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Compliance test report ID **206838-1TRFWL**

Date of issue
May 29, 2012

FCC Part 22 Subpart H: Cellular radiotelephone service. (Partial testing)

FCC Part 24 Subpart E: Personal communications services. (Partial testing)

RSS-132 Issue 2, 2005-09: Cellular telephones employing new technologies operating in the bands 824–849 MHz and 869–894 MHz. (Partial testing)

RSS-133 Issue 5, 2009-02: 2 GHz personal communications services. (Partial testing)

Applicant	**Digital Security Controls, a Division of Tyco Safety Products Canada Ltd.**
Product	**GSM/GPRS Alarm Communicator**
Model	**GS3125-K**
Model variant	**GS3125-BA**
FCC ID	**F5312GS3125**
IC	**160A-GS3125**

Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada. The tests included in this report are within the scope of this accreditation

SCC Accredited LAB
LAB Accrédité CCN

Test location

Nemko Canada Inc.
303 River Road
Ottawa, ON, K1V 1H2
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Test site FCC ID: 176392 and IC ID: 2040A-4 (3 m semi anechoic chamber)

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Tested by Kevin Rose, Wireless/EMC Specialist

Reviewed by Andrey Adelberg, Senior Wireless/EMC Specialist — May 29, 2012 **Date**

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Copyright notification

Table of Contents

Section 1 Report summary

1.1 Applicant and manufacturer

Digital Security Controls, a Division of Tyco Safety Products Canada Ltd.
95 Bridgeland Avenue
Toronto, ON
Canada
M6A1Y7

1.2 Test specifications

FCC Part 22 Subpart H: Cellular radiotelephone service
FCC Part 24 Subpart E: Personal communications services
RSS-132: Cellular telephones employing new technologies operating in the bands 824–849 MHz and 869–-894 MHz
RSS-133: 2 GHz personal communications services

1.3 Statement of compliance

In the configuration tested, the EUT was found Compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.4 Exclusions

None

1.5 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued

Section 2 Summary of test results

2.1 FCC Part 22, test results

Part	Test Method	Test description	Verdict
22.913(a)	2.1046	Effective Radiated Power Limits	Pass
22.917(a)	2.1053	Field strength of spurious radiation	Pass
Notes: This is partial testing based on the original report (SHEMO09120140807) The customer used a new antenna.			

2.2 FCC Part 24, test results

Part	Test Method	Test description	Verdict
24.232(b)	2.1046	Effective Radiated Power Limits	Pass
24.238(a)	2.1053	Field strength of spurious radiation	Pass
Notes: This is partial testing based on the original report (SHEMO09120140807) The customer used a new antenna.			

2.3 RSS-133, test results

Part	Test Method	Test description	Verdict
6.4	RSS Gen	Transmitter Output Power	Pass
6.5	RSS Gen	Transmitter Unwanted Emissions	Pass
Notes: This is partial testing based on the original report (SHEMO09120140807) The customer used a new antenna.			

2.4 RSS-132, test results

Part	Test Method	Test description	Verdict
4.4	RSS Gen	Transmitter Output Power	Pass
4.5	RSS Gen	Transmitter Unwanted Emissions	Pass
Notes: This is partial testing based on the original report (SHEMO09120140807) The customer used a new antenna.			

Section 3 Equipment under test (EUT) details

3.1 Sample information

Receipt date	April 25, 2012
Nemko sample ID number	2

3.2 EUT information

Product name	GSM/GPRS Alarm Communicator
Model	GS3125-BA and GS3125-K
Serial number	None
Part number	B073-R1

3.3 Technical information

Operating band	GSM-850, PCS-1900
Operating frequency	Transmit: 824–849 MHz and 1850–1900 MHz; Receive: 869–893 MHz and 1930–1960 MHz
Power requirements	The product requires an external power supply rated for the application. 10–27.6 V_{DC}
Antenna information	Whip antenna with gain of < −1 dBi

3.4 Product description and theory of operation

The GS3125 GSM/GPRS Cellular Alarm Communicator can be used for data communication over a cellular voice channel or over GPRS data network. It is a communication interface (B073) that integrates the SIMCOM GSM/GPRS radio Model SIM900.

Upon phone line loss, when an alarm is generated in the Alarm System, the control panel will pick up the phone line and GS3125 will simulate a line dial tone. The Panel will dial the number to be called (of the alarm receiver) and the GS3125 takes care of establishing the connection through the GSM network. When the called alarm receiver is answering the call a "voice" channel is being opened and communication is established between the panel and receiver. First the receiver answers with a handshake, the panel identifies that is talking to the right receiver and it sends data, the receiver generates the required kiss-off tone to confirm the received data as valid, the panel hangs-up and the call is being terminated.

The GS3125 has the added capability of communicating alarm signals via the GPRS data network using IP protocol. The capability enables a fast reliable path to central stations equipped with a Sur-Gard System III, System II receiver or with a PC based WinBCS software, (V2.0 or higher).

The GS3125 has 3 inputs, which can be programmed to send certain data associated with the type of events they are being assigned to.

The Input voltage to the GS3125 is 10–27.6 V_{DC}.

3.5 EUT exercise details

Powered up in TX Mode Controlled by the CMU200

3.6 EUT setup diagram

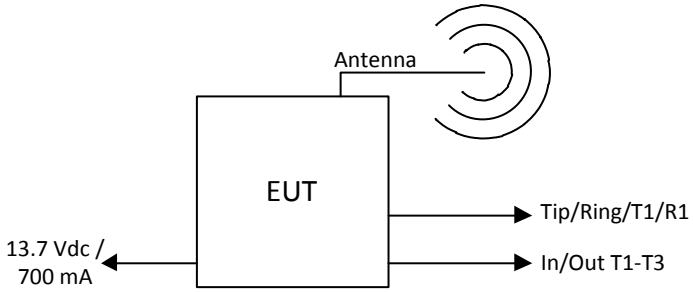


Diagram 3.6-1: Setup diagram

3.7 Support equipment

Description	Brand name	Model/Part number	Serial number	Rev.
GSM/GPRS Cellular Alarm Communicator	CMU200	CMU200	-	-
12V/1A External Power Supply	UNinput	KSAD1380100W1US	-	-

Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

This is partial testing based on the original report (SHEMO09120140807) The customer used a new antenna. ERP, ERIP and Radiated Spurious were performed to show compliance.

Model Variants:

The Model **GS3125-BA** is a GSM/GPRS Alarm Communicator that is capable to communicate alarm events to a central monitoring station using a GSM/GPRS cellular connection. It is housed in its own plastic enclosure.

The Model **GS3125-K** is a GSM/GPRS Alarm Communicator module using also a GSM/GPSR cellular communication channel. The product is identical in construction and functionality with the model GS3125-BA with the exception of the fact that is not provided with its own enclosure. This communication module can be hosted by a separate Alarm control panel enclsoure.

Both models are constructed using the same board assembly based on B073-R1 and for GSM/GPRS cellular communication are using the same radio module, model SIM900 from SIMCOM.

Despite the model name differences there are no difference in RF performance and functionality of the GS3125-BA and GS3125-K communication modules.

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5 Test conditions

5.1 Atmospheric conditions

Temperature: 15–30 °C
Relative humidity: 20–75 %
Air pressure: 86–106 kPa

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Nemko Canada Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 “Uncertainty in EMC measurements.” Measurement uncertainty was calculated using the methods described in CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements; as well as described in UKAS LAB34: The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

Section 7 Test equipment

7.1 Test equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	Mar. 09/13
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 40	FA002071	1 year	Feb. 09/13
Bilog antenna	Sunol	JB3	FA002108	1 year	Feb. 07/13
Horn antenna 18–26.5 GHz	Electro-metrics	SH-50/60-1	FA000479	—	VOU
Horn antenna #2	EMCO	3115	FA000825	1 year	Feb. 24/13
50 coax cable	Huber + Suhner	NONE	FA002013	1 year	Aug. 15/12
50 coax cable	Huber + Suhner	NONE	FA002074	1 year	Aug. 15/12
1–18 GHz pre-amplifier	JCA	JCA118-503	FA002091	1 year	Aug. 15/12
18–26 GHz pre-amplifier	Narda	BBS-1826N612	FA001550	—	VOU
Note: NCR - no calibration required and VOU - verify on use					

Section 8 Testing data

8.1 Effective Radiated Power Limits

8.1.1 Definitions and limits

FCC §22.913 Effective radiated power limits.

The effective radiated power (ERP) of transmitters in the Cellular Radiotelephone Service must not exceed the limits in this section.

(a) Maximum ERP. In general, the effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 W (57 dBm). However, for those systems operating in areas more than 72 km (45 miles) from international borders that:

(1) Are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census; or,

(2) Extend coverage on a secondary basis into cellular unserved areas, as those areas are defined in §22.949, the ERP of base transmitters and cellular repeaters of such systems must not exceed 1000 W (60 dBm). The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 W (38.45 dBm).

FCC §24.232(c) Power and antenna height limits.

Mobile and portable stations are limited to 2 W (33 dBm) EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

RSS-132 Clause 4.4 Transmitter Output Power

The transmitter output power shall not exceed the limits given in SRSP-503.

RSS-133 Clause 6.4 Transmitter Output Power

The average equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. Moreover, base station transmitters operating in the band 1930–1995 MHz shall not have output power exceeding 100 W (50 dBm).

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

8.1.2 Test summary

Test date	May 22, 2012	**Test engineer**	Kevin Rose	**Verdict**	Pass
Temperature	24 °C	**Air pressure**	1001 mbar	**Relative humidity**	42 %

8.1.3 Observations/special notes

The EUT was set up as tabletop configuration. The test was performed using a substitution method to calculate ERP and EIRP.

8.1.4 Test data

Table 8.1-1: ERP measurement results for GSM 850 as per FCC Part 22

Frequency, MHz	Polarization	Received level, dBµV	Substitution factor, dB	ERP, dBm	ERP limit, dBm	Margin, dB
824.2	Vertical	101.95	-75.73	26.22	38.5	12.28
	Horizontal	102.48	-78.90	23.58	38.5	14.92
836.6	Vertical	101.94	-75.52	26.42	38.5	12.08
	Horizontal	104.03	-78.90	25.13	38.5	13.37
848.8	Vertical	101.87	-75.32	26.55	38.5	11.95
	Horizontal	103.82	-78.90	24.92	38.5	13.58

Table 8.1-2: ERP measurement results for GSM 850 as per RSS-132

Frequency, MHz	Polarization	Received level, dBµV	Substitution factor, dB	ERP, dBm	ERP limit, dBm	Margin, dB
824.2	Vertical	101.95	-75.73	26.22	40.6	14.38
	Horizontal	102.48	-78.90	23.58	40.6	17.02
836.6	Vertical	101.94	-75.52	26.42	40.6	14.18
	Horizontal	104.03	-78.90	25.13	40.6	15.47
848.8	Vertical	101.87	-75.32	26.55	40.6	14.05
	Horizontal	103.82	-78.90	24.92	40.6	15.68

Table 8.1-3: EIRP measurement results for PCS 1900 as per FCC Part 24 and RSS-133

Frequency, MHz	Polarization	Received level, dBµV	Substitution factor, dB	EIRP, dBm	EIRP limit, dBm	Margin, dB
1850.2	Vertical	98.20	-68.02	32.33	33.0	0.67
	Horizontal	88.47	-68.48	22.14	33.0	10.86
1880.0	Vertical	96.59	-67.50	31.24	33.0	1.76
	Horizontal	87.96	-69.21	20.90	33.0	12.10
1909.8	Vertical	96.46	-66.95	31.66	33.0	1.34
	Horizontal	88.06	-67.94	22.27	33.0	10.73

8.2 Field Strength of spurious radiation

8.2.1 Definitions and limits

Out of band emissions. 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 $\log_{10}$ (P) dB or −13 dBm.

8.2.2 Test summary

Test date	May 22, 2012	**Test engineer**	Kevin Rose	**Verdict**	Pass
Temperature	23 °C	**Air pressure**	1000 mbar	**Relative humidity**	41 %

8.2.3 Observations/special notes and test results

The Spectrum was searched from 30 MHz to the 10th Harmonic.

The EUT was measured on three orthogonal axis.

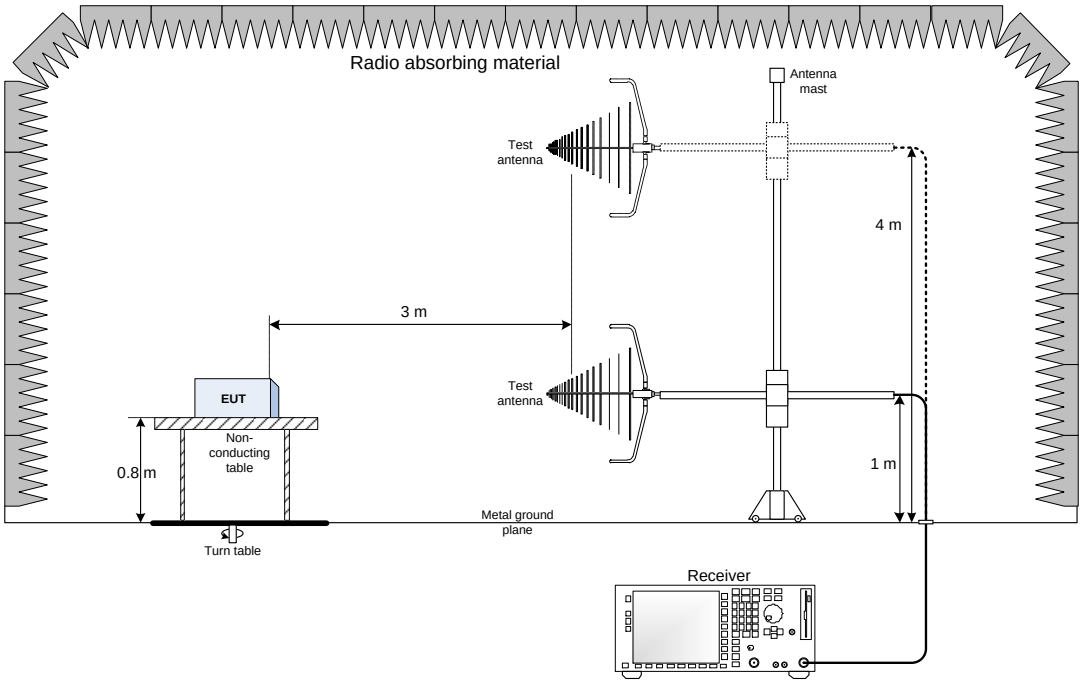
All measurements were performed using a Peak Detector with 100 kHz RBW below 1 GHz and a 1 MHz RBW above 1 GHz at a distance of 3 meters.

Low, Middle, and High channels for GSM 850 and PCS 1900 were investigated.

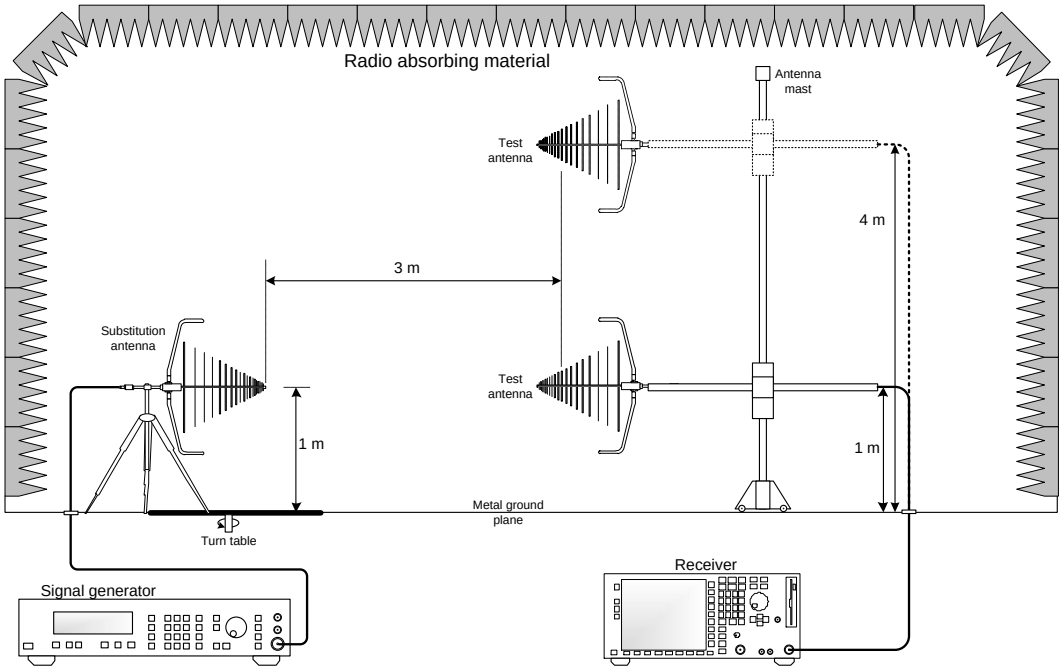
No spurious emissions were detected within 10 dB of the limit.

Section 9 Block diagrams of test set-ups

9.1 Radiated emissions set-up



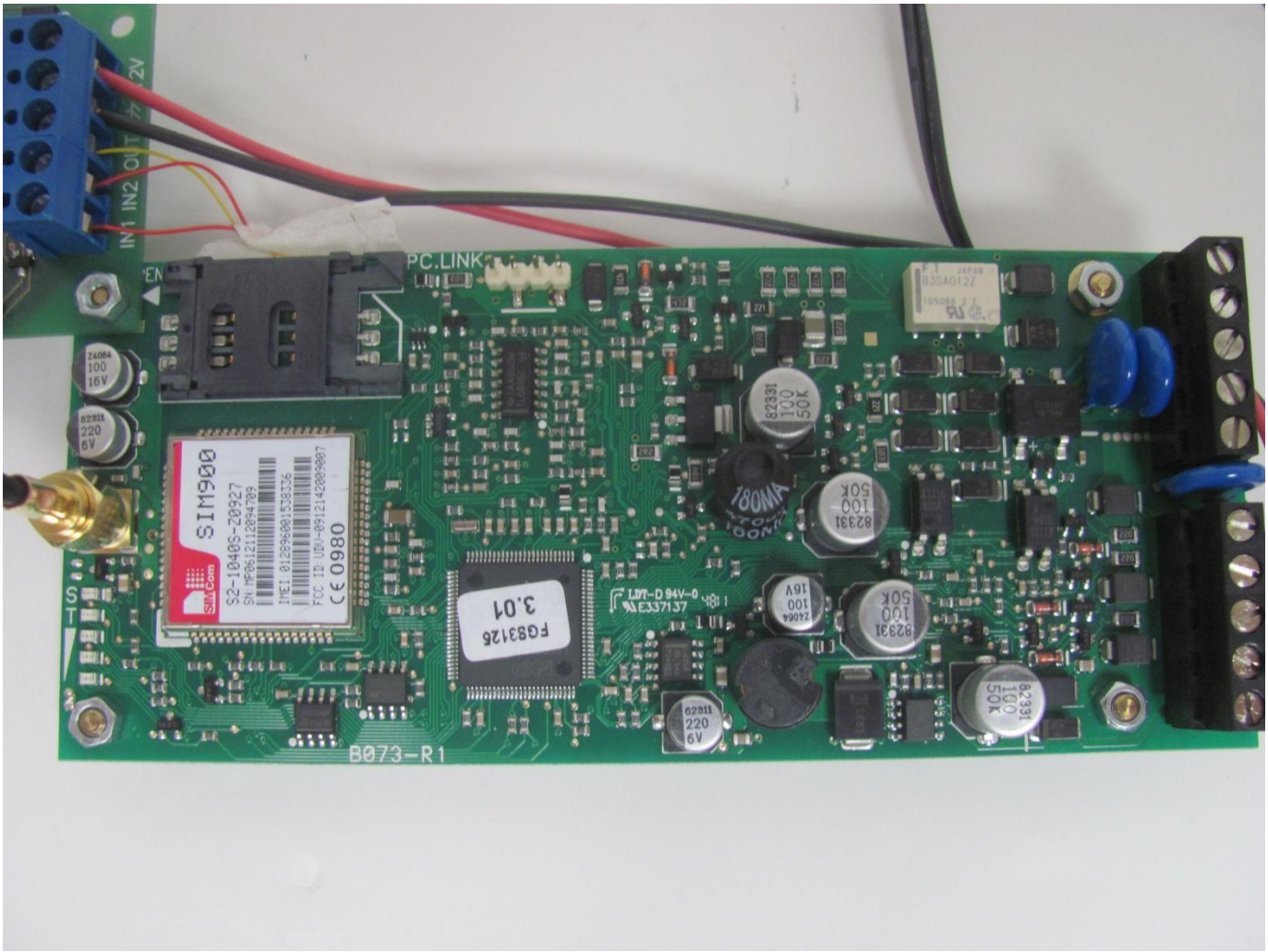
9.2 Substitution method set-up



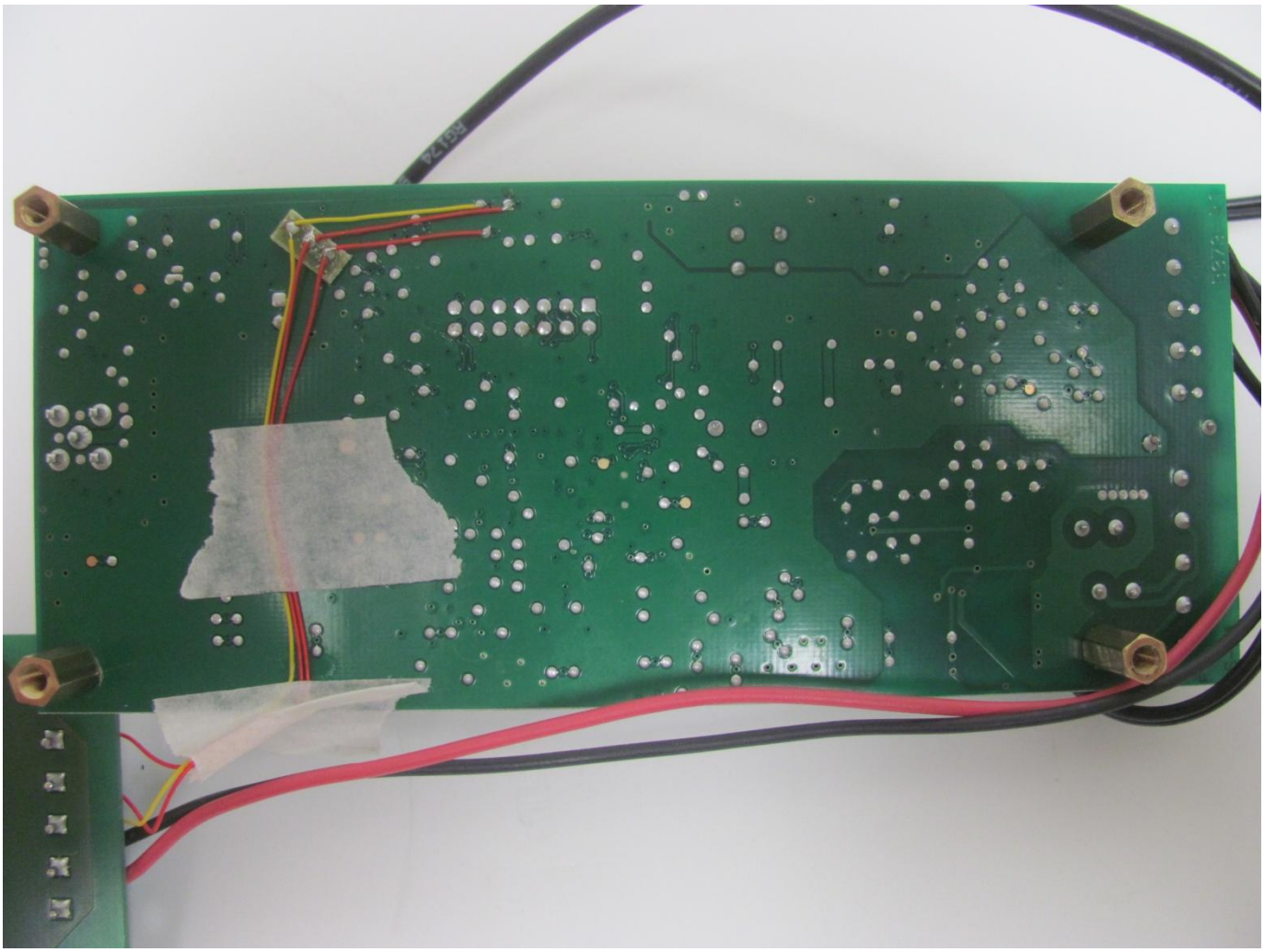
Section 10 EUT photos

10.1 External photos

10.1.1 EUT top view



10.1.2 EUT bottom view



10.1.3 RF section close up view