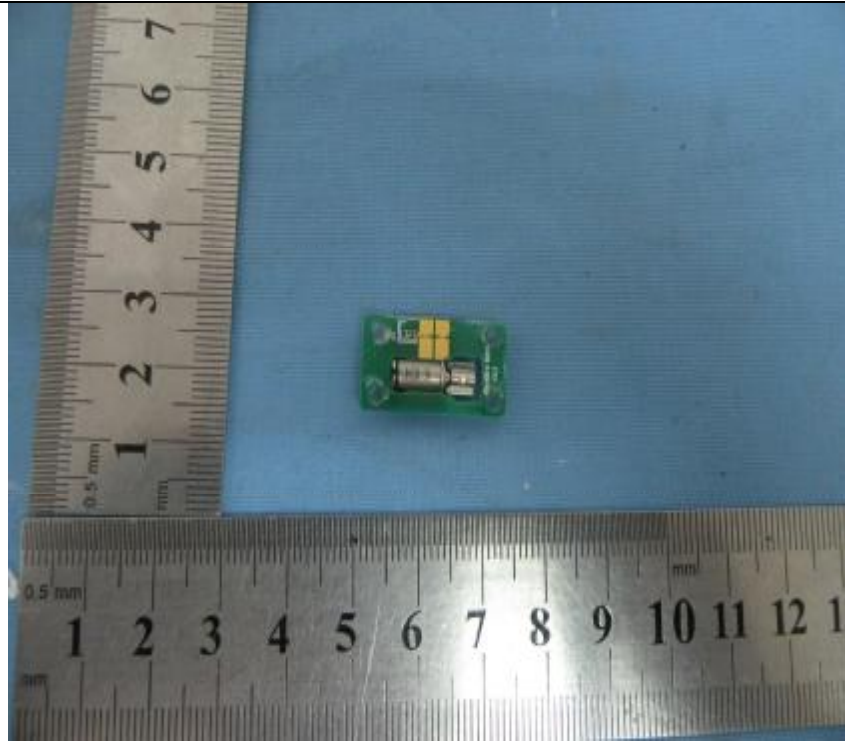


Figure 10

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Internal View []

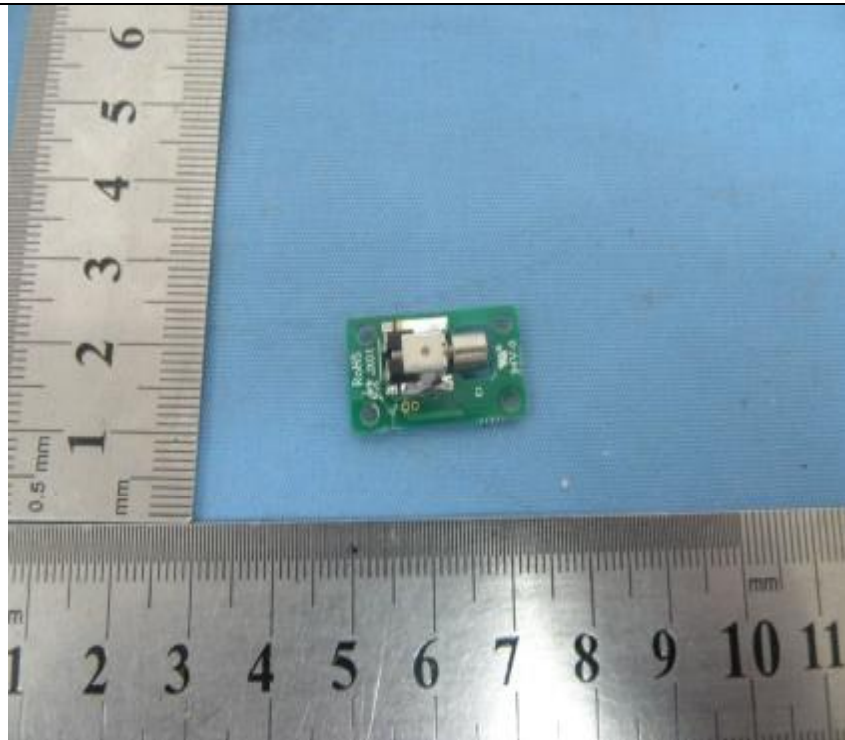


Figure 11

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Internal View []



Figure 12

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Internal View []

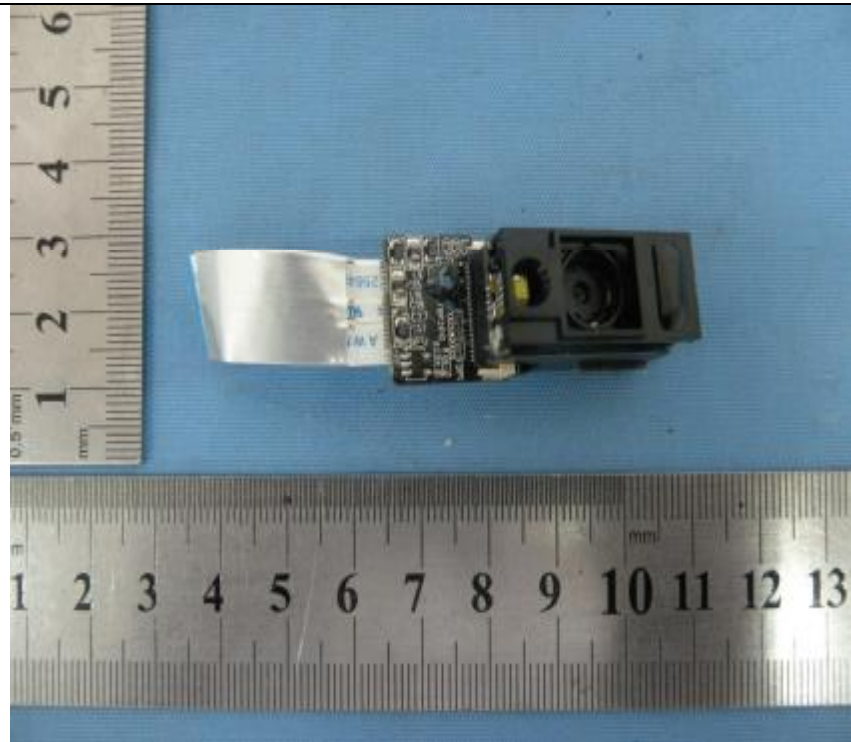


Figure 13

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Internal View []

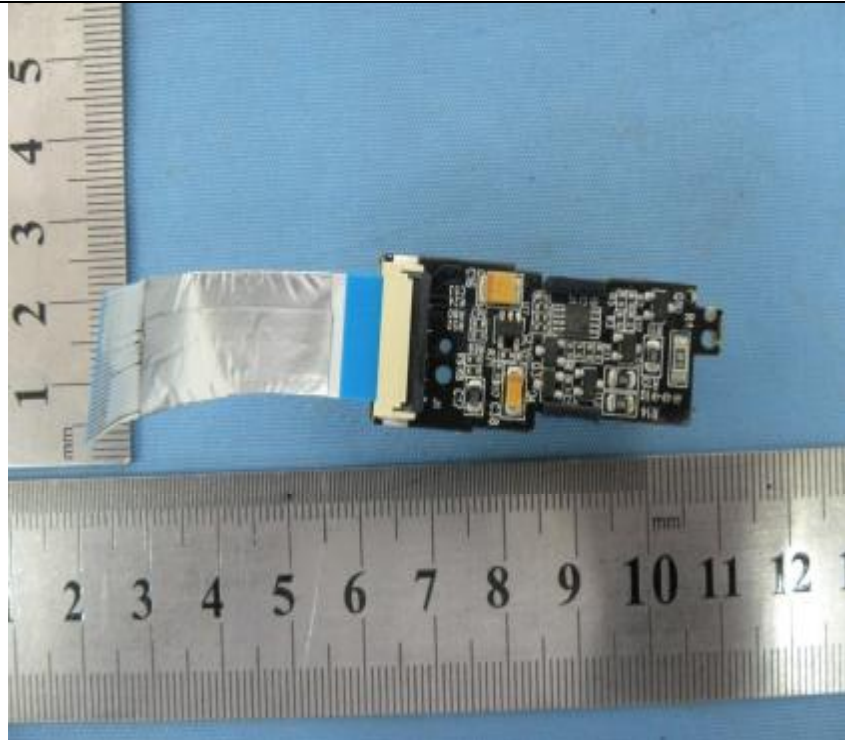


Figure 14

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Internal View []



Figure 15

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Internal View []

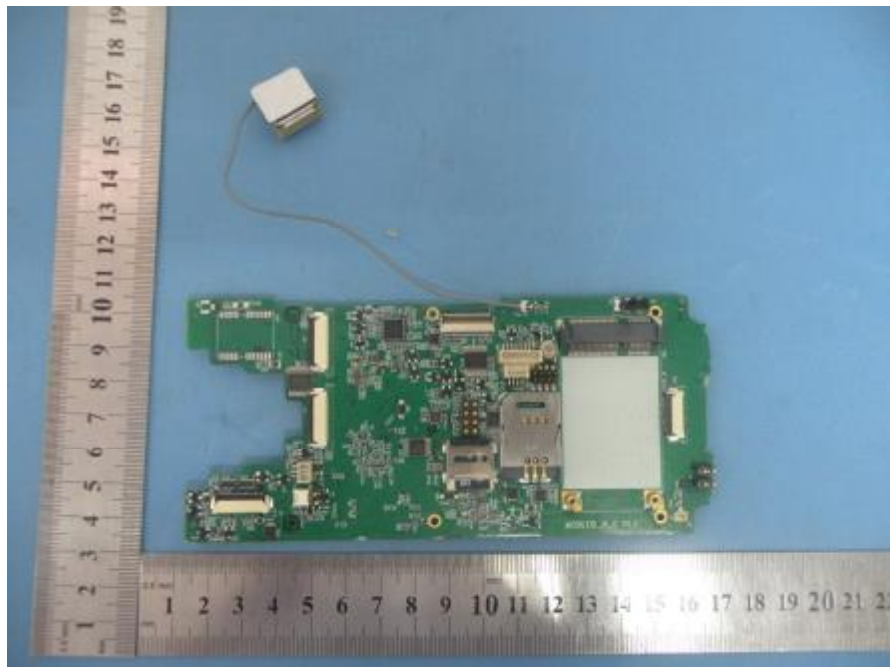


Figure 16

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Internal View []



Figure 17

Photo of EUT

Front View []

Rear View []

Top View []

Bottom View []

Left View []

Right View []

Internal View []



-----END OF THE REPORT-----