

# 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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## 1.1 General Information

### Client Information

Applicant: LM Technologies Ltd.  
Address of applicant: Unit 19, Spectrum House, 32-34 Gordon House Road,  
London, NW5 1LP, United Kingdom

Manufacturer: LM Technologies Ltd.  
Address of manufacturer: Unit 19, Spectrum House, 32-34 Gordon House Road,  
London, NW5 1LP, United Kingdom

### General Description of EUT:

Product Name: LM074 Bluetooth 5.0 Dual Mode Module  
Trade Name: LM Technologies  
Model No.: LM074-0190  
Adding Model(s): LM074-0191, LM074-0192  
FCC ID: VVXLM074  
Rated Voltage: DC5V

### Technical Characteristics of EUT:

Bluetooth Version: V5.0 (BR/EDR/BLE mode)  
Frequency Range: 2402-2480MHz  
RF Output Power: 7.378dBm (Conducted)  
Data Rate: 1Mbps, 2Mbps, 3Mbps  
Modulation: GFSK, Pi/4 DQPSK, 8DPSK  
Quantity of Channels: 79/40  
Channel Separation: 1MHz/2MHz  
Type of Antenna: Integral Antenna  
Antenna Gain: 2.0dBi

## 1.2 Standard Applicable

According to § 1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

(a) Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz: \* = Plane-wave equivalent power density

### 1.3 MPE Calculation Method

$$S = (30 * P * G) / (377 * R^2)$$

S = power density (in appropriate units, e.g., mw/cm<sup>2</sup>)

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, the power gain factor is normally numeric gain.

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

### 1.4 MPE Calculation Result

Maximum Tune-Up output power: 8(dBm)

Maximum peak output power at antenna input terminal: 6.31(mW)

Prediction distance: >20(cm)

Prediction frequency: 2402 (MHz)

Antenna gain: 2.0(dBi)

Directional gain (numeric gain): 1.58

The worst case is power density at prediction frequency at 20cm: 0.0020(mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

Result: Pass