CE RF Exposure Report

Project No.	:	2405G097
Equipment	:	Projector
Brand Name	:	XGIMI
Test Model	:	XN13A
Series Model	:	N/A
Applicant	:	XGIMI Technology Co., Ltd.
Address	:	Building No.4, Zone A, No.1129, Shijicheng Road, Chengdu High-tech Zone, Sichuan Pilot Free Trade Zone, China
Manufacturer	:	XGIMI Technology Co., Ltd.
Address	:	Building No.4, Zone A, No.1129, Shijicheng Road, Chengdu High-tech Zone, Sichuan Pilot Free Trade Zone, China
Factory	:	Yibin XGIMI Optoelectronic Co., Ltd.
Address	:	No. 2, West Section 4, Changjiang North Road, Lingang Economic Development Zone, Yibin City, Sichuan P.R. China
Date of Receipt	:	May 31, 2024
Date of Test	:	Jun. 06, 2024 ~ Jul. 05, 2024
Issued Date	:	Jul. 19, 2024
Report Version	:	R00
Test Sample	:	Engineering Sample No.: SSL2024053136
Standard(s)	:	EN 50665:2017 EN IEC 62311:2020

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-ETSP-7-2405G097	R00	Original Report.	Jul. 19, 2024	Valid

1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

Equipment	Projector	
Brand Name	XGIMI	
Test Model	XN13A	
Series Model	N/A	
Model Difference(s)	N/A	
Hardware Version	V06	
Software Version	V0.0.75	
Power Source	DC voltage supplied from AC adapter. Model: S065ARV2000325	
Power Rating	I/P: 100-240V~ 50/60Hz 1.8A Max O/P: 5.0V⎓3.0A 15.0W or 9.0V⎓3.0A 27.0W or 12.0V⎓3.0A 36.0W or 15.0V⎓3.0A 45.0W or 20.0V⎓3.25A 65.0W	
Product Description _BT	Operation Frequency	2402 MHz ~ 2480 MHz
	Modulation Type	GFSK,π/4-DQPSK,8-DPSK
	Modulation Technology	FHSS
	Transfer Rate	1Mbps, 2Mbps, 3Mbps
	Max. e.i.r.p.	1Mbps: 7.16 dBm (5.20 mW) 2Mbps: 7.05 dBm (5.07 mW) 3Mbps: 7.61 dBm (5.77 mW)
Product Description _LE	Operation Frequency	2402 MHz ~ 2480 MHz
	Modulation Type	GFSK
	Bit Rate of Transmitter	1Mbps, 2Mbps
	Max. e.i.r.p.	1Mbps: 7.88 dBm (6.14 mW) 2Mbps: 7.86 dBm (6.11 mW)
Product Description _2.4GHz	Operation Frequency	2412 MHz ~ 2462 MHz
	Modulation Technology	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n: OFDM
	Bit Rate of Transmitter	IEEE 802.11b: 11/5.5/2/1 Mbps IEEE 802.11g: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 300 Mbps
	Max. e.i.r.p.	IEEE 802.11b: 17.80 dBm (60.26 mW) IEEE 802.11g: 19.80 dBm (95.50 mW) IEEE 802.11n(HT20): 19.51 dBm (89.33 mW) IEEE 802.11n(HT40): 19.66 dBm (92.47 mW)

Product Description _5GHz	Operation Frequency Band(s)	5150MHz ~ 5250MHz 5250MHz ~ 5350MHz 5470MHz ~ 5725MHz 5725MHz ~ 5850MHz
	Modulation Technology	IEEE 802.11a/n/ac: OFDM
	Bit Rate of Transmitter	IEEE 802.11a: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 300 Mbps IEEE 802.11ac: up to 866.7 Mbps
	Max. e.i.r.p._Band 1-3	IEEE 802.11a: 19.52 dBm (89.54 mW) IEEE 802.11n(HT20): 20.83 dBm (121.06 mW) IEEE 802.11n(HT40): 22.26 dBm (168.27 mW) IEEE 802.11ac(VHT20): 21.42 dBm (138.68 mW) IEEE 802.11ac(VHT40): 22.79 dBm (190.11 mW) IEEE 802.11ac(VHT80): 22.84 dBm (192.31 mW)
	Max. e.i.r.p._Band 4	IEEE 802.11a: 13.81 dBm (24.04 mW) IEEE 802.11n(HT20): 13.89 dBm (24.49 mW) IEEE 802.11n(HT40): 13.32 dBm (21.48 mW) IEEE 802.11ac(VHT20): 13.95 dBm (24.83 mW) IEEE 802.11ac(VHT40): 13.76 dBm (23.77 mW) IEEE 802.11ac(VHT80): 13.94 dBm (24.77 mW)

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:
   For BT:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

For LE:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

For 2.4GHz:

CH01 – CH11 for IEEE 802.11b,IEEE 802.11g,IEEE 802.11n(HT20) CH03 – CH09 for IEEE 802.11n(HT40)					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	06	2437	11	2462
02	2417	07	2442		
03	2422	08	2447		
04	2427	09	2452		
05	2432	10	2457		

For 5GHz:

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
Band 1		Band 1		Band 1	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
Band 2		Band 2		Band 2	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	54	5270	58	5290
56	5280	62	5310		
60	5300				
64	5320				

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
Band 3		Band 3		Band 3	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510	106	5530
104	5520	110	5550	122	5610
108	5540	118	5590		
112	5560	126	5630		
116	5580	134	5670		
120	5600				
124	5620				
128	5640				
132	5660				
136	5680				
140	5700				

IEEE 802.11a IEEE 802.11n(HT20) IEEE 802.11ac(VHT20)		IEEE 802.11n(HT40) IEEE 802.11ac(VHT40)		IEEE 802.11ac(VHT80)	
Band 4		Band 4		Band 4	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				
165	5825				

3. Table for Filed Antenna:

For BT:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ZTX	N/A	FPC	N/A	2.77

Note:
The antenna gain is provided by the manufacturer.

For 2.4GHz:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ZTX	N/A	FPC	N/A	3.70
2	ZTX	N/A	FPC	N/A	4.15

Note:
(1) This EUT supports CDD. Physically, the EUT provides two completed transmitters and receivers (2T2R).
(2) The antenna gain is provided by the manufacturer.

For 5GHz:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	ZTX	N/A	FPC	N/A	4.30
2	ZTX	N/A	FPC	N/A	5.99

Note:
(1) This EUT supports CDD. Physically, the EUT provides two completed transmitters and receivers (2T2R).
(2) The antenna gain is provided by the manufacturer.

4. The worst case for 1TX/2TX as follow:

For 2.4GHz:

Operating Mode / TX Mode	1TX	2TX
IEEE 802.11b	V (Ant. 1)	-
IEEE 802.11g	V (Ant. 1)	-
IEEE 802.11n(HT20)	-	V (Ant. 1+Ant. 2)
IEEE 802.11n(HT40)	-	V (Ant. 1+Ant. 2)

For 5GHz:

Operating Mode / TX Mode	1TX	2TX
IEEE 802.11a	V (Ant. 1)	-
IEEE 802.11n(HT20)	-	V (Ant. 1+Ant. 2)
IEEE 802.11n(HT40)	-	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT20)	-	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT40)	-	V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT80)	-	V (Ant. 1+Ant. 2)

2. MAXIMUM PERMISSIBLE EXPOSURE

2.1 APPLICABLE STANDARD

According to its specifications, the EUT must comply with the requirements of the following standards:

EN 50665 - Generic standard for assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz).

EN IEC 62311 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz to 300 GHz)

1 LIMIT

Council Recommendation 1999/519/EC Annex III
Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density S_{eq} (W/m²)
0-1 Hz	—	$3,2 \times 10^4$	4×10^4	—
1-8 Hz	10 000	$3,2 \times 10^4/f^2$	$4 \times 10^4/f^2$	—
8-25 Hz	10 000	4 000/f	5 000/f	—
0,025-0,8 kHz	250/f	4/f	5/f	—
0,8-3 kHz	250/f	5	6,25	—
3-150 kHz	87	5	6,25	—
0,15-1 MHz	87	0,73/f	0,92/f	—
1-10 MHz	$87/f^{1/2}$	0,73/f	0,92/f	—
10-400 MHz	28	0,073	0,092	2
400-2 000 MHz	$1,375\ f^{1/2}$	$0,0037\ f^{1/2}$	$0,0046\ f^{1/2}$	f/200
2-300 GHz	61	0,16	0,20	10

2 MPE Calculation Method

$E\ (V/m) = (30*P*G)^{0.5}/d$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

d=0.2m, as the calculated distance.

3. TEST RESULTS

For BT:

Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Electric Field (V/m)	Limit of Electric Field (V/m)	Result
7.61	5.77	2.080	61	Pass

For LE:

Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Electric Field (V/m)	Limit of Electric Field (V/m)	Result
7.88	6.14	2.146	61	Pass

For 2.4GHz:

Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Electric Field (V/m)	Limit of Electric Field (V/m)	Result
19.80	95.50	8.463	61	Pass

For 5GHz:

Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Electric Field (V/m)	Limit of Electric Field (V/m)	Result
22.84	192.31	12.010	61	Pass

Conclusion:

Both of the BT/LE and 2.4GHz/5GHz device can transmit simultaneously, the formula of calculated the exposure is:

$(CEF1 / LEF1)^2 + (CEF2 / LEF2)^2 + ……etc. < 1$
CEF = Calculation E-Field Strength
LEF = Limit of E-Field Strength

Therefore, the calculation of this situation is $(2.146 / 61)^2 + (12.010 / 61)^2 = 0.04$, which is less than the “1” limit.

RF exposure assessment has been performed above to prove that this unit will not generate the harmful EM emission above the reference level as specified in EC Council Recommendation (1999/519/EC).

End of Test Report