

FCC ID: Z9G-EDF181

IC: 1004A-EDF181, HVIN: EDF100026

# 1 Safety Human Exposure

## 1.1 Radio Frequency Exposure Compliance

### 1.1.1 Electromagnetic Fields

RESULT:

Pass

**Test Specification**

Test standard

: CFR47 FCC Part 2: Section 2.1091  
CFR47 FCC Part 1: Section 1.1310  
FCC KDB Publication 447498 v06, section 7  
RSS-102 Issue 5 February 2021

➤ **FCC requirements**

**FCC 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 20cm normally can be maintained between the user and the device.

**MPE Calculation Method according to KDB 447498 v06**

Power Density:  $S_{(mW/cm^2)} = PG/4\pi R^2$  or  $EIRP/4\pi R^2$

Where:

S = power density (mW/cm<sup>2</sup>)

P = power input to the antenna (mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (cm)

From the peak RF output power, the minimum mobile separation distance, d=20 cm, as well as the antenna gain, the RF power density can be calculated as below:

$$S_{(mW/cm^2)} = PG/4\pi R^2$$

**MPE Limit for FCC**

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

a) EUT RF Exposure Evaluation standalone operations

Test Mode	Maximum conducted Power		Antenna Gain (dBi)	Measured e.i.r.p		$S_{(mW/cm^2)} = \frac{PG}{4\pi R^2}$	Limit (mW/cm <sup>2</sup> )
	(dBm)	(mW)		(dBm)	(mW)		
BT (BDR/EDR)	11.71	14.83	-0.29	11.42	13.87	0.00276	1

Test Mode	Maximum field strength		Antenna Gain (dBi)	Measured e.i.r.p		$S_{(mW/cm^2)} = \frac{PG}{4\pi R^2}$	Limit (mW/cm <sup>2</sup> )
	(dBuV/m @3m)	(mW)		(dBm)	(mW)		
5.8GHz SRD	102.48	5.31	1.57	8.82	7.62	0.00152	1

b) EUT RF Exposure Evaluation simultaneous transmission operations

Simultaneous transmission mode	The sum of the ratios	Result
BT (BDR/EDR) + 5.8GHz SRD	$0.00276/1 + 0.00152/1 < 1$	Pass

- **IC requirements:** The EUT shall comply with the requirement of RSS-102.

**Exemption from Routine Evaluation Limits – RF Exposure Evaluation**

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device’s radiating element is greater than 20 cm, except when the device operates as follows:

**MPE Limit for IC**

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m <sup>2</sup> )	Reference Period (minutes)
0.003-10 <sup>21</sup>	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> <sup>0.5</sup>	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> <sup>0.25</sup>	0.1540/ <i>f</i> <sup>0.25</sup>	8.944/ <i>f</i> <sup>0.5</sup>	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> <sup>0.3417</sup>	0.008335 <i>f</i> <sup>0.3417</sup>	0.02619 <i>f</i> <sup>0.6834</sup>	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> <sup>1.2</sup>
150000-300000	0.158 <i>f</i> <sup>0.5</sup>	4.21 x 10 <sup>-4</sup> <i>f</i> <sup>0.5</sup>	6.67 x 10 <sup>-5</sup> <i>f</i>	616000/ <i>f</i> <sup>1.2</sup>

**Note:** *f* is frequency in MHz.  
 \*Based on nerve stimulation (NS).  
 \*\* Based on specific absorption rate (SAR).

**a) EUT RF Exposure Evaluation standalone operations:**

Test Mode	Measured Peak Power		Antenna Gain (dBi)	Measured e.i.r.p (mW)		S <sub>(W/m<sup>2</sup>)</sub> = PG/4πR <sup>2</sup>	Limit (W/m <sup>2</sup> )
	(dBm)	(mW)		(dBm)	(mW)		
BT (BDR/EDR)	11.71	14.83	-0.29	11.42	13.87	0.0276	5.35

Test Mode	Maximum field strength		Antenna Gain (dBi)	Measured e.i.r.p		S <sub>(W/m<sup>2</sup>)</sub> = PG/4πR <sup>2</sup>	Limit (W/m <sup>2</sup> )
	(dBuV/m @3m)	(mW)		(dBm)	(mW)		
5.8GHz SRD	84.05	0.08	1.57	0.45	1.11	0.0001	9.77

**b) EUT RF Exposure Evaluation simultaneous transmission operations**

Simultaneous transmission mode	The sum of the ratios	Result
BT (BDR/EDR) + 5.8GHz SRD	0.0276/5.35 + 0.0001/9.77 < 1	Pass

“RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.”