

TEST REPORT

FCC RULES Part 22H and Part 15 Subpart B

FCC ID :S3Q - MC3000

Report File No. : STROR-05-032

Date of Issue : Apr 01, 2005

Kind of Product : PDA

Model Name : MC3000

Manufacturer : InnoTeleteck, Inc.

Serial No. : -

Test Result : Complied

The results shown in this report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of company.

VERIFICATION OF COMPLIANCE

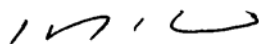
Applicant : .InnoTeletek,Inc.
Kind of Product : PDA
Brand Name : -
Model Name : MC3000
Model Difference : -
Report File No. : STROR-05-032
Date of test : Mar. 14, 2005 ~ Apr. 01, 2005
Receiver EUT : -

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC RULES Part 22H and Part 15 Subpart B	Complied

The above equipment was tested by SGS Testing Korea Co., Ltd. for compliance with the requirements set forth in the FCC RULES Part 22H and Part 15 Subpart B. The results of testing in this report apply to the product system that was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:*Date*

Apr. 01, 2005

*Feel Jeong**Approved By**Date*

Apr. 01, 2005

James Kwon

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1. General Description of EUT

▶Genuine Industrial Model

InnoTeletek MC3000 is a genuine industrial PDA designed for harsh out-door environments

- Durability : 1.5m drop to concrete
- Protection : Sealed to IP54 standard(Dust-tight, Protected against splash water)
- Operating temperature : -20℃ ~ 60℃
- Stability : Components for industrial type

▶Barcode Decoding and Image Capturing (CMOS Imager or Laser Scanner)

- MC3000, featuring a built-in Laser Scanner or CMOS Imager (0.3/1.3M pixels), decode bar code data or/and capture images very effectively, so they can help improve productivity of logistics and distribution companies.

▶User Friendly

- MC3000 comfortably fits into palm of your hand, enables one-handed data capture. User friendly Windows-based environment makes it easy to operate by finger touch or stylus pen input.

2. General Information of EUT

Transceiver

Power Supply	DC 3.8 V(Li-Ion), 2000mA
Operating Frequency	824.73 ~ 848.19 MHz
Modulation	OQPSK
Operating Temperature	-20 ℃~+ 60 ℃
Frequency Generation	PLL
Communication method	Full-Duplex
Size	30mm(Head) * 27mm(Tail) * 176.2mm*77.8mm
Antenna Type	External Antenna

3. SPURIOUS RADIATED EMISSIONS

3.1 Limit

§ 22.917(a) Out of band emissions. The power of any emission outside of the authorized operating frequency must be attenuated below the transmitting (P) by a factor of at least $43+10\log(P)$ dB.

3.2 Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

3.3 Test Result

Temperature:	23 °C
Relative Humidity:	49%

Test Data for CDMA800

Frequency (MHz)	Ant.Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
TX LOW channel								
1649.46	H	-55.64	0.44	8.01	5.87	-50.21	-13	37.21
1649.46	V	-56.86	0.44	8.01	5.87	-51.43	-13	38.43
2474.19	H	-58.31	0.51	10.24	8.10	-50.72	-13	37.72
2474.19	V	-57.01	0.51	10.24	8.10	-49.42	-13	36.42
3298.92	H	-57.44	1.91	11.12	8.98	-50.37	-13	37.37
3298.92	V	-56.07	1.91	11.12	8.98	-49.00	-13	36.00
TX MID Channel								
1672.92	H	-55.54	0.44	8.01	5.87	-50.11	-13	37.11
1672.92	V	-56.82	0.44	8.01	5.87	-51.39	-13	38.39
2509.38	H	-58.40	0.51	10.24	8.10	-50.81	-13	37.81
2509.38	V	-56.97	0.51	10.24	8.10	-49.38	-13	36.38
3345.84	H	-57.24	1.91	11.12	8.98	-50.17	-13	37.17
3345.84	V	-56.41	1.91	11.12	8.98	-49.34	-13	36.34
TX HIGH Channel								
1696.38	H	-55.45	0.44	8.01	5.87	-50.02	-13	37.02
1696.38	V	-54.77	0.44	8.01	5.87	-49.34	-13	36.34
2544.57	H	-57.89	0.51	10.24	8.10	-50.30	-13	37.30
2544.57	V	-56.96	0.51	10.24	8.10	-49.37	-13	36.37
3392.76	H	-56.89	1.91	11.12	8.98	-49.82	-13	36.82
3392.76	V	-56.07	1.91	11.12	8.98	-49.00	-13	36.00

Remake: 1. No more harmonic above 4th harmonic for all channel.

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum analyzer	H/P	8593E	Aug. 2005
Signal Generator	Agilent	8648D	May. 2005
Dipole Antenna	Schwarzbeck Mess	UHAP	May. 2005
Horn Antenna	Schwarzbeck	BBHA9120A	Jul. 2006
Horn Antenna	Schwarzbeck	BBHA9120A	Jul. 2006
Mobile Test Unit	Agilent	E5515C	May. 2005`
Anechoic Chamber	Seo Young EMC	-	-

4. Powerline Conducted Emissions

4.1 Limit

§15.107(a) for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 uH/50ohm line impedance stabilization network(LISN).

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15 – 0.50	66-56*	56-46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

* Decreases with the logarithm of the frequency.

4.2 Test Procedure

The test procedure is performed in a 12ft×12ft×8ft(L×W×H) shielded room. The EUT along with its peripherals were placed on a 1.0m(W)× 1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chasis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chasis ground also bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

4.3 Test Result

Temperature:	23 °C
Relative Humidity:	49%

FREQ. (MHz)	LEVEL(dB μ V)		LINE	LIMIT(dB μ V)		MARGIN(dB μ V)	
	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.15	32.20	25.00	H	66.00	56.00	33.80	31.00
0.17	47.10	32.80	H	64.96	54.96	17.86	22.16
0.69	37.00	23.40	H	56.00	46.00	19.00	22.60
1.06	41.50	31.70	H	56.00	46.00	14.50	14.30
1.54	37.20	24.40	N	56.00	46.00	18.80	21.60
1.71	38.00	26.40	N	56.00	46.00	18.00	19.60

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
LISN	3825/2	EMCO	Dec. 2005
LISN	3825/2	EMCO	Dec. 2005
Pulse Limiter	PL-01	PMM	Jul. 2005
Shielded Room	N/A	-	-
Test Receiver	ESPC	R/S	Dec. 2005

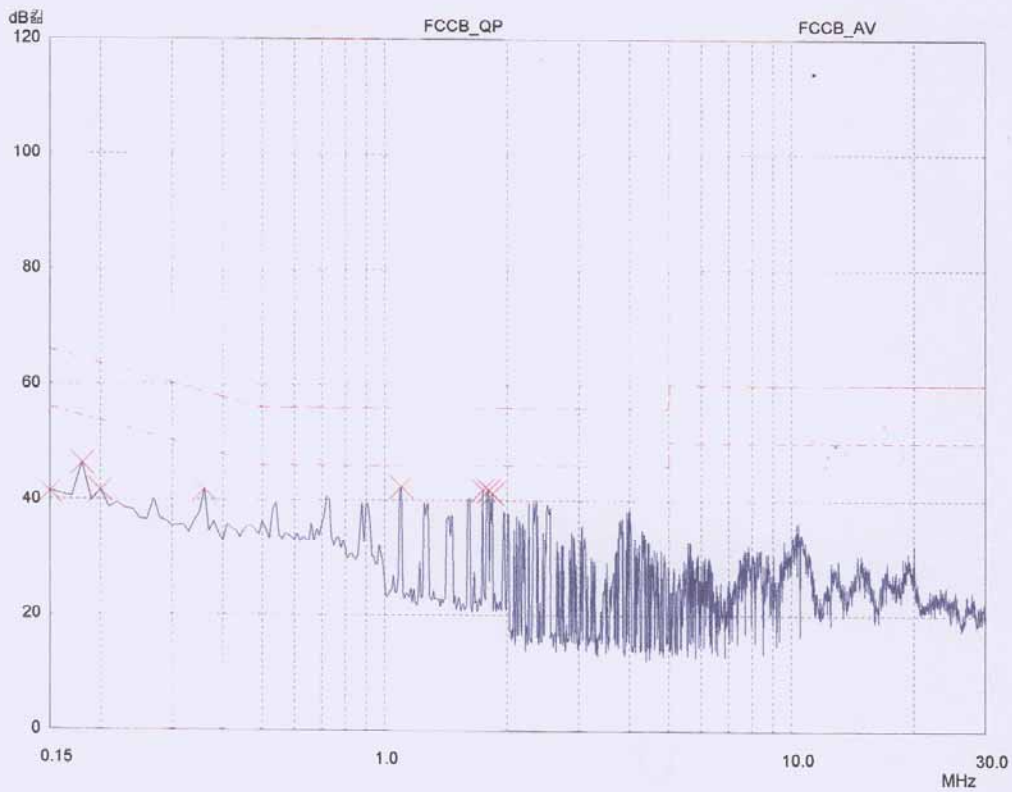
Please refer to the following plots.

InnoTeletek, Inc.

EUT: PDA
Manuf: InnoTeletek, Inc.
Op Cond: NEUTRAL
Operator: Feel. Jeong
Test Spec: FCC Part 15
Comment:

File: r0042n.dat : New Measurement

Prescan Measurement: X PK
Meas Time: see scan settings
Peaks: 8
Acc Margin: 25 dB

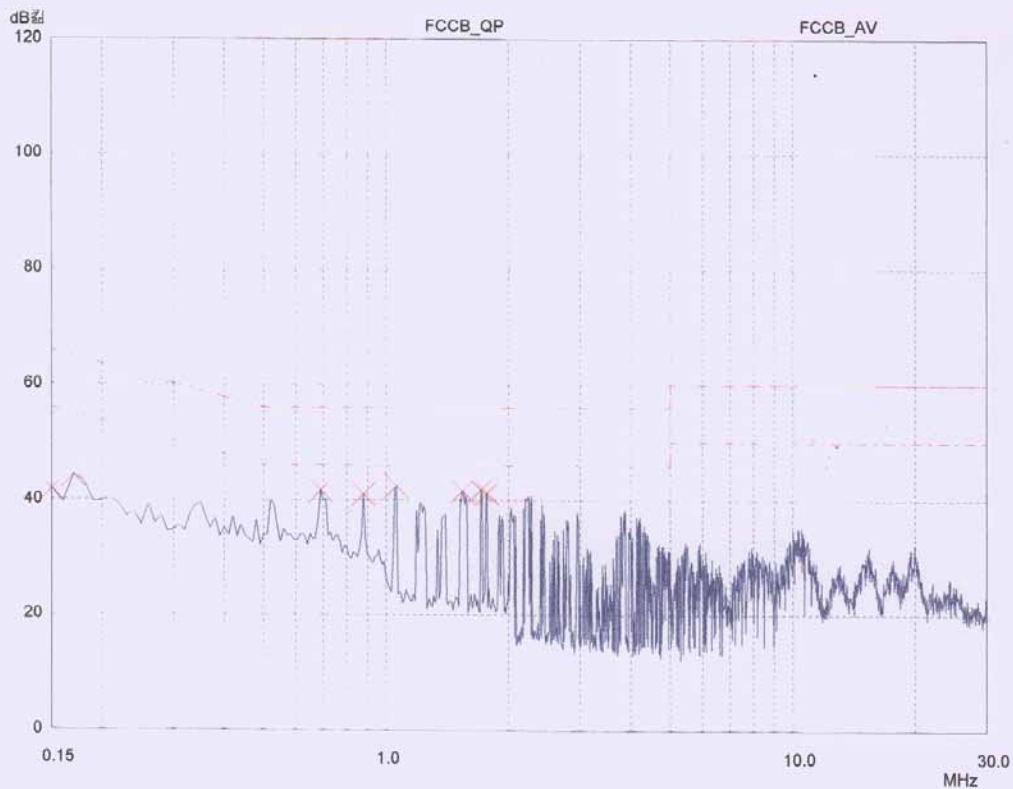


InnoTeletek, Inc.

EUT: PDA
Manuf: InnoTeletek, Inc.
Op Cond: HOT
Operator: Feel. Jeong
Test Spec: FCC Part 15
Comment:

File: r0042h.dat : New Measurement

Prescan Measurement: X PK
Meas Time: see scan settings
Peaks: 8
Acc Margin: 25 dB



5. RF RADIATED OUTPUT POWER

5.1 Limit

FCC §22.913(a), the ERP of mobile transmitters must not exceed 7 watts.

5.2 Test Procedure

1. On a test site, the EUT shall be placed at 1.5m height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a horn (substitution antenna).
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. In necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

17. The measure of the effective radiated power is the large of the two levels recorded, at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

5.3 Test Results

Temperature:	23 °C
Relative Humidity:	49%

For CDMA800:

FREQUENCY (MHZ)	Antenna Polarization(H/V)	EIRP (dBm)	ERP (dBm)
824.73	V	18.35	16.21
836.73	V	18.14	16.00
848.19	V	17.56	15.42

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum analyzer	H/P	8593E	Aug. 2005
Signal Generator	Agilent	8648D	May. 2005
Dipole Antenna	Schwarzbeck Mess	UHAP	May. 2005
Dipole Antenna	Schwarzbeck Mess	UHAP	May. 2005
Mobile Test Unit	Agilent	E5515C	May. 2005
Log-periodic	S/B	UHALP9107	Jan. 2006
Amplifier	H.P	8447D	Jun. 2005
Anechoic Chamber	Seo Young EMC	-	-

6.CONDUCTED OUTPUT POWER

6.1 Limit

FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

6.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

6.3 Test Results

Temperature:	23 °C
Relative Humidity:	49%

Channel	Frequency(MHz)	Output Power (dBm)	Output Power (mW)	Limit (W)
LOW	824.73	24.20	263	7
MIDDLE	836.46	24.13	259	7
HIGH	846.19	24.17	261	7

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum analyzer	Agilent	E4440A	May. 2005
Mobile Test Unit	Agilent	E5515C	May. 2005
Dual Directional Coupler	Agilent	778D	Nov. 2005

7. OCCUPIED BANDWIDTH

7.1 Limit

Requirements: CFR 47, Section 2.1049, Section 22.901, Section 22.917

7.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 30 kHz.

7.3 Test Results

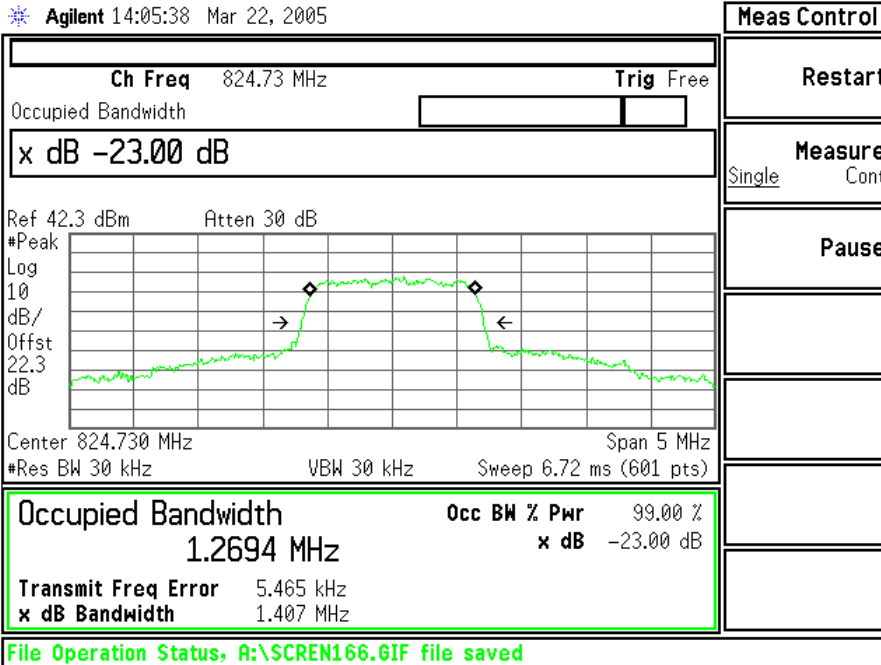
Temperature:	23 °C
Relative Humidity:	49%

Test Equipment Used

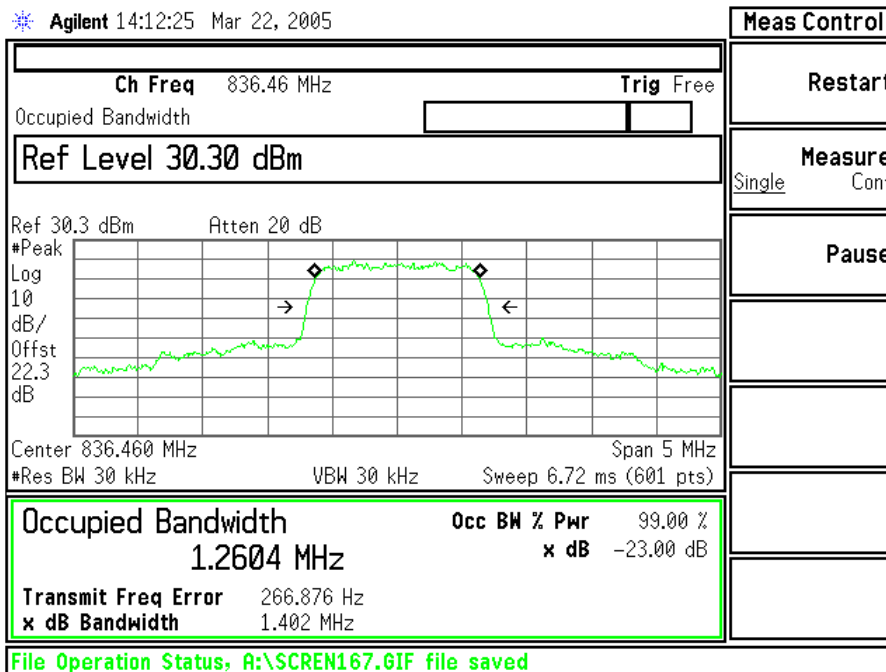
EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum analyzer	Agilent	E4440A	May. 2005
Mobile Test Unit	Agilent	E5515C	May. 2005
Dual Directional Coupler	Agilent	778D	Nov. 2005

Please refer to the following plots.

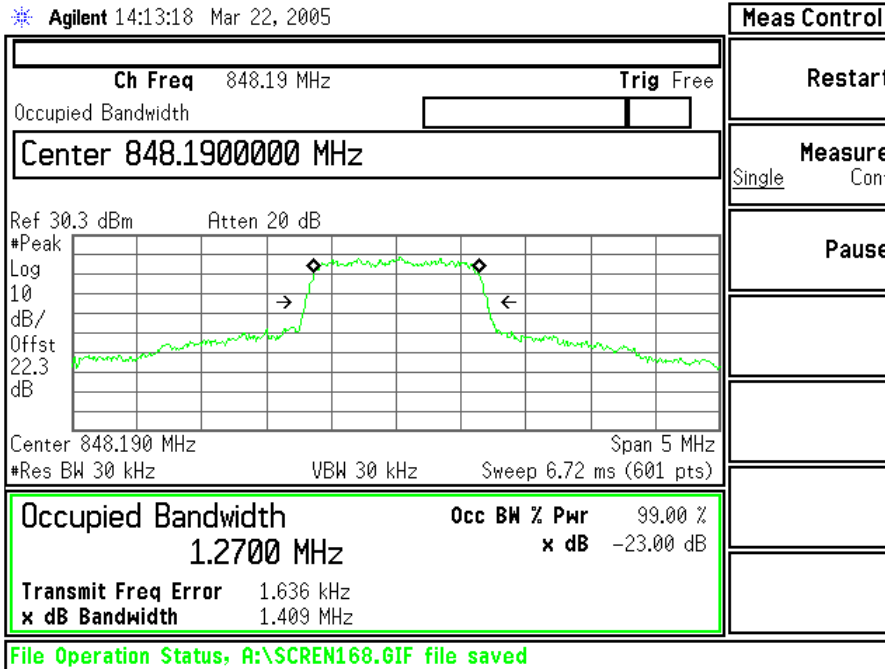
Low Channel



Middle Channel



High Channel



8. SPURIOUS EMISSIONS AT ANTENNA TERMINAL

8.1 Limit

Requirements: CFR 47, § 2.1051. § 22.917

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

8.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.

The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

8.3 Test Results

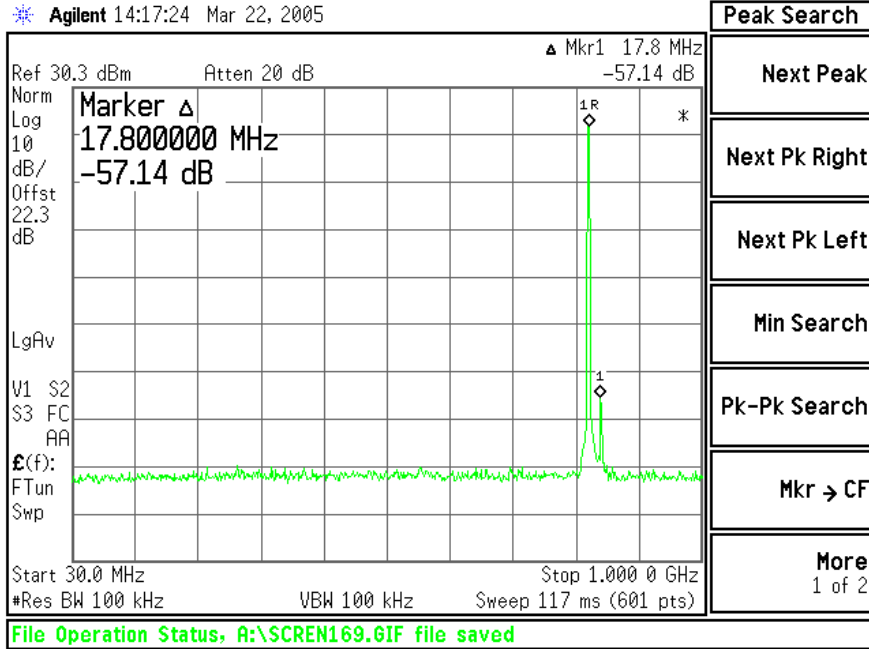
Temperature:	23 °C
Relative Humidity:	49%

Test Equipment Used

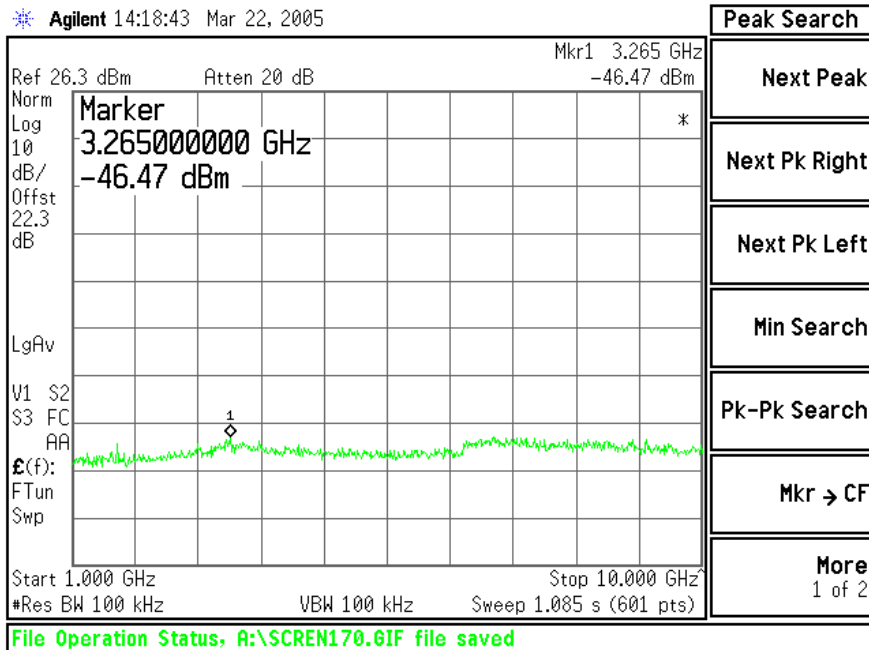
EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum analyzer	Agilent	E4440A	May. 2005
Mobile Test Unit	Agilent	E5515C	May. 2005
Dual Directional Coupler	Agilent	778D	Nov. 2005

Please refer to the following plots.

Low Channel

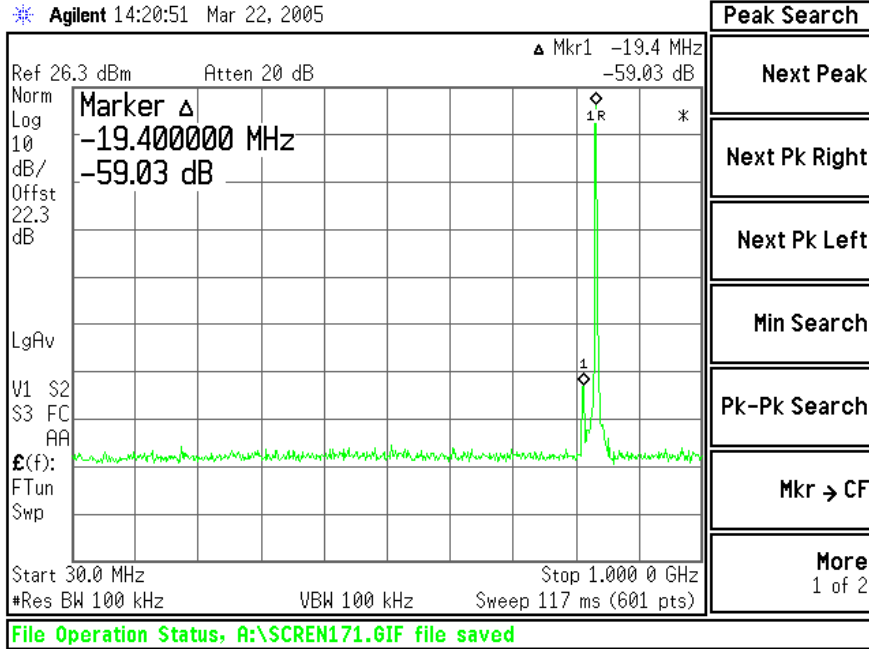


Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More 1 of 2

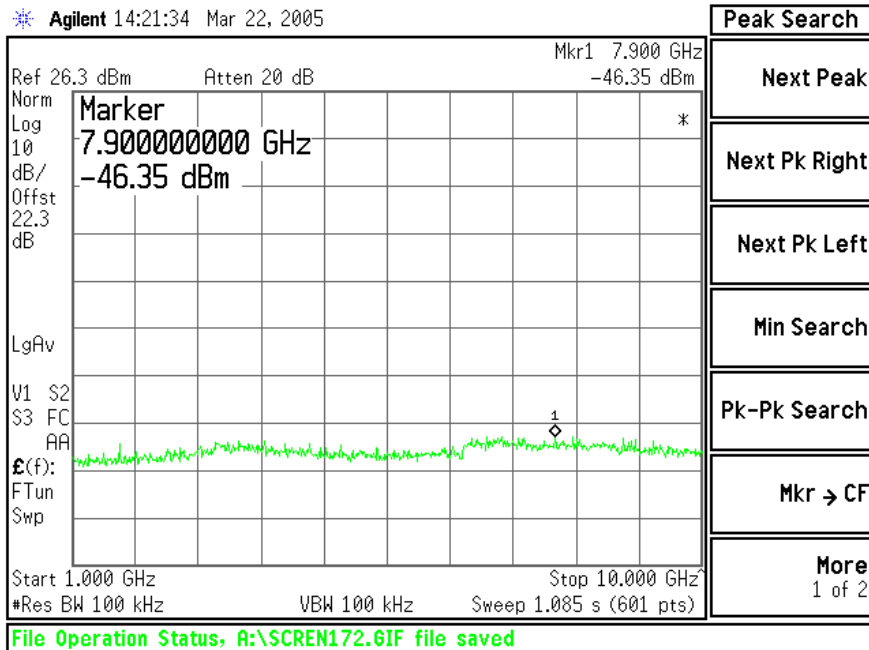


Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More 1 of 2

Middle Channel

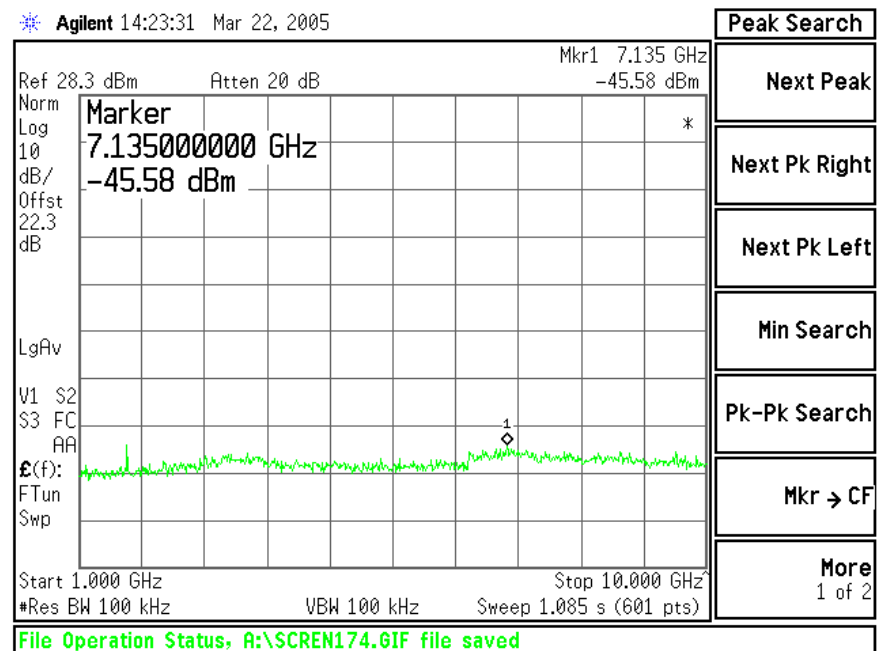
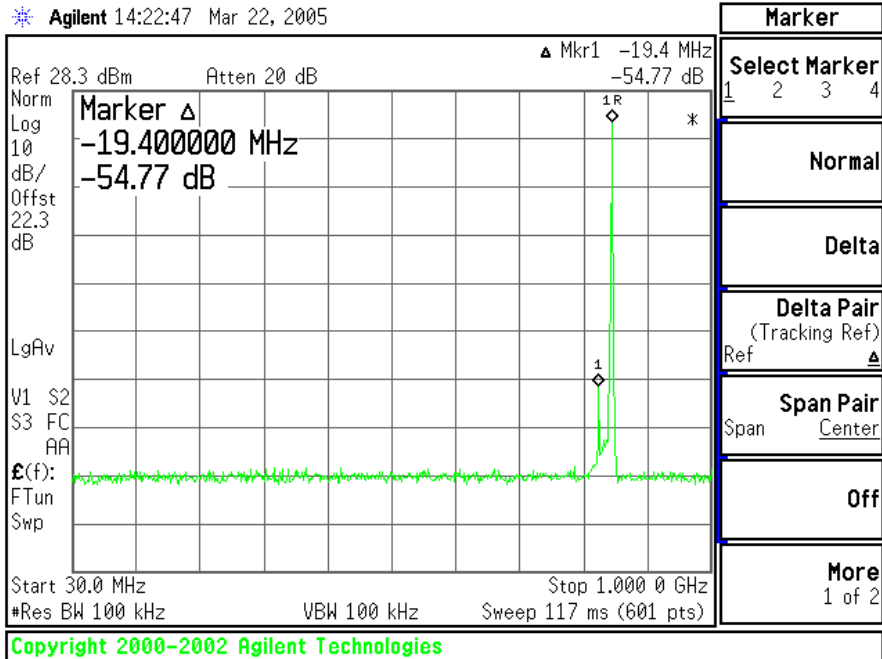


Peak Search	
Next Peak	
Next Pk Right	
Next Pk Left	
Min Search	
Pk-Pk Search	
Mkr \rightarrow CF	
More	1 of 2



Peak Search	
Next Peak	
Next Pk Right	
Next Pk Left	
Min Search	
Pk-Pk Search	
Mkr \rightarrow CF	
More	1 of 2

High Channel



9.FREQUENCY STABILITY

9.1 Limit

Requirements: FCC § 2.1055 (a), § 2.1055 (d) & following:

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1_Frequency Tolerance for Transmitters in the Public Mobile Services

 Mobile

Base, fixed [SU][le]/ Mobile

Frequency range (MHz) (ppm) SU]3 watts [le]3 watts

(ppm) (ppm)

25 to 50..... 20.0 20.0 50.0

50 to 450..... 5.0 5.0 50.0

450 to 512..... 2.5 5.0 5.0

821 to 896..... 1.5 2.5 2.5

928 to 929..... 5.0 n/a n/a

929 to 960..... 1.5 n/a n/a

2110 to 2220..... 10.0 n/a n/a

9.2 Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

9.3 Test Results

Temperature:	23 °C
Relative Humidity:	49%

Frequency Stability Versus Temperature

Reference Frequency: 836.46 MHz, Limit:2.5ppm			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MHz	PPM Error
60	3.8 V	836.460005	0.006
50	3.8 V	836.460012	0.014
40	3.8 V	836.460027	0.032
30	3.8 V	836.460020	0.024
20	3.8 V	836.460014	0.017
10	3.8 V	836.459990	-0.012
0	3.8 V	836.459971	-0.034
-10	3.8 V	836.459975	-0.030
-20	3.8 V	836.459969	-0.037
-30	3.8 V	836.459957	-0.051

Frequency Stability Versus Battery Voltage

Reference Frequency: 836.46 MHz, Limit:2.5ppm			
Power Supplied (Vdc)	Environment Temperature (°C)	MHz	PPM
3.23	20	836.460027	0.032
4.37	20	836.460023	0.027

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum analyzer	Agilent	E4440A	May. 2005
Mobile Test Unit	Agilent	E5515C	May. 2005
Dual Directional Coupler	Agilent	778D	Nov. 2005
Temperature Chamber	Han-Gil Technique	HGTP-4050	Nov. 2005

10. BAND EDGE

10.1 Limit

§ 22.917, 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.

10.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 30 kHz.

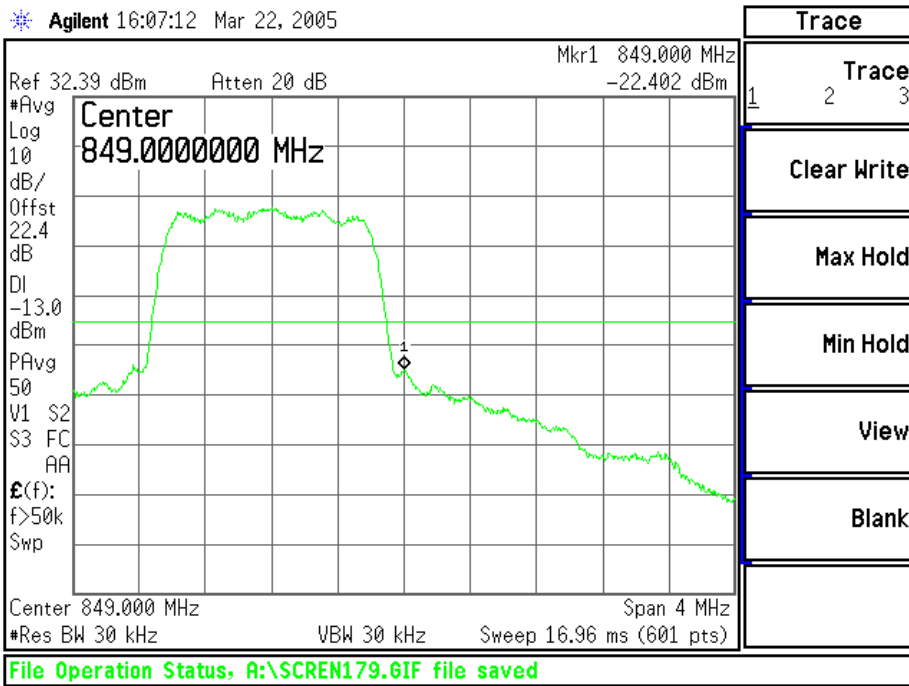
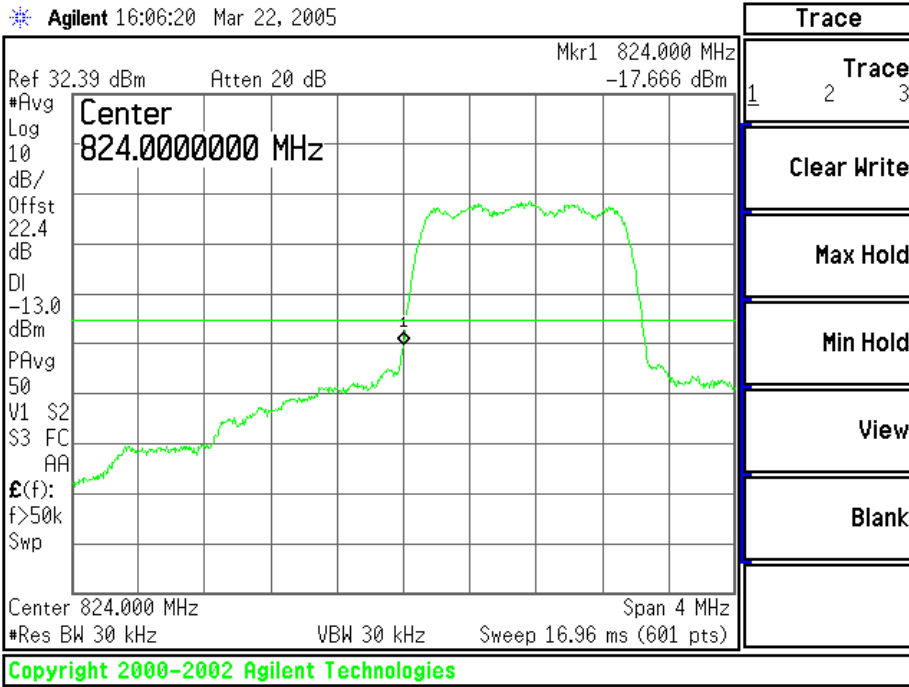
10.3 Test Results

Temperature:	23 °C
Relative Humidity:	49%

Test Equipment Used

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum analyzer	Agilent	E4440A	May. 2005
Mobile Test Unit	Agilent	E5515C	May. 2005
Dual Directional Coupler	Agilent	778D	Nov. 2005

Please refer to the following plots.



11. Attachment A-1 Photos of the test set up



Attachment A-2 Photos of the test set up



12. Attachment B – Photos of the EUT

View of EUT



Rear View of EUT



Left View of EUT



Right View of EUT



Top View of EUT**Bottom View of EUT**

Inner View of EUT**Inner View of EUT**

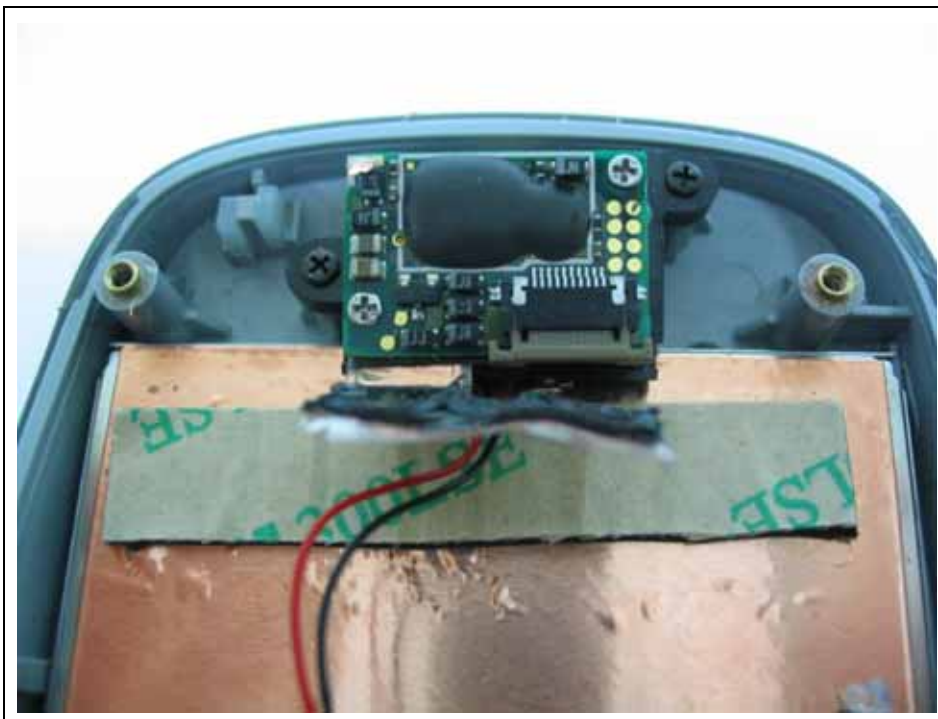
Inner View of EUT**Inner View of EUT**

Inner View of EUT**Inner View of EUT**

Inner View of EUT



Inner View of EUT



Inner View of EUT



Inner View of EUT

