

**Test Report No. 7191035552-EEC12/01**  
dated 18 Jun 2012

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**FORMAL REPORT ON TESTING IN ACCORDANCE WITH**  
**47 CFR FCC Part 15B : 2011 (CLASS B)**  
**OF A**  
**VEHICLE MOUNT TERMINAL**  
**[ Model : VM1 C ]**  
**[ FCC ID : KDZLXE-VM1 ]**

**TEST FACILITY**

TÜV SÜD PSB Pte Ltd,  
Electrical & Electronics Centre (EEC), Product Services,  
13 International Business Park #01-01, Singapore 609932

**FCC REG. NO.**

160581 (3m and 10m Semi-Anechoic Chamber, International Business Park)

**IND. CANADA REG. NO.**

2932N-1 (10m Semi-Anechoic Chamber, International Business Park)

**PREPARED FOR**

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**QUOTATION NUMBER**

219124671 & 219152743

**JOB NUMBER**

7191006338 & 7191035552

**TEST PERIOD**

05 May 2011 – 13 Jun 2011

**PREPARED BY**

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LA-2007-0380-A  
LA-2007-0381-F  
LA-2007-0382-B  
LA-2007-0383-G  
LA-2007-0384-G  
LA-2007-0385-E  
LA-2007-0386-C  
LA-2010-0464-D

The results reported herein have been performed in accordance with the laboratory's terms of accreditation under the Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme. Tests/Calibrations marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our laboratory.

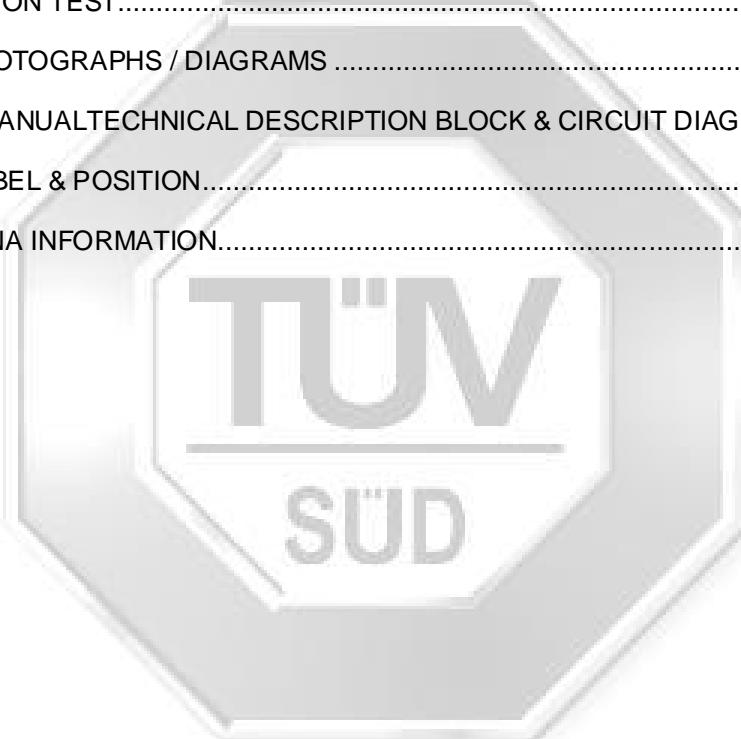
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## **TEST SUMMARY**

The product was tested in accordance with the customer's specifications.

### **Test Results Summary**

<b>Test Standard</b>	<b>Description</b>	<b>Pass / Fail</b>
47 CFR FCC Part 15B : 2011		
15.107	Conducted Emissions (Class B)	Pass
15.109	Radiated Emissions (Class B)	Pass

### **Notes**

1. All test measurement procedures are according to ANSI C63.4: 2003.
2. The following RF modules are FCC certified RF modules:
  - WLAN module (FCC ID: TWG-SDCMSD30AG) and
  - mobile telecom module (WWAN) (FCC ID: N7NGOBI2)

As the modules are integrated onto the Equipment Under Test (EUT) without modifications, only the spurious emissions of the EUT were evaluated.

3. Vehicle Mount Terminal (EUT) come with 2 types of keypad as shown:



4. This report 7191035552-EEC12/01 was reproduced from the test report 7191006338-EEC11/01 to change applicant name from LXE Inc. to Honeywell International Inc. In addition, antenna information was added to ANNEX D.
5. The FCC Part 15, subpart E for SDC-MSD30AG was tested by Elliott Laboratories and was documented in report files R78443 and R78277.

### **Modifications**

No modifications were made.

## PRODUCT DESCRIPTION

Description	<p>: The Equipment Under Test (EUT) is a <b>VEHICLE MOUNT TERMINAL WITH QUICK MOUNT CRADLE</b>. It is designated for industrial environment and vehicle use. The terminal integrated with the following wireless modules:</p> <ul style="list-style-type: none"><li>- Bluetooth module</li><li>- certified WLAN module (FCC ID: TWG-SDCMSD30AG) and</li><li>- mobile telecom module (WWAN) (FCC ID: N7NGOB12)</li></ul> <p>It also integrated with audio function and basic I/O ports as follows:</p> <ul style="list-style-type: none"><li>- serial-RS232</li><li>- USB and</li><li>- CANBUS</li></ul> <p>Input and output ports are available for peripheral support like power input, RS232, USB and CANBUS/Audio. The terminal can be powered by vehicle battery from 10V to 60V or an AC-DC adapter or UPS battery. The UPS battery provides an alternate power when the terminal is removed from the cradle mount or when the vehicle is powered off. The front panel of the display designated with 64-Key QWERTY keyboard and/or 13 functional keys. Four SMA antennas connectors are mounted at the top-rear for the housing panel for external connection.</p>
Applicant	<p>: Honeywell International Inc 9680 Old Bailes Road, Fort Mill, SC 29707 USA</p>
Manufacturer	<p>: GES Singapore Pte Ltd 28 Marsiling Lane, Singapore 739152</p>
Factor (ies)	<p>: GES Manufacturing Services (M) Sdn Bhd PLO 34 Fasa 2, Kawasan Perindustrian Senai, 81400 Senai, Johor, Malaysia</p>
Model Number	<p>: VM1 C</p>
FCC ID	<p>KDZLXE-VM1</p>
Serial Number	<p>: VM1110300173 (Config#1: 64-Key) VM1110400348 (Config#2: 13-Key)</p>
Microprocessor	<p>: Intel Atom, Z530</p>

## **PRODUCT DESCRIPTION**

### **Continued**

Operating Frequency	: <u>Bluetooth (FCC ID: KDZLXE-VM1)</u> 2.412GHz - 2.480GHz
	<u>WLAN 802.11a/b/g (FCC ID: TWG-SDCMSD30AG)</u> 2.412GHz - 2.462GHz 5.180GHz to 5.240GHz 5.260GHz to 5.320GHz 5.500GHz to 5.700GHz
	<u>WWAN (FCC ID: N7NGOBI2)</u> 824.2MHz – 848.8MHz 1850.2MHz – 1909.8MHz
Clock / Oscillator Frequency	: Z530 CPU speed: 1.6GHz FSB, front-side bus: 400MHz, 533MHz Clock generator: 14.31818MHz, 100MHz, 133.33MHz, 200MHz, 1666.67MHz, Crystal clock (USB CAD BUS): 24MHz Crystal clock: 32.768kHz
Port / Connectors	: Refer to manufacturer's user manual / operating manual
Rated Input Power	: 7-12Vdc, 7.5A (Terminal) 10Vdc to 60Vdc, 6.4A (Terminal and Quick Mount Cradle)
Accessories	: Refer to manufacturer's user manual / operating manual

**SUPPORTING EQUIPMENT DESCRIPTION**

Equipment Description (Including Brand Name)	Model, Serial & FCC ID Number	Cable Description (List Length, Type & Purpose)
DMC Monitor	M/N: AM1564 S/N: MT71C3014046 FCC ID: I84AM1564	3.00m unshielded power cable
HP PC	M/N: HPDX2300 S/N: SGH73006RP FCC ID: DoC	1.80m unshielded power cable
Datamini Mouse	M/N: 80XX S/N: SG74800268 FCC ID: DoC	1.80m PS/2 cable
Symbol Scanner	M/N: SBRE S/N: M1J37F764 FCC ID: Nil	1.50m USB cable
HP Keyboard	M/N: SK-2501K S/N: M970936881 FCC ID: GYVR385K	1.80m PS/2 cable
CanBus cable Power Adapter	M/N: GT81081-6015-T3 S/N: RCHS10082139/09 FCC ID: DoC	1.80m unshielded power cable
Microsoft Mouse	M/N: Nil S/N: Nil FCC ID: DoC	1.50m USB cable

## EUT OPERATING CONDITIONS

### 47 CFR FCC Part 15B

1. Conducted Emissions
2. Radiated Emissions

The EUT was exercised in its typical operating modes (all possible supported modes) as listed below throughout the test:

- a. 802.11b/g + ITE + Active Sync + WWAN + Bluetooth (using internal antennas)
- b. 802.11a + ITE + Active Sync + WWAN + Bluetooth (using internal antennas)
- c. 802.11b/g + ITE + Active Sync + WWAN + Bluetooth (using external antennas)
- d. 802.11a + ITE + Active Sync + WWAN + Bluetooth (using external antennas)



**CONDUCTED EMISSION TEST**

**47 CFR FCC Part 15.107 Conducted Emission Limits (Class B)**

**AC Port**

Frequency Range (MHz)	Limit Values (dB $\mu$ V)	
	Quasi-peak (QP)	Average (AV)
0.15 - 0.5	66 – 56 *	56 – 46 *
0.5 - 5.0	56	46
5.0 - 30.0	60	50

\* Decreasing linearly with the logarithm of the frequency

**47 CFR FCC Part 15.107 Conducted Emission Test Instrumentation**

Instrument	Model	S/No	Cal Due Date
Rohde & Schwarz EMI Test Receiver (9kHz-3GHz)	ESCI	100477	24 Sep 2011
Schaffner LISN 2-Line V-Network (EUT) (9kHz-30MHz)	NNB41	04/10152	14 Sep 2011
Schaffner LISN 2-Line V-Network (9kHz-30MHz)	NNB41	04/10151	14 Sep 2011

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**CONDUCTED EMISSION TEST**

**AC Port**

**47 CFR FCC Part 15.107 Conducted Emission Test Setup**

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard as shown in the setup photos.
2. The power supply for the EUT was fed through a  $50\Omega/50\mu\text{H}$  EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipment were powered separately from another LISN.

**47 CFR FCC Part 15.107 Conducted Emission Test Method**

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A scan was made on the NEUTRAL line over the required frequency range using an EMI test receiver.
3. High peaks, relative to the limit line, were then selected.
4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 9kHz. Both Quasi-peak and Average measurements were made.
5. Steps 2 to 4 were then repeated for the LIVE line.

**Sample Calculation Example**

At 20 MHz

Q-P limit (Class B) =  $1000 \mu\text{V} = 60.0 \text{ dB}\mu\text{V}$

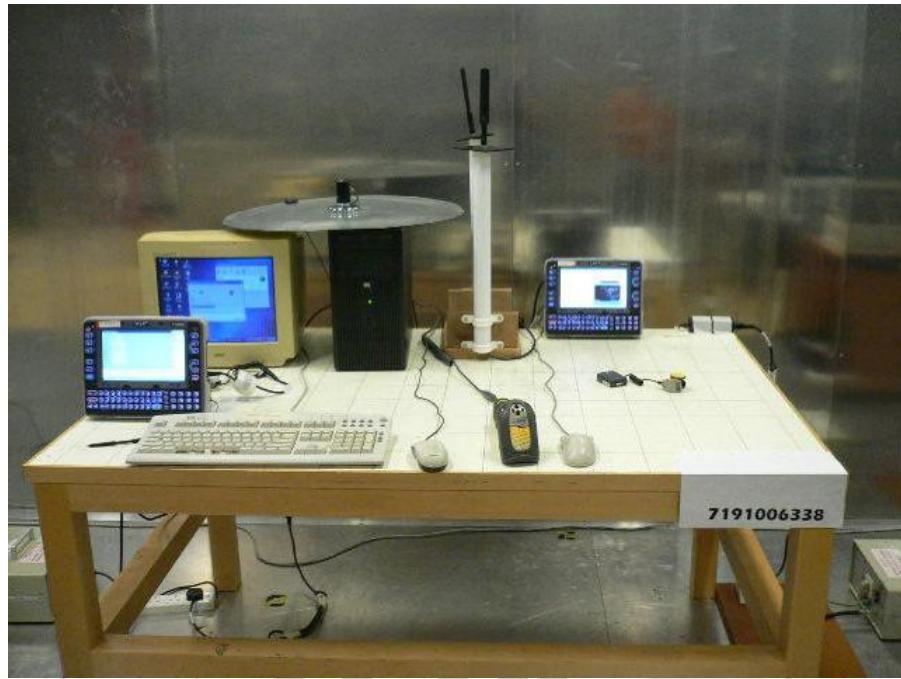
Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.2 dB

Q-P reading obtained directly from EMI Receiver =  $40.0 \text{ dB}\mu\text{V}$   
(Calibrated for system losses)

Therefore, Q-P margin =  $40.0 - 60.0 = -20.0$

i.e. **20.0 dB below Q-P limit**

**CONDUCTED EMISSION TEST**



**Conducted Emissions Test Setup (Front View)**



**Conducted Emissions Test Setup (Rear View)**

**CONDUCTED EMISSION TEST**

**47 CFR FCC Part 15.107 Conducted Emission Results**

Operating Mode	Internal Antenna + 802.11b/g + ITE + BT + Active Sync + WWAN mode (Worst mode)	Temperature	23°C
Test Input Power	110V 60Hz	Relative Humidity	58%
Line Under Test	AC Mains	Atmospheric Pressure	1030mbar
Class	B	Tested By	Kelvin Cheng

Frequency (MHz)	Q-P Value (dB $\mu$ V)	Q-P Margin (dB)	AV Value (dB $\mu$ V)	AV Margin (dB)	Line
0.1745	37.5	-27.2	17.7	-37.0	Neutral
0.7455	38.7	-17.3	33.5	-12.5	Live
2.6893	44.3	-11.7	41.4	-4.6	Live
7.6901	44.6	-15.4	43.9	-6.1	Live
9.8206	41.2	-18.8	40.4	-9.6	Neutral
15.3805	33.6	-26.4	31.8	-18.2	Live

Operating Mode	Internal Antenna + 802.11a + ITE + BT + Active Sync + WWAN mode (Worst mode)	Temperature	23°C
Test Input Power	110V 60Hz	Relative Humidity	58%
Line Under Test	AC Mains	Atmospheric Pressure	1030mbar
Class	B	Tested By	Kelvin Cheng

Frequency (MHz)	Q-P Value (dB $\mu$ V)	Q-P Margin (dB)	AV Value (dB $\mu$ V)	AV Margin (dB)	Line
0.7286	40.7	-15.3	35.9	-10.1	Live
6.2785	42.0	-18.0	35.1	-14.9	Live
6.8219	46.7	-13.3	39.1	-10.9	Live
7.7301	51.8	-8.2	43.6	-6.4	Live
9.8239	42.2	-17.8	34.2	-15.8	Live
11.8208	39.4	-20.6	31.5	-18.5	Live

**Notes**

1. All possible modes of operation were investigated from 150kHz to 30MHz. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
150kHz - 30MHz  
RBW: 9kHz VBW: 30kHz
4. Conducted Emissions Measurement Uncertainty  
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 9kHz – 30MHz is  $\pm 3.0$ dB.

**RADIATED EMISSION TEST**

**47 CFR FCC Part 15.109 Radiated Emission Limits (Class B)**

Frequency Range (MHz)	Quasi-Peak Limit Values (dB $\mu$ V/m) @ 3m
30 - 88	40.0
88 - 216	43.5
216 - 960	46.0
Above 960	54.0*

\* Above 1GHz, average detector was used. A peak limit of 20dB above the average limit does apply.

**47 CFR FCC Part 15.109 Radiated Emission Test Instrumentation**

Instrument	Model	S/No	Cal Due Date
Rohde & Schwarz EMI Test Receiver (20Hz – 26.5GHz)	ESMI	829179/002 829179/005	28 Jul 2011
TDK RF Solutions Hybrid Log Periodic Antenna (30MHz-3GHz)	HLP-3003C	130238	19 Mar 2012
Sonoma Preamplifier (9kHz – 1GHz)	310N	270640	13 Sep 2011
TDK RF Solution Horn Antenna (1GHz-18GHz)	HRN-0118	130256	15 Mar 2012
Schwarzbeck Horn Antenna (2-18GHz) / Pre-amplifier assembly HAP-series	BBHA 9120 C/ HAP06-18W	00000004	25 Mar 2012
Sonoma Preamplifier (9kHz – 1GHz)	310N	270640	13 Sep 2011
Toyo MicroWave Preamplifier (1GHz - 8GHz)	TPA0108-40	0443	02 Feb 2012
ETS Horn Antenna (18GHz – 40GHz)	3116	0004-2474	19 Apr 2012
Micro-Tronics Bandstop Filter (2.4-2.5 GHz)	BRM50701	017	13 Aug 2011

## RADIATED EMISSION TEST

### **47 CFR FCC Part 15.109 Radiated Emission Test Setup**

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard as shown in the setup photos.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.

### **47 CFR FCC Part 15.109 Radiated Emission Test Method**

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A prescan was carried out to pick the worst emission frequencies from the EUT. For EUT which is a portable device, the prescan was carried out by rotating the EUT through three orthogonal axes to determine which altitude and equipment arrangement produces such emissions.
3. The test was carried out at the selected frequency points obtained from the prescan in step 2. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
  - a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
  - b. The EUT was then rotated to the direction that gave the maximum emission.
  - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
4. A Quasi-peak measurement was made for that frequency point if it was less than or equal to 1GHz. For frequency point that above 1GHz, both Peak and Average measurements were carried out.
5. Steps 3 and 4 were repeated for the next frequency point, until all selected frequency points were measured.
6. The frequency range covered was from 30MHz to 5<sup>th</sup> harmonic of the highest frequency used or generated by the EUT, using the Bi-log antenna for frequencies from 30MHz up to 1GHz, and the Horn antenna above 1GHz.

### **Sample Calculation Example**

At 300 MHz

Q-P limit (Class B) = 70.8  $\mu$ V/m = 37.0 dB $\mu$ V/m

Log-periodic antenna factor & cable loss at 300 MHz = 18.5 dB

Q-P reading obtained directly from EMI Receiver = 31.0 dB $\mu$ V/m  
(Calibrated level including antenna factors & cable losses)

Therefore, Q-P margin = 31.0 - 37.0 = -6.0

i.e. 6 dB below Q-P limit

**RADIATED EMISSION TEST**

**30MHz – 1GHz Test Setup**



**Radiated Emissions Test Setup (Front View)**



**Radiated Emissions Test Setup (Rear View)**

**RADIATED EMISSION TEST**

**1GHz – 40GHz Test Setup**



**Radiated Emissions Test Setup (Front View)**



**Radiated Emissions Test Setup (Rear View)**

**RADIATED EMISSION TEST**

**47 CFR FCC Part 15.109 Radiated Emission Results**

Operating Mode	Internal Antenna + 802.11b/g + ITE + BT + Active Sync + WWAN mode	Temperature	23°C
Test Input Power	110V 60Hz	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Class	B	Tested By	Derrick Ng

Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dB $\mu$ V/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)
67.6120	24.3	-15.7	192	112	V
233.2160	28.3	-17.7	284	104	V
333.7400	37.4	-8.6	10	103	H
367.1400	34.5	-11.5	10	106	H
719.9660	41.4	-4.6	77	102	H
847.2380	45.4	-0.6	351	139	V

Emissions above 1GHz – 25GHz

Frequency (GHz)	Peak Value (dB $\mu$ V/m)	Peak Margin (dB)	Average Value (dB $\mu$ V/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)
1.3478	48.2	-25.8	25.2	-28.8	353	301	V
1.5106	46.2	-27.8	24.1	-29.9	19	301	V
2.9975	48.6	-25.4	34.8	-19.2	345	101	V
3.7551	49.1	-24.9	31.4	-22.6	353	101	V
8.9492	29.9	-44.1	20.1	-33.9	353	301	V
10.4844	40.7	-33.3	11.0	-43.0	11	399	H

Notes

1. All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "–ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
RBW: 120kHz      VBW: 1MHz  
>1GHz  
RBW: 1MHz      VBW: 1MHz
4. Radiated Emissions Measurement Uncertainty  
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 40.0GHz is  $\pm 4.6$ dB.

RADIATED EMISSION TEST

**47 CFR FCC Part 15.109 Radiated Emission Results**

Operating Mode	Internal Antenna + 802.11a + ITE + BT + Active Sync + WWAN mode	Temperature	23°C
Test Input Power	110V 60Hz	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Class	B	Tested By	Derrick Ng

Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dB $\mu$ V/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)
41.7180	35.1	-4.9	62	108	V
53.9480	20.5	-19.5	348	356	H
84.0500	33.6	-6.4	292	250	H
126.0050	28.4	-15.1	293	113	V
333.7510	36.7	-9.3	9	105	H
847.2710	41.8	-4.2	1	146	V

Emissions above 1GHz – 40GHz

Frequency (GHz)	Peak Value (dB $\mu$ V/m)	Peak Margin (dB)	Average Value (dB $\mu$ V/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)
1.3366	49.2	-24.8	32.0	-22.0	10	201	V
2.9919	49.8	-24.2	40.3	-13.7	7	201	V
3.7550	50.1	-23.9	31.3	-22.7	7	201	V
4.4957	47.7	-26.3	43.8	-10.2	353	101	V
4.9671	51.7	-22.3	42.1	-11.9	353	301	H
6.9965	34.1	-39.9	15.6	-38.4	353	301	V

Notes

1. All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "–ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
 RBW: 120kHz      VBW: 1MHz  
>1GHz  
 RBW: 1MHz      VBW: 1MHz
4. Radiated Emissions Measurement Uncertainty  
 All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 40.0GHz is  $\pm 4.6$ dB.

**RADIATED EMISSION TEST**

**47 CFR FCC Part 15.109 Radiated Emission Results**

Operating Mode	External Antenna + 802.11b/g + ITE + BT + Active Sync + WWAN mode	Temperature	23°C
Test Input Power	110V 60Hz	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Class	B	Tested By	Derrick Ng

Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dB $\mu$ V/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)
83.4500	30.7	-9.3	307	100	V
89.9920	35.2	-8.3	64	100	V
119.8160	28.0	-15.5	301	100	V
300.3280	41.9	-4.2	14	100	H
333.7180	44.9	-1.1	10	100	H
748.3910	42.6	-3.4	351	100	V

Emissions above 1GHz – 25GHz

Frequency (GHz)	Peak Value (dB $\mu$ V/m)	Peak Margin (dB)	Average Value (dB $\mu$ V/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)
1.3479	49.1	-24.9	24.7	-29.3	345	201	V
1.5050	49.0	-25.0	39.6	-14.4	335	101	V
3.0032	48.6	-25.4	32.8	-21.2	10	399	V
3.6429	48.1	-25.9	33.3	-20.7	910	399	V
3.7494	50.2	-23.8	38.3	-15.8	353	101	V
4.5013	47.7	-26.3	35.8	-18.2	352	101	V

**Notes**

1. All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "–ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
 RBW: 120kHz      VBW: 1MHz  
>1GHz  
 RBW: 1MHz      VBW: 1MHz
4. Radiated Emissions Measurement Uncertainty  
 All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 40.0GHz is  $\pm 4.6$ dB.

RADIATED EMISSION TEST

**47 CFR FCC Part 15.109 Radiated Emission Results**

Operating Mode	External Antenna + 802.11a + ITE + BT + Active Sync + WWAN mode	Temperature	23°C
Test Input Power	110V 60Hz	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
Class	B	Tested By	Derrick Ng

Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dB $\mu$ V/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)
42.3560	37.2	-2.8	121	101	V
44.7730	35.9	-4.1	140	101	V
66.2770	30.8	-9.2	267	200	V
300.3280	41.1	-4.9	351	155	H
333.6840	43.2	-2.8	16	101	H
748.4020	42.2	-3.8	1	101	V

Emissions above 1GHz – 40GHz

Frequency (GHz)	Peak Value (dB $\mu$ V/m)	Peak Margin (dB)	Average Value (dB $\mu$ V/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)
1.1122	43.7	-30.3	40.7	-13.3	353	101	V
1.3367	49.2	-24.8	45.2	-8.8	7	201	V
1.5050	50.1	-23.9	40.2	-13.8	2	101	V
1.9988	44.8	-29.2	42.0	-12.0	353	101	V
3.0088	49.0	-25.0	34.0	-20.0	353	301	V
3.7551	50.5	-23.5	34.5	-19.5	352	301	V

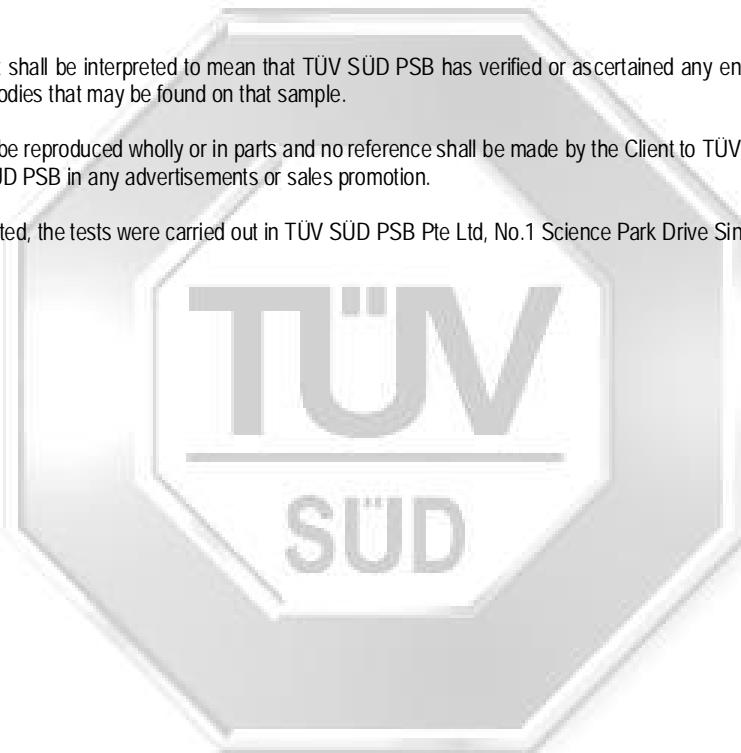
Notes

1. All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "–ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
 RBW: 120kHz      VBW: 1MHz  
>1GHz  
 RBW: 1MHz      VBW: 1MHz
4. Radiated Emissions Measurement Uncertainty  
 All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 40.0GHz is  $\pm 4.6$ dB.

Please note that this Report is issued under the following terms :

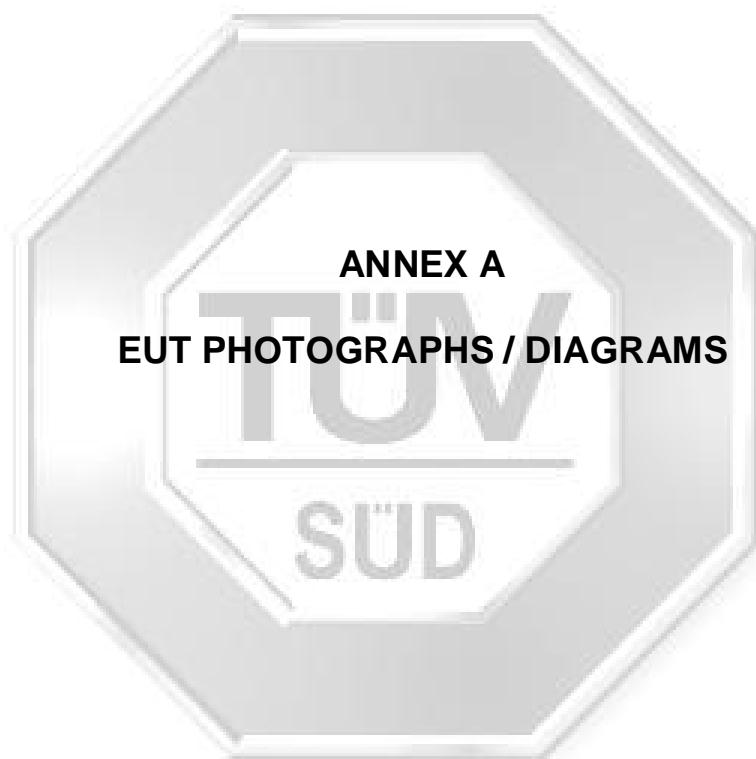
1. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that TÜV SÜD PSB approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB in any way "guarantees" the later performance of the product/equipment. Unless otherwise stated in this report, no tests were conducted to determine long term effects of using the specific product/equipment.
2. The sample/s mentioned in this report is/are submitted/supplied/manufactured by the Client. TÜV SÜD PSB therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.
3. Nothing in this report shall be interpreted to mean that TÜV SÜD PSB has verified or ascertained any endorsement or marks from any other testing authority or bodies that may be found on that sample.
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5. Unless otherwise stated, the tests were carried out in TÜV SÜD PSB Pte Ltd, No.1 Science Park Drive Singapore 118221.

July 2011



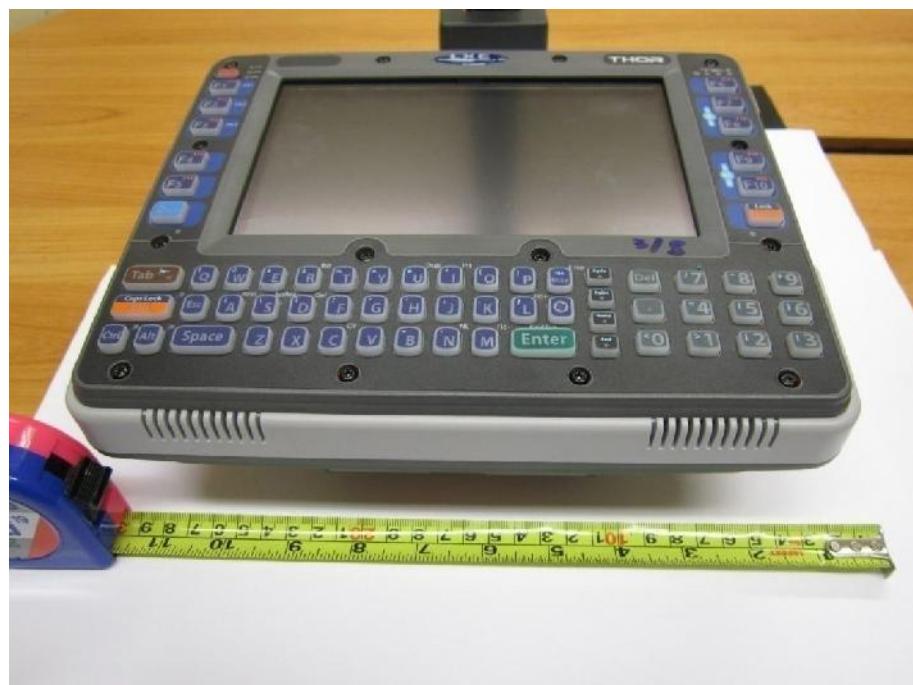
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**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**



**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**Front View**



**Rear View**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**Left View**



**Right View**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



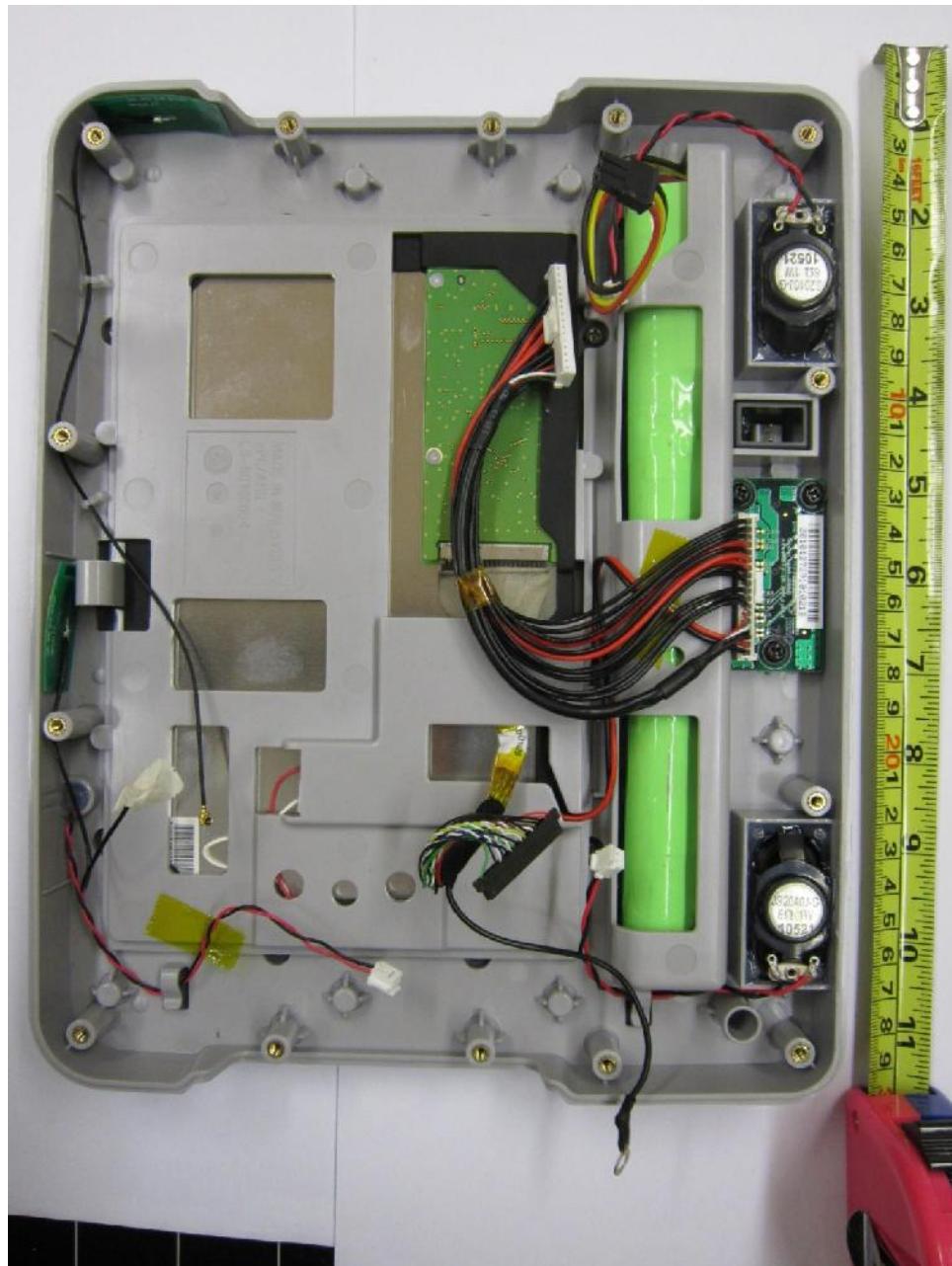
**Top View**



**Bottom View**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**EUT Top Housing Internal View 1**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**EUT Top Housing Internal View 2**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

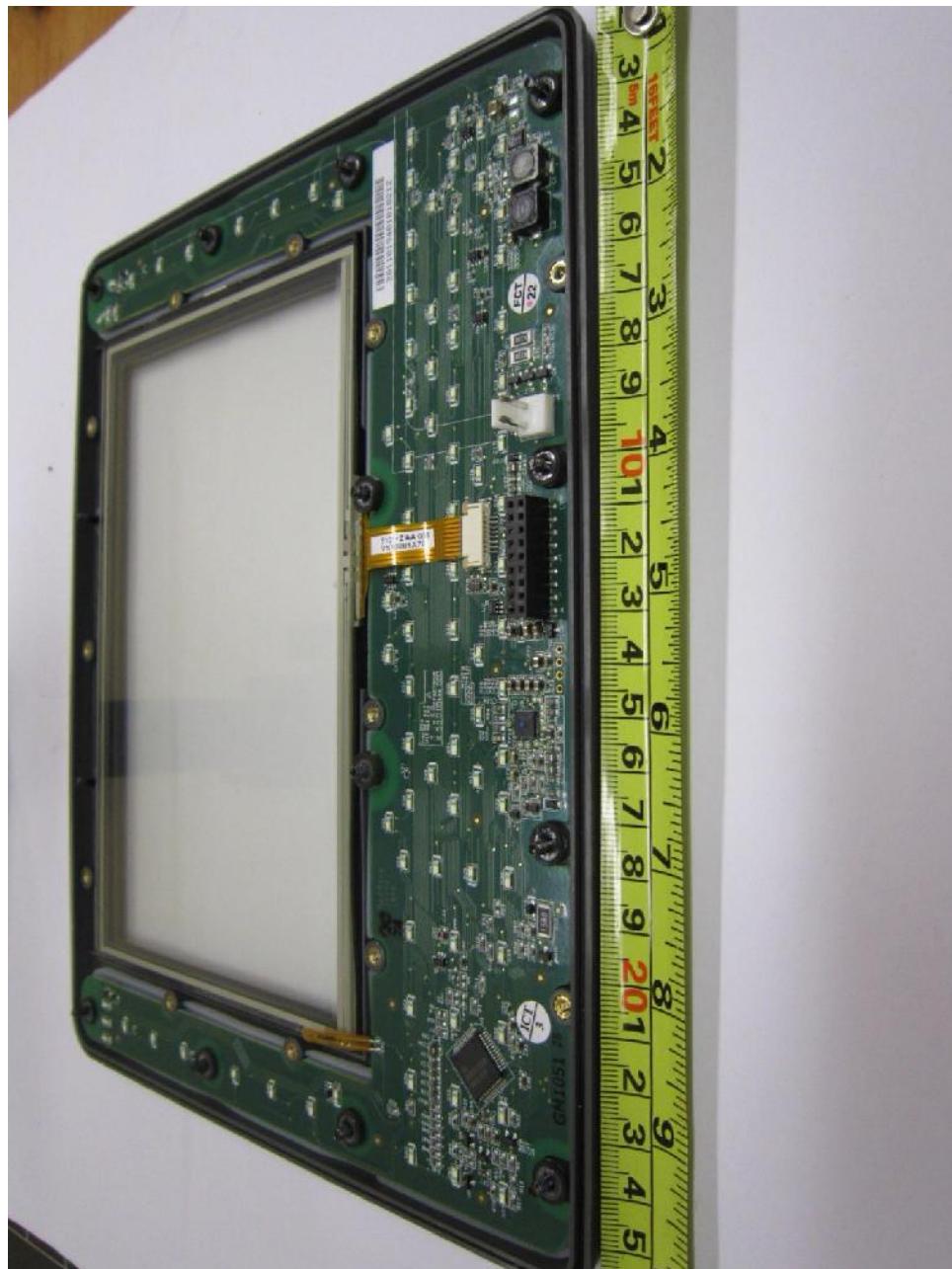
**EUT PHOTOGRAPHS**



**EUT Top Housing Internal View 3**

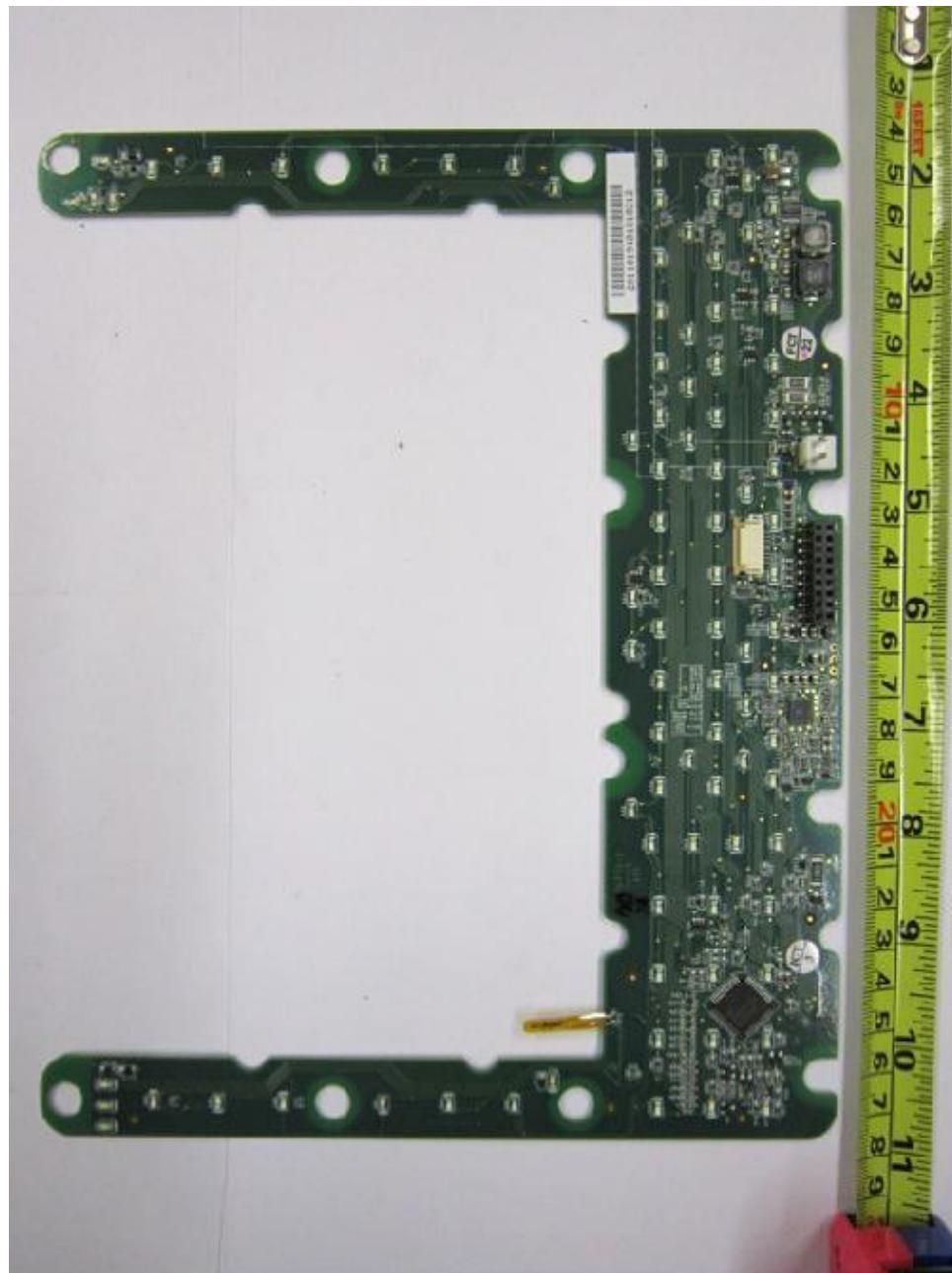
**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

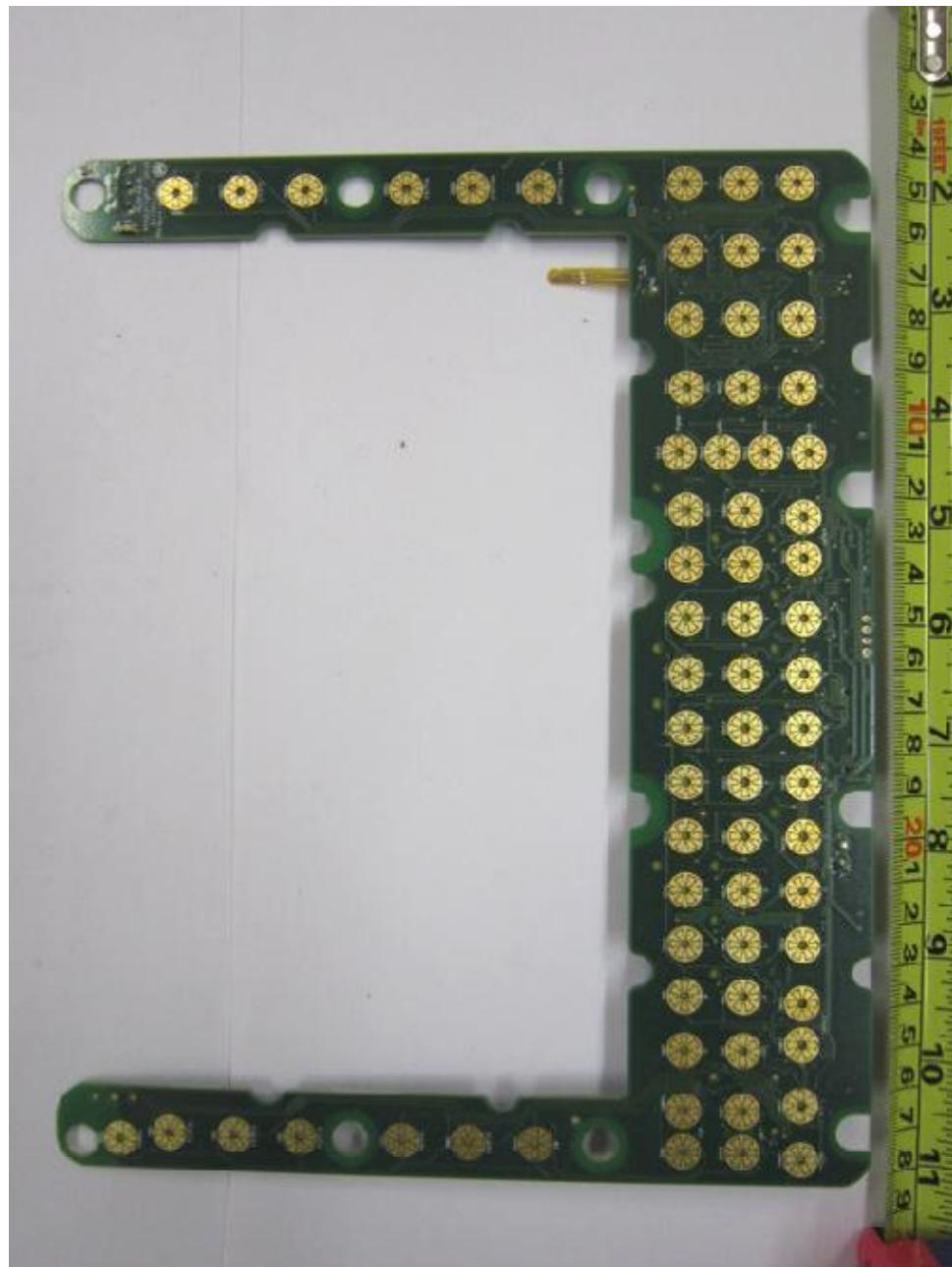
**EUT PHOTOGRAPHS**



**Keypad PCB Component Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**Keypad PCB Trace Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**EUT Bottom Housing Internal View 1**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

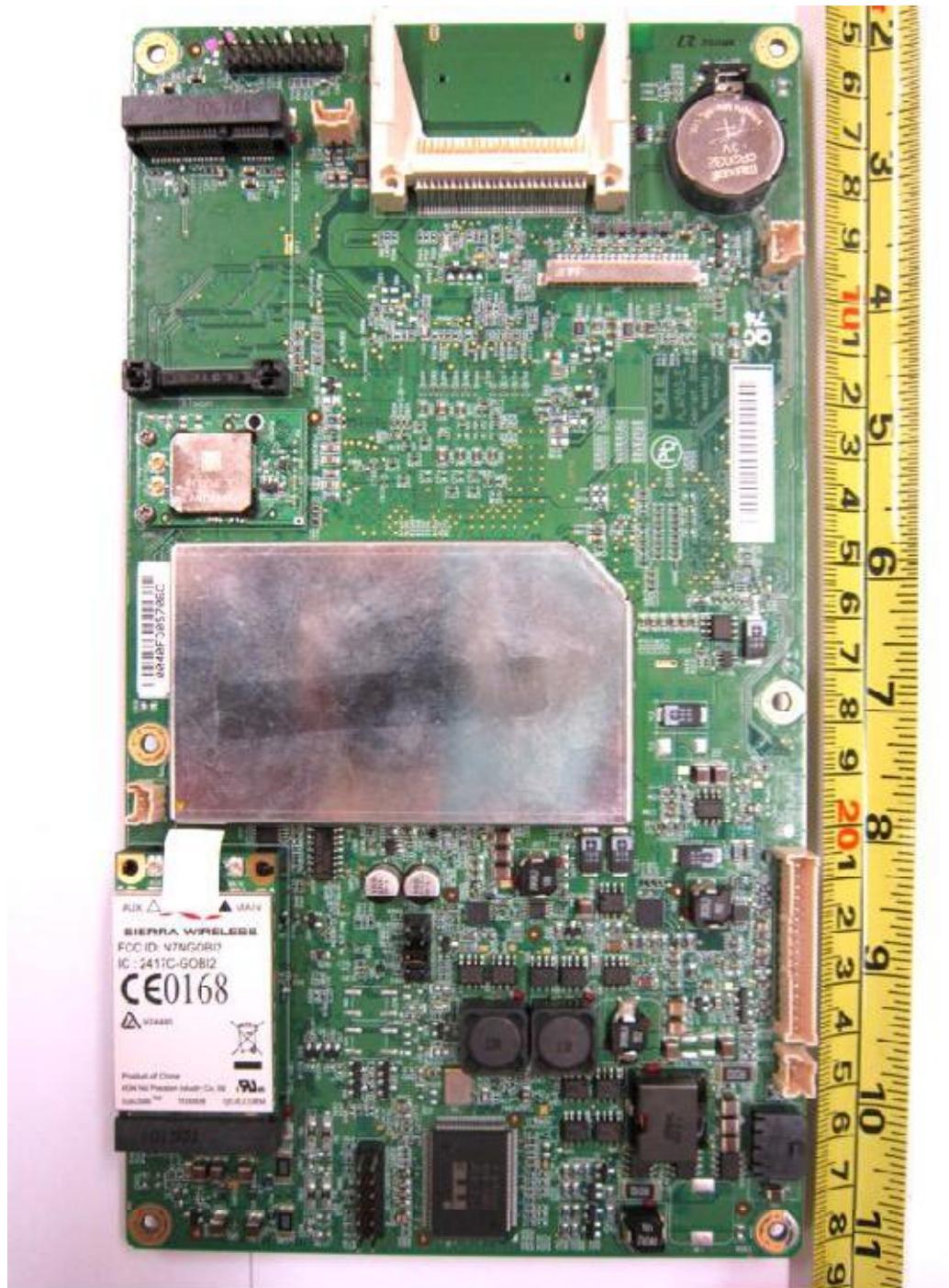
**EUT PHOTOGRAPHS**



**EUT Bottom Housing Internal View 2**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

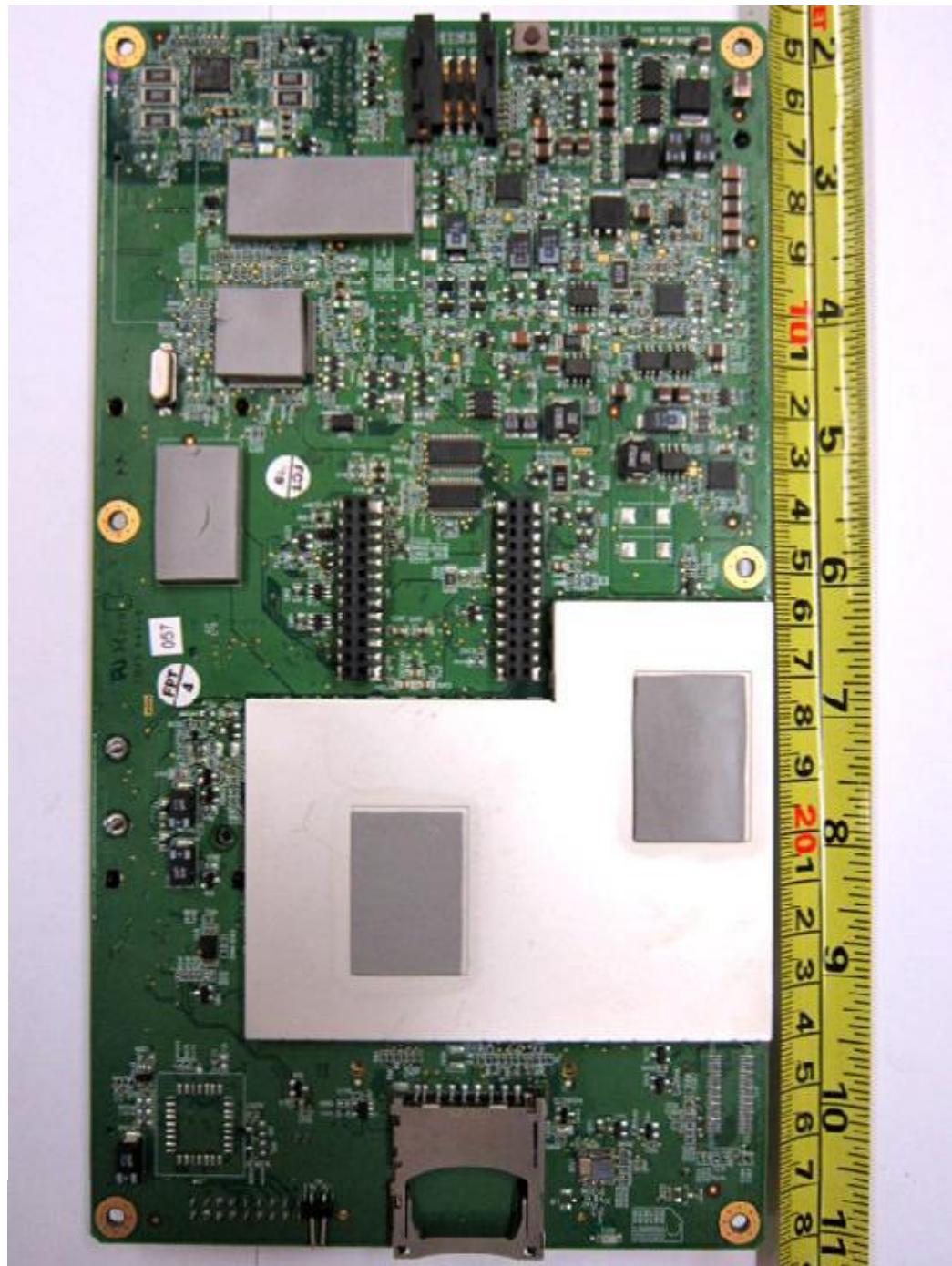
**EUT PHOTOGRAPHS**



**Main-Board PCB Component Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

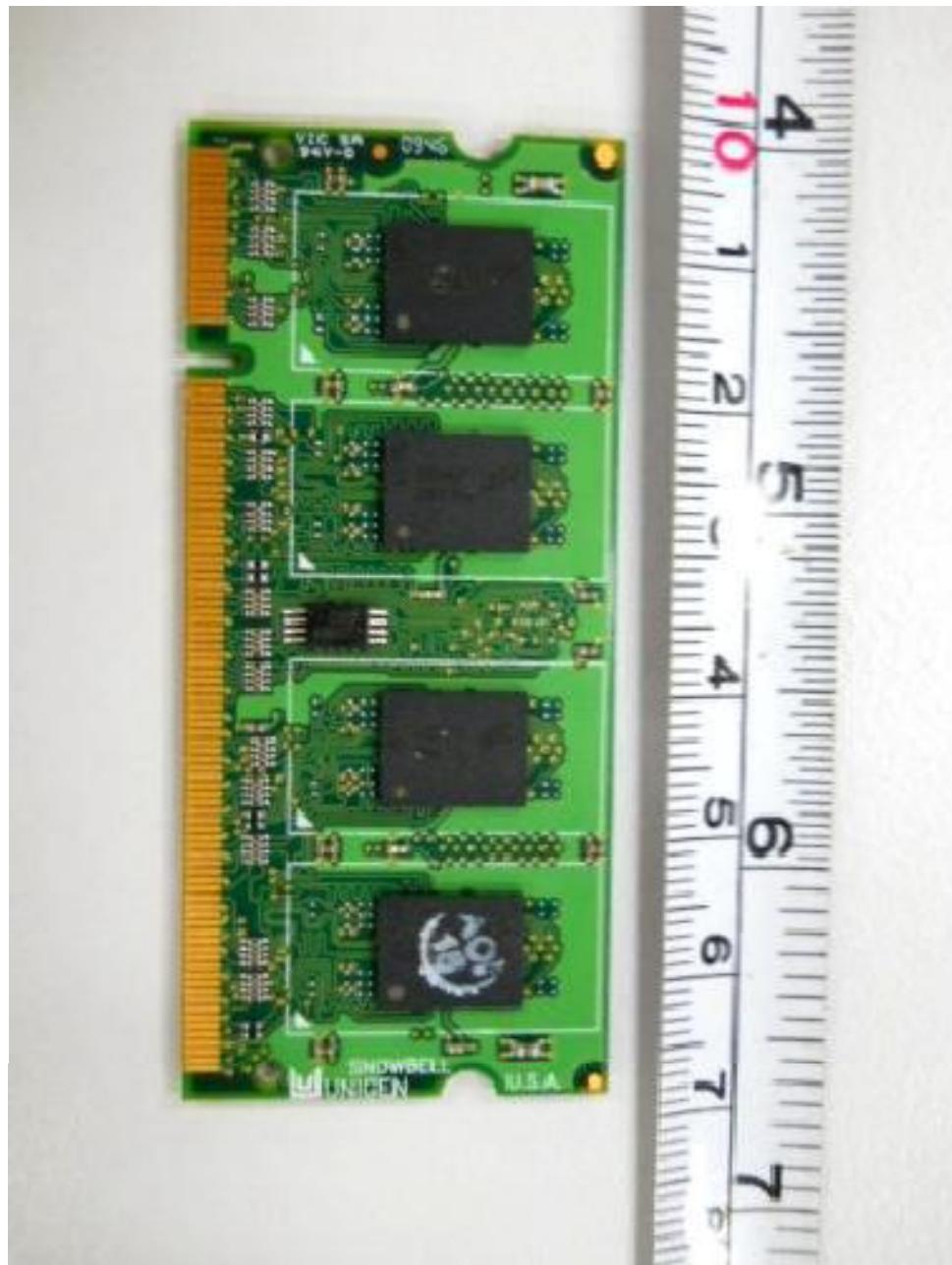
**EUT PHOTOGRAPHS**



**Main-Board PCB Trace Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

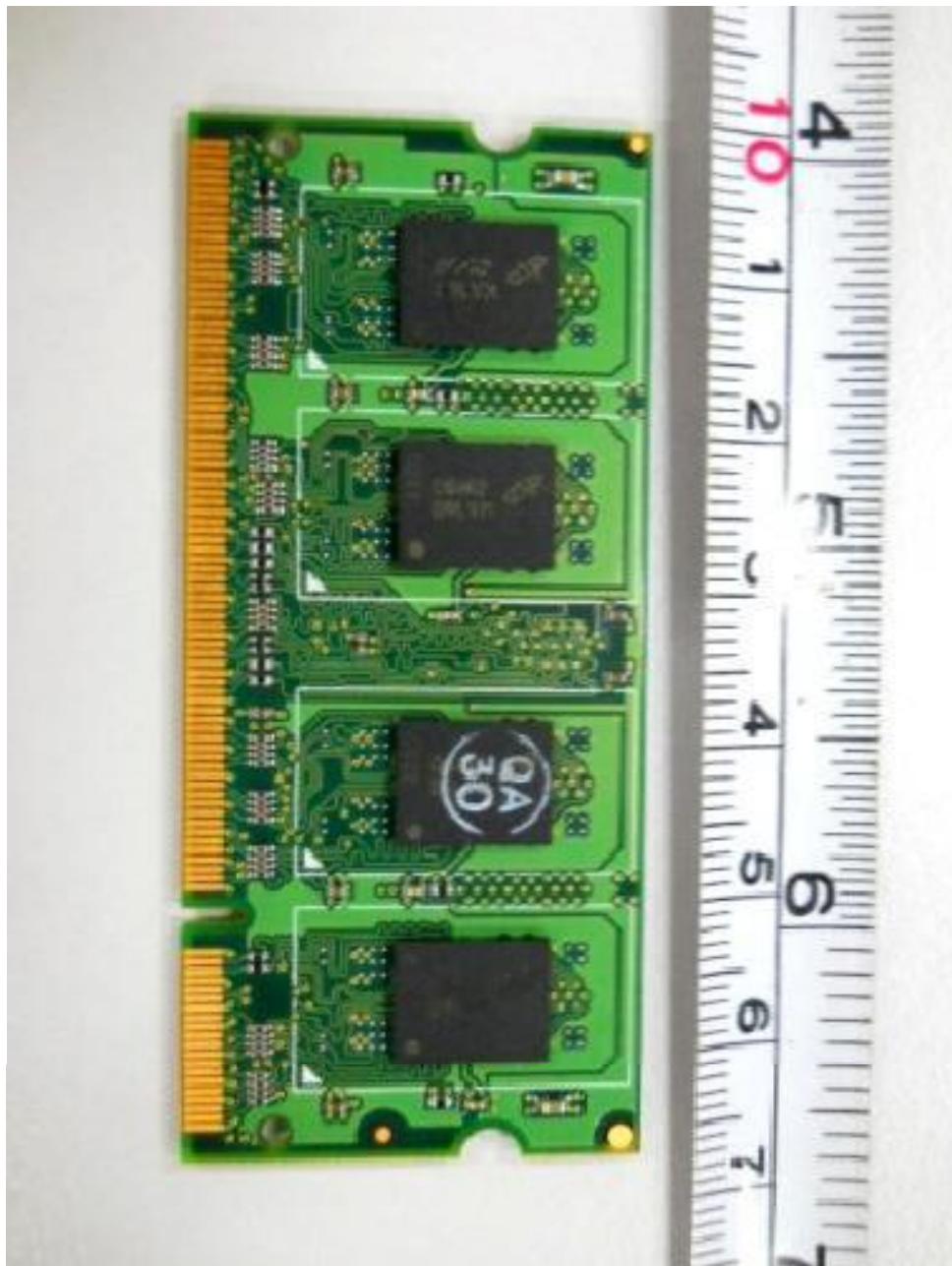
**EUT PHOTOGRAPHS**



**DDR2-SODIMM PCB Component Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

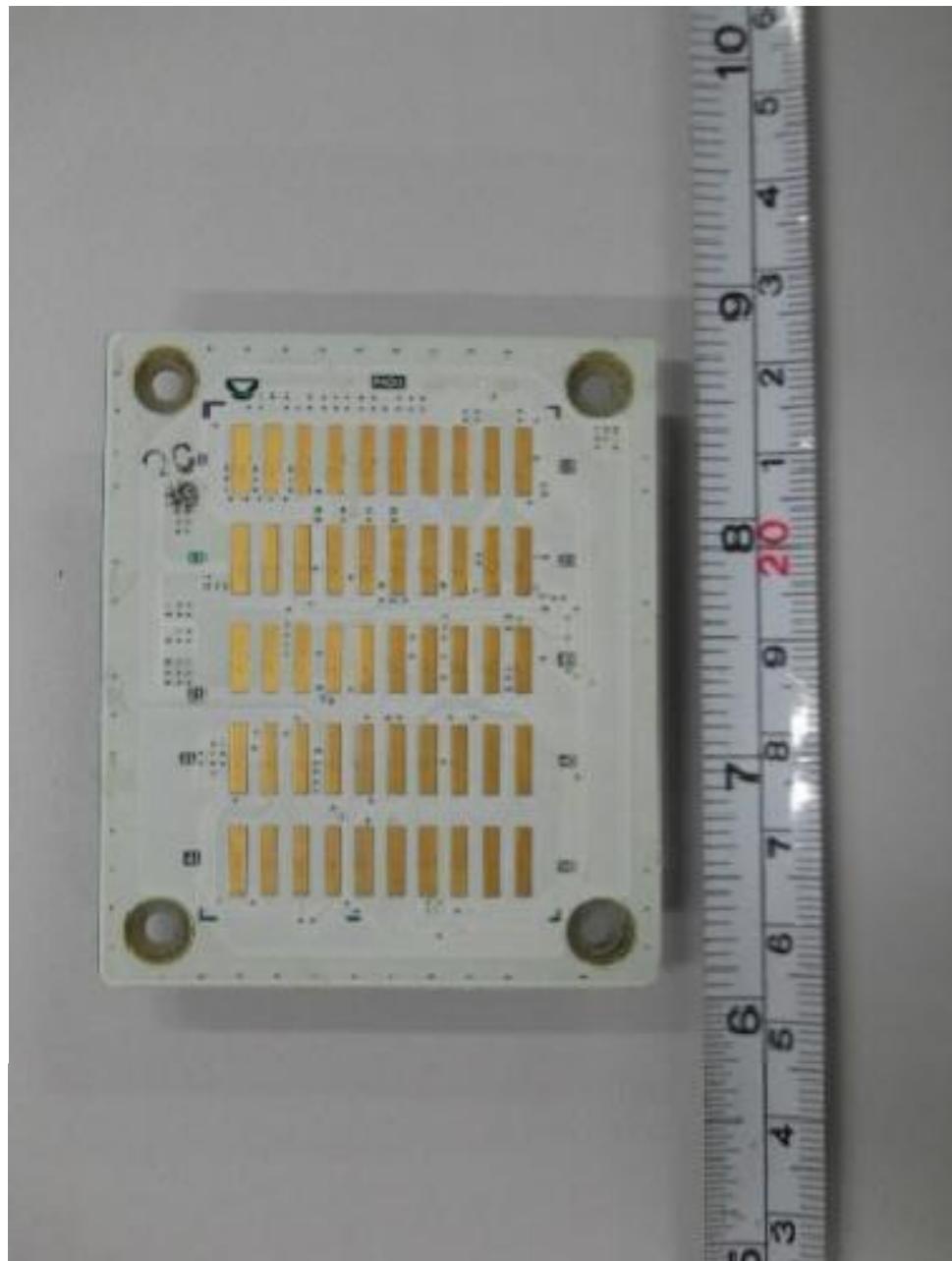
**EUT PHOTOGRAPHS**



**DDR2-SODIMM PCB Trace Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**Docking Interface PCB Component Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

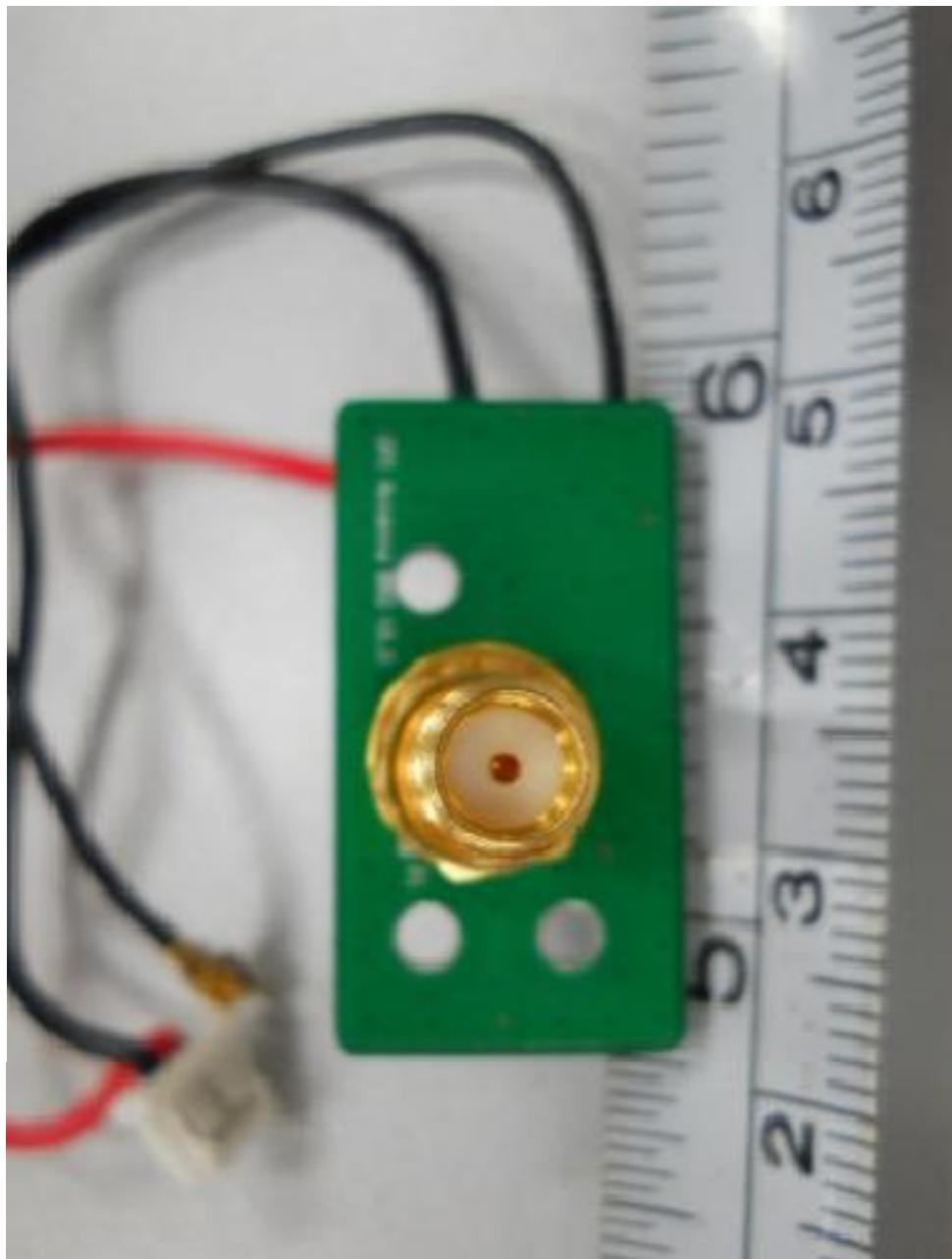
**EUT PHOTOGRAPHS**



**Docking Interface PCB Trace Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



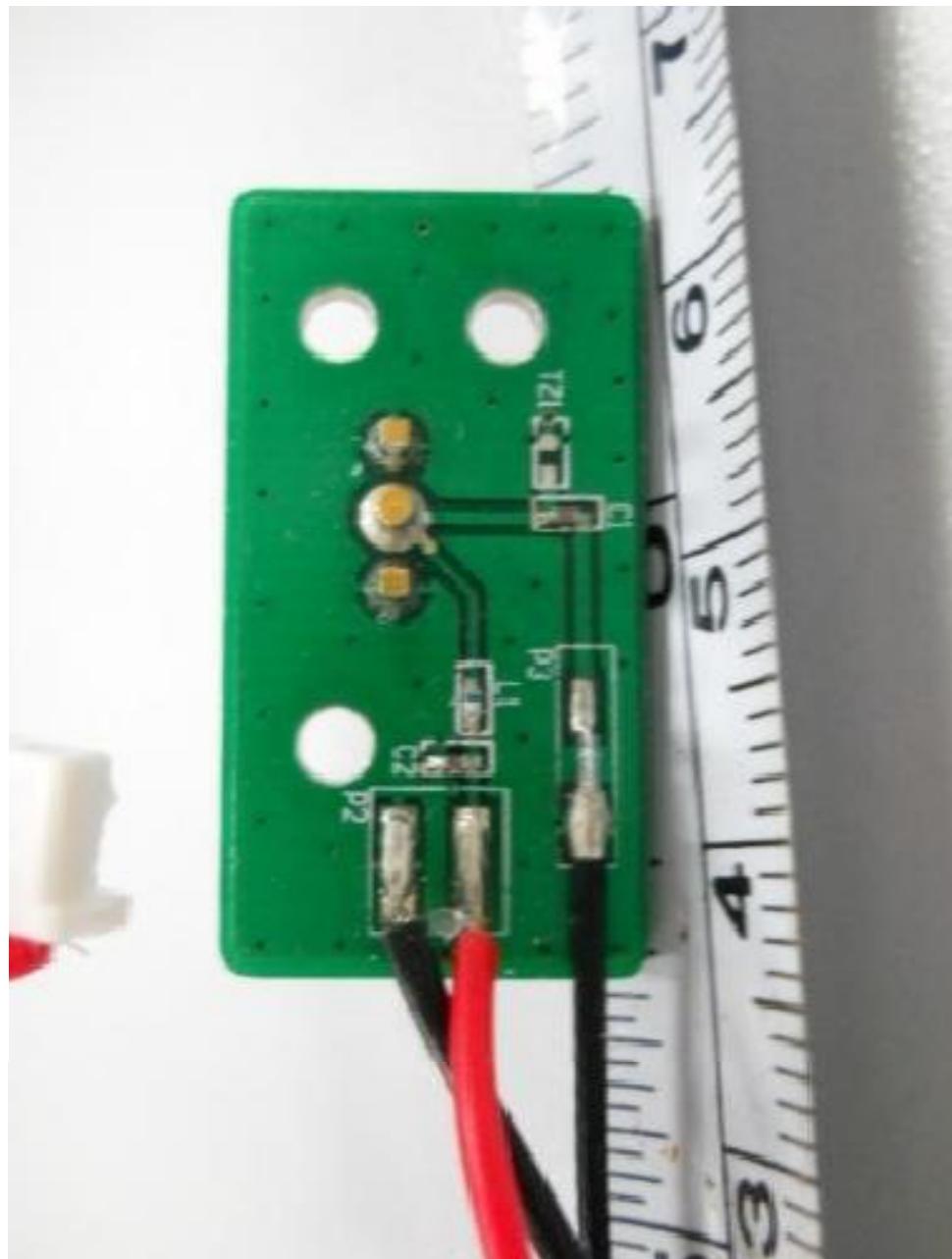
**GPS Power-3.3V PCB Component Side**



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**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

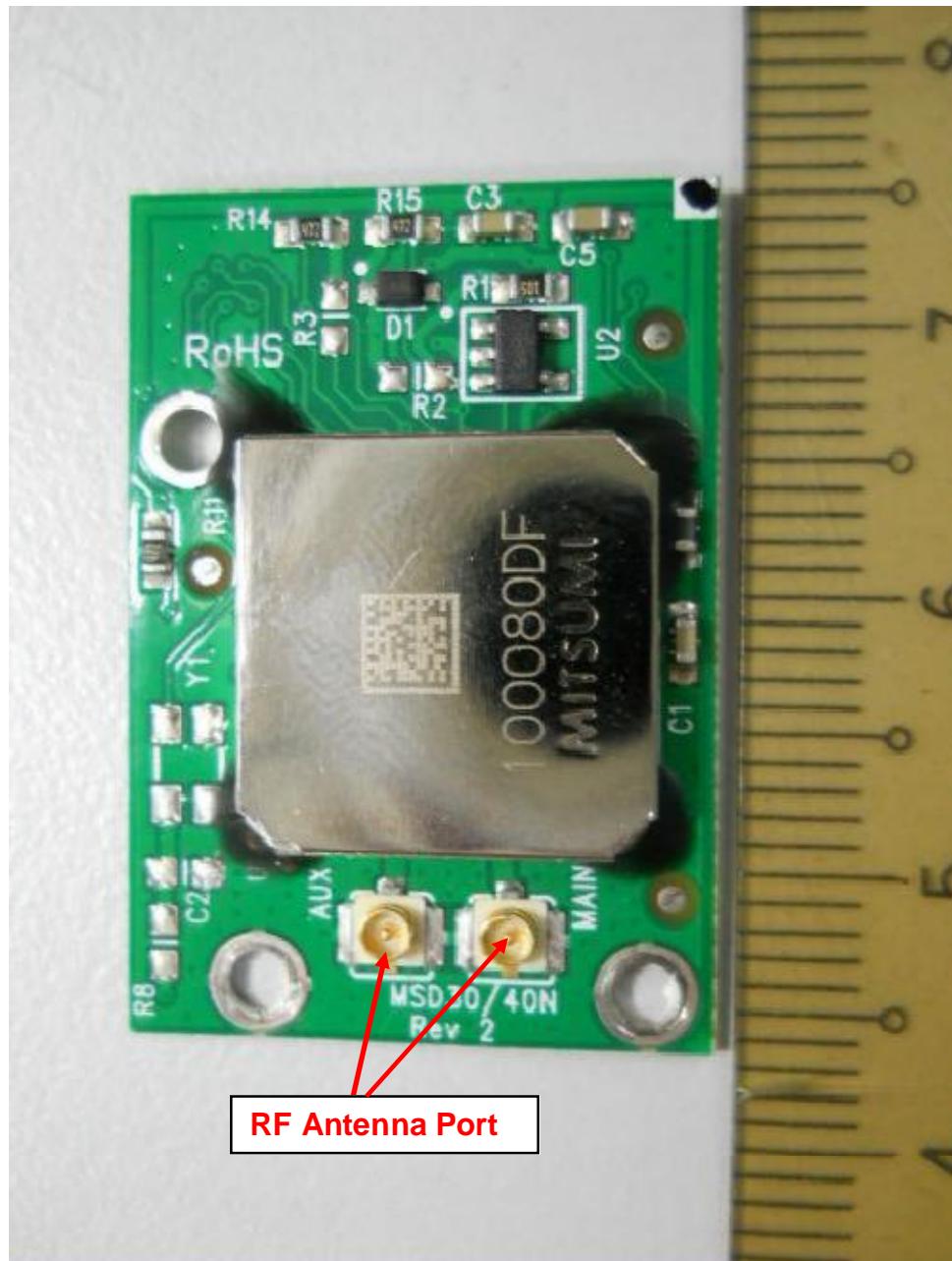
**EUT PHOTOGRAPHS**



**GPS Power-3.3V PCB Trace Side**

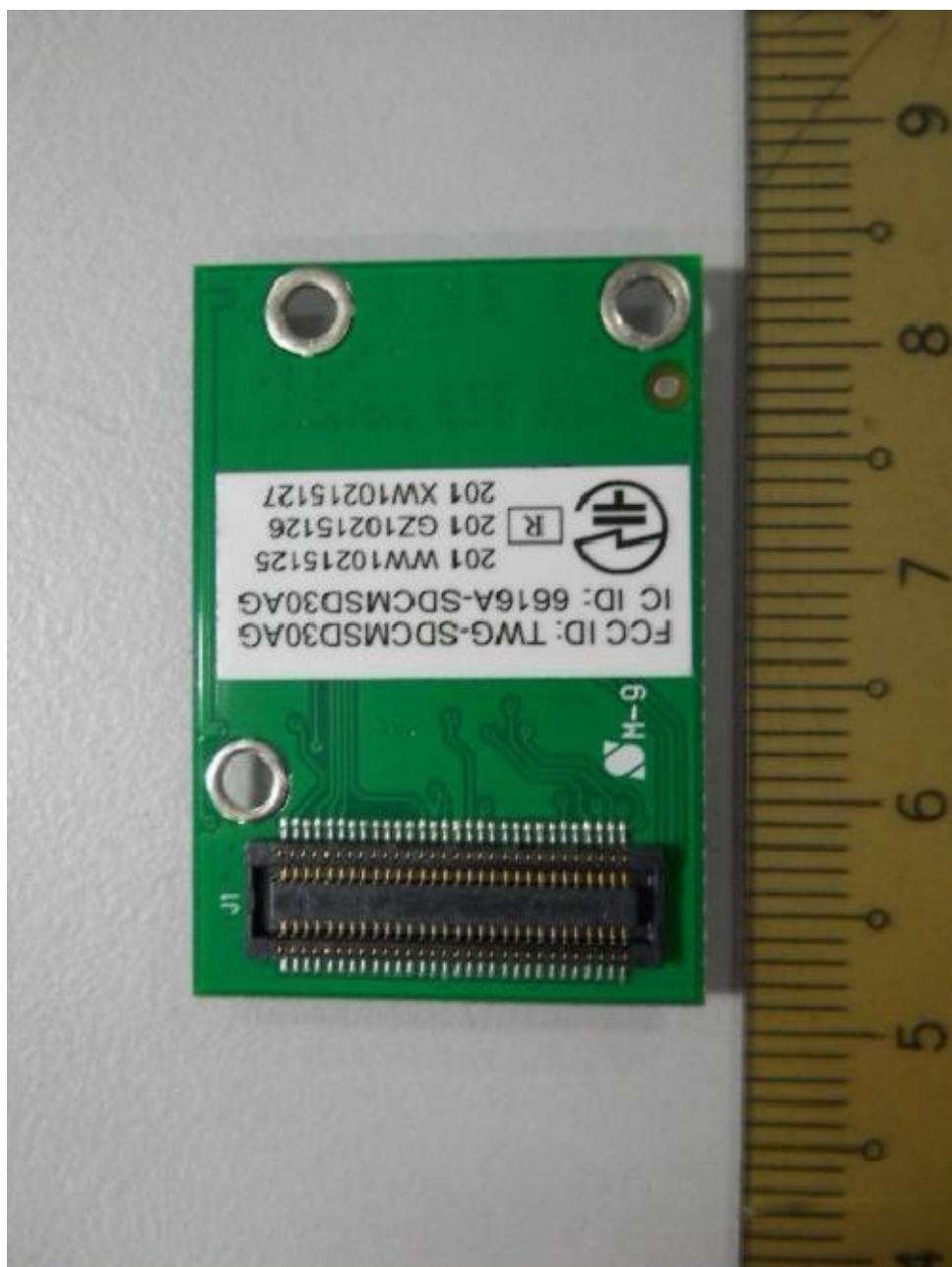
**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**WLAN MODULE-MSD30AD PCB Trace Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

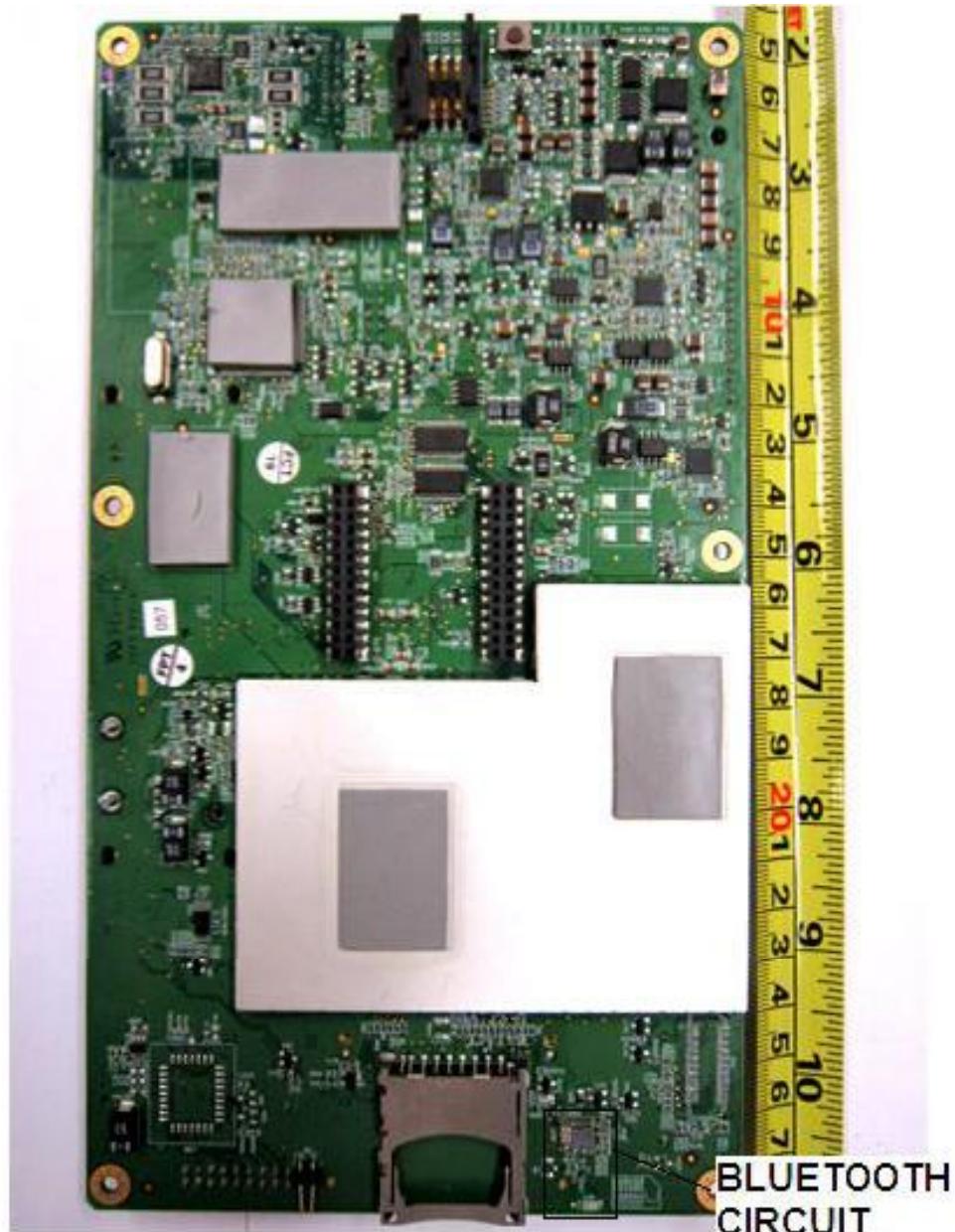
**EUT PHOTOGRAPHS**



WWAN Module PCB Trace Side

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

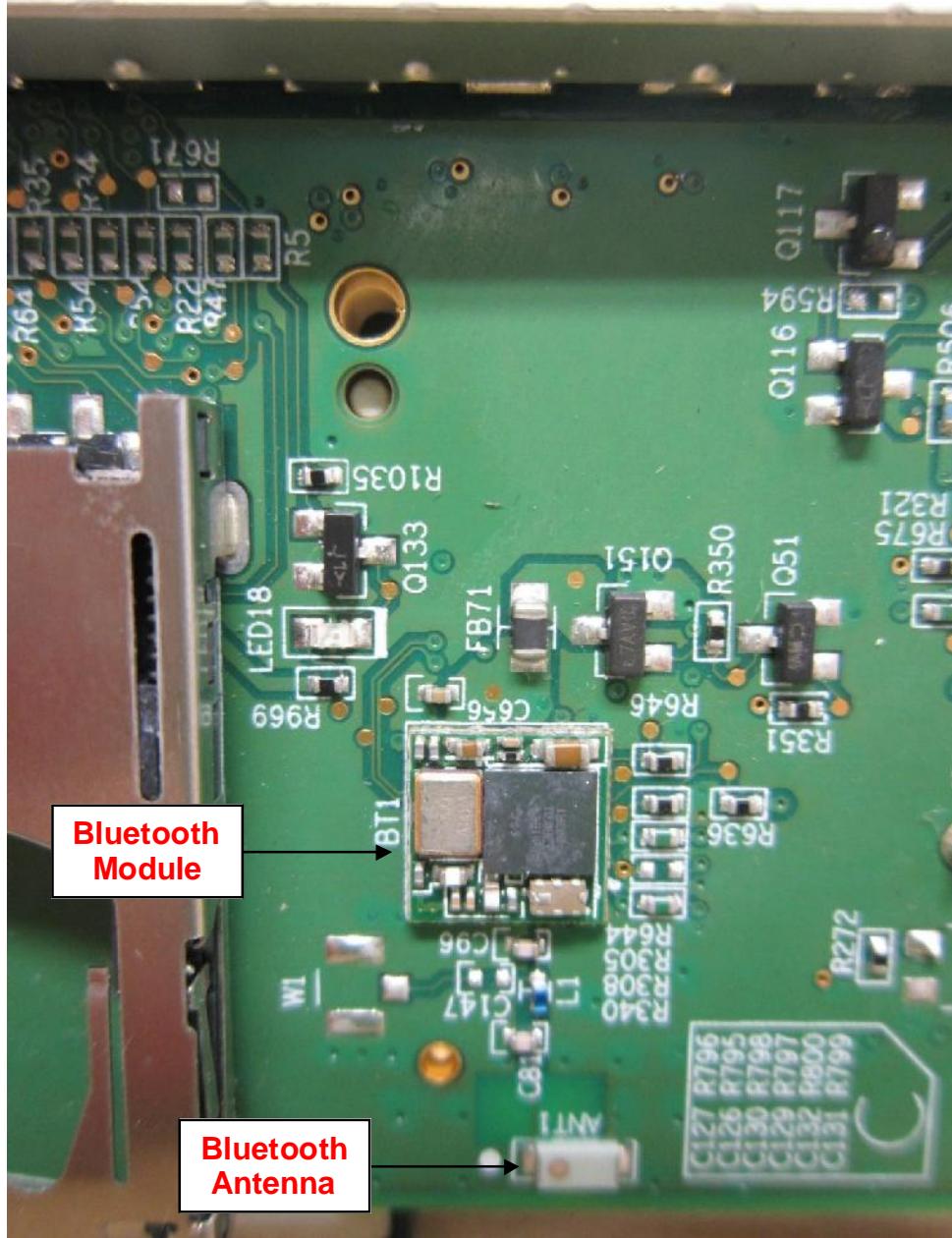
**EUT PHOTOGRAPHS**



**Bluetooth-Module PCB Component Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

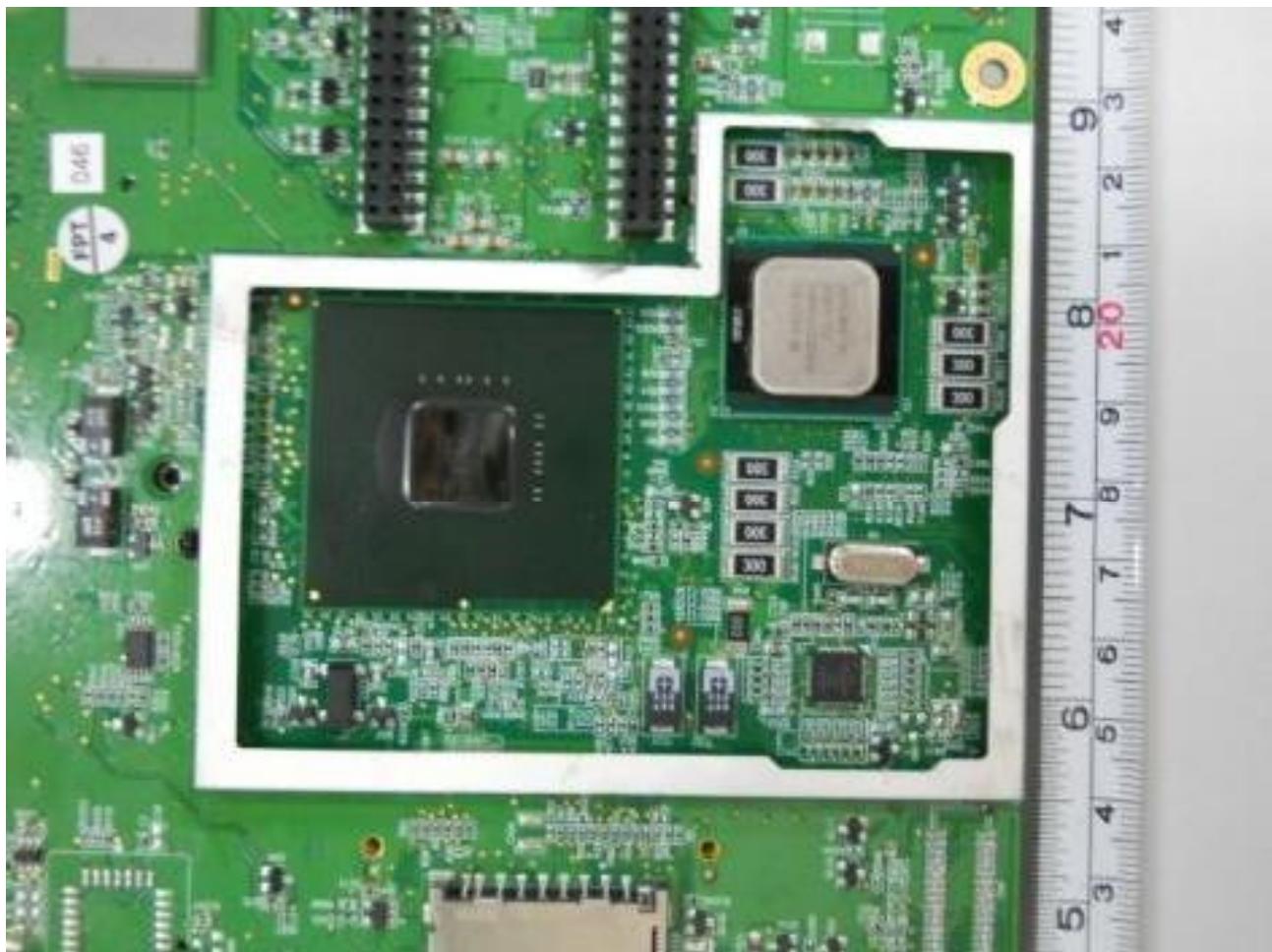
**EUT PHOTOGRAPHS**



Bluetooth-Module PCB Component Side

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS**



**CPU Circuit Shield Cover Removed PCB Component Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

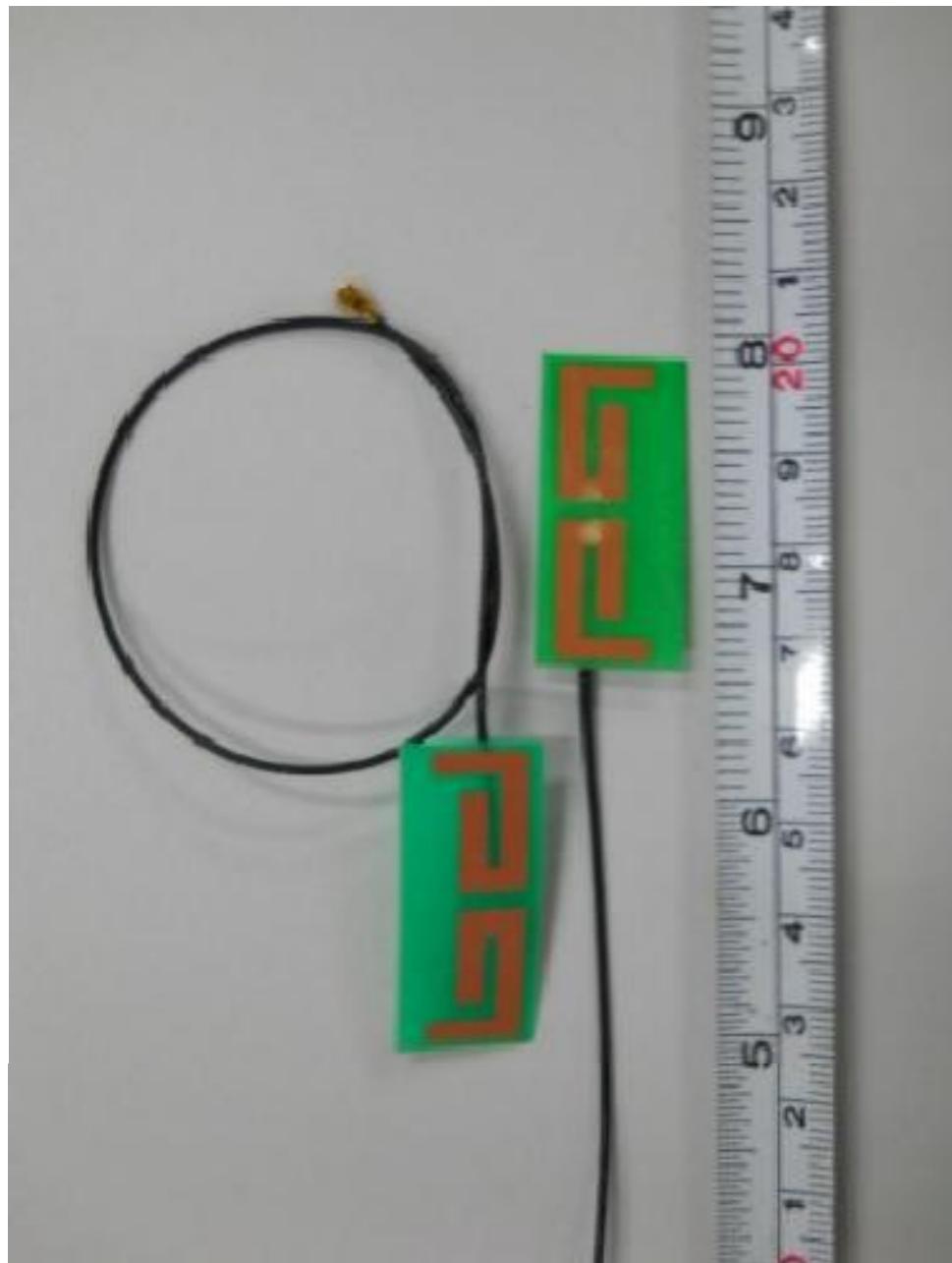
**EUT PHOTOGRAPHS**



**Memory DDR2-SDIO Shield Cover Removed Module PCB Component Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

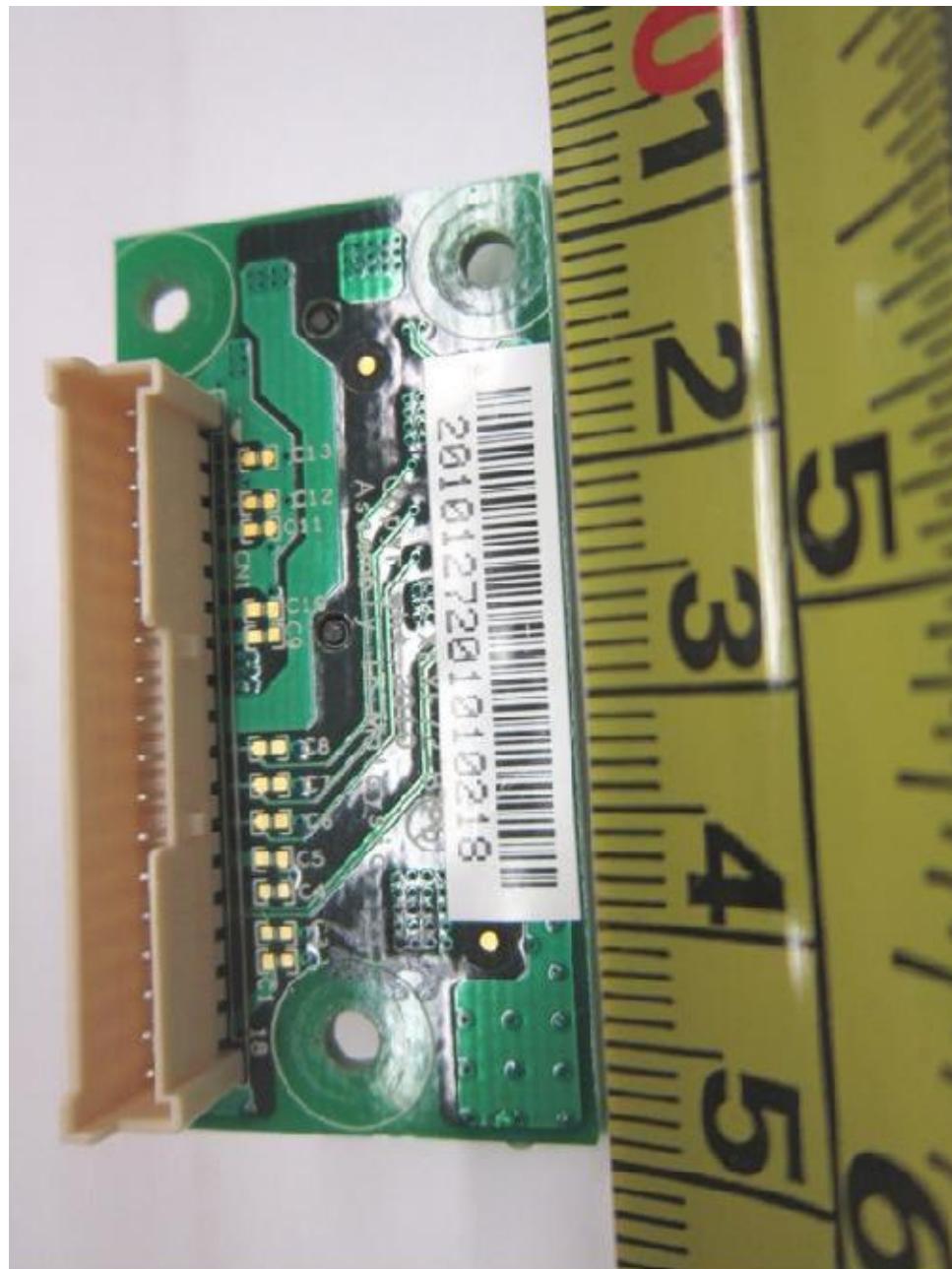
**EUT PHOTOGRAPHS**



**Internal WLAN Antennas-PCB Module PCB Component Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

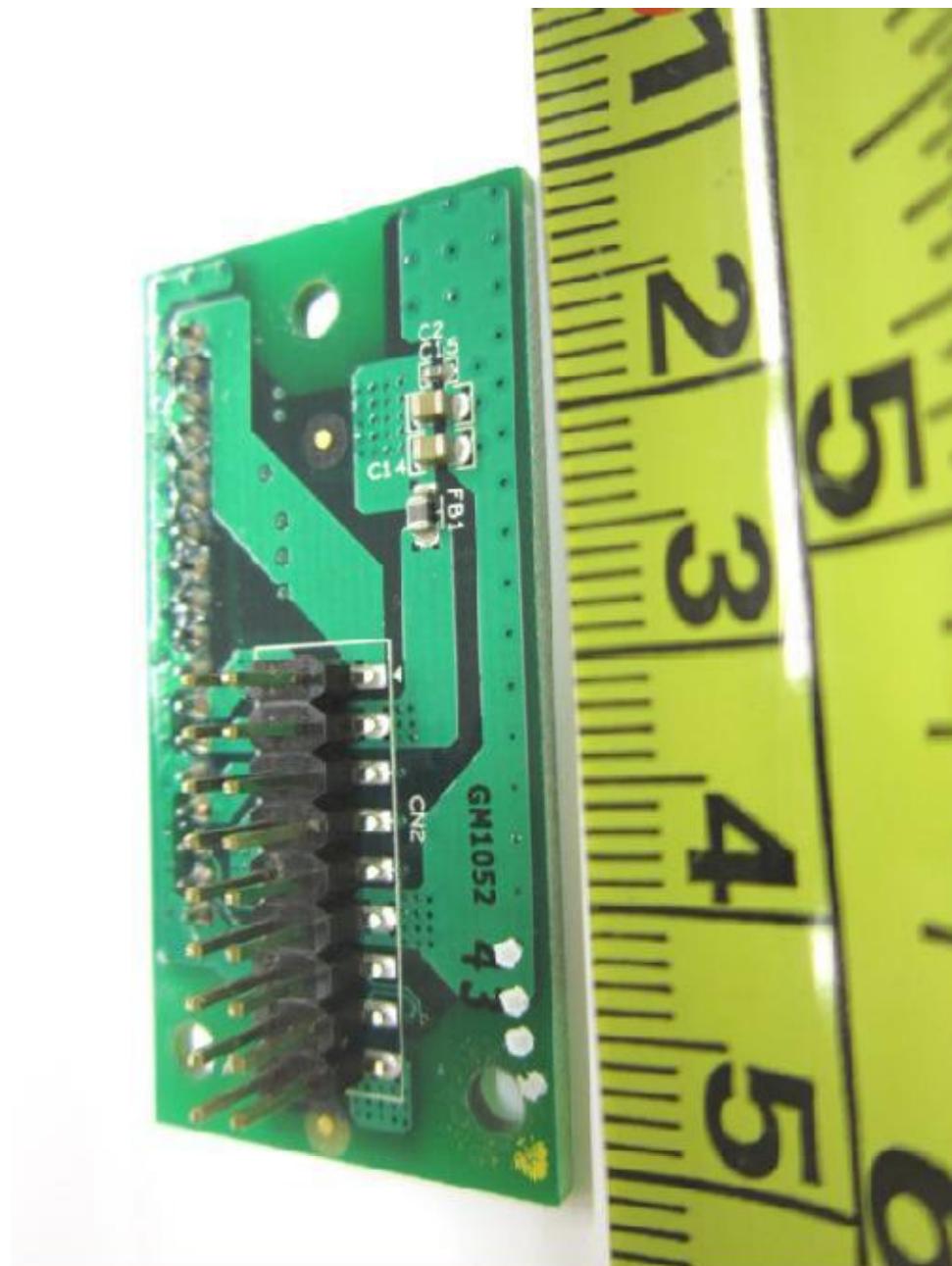
**EUT PHOTOGRAPHS**



**Keyboard Interface PCB Component Side**

**ANNEX A EUT PHOTOGRAPHS / DIAGRAMS**

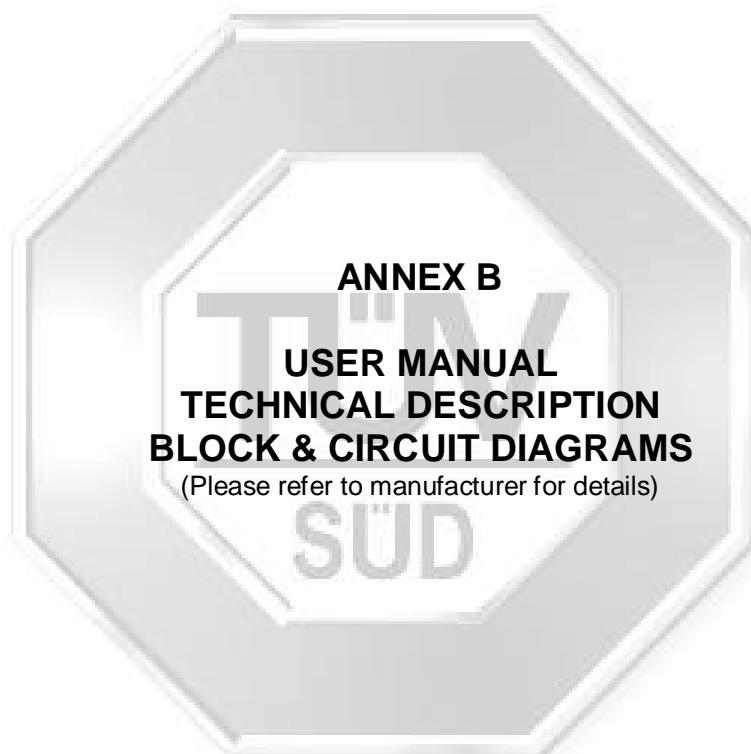
**EUT PHOTOGRAPHS**



Keyboard Interface PCB Trace Side

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**ANNEX B USER MANUALTECHNICAL DESCRIPTION BLOCK & CIRCUIT DIAGRAMS**





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**ANNEX C FCC LABEL & POSITION**



**ANNEX C FCC LABEL & POSITION**

Labelling requirements per Section 2.925 & 15.19

The label shown will be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.

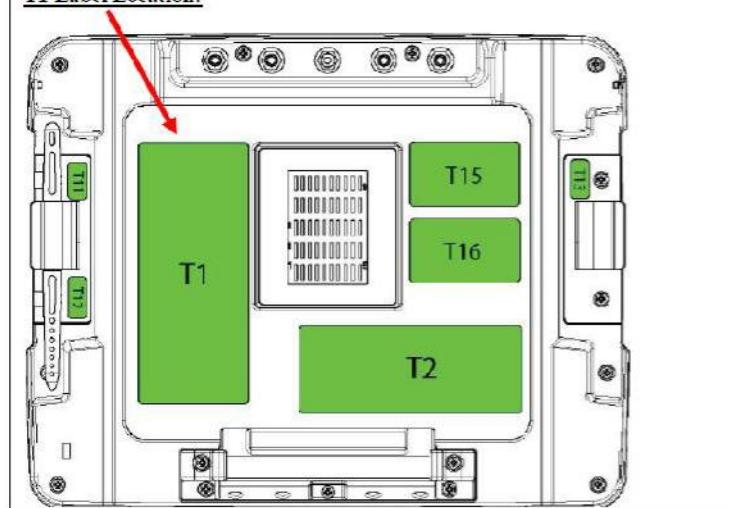
**VM1 Terminal Product Label(T1)**

(1) Size: 120mm X50mm  
(2) Specification: Printed Polyester, Maximum surface temperature specified, or 40 degree C if not specified.  
(3) UL-CCN: PGDQ2 or PGJ2

VM1 C: Windows CE with  
MSD30AG wifi module,  
GOBI2000



**T1 Label Location:**





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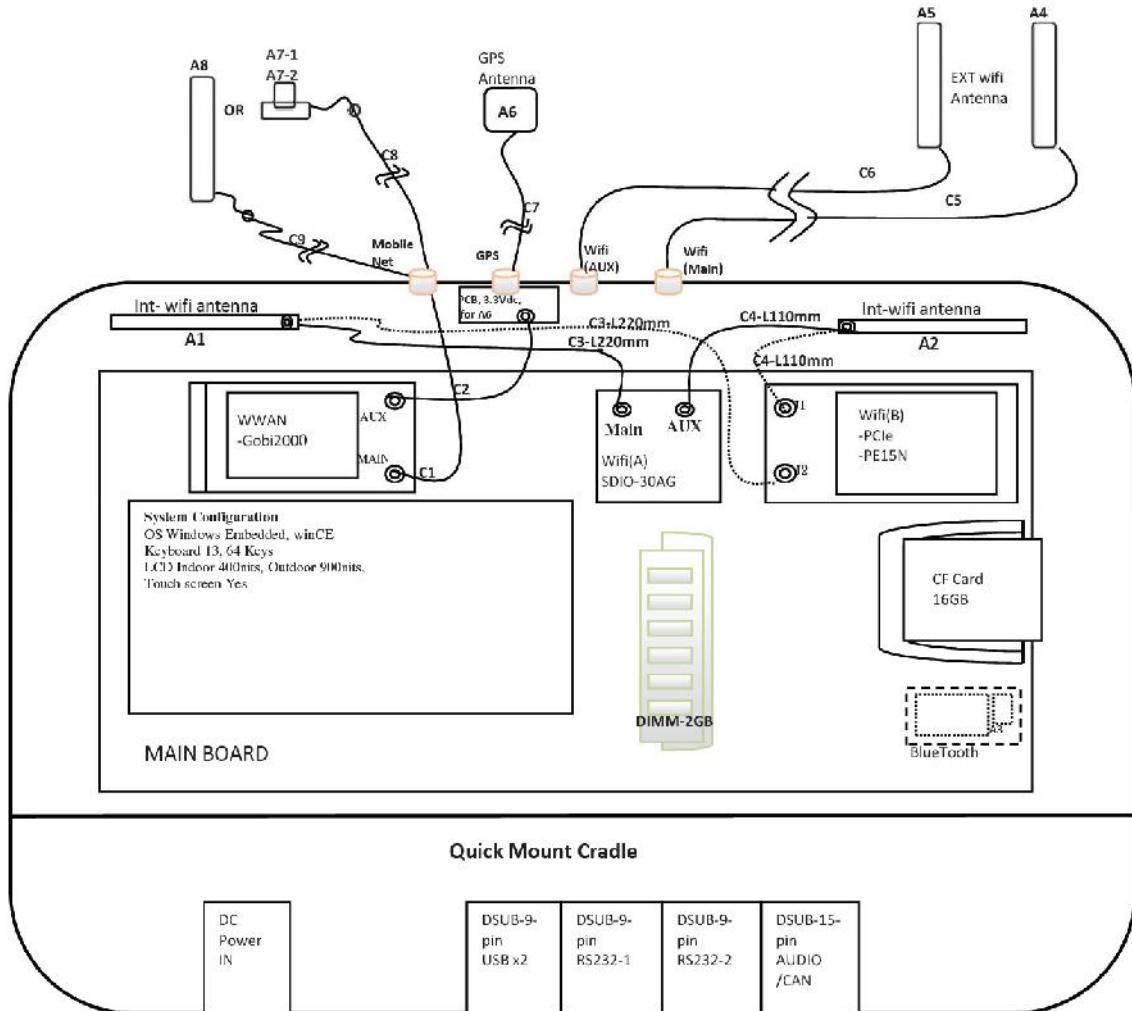
**ANNEX D ANTENNA INFORMATION**



**ANNEX D ANTENNA INFORMATION**

**TYPE OF RF CABLES AND ANTENNAS**

(a) Antennas and cables connection diagram





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**ANNEX D ANTENNA INFORMATION**

**(b) TYPES OF ANTENNA**

The information in below table are provides from their respective specification					
Ref ID	Description	Type	Gain	Manufacturer	Connection
B1	Internal wifi antenna	FIT-ANT-VM1-10	2.4 to 2.485Ghz: 2dBi 4.9 to 5.9Ghz: 4dBi	Frontier Integrated Technology	Cable C3-L220mm, connect to SDIO-MAIN or PE15N-J2
B2		FIT-ANT-VM1-1			Cable C4-L110mm, connect to SDIO-AUX or PE15N-J1
B3	Bluetooth	AH316M215001	2.4 to 2.485Ghz: -1.5dBi	Taiyo Yuden	PCB- surface mounted device, SMD type
B4	External wifi antenna, dual band 2.40-2.50G/4.90-5.90G. Dual Band Swivel Mount. Dipole RP-TNC Blade.	R380500314	2.4 ~ 2.5Ghz: 1.6dBi 4.9 ~ 5.9Ghz: 5dBi	IARSFN	Connect to WiFi RF terminals via RF cable-C5(for A4-Main) and C6( for A5-Aux).
B5					
B6	External GPS antenna,	GPS15MGSMD	1575.42 MHz: 3dBi Cable loss 10dB	LAIRD	Antenna with attached cable connect to VM1-GPS RF terminal
B7	MobileNet antenna. There are two parts; Multi Band Phantom-A7-1 and Miniature Magnetic Mounts A7-2	A7-1: TRAB806/17103 (BLK Phantom wideband806-960, 1575, 1710-2500MHz 3dB MEG N) A7-2: G10404 (MTMDN15SMA M-001, MOUNT, MGM, 3/4, A105, SMAI, CMP, CH)	AMPS 806-896 MHz: 5.9dBi GSM 890-960 MHz: 5.8dBi GPS 1575.42 MHz: 5.1dBi DCS 1710-1880 MHz: 4.2dBi PCS 1850-1990 MHz: 4.2dBi UMTS 1900-2170 MHz: 4.4dBi ISM (BT) 2.4-2.5 GHz: 3.0dBi	LAIRD	Connect to Mobile-Net RF terminal via the attached cable of magnetic mount
B8	MobileNet antenna-alternate type. Mount by double sized adhesive tape on non-metallic surface.	STEALTH BLADE ; W1923G0300-824-960/1710-2170MHz	824-960/1710-2170 MHz: 0dBi	Pulse	As alternate for non-metallic surface connected to Mobile-Net RF terminal via RF cable C9



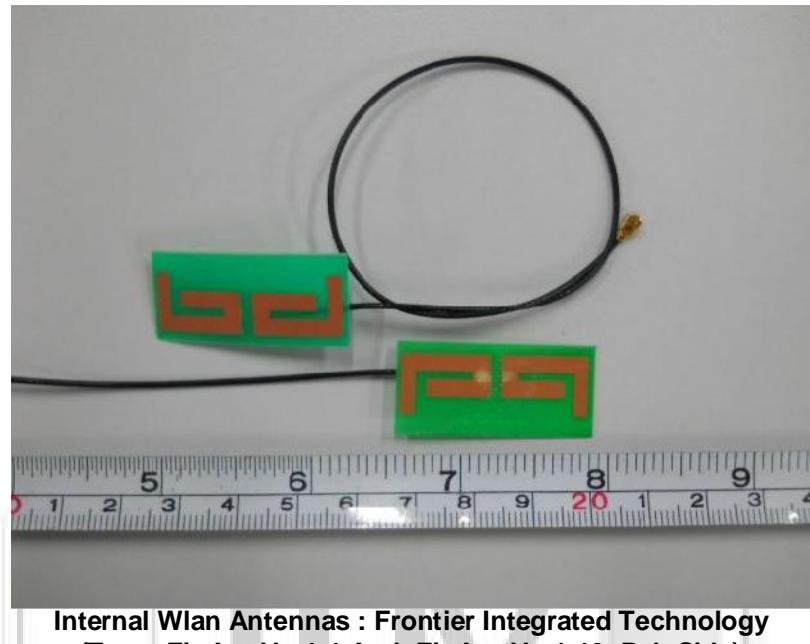
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**ANNEX D ANTENNA INFORMATION**

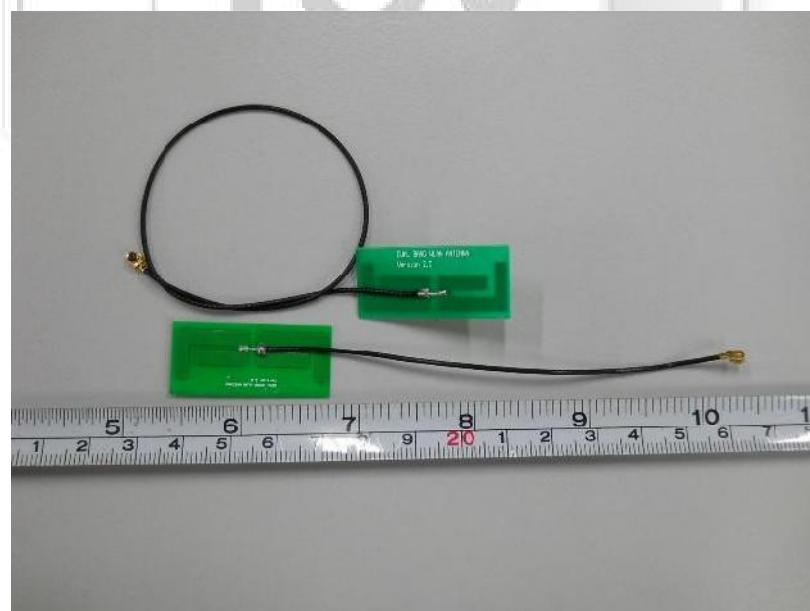
**(C ) Type of RF Cables and Interconnection**

Ref ID	Part description, and Type	Connection		Specification: Length, cable loss, frequency range
		From	To	
C1	RF cable-Main	Main-Gobi2000	MOBILE NET-VM1 SMA connector-Main	
C2	RF cable-Aux	AUX-Gobi2000	MOBILE NET-VM1 SMA connector-GPS-PCBA	
C3	Internal wifi cable	Wifi(A) SDIO-Main	Internal Antenna A1-SIDE	Type: Cable 036 RF – XXX – X "XXX": Length in mm, 50 to 400 Example: 100mm=100 "X": Washer and nut options Blank-Separately packed (standard) A- Assembled with connectors
		Wifi(B) PCIe - J2	Internal Antenna A1-SIDE	
C4	Internal wifi cable	Wifi(A) SDIO-AUX	Internal Antenna A2-TOP	
		Wifi(B) PCIe - J1	Internal Antenna A2-TOP	
C5	Wifi cable: RDN1008006	wifi-main	Wifi antenna-A4	M/N: SMA R/A PLUG to RP TNC JACK OR LMR240 RF CABLE. RF cable, 4.573m cable.
C6		wifi-Aux	Wifi antenna-A5	
C7	GPS cable	GPS	GPS antenna - A6	Cable(4.8m) attached to GPS antenna
C8	MobileNet cable	MobileNet	Magnetic mount base(A7-2)	cable attached to magnetic mount base
C9	MobileNet cable: RDN1007129	MobileNet	Pulse antenna-A8 *alternate	M/N: SMA RA PLUG to SMA STR JACK FOR LMR240 RF CABLE. RF cable, 4.573m cable.

**ANNEX D ANTENNA INFORMATION**



**Internal Wlan Antennas : Frontier Integrated Technology  
(Type: Fit-Ant-Vm1-1 And Fit-Ant-Vm1-10, Pcb Side)**



**Internal Wlan Antennas - Frontier Integrated Technology ( Pcb Bottom Side)**

**ANNEX D ANTENNA INFORMATION**



**Mobile Net Antenna : Pulse (Type: W1923g0300) & Cable (Type: Rdn1007129)**



**Mobile Net Antenna : Laird (Type : Multi Band Phantom, Type : Trab806/17103 & Miniature Magnetic Mounts, Type : G16404 Attached With Attached 12ft Cable)**

**ANNEX D ANTENNA INFORMATION**



**GPS Antenna : Laird (Type : GPS15MGSMB With Attached 4.8m RF Cable)**

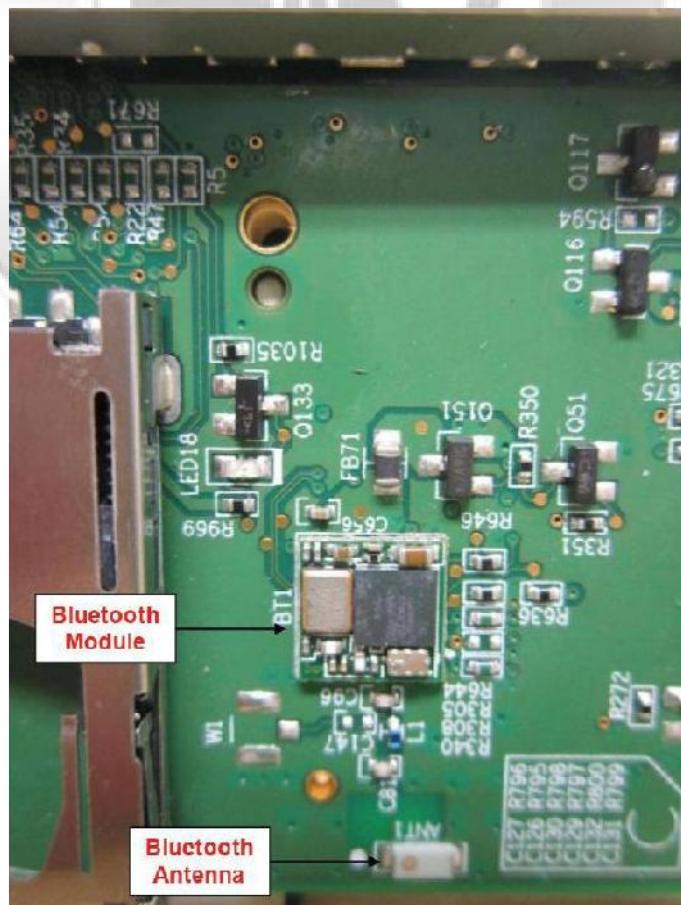


**WLAN External Antennas : Larsen (Type : R380500314)**

**ANNEX D ANTENNA INFORMATION**



External WLAN cables : RDN1008006, 4.573m



Bluetooth : Country Mate Technology Ltd (Type : Cm-1bc04-003)  
Antenna : Taiyo Yuden (Type : Ah316m245001)