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ENAC ENSAYOS Nº 51/LE147

Informe de ensayo nº:
Test report No:

NIE: 43010REM.001

Test report

FCC Rules and Regulations 47 CFR Chapter I Part 15 Subpart B (10-01-13 Edition); ICES-003 ISSUE 5 (2012) & American National standard for Testing Unlicensed Wireless Devices

Identificación del objeto ensayado.....: Identification of item tested	3G CELLULAR ALARM COMMUNICATOR
Marca .....: Trade	DSC
Modelo y/o referencia tipo .....: Model and /or type reference	3G4010, 3G4010CF
Other identification of the product .....:	S/N: 651S1429019827 FCC ID: F53143G4010 and IC: 160A-3G4010
Final HW version .....:	UA673 Rev. 02
Final SW version .....:	Ver. 4.0
Características .....: Features	3G Cellular interface used for connection to Alarm System in order to send events to monitoring station. Use integrated Telit radio model UE910-NAR. Module can use external whip antenna.
Peticionario .....: Applicant	DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD. 3301 Lanstaff Road, Concord, On L4K4L2 Canada. Dan Nita +905 760 3000, Ext. 2706 dnita@tycoint.com
Método de ensayo solicitado, norma.....: Test method requested, standard	FCC Rules and Regulations 47 CFR Chapter I Part 15 Subpart B (10-01-12 Edition); ICES-003 ISSUE 5 (2012) & ANSI C63.10-2009: American National standard for Testing Unlicensed Wireless Devices.
Resultado.....: Summary	IN COMPLIANCE
Aprobado por (nombre / cargo y firma) .....: Approved by (name / position & signature)	Rafael López EMC LAB Manager Firmado digitalmente por Rafael López Martín Fecha: 2014.09.19 08:27:44 +02'00'
Fecha de realización .....: Date of issue	2014-09-05
Formato de informe No. .....: Report template No	FDT08_15

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Competences and guarantees

AT4 wireless is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

This certificate of conformity was issued in accordance with the decision Nº 3/2000 of the Joint Committee established under the Agreement on Mutual Recognition between the European Community and the United States of America. By this decision, AT4 wireless can act as Conformity Assessment Body (CAB) on Electromagnetic Compatibility. This Certificate applies to the samples listed at technical reports.

This laboratory is designed by the Federal Communications Commission (ES0004)

AT4 wireless is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, AT4 wireless has a calibration and maintenance program for its measurement equipment.

AT4 wireless guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at AT4 wireless at the time of performance of the test.

AT4 wireless is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of AT4 wireless.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of AT4 wireless and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the AT4 wireless internal document PODT000.

Usage of samples

Samples under test have been selected by: The client.

Sample S/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
43010/01	3G Cellular Alarm Communicator	3G410	651S1429019827	2014-08-12
43010/04	Battery	---	---	2014-08-12

Test sample description

The test sample consists of a 3 production ready samples provided for FCC/IC and PTCRB testing. Auto-answer and pass through mode available on the test samples to facilitate necessary testing. Testing and certification to be done using both supplied antennas.

Test samples supplier

DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.

3301 Lanstaff Road, Concord, On L4K4L2 Canada.

Dan Nita

+905 760 3000, Ext. 2706

dnita@tycoint.com

Testing period

The performed test started on 2014-08-25 and finished on 2014-08-28.

The tests have been performed at AT4 wireless.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 30 ºC
Relative humidity	Min. = 45 % Max. = 60 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 ºC Max. = 30 ºC
Relative humidity	Min. = 45 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m & 3m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Site VSWR	< ±6 dB at 3m distance between item under test and receiver antenna, (1 GHz to 18 GHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 18 GHz).

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 30 ºC
Relative humidity	Min. = 45 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

Remarks and comments

The tests have been realized by the technical personnel: Mario Alberto Ureña.

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 150 kHz to 30 MHz is I = ± 3,60 dB for quasi-peak measurements, I = ± 3,48 dB for peak measurements (k = 2).

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1 GHz is I = ± 4,57 dB for quasi-peak measurements, I = ± 4,48 dB for peak measurements (k = 2) and from 1 to 12,75 GHz is I = ± 3,43 dB for average and peak measurements.

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 12,75 GHz to 26 GHz is I = ± 4,09 dB for average and peak measurements.

Testing verdicts (Legend)

Not applicable ..... :	N/A
Pass ..... :	P
Fail ..... :	F
Not measured ..... :	N/M

List of equipment used during the test					
CONTROL NUMBER	**DESCRIPTION**	**MANUFACTURER**	**MODEL**	**LAST CALIBRATION**	**NEXT CALIBRATION**
1999	EMI Receptor	ROHDE & SCHWARZ	ESIB 26	2013-05-30	2015-05-30
1935	EMI Receptor	ROHDE & SCHWARZ	ESPI 3	2013-12-11	2015-12-11
2932	Bilog Hybrid Antenna	SUNOL	JB6	2014-05-11	2017-05-11
0246	Horn Antenna	HP	11966E	2012-04-27	2015-04-27
1920	Horn Antenna	AGILENT	11966J	2011-09-27	2014-09-27
1658	RF Amplifier	SCHAFFNER	CPA9231A	2013-06-11	2015-06-11
1975	RF Amplifier	MITEQ	JS4	2014-05-22	2016-05-22
3783	RF Amplifier	BONN ELEKTRONIK	BLMA 0118-3A	2013-04-23	2015-05-19
0258	Transient Limiter	HP	119471A	2012-09-19	2014-09-19
1650	Artificial Network	SCHWARZBECK	NNLK - 8121	2013-06-25	2015-06-25
3545	Temperature & Humidity probe	PICO TECHNOLOGY	HUMIDIPROBE	2014-01-21	2015-01-21
3548	Temperature & Humidity probe	PICO TECHNOLOGY	HUMIDIPROBE	2014-01-21	2015-01-21
3556	Temperature & Humidity probe	T & D	TR-72W	2014-01-21	2015-01-21

Appendix A – Test result

APPENDIX A CONTENT:

DESCRIPTION OF THE OPERATION MODES

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. Every operation mode takes a failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

In the following table appears the operation modes used by the samples tested to that it refers the present test report.

OPERATION MODE	DESCRIPTION
OM#01	EUT ON. Idle mode. Power supply: 115Vac.
OM#02	EUT ON. TCH mode. Power supply: 115Vac.

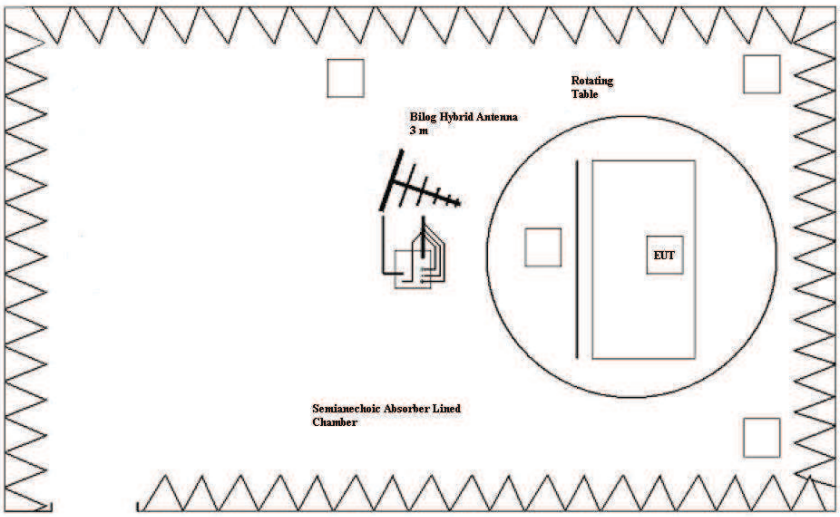
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE.

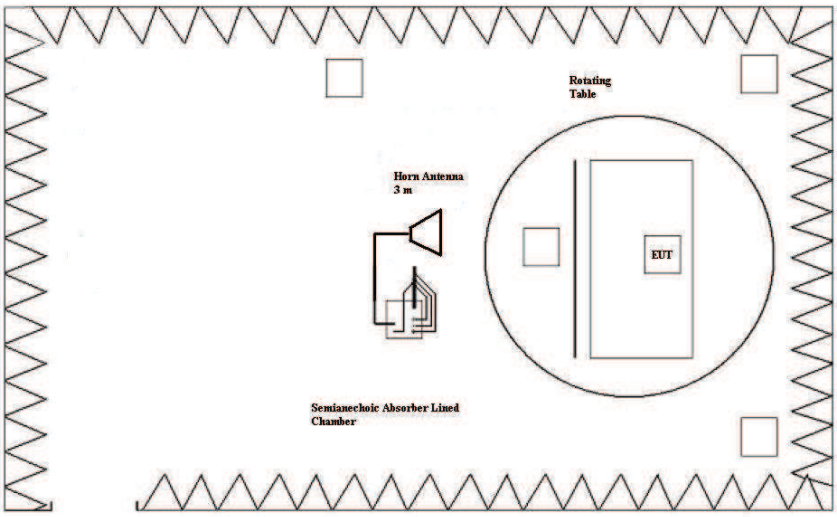
LIMITS:	Product standard:	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART B (10-01-12 Edition); ICES-003 ISSUE 5 (2012) & ANSI C63.10-2009
	Test standard:	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART B (10-01-12 Edition); ICES-003 ISSUE 5 (2012) & ANSI C63.10-2009

LIMITS OF INTERFERENCE CLASS B

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15.109, Subpart B (10-01-12 Edition); ICES-003 ISSUE 5 (2012) & ANSI C63.10-2009 in the frequency range 30 MHz to 26 GHz, for Class B equipment, which is a transmitter in a band over 500 MHz, was:

Frequency range (MHz)	Limit for 3 m (µV/m)	Limit for 3 m (dBµV/m)
30 to 88	100	40
88 to 216	150	43,52
216 to 960	200	46,02
Above 960	500	53,98





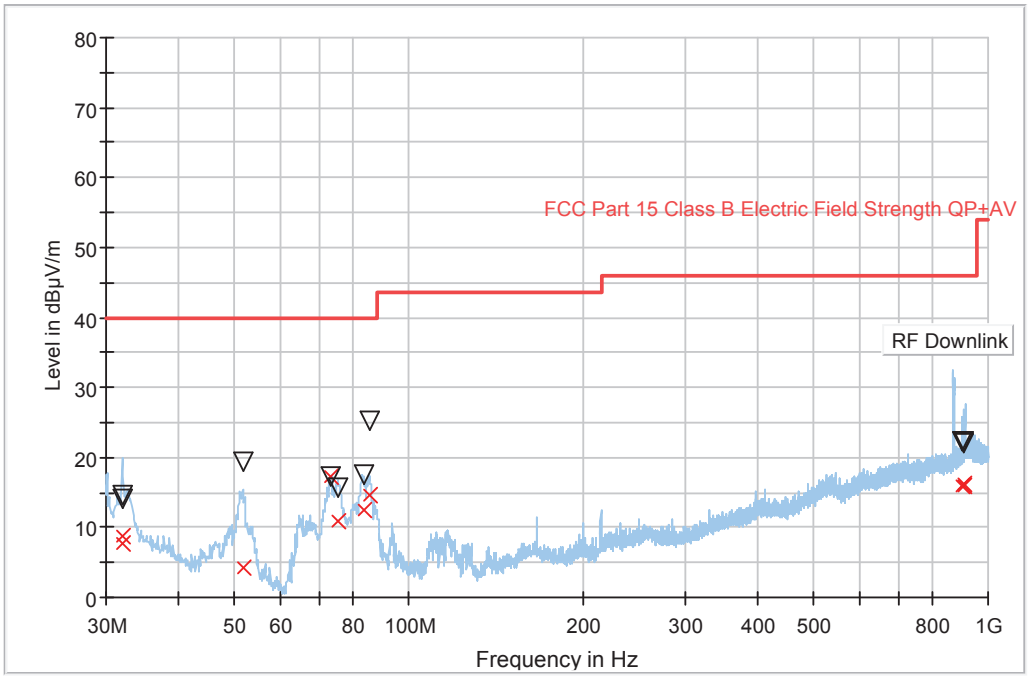
TESTED SAMPLES:	S/01
TESTED OPERATION MODES:	OM#01
TEST RESULTS :	CRmmnn: CR, Radiation Condition; mm: Sample number; nn: Operation mode, xx: Polarisation.

CRmmnn	Description	Result
CR0101	EUT ON. Idle mode. Power supply: 115Vac. Range 30-1000 MHz.	P
CR0101_RA1_PH	EUT ON. Idle mode. Power supply: 115Vac. Range 1-18 GHz. Horizontal pol.	P
CR0101_RA1_PV	EUT ON. Idle mode. Power supply: 115Vac. Range 1-18 GHz. Vertical pol.	P
CR0101_RA2_PH	EUT ON. Idle mode. Power supply: 115Vac. Range 18-26 GHz. Horizontal pol.	P
CR0101_RA2_PV	EUT ON. Idle mode. Power supply: 115Vac. Range 18-26 GHz. Vertical pol.	P

Radiated Emission: CR0101 (30MHz to 1GHz)

Project:	43010REM.001
Company:	DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. IDLE Mode. 115 Vac.

Full Spectrum



Peak Preview
FCC Part 15 Class B Electric Field Strength QP+AV
QuasiPeak
MaxPeak

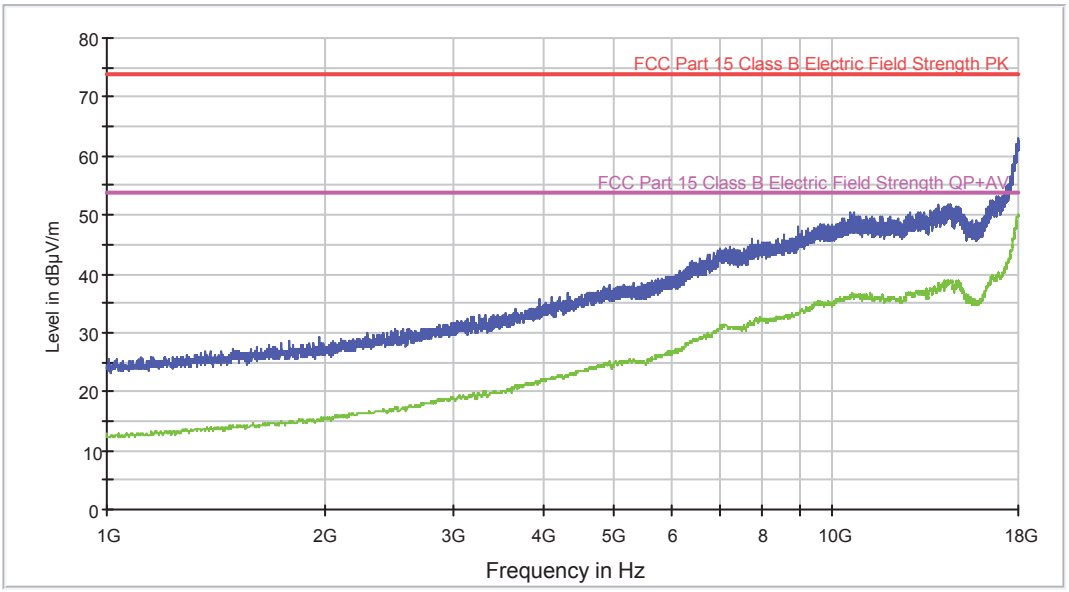
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Height (cm)	Pol	Azimuth (deg)
31.993506	7.59	14.09	363.0	V	182.0
32.051948	8.65	14.56	365.0	V	211.0
51.667532	4.17	19.48	286.0	V	267.0
73.325974	17.16	17.23	176.0	V	67.0
75.587013	10.77	15.66	250.0	V	150.0
83.596104	12.62	17.66	383.0	V	137.0
85.487013	14.60	25.27	311.0	V	220.0
904.740260	16.07	22.31	400.0	H	253.0
910.797403	15.90	22.18	241.0	V	203.0
911.684416	16.08	22.22	309.0	H	29.0

Radiated Emission: CR0101_RA1_PH (1 – 18 GHz)

Project:	43010REM.001
Company:	DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. IDLE Mode. 115 Vac. Horizontal Polarization.

ER FCC 1-18GHz class B



MaxPeak
FCC Part 15 Class B Electric Field Strength PK
Average
FCC Part 15 Class B Electric Field Strength QP+AV

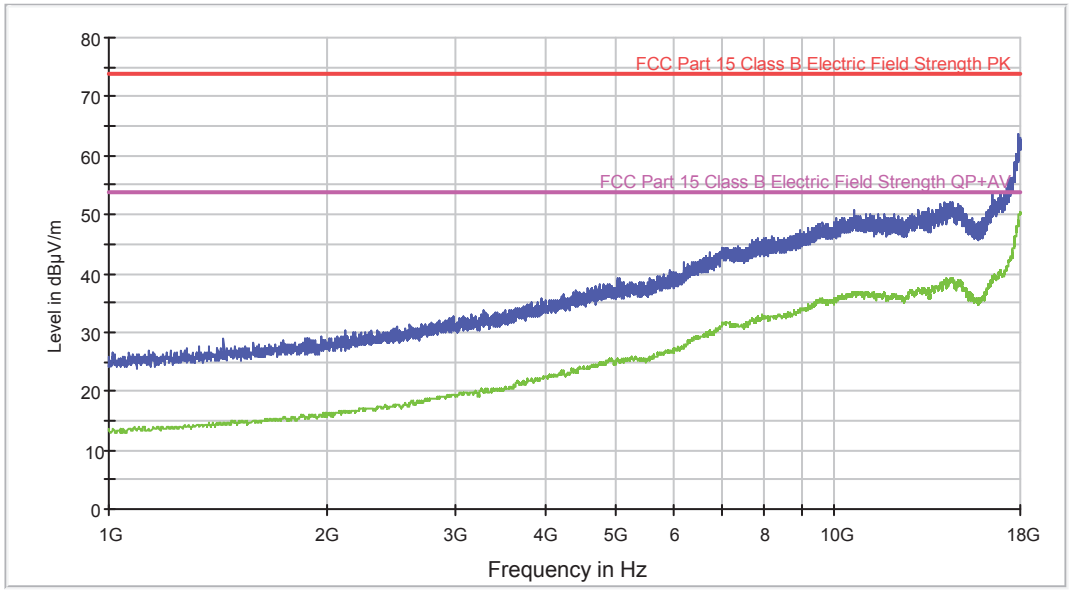
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Average-ClearWrite (dBµV/m)
1325.000000	26.3	13.6
1741.000000	28.3	14.6
2282.000000	29.9	16.5
3136.000000	32.4	18.9
4089.000000	36.2	22.2
5636.000000	38.7	25.7
7219.000000	44.6	31.0
9584.000000	48.4	35.2
13089.000000	50.5	36.9
17957.000000	62.9	50.1

Radiated Emission: CR0101_RA1_PV (1 – 18 GHz)

Project:	43010REM.001
Company:	DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. IDLE Mode. 115 Vac. Vertical Polarization.

ER FCC 1-18GHz class B



MaxPeak
FCC Part 15 Class B Electric Field Strength PK
Average
FCC Part 15 Class B Electric Field Strength QP+AV

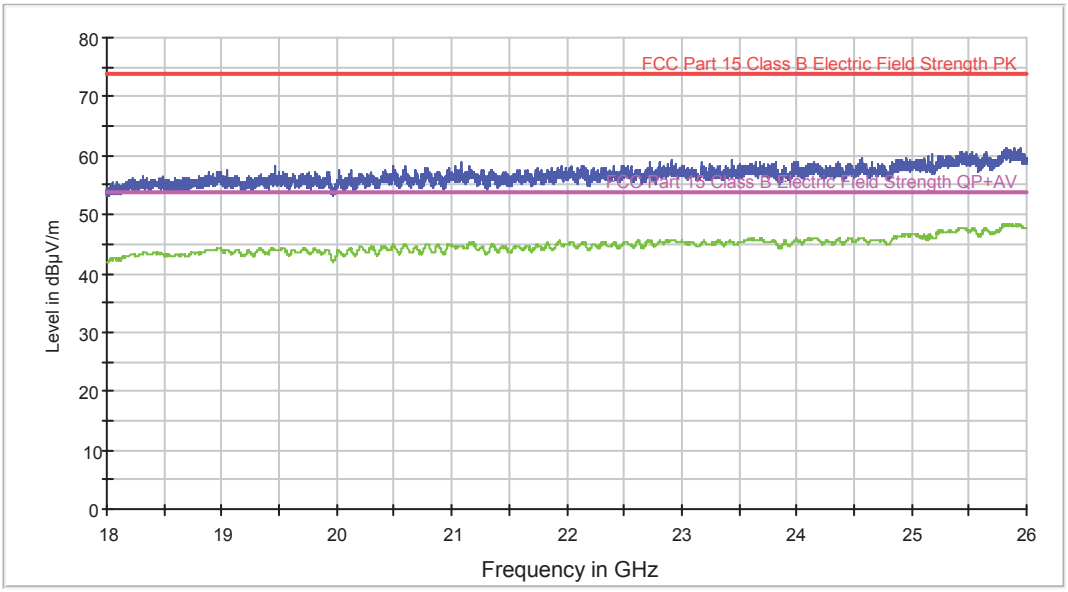
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Average-ClearWrite (dBµV/m)
1328.000000	27.5	14.0
1440.000000	29.0	14.5
2113.000000	30.4	16.7
3162.000000	33.1	19.8
4218.000000	36.3	23.2
5010.000000	39.2	25.3
7329.000000	44.5	31.2
10024.000000	49.4	35.5
13412.000000	51.1	37.3
17939.000000	63.5	49.8

Radiated Emission: CR0101_RA2_PH (18 – 26 GHz)

Project:	43010REM.001
Company:	DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. IDLE Mode. 115 Vac. Horizontal Polarization.

ER FCC 18-26GHz class B



MaxPeak
FCC Part 15 Class B Electric Field Strength PK

Average
FCC Part 15 Class B Electric Field Strength QP+AV

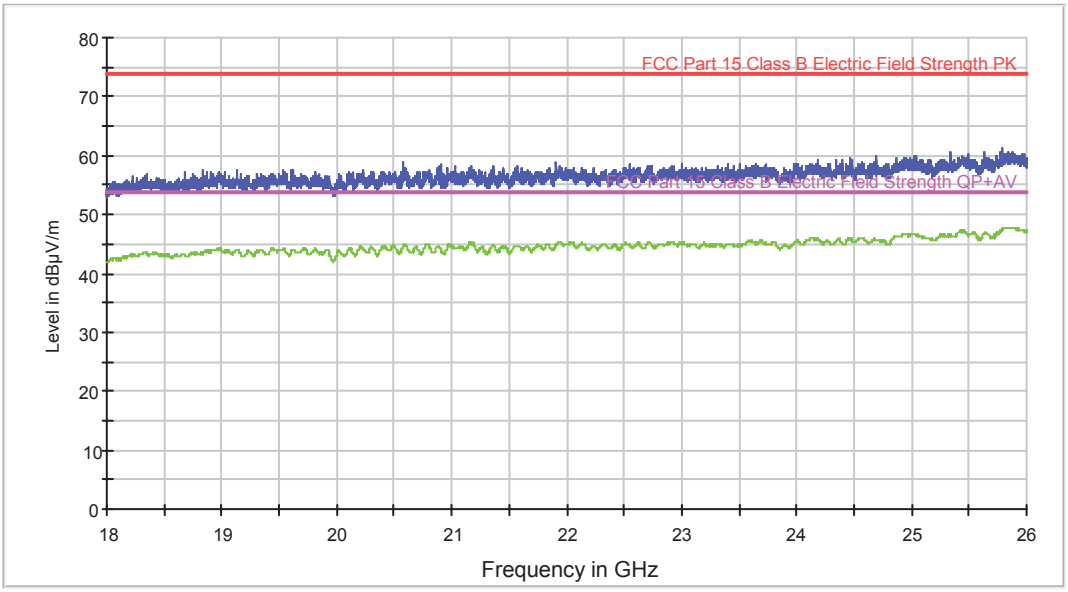
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Average-ClearWrite (dBµV/m)
18496.000000	56.4	43.2
19050.000000	57.4	43.9
19459.000000	58.1	44.0
20493.000000	58.3	44.8
21086.000000	58.8	44.7
21954.000000	58.3	44.9
22910.000000	59.2	45.6
23434.000000	59.1	45.4
24564.000000	59.6	46.0
25827.000000	61.4	48.2

Radiated Emission: CR0101_RA2_PV (18 -26 GHz)

Project:	43010REM.001
Company:	DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. IDLE Mode. 115 Vac. Vertical Polarization.

ER FCC 18-26GHz class B



MaxPeak
FCC Part 15 Class B Electric Field Strength PK

Average
FCC Part 15 Class B Electric Field Strength QP+AV

Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Average-ClearWrite (dBµV/m)
18344.000000	56.8	43.4
18843.000000	57.7	43.6
19621.000000	57.6	44.0
20582.000000	58.9	44.8
20902.000000	58.6	44.2
21912.000000	58.7	45.0
23001.000000	58.5	45.2
23726.000000	58.7	45.1
25039.000000	60.1	46.6
25798.000000	61.1	47.5

CONTINUOUS CONDUCTED EMISSION ON POWER LEADS

LIMITS:	Product standard :	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART B (10-01-12 Edition); ICES-003 ISSUE 5 (2012) & ANSI C63.10-2009
	Test standard :	FCC RULES AND REGULATIONS 47 CFR PART 15, SUBPART B (10-01-12 Edition); ICES-003 ISSUE 5 (2012) & ANSI C63.10-2009

CLASS B

The applied limit for continuous conducted emissions in power leads, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-01-12 Edition); ICES-003 ISSUE 5 (2012) & ANSI C63.10-2009, in the frequency range 0,15 to 30 MHz, for Class B equipment was:

Frequency range (MHz)	**Limit (dBµV)**	
	Quasi-peak	**Average**
0,15 to 0,5	66-56	56-46
0,5 to 5	56	46
5 to 30	60	50

TESTED SAMPLES:	S/01
TESTED OPERATION MODES:	OM#01 & 02
TEST RESULTS :	CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

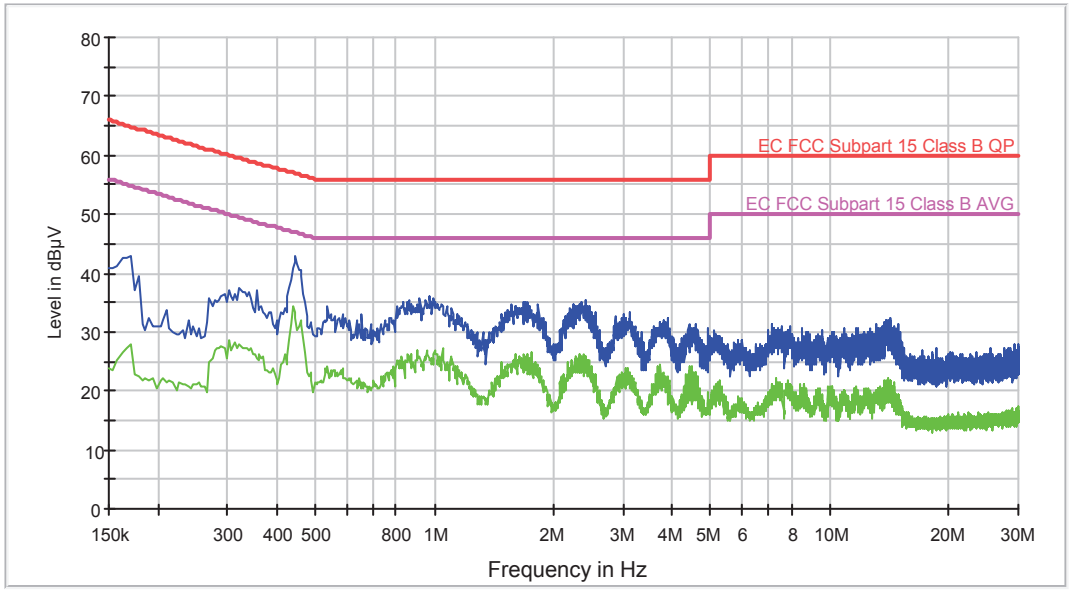
CCmmnnhh	**Description**	**Result**
CC01010N	Neutral wire noise	P
CC0101L1	Phase wire noise	P
CC01020N	Neutral wire noise	P
CC0102L1	Phase wire noise	P

Continuous Conducted emission : CC01010N	Detector : Peak / Average / Cuasi-peak

Project: 43010REM.001
Company: DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.

Sample: S/01
Operation mode: OM#01
Description: EUT ON. IDLE Mode. 115 Vac. Neutral Noise

EMI EC FCC Subpart 15 Class B ESU26 CC



EC FCC Subpart 15 Class B QP
IDLE FDD5 MaxPeak-ClearWrite
EC FCC Subpart 15 Class B AVG
IDLE FDD5 Average-ClearWrite

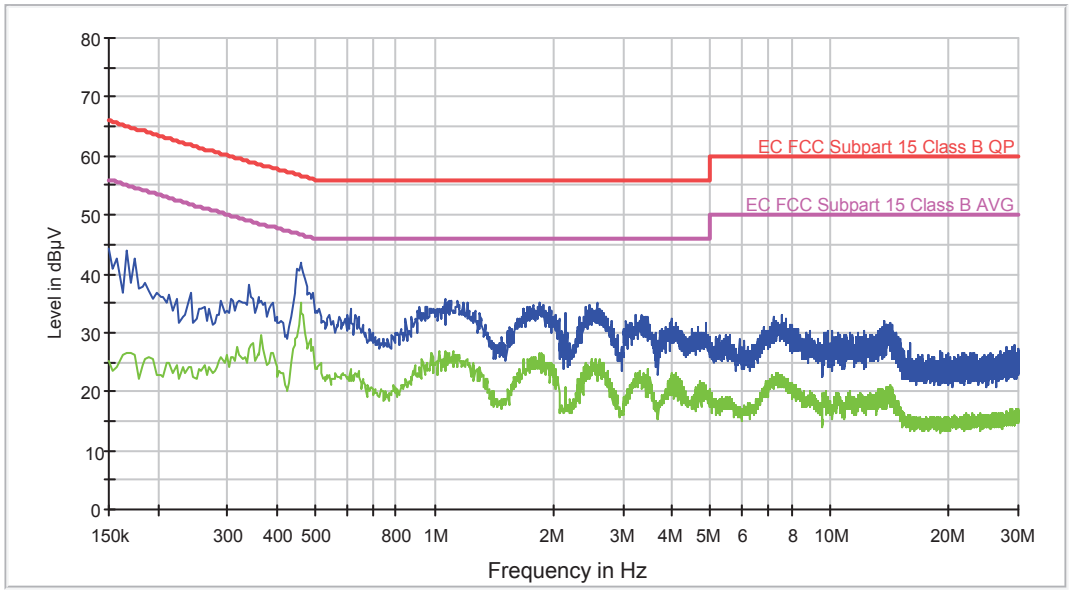
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.170000	42.9	28.0
0.322000	37.6	28.0
0.446000	42.7	32.4
0.970000	35.9	25.4
1.726000	35.1	23.0
2.402000	35.3	26.0
3.894000	32.3	21.3
7.150000	31.4	19.4
14.150000	32.4	20.7
29.382000	28.0	16.5

Continuous Conducted emission : CC0101L1	Detector : Peak / Average / Cuasi-peak

Project: 43010REM.001
Company: DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.
Sample: S/01
Operation mode: OM#01
Description: EUT ON. IDLE Mode. 115 Vac. Phase Noise

EMI EC FCC Subpart 15 Class B ESU26 CC



IDLE FDD5 MaxPeak-ClearWrite
EC FCC Subpart 15 Class B QP
IDLE FDD5 Average-ClearWrite
EC FCC Subpart 15 Class B AVG

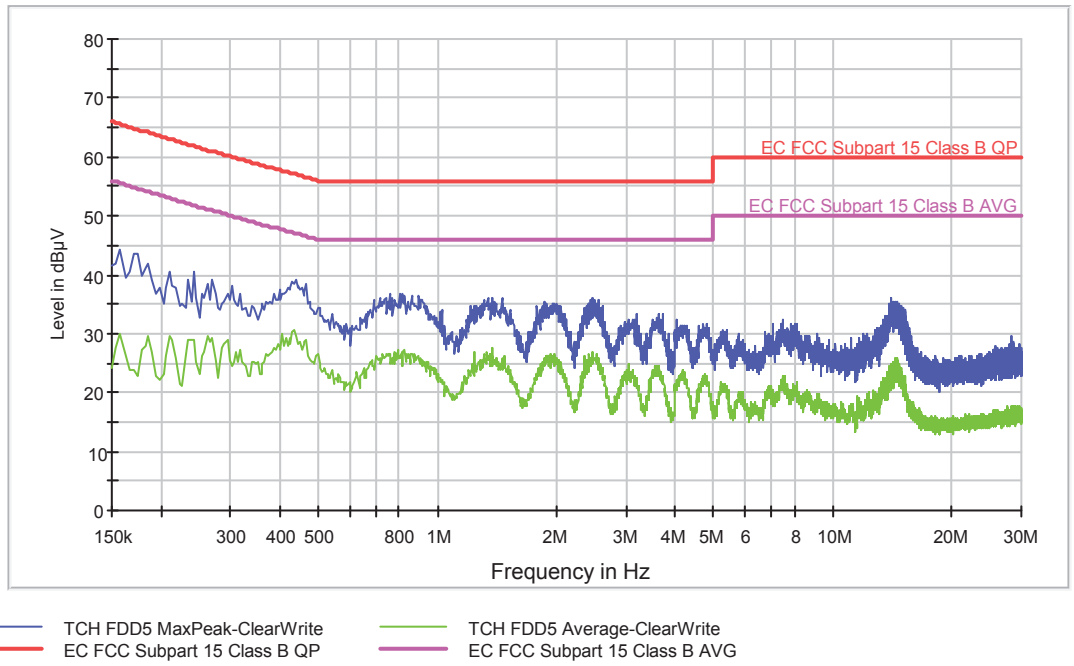
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	44.2	25.1
0.338000	38.0	27.2
0.458000	41.8	35.0
1.062000	35.8	26.8
1.846000	35.1	26.1
2.574000	35.0	24.6
3.998000	32.4	21.3
7.570000	32.9	22.4
13.754000	32.0	18.2
29.170000	27.8	16.4

Continuous Conducted emission : CC01020N	Detector : Peak / Average / Cuasi-peak

Project: 43010REM.001
Company: DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.
Sample: S/01
Operation mode: OM#02
Description: EUT ON. TCH Mode. 115 Vac. Neutral Noise

EMI EC FCC Subpart 15 Class B ESU26 CC



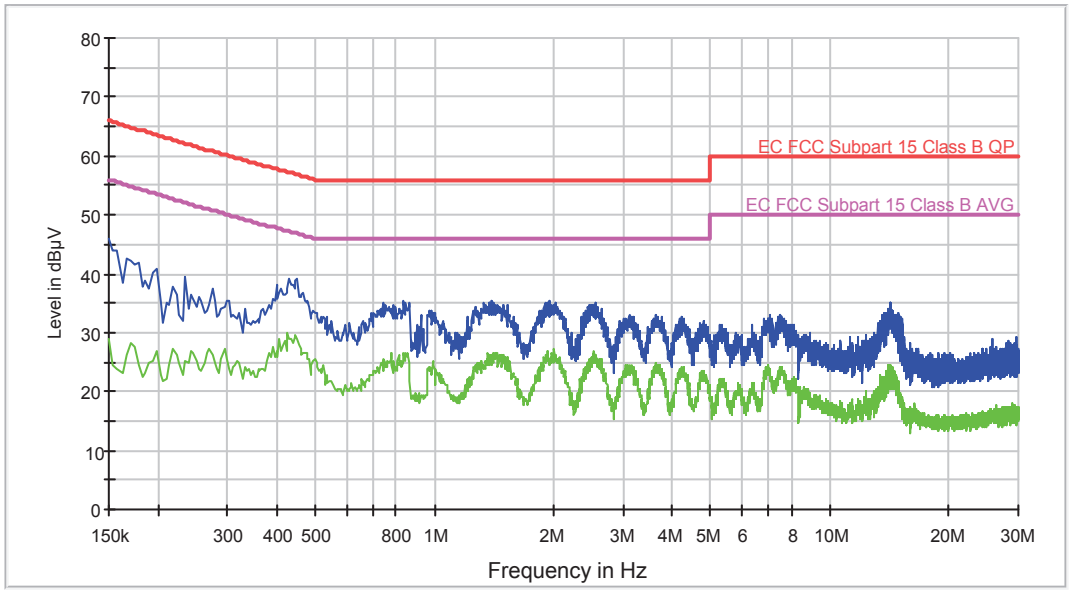
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.158000	44.3	29.9
0.270000	39.3	29.4
0.438000	39.0	29.5
0.758000	36.7	26.5
1.378000	36.0	27.5
2.462000	35.9	25.9
3.630000	33.4	23.6
7.510000	32.4	21.3
14.122000	36.0	24.5
28.430000	29.5	15.7

Continuous Conducted emission : CC0102L1	Detector : Peak / Average / Cuasi-peak

Project: 43010REM.001
Company: DIGITAL SECURITY CONTROLS, A DIV. OF TYCO SAFETY PRODUCTS CANADA LTD.
Sample: S/01
Operation mode: OM#02
Description: EUT ON. TCH Mode. 115 Vac. Phase Noise

EMI EC FCC Subpart 15 Class B ESU26 CC



EC FCC Subpart 15 Class B QP
TCH FDD5 MaxPeak-ClearWrite
EC FCC Subpart 15 Class B AVG
TCH FDD5 Average-ClearWrite

Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	45.8	29.1
0.430000	39.2	28.9
0.450000	39.0	29.0
0.838000	35.5	26.6
1.390000	35.5	26.1
2.546000	35.2	26.1
3.618000	32.9	24.1
7.022000	33.1	23.1
14.178000	35.0	21.3
29.794000	29.4	15.3