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FORMAL REPORT ON TESTING IN ACCORDANCE WITH  
FCC Parts 2, 15 & 24 : 2006  
OF A  
**MOBILE DATA TERMINAL**  
**[ Model : W738P and W738G ]**  
**[ FCC ID : UCW17W738V2 ]**

**TEST FACILITY**

TÜV SÜD PSB Corporation Pte Ltd,  
Telecoms & EMC, Testing Group,  
1 Science Park Drive, Singapore 118221

**FCC REG. NO.**

90937 (3m & 10m OATS)  
99142 (10m Anechoic Chamber)  
871638 (5m Anechoic Chamber)  
325572 (10m Anechoic Chamber)

**IND. CANADA REG. NO.**

IC 4257 (3m and 10m Anechoic Chambers)

**PREPARED FOR**

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**JOB NUMBER**

53S062804


**TEST PERIOD**

30 Oct 2006 – 01 Nov 2006

**PREPARED BY**

  
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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
FCC Part 24: 2006		
15.107(a)	Conducted Emissions	Not Applicable *See Note 3
24.232(b), 2.1046	RF Power Output	Pass
24.238(a), 2.1051	Out of Band Emissions	Pass
24.238(a)	Band Edge Compliance (Radiated)	Pass
15.109	Receiver Spurious Emissions	Pass
1.1310	Maximum Permissible Exposure	Pass

### Notes

- Three channels as listed below, which respectively represent the lower, middle and upper channels of the Equipment Under Test (EUT) were chosen and tested. For each channel, the EUT was configured to operate in the test mode.  

<u>Transmit Channel</u>	<u>Frequency (MHz)</u>
Channel 512	1850.2
Channel 661	1880.0
Channel 810	1909.8
- All test measurement procedures are according to ANSI C63.4: 2003.
- The Equipment Under Test (EUT) is a battery operated device and contains no provision for public utility connections.
- All the measurements in FCC Part 24 were done based on radiated measurements.
- The EUT is a Class B device when in non-transmitting state and meets the FCC Part15B Class B requirements.
- The RF module of the Equipment Under Test (EUT) is a qualified RF module, which bears the FCC ID: QIPMC56. As such, only limited tests as mentioned above were evaluated.

### Modifications

- No modifications were made.

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**PRODUCT DESCRIPTION**

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Description : The Equipment Under Test (EUT) is a **MOBILE DATA TERMINAL**.

Manufacturer : E-smart Distribution Pte Ltd  
17 Kallang Junction #04-03 Esmart Centre  
Singapore 339274

TTM Manufacturing Sdn Bhd  
11 Jalan Angkasa Mas 5  
Kawasan Perindustrian Tebrau II  
81100 Johor Bahru  
Malaysia

Model Number : W738P & W738G

Serial Number : 738-P-YYMM-XXXX5, 0412-00001

Microprocessor : Intel PXA255

Operating Frequency : 900MHz & 1800MHz (GSM/GPRS)

Clock / Oscillator Frequency : 3.68MHz, 400MHz

Port / Connectors : Refer to manufacturers' user manual / operating manual.

Rated Input Power : 12VDC

Accessories : Refer to manufacturers' user manual / operating manual.



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**SUPPORTING EQUIPMENT DESCRIPTION**

The EUT was tested as a stand-alone unit without any supporting equipment.

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**EUT OPERATING CONDITIONS**

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<b>FCC Parts 2, 15 and 24</b>
<ol style="list-style-type: none"><li>1. RF Output Power</li><li>2. Out of Band Emission</li><li>3. Band Edge Compliance (Radiated)</li><li>4. Receiver Spurious Emission</li><li>5. Maximum Permissible Exposure</li></ol>
<p>The EUT was exercised by operating in continuous loopback mode with maximum transmission at lower, middle and upper channels one at a time. The R&amp;S CMU200 was used as a PCS1900 base station.</p>

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**RF OUTPUT POWER TEST**

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**FCC Part 24.232(b) RF Output Power Limits**

The EUT shows compliance to the requirements of this section, which states the mobile/portable stations are limited to 2 atts EIRP peak power and the equipment must employ means to limits the power to the minimum necessary for successful communication.

**FCC Parts 2.1046 and 24.232(b) RF Output Power Test Instrumentation**

Instrument	Model	S/No	Cal Due Date
R&S Test Receiver (20Hz-26.5GHz) – ESMI3	ESMI	829214/005 829550/004	04 Jul 2007
EMCO Horn Antenna – H14	3115	0003-6087	19 May 2007
EMCO Horn Antenna – H15	3115	0003-6088	19 May 2007
Weinschel Corp 10dB Attenuator	47-10-43	BD8406	19 May 2007
Agilent Signal Generator	83620B	3844A01337	24 Jan 2007

## RF OUTPUT POWER TEST

### FCC Parts 2.1046 and 24.232(b) RF Output Power Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.
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 antenna was set at the required test distance away from the EUT and supporting equipment boundary.

### FCC Parts 2.1046 and 24.232(b) RF Output Power Test Method

1. The EUT was set to transmit at the maximum power at the lower channel with the modulation on at normal test condition.
2. The receiving antenna (test antenna) was set at vertical polarization with the height of 1m.
3. With the spectrum analyser was set to max hold enabled (peak detector mode), the level of the operating frequency (carrier emission) was recorded. For EUT which is a portable device, the carrier emission was carried out by rotating the EUT through three orthogonal axes to determine which attitude and equipment arrangement produces the highest emission.
4. The test antenna was then raised or lowered through the specified range of heights (1m – 4m) until a maximum signal level was detected on the test receiver.
5. The EUT was then rotated through 360° in the horizontal plane until the maximum signal was received. The maximum received signal level was recorded as A (in dBm).
6. The EUT was replaced with the substitution antenna with the antenna input was connected to the signal generator via a 10dB attenuator (if required).
7. The signal generator was set to the found carrier frequency. The output level of the signal generator was adjusted until the test receiver was at least 20dB above the level when the signal generator was switched off.
8. The test antenna was raised and lowered through the specified range of heights (1m – 4m) until the maximum signal level was received on the test receiver.
9. The substitution antenna was rotated until the maximum level was detected on the test receiver.
10. The output level of the signal generator was adjusted until the received signal level at the test receiver was equal to the level recorded in step 5 (A dBm). The signal generator output level was recorded as B (in dBm).
11. The spurious emission level, P (e.i.r.p) was computed as followed:
 

P (e.i.r.p)	=	B – C – D + E
where C	=	cable loss between the signal generator and the substitution
D	=	attenuation level if attenuator is used
E	=	substitution antenna gain
12. The steps 2 to 11 were repeated with the receiving antenna was set to horizontal polarization.
13. Comparison was made on both measured results with vertical and horizontal polarizations. The highest value out of vertical and horizontal polarizations was recorded.
14. The steps 1 to 13 were repeated with the EUT was set to operate at the middle and upper channels respectively.



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**RF OUTPUT POWER TEST**



**RF Output Power Test Setup (Front View)**



**RF Output Power Test Setup (Rear View)**

**RF OUTPUT POWER TEST****FCC Parts 2.1046 and 24.232(b) RF Output Power Results**

Operating Mode	PCS1900 Transmit	Temperature	20°C
Test Input Power	110VAC 60Hz	Relative Humidity	55%
Test Distance	3m	Atmospheric Pressure	1030mbar
		Tested By	Xu Quanyang

Frequency (MHz)	Amplitude (dBW)	Limit (dBW)	Channel
1850.2	-14.9	3	512
1880.0	-14.5	3	661
1909.8	-14.3	3	810

Notes

- EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
≥1GHz  
 RBW: 1MHz VBW: 1MHz
- RF Output Power 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 – 25GHz is ±4.3dB (for EUTs < 0.5m X 0.5m X 0.5m).

## OUT OF BAND EMISSION TEST

### FCC Part 24.238(a) Out of Band Emission Limits

The EUT shows compliance to the requirements of this section, which states the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power, P by a factor of at least  $43 + 10\log(P)$ dB.

### FCC Parts 2.1051 and 24.238(a) Out of Band Emission Test Instrumentation

Instrument	Model	S/No	Cal Due Date
R&S Test Receiver (20Hz-26.5GHz) – ESMI3	ESMI	829214/005 829550/004	04 Jul 2007
Schaffner Pre-Amplifier	CPA9231A	3422	01 Apr 2007
MITEQ Preamplifier (0.1-26.5GHz) – PA4	NSP2650-N	604879	07 Nov 2006
Schaffner Bilog Antenna –BL4	CBL6112B	2593	12 May 2007
EMCO Horn Antenna – H14	3115	0003-6087	19 May 2007
EMCO Horn Antenna – H15	3115	0003-6088	19 May 2007
Agilent Signal Generator	83620B	3844A01337	24 Jan 2007
K&L Microwave Variable Bandstop Filter	3TNF- 1000/2000/N/N	436	04 Aug 2007

## OUT OF BAND EMISSION TEST

### FCC Parts 2.1051 and 24.238(a) Out of Band Emission Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.
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 antenna was set at the required test distance away from the EUT and supporting equipment boundary.

### FCC Parts 2.1051 and 24.238(a) Out of Band Emission Test Method

1. The EUT was set to transmit at the maximum power at the lower channel with the modulation on at normal test condition.
2. The receiving antenna (test antenna) was set at vertical polarization with the height of 1m.
3. With the spectrum analyser was set to max hold enabled (peak detector mode), the emissions outside the operating frequency range (spurious emissions) were searched and recorded. For EUT which is a portable device, the spurious emission search was carried out by rotating the EUT through three orthogonal axes to determine which attitude and equipment arrangement produces worst emissions.
4. For each spurious emission found, the test antenna was raised or lowered through the specified range of heights (1m – 4m) until a maximum signal level was detected on the test receiver.
5. The EUT was then rotated through 360° in the horizontal plane until the maximum signal was received. The maximum received signal level was recorded as A (in dBm).
6. The EUT was replaced with the substitution antenna with the antenna input was connected to the signal generator via a 10dB attenuator (if required).
7. The signal generator was set to the found spurious frequency. The output level of the signal generator was adjusted until the test receiver was at least 20dB above the level when the signal generator was switched off.
8. The test antenna was raised and lowered through the specified range of heights (1m – 4m) until the maximum signal level was received on the test receiver.
9. The substitution antenna was rotated until the maximum level was detected on the test receiver.
10. The output level of the signal generator was adjusted until the received signal level at the test receiver was equal to the level recorded in step 5 (A dBm). The signal generator output level was recorded as B (in dBm).
11. The spurious emission level, P (e.i.r.p) was computed as followed:
 

P (e.i.r.p)	=	B – C – D + E
where C	=	cable loss between the signal generator and the substitution
D	=	attenuation level if attenuator is used
E	=	substitution antenna gain
12. The steps 2 to 11 were repeated with the receiving antenna was set to horizontal polarization.
13. Comparison was made on both measured results with vertical and horizontal polarizations. The highest value out of vertical and horizontal polarizations was recorded.
14. The steps 2 to 13 were repeated until all the spurious emissions (up to 10<sup>th</sup> harmonics of the carrier frequency) were measured.
15. The steps 1 to 14 were repeated with the EUT was set to operate at the middle and upper channels respectively.

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**OUT OF BAND EMISSION TEST**



**Out of Band Emissions Test Setup (Front View)**



**Out of Band Emissions Test Setup (Rear View)**

**OUT OF BAND EMISSION TEST****FCC Parts 2.1051 and 24.238(a) Out of Band Emission Results**

Operating Mode	PCS1900 Transmit	Temperature	24°C
Test Input Power	110VAC 60Hz	Relative Humidity	58%
Test Distance	3m	Atmospheric Pressure	1030mbar
		Tested By	Lucas Beh

**Lower Channel (Channel 512) Carrier Power: -8.7dBW (21.3dBm)**

Frequency (MHz)	Amplitude (dBW)	Limit (dBc)	Actual Attenuation Below Carrier (dBc)
3700.4	-51.0	-34.3	-42.3
5550.6	-67.0	-34.3	-58.3
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**Middle Channel (Channel 661) Carrier Power: -9.2dBW (20.8dBm)**

Frequency (MHz)	Amplitude (dBW)	Limit (dBc)	Actual Attenuation Below Carrier (dBc)
3760.0	-52.0	-33.8	-42.8
5640.0	-67.0	-33.8	-57.8
--	--	--	--
--	--	--	--
--	--	--	--
--	--	--	--

**Upper Channel (Channel 810) Carrier Power: -10.0dBW (20.0dBm)**

Frequency (MHz)	Amplitude (dBW)	Limit (dBc)	Actual Attenuation Below Carrier (dBc)
3819.6	-52.0	-33.0	-42.0
5729.4	-66.0	-33.0	-56.0
--	--	--	--
--	--	--	--
--	--	--	--
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**OUT OF BAND EMISSION TEST**

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Notes

1. All possible modes of operation were investigated. Only the worst case emissions measured. All other emissions were relatively insignificant.
2. "--" indicates no emissions were found and shows compliance to the limits.
3. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
RBW: 120kHz VBW: 1MHz  
>1GHz  
RBW: 1MHz VBW: 1MHz
4. The upper frequency of radiated emission investigations was according to requirements stated in Section 15.33(a) for intentional radiators & Section 15.33(b) for unintentional radiators.
5. Out of Band 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 – 25GHz is  $\pm 4.3\text{dB}$  (for EUTs < 0.5m X 0.5m X 0.5m).

## **BAND EDGE COMPLIANCE (RADIATED) TEST**

### **FCC Part 24.238(a) Band Edge Compliance (Radiated) Limits**

The EUT shows compliance to the requirements of this section, which states the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power, P by a factor of at least  $43 + 10\log(P)$ dB.

### **FCC Part 24.238(a) Band Edge Compliance (Radiated) Test Instrumentation**

<b>Instrument</b>	<b>Model</b>	<b>S/No</b>	<b>Cal Due Date</b>
R&S Test Receiver (20Hz-26.5GHz) – ESMI3	ESMI	829214/005 829550/004	04 Jul 2007
EMCO Horn Antenna – H14	3115	0003-6087	19 May 2007
Weinschel Corp 10dB Attenuator	47-10-43	BD8406	19 May 2007
Agilent Signal Generator	83620B	3844A01337	24 Jan 2007



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**BAND EDGE COMPLIANCE (RADIATED) TEST**

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**FCC Part 24.238(a) Out of Band Emission Test Setup**

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.
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 antenna was set at the required test distance away from the EUT and supporting equipment boundary.

**FCC Part 24.238(a) Out of Band Emission Test Method**

1. The EUT was set to transmit at the maximum power at the lower channel with the modulation on at normal test condition.
2. The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band and any spurious emissions at the band edge.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected. The band edge spurious emissions plot was plotted.
4. The EUT was set to transmit at the maximum power at the upper channel with the modulation on at normal test condition.
5. The steps 2 to 3 were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band and any spurious emissions at the band-edge.

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**BAND EDGE COMPLIANCE (RADIATED) TEST**



**Band Edge Compliance (Radiated) Test Setup (Front View)**



**Band Edge Compliance (Radiated) Test Setup (Rear View)**

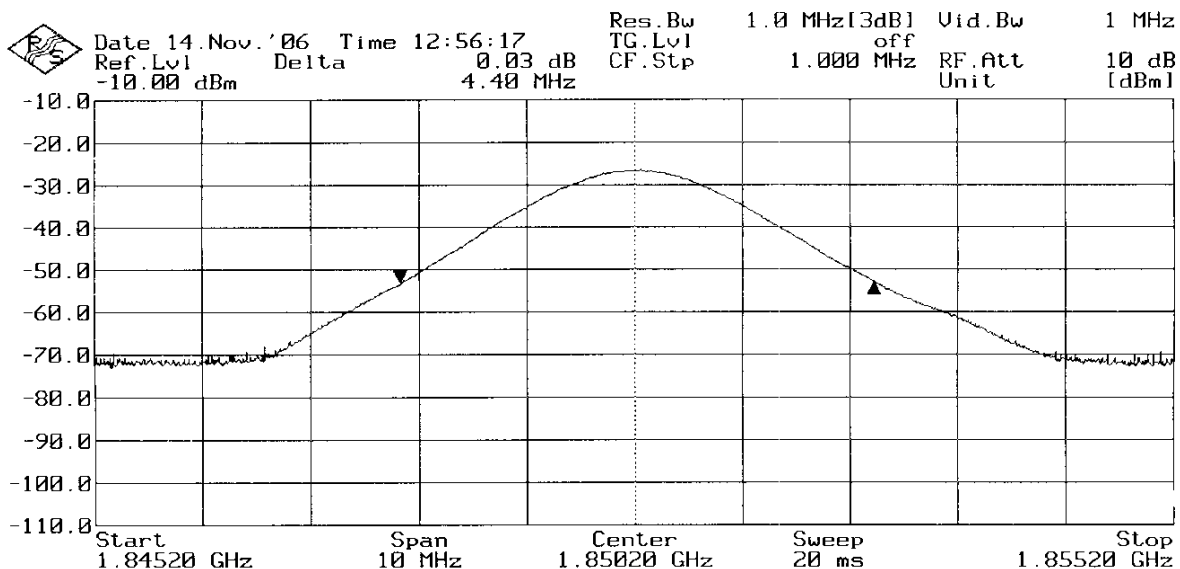
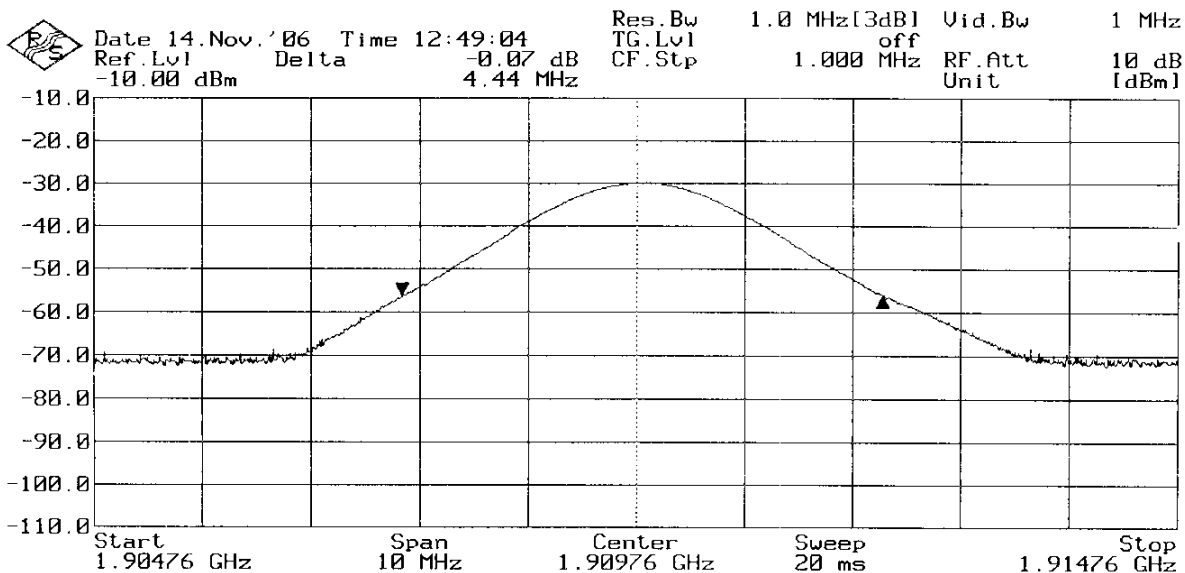
**BAND EDGE COMPLIANCE (RADIATED) TEST****FCC Part 24.238(a) Band Edge Compliance (Radiated) Results**

Operating Mode	PCS1900 Transmit	Temperature	20°C
Test Input Power	110VAC 60Hz	Relative Humidity	55%
Test Distance	3m	Atmospheric Pressure	1030mbar
Attached Plots	3 - 4	Tested By	Xu Quanqiang

No significant signal was found and they were below the specified limit.

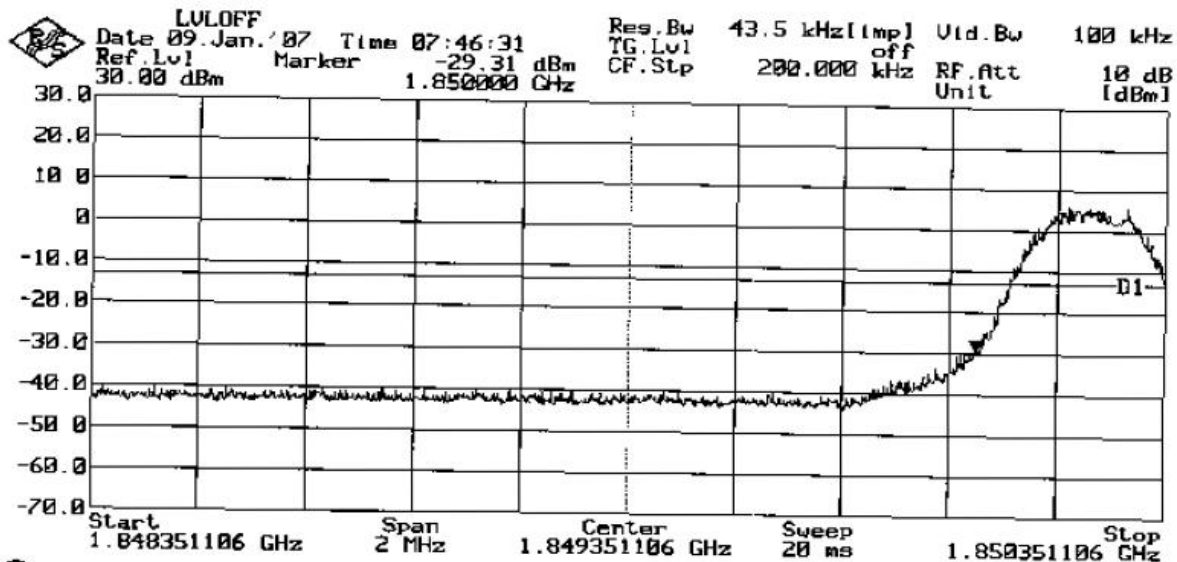
**Notes**

1. Refer to Plots 1 and 2 for lower and upper channels 26dB bandwidth.
2. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings (at least 1% of the 26dB of the channel under evaluation):  
RBW: 100kHz      VBW: 100kHz

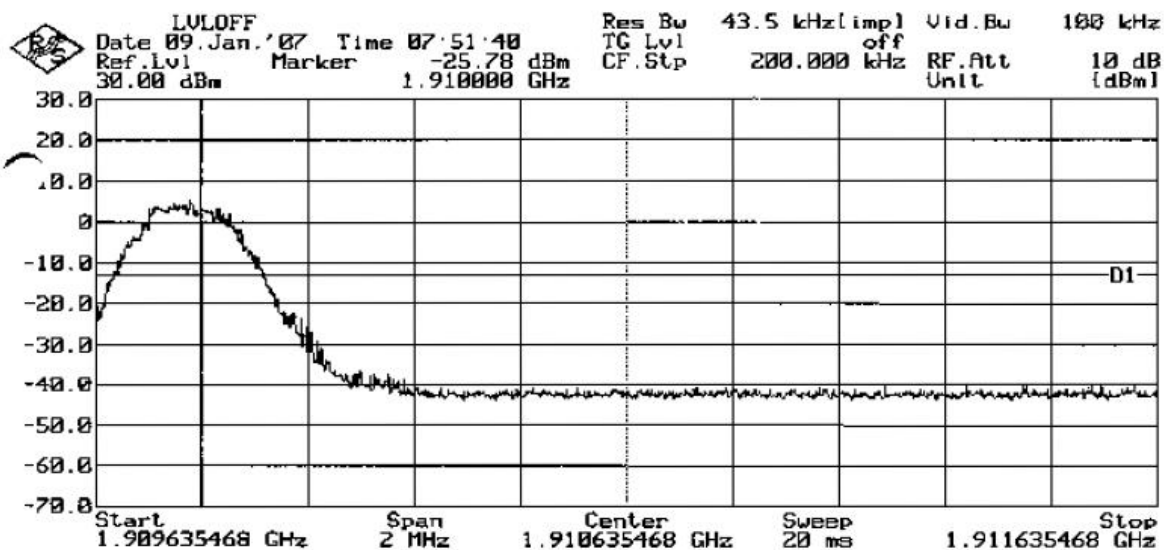
**BAND EDGE COMPLIANCE (RADIATED) TEST****Band Edge Compliance (Radiated) Plots (26dB Bandwidth)****Plot 1 – Lower Channel (Channel 512) 26dB Bandwidth****Plot 2 – Upper Channel (Channel 810) 26dB Bandwidth**

# BAND EDGE COMPLIANCE (RADIATED) TEST

## Band Edge Compliance (Radiated) Plots



Plot 3 - Lower Band Edge



Plot 4 - Upper Band Edge

**RECEIVER SPURIOUS EMISSION TEST**

**FCC Part 15.109 Receiver Spurious Emission Limits (Class B)**

Frequency Range (MHz)	Quasi-Peak Limit Values (dBμV/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.

**FCC Part 15.109 Receiver Spurious Emission Test Instrumentation**

Instrument	Model	S/No	Cal Due Date
R&S Test Receiver (20Hz-26.5GHz) – ESMI3	ESMI	829214/005 829550/004	04 Jul 2007
Schaffner Pre-Amplifier	CPA9231A	3422	01 Apr 2007
MITEQ Preamplifier (0.1-26.5GHz) – PA4	NSP2650-N	604879	07 Nov 2006
Schaffner Bilog Antenna –BL4	CBL6112B	2593	12 May 2007
EMCO Horn Antenna – H14	3115	0003-6087	19 May 2007
K&L Microwave Variable Bandstop Filter	3TNF- 1000/2000/N/N	436	04 Aug 2007

## RECEIVER SPURIOUS EMISSION TEST

### FCC Part 15.109 Receiver Spurious 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.

### FCC Part 15.109 Receiver Spurious 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 attitude 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 10<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 3GHz, and the Horn antenna above 3GHz.

### **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. <b>6 dB below Q-P limit</b>



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**RECEIVER SPURIOUS EMISSION TEST**



**Receiver Spurious Emissions Test Setup (Front View)**



**Receiver Spurious Emissions Test Setup (Rear View)**



**RECEIVER SPURIOUS EMISSION TEST****FCC Part 15.109 Receiver Spurious Emission Results**

Operating Mode	PCS 1900 Receiving	Temperature	23°C
Test Input Power	110V 60Hz	Relative Humidity	55%
Test Distance	3m	Atmospheric Pressure	1030mbar
Class	B	Tested By	Thor Wen Lei

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)
235.1670	40.7	-5.3	359	101	H
268.7631	39.6	-6.4	47	101	H
335.9600	39.6	-6.4	40	101	H
398.0900	39.9	-6.1	359	101	H
431.9621	41.5	-4.5	328	101	V
895.7281	42.5	-3.5	25	100	V

Emissions above 1GHz

Frequency (GHz)	Peak Value (dB $\mu$ V/m)	Average Value (dB $\mu$ V/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)	Channel
3.7596	73.9	52.4	-1.6	78	101	H	512
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

Notes

- 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.
- A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
- EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:  
30MHz - 1GHz  
 RBW: 120kHz VBW: 1MHz  
>1GHz  
 RBW: 1MHz VBW: 1MHz
- 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 – 25.0GHz (QP only @ 3m & 10m) is  $\pm 4.3$ dB (for EUTs < 0.5m X 0.5m X 0.5m).

## MAXIMUM PERMISSIBLE EXPOSURE (MPE) TEST

### FCC Part 1.1310 Maximum Permissible Exposure (MPE) Limits

The EUT shows compliance to the requirements of this section, which states the MPE limits for general population / uncontrolled exposure are as shown below:

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (min)
0.3 - 1.34	614	1.63	100 <sup>Note 2</sup>	30
1.34 - 30	824 / f	2.19 / f	180 / f <sup>2</sup> <sup>Note 2</sup>	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	-	-	f / 1500	30
1500 - 100000	-	-	1.0	30
Notes				
1. f = frequency in MHz				
2. Plane wave equivalent power density				

### FCC Part 1.1310 Maximum Permissible Exposure (MPE) Test Instrumentation

Instrument	Model	S/No	Cal Due Date
PMM 8053 Portable Field Meter	8053	0220J10308	16 Apr 2007
PMM Electric and Magnetic Field Analyzer	EHP-50A	1311L10515	16 Apr 2007

### FCC Part 1.1310 Maximum Permissible Exposure (MPE) Test Setup

- The EUT and supporting equipment were set up as shown on the setup photo.
- The relevant field probe was positioned at least 20cm away from the EUT and supporting equipment boundary.

### FCC Part 1.1310 Maximum Permissible Exposure (MPE) Test Method

- The EUT was switched on and allowed to warm up to its normal operating condition.
- The test was first carried out at one of the positions / sides of the EUT.
- Power density measurement (mW/cm<sup>2</sup>) was made using the field meter set to the required averaging time.
- Steps 2 and 3 were repeated for the next position and its associate EUT operating mode, until all possible positions and modes were measured.

### Sample Calculation Example

At 2400 MHz, limit = 1.0 mW/cm<sup>2</sup>

Power density reading obtained directly from field meter = 0.3 mW/cm<sup>2</sup> averaged over the required 30 minutes.

Therefore, margin = 0.3 – 1.0 = -0.7 mW/cm<sup>2</sup> i.e. **0.7 mW/cm<sup>2</sup> below limit**

**MAXIMUM PERMISSIBLE EXPOSURE (MPE) TEST**



**Maximum Permissible Exposure (MPE) Test Setup**

**MAXIMUM PERMISSIBLE EXPOSURE (MPE) TEST****FCC Part 1.1310 Maximum Permissible Exposure (MPE) Results**

Test Input Power	110V 60Hz	Temperature	20°C
Test Distance	20cm	Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Xu Quanyang

Channel	Channel Frequency (GHz)	Power Density Value (mW/cm <sup>2</sup> )	Margin (mW/cm <sup>2</sup> )	Averaging Time (min)	Limit (mW/cm <sup>2</sup> )
512	1850.2	0.0050	-0.9950	30	1.0
661	1880.0	0.0044	-0.9956	30	1.0
810	1909.8	0.0043	-0.9957	30	1.0

Notes

1. All possible modes of operation were investigated. Only the worst case highest radiation levels were measured. Measurements were taken at the required averaging time. All other radiation levels 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. 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 0.1MHz – 3GHz is  $\pm 15\%$ .



**This Report is issued under the following conditions:**

1. Results of the testing/calibration in the form of a report will be issued immediately after the service has been completed or terminated.
2. Unless otherwise requested, a report shall contain only technical results. Analysis and interpretation of the results and professional opinion and recommendations expressed thereupon, if required, shall be clearly indicated and additional fee paid for, by the Client.
3. 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 Corporation approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that TÜV SÜD PSB Corporation in any way "guarantees" the later performance of the product/equipment.
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October 2006



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

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## **ANNEX A**

### **EUT PHOTOGRAPHS / DIAGRAMS**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738P**



**Front View**



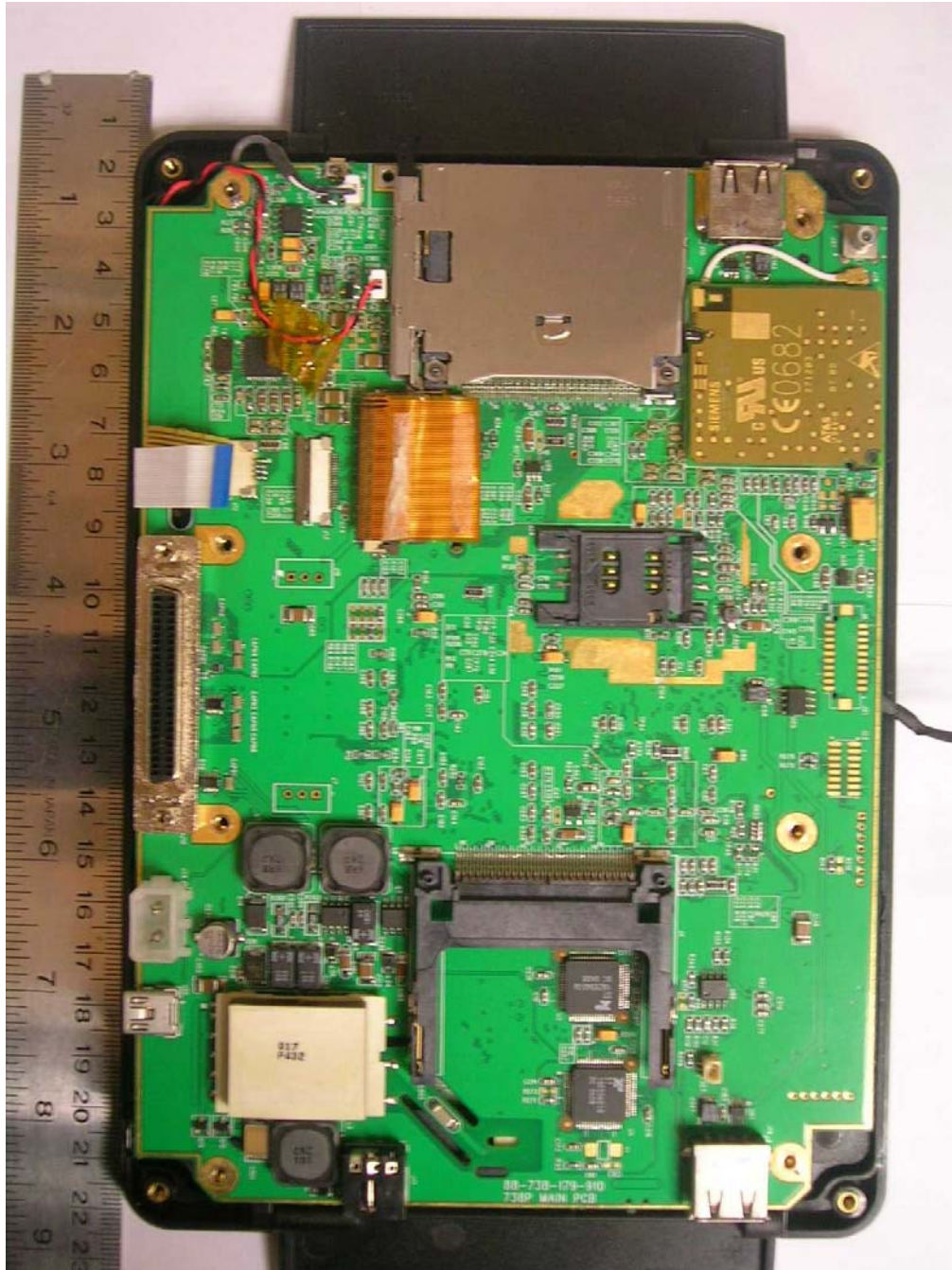
**Rear View**



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738P**



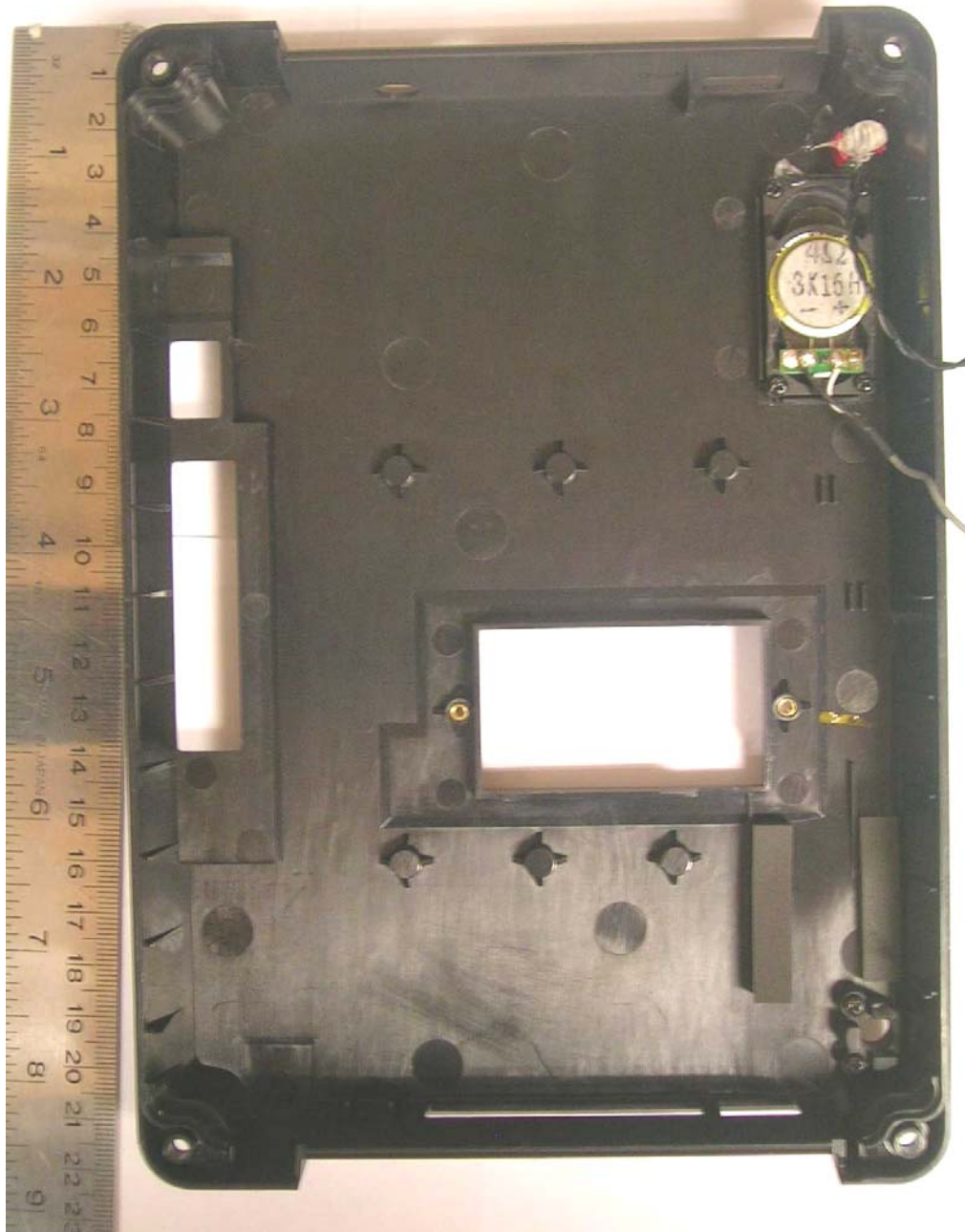
**Internal View – Top Cover**



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738P**

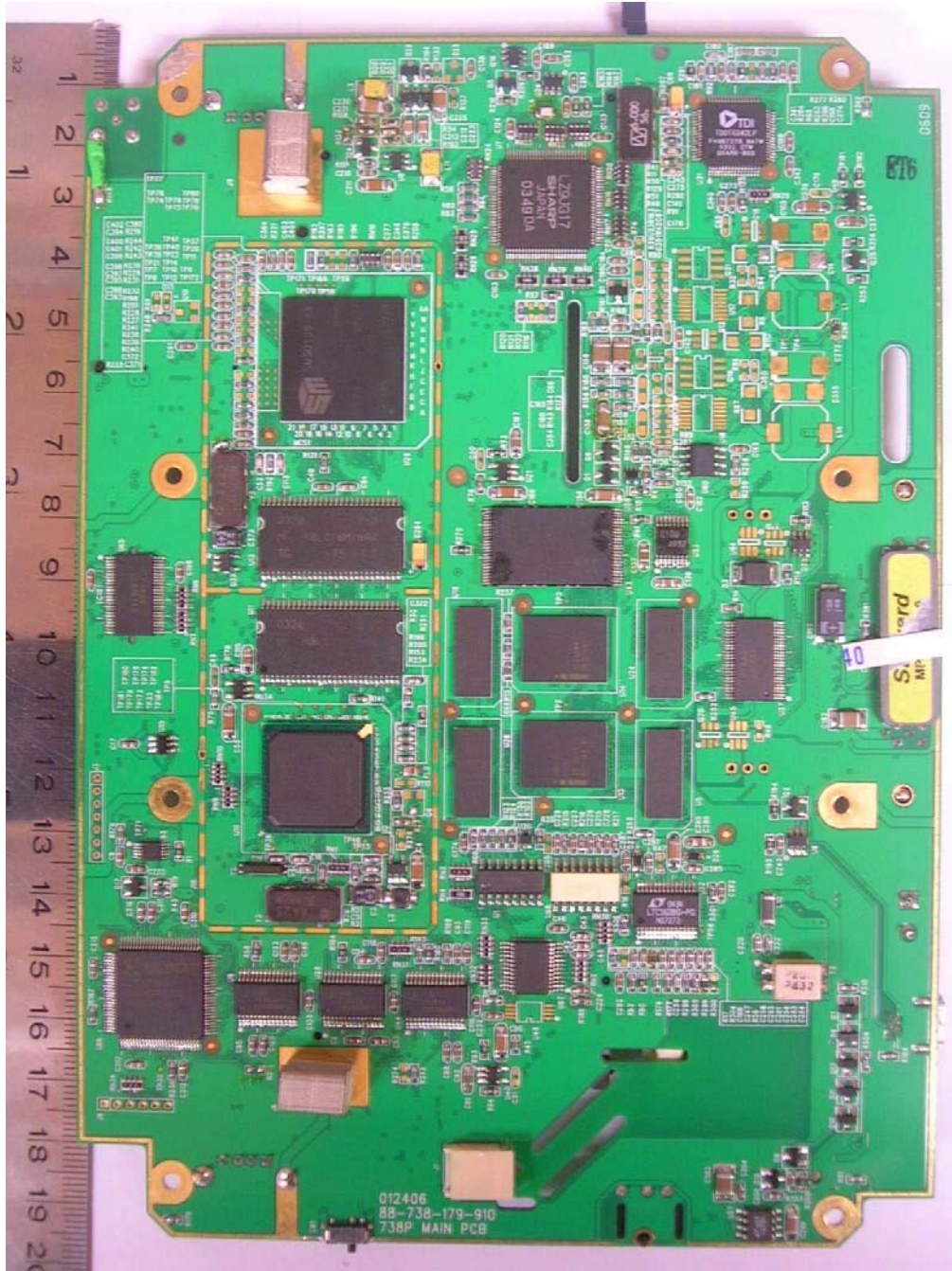


**Internal View – Bottom Cover**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738P**



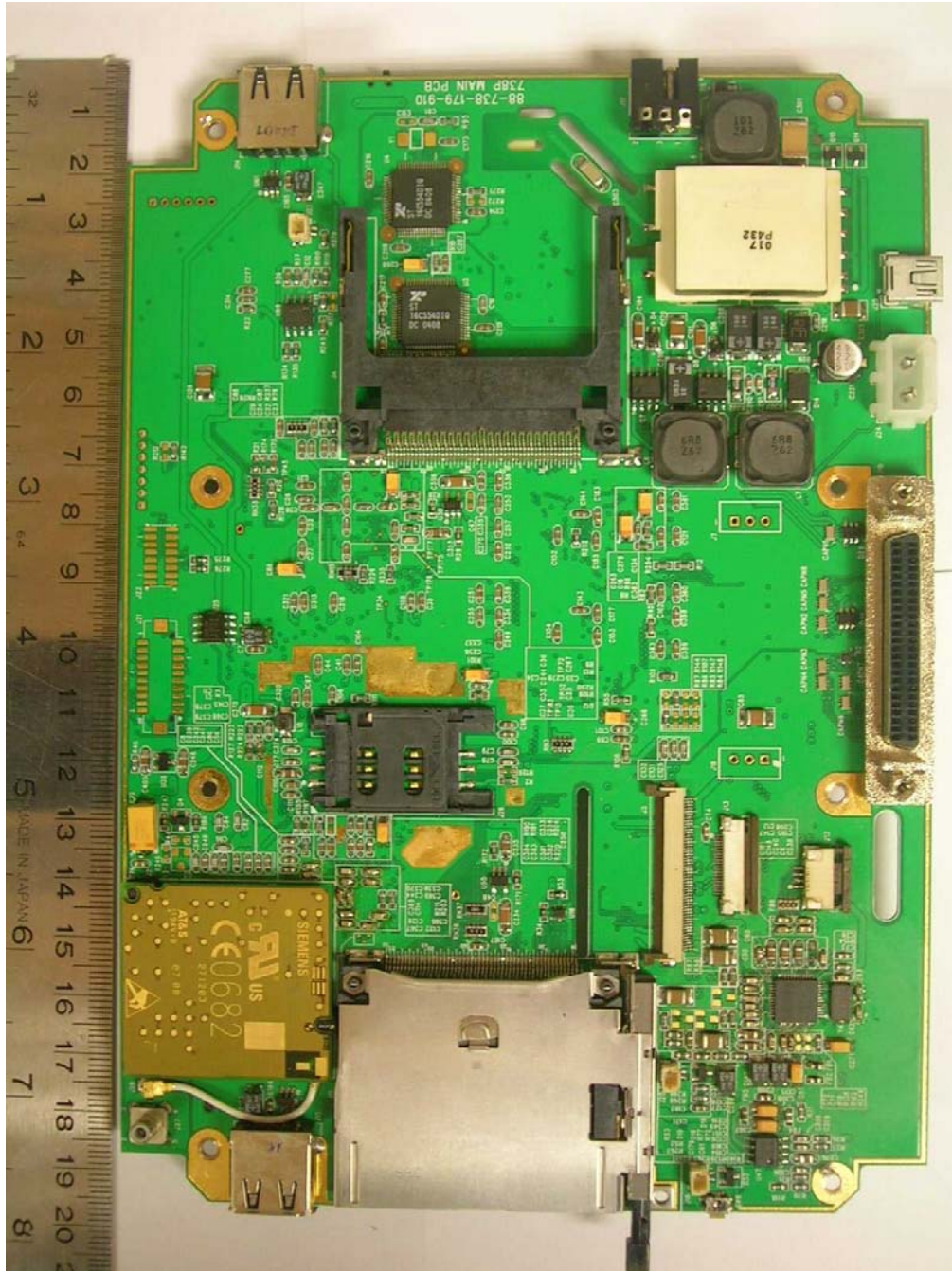
**Main-Board - Component Side**



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738P**

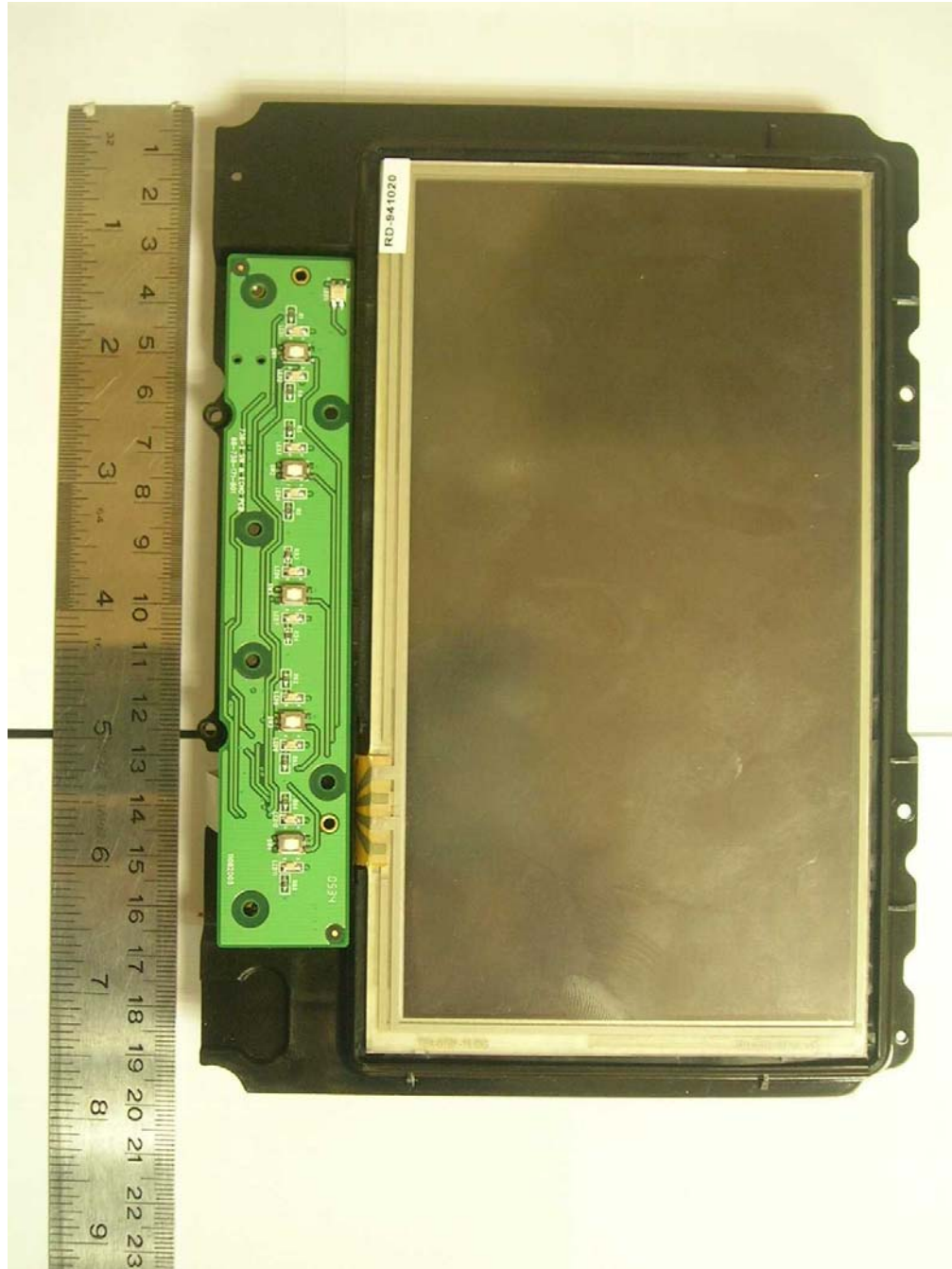


**Main-Board - PCB Trace Side**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738P**



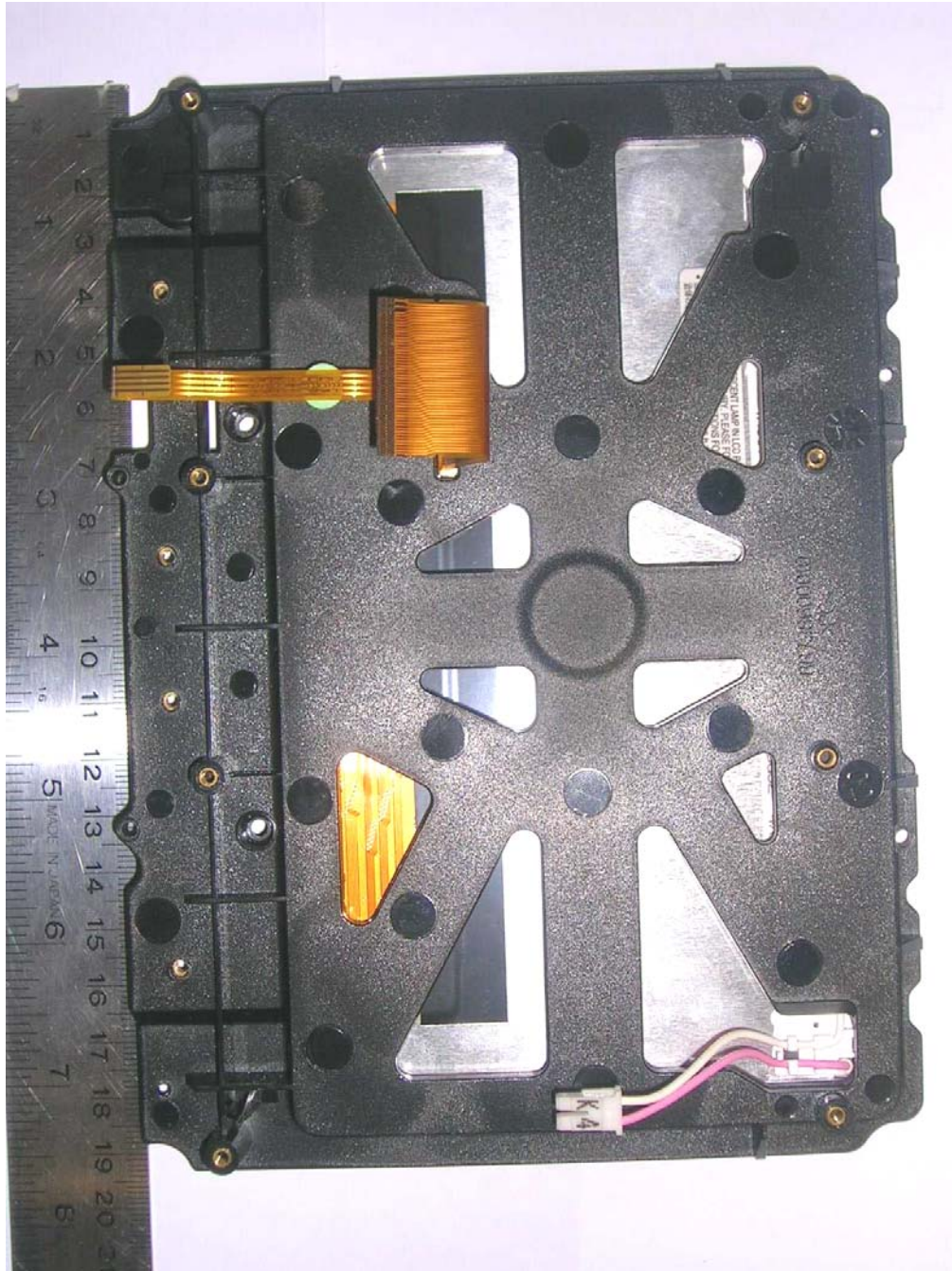
**LCD Display – Front View**



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738P**

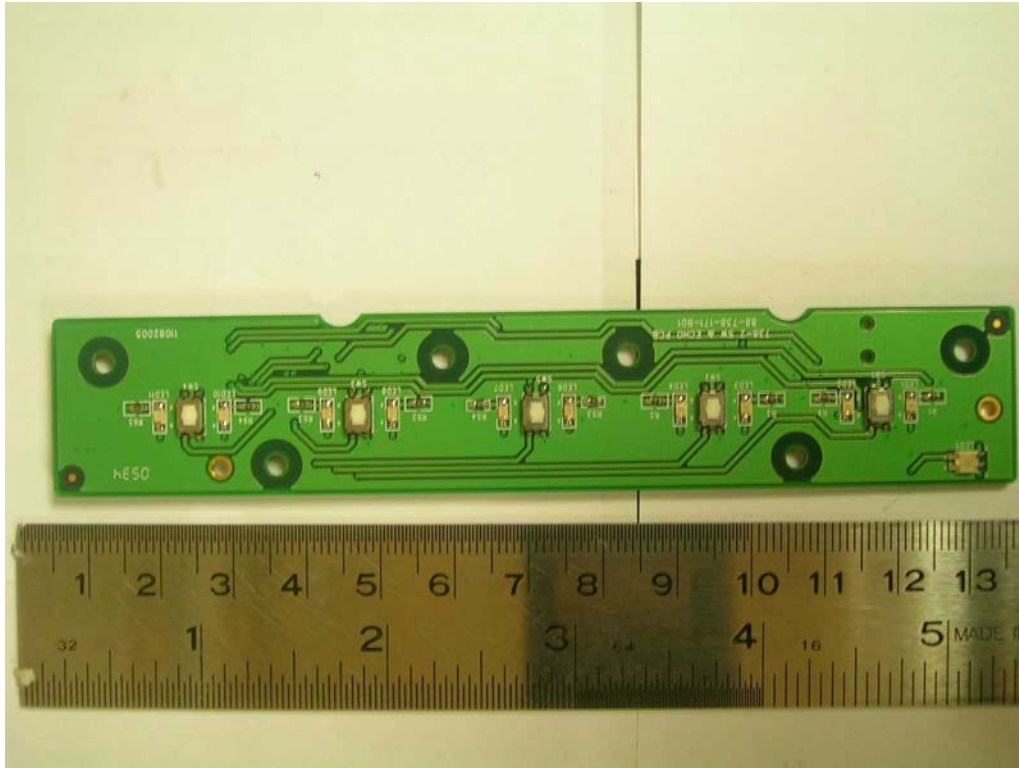


**LCD Display - Rear View**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738P**

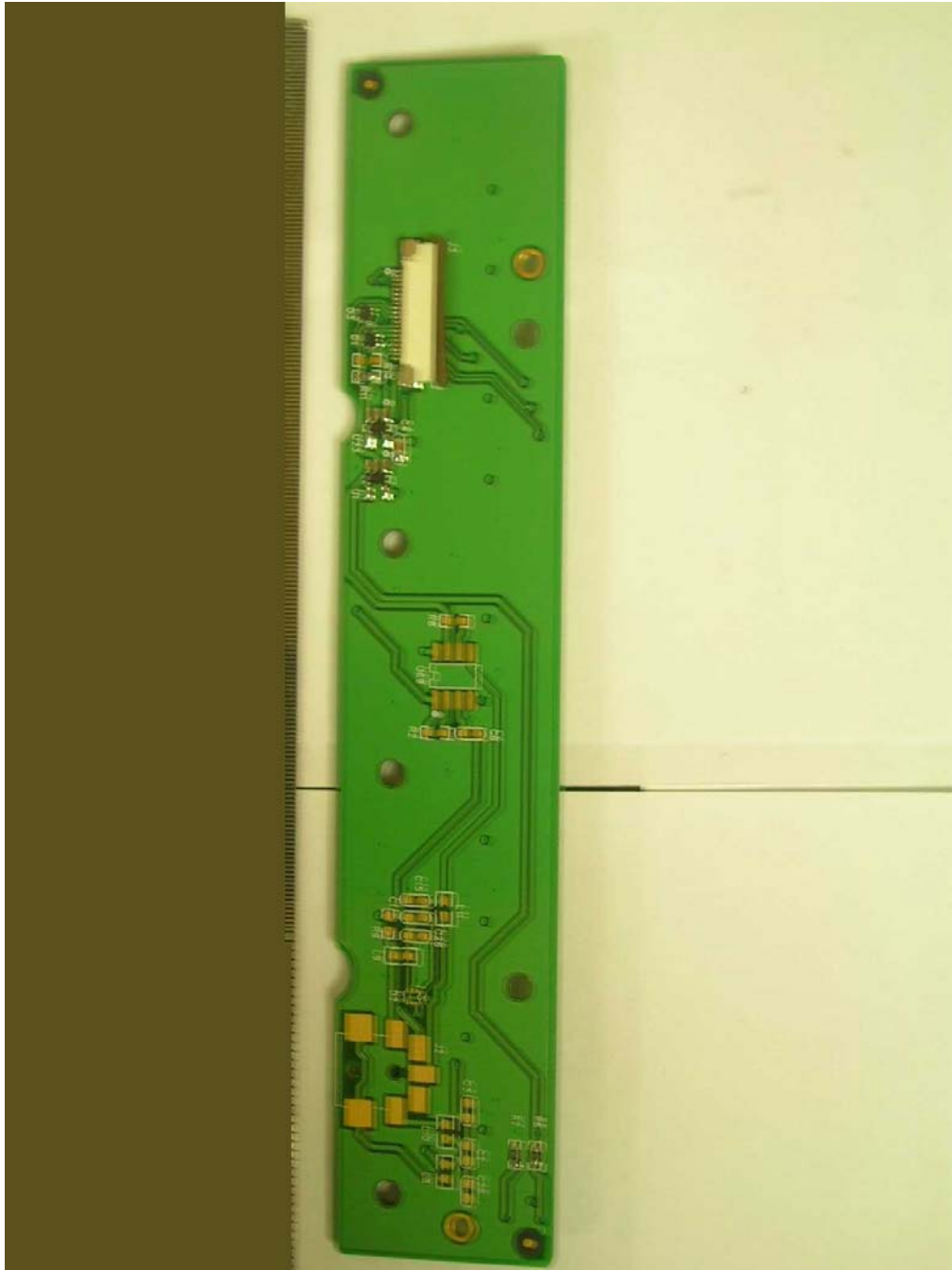


**LCD Display - Component Side**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738P**

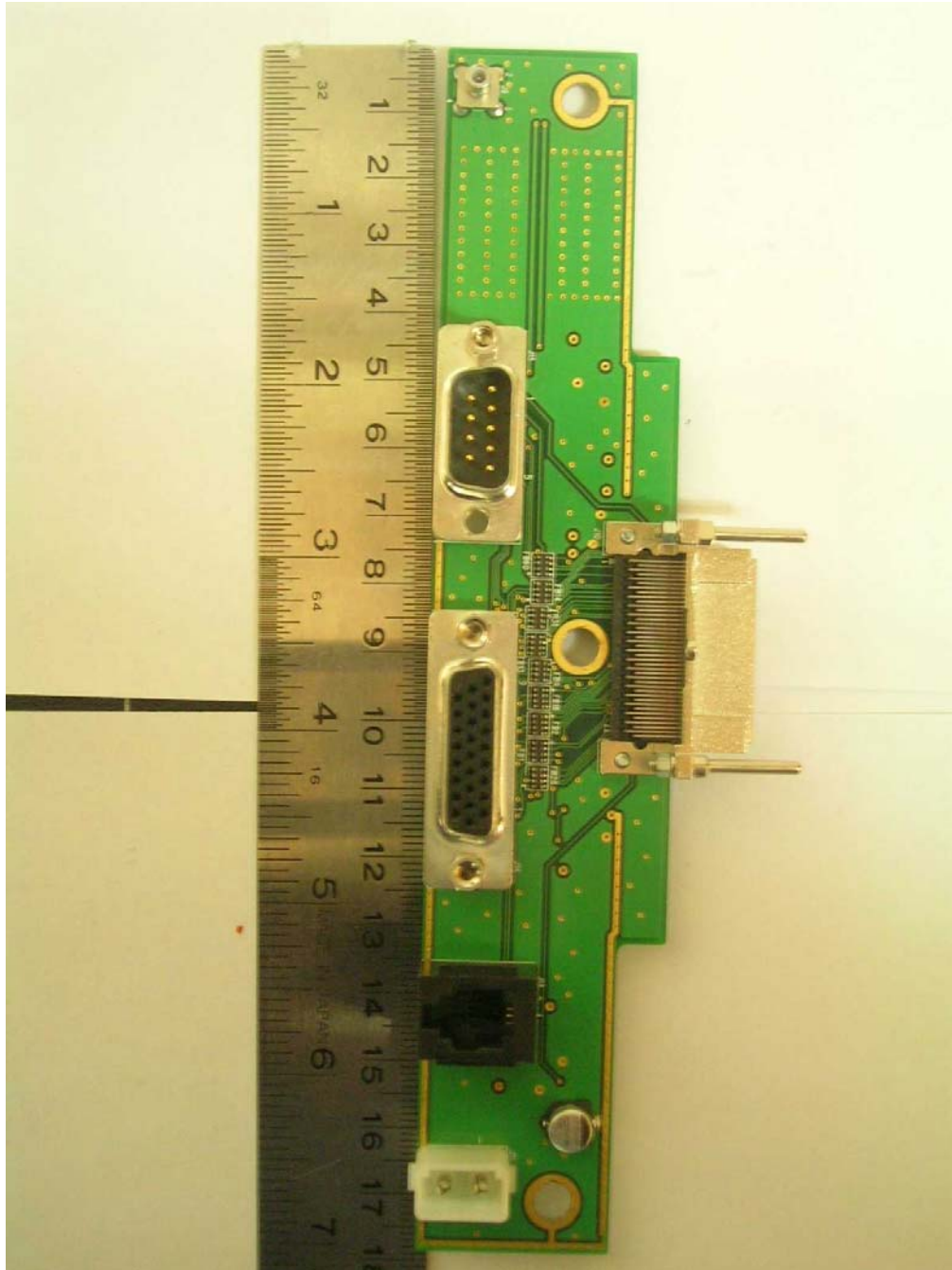


**LCD Display - Trace Side**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**



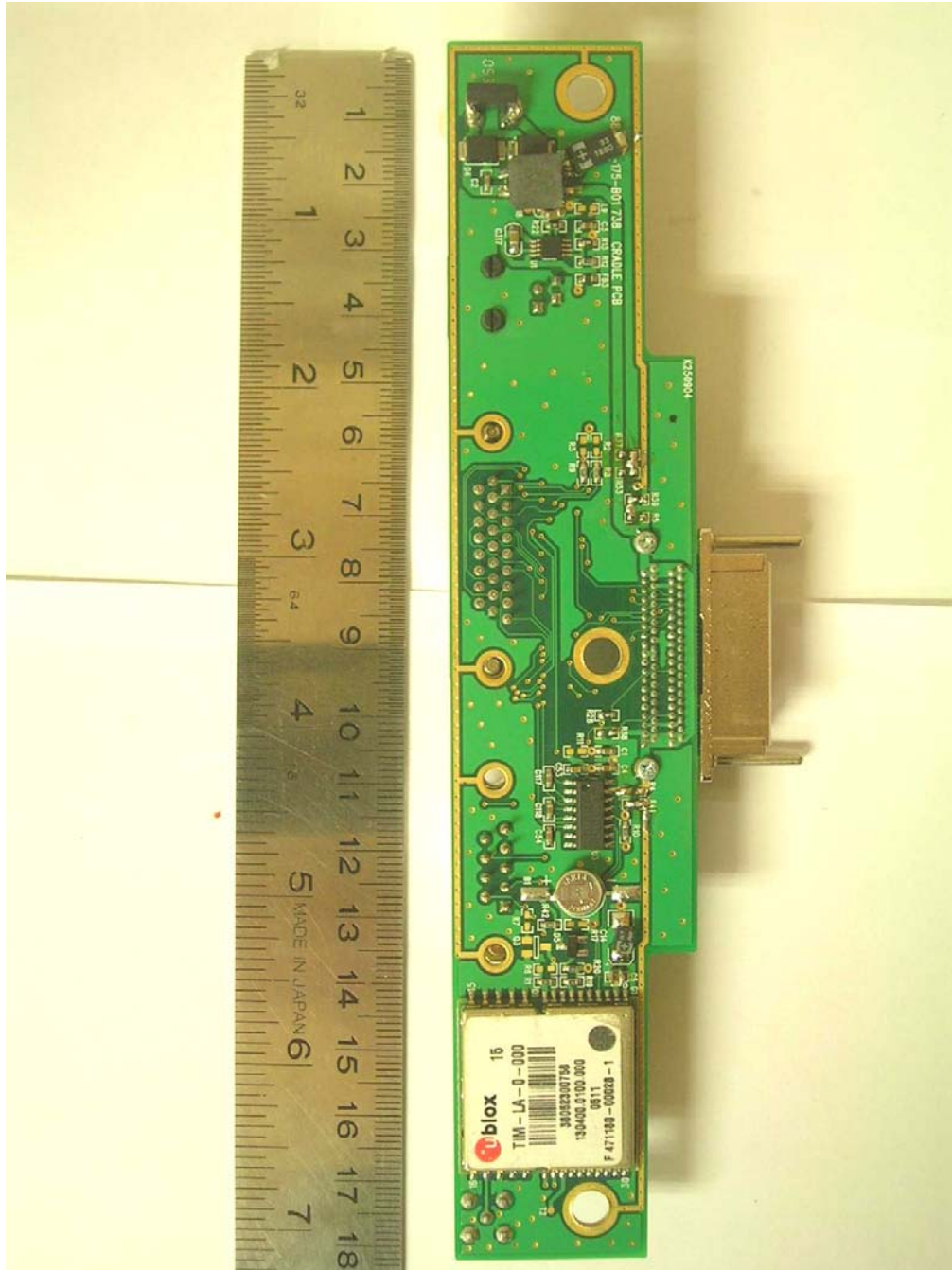
**Sub-Board - PCB Component Side**



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**



**Sub-Board - PCB Trace Side**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**

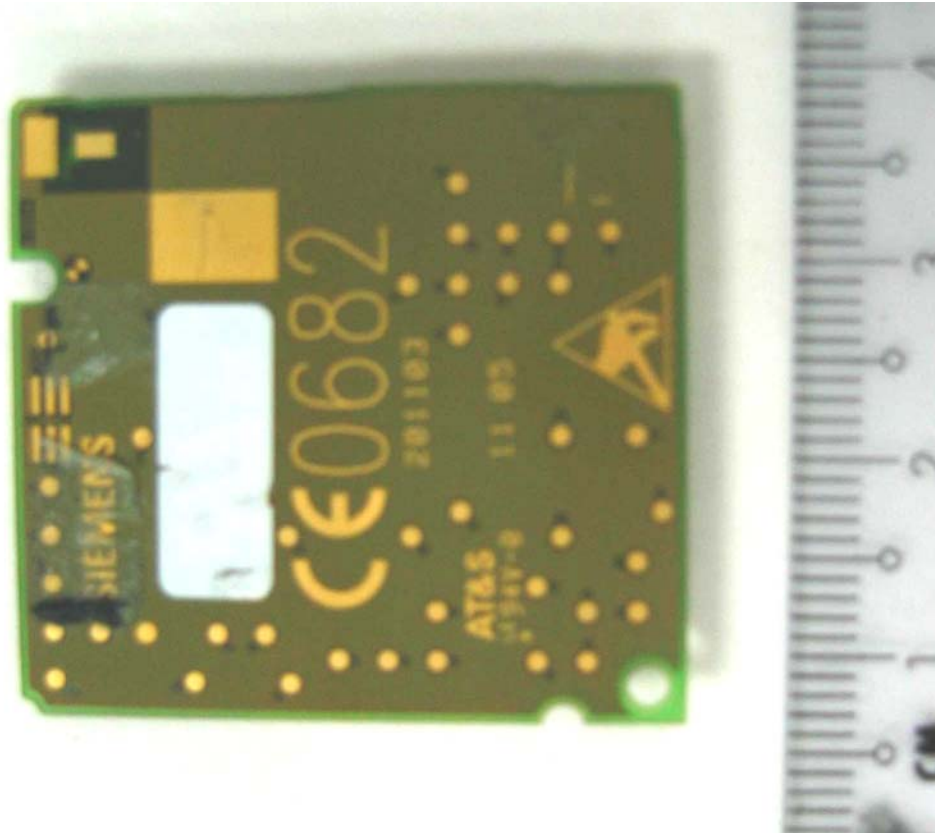


**RF Module**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**



**RF Module**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**



**Front View**

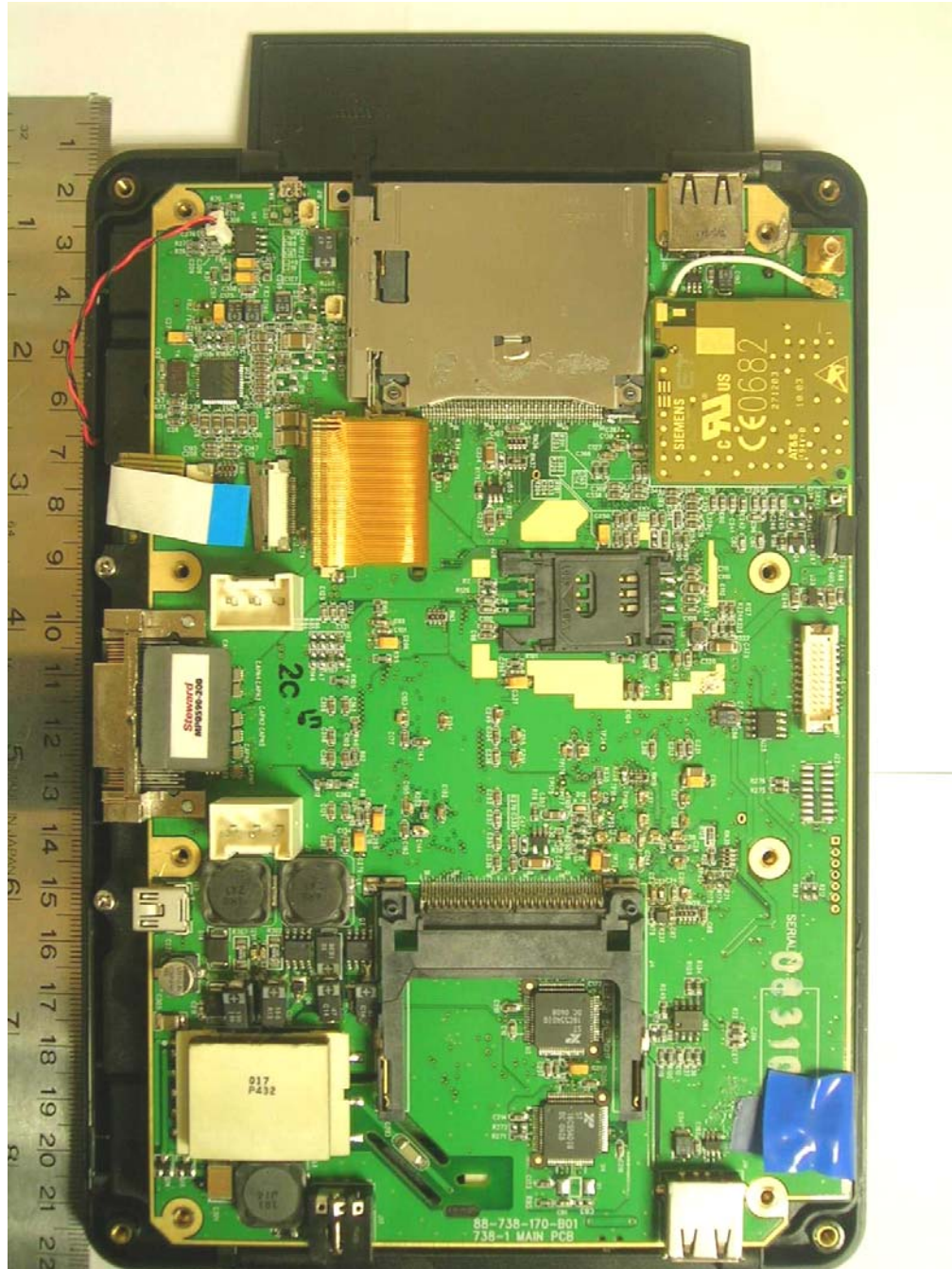


**Rear View**



## ANNEX A

## EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G

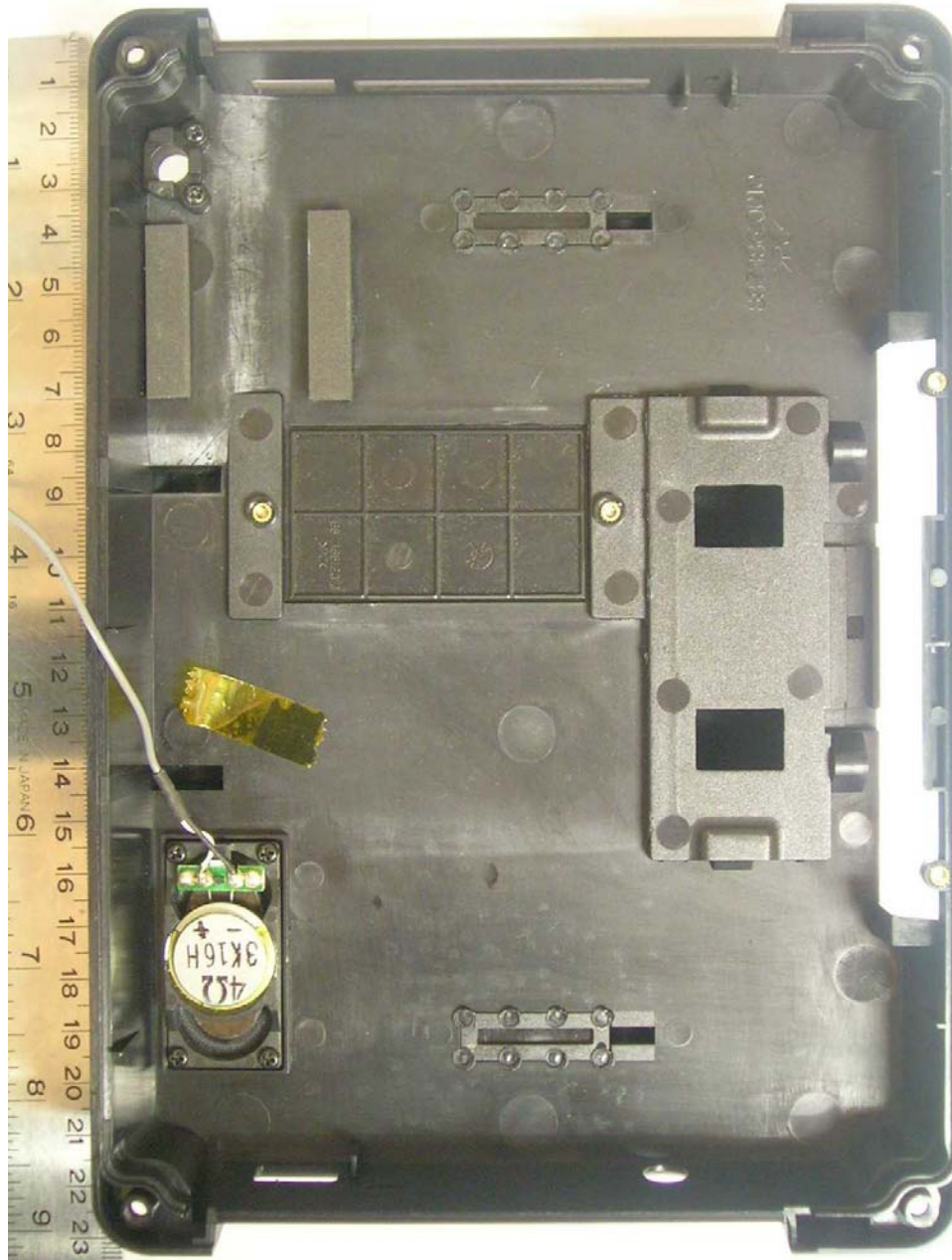


### Internal View - Top Cover

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**



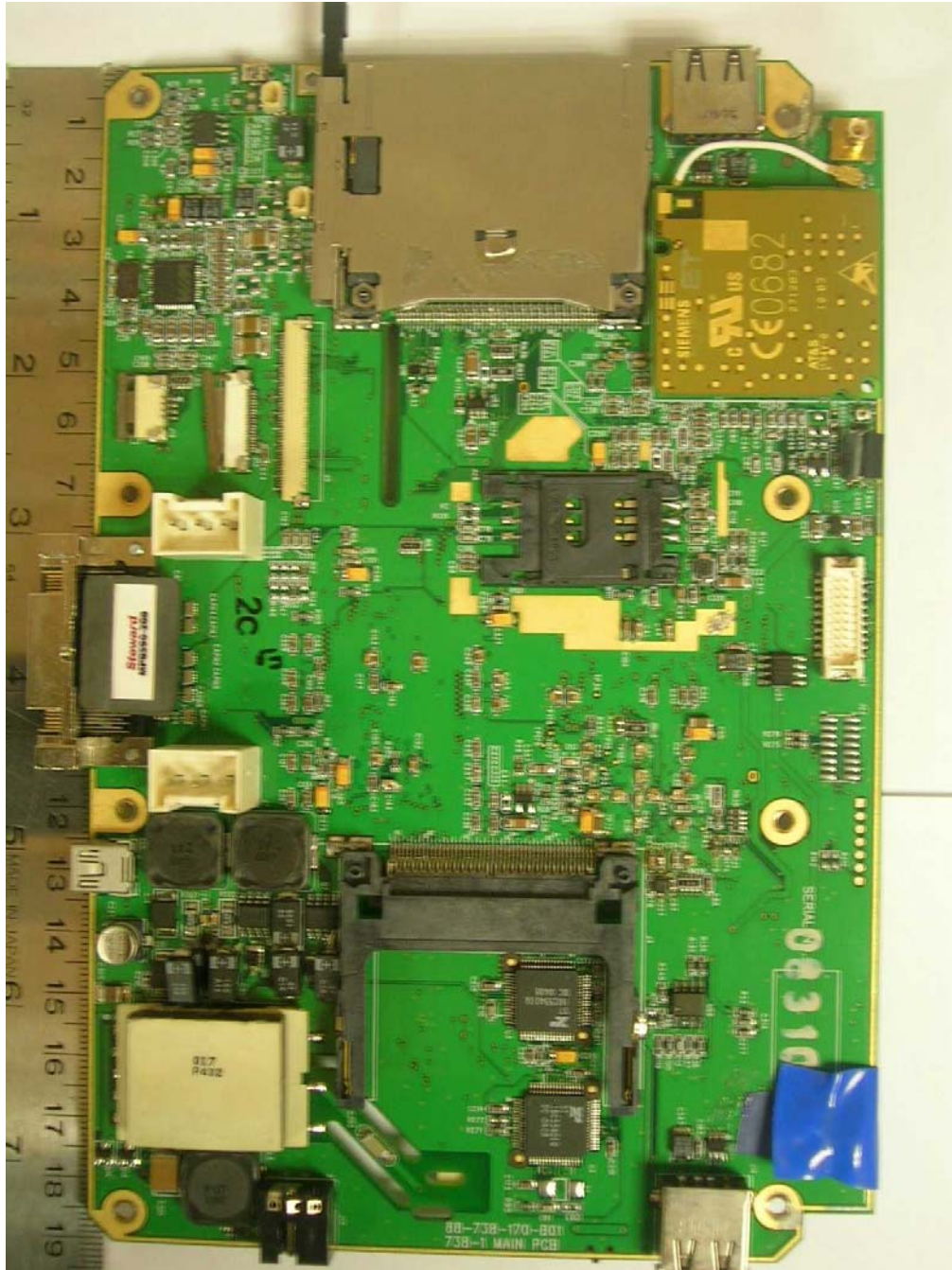
**Internal View – Bottom Cover**



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**



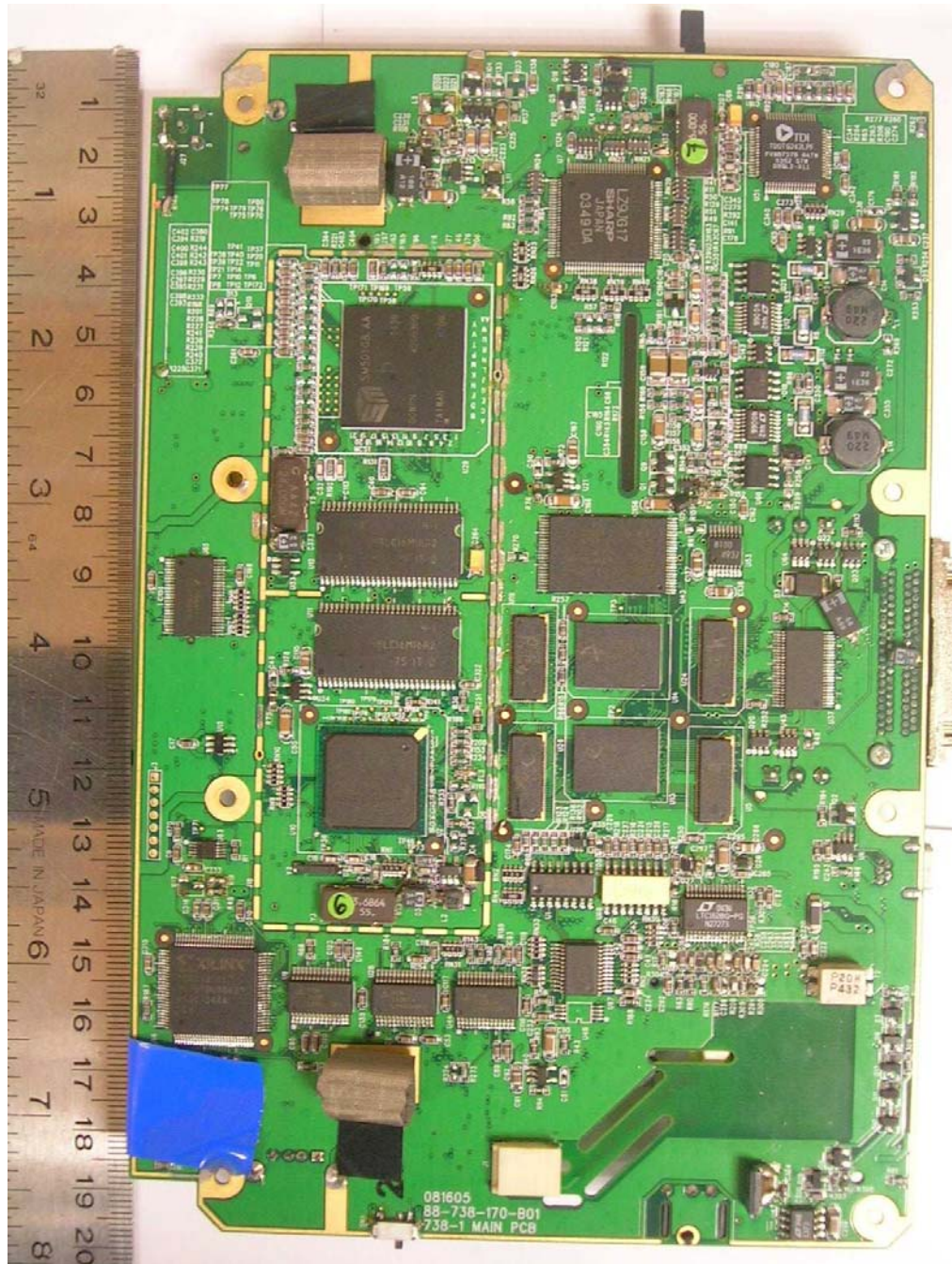
**Main-Board - Component Side**



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**

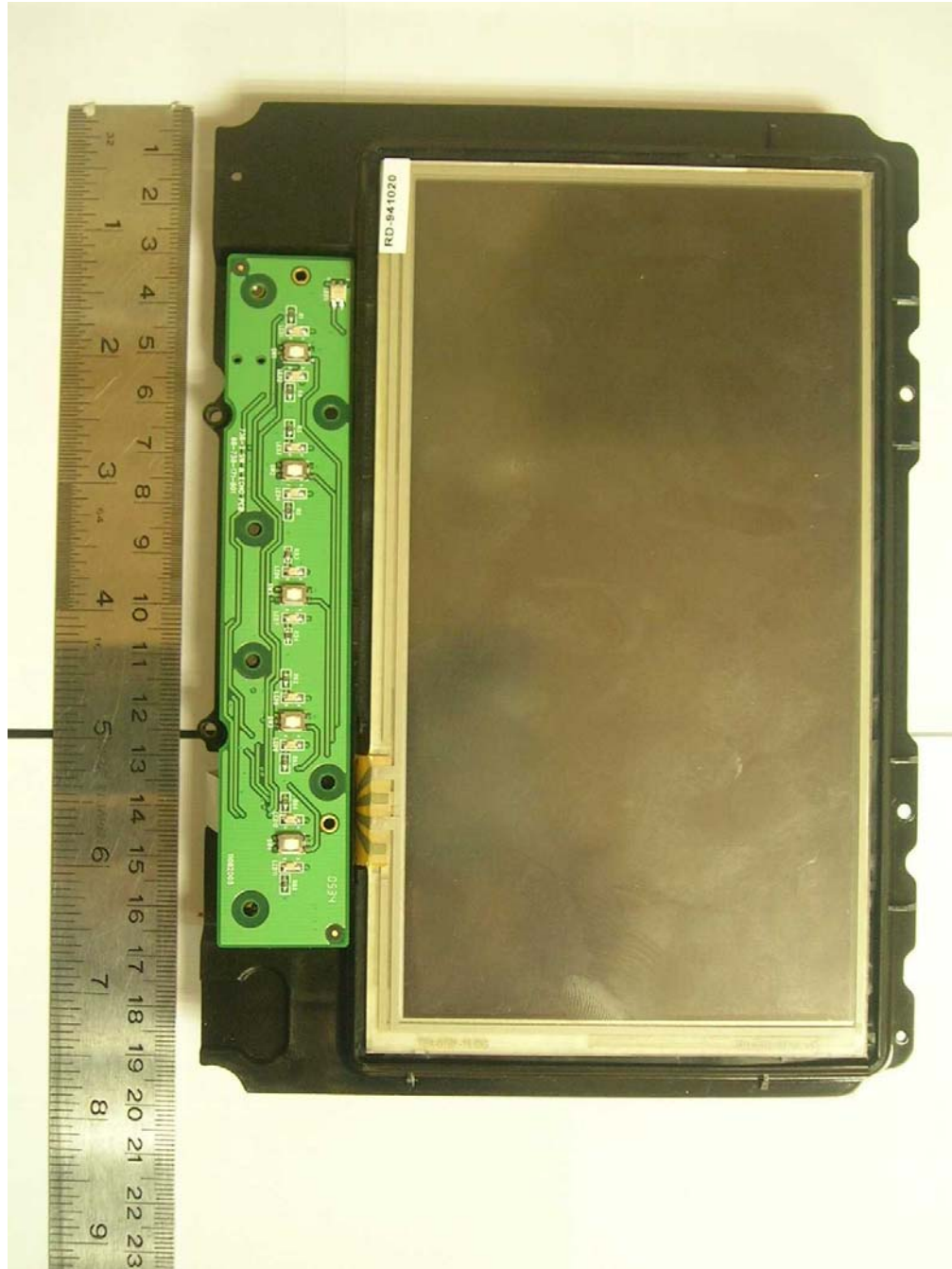


**Main-Board - Trace Side**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**



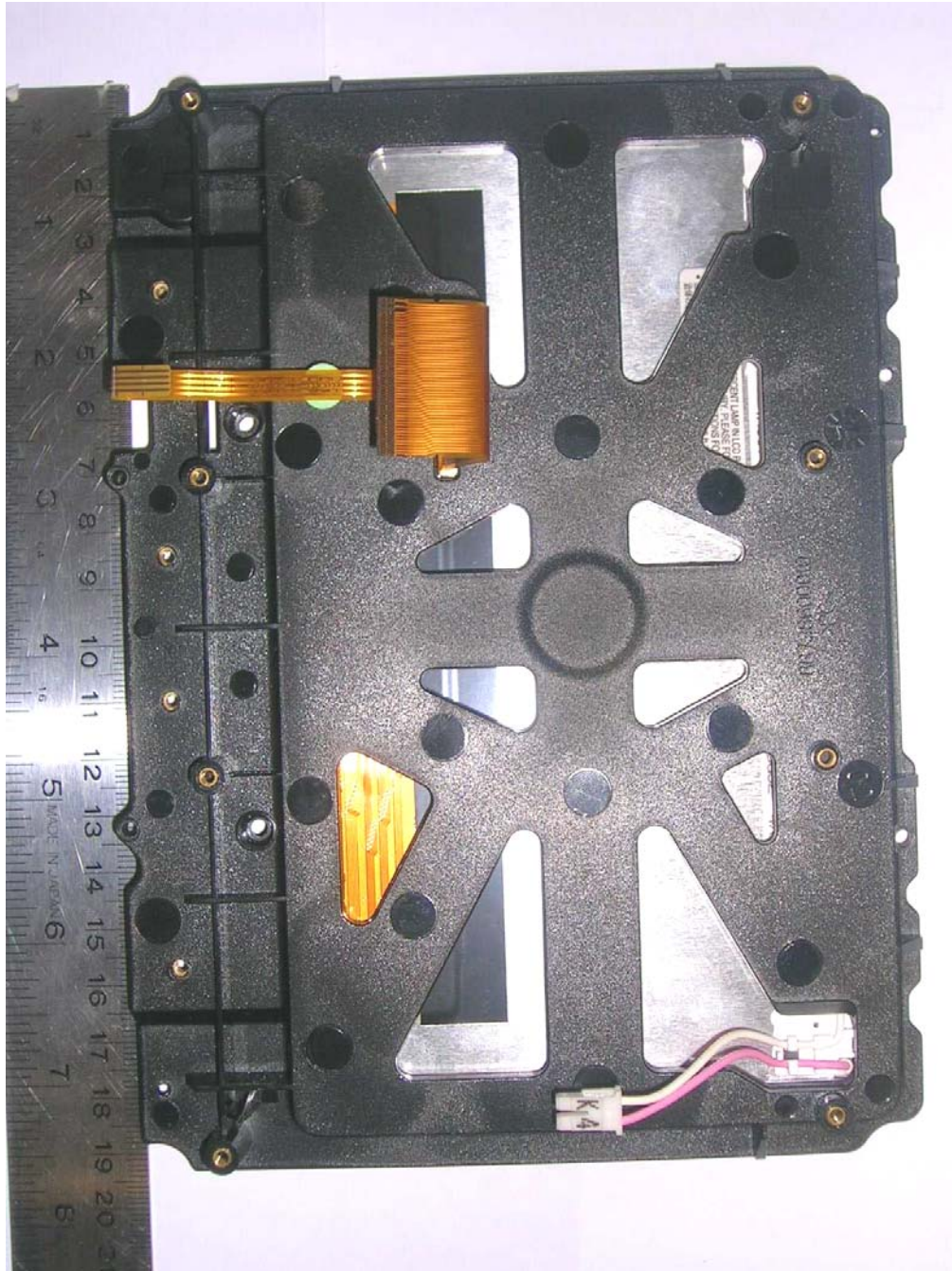
**LCD Display – Front View**



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**

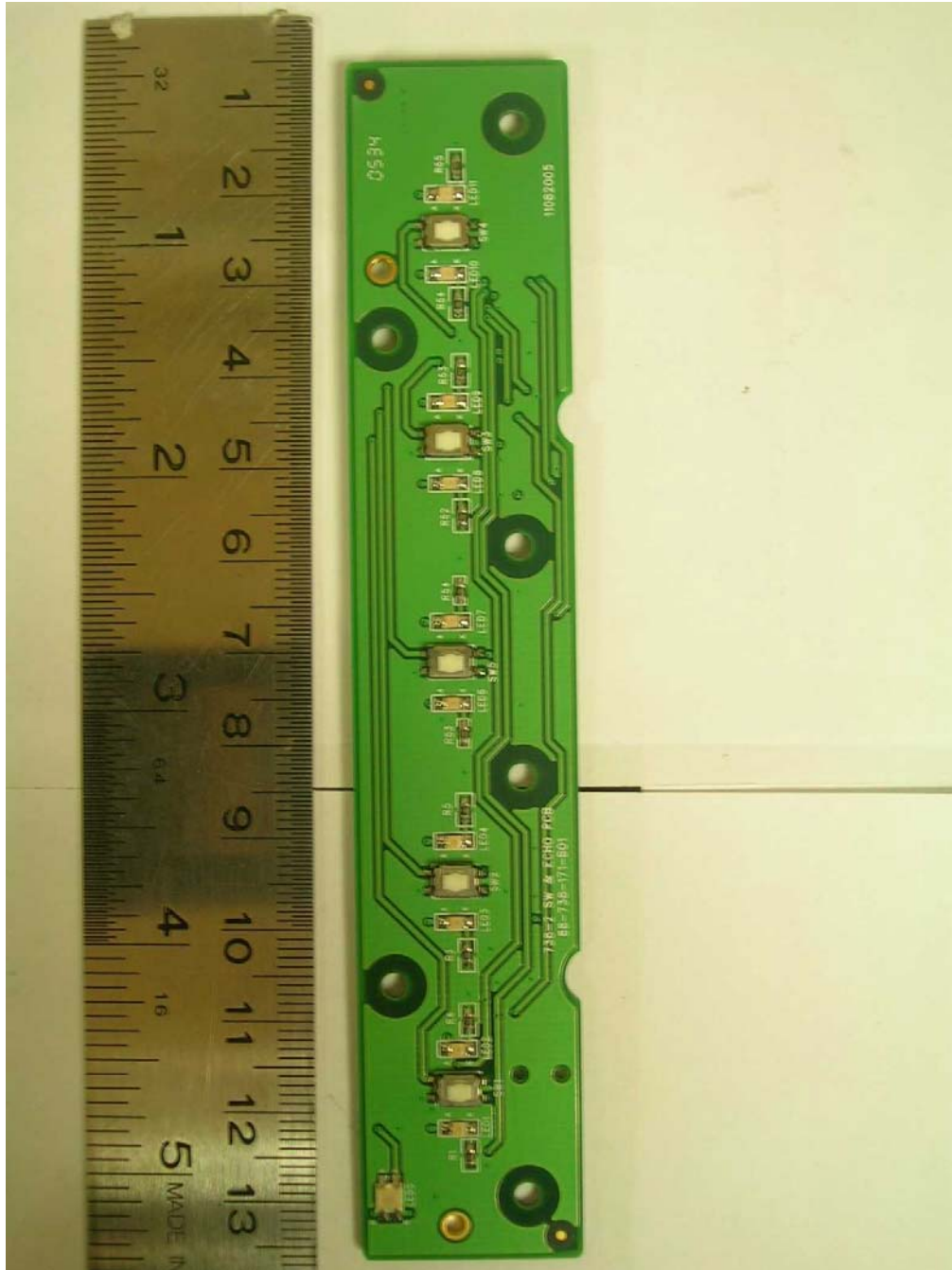


**LCD Display - Rear View**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**

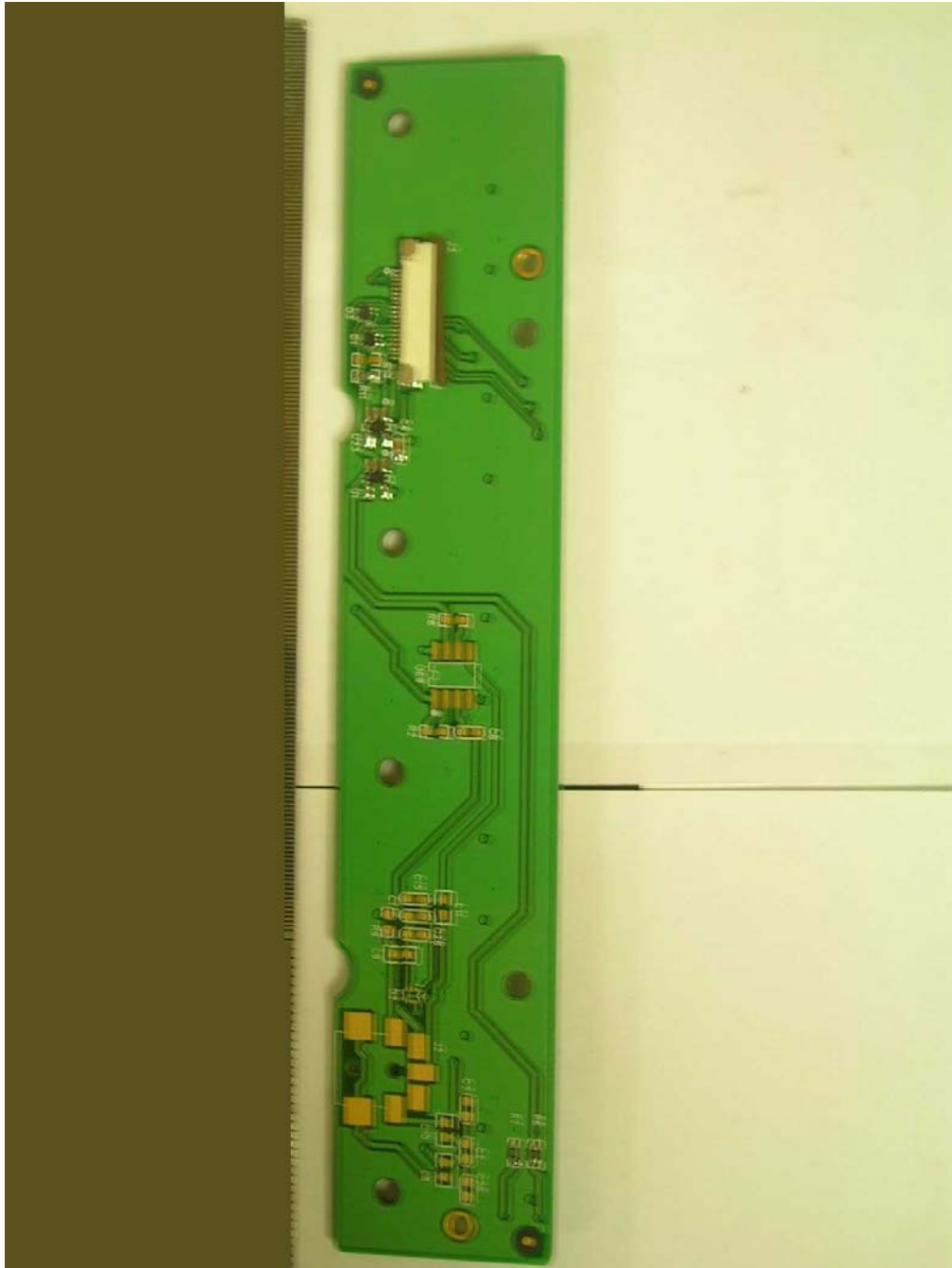


**LCD Display - Component Side**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**



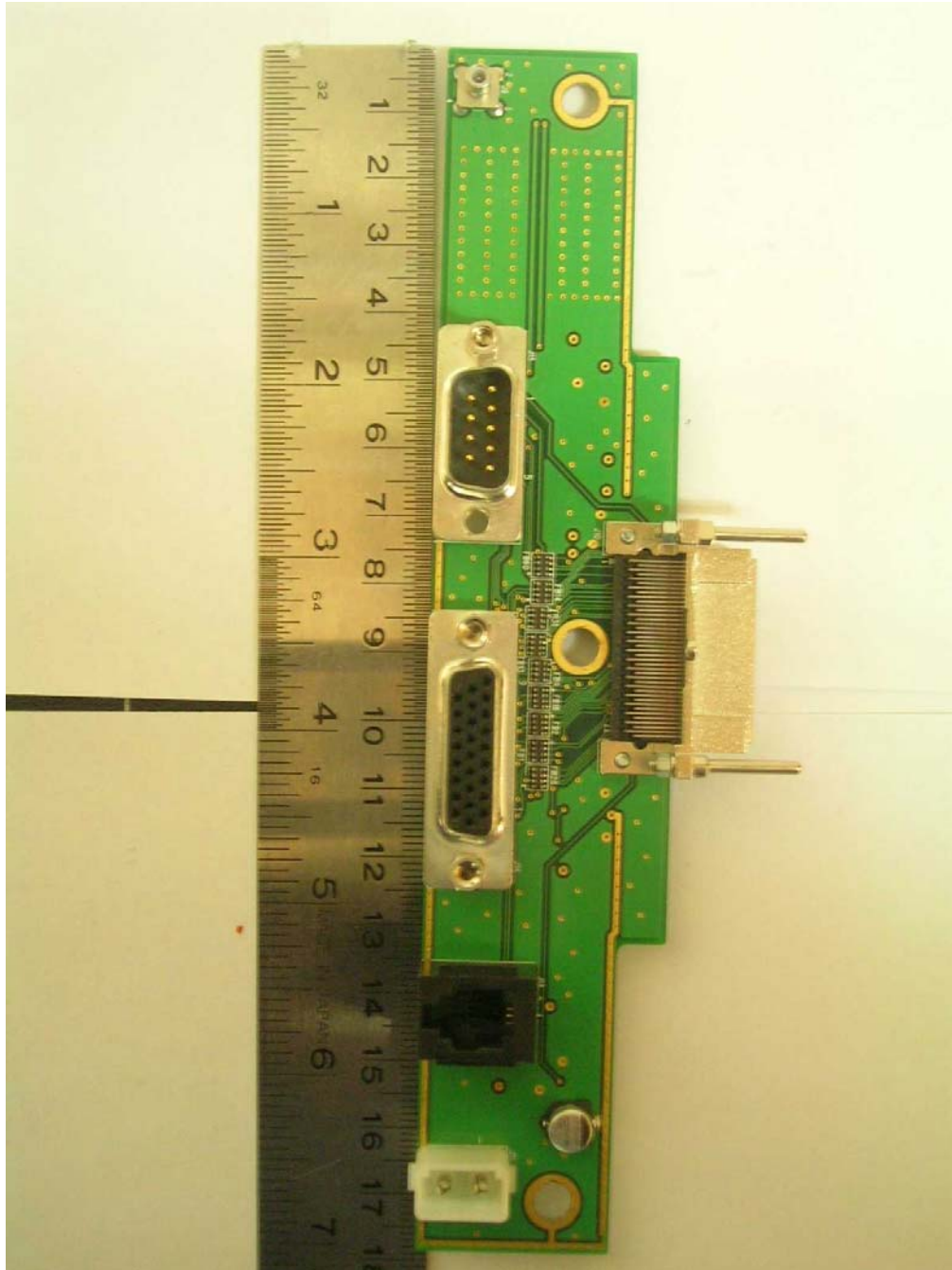
**LCD Display - Trace Side**



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**

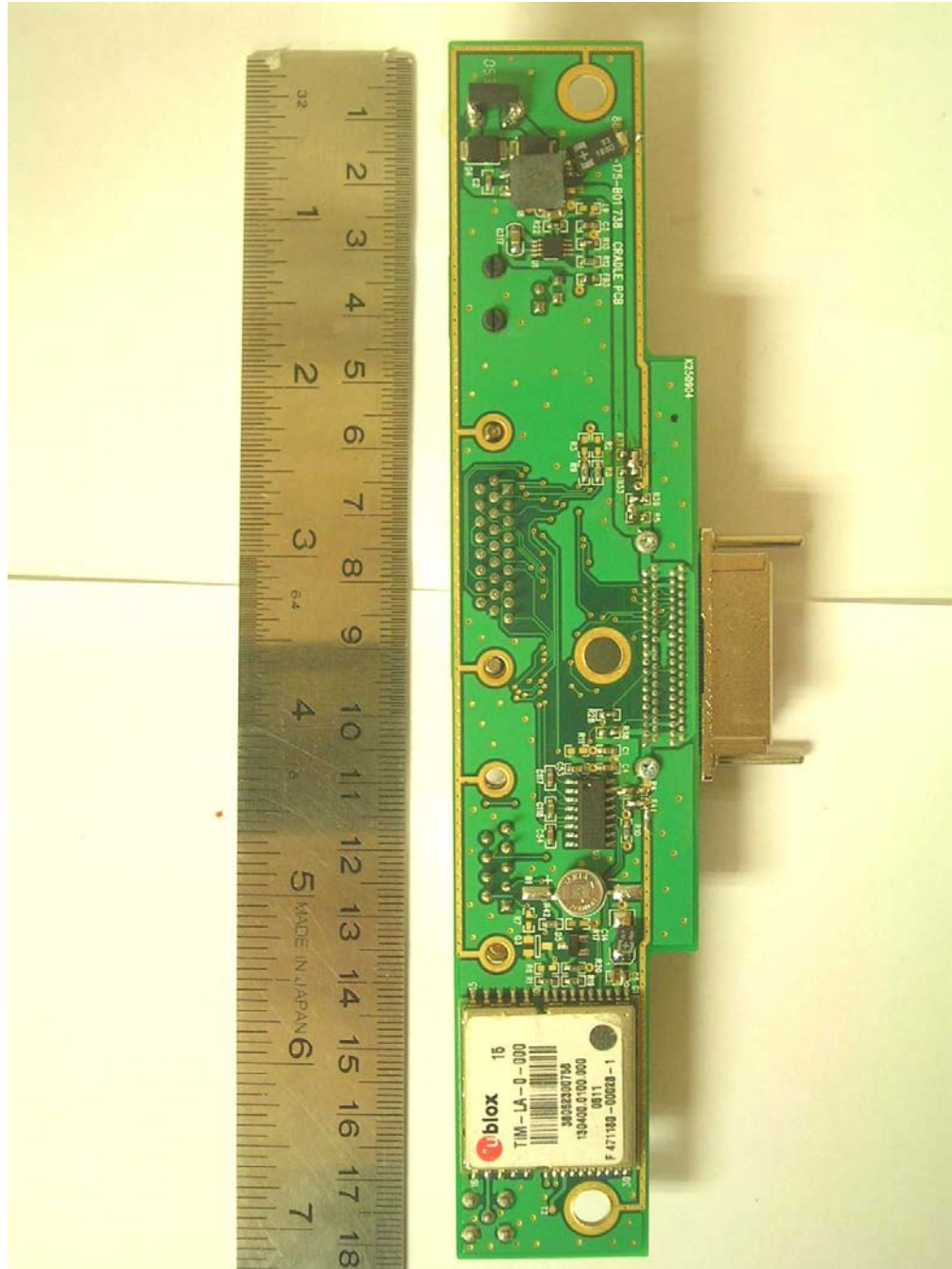


**Sub-Board - PCB Component Side**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**



**Sub-Board - PCB Trace Side**



**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**

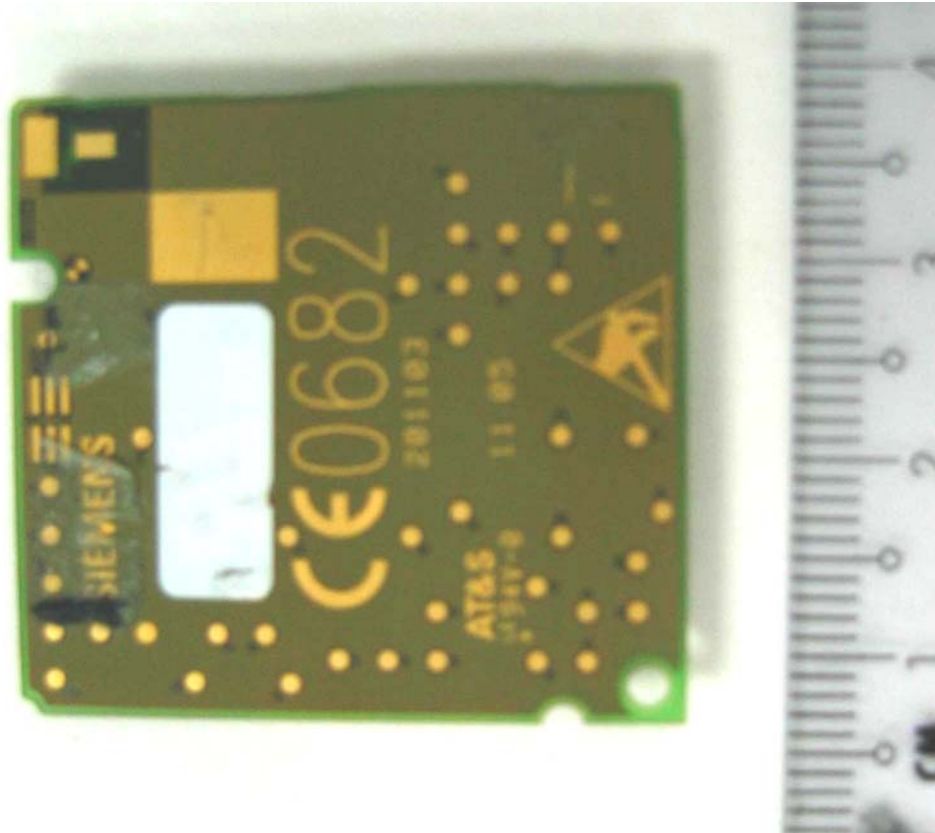


**RF Module**

**EUT PHOTOGRAPHS / DIAGRAMS**

**ANNEX A**

**EUT PHOTOGRAPHS FOR MOBILE DATA TERMINAL MODEL – W738G**



**RF Module**



**FCC LABEL & POSITION**

**ANNEX B**

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**ANNEX B**

**FCC LABEL & POSITION**

## FCC LABEL & POSITION

## ANNEX B

### 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.



Sample Label



Physical Location of FCC Label on EUT



**USER MANUAL TECHNICAL DESCRIPTION BLOCK  
& CIRCUIT DIAGRAMS**

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**ANNEX C**

**ANNEX C**

**USER MANUAL  
TECHNICAL DESCRIPTION  
BLOCK & CIRCUIT DIAGRAMS**

(Please refer to manufacturer for details)