1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

Client Information

Applicant:	LM Technologies Ltd.
Address of applicant:	Unit19, Spectrum House, 32-34, Gordon House Road, London, NW5 1LP, United Kingdom
Manufacturer:	LM Technologies Ltd.
Address of manufacturer:	Unit19, Spectrum House, 32-34, Gordon House Road, London, NW5 1LP, United Kingdom

General Description of EUT:

Product Name:	LM832 Wi-Fi & BT Dual Mode Combi Module
Trade Name:	LM Technologies
Model No.:	LM832-0474
Adding Model(s):	LM832-0475, LM832-0472, LM832-0473, LM832-0476, LM832-0477, LM832-0832
FCC ID:	VVXLM832-0474
Rated Voltage:	DC3.3V

Technical Characteristics of EUT:

Wi-Fi

Support Standards:	802.11b, 802.11g, 802.11n(HT20)
Frequency Range:	2412-2462MHz
RF Output Power:	13.08dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 72.2Mbps
Quantity of Channels:	11
Channel Separation:	5MHz
Type of Antenna:	PCB
Antenna Gain:	0dBi

BT

Bluetooth Version:	V4.1
Frequency Range:	2402-2480MHz
RF Output Power:	9.467dBm (Conducted)
Data Rate:	1Mbps, 2Mbps, 3Mbps
Modulation:	GFSK, Pi/4 QDPSK, 8DPSK
Quantity of Channels:	79/40
Channel Separation:	1/2MHz
Type of Antenna:	PCB
Antenna Gain:	0dBi

Device Category: Mobile Device

Note 1: The appearance of others models listed in the report is different from main-test model LM832-0474, but the circuit and the electronic construction do not change, declared by the manufacturer.

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^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ 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^2)	Averaging Times $\|E\|^2$, $\|H\|^2$ 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 equivalents power density

1.3 MPE Calculation Method

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

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

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

WiFi
Maximum Tune-Up output power: 14 (dBm)
Maximum peak output power at antenna input terminal: 25.12 (mW)
Prediction distance: >20(cm)
Prediction frequency: 2412 (MHz)
Antenna gain: 0 (dBi)
Directional gain (numeric gain): 1
The worst case is power density at prediction frequency at 20cm: 0.005(mw/cm^2)
MPE limit for general population exposure at prediction frequency: 1 (mw/cm^2)

BT
Maximum Tune-Up output power: 10 (dBm)
Maximum peak output power at antenna input terminal: 10 (mW)
Prediction distance: >20(cm)
Prediction frequency: 2402 (MHz)
Antenna gain: 0 (dBi)
Directional gain (numeric gain): 1
The worst case is power density at prediction frequency at 20cm: 0.002(mw/cm^2)
MPE limit for general population exposure at prediction frequency: 1 (mw/cm^2)

Result: Pass

1.5 Test Setup Photos