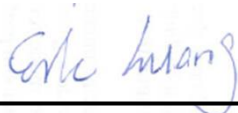


# RF Exposure Evaluation Report

**APPLICANT** : Telit Wireless Solutions Co., Ltd.  
**EQUIPMENT** : LM940  
**BRAND NAME** : Telit  
**MODEL NAME** : LM940  
**FCC ID** : RI7LM940  
**STANDARD** : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Eric Huang / Manager



Approved by: Jones Tsai / Manager



## **SPORTON INTERNATIONAL INC.**

**No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)**



**Table of Contents**

**1. ADMINISTRATION DATA ..... 4**

    1.1. Testing Laboratory ..... 4

**2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT) ..... 5**

**3. MAXIMUM RF AVERAGE OUTPUT POWER AMONG PRODUCTION UNITS ..... 6**

**4. RF EXPOSURE LIMIT INTRODUCTION ..... 7**

**5. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION ..... 8**

    5.1. Standalone Power Density Calculation ..... 8

    5.2. Collocated Power Density Calculation..... 9



**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA750208	Rev. 01	Initial issue of report	Jul. 14, 2017



**1. Administration Data**

**1.1. Testing Laboratory**

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978

Applicant	
Company Name	Telit Wireless Solutions Co., Ltd.
Address	13th Fl. Shinyoung Securities Bldg., 6, Gukjegeumyung-ro 8-gil, Seoul, 07330, South Korea

Manufacturer	
Company Name	Telit Wireless Solutions Co., Ltd.
Address	13th Fl. Shinyoung Securities Bldg., 6, Gukjegeumyung-ro 8-gil, Seoul, 07330, South Korea



## 2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	LM940
Brand Name	Telit
Model Name	LM940
FCC ID	RI7LM940
Wireless Technology and Frequency Range	WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 30: 2307.5 MHz ~ 2312.5 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz
Mode	RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM
EUT Stage	Identical Prototype

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



**3. Maximum RF average output power among production units**

Mode		Maximum Average power(dBm)
WCDMA	Band II	24.0
	Band IV	24.0
	Band V	24.0
LTE	Band 2	23.5
	Band 4	23.5
	Band 5	24.0
	Band 7	23.5
	Band 12	23.5
	Band 13	23.5
	Band 17	23.5
	Band 25	23.5
	Band 26	24.0
	Band 30	23.0
	Band 38	23.5
	Band 41	23.5
	Band 66	23.5



### 4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



### 5. Radio Frequency Radiation Exposure Evaluation

#### 5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum ERP (dBm)	Maximum ERP (W)	Maximum EIRP (dBm)	Maximum EIRP (W)	Maximum Output Power Limit (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WCDMA Band 2	1852.4	9.0	24.0	30.850	1.216	33.000	1.995	2.000	1995.262	0.397	1.000
WCDMA Band 4	1712.4	9.0	24.0	30.850	1.216	33.000	1.995	1.000	1995.262	0.397	1.000
WCDMA Band 5	826.4	7.0	24.0	28.850	0.767	31.000	1.259	7.000	1258.925	0.251	0.551
LTE Band 2	1850.7	10.0	23.5	31.350	1.365	33.500	2.239	2.000	2238.721	0.446	1.000
LTE Band 4	1710.7	9.0	23.5	30.350	1.084	32.500	1.778	1.000	1778.279	0.354	1.000
LTE Band 5	824.7	7.0	24.0	28.850	0.767	31.000	1.259	7.000	1258.925	0.251	0.550
LTE Band 7	2502.5	8.0	23.5	29.350	0.861	31.500	1.413	1.000	1412.538	0.281	1.000
LTE Band 12	699.7	7.0	23.5	28.350	0.684	30.500	1.122	3.000	1122.018	0.223	0.466
LTE Band 13	779.5	7.0	23.5	28.350	0.684	30.500	1.122	3.000	1122.018	0.223	0.520
LTE Band 17	706.5	7.0	23.5	28.350	0.684	30.500	1.122	3.000	1122.018	0.223	0.471
LTE Band 25	1850.7	10.0	23.5	31.350	1.365	33.500	2.239	2.000	2238.721	0.446	1.000
LTE Band 26	814.7	7.0	24.0	28.850	0.767	31.000	1.259	7.000	1258.925	0.251	0.543
LTE Band 30	2307.5	11.0	23.0	31.850	1.531	34.000	2.512	8.000	2511.886	0.500	1.000
LTE Band 38	2572.5	10.0	23.5	31.350	1.365	33.500	2.239	1.000	2238.721	0.446	1.000
LTE Band 41	2498.5	10.0	23.5	31.350	1.365	33.500	2.239	0.250	2238.721	0.446	1.000
LTE Band 66	1710.7	10.0	23.5	31.350	1.365	33.500	2.239	1.250	2238.721	0.446	1.000

Note: For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band



**5.2. Collocated Power Density Calculation**

**Note:**

1. This MPE analysis is applicable to any collocated transmitters with transmit power for WLAN is less than or equal to 26dBm and for Bluetooth is less than or equal to 15dBm.
2. A maximum antenna gain of 5 dBi for WLAN/BT has been assumed for all collocated antennas.

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Power Density / Limit
WCDMA Band 2	1852.4	6.0	24.0	30.0	1.00	1000.00	0.199	1.000	0.199
WCDMA Band 4	1712.4	5.0	24.0	29.0	0.79	794.33	0.158	1.000	0.158
WCDMA Band 5	826.4	3.0	24.0	27.0	0.50	501.19	0.100	0.551	0.181
LTE Band 2	1850.7	6.0	23.5	29.5	0.89	891.25	0.177	1.000	0.177
LTE Band 4	1710.7	6.0	23.5	29.5	0.89	891.25	0.177	1.000	0.177
LTE Band 5	824.7	3.0	24.0	27.0	0.50	501.19	0.100	0.550	0.181
LTE Band 7	2502.5	7.0	23.5	30.5	1.12	1122.02	0.223	1.000	0.223
LTE Band 12	699.7	3.0	23.5	26.5	0.45	446.68	0.089	0.466	0.191
LTE Band 13	779.5	3.0	23.5	26.5	0.45	446.68	0.089	0.520	0.171
LTE Band 17	706.5	3.0	23.5	26.5	0.45	446.68	0.089	0.471	0.189
LTE Band 25	1850.7	6.0	23.5	29.5	0.89	891.25	0.177	1.000	0.177
LTE Band 26	814.7	3.0	24.0	27.0	0.50	501.19	0.100	0.543	0.184
LTE Band 30	2307.5	7.0	23.0	30.0	1.00	1000.00	0.199	1.000	0.199
LTE Band 38	2572.5	7.0	23.5	30.5	1.12	1122.02	0.223	1.000	0.223
LTE Band 41	2498.5	7.0	23.5	30.5	1.12	1122.02	0.223	1.000	0.223
LTE Band 66	1710.7	6.0	23.5	29.5	0.89	891.25	0.177	1.000	0.177
WLAN2.4GHz Band	2412	5.0	26.0	31.0	1.26	1258.93	0.251	1.000	0.251
WLAN5GHz Band	5180	5.0	26.0	31.0	1.26	1258.93	0.251	1.000	0.251
Bluetooth	2402	5.0	15.0	20.0	0.10	100.00	0.020	1.000	0.020

WLAN Power Density / Limit	Bluetooth Power Density / Limit	WWAN Power Density / Limit	Σ(Power Density / Limit) of WWAN+WLAN+Bluetooth
0.251	0.020	0.223	0.494

**Note:**

1. For collocation analysis, LTE Band 7 is chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.
2. Σ(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN + Bluetooth.
3. Considering the WWAN module collocation with the WLAN and Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 3 collocated transmitters is compliant



**Conclusion:**

Based on 47 CFR§2.1091, the analysis concludes that this product is compliant with the RF exposure requirements in mobile exposure condition, provided the peak gain of the connected WWAN antenna, the conducted power and the antenna gain of the collocated transmitter, do not exceed the limits for each frequency band listed below.

Device	Technology	Band	Frequency (MHz)	Maximum Conducted Power (dBm)	Stanalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
LM940	WCDMA	Band II	1852.4~1907.6	24.0	9.0	6.0
		Band IV	1712.4~1752.6	24.0	9.0	5.0
		Band V	826.4~846.6	24.0	7.0	3.0
	LTE	Band 2	1850.7~1909.3	23.5	10.0	6.0
		Band 4	1710.7~1754.3	23.5	9.0	6.0
		Band 5	824.7~848.3	24.0	7.0	3.0
		Band 7	2502.5~2567.5	23.5	8.0	7.0
		Band 12	699.7~715.3	23.5	7.0	3.0
		Band 13	779.5~784.5	23.5	7.0	3.0
		Band 17	706.5~713.5	23.5	7.0	3.0
		Band 25	1850.7~1914.3	23.5	10.0	6.0
		Band 26	814.7~848.3	24.0	7.0	3.0
		Band 30	2307.5~2312.5	23.0	11.0	7.0
		Band 38	2572.5~2617.5	23.5	10.0	7.0
		Band 41	2498.5~2687.5	23.5	10.0	7.0
		Band 66	1710.7~1779.3	23.5	10.0	6.0