

RF Exposure Assessment

LG Electronics Inc.

Notebook PC

Model No: LGX30

Brand: LG

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1. EUT Information:

Product	Notebook PC	
Trade Name	LG	
Model Number	LGX30	
FCC ID	BEJ9Q-LGX30G02	
Frequency Range	GPRS/EGPRS 850: 824.2~848.8MHz GPRS/EGPRS 1900: 1850.2~1909.8MHz 802.11b/g/n-HT20: 2412~2462MHz 802.11n-HT40: 2422~2452MHz BT: 2402~2480MHz	
Transmit Power	850 Band: GPRS: 33.01dBm EGPRS: 26.55dBm	1900 Band: GPRS: 29.57 EGPRS: 26.11dBm
	802.11b: 16.44dBm 802.11g: 22.34dBm 802.11n-HT20: 20.71dBm 802.11n-HT40: 18.37dBm BT(GFSK): 0.31dBm BT(8DPSK): 2.23dBm	
Max SAR(1g)	GPRS 850: 0.020(W/kg) EGPRS 850: 0.019(W/kg) GPRS 1900: 0.064(W/kg) EGPRS 1900: 0.032(W/kg) 802.11b: 0.00771(W/kg) 802.11g: 0.00604(W/kg) 802.11n-HT20:0.0023(W/kg) 802.11n-HT40: 0.0059(W/kg)	
Modulation Technique	802.11b: DSSS 802.11g/n: OFDM GSM/PCS BT: GFSK for 1Mbps, $\pi/4$ DPQSK for 2Mbps, 8DPSK for 3Mbps	
Antenna Specification	PIFA Antenna	
Co-location	AW-NE104H (WiFi), F33072 (2.5G Module)	

Note:

1. The BT's power is less than 60/f; it's not needed to do SAR evaluation testing.
2. The AUX antenna of WiFi and 2.5G module just for receiving and without transmitting.
3. The evaluation procedure follows KDB616217.

1. Antenna Distance:

	WLAN _{main} to user	WLAN _{AUX} to user	WWAN _{main} to user	WLAN _{main} to WWAN _{main}	WLAN _{AUX} to WWAN _{main}
Distance(cm)	5.1	7.4	9	28	1

2. Individual SAR Evaluation:

Type	SAR value(W/kg)
2437MHz(802.11g)@WLAN _{main}	0.00771
850MHz@WWAN _{main}	0.020
1900MHz@WWAN _{main}	0.064

3. Individual Output Power

Type	Output Power(mW)
802.11b/g/n	171.4
WWAN 850MHz	998 (with 50% duty cycle)
WWAN 1900MHz	447 (with 50% duty cycle)

4. Antenna to Antenna and Antenna to User ratio Consideration:

- $N_x = 802.11 \text{ b/g/n} = P/(60/f) - 1 = 171.4/(60/2.45) - 1 = 6$
- $N_y = \text{WWAN 850MHz} = P/(60/f) - 1 = 998/(60/0.85) - 1 = 13$, $N_y = \text{WWAN 1900MHz} = P/(60/f) - 1 = 447/(60/1.9) - 1 = 13$
- WLAN to WWAN antenna ratio $= (5 + 1/2 * N_x + 1/2 * N_y) = (5 + 3 + 6.5) = 14.5 = 15 \text{ cm}$
- WLAN to user distance ratio $= (5 + 1/2 * N_x) = 8 \text{ cm}$
- WWAN to user distance ratio $= (5 + 1/2 * N_y) = 11.5 \text{ cm}$

5. Simultaneously SAR consideration:

- WLAN_{main} to WWAN_{main} separation distance = 28 cm > 15 cm
- WAN_{AUX} to WWAN_{main} separation distance = 1 cm < 15 cm
- WLAN_{main} to user = 5.1 cm < 8 cm
- WLAN_{AUX} to user = 7.4 cm < 8 cm
- WWAN_{main} to user = 9.6 cm < 11.5 cm
- KDB 616217 “Simultaneously transmission evaluation is required only for the antenna that do not satisfy the antenna $(5 + 1/2 * N_x + 1/2 * N_y)$ and user $(5 + 1/2 * N_x)$ separation distance threshold”

Antenna to user separation distances for WLAN and WWAN are more than 5 cm to user, and WWAN & 802.11 (2.45 GHz): $(5 + 1/2 * n_x + 1/2 * n_y) = 15 \text{ cm} < 28 \text{ cm}$ (WLAN main to WWAN main), thus simultaneous SAR evaluation is not required.

6. Antenna Distance:

