

RF EXPOSURE EVALUATION

EUT Specification

EUT	Cell Phone Signal Booster			
Model Number	20L4.LCPA.1			
FCC ID	2AMPB-20L4LCPA1			
Antenna gain (Max)	Mode	Frequency(MHz)	Antenna Gain(dBi)	Cable loss(dB)
	UP LINK	1850-1910	10	3
		824 - 849	10	3
		1710 - 1755	10	3
		704 - 716	10	3
		699 - 716	10	3
		1850-1915	10	3
	DOWNLINK	1930-1990	9	3
		869 - 894	9	3
		2110 - 2155	9	3
		734-746	9	3
		729 - 746	9	3
		1930-1995	9	3
Operation Frequency	Cellular:Uplink: 824MHz - 849MHz, Downlink: 869MHz - 894MHz AWS-1:Uplink: 1710 - 1755MHz, Downlink: 2110 - 2155MHz Lower A-C Blocks:Uplink: 698 - 716MHz, Downlink: 728 - 746MHz Broadband PCS:Uplink: 1850-1915MHz, Downlink: 1930-1995MHz			
Input Rating	DC 5V from Switching Power Supply			
Max. output power	Cellular (LTE Band 5): Uplink: 824MHz - 849MHz,18.70dBm, Downlink: 869MHz - 894MHz,10.85dBm AWS(LTE Band 4): Uplink: 1710 - 1755MHz, 17.80dBm, Downlink: 2110 - 2155MHz, 10.70dBm LSMH (LTE Band 12): Uplink: 698 - 716MHz, 17.88dBm, Downlink: 728 - 746MHz, 10.94dBm EPCS (LTE Band 25): Uplink: 1850-1915MHz, 20.26dBm, Downlink: 1930-1995MHz, 10.49dBm			

Test Requirement:

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm²)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	..	..	F/300	6
1500-100000	..	..	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	..	..	F/1500	6
1500-100000	..	..	1	30

11.1 Friis transmission formula: $P_d = \frac{P_{out} G}{4\pi R^2}$

Where

P_d = Power density in mW/cm²

P_{out} =output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π =3.1416

R = distance between observation point and center of the radiator in cm=20cm

Pd the limit of MPE, $1\text{mW}/\text{cm}^2$. If we know the maximum gain of the nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

11.2 Measurement Result

Operating Mode Frequency(MHz)	Tune up tolerance (dBm)	Max tune up conducted power(dBm)	Cable loss	EIRP(mW)	Ant. Gain(dBi)	Power density at 20cm (mW/ cm ²)	Power density Limits(mW/cm ²)
UL824 -849	19 ± 1	20	3	501.187	10	0.099758	0.55
DL 869-894	11 ± 1	12	3	63.096	9	0.012559	0.58
UL1710 -1755	18 ± 1	19	3	398.107	10	0.079241	1
DL 2110-2155	11 ± 1	12	3	63.10	9	0.012560	1
UL698-716	18 ± 1	19	3	398.11	10	0.079242	0.47
DL 728-746	11 ± 1	12	3	63.10	9	0.012560	0.49
UL1850-1915	20 ± 1	21	3	630.957	10	0.125589	1
DL 1930-1995	10 ± 1	11	3	50.119	9	0.009976	1

Signature:

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