



RF Exposure Evaluation Report

FOR:

**Manufacturer: Digital Security Controls, a division of Tyco Safety Products
Canada Ltd.**

Model Name: WiFi422SCW

Product Description: WiFi Module for DSC Impassa Alarm System

**FCC ID: F5312WiFi422SCW
IC ID: 160A-WiFi422SCW**

References:

1. FCC OET Bulletin 65 Supplement
2. FCC CFR Part 1 (1.1307 & 1.1310), Part 2 (2.1091)
3. RSS-102- Radio Frequency Exposure Compliance of Radiocommunication Apparatus
Issue 4 March 2010, Ch, 2.5 and Ch. 4

1 Administrative Data

1.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
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Fax:	+1 (408) 586 6299
Test Lab Manager:	Sajay Jose
Test Engineer:	Zack Gray

1.2 Identification of the Client

Applicant's Name:	Digital Security Controls, a division of Tyco Safety Products Canada Ltd.
Street Address:	3301 Langstaff Road
City/Zip Code	Concord, ON L4K 4L2
Country	CA
Contact Person:	Dan Nita
Phone No.	(905) 760-3000 Ext. 2706

1.3 Identification of the Manufacturer

Same as client.

2 Equipment under Test (EUT)

2.1 Specification of the Equipment under Test

Model No:	WiFi422SCW
HW Version:	UA608 Rev. 03
SW Version:	Ver 1.0
EUT S/N Tested:	8007D0
FCC-ID:	F5312WiFi422SCW
IC-ID:	160A-WiFi422SCW
Product Description:	WiFi Module for DSC Impassa Alarm System
Frequency Range / number of channels:	2412 MHz- 2462 MHz / 11
Type(s) of Modulation:	802.11b: DSSS 802.11g: OFDM
Modes of Operation:	802.11b / 802.11g
Antenna Type and Gain:	Ceramic Antenna Manufacturer specified Peak Gain: 0.5 dBi for all channels
Co-located Transmitters/ Antennas?	<input checked="" type="checkbox"/> Yes: with FCC ID: F53113G255SM (IC ID: 160A-3G255SM) <input type="checkbox"/> No
Power supply:	Internal battery Powered: 10 V min/ 12 V nom/12.5 V max Additionally, powered by 110V AC/DC adapter
Operating temperature range:	-10°C – 55°C
Prototype / Production unit:	Prototype
Device Category:	<input checked="" type="checkbox"/> Fixed Installation <input type="checkbox"/> Mobile <input type="checkbox"/> Portable
Exposure Category:	<input type="checkbox"/> Occupational/ Controlled <input checked="" type="checkbox"/> General Population/ Uncontrolled

3 Assessment

This report serves as the Technical Information regarding RF Exposure evaluation of the below identified device according to the rules as stipulated in the documents listed under References above.

The device meets the RF exposure limits, or - for some of it's radio functions / bands - the conditions for exemption from routine evaluation as defined in the referenced FCC and IC rule parts.

Company	Description	Model #
Digital Security Controls, a division of Tyco Safety Products Canada Ltd.	WiFi Module for DSC Impassa Alarm System	WiFi422SCW

2012-12-18 Compliance Zack Gray
(Test Engineer)

Date	Section	Name	Signature
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4 RF Exposure Evaluation Requirements

4.1 FCC:

Calculations can be made to predict RF field strength and power density levels around typical RF sources using the general equations (3) and (4) on page 19 of the following FCC document: "OET Bulletin 65, Edition 97-01 - Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields".

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Power density (mW/cm ²)	Averaging time (minutes)
300 – 1500	f (MHz) /1500	30
1500 – 100.000	1.0	30

Using the equation from page 19 of OET Bulletin 65, Edition 97-01:

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Additionally, according to § 2.1091:

The limit for <1.5 GHz mobile operations where no routine evaluation is required is: 1.5W ERP

The limit for >1.5 GHz mobile operations where no routine evaluation is required is: 3W ERP

4.2 IC:

RSS-102 Section 2.5.2

RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 1.5 GHz and the maximum EIRP of the device is equal to or less than 2.5 W;
- at or above 1.5 GHz and the maximum EIRP of the device is equal to or less than 5 W.

RSS-102 4.2: RF Field strength limits for devices used by the General Public (Uncontrolled Environment):

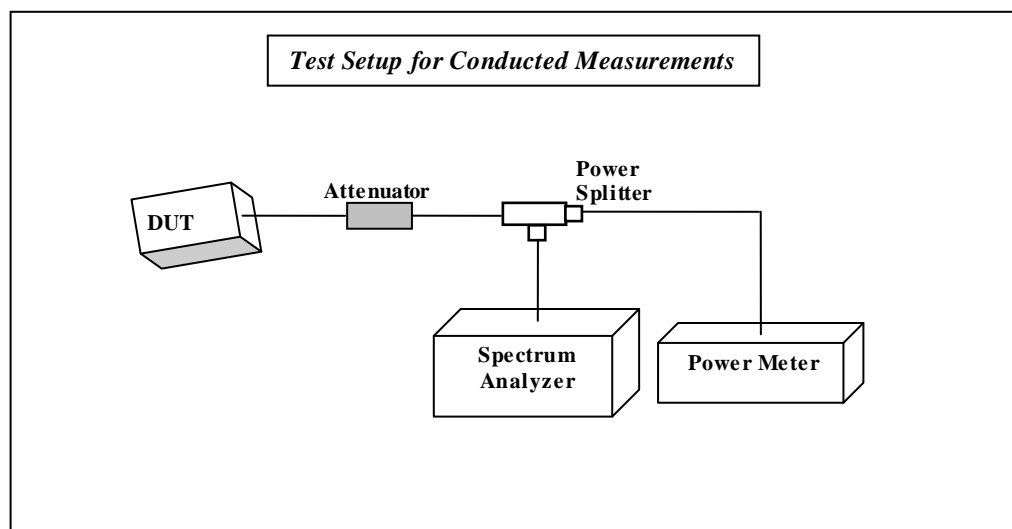
Power density

300MHz- 1500 MHz= f/150 W/m²

1500 MHz- 1500000 MHz= 10 W/m²

5 Measurement procedure:

5.1 Radiated power Calculation- ERP/EIRP-



1. Connect the equipment as shown in the above diagram.
2. Adjust the settings of the EUT to set to transmit at a specific mode.
3. Measure conducted power using the power meter or the Spectrum Analyzer.
4. ERP/EIRP is calculated by adding the antenna gain to the measured conducted power.

EIRP= Measured conducted power+ Antenna Gain (dBi)

(Antenna gain based on measurement or data from the antenna manufacturer.)

ERP= EIRP- 2.14

5.2 Measurement Equipment information:

Instrument/Ancillary	Model	Manufacturer	Serial No.	Cal Date	Cal Interval
Radio Communication Tester	CMU 200	Rohde & Schwarz	101821	May 2011	2 Years
EMI Receiver/Analyzer	ESU 40	Rohde & Schwarz	100251	Aug 2012	2 Years
Spectrum Analyzer	FSU	Rohde & Schwarz	200302	May 2011	2 Years
Loop Antenna	6512	EMCO	00049838	Aug 2011	3 years
Biconilog Antenna	3141	EMCO	0005-1186	Apr 2012	3 years
Horn Antenna (1-18GHz)	3115	ETS	00035114	Mar 2012	3 years
Horn Antenna (1-18GHz)	3115	ETS	00035111	Apr 2012	3 years
Horn Antenna (18-40GHz)	3116	ETS	00070497	Aug 2011	3 years
Communication Antenna	IBP5-900/1940	Kathrein	n/a	n/a	n/a
High Pass Filter	5HC2700	Trilithic Inc.	9926013	Part of system calibration	
High Pass Filter	4HC1600	Trilithic Inc.	9922307	Part of system calibration	
Pre-Amplifier	JS4-00102600	Miteq	00616	Part of system calibration	
Power Smart Sensor	R&S	NRP-Z81	100161	May 2011	2 Years

5.3 Measurement Summary:

Band of operation	Peak Radiated Power- EIRP		Limits (IC) (where no routine evaluation is required)	Peak Radiated Power ERP		Limits (FCC) (where no routine evaluation is required)
	MHz	dBm	mW	W	dBm	mW
GSM/GPRS/EDGE 824.2-848.8	32.3	1713.9	2.5	30.2	1047.1	1.5
GSM/GPRS/EDGE 1850.2-1909.8	31.1	1288.2	5	28.9	787.0	3
UMTS FDDV 826.4-846.6MHz	24.9	311.9	2.5	22.8	190.5	1.5
UMTS FDDII 1852.4-1907.6MHz	25.8	380.2	5	23.7	232.3	3
2412 - 2462	15.59	36.22	5	13.45	22.13	3

Measured ERP/EIRP values as taken from test report #EMC_TYCOS-045-12001_DTS issued by CETECOM Inc on Dec 13, 2012 and #EMC_TYCOS-045-12001_WWAN issued by CETECOM Inc on Dec 17, 2012

Since the Peak ERP and Peak EIRP are below FCC & IC limits respectively, this mobile device is exempt from Routine evaluation.

5.4 Prediction for Simultaneous Transmission

Simultaneous transmission evaluation of this WLAN module with the WWAN module is done as shown below

WLAN + GSM 850

WLAN + GSM 1900

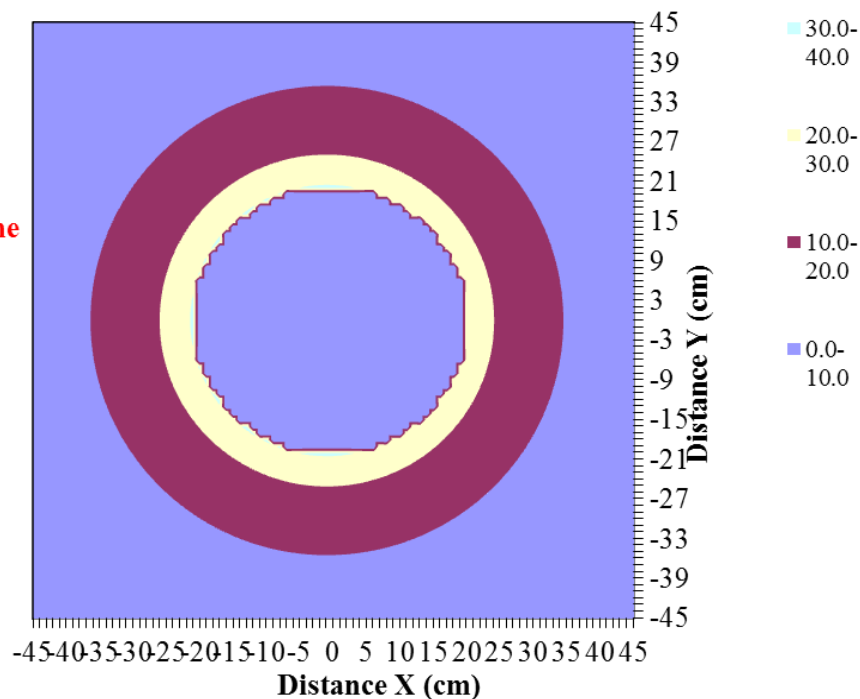
Worst case representation of the MPE contour for all the antennas within 1cm of each other is shown below.

GSM 850 and WLAN Co-Transmission mode:

Antenna No.		Total	1	2
Tx Status			On	On
Frequency	MHz		836	2436
MPE Limit	mW/cm ²		0.56	1.00
Max % MPE	%	31.3	30.6	0.7
Power	(W)	0.893	0.857	0.036
Antenna Gain	dBi		0.00	0.00
EIRP	(W)	0.89	0.857	0.036
X	(cm)		-1.0	0.0
Y	(cm)		0.0	0.0
Sector			FALSE	FALSE
Arc			FALSE	FALSE
q1	degs	input	-120	-120
q2			60	60
q1		actual	-120	-120
q2			60	60

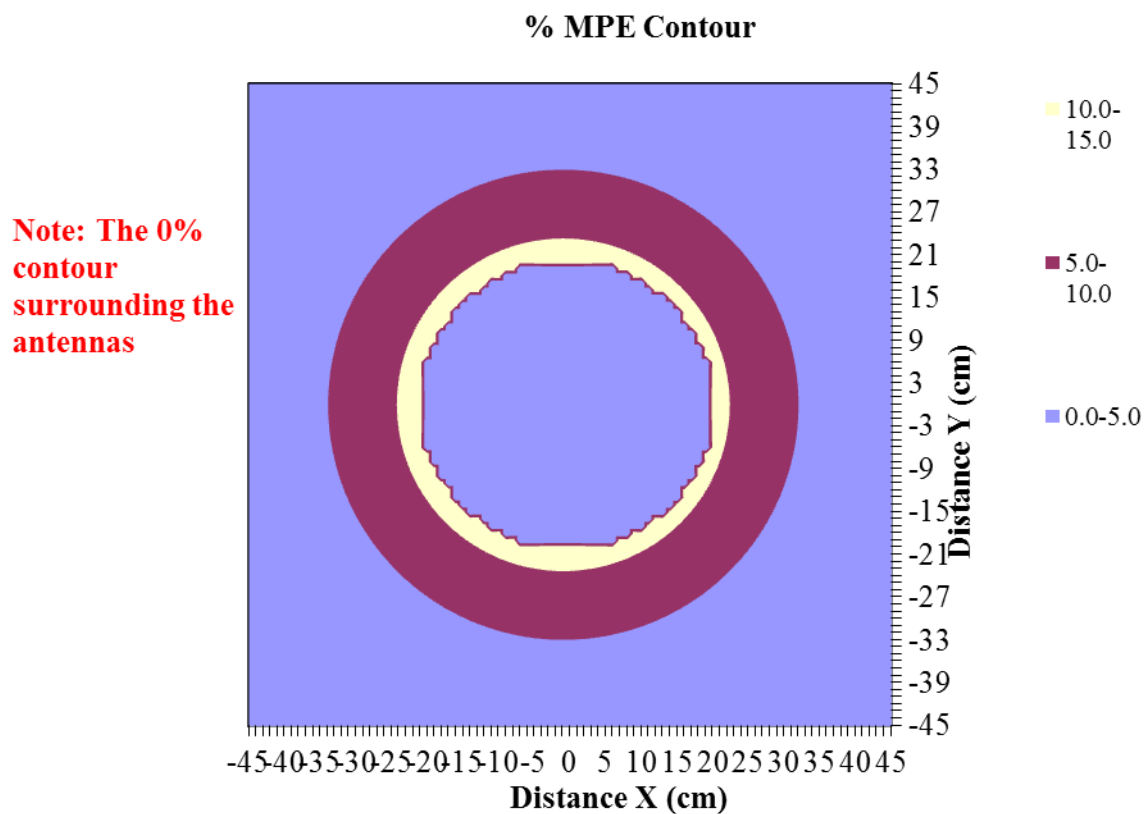
% MPE Contour

Note: The 0% contour surrounding the antennas



GSM 1900 and WLAN Co-Transmission mode:

Antenna No.		Total	1	2
Tx Status			On	On
Frequency	MHz		1880	2436
MPE Limit	mW/cm ²		1.00	1.00
Max % MPE	%	13.5	12.8	0.7
Power	(W)	0.680	0.644	0.036
Antenna Gain	dBi		0.00	0.00
EIRP	(W)	0.68	0.644	0.036
X	(cm)		-1.0	0.0
Y	(cm)		0.0	0.0
Sector			FALSE	FALSE
Arc			FALSE	FALSE
q1	degs	input	-120	-120
q2			60	60
q1		actual	-120	-120
q2			60	60



Verdict: Since the max MPE is <100%, the device is compliant in simultaneous transmission mode.