Product operation frequency range and FCC ID number information.

Model number: dLRU-678

Operation frequency band:

600MHz Service

Uplink:	663MHz to 698MHz
Downlink:	617MHz to 652MHz

Lower 700MHz

Uplink:	698MHz to 716MHz
Downlink:	728MHz to 746MHz

Upper 700MHz

Uplink:	776MHz to 787MHz
Downlink:	746MHz to 757MHz

FirstNet:

Uplink:	788MHz to 798MHz
Downlink:	758MHz to 768MHz

ESMR:

Uplink:	817MHz to 824MHz
Downlink:	862MHz to 869MHz

Cellular:

Uplink:	824MHz to 849MHz
Downlink:	869MHz to 894MHz

Supported signal modulation type:

LTE

Input signal channel space:

5MHz for LTE

10MHz for LTE

15MHz for LTE

20MHz for LTE

FCC ID:

OJFDLRU678

RF Exposure Compliance Requirement

1. Standard requirement

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

(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			1.0	30

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

1. MPE Calculation Method

$$R = \sqrt{\frac{PG}{4\pi S}}$$

$S\ (mW/cm^2)=P*G/4Pi*R^2$

S= Power Density (mW/cm^2)

P=Peak RF conducted output Power (mW)

G=EUT Antenna numeric gain (numeric)

R= Separation distance between radiator and human body (cm);

From the maximum EUT RF output power, as well as the gain of the used antenna, according to the RF power density limit above, the minimum distance between the antenna and human body will be calculated.

2. Calculated Result

The permitted max antenna gain for the device is 12.5dBi.

Take the Limits for General Population / Uncontrolled Exposure.

The limit for Power Density (S)(mW/cm2) = F/1500

Here, F is the highest operation frequency for worst-case (in MHz)

3. Conclusion

1. For 600MHz Service (Downlink Only)

According to the test report GZEM201101673602, the tested max. total conducted power for 2x2 MIMO is 20.22dBm+20.22dBm=210.4mW

Frequency (MHz)	Maximum Antenna Gain (Numeric)	Total conducted power (mW)	Limit of Power Density (S) (mW/cm^2)	Minimum Distance to human body (cm)
617.67	17.78	210.4	0.4347	26.17

2. For Low 700MHz (Downlink Only)

According to the test report GZEM201101673602, the tested max. total conducted power for 2x2 MIMO is 20.32dBm+20.32dBm=214.78mW

Frequency (MHz)	Maximum Antenna Gain (Numeric)	Total conducted power (mW)	Limit of Power Density (S) (mW/cm^2)	Minimum Distance to human body (cm)
738.73	17.78	214.78	0.4973	24.73

3. For Upper 700MHz (Downlink Only)

According to the test report GZEM201101673602, the tested max. total conducted power for 2x2 MIMO is 20.09dBm+20.09dBm=203.7mW

Frequency (MHz)	Maximum Antenna Gain (Numeric)	Total conducted power (mW)	Limit of Power Density (S) (mW/cm^2)	Minimum Distance to human body (cm)
746.04	17.78	203.7	0.5047	23.90

4. For FirstNet (Downlink Only)

According to the test report GZEM201101673602, the tested max. total conducted power for 2x2 MIMO is 20.15dBm+20.15dBm=206.54mW

Frequency (MHz)	Maximum Antenna Gain (Numeric)	Total conducted power (mW)	Limit of Power Density (S) (mW/cm^2)	Minimum Distance to human body (cm)
761.96	17.78	206.54	0.5120	23.90

5. For ESMR (Downlink Only)

According to the test report GZEM201101673602, the tested max. total conducted power for 2x2 MIMO is 20.35dBm+20.35dBm=216.27mW

Frequency (MHz)	Maximum Antenna Gain (Numeric)	Total conducted power (mW)	Limit of Power Density (S) (mW/cm^2)	Minimum Distance to human body (cm)
869.00	17.78	216.27	0.5794	22.98

6. For Cellular (Downlink Only)

According to the test report GZEM201101673602, the tested max. total conducted power for 2x2 MIMO is 20.24dBm+20.24dBm=211.4mW

Frequency (MHz)	Maximum Antenna Gain (Numeric)	Total conducted power (mW)	Limit of Power Density (S) (mW/cm^2)	Minimum Distance to human body (cm)
886.71	17.78	210.86	0.5960	22.38

So the recommend use distance away from EUT external antenna is larger than 26.17cm for MIMO transmission.