

RF Exposure evaluation

FCC ID	2BE3U-X1
Product Name	Bonding Encoder
Model/Type reference	X1
Listed Model(s)	X3, X10, X1 Plus
Exposure category	General population/uncontrolled environment
EUT Type	Production Unit
Device Type	Mobile Device

1. Reference

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

FCC CFR 47 part1 1.1310: Radio frequency radiation exposure limits.

FCC CFR 47 part2 2.1091: Radio frequency radiation exposure evaluation: mobile devices

2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f ²)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500–100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f ²)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

*=Plane-wave equivalent power density

3. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S=power density

P=power input to antenna

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

4. Antenna Information

FLW8189FSA7-A WiFi module can only use antennas certificated as follows provided by manufacturer;

Antenna No.	Type of antenna:	Gain of the antenna (Max.)	Frequency range:
WIFI ANT1	FPC Antenna	-2.95dBi for 2.4GWIFI -4.15 dBi for 5.2GWIFI -4.51dBi for 5.3G WIFI -4.23dBi for 5.5GWIFI -4.28dBi for 5.8GWIFI	2400-6000MHz
WIFI ANT2	FPC Antenna	-3.12dBi for 2.4GWIFI -4.18 dBi for 5.2GWIFI -4.22dBi for 5.3G WIFI -4.51dBi for 5.5GWIFI -4.55dBi for 5.8GWIFI	2400-6000MHz
LTE Module1 ANT	FPC Antenna	-2.46dBi for Band5 -4.51dBi for Band7	800M-2700MHz
LTE Module2 ANT	FPC Antenna	-2.21dBi for Band5 -3.58dBi for Band7	800M-2700MHz
LTE Module3 ANT	FPC Antenna	-2.84dBi for Band5 -3.60dBi for Band7	800M-2700MHz

5. Conducted Output Power

2.4G WIFI:

Mode	Channel	ANT1 Peak Output Power (dBm)	ANT1 Peak Output Power (mW)	ANT2 Peak Output Power (dBm)	ANT2 Peak Output Power (mW)
IEEE 802.11b	1	7.7	5.89	7.92	6.19
	6	8.69	7.40	8.6	7.24
	11	8.26	6.70	8.92	7.80
IEEE 802.11g	1	8.74	7.48	8.94	7.83
	6	8.56	7.18	8.96	7.87
	11	9	7.94	8.93	7.82
IEEE 802.11n_20	1	8.91	7.78	8.29	6.75
	6	7.93	6.21	8.21	6.62
	11	8.79	7.57	8.19	6.59

5GWIFI(U-NII-1):

Mode	Channel	ANT1 Output Power (dBm)	ANT1 Output Power (mW)	ANT2 Output Power (dBm)	ANT2 Output Power (mW)
IEEE 802.11a	36	6.53	4.50	7.19	5.24
	40	6.85	4.84	6.81	4.80
	48	8.64	7.31	7.86	6.11
IEEE 802.11n_20	36	6.71	4.69	7.67	5.85
	40	8.27	6.71	8.33	6.81
	48	7.17	5.21	6.4	4.37
IEEE 802.11n_40	38	8.66	7.35	8.04	6.37
	46	7.12	5.15	6.53	4.50
IEEE 802.11ac_20	36	7.5	5.62	8.53	7.13
	40	7.15	5.19	7.38	5.47
	48	7.07	5.09	6.38	4.35
IEEE 802.11ac_40	38	6.75	4.73	7.1	5.13
	46	7.26	5.32	6.55	4.52
IEEE 802.11ac_80	42	6.95	4.95	6.99	5.00

5GWIFI(U-NII-2A and U-NII-2C):

Mode	Channel	ANT1 Output Power (dBm)	ANT1 Output Power (mW)	ANT2 Output Power (dBm)	ANT2 Output Power (mW)
IEEE 802.11a	52	6.87	4.86	6.89	4.89
	60	7.47	5.58	8.01	6.32

	64	8.55	7.16	7.27	5.33
	100	9.02	7.98	7.53	5.66
	116	6.8	4.79	7.86	6.11
	140	6.92	4.92	6.35	4.32
IEEE 802.11n_20	52	8.32	6.79	7.06	5.08
	60	8.57	7.19	7.25	5.31
	64	5.67	3.69	6.85	4.84
	100	8.9	7.76	8.01	6.32
	116	8.62	7.28	7.77	5.98
	140	6.61	4.58	6.28	4.25
IEEE 802.11n_40	54	9.19	8.30	8.1	6.46
	62	8.34	6.82	7.66	5.83
	110	8.88	7.73	8.19	6.59
	134	6.56	4.53	8	6.31
IEEE 802.11ac_20	52	6.48	4.45	7.86	6.11
	60	7.95	6.24	6.31	4.28
	64	8.41	6.93	8.15	6.53
	100	8.7	7.41	8.96	7.87
	116	8.42	6.95	7.15	5.19
	140	6.44	4.41	7.48	5.60
IEEE 802.11ac_40	54	7.45	5.56	6.51	4.48
	62	8.35	6.84	7.43	5.53
	110	7.81	6.04	7.13	5.16
	134	7.44	5.55	8.02	6.34
IEEE 802.11ac_80	58	7.87	6.12	6.62	4.59
	106	7.93	6.21	8.51	7.10
	122	7.14	5.18	6.72	4.70

5GWIFI(U-NII-3):

Mode	Channel	ANT1 Output Power (dBm)	ANT1 Output Power (mW)	ANT2 Output Power (dBm)	ANT2 Output Power (mW)
IEEE 802.11a	149	7.08	5.11	6.71	4.69
	157	6.87	4.86	6.7	4.68
	165	7.11	5.14	7.43	5.53
IEEE 802.11n_20	149	7.42	5.52	7.01	5.02
	157	7.66	5.83	10.06	10.14
	165	8.24	6.67	7.34	5.42
IEEE	151	7.92	6.19	8.38	6.89

802.11n_40	159	8.7	7.41	7.27	5.33
IEEE 802.11ac_20	149	7.57	5.71	7.45	5.56
	157	7.26	5.32	8.1	6.46
	165	7.83	6.07	8.63	7.29
IEEE 802.11ac_40	151	7.73	5.93	8.34	6.82
	159	7.94	6.22	8.78	7.55
IEEE 802.11ac_80	155	6.77	4.75	7.3	5.37

LTE :

BAND	ANT1 Output Power (dBm)	ANT1 Output Power (mW)	ANT2 Output Power (dBm)	ANT2 Output Power (mW)	ANT3 Output Power (dBm)	ANT3 Output Power (mW)
5	23.50	223.87	23.28	212.81	23.31	214.29
7	24.98	314.77	24.71	295.80	25.66	368.13

Manufacturing Tolerance

2.4GWIFI:

WIFI ANT1:

IEEE 802.11b			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	7	8	8
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11g			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	8	8	9
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n_20			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	8	7	8
Tolerance $\pm$ (dB)	1.0	1.0	1.0

WIFI ANT2:

IEEE 802.11b			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	7	8	8
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11g			
Channel	Channel 1	Channel 6	Channel 11

Target (dBm)	8	8	8
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n_20			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	8	8	8
Tolerance $\pm$ (dB)	1.0	1.0	1.0

5GWIFI(U-NII-1):

WIFI ANT1:

IEEE 802.11b			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	6	6	8
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n_20			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	6	8	7
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n_40			
Channel	Channel 38	Channel 46	
Target (dBm)	8	7	
Tolerance $\pm$ (dB)	1.0	1.0	
IEEE 802.11ac_20			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	7	7	7
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ac_40			
Channel	Channel 38	Channel 46	
Target (dBm)	6	7	
Tolerance $\pm$ (dB)	1.0	1.0	
IEEE 802.11ac_80			
Channel	Channel 42		
Target (dBm)	6		
Tolerance $\pm$ (dB)	1.0		

WIFI ANT2:

IEEE 802.11b			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	7	6	7

Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n_20			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	7	8	6
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n_40			
Channel	Channel 38	Channel 46	
Target (dBm)	8	6	
Tolerance ±(dB)	1.0	1.0	
IEEE 802.11ac_20			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	8	7	6
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac_40			
Channel	Channel 38	Channel 46	
Target (dBm)	7	6	
Tolerance ±(dB)	1.0	1.0	
IEEE 802.11ac_80			
Channel	Channel 42		
Target (dBm)	6		
Tolerance ±(dB)	1.0		

5GWIFI(U-NII-2A and U-NII-2C):

WIFI ANT1:

IEEE 802.11a						
Channel	Channel 52	Channel 60	Channel 64	Channel 100	Channel 116	Channel 140
Target (dBm)	6	7	8	9	6	6
Tolerance $\pm$ (dB)	1.0	1.0	1.0	1.0	1.0	1.0

IEEE 802.11n_20						
Channel	Channel 52	Channel 60	Channel 64	Channel 100	Channel 116	Channel 140
Target (dBm)	8	8	5	8	8	6
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
IEEE 802.11n_40						
Channel	Channel 54	Channel 62	Channel 110		Channel 134	
Target (dBm)	9	8	8		6	
Tolerance ±(dB)	1.0	1.0	1.0		1.0	
IEEE 802.11ac_20						
Channel	Channel 52	Channel 60	Channel 64	Channel 100	Channel 116	Channel 140
Target (dBm)	6	7	8	8	8	6
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
IEEE 802.11ac_40						
Channel	Channel 54	Channel 62	Channel 110		Channel 134	
Target (dBm)	7	8	7		7	
Tolerance ±(dB)	1.0	1.0	1.0		1.0	
IEEE 802.11ac_80						
Channel	Channel 58			Channel 106	Channel 122	
Target (dBm)	7			7	7	
Tolerance ±(dB)	1.0			1.0	1.0	

WIFI ANT2:

IEEE 802.11a						
Channel	Channel 52	Channel 60	Channel 64	Channel 100	Channel 116	Channel 140

Target (dBm)	6	8	7	7	7	6
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
IEEE 802.11n_20						
Channel	Channel 52	Channel 60	Channel 64	Channel 100	Channel 116	Channel 140
Target (dBm)	7	7	6	8	7	6
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
IEEE 802.11n_40						
Channel	Channel 54	Channel 62	Channel 110	Channel 134		
Target (dBm)	8	7	8	8	8	
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	
IEEE 802.11ac_20						
Channel	Channel 52	Channel 60	Channel 64	Channel 100	Channel 116	Channel 140
Target (dBm)	7	6	8	8	7	7
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
IEEE 802.11ac_40						
Channel	Channel 54	Channel 62	Channel 110	Channel 134		
Target (dBm)	6	7	7	8		
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	
IEEE 802.11ac_80						
Channel	Channel 58			Channel 106	Channel 122	
Target (dBm)	6			8	6	
Tolerance ±(dB)	1.0			1.0	1.0	

5GWIFI(U-NII-3):

WIFI ANT1:

IEEE 802.11a			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	7	6	7
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n_20			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	7	7	8
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11n_40			
Channel	Channel 151	Channel 159	
Target (dBm)	7	8	
Tolerance ±(dB)	1.0	1.0	
IEEE 802.11ac_20			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	7	7	7
Tolerance ±(dB)	1.0	1.0	1.0
IEEE 802.11ac_40			
Channel	Channel 151	Channel 159	
Target (dBm)	7	7	
Tolerance ±(dB)	1.0	1.0	
IEEE 802.11ac_80			
Channel	Channel 155		
Target (dBm)	6		
Tolerance ±(dB)	1.0		

WIFI ANT2:

IEEE 802.11a			
Channel	Channel 149	Channel 157	Channel 165

Target (dBm)	6	6	7
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n_20			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	7	10	7
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n_40			
Channel	Channel 151	Channel 159	
Target (dBm)	8	7	
Tolerance $\pm$ (dB)	1.0	1.0	
IEEE 802.11ac_20			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	7	8	8
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ac_40			
Channel	Channel 151	Channel 159	
Target (dBm)	8	8	
Tolerance $\pm$ (dB)	1.0	1.0	
IEEE 802.11ac_80			
Channel	Channel 155		
Target (dBm)	7		
Tolerance $\pm$ (dB)	1.0		

2.4GWIFI MIMO(WIFI ANT1+WIFI ANT2)

IEEE 802.11n_20			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	10	10	10
Tolerance $\pm$ (dB)	1.0	1.0	1.0

5GWIFI(U-NII-1):

MIMO(WIFI ANT1+WIFI ANT2)

IEEE 802.11n_20			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	11	11	11
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n_40			
Channel	Channel 38	Channel 46	
Target (dBm)	10	10	
Tolerance $\pm$ (dB)	1.0	1.0	
IEEE 802.11ac_20			
Channel	Channel 36	Channel 40	Channel 48
Target (dBm)	10	10	10
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ac_40			
Channel	Channel 38	Channel 46	
Target (dBm)	10	10	
Tolerance $\pm$ (dB)	1.0	1.0	
IEEE 802.11ac_80			
Channel	Channel 42		
Target (dBm)	10		
Tolerance $\pm$ (dB)	1.0		

5GWIFI(U-NII-2A and U-NII-2C):

MIMO(WIFI ANT1+WIFI ANT2)

IEEE 802.11n_20						
Channel	Channel 52	Channel 60	Channel 64	Channel 100	Channel 116	Channel 140
Target (dBm)	10	10	9	11	11	9
Tolerance $\pm$ (dB)	1.0	1.0	1.0	1.0	1.0	1.0
IEEE 802.11n_40						
Channel	Channel 54	Channel 62	Channel 110		Channel 134	
Target (dBm)	11	11	11		10	
Tolerance $\pm$ (dB)	1.0	1.0	1.0		1.0	

IEEE 802.11ac_20						
Channel	Channel 52	Channel 60	Channel 64	Channel 100	Channel 116	Channel 140
Target (dBm)	10	10	11	11	10	10
Tolerance $\pm$ (dB)	1.0	1.0	1.0	1.0	1.0	1.0
IEEE 802.11ac_40						
Channel	Channel 54		Channel 62	Channel 110		Channel 134
Target (dBm)	10		10	10		10
Tolerance $\pm$ (dB)	1.0		1.0	1.0		1.0
IEEE 802.11ac_80						
Channel		Channel 58		Channel 106		Channel 122
Target (dBm)		10		11		10
Tolerance $\pm$ (dB)		1.0		1.0		1.0

5GWIFI(U-NII-3):
MIMO(WIFI ANT1+WIFI ANT2)

IEEE 802.11n_20			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	10	12	10
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11n_40			
Channel	Channel 151	Channel 159	
Target (dBm)	11	11	
Tolerance $\pm$ (dB)	1.0	1.0	
IEEE 802.11ac_20			
Channel	Channel 149	Channel 157	Channel 165
Target (dBm)	10	10	11
Tolerance $\pm$ (dB)	1.0	1.0	1.0
IEEE 802.11ac_40			

Channel	Channel 151	Channel 159
Target (dBm)	11	11
Tolerance $\pm$ (dB)	1.0	1.0
IEEE 802.11ac_80		
Channel	Channel 155	
Target (dBm)	10	
Tolerance $\pm$ (dB)	1.0	

LTE Module1

Channel	BAND 5	BAND 7
Target (dBm)	23	25
Tolerance $\pm$ (dB)	1.0	1.0

LTE Module2

Channel	BAND 5	BAND 7
Target (dBm)	23	24
Tolerance $\pm$ (dB)	1.0	1.0

LTE Module3

Channel	BAND 5	BAND 7
Target (dBm)	23	25
Tolerance $\pm$ (dB)	1.0	1.0

6. Standalone MPE Result

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance, $r=20\text{cm}$, the RF power density can be obtained.

LTE

BAND/Mode		Tune Up (dBm)	Antenna Gain(dBi)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)	Result
LTE Module1	LTE Band 5	24	-2.46	0.02836	0.5498	PASS
	LTE Band 7	26	-4.51	0.02804	1.0000	PASS
LTE Module2	LTE Band 5	24	-2.21	0.03004	0.5498	PASS
	LTE Band 7	25	-3.58	0.02759	1.0000	PASS
LTE Module3	LTE Band 5	24	-2.84	0.02599	0.5498	PASS
	LTE Band 7	26	-3.60	0.03457	1.0000	PASS

2.4GWIFI

BAND/Mode		Tune Up (dBm)	Antenna Gain(dBi)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)	Result
802.11b	ANT1	9	-2.95	0.00080	1.0000	PASS
	ANT2	10	-3.12	0.00097	1.0000	PASS
802.11g	ANT1	9	-2.95	0.00080	1.0000	PASS
	ANT2	9	-3.12	0.00077	1.0000	PASS
802.11n (HT20)	ANT1+ ANT2	11	-0.02	0.00249	1.0000	PASS

5GWIFI(U-NII-1)

BAND/Mode		Tune Up (dBm)	Antenna Gain(dBi)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)	Result
802.11a	ANT1	8	-4.15	0.00048	1.0	PASS
	ANT2	8	-4.18	0.00048	1.0	PASS
802.11n (HT20)	ANT1+ ANT2	12	-1.15	0.00242	1.0	PASS
802.11n (HT40)	ANT1+ ANT2	11	-1.15	0.00192	1.0	PASS
802.11ac (HT20)	ANT1+ ANT2	11	-1.15	0.00192	1.0	PASS
802.11ac (HT40)	ANT1+ ANT2	11	-1.15	0.00192	1.0	PASS
802.11ac (HT80)	ANT1+ ANT2	11	-1.15	0.00192	1.0	PASS

5GWIFI(U-NII-2A)

BAND/Mode		Tune Up (dBm)	Antenna Gain(dBi)	MPE (mW/cm2)	MPE Limits (mW/cm2)	Result
802.11a	ANT1	9	-4.51	0.00056	1.0	PASS
	ANT2	9	-4.22	0.00060	1.0	PASS
802.11n (HT20)	ANT1+ ANT2	11	-1.35	0.00184	1.0	PASS
802.11n (HT40)	ANT1+ ANT2	12	-1.35	0.00231	1.0	PASS
802.11ac (HT20)	ANT1+ ANT2	12	-1.35	0.00231	1.0	PASS
802.11ac (HT40)	ANT1+ ANT2	11	-1.35	0.00184	1.0	PASS
802.11ac (HT80)	ANT1+ ANT2	11	-1.35	0.00184	1.0	PASS

5GWIFI(U-NII-2C)

BAND/Mode		Tune Up (dBm)	Antenna Gain(dBi)	MPE (mW/cm2)	MPE Limits (mW/cm2)	Result
802.11a	ANT1	10	-4.23	0.00075	1.0	PASS
	ANT2	8	-4.51	0.00044	1.0	PASS
802.11n (HT20)	ANT1+ ANT2	12	-1.36	0.00231	1.0	PASS
802.11n (HT40)	ANT1+ ANT2	12	-1.36	0.00231	1.0	PASS
802.11ac (HT20)	ANT1+ ANT2	12	-1.36	0.00231	1.0	PASS
802.11ac (HT40)	ANT1+ ANT2	11	-1.36	0.00183	1.0	PASS
802.11ac (HT80)	ANT1+ ANT2	12	-1.36	0.00231	1.0	PASS

5GWIFI(U-NII-3)

BAND/Mode		Tune Up (dBm)	Antenna Gain(dBi)	MPE (mW/cm2)	MPE Limits (mW/cm2)	Result
802.11a	ANT1	8	-4.28	0.00047	1.0	PASS
	ANT2	8	-4.55	0.00044	1.0	PASS
802.11n (HT20)	ANT1+ ANT2	13	-1.4	0.00288	1.0	PASS
802.11n (HT40)	ANT1+ ANT2	12	-1.4	0.00228	1.0	PASS
802.11ac (HT20)	ANT1+ ANT2	12	-1.4	0.00228	1.0	PASS
802.11ac (HT40)	ANT1+ ANT2	12	-1.4	0.00228	1.0	PASS
802.11ac (HT80)	ANT1+ ANT2	11	-1.4	0.00181	1.0	PASS

Remark:

1. Output power (Peak) including turn-up tolerance;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer.

7. Simultaneous Transmission MPE Evaluation

The EUT equip with Two 2.4GWIFI/5G WIFI antenna and Three LTE antenna. So, need consider simultaneous transmission;

According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;

$\sum \text{of MPE ratios} \leq 1.0$

simultaneous transmission operations :

scenario 1: 2.4GWIFI+LTE(Module1+Module2+Module3)

scenario 2: 5GWIFI+LTE(Module1+Module2+Module3)

2.4GWIFI MPE	5GWIFI MPE	LTE BAND5 MPE			LTE BAND7 MPE			$\sum$ MPE ratios	Limit	Results
ANT1+ANT2	ANT1+ANT2	Module1	Module2	Module3	Module1	Module2	Module3			
0.00249	/	0.02836	0.03004	0.02599	/	/	/	0.0869	1.0	Pass
/	0.00288	0.02836	0.03004	0.02599	/	/	/	0.0873	1.0	Pass
0.00249	/	/	/	/	0.02804	0.02759	0.03457	0.0927	1.0	Pass
/	0.00288	/	/	/	0.02804	0.02759	0.03457	0.0931	1.0	Pass
0.00249	/	0.02836	/	0.02599	/	0.02759	/	0.0844	1.0	Pass
/	0.00288	0.02836	/	0.02599	/	0.02759	/	0.0848	1.0	Pass
0.00249	/	0.02836	0.03004	/	/	/	0.03457	0.0955	1.0	Pass
/	0.00288	0.02836	0.03004	/	/	/	0.03457	0.0959	1.0	Pass
0.00249	/	/	0.03004	0.02599	0.02804	/	/	0.0866	1.0	Pass
/	0.00288	0.02836	0.03004	/	/	/	0.03457	0.0959	1.0	Pass

Note: MPE ratios= MPE(mW/cm²)/MPE Limits(mW/cm²)

8. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----End of the report-----