

Test Report No. 7191035552-EEC12/08
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 W]
[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

Honeywell International Inc
9680 Old Bailes Road, Fort Mill, SC 29707
USA

Tel : 803-835-8220

Fax : 803-835-8097

QUOTATION NUMBER

219124671 & 219152743

JOB NUMBER

7191006338 & 7191035552

TEST PERIOD

05 May 2011 – 13 Jun 2011

PREPARED BY

Quek Keng Huat
Higher Associate Engineer

APPROVED BY

Lim Cher Hwee
Assistant Vice President



Laboratory:
TÜV SÜD PSB Pte. Ltd.
No.1 Science Park Drive
Singapore 118221



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LA-2007-0386-C
LA-2010-0464-D

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Phone : +65-6885 1333
Fax : +65-6776 8670
E-mail: testing@tuv-sud-psb.sg
www.tuv-sud-psb.sg
Co. Reg : 199002667R

Regional Head Office:
TÜV SUD Asia Pacific Pte. Ltd.
3 Science Park Drive, #04-01/05
The Franklin, Singapore 118223

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TEST SUMMARY

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

Test Results Summary

Test Standard	Description	Pass / Fail
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-SDCPE15N) 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-EEC12/08 was reproduced from the test report 7191006338-EEC11/08 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 VEHICLE MOUNT TERMINAL WITH QUICK MOUNT CRADLE. It is designated for industrial environment and vehicle use. The terminal integrated with the following wireless modules:</p> <ul style="list-style-type: none">- Bluetooth module- certified WLAN module (FCC ID: TWG-SDCPE15N) and- mobile telecom module (WWAN) (FCC ID: N7NGOB12) <p>It also integrated with audio function and basic I/O ports as follows:</p> <ul style="list-style-type: none">- serial-RS232- USB and- CANBUS <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 W</p>
FCC ID	<p>KDZLXE-VM1</p>
Serial Number	<p>: VM1110300146 (Config#3) VM1110400168 (Config#4)</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/n (FCC ID: TWG-SDCPE15N)</u> 2.412GHz – 2.462GHz 2.422GHz – 2.452GHz 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/n + ITE + Active Sync + WWAN + Bluetooth (using internal antennas)
- b. 802.11a + ITE + Active Sync + WWAN + Bluetooth (using internal antennas)
- c. 802.11b/g/n + 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 μ 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

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	External Antenna + 802.11b/g/n + 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	Kyaw Soe Hein

Frequency (MHz)	Q-P Value (dB μ V)	Q-P Margin (dB)	AV Value (dB μ V)	AV Margin (dB)	Line
0.1887	49.4	-14.7	38.4	-15.7	Neutral
0.2497	43.1	-18.7	34.8	-17.1	Neutral
0.3132	38.7	-21.2	30.8	-19.1	Neutral
0.4363	28.7	-28.4	19.7	-27.4	Neutral
0.5009	30.1	-25.9	21.2	-24.8	Live
8.0083	37.3	-22.7	30.3	-19.7	Neutral

Operating Mode	External 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	Kyaw Soe Hein

Frequency (MHz)	Q-P Value (dB μ V)	Q-P Margin (dB)	AV Value (dB μ V)	AV Margin (dB)	Line
0.1896	47.5	-16.6	41.3	-12.8	Neutral
0.3760	33.5	-24.9	28.2	-20.2	Neutral
0.7117	34.3	-21.7	29.0	-17.0	Neutral
7.2072	42.2	-17.8	36.5	-13.5	Neutral
7.5810	42.1	-17.9	36.3	-13.7	Live
8.6497	45.3	-14.7	25.7	-24.3	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 $\pm 3.0\text{dB}$.

RADIATED EMISSION TEST

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

Frequency Range (MHz)	Quasi-Peak Limit Values (dB μ 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 5th 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 μ V/m = 37.0 dB μ V/m

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

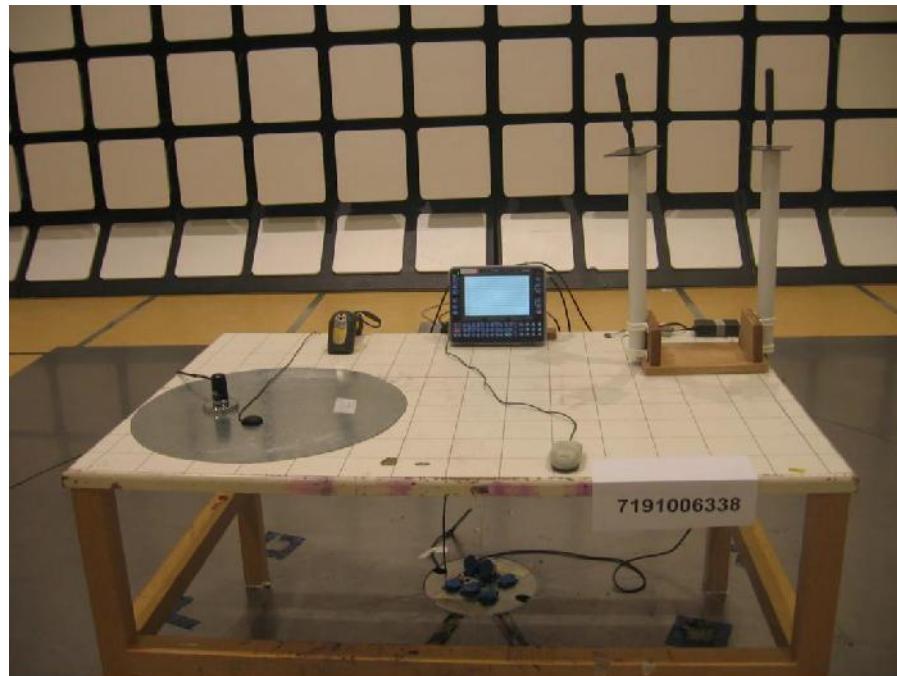
Q-P reading obtained directly from EMI Receiver = 31.0 dB μ V/m
(Calibrated level including antenna factors & cable losses)

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)



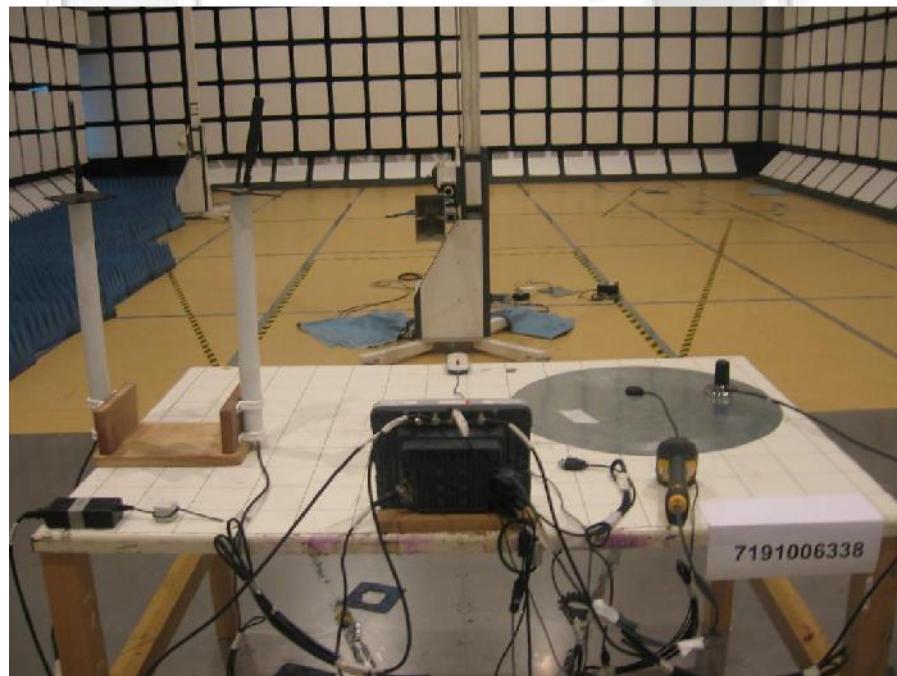
Radiated Emissions Test Setup (Rear View)

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/n + 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 μ V/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)
68.0900	29.1	-10.9	30	364	H
88.7600	30.3	-13.2	37	281	H
192.0390	31.4	-12.1	3	102	V
396.5760	28.7	-17.3	20	102	H
465.4550	36.3	-9.7	25	118	V
929.0250	32.8	-13.3	13	193	H

Emissions above 1GHz – 25GHz

Frequency (GHz)	Peak Value (dB μ V/m)	Peak Margin (dB)	Average Value (dB μ V/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)
4.9967	36.3	-37.7	36.2	-17.8	319	102	H
7.2358	40.3	-33.7	40.0	-14.0	359	101	H
7.4929	42.3	-31.7	42.3	-11.7	359	118	V
13.2365	47.3	-26.7	47.2	-6.8	27	357	H
14.1269	48.1	-25.9	48.0	-6.0	104	342	V
17.9172	50.2	-23.8	50.2	-3.8	107	379	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 ± 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 μ V/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)
33.5450	20.5	-19.5	99	399	V
63.7900	32.8	-7.2	122	313	H
192.0050	33.7	-9.8	9	102	V
332.4400	35.3	-10.7	32	100	H
465.4220	35.6	-10.4	30	104	V
923.7040	37.2	-8.8	324	225	H

Emissions above 1GHz – 40GHz

Frequency (GHz)	Peak Value (dB μ V/m)	Peak Margin (dB)	Average Value (dB μ V/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)
3.2549	45.5	-28.5	38.9	-15.1	158	142	H
4.9971	56.0	-18.0	39.8	-14.2	329	114	H
7.4934	43.0	-31.0	41.8	-12.2	359	102	V
12.3433	44.8	-29.2	44.7	-9.4	6	393	V
13.3351	47.6	-26.4	47.6	-6.4	5	255	V
17.7163	49.4	-24.6	49.3	-4.7	18	394	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 ± 4.6 dB.

RADIATED EMISSION TEST

47 CFR FCC Part 15.109 Radiated Emission Results

Operating Mode	External Antenna + 802.11b/g/n + 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 μ V/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)
45.6840	31.8	-8.2	35	100	V
60.7230	34.9	-5.1	353	100	V
456.0910	41.9	-4.1	359	100	V
465.3890	43.0	-3.0	359	100	V
922.1820	39.3	-6.7	310	147	H
963.6600	32.0	-22.0	20	167	H

Emissions above 1GHz – 25GHz

Frequency (GHz)	Peak Value (dB μ V/m)	Peak Margin (dB)	Average Value (dB μ V/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)
1.6273	52.3	-21.7	49.9	-4.2	325	177	H
7.4685	41.4	-32.6	41.1	-12.9	1	111	V
12.2238	44.1	-29.9	44.0	-10.0	42	237	V
13.5513	47.7	-26.3	47.7	-6.3	272	383	H
16.3171	47.3	-26.7	47.2	-6.8	141	398	V
17.9193	50.3	-23.8	50.2	-3.8	259	390	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 ± 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 μ V/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)
45.9060	32.5	-7.5	92	100	V
60.7460	34.7	-5.3	9	101	V
144.0090	33.6	-9.9	16	100	V
456.0470	39.4	-6.6	120	187	H
465.4550	37.8	-8.2	105	183	H
922.4260	39.9	-6.1	316	225	H

Emissions above 1GHz – 40GHz

Frequency (GHz)	Peak Value (dB μ V/m)	Peak Margin (dB)	Average Value (dB μ V/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)
1.6275	49.8	-24.2	49.7	-4.3	355	355	V
3.2547	47.1	-26.9	41.8	-12.2	43	43	V
7.4681	41.2	-32.8	40.9	-13.1	312	312	V
13.5347	47.6	-26.4	47.6	-6.4	152	152	V
16.5173	47.7	-26.3	47.6	-6.4	129	129	V
17.8547	50.2	-23.8	50.1	-3.9	96	96	H

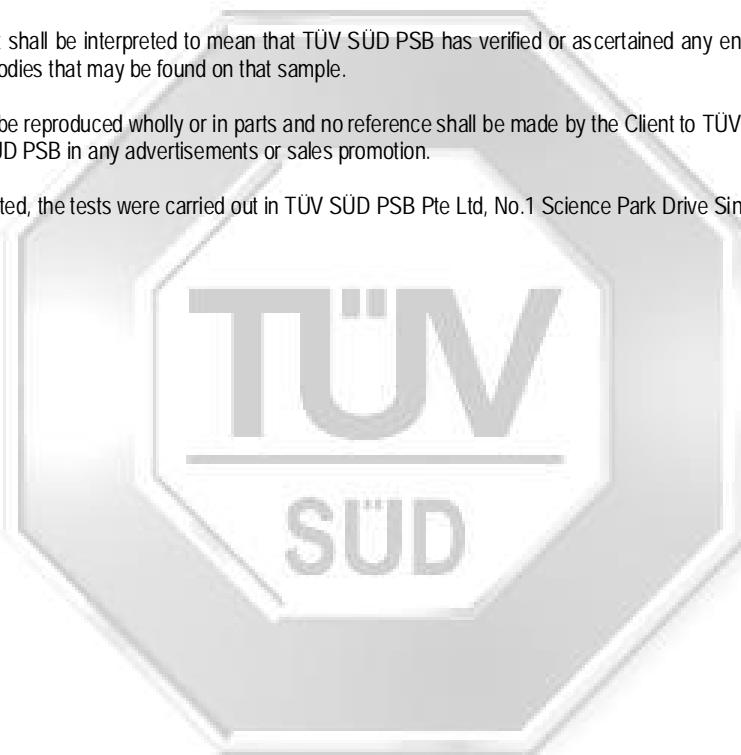
Notes

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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 ± 4.6 dB.

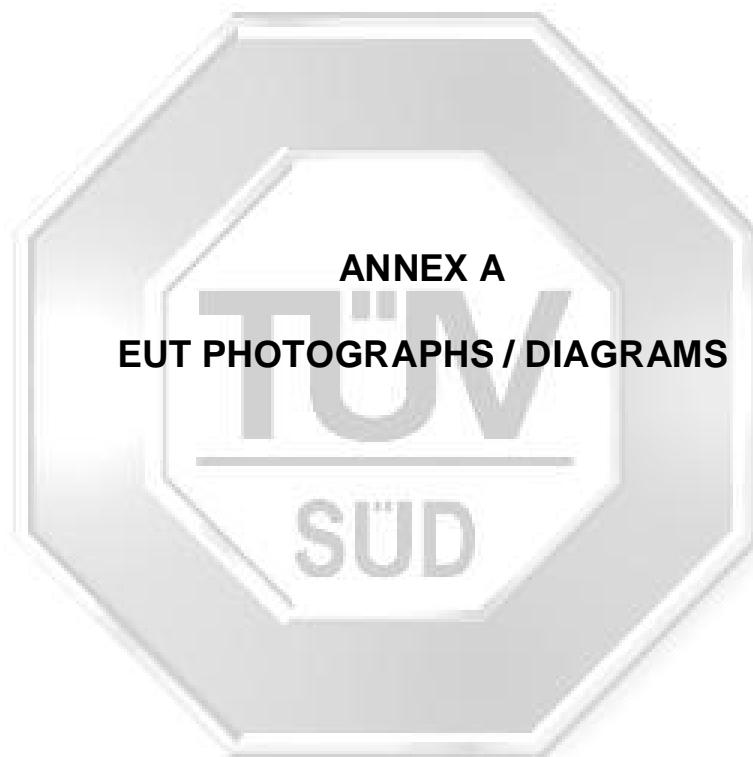
Please note that this Report is issued under the following terms :

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



ANNEX A EUT PHOTOGRAPHS / DIAGRAMS



ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

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Front View



Rear View

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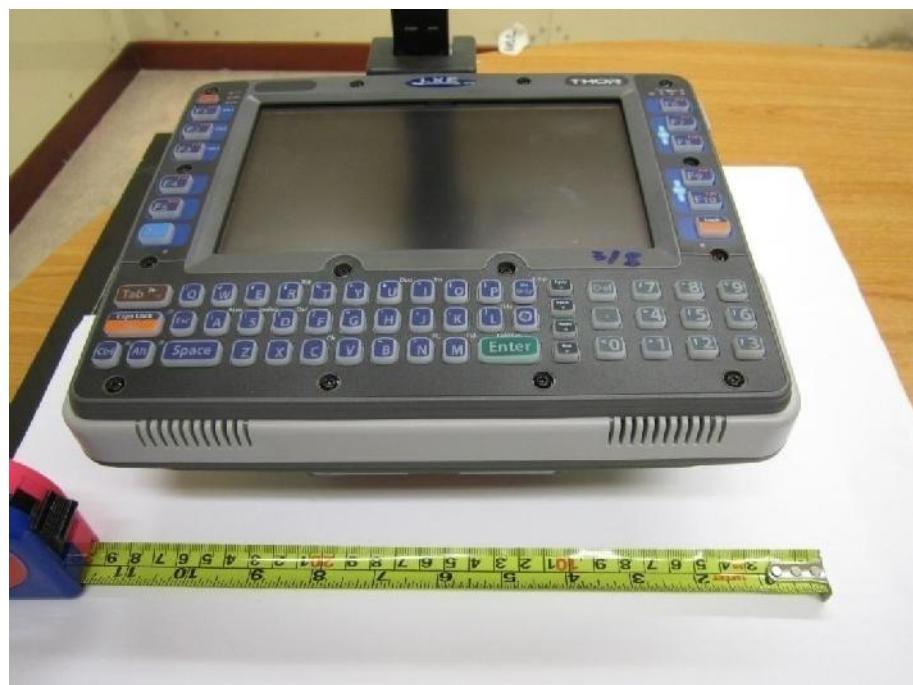
Left View



Right View

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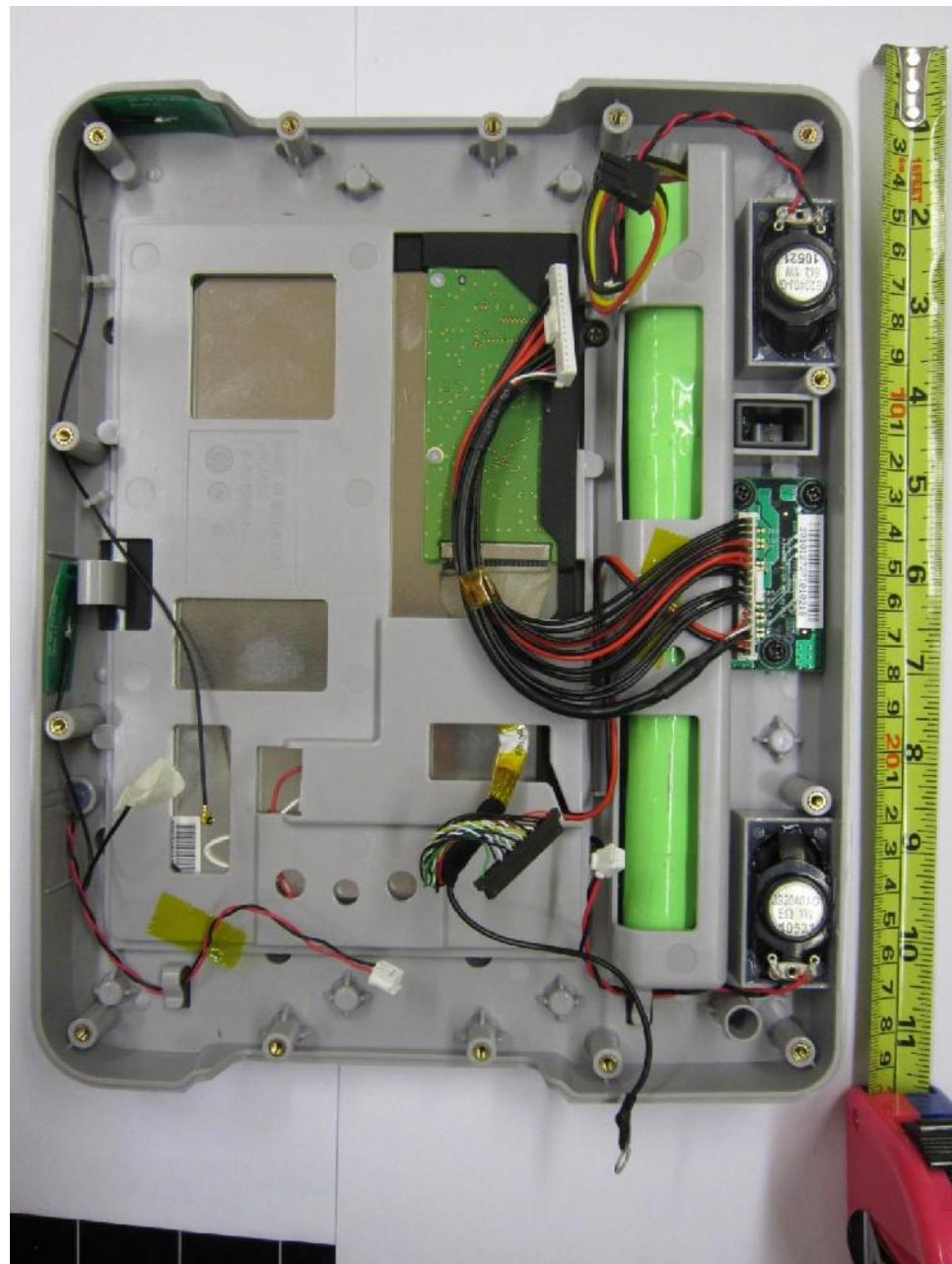
Top View



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

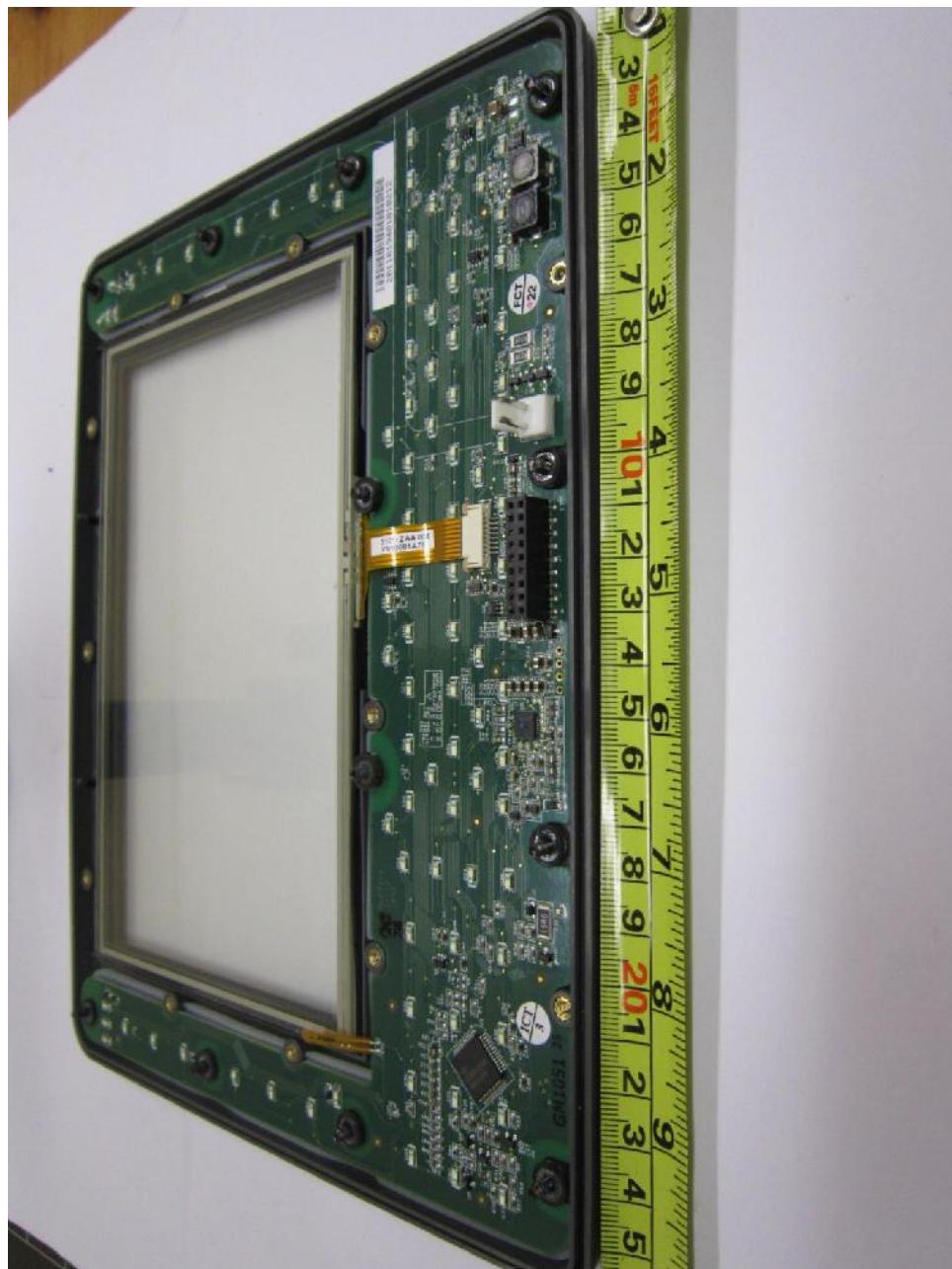
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EUT Top Housing Internal View 3

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

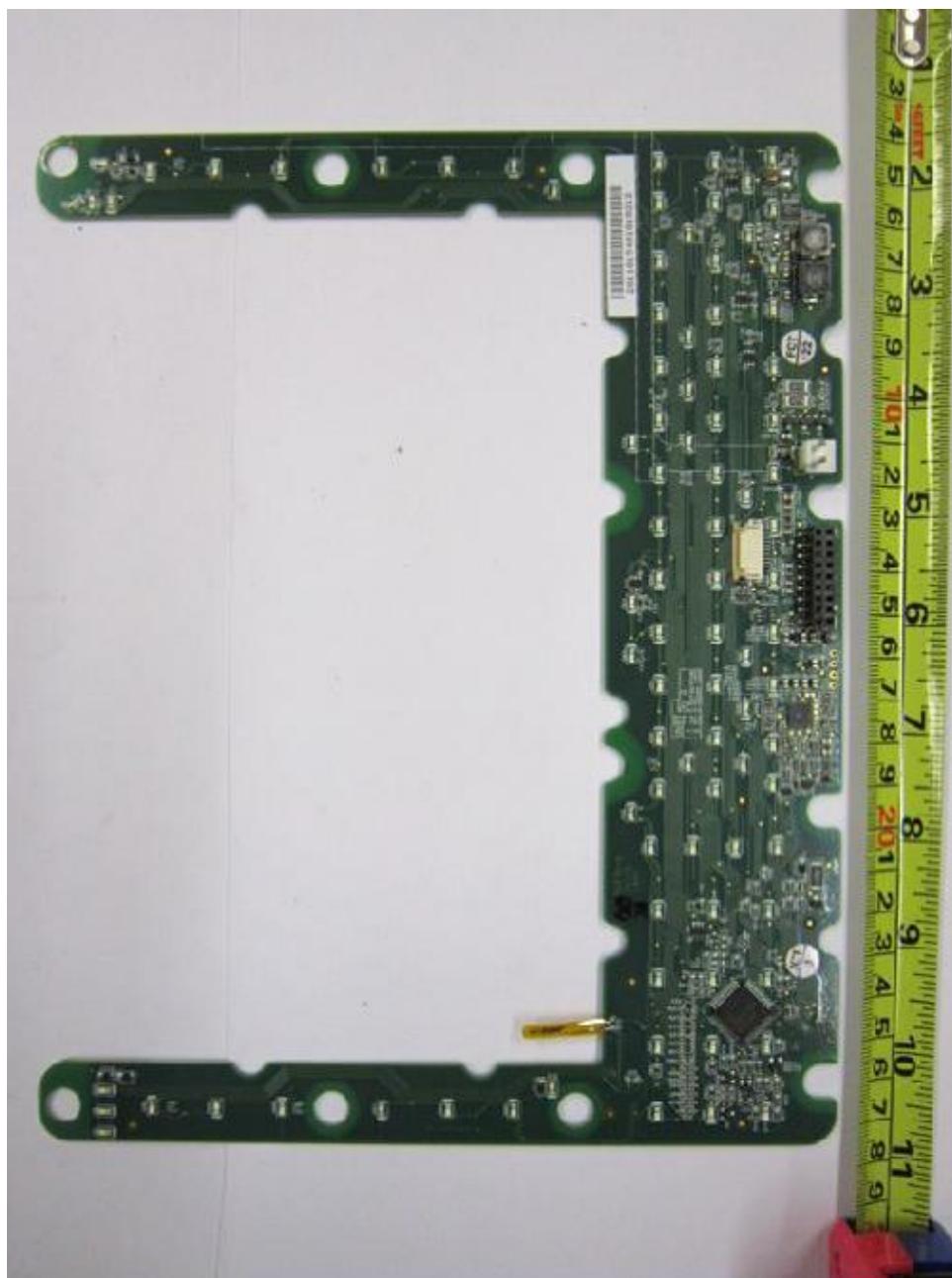
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Keypad Internal View

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

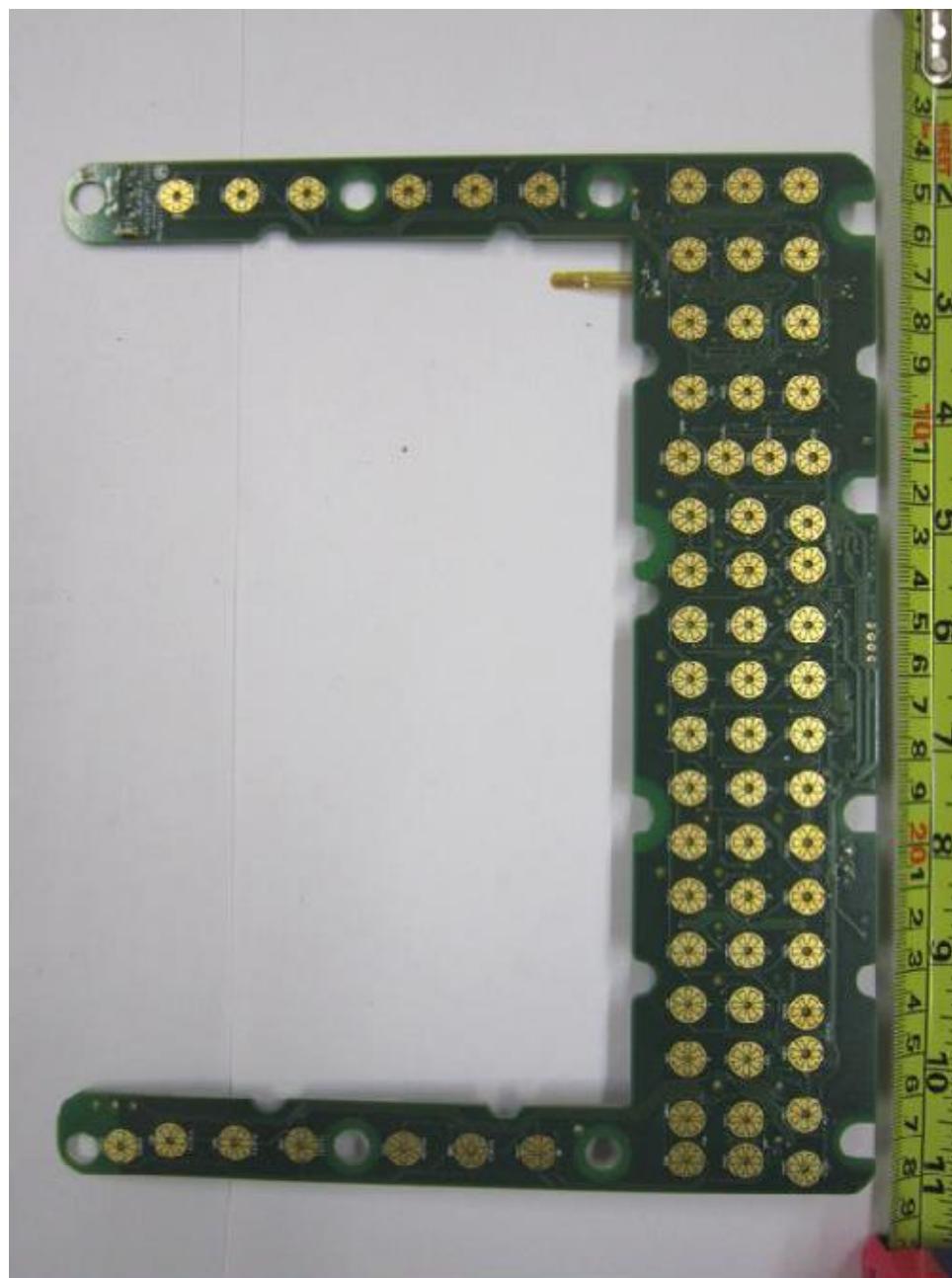
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Keypad PCB Component Side

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

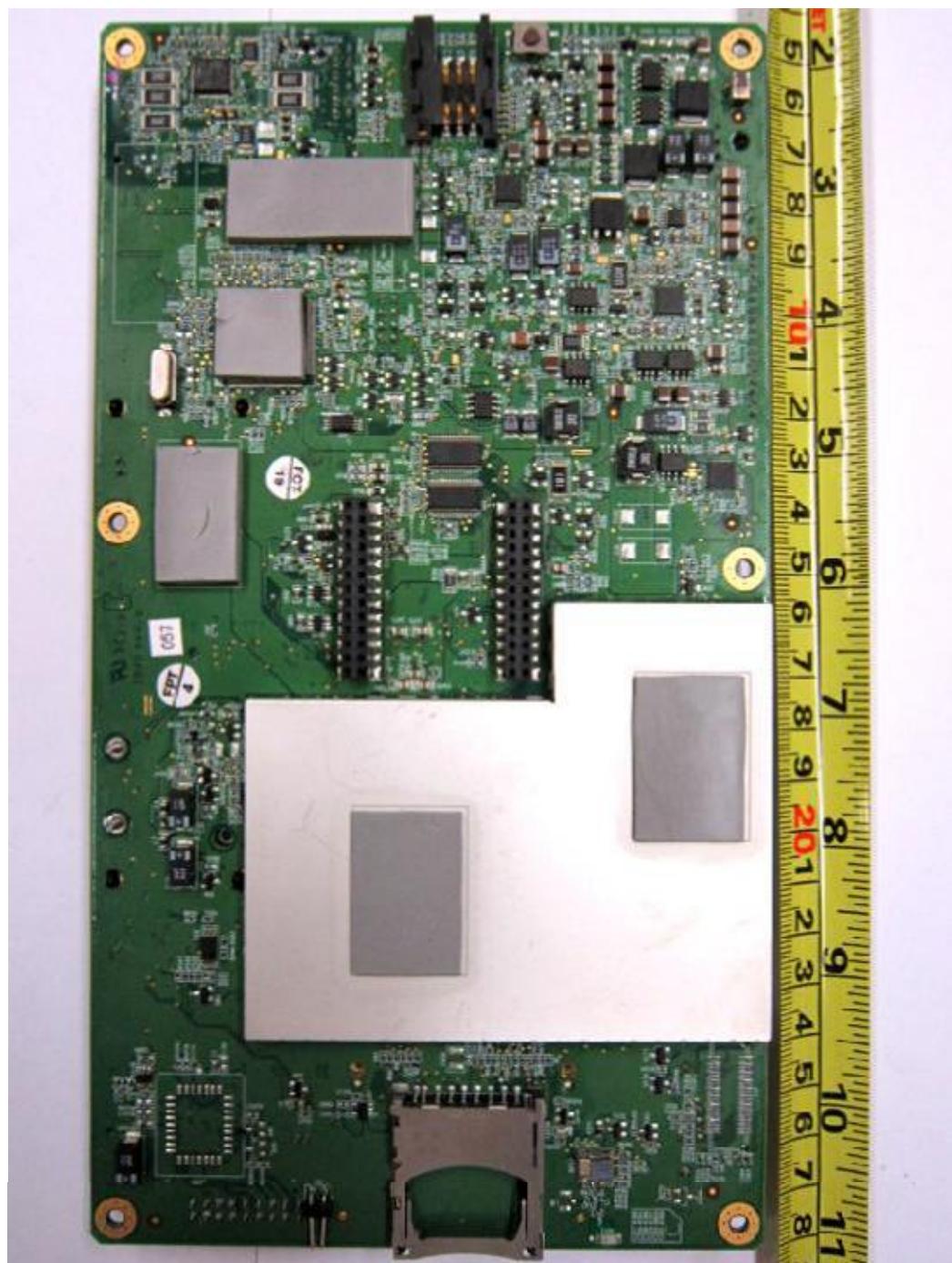
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Main-Board PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

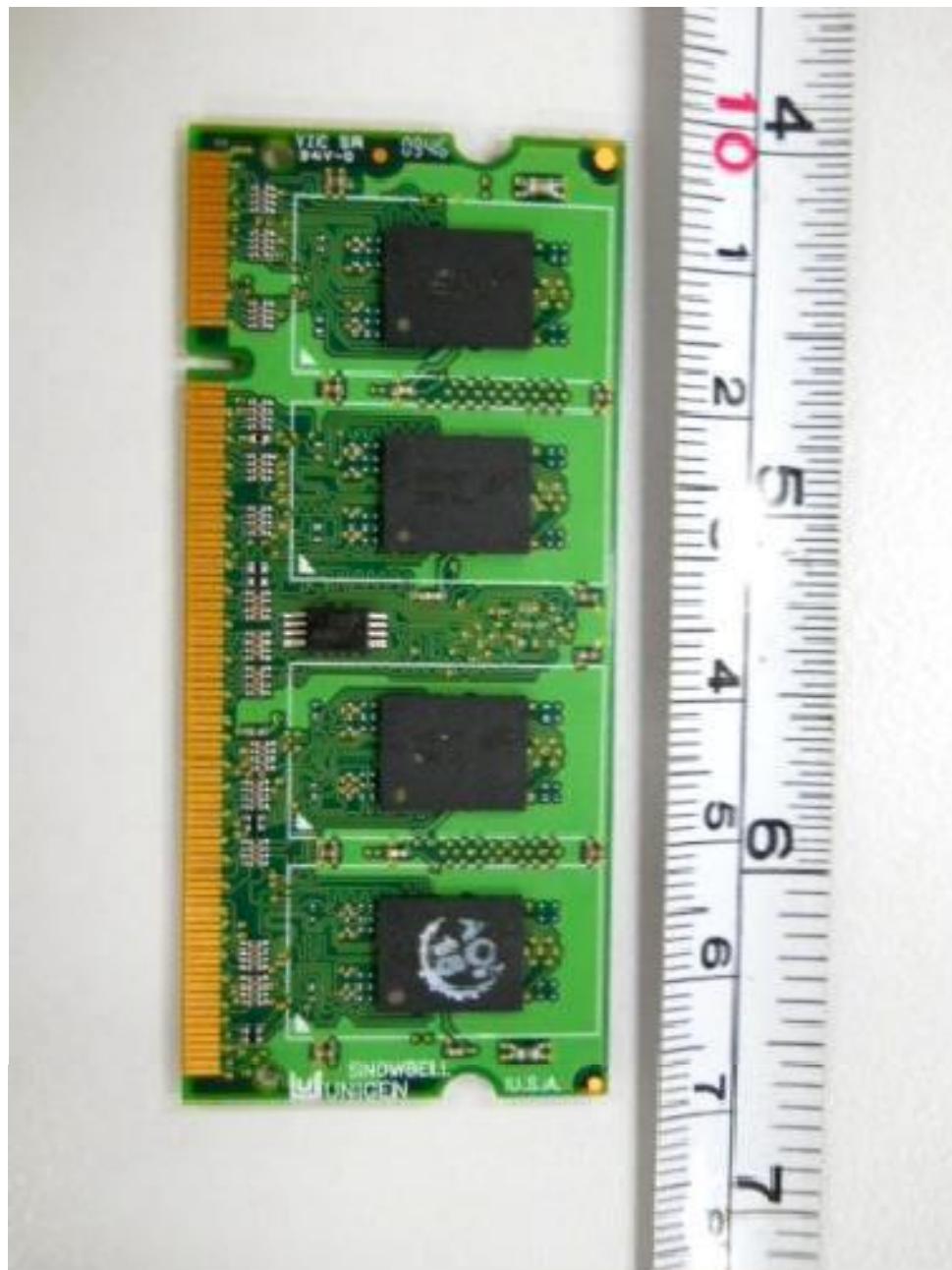
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Main-Board PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

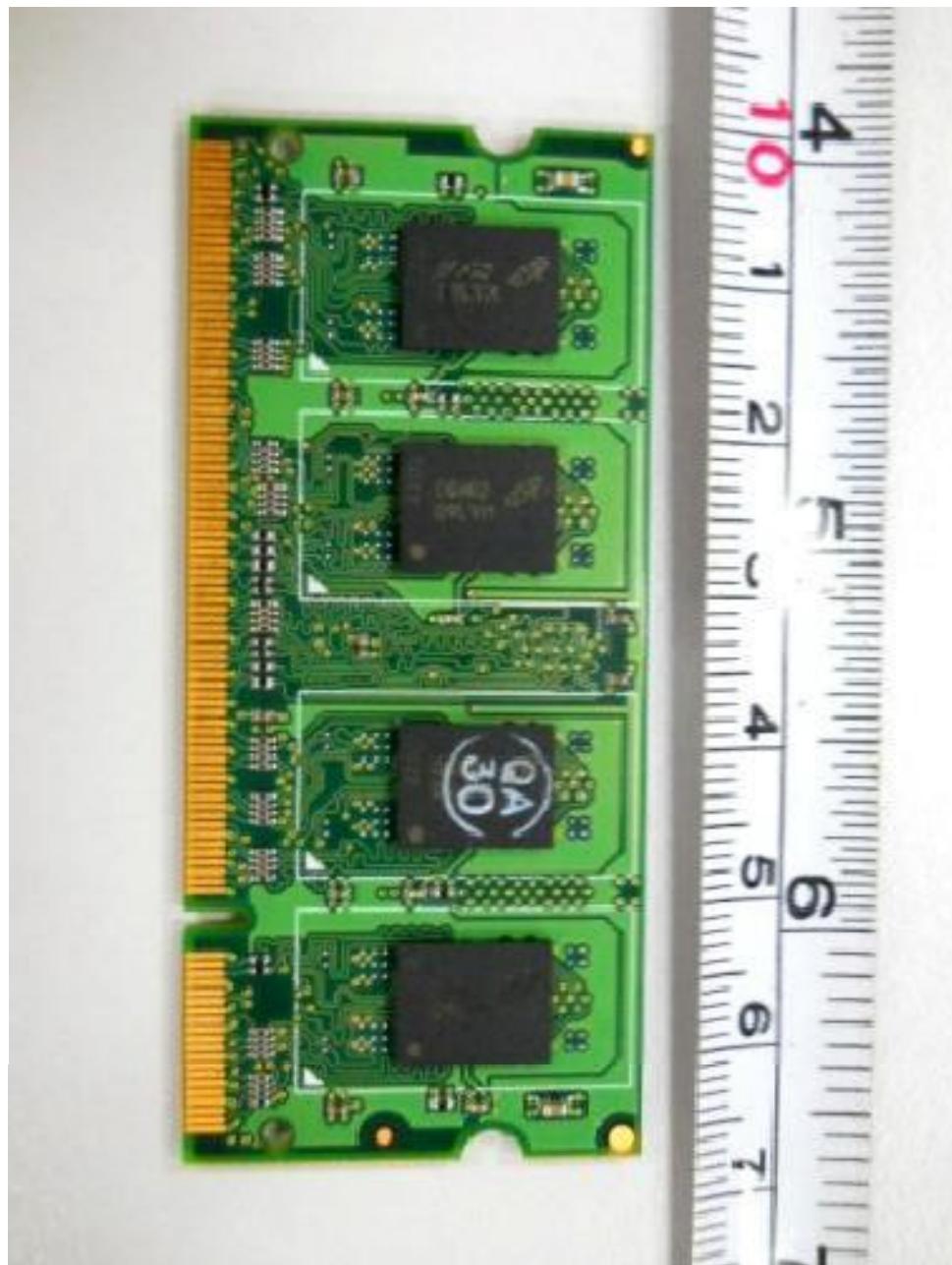
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DDR2-SODIMM PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

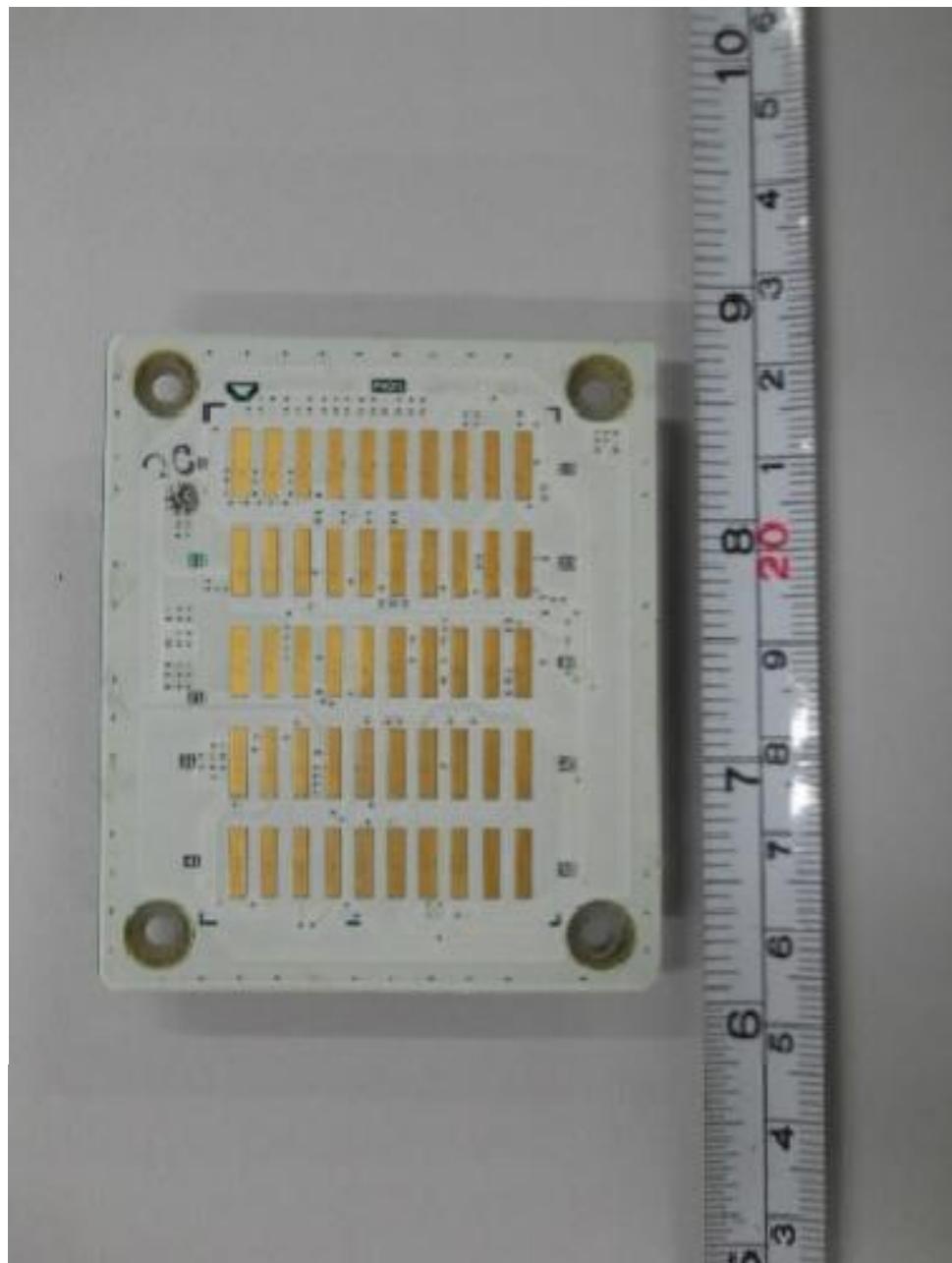
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DDR2-SODIMM PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

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Docking Interface PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

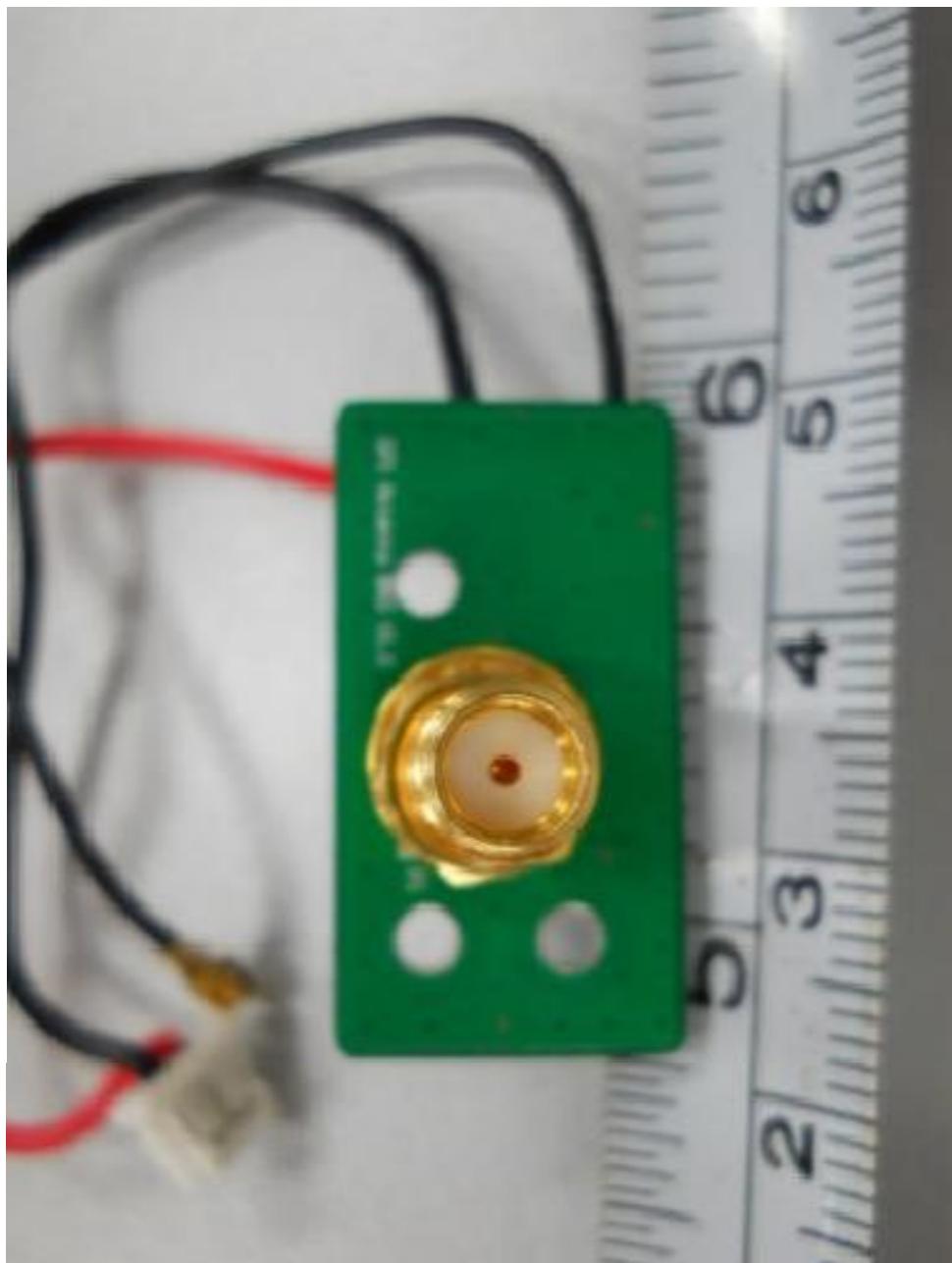
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Docking Interface PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

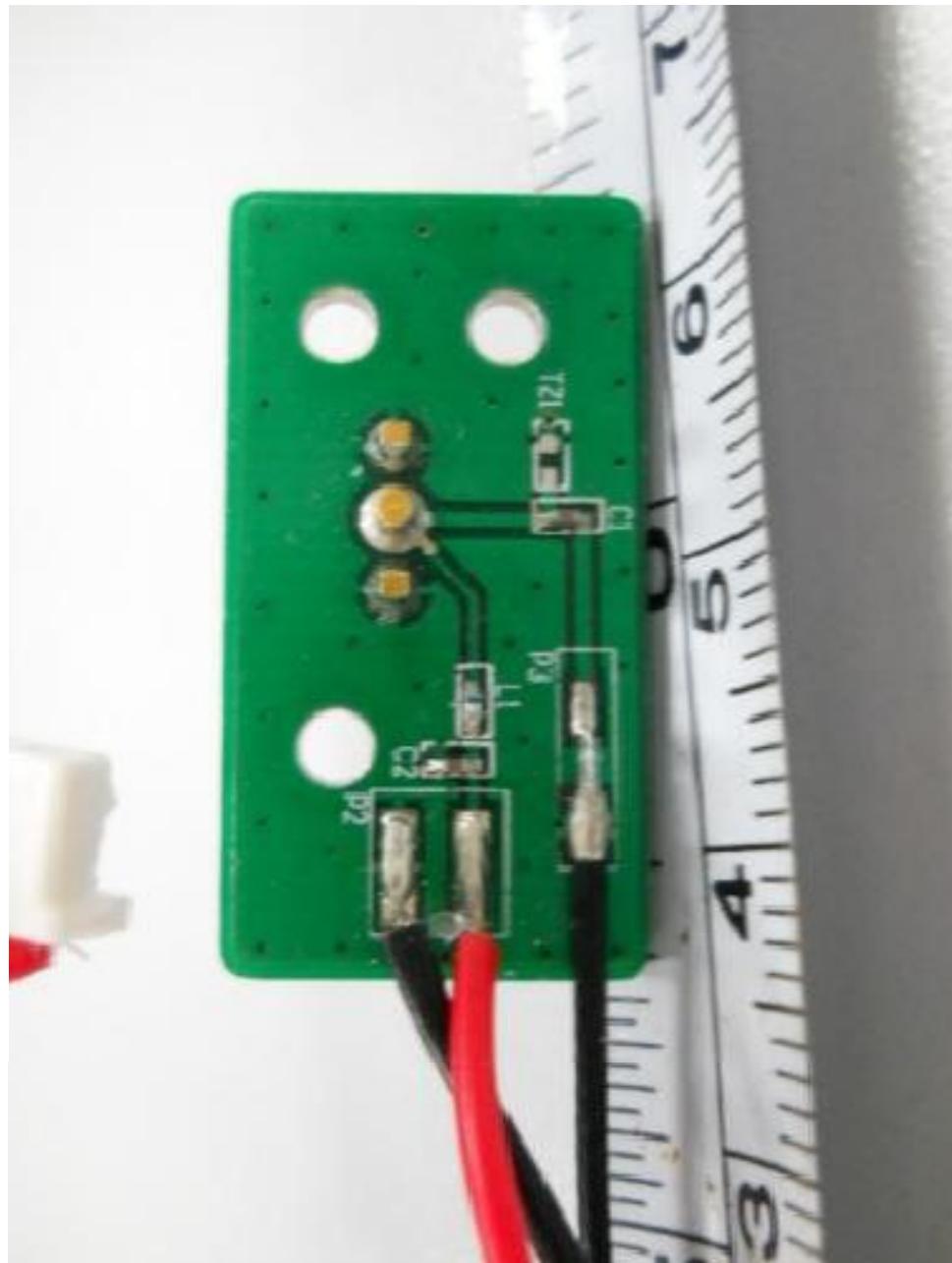
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GPS Power-3.3V PCB Component Side

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GPS Power-3.3V PCB Trace Side

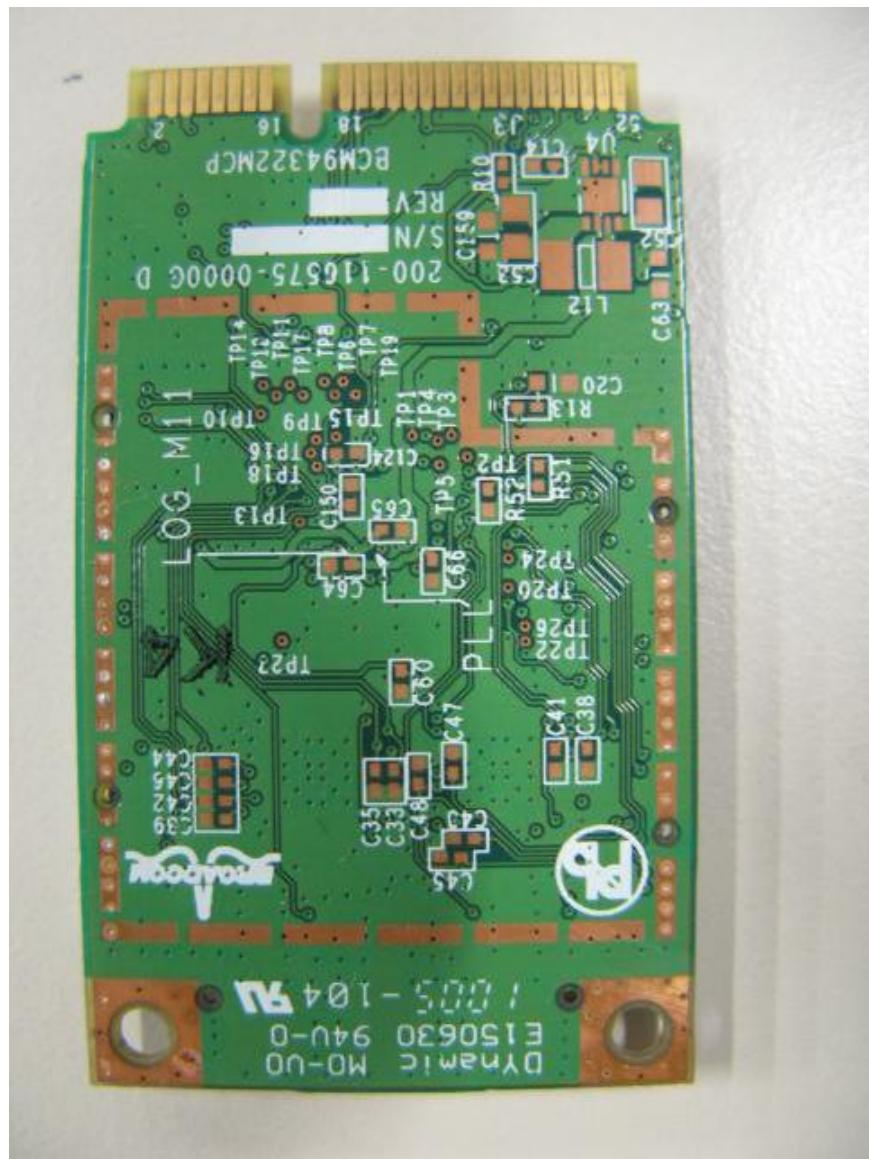
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ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

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WLAN Module-PE15N PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

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ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

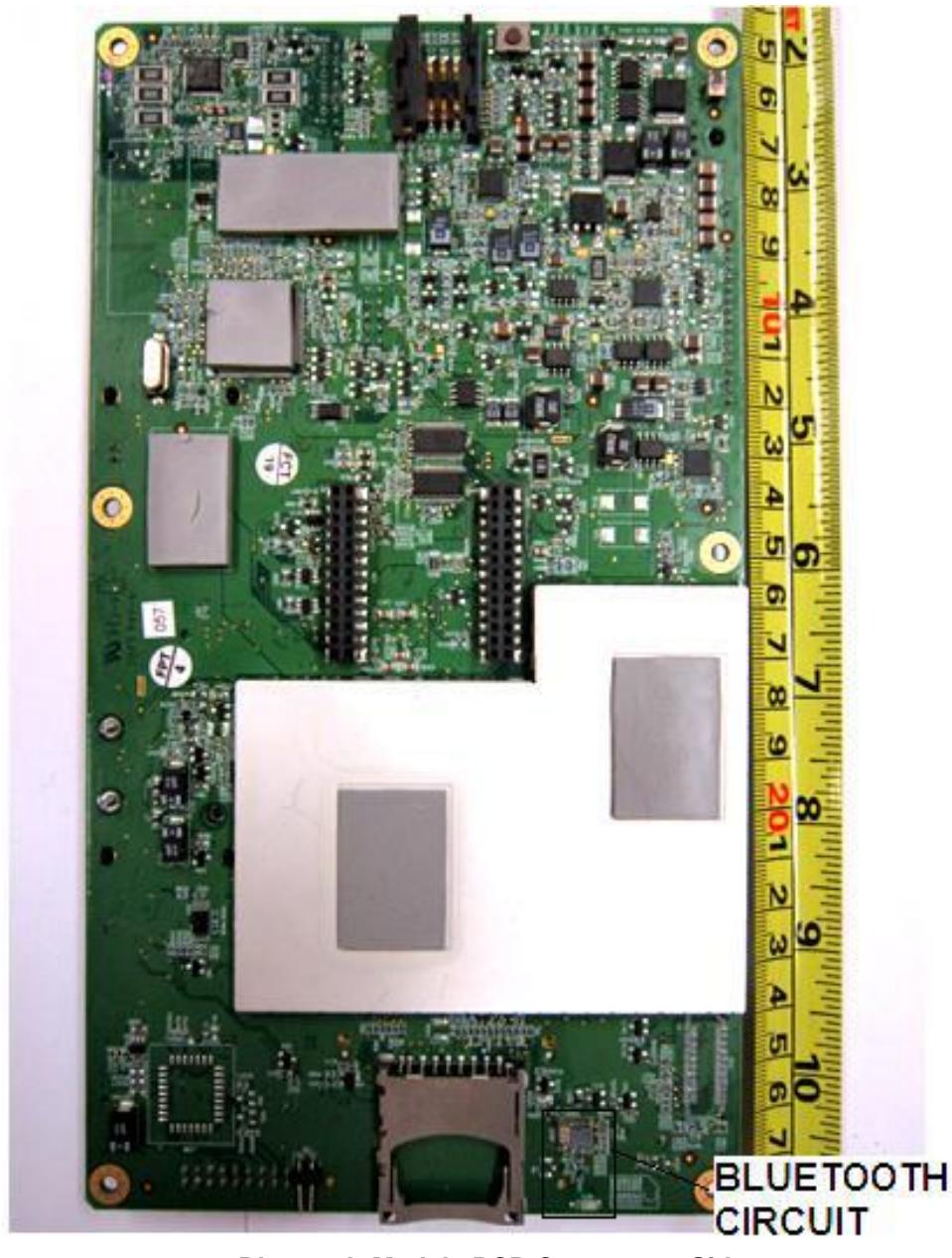
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WWAN Module PCB Trace Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

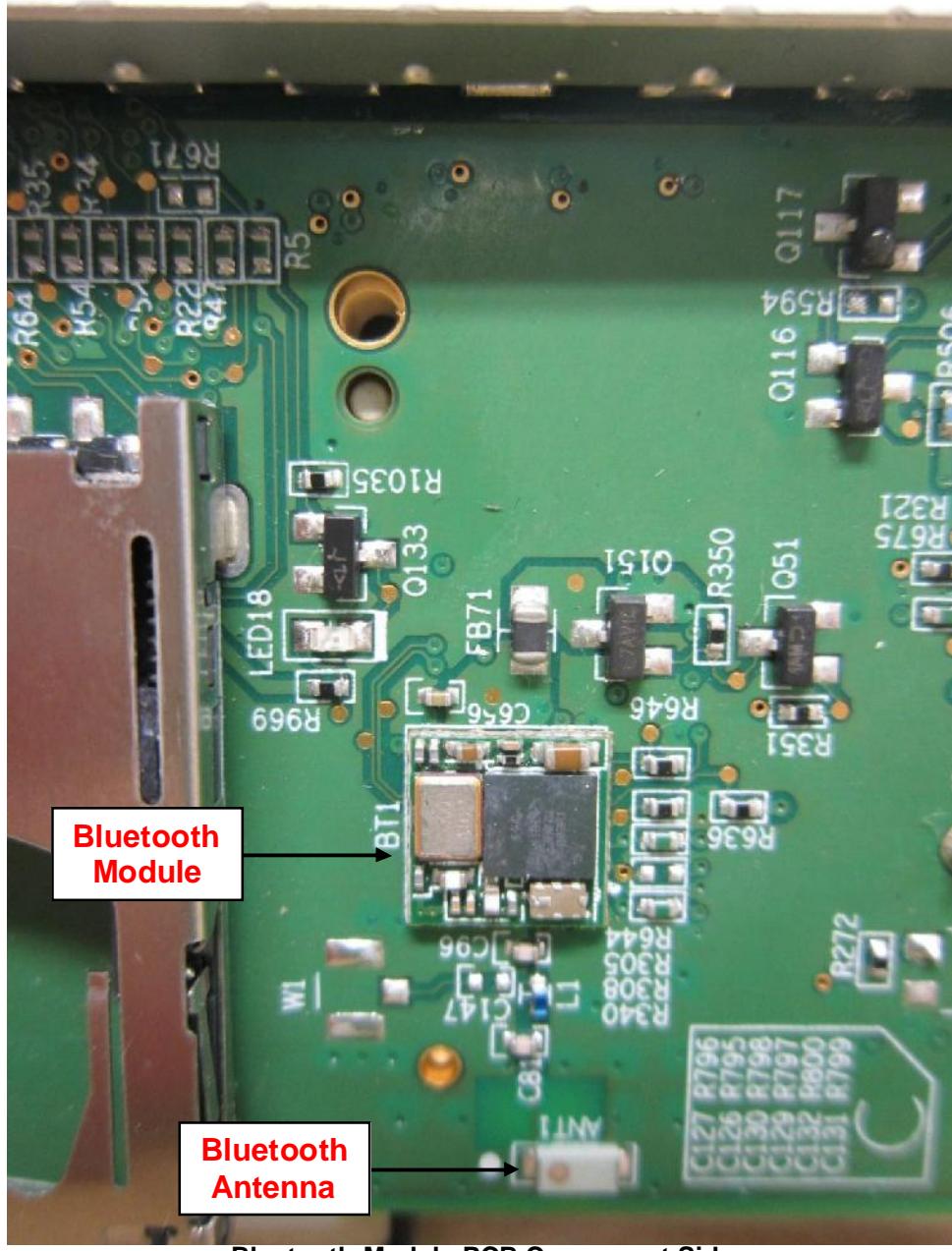
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Bluetooth-Module PCB Component Side

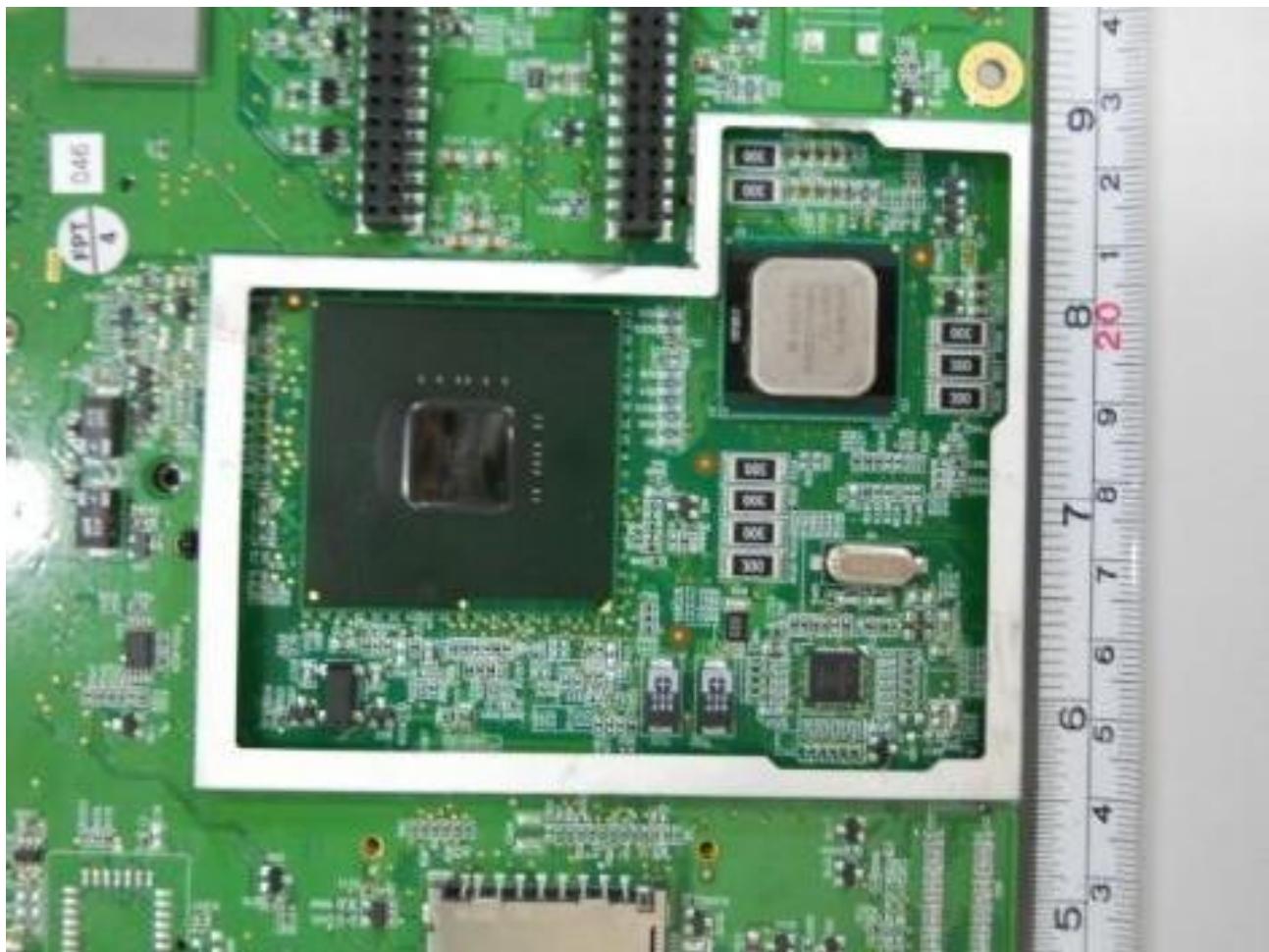
ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

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EUT PHOTOGRAPHS



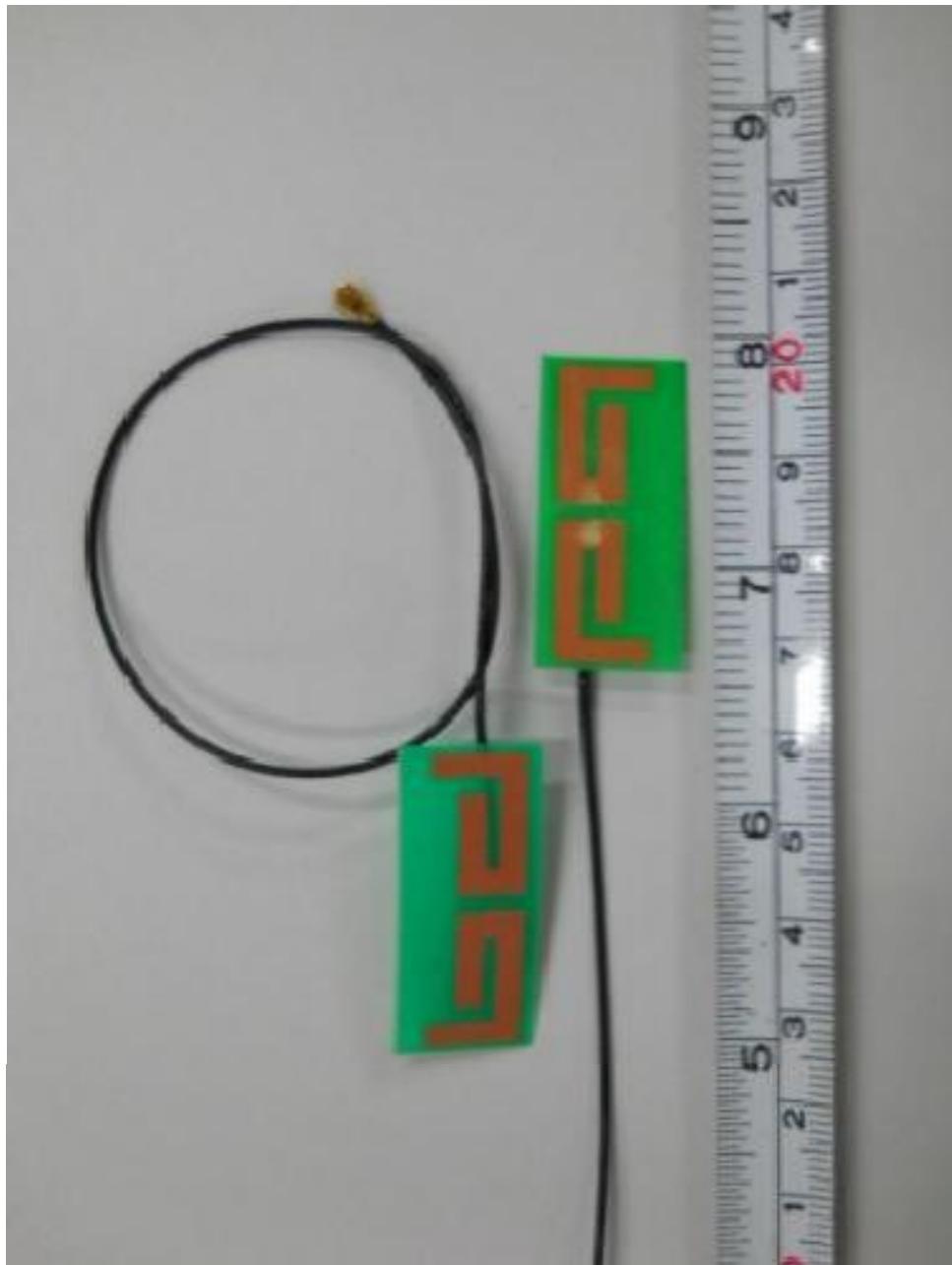
ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

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ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

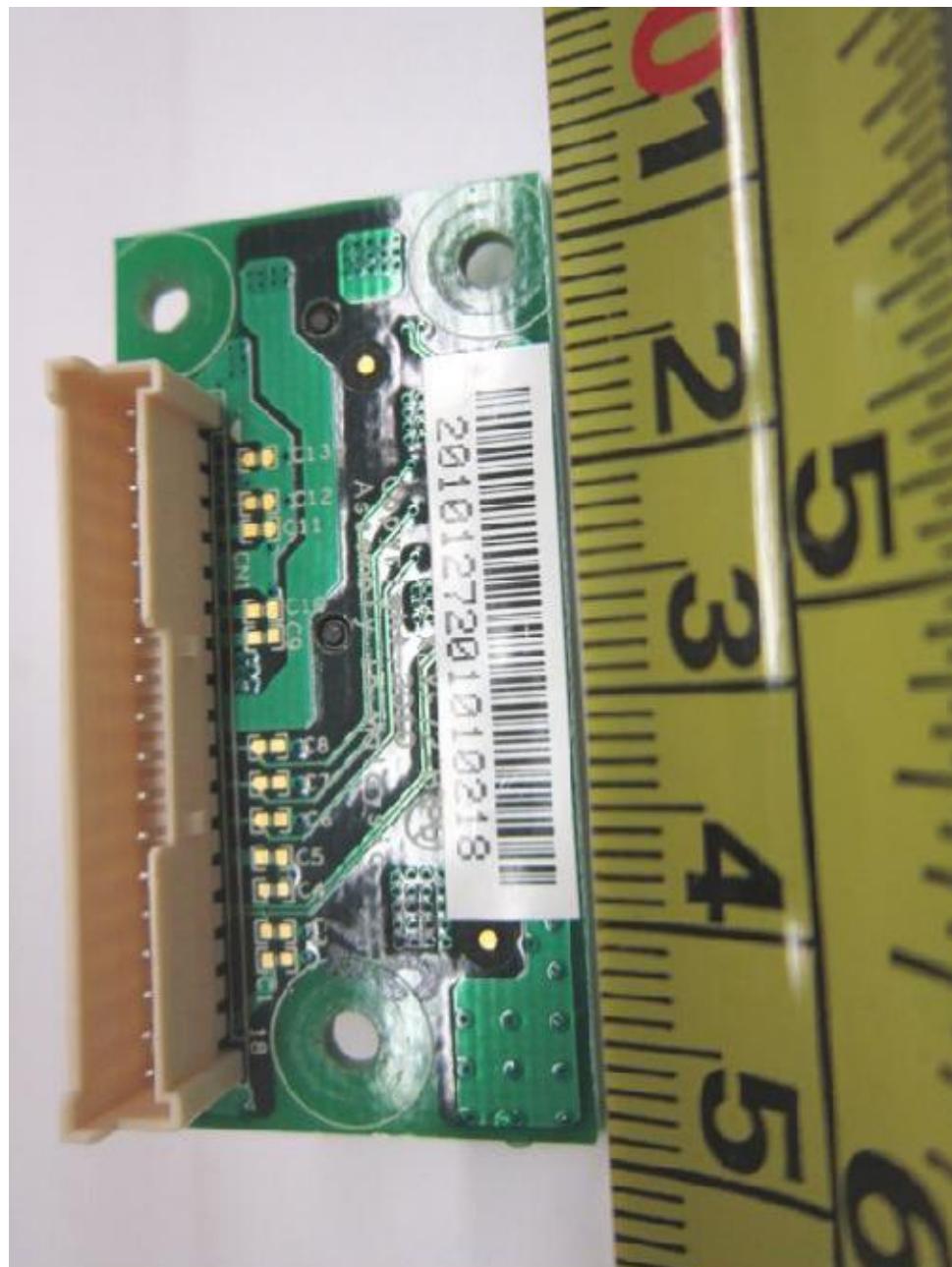
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Internal WLAN Antennas-PCB Module PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

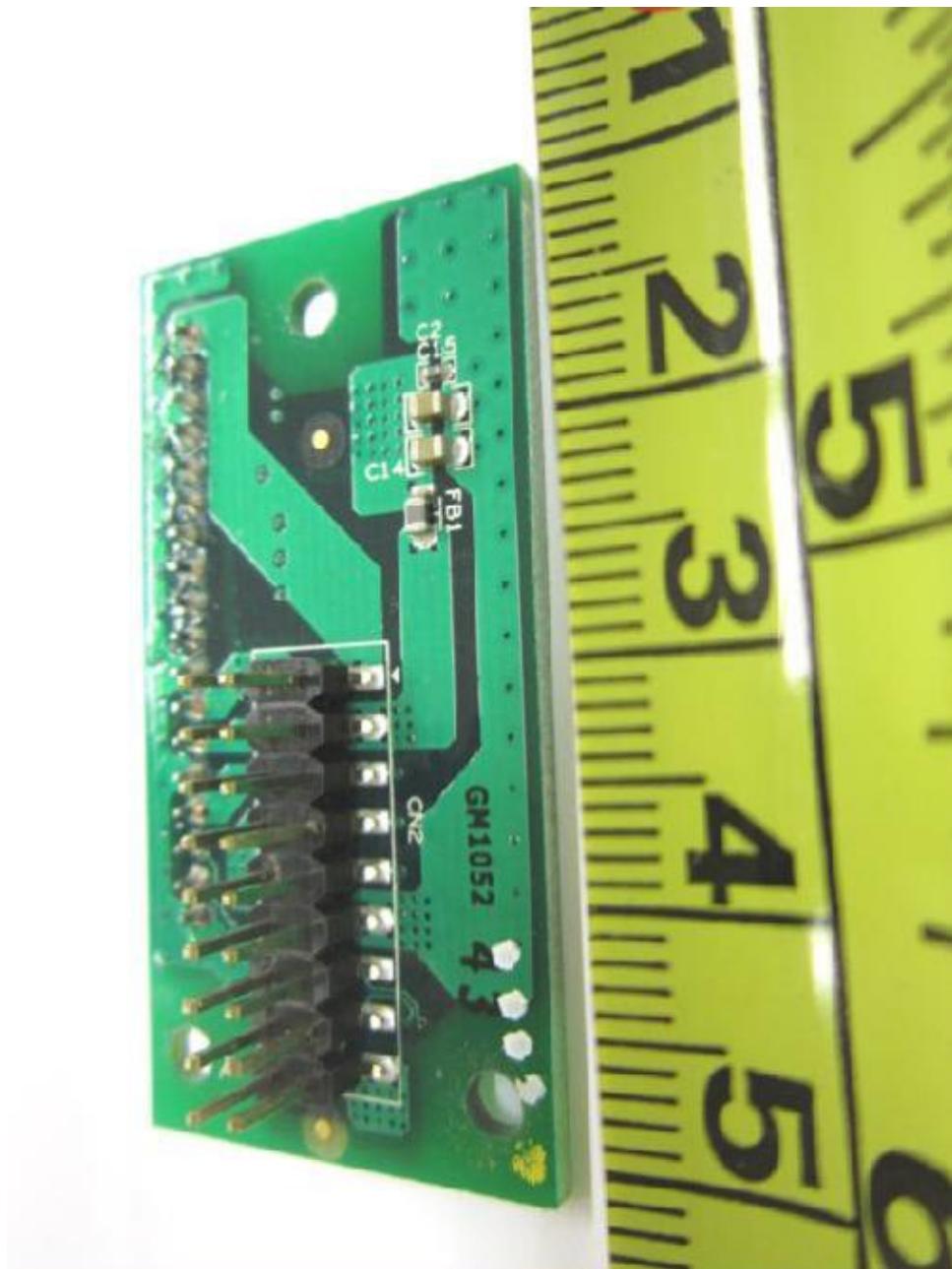
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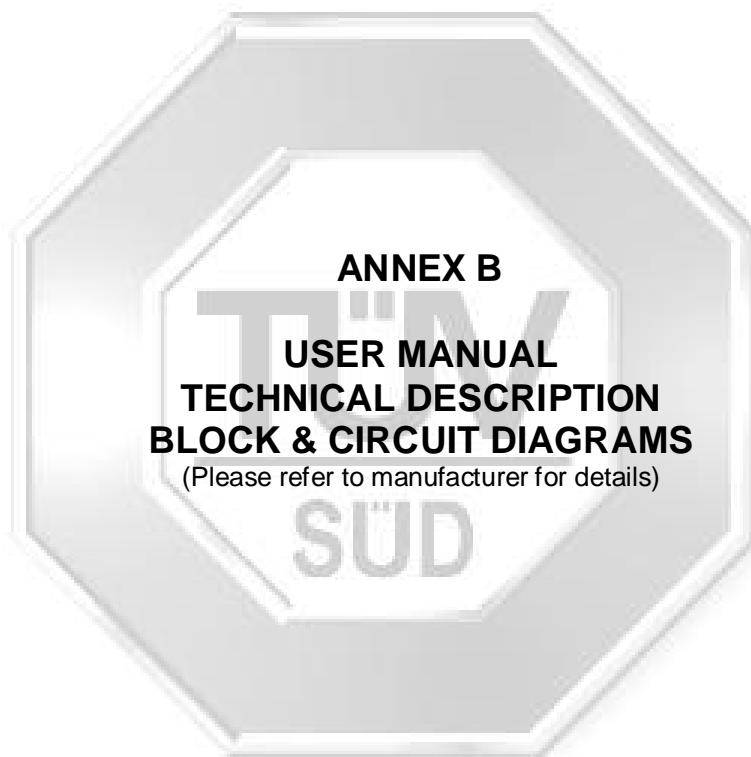
Keyboard Interface PCB Component Side

ANNEX A EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS



ANNEX B USER MANUALTECHNICAL DESCRIPTION BLOCK & CIRCUIT DIAGRAMS



ANNEX C FCC LABEL & POSITION





PSB Singapore

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.

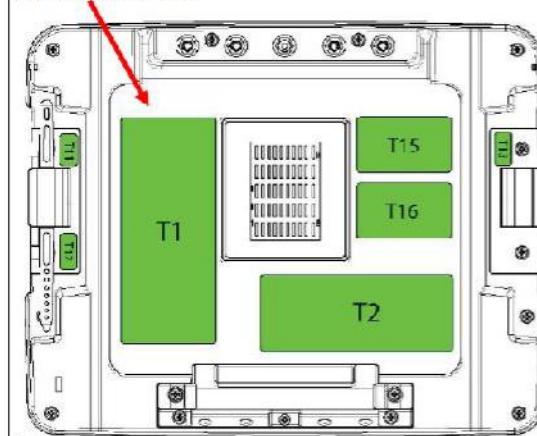
VM1 Terminal Product Label

(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 W: Windows OS
with PE15N wifi module,
GOBI2000



T1 Label Location:



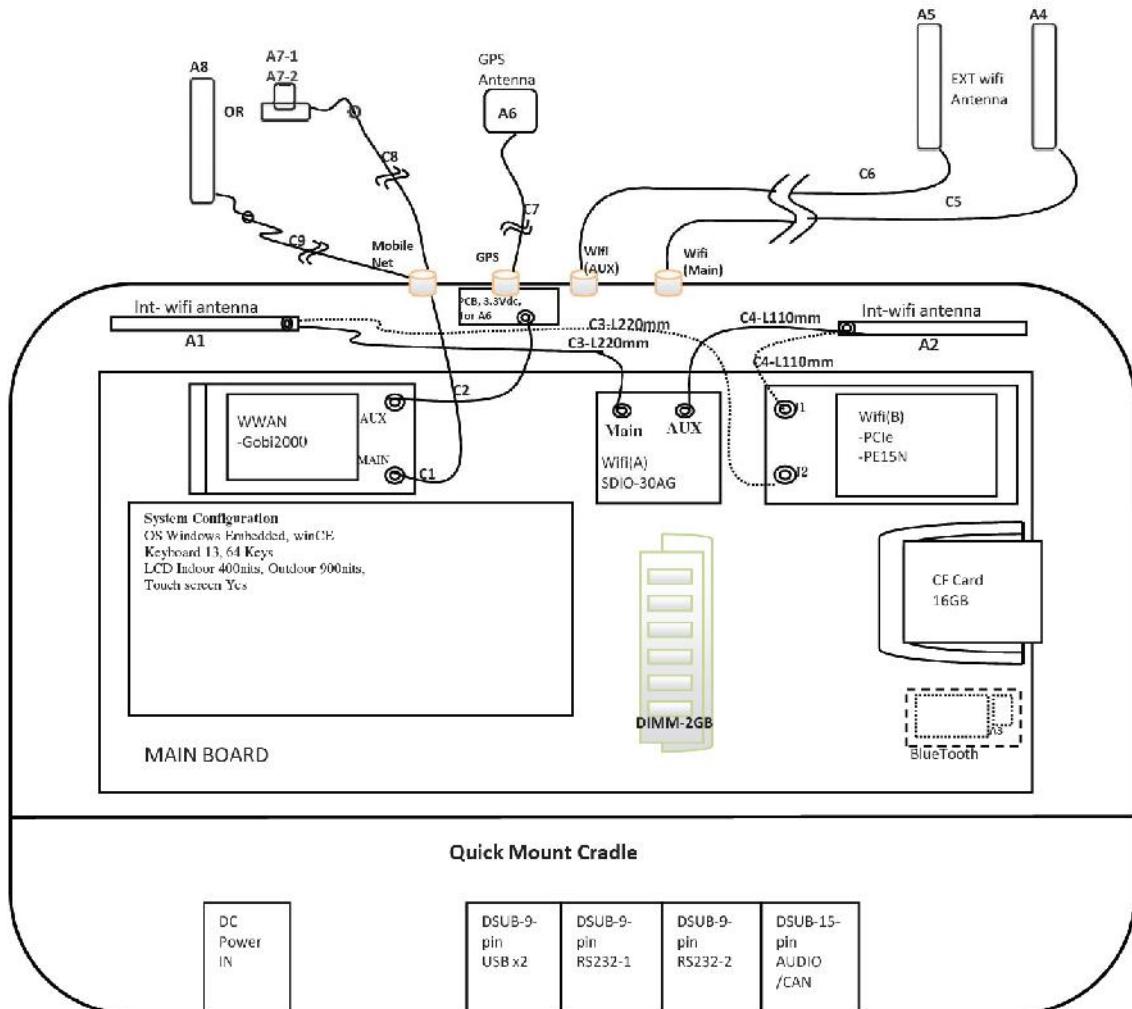
ANNEX D ANTENNA INFORMATION



ANNEX D ANTENNA INFORMATION

TYPE OF RF CABLES AND ANTENNAS

(a) Antennas and cables connection diagram





ANNEX D ANTENNA INFORMATION

(b) TYPES OF ANTENNA

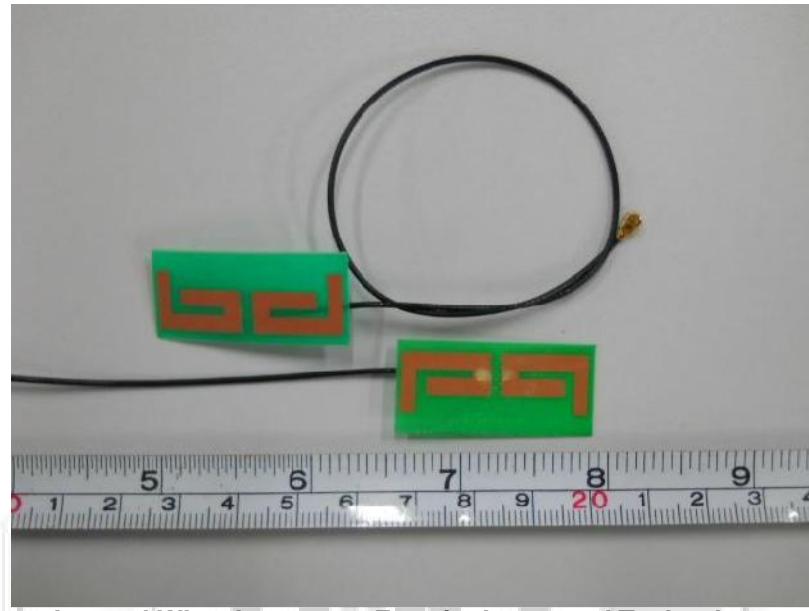
The information in below table are provides from their respective specification					
Ref ID	Description	Type	Gain	Manufacturer	Connection
B1	Internal wifi antenna	FIT-ANT-VM1-10	2.4 to 2.485Ghz: 2dBi 4.9 to 5.9Ghz: 4dBi	Frontier Integrated Technology	Cable C3-L220mm, connect to SDIO-MAIN or PE15N-J2
B2		FIT-ANT-VM1-1			Cable C4 L110mm, connect to SDIO-AUX or PE15N-J1
B3	Bluetooth	AH316M245001	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: 1.0dBi 4.9 - 5.9Ghz: 5dBi	LARSEN	Connect to WIFI RF terminals via RF cable-C5(for A4-Main) and C6(for A5-Aux).
B5					
B6	External GPS antenna,	GPS15MGSMB	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: TRAD006/17103 (DLK Phantom wideband806-960, 1575, 1710 2500MHz 3dB MEG N) A7-2: G16404 (MTMDN15SMA M-001, MOUNT, MGM, 3/4 A195,SMAM I, CMP, CH)	AMPS 800-890 MHz:5.9dBi GSM 900-960 MHz: 5.0dBi 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 ; W1923GU300-824-960/1710-2170MHz	824-960/1710-2170 MHz: 0dBi	Pulse	As alternate for non-metallic surface connected to Mobile-Net RF terminal via RF cable C9

ANNEX D ANTENNA INFORMATION

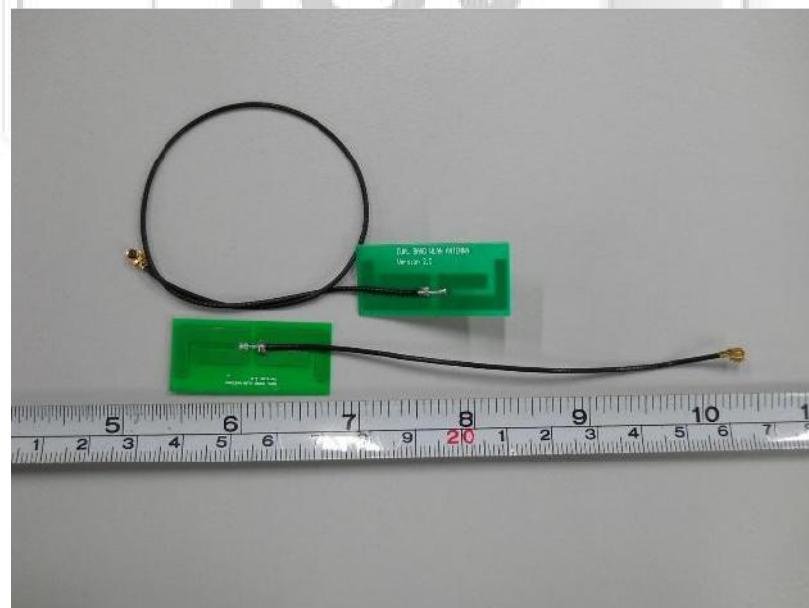
(C) Type of RF Cables and Interconnection

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	
		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	
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)

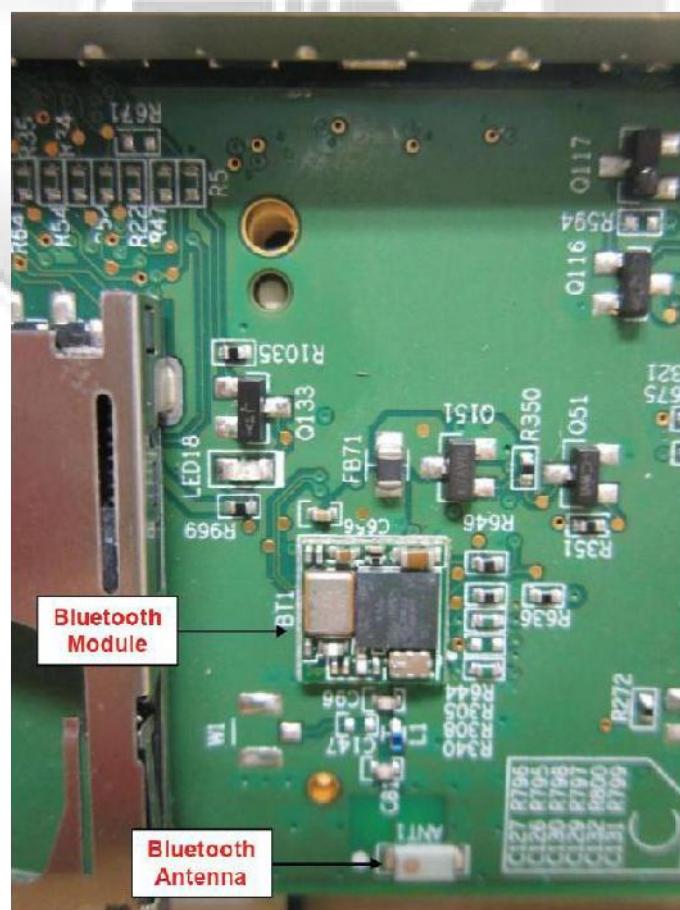


WLAN External Antennas : Larsen (Type : R380500314)

ANNEX D ANTENNA INFORMATION



External WLAN cables : RDN1008006, 4.573m



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