FCC Test Report

(Part 27)

Product Name : LTE Cellular Alarm Communicator

Model No : LT7090

FCC ID : F5316LT7090

Applicant : Digital Security Controls Ltd.

Address : 3301 Langstaff Road, Concord, Ontario, Canada, L4K 4L2

Date of Receipt : 2016/06/24

Issued Date : 2016/07/19

Report No. : 1660547R-HPUSP43V00

Report Version : V1.0

Testing Laboratory
3023

Test Report

Issued Date : 2016/07/19
Report No.: 1660547R-HPUSP43V00

Product Name	: LTE Cellular Alarm Communicator
Applicant	: Digital Security Controls Ltd.
Address	: 3301 Langstaff Road, Concord, Ontario, Canada, L4K 4L2
Manufacturer	: Digital Security Controls Ltd.
Trade Name	: DSC
Model No.	: LT7090
EUT Rated Voltage	: DC 3.9V
EUT Test Voltage	: DC 3.9V
	(provided by HOST that is powered by 120Vac/12Vdc external adapter)
Measurement Standard	: FCC CFR Title 47 Part 2 27
Measurement Reference	: TIA/EIA 603-C
Test Result	: Complied

Documented By : Anny Chou
(Senior Adm. Specialist / Anny Chou)

Tested By : Vorana Chen
(Senior Engineer / Vorana Chen)

Approved By :
(Director /Vincent Lin)

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	LTE Cellular Alarm Communicator
Model No.	LT7090
Trade Name	DSC
IMEI No.	35322806
FCC ID	F5316LT7090
TX Frequency	LTE Band 4: 1710~1755MHz
	LTE Band 13: 777~787MHz
Rx Frequency	LTE Band 4: 2110~2155MHz
	LTE Band 13: 746~756MHz
Bandwidth	LTE Band 4: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20 MHz
	LTE Band 13: 5MHz/10MHz
HW Version	UA709 Rev. 02
SW Version	Ver 1.0
Antenna Type	Dipole

1.2. Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	DSC	19001268	2.2 dBi for 777~787 MHz 1.5 dBi for 1710~1755 MHz

1.3. Remarks

1. Only radiated spurious emissions was tested. All conducted measurement are based on Original Report T140415W01-RP2.
2. The module has been tested inside the host model WS900-29.
3. Spurious emissions have been tested with all the rest of transmitters activated and the measures have not been affected.

1.4. Operational Description

The information contained within this report is intended to show verification of compliance of the 700/1700MHz Notebook to the requirements of FCC 47 CFR Part 2, 27.

The EUT provide all functions described as above. The EUT is tested with maximum rated TX power via the Base Station simulator.

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode:	LTE Band 4 (5M)-QPSK
	LTE Band 4 (5M)-16QAM
	LTE Band 4 (10M)-QPSK
	LTE Band 4 (10M)-16QAM
	LTE Band 4 (20M)-QPSK
	LTE Band 4 (20M)-16QAM
	LTE Band 13 (5M)-QPSK
	LTE Band 13 (5M)-16QAM
	LTE Band 13 (10M)-QPSK
	LTE Band 13 (10M)-16QAM

All operation modes have been verified and this is the worst case.

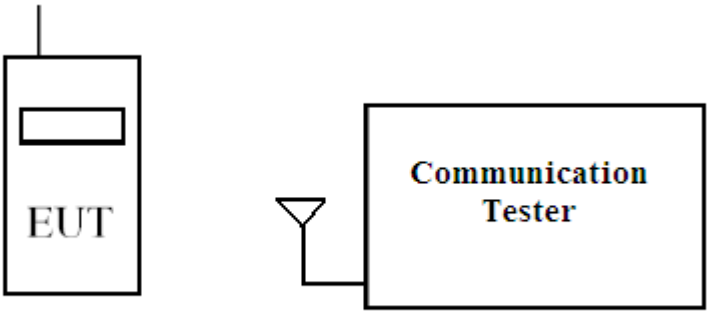
Test Mode:	LTE Band 4 (5M)-QPSK
	LTE Band 13 (5M)-16QAM

Note:

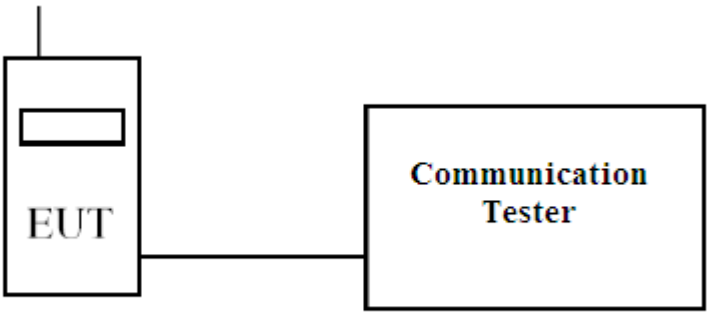
The maximum power levels are chosen in the LTE Band 4/13, only these modes were used for all tests.

1.5. Configuration of tested System

(a) Configuration of Radiated measurement



(b) Configuration of Conducted measurement



1.6. EUT Setup Procedures

(1) Setup the EUT and simulators as shown on 1.3
(2) Turn on the power of all equipments.
(3) The EUT was set to communicate with MT8820C.
(4) Repeat the above procedure (3).

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	53
Barometric pressure (mbar)	860-1060	982

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
FCC Registration Number :92195

Site Name: Quie Tek Corporation

LinKou Testing Laboratory:
No.5-22, Ruishukeng, Linkou Dist.,
New Taipei City 24451,
Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

1.8. Type of Emission

Note: Please refer to Original Report No.: T140415W01-RP2.

1.9. Voltages and DC currents

Note: Please refer to Original Report No.: T140415W01-RP2

2. Technical Test

2.1. Summary of test result

Standard	Test Item	Result	Note
2.1051	Spurious Emission at Antenna Terminals	Not tested[1]	
22.917(a)		Pass[1,2]	
24.238(a)		Pass[1,2]	
27.53(g)		Not tested[1]	

Note: 1. Please refer to Original Report No.: T140415W01-RP2.
2. Only radiated spurious emissions tests were requested.

2.2. List of test Equipment

Radiated / Site3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2707	2016/06/12
Horn Antenna	R&S	9120D	875	2016/01/17
Pre-Amplifier	Agilent	87405C	MY47010653	2016/02/23
Spectrum Analyzer	Agilent	N9010A	MY52220597	2016/02/18
DC power supply	Agilent	E3610A	MY40009845	2016/07/11
Communication Tester	Agilent	8820C	6201465467	2016/06/21

2.3. Measurement Uncertainty

Radiated Emission (Below 1GHz)
The measurement uncertainty of confidence of 95% is evaluated as ± 3.44 dB .
Radiated Emission (Above 1GHz)
The measurement uncertainty of confidence of 95% is evaluated as ± 4.08 dB

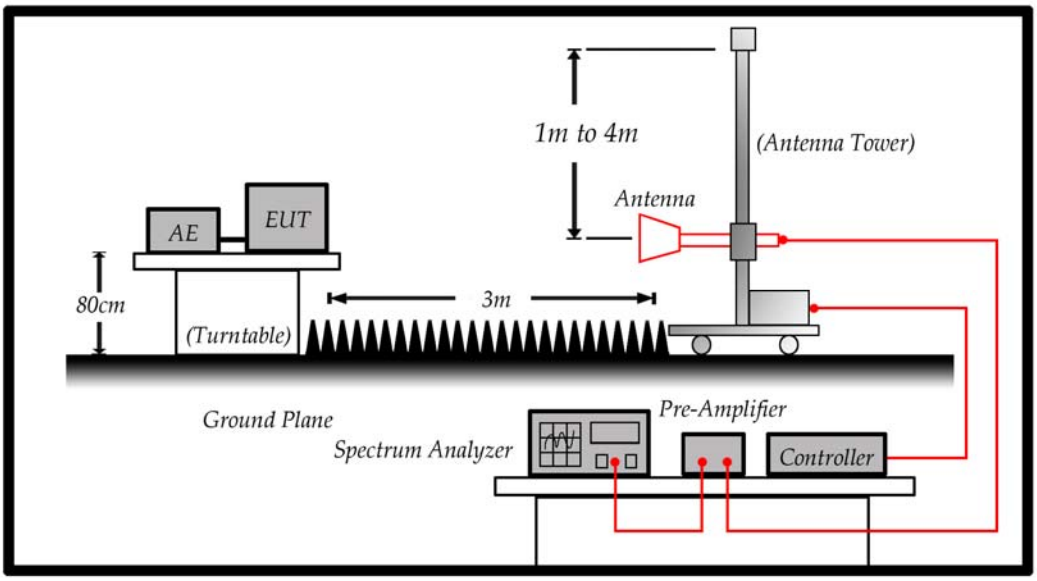
3. Spurious Emission

3.1. Test Specification

According to Part 2.1051, 2.1053, 22.917(a), 24.238(a).

3.2. Test Setup

3.2.1 Field strength of spurious radiation.



3.3. Limits

Limit	**<-13dBm**

43 + 10Log(P) down on the carrier where P is the power in Watts.

3.4. Test Procedure

In accordance with Part 2.1051, 2.1053, 22.917(a), 24.238(a)., the spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 30MHz to 20GHz. The EUT was set to transmit on full power. The EUT was tested on Low, middle and High channels for both power levels. The resolution and video bandwidth was set to 3MHz in accordance with Part 2.1051, 2.1053, 22.917(a), 24.238(a).. The spectrum analyzer detector was set to Max Hold.In addition, measurements were made up to the 10^{th} harmonic of the fundamental. The device was then replaced with a substitution antenna, which input signal was adjusted until the received level matched that of the previously detected emission.
(1) The EUT is tested with maximum rated TX power via the Base Station simulator.
(2) The EUT is tested in three orthogonal planes, The worst case was showing in this report.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to TIA/EIA 603-C on radiated measurement.

3.5. Test Result of Spurious Emission

Product	LTE Cellular Alarm Communicator		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2016/07/15	Test Site	Site3
Test Condition	Band 4 (5M) QPSK(1,0)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)
Horizontal Emissions Band 4 (5M) QPSK(1,0) CH19975						
3425.000	-44.816	-46.071	2.530	12.600	-36.001	-13
5128.000	-55.196	-50.951	3.050	13.100	-40.901	-13
6840.000	-54.867	-43.978	3.650	11.500	-36.128	-13
8563.000	-59.857	-44.593	3.850	12.000	-36.443	-13
10275.000	-59.673	-43.350	4.580	12.000	-35.930	-13
11987.500	-58.811	-42.415	4.800	13.300	-33.915	-13
Vertical Emissions Band 4 (5M) QPSK(1,0) CH19975						
3425.000	-43.638	-43.898	2.530	12.600	-33.828	-13
5137.500	-54.702	-50.172	3.050	13.100	-40.122	-13
6840.000	-52.664	-41.168	3.650	11.500	-33.318	-13
8562.500	-59.261	-43.623	3.850	12.000	-35.473	-13
10275.000	-60.063	-43.923	4.580	12.000	-36.503	-13
11987.500	-59.575	-43.045	4.800	13.300	-34.545	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 12 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Cellular Alarm Communicator		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2016/07/15	Test Site	Site3
Test Condition	Band 4 (5M) QPSK(1,0)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions Band 4 (5M) QPSK(1,0) CH20175

3465.000	-47.102	-47.884	2.530	12.600	-37.814	-13
5197.500	-57.771	-53.720	3.050	13.100	-43.670	-13
6930.000	-54.998	-43.139	3.650	11.500	-35.289	-13
8662.500	-59.175	-43.676	3.850	12.000	-35.526	-13
10395.000	-58.629	-41.908	4.580	12.000	-34.488	-13
12127.500	-57.666	-40.571	4.800	13.300	-32.071	-13

Vertical Emissions Band 4 (5M) QPSK(1,0) CH20175

3465.000	-46.843	-46.735	2.530	12.600	-36.665	-13
5197.500	-54.163	-49.825	3.050	13.100	-39.775	-13
6930.000	-52.722	-40.359	3.650	11.500	-32.509	-13
8662.500	-58.734	-42.719	3.850	12.000	-34.569	-13
10395.000	-58.428	-41.491	4.580	12.000	-34.071	-13
12127.500	-57.136	-40.163	4.800	13.300	-31.663	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 13 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Cellular Alarm Communicator		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2016/07/15	Test Site	Site3
Test Condition	Band 4 (5M) QPSK(1,0)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions Band 4 (5M) QPSK(1,0) CH20375

3505.000	-47.032	-47.620	2.530	12.600	-37.550	-13
5257.500	-56.330	-52.154	3.050	13.100	-42.104	-13
7010.000	-59.150	-46.329	3.650	11.500	-38.479	-13
8762.500	-59.118	-42.837	3.850	12.000	-34.687	-13
10515.000	-59.064	-42.691	4.580	12.000	-35.271	-13
12267.500	-58.458	-40.659	4.800	13.300	-32.159	-13

Vertical Emissions Band 4 (5M) QPSK(1,0) CH20375

3505.000	-47.711	-47.229	2.530	12.600	-37.159	-13
5257.500	-53.845	-49.274	3.050	13.100	-39.224	-13
7010.000	-53.946	-40.338	3.650	11.500	-32.488	-13
8762.500	-58.502	-41.685	3.850	12.000	-33.535	-13
10515.000	-58.659	-42.275	4.580	12.000	-34.855	-13
12267.500	-57.240	-39.500	4.800	13.300	-31.000	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 13 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Cellular Alarm Communicator		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2016/07/15	Test Site	Site3
Test Condition	Band 13 (5M) 16QAM(1,24)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions Band 13 (5M) 16QAM(1,24) CH23205

1559.000	-55.853	-60.291	1.630	9.800	-52.121	-40
2338.500	-55.547	-55.688	2.100	10.600	-47.188	-13
3118.000	-57.000	-58.098	2.350	12.300	-48.148	-13
3897.500	-58.937	-59.258	2.700	12.600	-49.358	-13
4677.000	-58.380	-55.096	2.830	12.700	-45.226	-13
5456.500	-55.806	-51.660	3.200	13.000	-41.860	-13
6236.000	-55.684	-48.505	3.200	12.100	-39.605	-13
7015.500	-58.701	-45.902	3.600	11.500	-38.002	-13
7795.000	-59.744	-44.196	3.980	11.500	-36.676	-13

Vertical Emissions Band 13 (5M) 16QAM(1,24) CH23205

1559.000	-57.914	-61.648	1.630	9.800	-53.478	-40
2338.500	-57.512	-57.070	2.100	10.600	-48.570	-13
3118.000	-57.061	-57.147	2.350	12.300	-47.197	-13
3897.500	-59.626	-57.735	2.700	12.600	-47.835	-13
4677.000	-58.086	-54.128	2.830	12.700	-44.258	-13
5456.500	-55.800	-51.279	3.200	13.000	-41.479	-13
6236.000	-55.349	-48.374	3.200	12.100	-39.474	-13
7015.500	-58.815	-45.231	3.600	11.500	-37.331	-13
7795.000	-54.496	-38.183	3.980	11.500	-30.663	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 12 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Cellular Alarm Communicator		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2016/07/15	Test Site	Site3
Test Condition	Band 13 (5M) 16QAM(1,24)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions Band 13 (5M) 16QAM(1,24) CH23230

1564.000	-57.697	-62.117	1.630	9.800	-53.947	-40
2346.000	-50.098	-50.328	2.100	10.600	-41.828	-13
3128.000	-55.582	-56.651	2.350	12.300	-46.701	-13
3910.000	-58.482	-58.632	2.700	12.600	-48.732	-13
4692.000	-55.867	-52.518	2.830	12.700	-42.648	-13
5474.000	-54.683	-50.529	3.200	13.000	-40.729	-13
6256.000	-55.774	-48.305	3.200	12.100	-39.405	-13
7038.000	-58.572	-45.656	3.600	11.500	-37.756	-13
7820.000	-59.869	-44.452	3.980	11.500	-36.932	-13

Vertical Emissions Band 13 (5M) 16QAM(1,24) CH23230

1564.000	-55.027	-58.774	1.630	9.800	-50.604	-40
2346.000	-56.552	-56.180	2.100	10.600	-47.680	-13
3128.000	-56.536	-56.614	2.350	12.300	-46.664	-13
3910.000	-58.772	-56.887	2.700	12.600	-46.987	-13
4692.000	-59.402	-55.330	2.830	12.700	-45.460	-13
5474.000	-56.734	-52.209	3.200	13.000	-42.409	-13
6253.000	-55.631	-48.371	3.200	12.100	-39.471	-13
7038.000	-59.939	-46.247	3.600	11.500	-38.347	-13
7820.000	-61.269	-44.977	3.980	11.500	-37.457	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 12 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	LTE Cellular Alarm Communicator		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2016/07/15	Test Site	Site3
Test Condition	Band 13 (5M) 16QAM(1,24)	Test Range	9kHz ~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions Band 13 (5M) 16QAM(1,24) CH23255

1569.000	-55.865	-60.267	1.630	9.800	-52.097	-40
2353.500	-51.339	-51.658	2.100	10.600	-43.158	-13
3138.000	-56.057	-57.098	2.350	12.300	-47.148	-13
3922.500	-58.784	-58.763	2.700	12.600	-48.863	-13
4707.000	-57.825	-54.428	2.830	12.700	-44.558	-13
5491.500	-52.593	-48.491	3.200	13.000	-38.691	-13
6276.000	-55.595	-47.852	3.200	12.100	-38.952	-13
7060.500	-58.614	-45.581	3.600	11.500	-37.681	-13
7845.000	-59.485	-44.198	3.980	11.500	-36.678	-13

Vertical Emissions Band 13 (5M) 16QAM(1,24) CH23255

1569.000	-57.998	-61.758	1.630	9.800	-53.588	-40
2335.500	-56.237	-55.767	2.100	10.600	-47.267	-13
3138.000	-55.921	-55.990	2.350	12.300	-46.040	-13
3922.500	-57.761	-55.832	2.700	12.600	-45.932	-13
4707.000	-57.380	-53.217	2.830	12.700	-43.347	-13
5491.500	-53.684	-49.162	3.200	13.000	-39.362	-13
6276.000	-55.920	-48.273	3.200	12.100	-39.373	-13
7060.500	-58.474	-44.674	3.600	11.500	-36.774	-13
7845.000	-59.973	-43.841	3.980	11.500	-36.321	-13

Note:

1. Receiver setting (Peak Detector) : RBW:1MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 12 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.