



FCC 47 CFR MPE REPORT

BYD Auto Industry Company Limited

In-vehicle Multimedia Host

Model Number: MTED03

FCC ID: SD4-MTED03

Applicant:	BYD Auto Industry Company Limited
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Maximum Permissible Exposure

1. Applicable Standards

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 and KDB 447498 D01 v06 this device has been defined as a mobile device whereby a distance of 0.3m normally can be maintained between the user and the device.

1.1. Limits for Maximum Permissible Exposure (MPE)

(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
1500-10000			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
1500-10000			1.0	30

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

1.2. MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

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)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.3m, as well as the gain of the used antenna, the RF power density can be obtained

2. Conducted Power Result

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
GFSK	2402	5.01	3.170
	2441	5.01	3.170
	2480	5.39	3.459
$\pi/4$ -DQPSK	2402	7.51	5.636
	2441	7.53	5.662
	2480	7.57	5.715
8-DPSK	2402	7.85	6.095
	2441	7.87	6.124
	2480	8.42	6.950
BLE 1M	2402	4.83	3.041
	2440	4.91	3.097
	2480	5.13	3.258
BLE 2M	2402	4.92	3.105
	2440	4.88	3.076
	2480	5.12	3.251
IEEE 802.11b	2412	13.26	21.184
	2437	13.6	22.909
	2462	13.52	22.491
IEEE 802.11g	2412	16.44	44.055
	2437	17	50.119
	2462	16.6	45.709
IEEE 802.11n HT20	2412	15.95	39.355
	2437	16.63	46.026
	2462	16.17	41.400
IEEE 802.11ax HE20	2412	17.46	55.719
	2437	18.16	65.464
	2462	17.25	53.088
IEEE 802.11be EHT20	2412	17.41	55.081
	2437	18.17	65.615
	2462	17.43	55.335
IEEE 802.11a	5180	15.08	32.211
	5200	15.33	34.119
	5240	15.08	32.211
	5260	14.89	30.832
	5300	14.34	27.164

	5320	14.23	26.485
	5500	14.13	25.882
	5580	13.89	24.491
	5700	13.26	21.184
	5745	13.11	20.464
	5785	13.47	22.233
	5825	13.12	20.512
IEEE 802.11n HT20	5180	14.66	29.242
	5200	14.73	29.717
	5240	14.18	26.182
	5260	14.18	26.182
	5300	13.71	23.496
	5320	13.61	22.961
	5500	13.36	21.677
	5580	12.32	17.061
	5700	12.16	16.444
	5745	11.84	15.276
	5785	10.67	11.668
	5825	12.71	18.664
IEEE 802.11ac VHT20	5180	14.29	26.853
	5200	14.53	28.379
	5240	13.88	24.434
	5260	13.68	23.335
	5300	13.33	21.528
	5320	13.16	20.701
	5500	14.92	31.046
	5580	13.95	24.831
	5700	13.76	23.768
	5745	13.44	22.080
	5785	12.92	19.588
	5825	12.81	19.099
IEEE 802.11ax HE20	5180	14.63	29.040
	5200	14.42	27.669
	5240	14.23	26.485
	5260	13.81	24.044
	5300	13.58	22.803
	5320	13.31	21.429
	5500	15.05	31.989
	5580	14.1	25.704

	5700	13.74	23.659
	5745	13.04	20.137
	5785	12.75	18.836
	5825	12.86	19.320
IEEE 802.11be EHT20	5180	14.97	31.405
	5200	15.34	34.198
	5240	14.87	30.690
	5260	14.71	29.580
	5300	14.56	28.576
	5320	14.2	26.303
	5500	14.42	27.669
	5580	13.85	24.266
	5700	13.4	21.878
	5745	13.58	22.803
	5785	13.37	21.727
	5825	13.36	21.677
IEEE 802.11n HT40	5190	14.96	31.333
	5230	14.39	27.479
	5270	14.05	25.410
	5310	13.8	23.988
	5510	12.33	17.100
	5590	14.73	29.717
	5670	14.15	26.002
	5755	13.91	24.604
	5795	12.93	19.634
IEEE 802.11ac VHT40	5190	14.68	29.376
	5230	14.21	26.363
	5270	13.84	24.210
	5310	13.6	22.909
	5510	14.77	29.992
	5590	13.89	24.491
	5670	13.72	23.550
	5755	12.99	19.907
	5795	12.6	18.197
IEEE 802.11ax HE40	5190	14.91	30.974
	5230	14.69	29.444
	5270	14.1	25.704
	5310	12.4	17.378
	5510	15.91	38.994

	5590	16.4	43.652
	5670	15.8	38.019
	5755	15.9	38.905
	5795	15.96	39.446
IEEE 802.11be EHT40	5190	15.55	35.892
	5230	15.51	35.563
	5270	15.15	32.734
	5310	15.19	33.037
	5510	14.54	28.445
	5590	14.2	26.303
	5670	16.58	45.499
	5755	16.95	49.545
	5795	16.83	48.195
IEEE 802.11ac VHT80	5210	14.52	28.314
	5290	13.55	22.646
	5530	14.48	28.054
	5610	14.07	25.527
	5775	12.77	18.923
IEEE 802.11ax HE80	5210	12.59	18.155
	5290	14.99	31.550
	5530	17.25	53.088
	5610	17.03	50.466
	5775	16.61	45.814
IEEE 802.11be EHT80	5210	15.57	36.058
	5290	14.9	30.903
	5530	14.39	27.479
	5610	13.92	24.660
	5775	13.64	23.121
IEEE 802.11ac VHT160	5250	14.23	26.485
	5570	16.13	41.020
IEEE 802.11ax HE160	5250	14.49	28.119
	5570	14.44	27.797
IEEE 802.11be EHT160	5250	13.52	22.491
	5570	14.4	27.542

Mode	Peak output power (dBm)	Peak output power(mW)
GSM 850(824-849MHz)	32.55	1798.871
GPRS 850(824-849MHz)	32.88	1940.886
EGPRS 850(824-849MHz)	27.44	554.626
GSM 1900(1850-1910MHz)	30.00	1000.000
GPRS 1900(1850-1910MHz)	30.07	1016.249
EGPRS 1900(1850-1910MHz)	26.02	399.945
WCDMA Band 2(1850-1910MHz)	23.72	235.505
WCDMA Band 4(1710-1755MHz)	23.20	208.930
WCDMA Band 5(824-849MHz)	24.78	300.608
LTE Band 2(1850-1910MHz)	23.76	237.684
LTE Band 4(1710-1755MHz)	23.87	243.781
LTE Band 5(824-849MHz)	23.71	234.963
LTE Band 7(2500-2570MHz)	23.73	236.048
LTE Band 12(699-716MHz)	23.80	239.883
LTE Band 13(777-787MHz)	24.27	267.301
LTE Band 14(788-798MHz)	24.35	272.270
LTE Band 17(704-716MHz)	23.71	234.963
LTE Band 18(815-830MHz)	23.96	248.886
LTE Band 19(830-845MHz)	23.74	236.592
LTE Band 25(1850-1915MHz)	23.91	246.037
LTE Band 26(814-849MHz)	24.03	252.930
LTE Band 38(2570-2620MHz)	23.65	231.739
LTE Band 40(2305-2315MHz)	13.69	23.388
LTE Band 40(2350-2360MHz)	16.03	40.087
LTE Band 41(2496-2690MHz)	23.73	236.048
LTE Band 42(3400-3600MHz)	22.71	186.638
LTE Band 48(3550-3700MHz)	11.84	15.276
LTE Band 66(1710-1780MHz)	23.92	246.604
LTE Band 71(663-698MHz)	23.51	224.388
NR n2(1850-1910MHz)	21.87	153.815
NR n5(824-849MHz)	23.34	215.774
NR n7(2500-2570MHz)	21.19	131.522
NR n38(2570-2620MHz)	20.95	124.451
NR n41(2496-2690MHz)	21.12	129.420
NR n66(1710-1780MHz)	22.12	162.930
NR n71(663-698MHz)	21.92	155.597
NR n77(3300-4200MHz)	21.89	154.525
NR n78(3300-3800MHz)	21.97	157.398

3. Calculated Result and Limit

Mode	Peak output power (dBm)	Target power (dBm)	MAX Target power (dBm)	Antenna gain		Power Density (S) (mW /cm ²)	Limited of Power Density (S) (mW /cm ²)	Ratio	Test Result
				(dBi)	(Linear)				
2.4G Band									
GFSK	5.39	5±1	6	2.93	1.963	0.001	1	0.001	Complies
π/4-DQPSK	7.57	7±1	8	2.93	1.963	0.001	1	0.001	Complies
8-DPSK	8.42	8±1	9	2.93	1.963	0.001	1	0.001	Complies
BLE 1M	5.13	5±1	6	2.93	1.963	0.001	1	0.001	Complies
BLE 2M	5.12	5±1	6	2.93	1.963	0.001	1	0.001	Complies
IEEE 802.11b	13.6	13±1	14	2.93	1.963	0.004	1	0.004	Complies
IEEE 802.11g	17	17±1	18	2.93	1.963	0.011	1	0.011	Complies
IEEE 802.11n HT20	16.63	16±1	17	2.93	1.963	0.009	1	0.009	Complies
IEEE 802.11ax HE20	18.16	18±1	19	2.93	1.963	0.014	1	0.014	Complies
IEEE 802.11be EHT20	18.17	18±1	19	2.93	1.963	0.014	1	0.014	Complies
5G Band									
IEEE 802.11a	15.33	15±1	16	2.2	1.660	0.006	1	0.006	Complies
IEEE 802.11n HT20	14.73	14±1	15	2.2	1.660	0.005	1	0.005	Complies
IEEE802.11ac VHT20	14.92	14±1	15	2.2	1.660	0.005	1	0.005	Complies
IEEE802.11ax HE20	15.05	15±1	16	2.2	1.660	0.006	1	0.006	Complies
IEEE802.11be EHT20	15.34	15±1	16	2.2	1.660	0.006	1	0.006	Complies
IEEE 802.11n HT40	14.96	14±1	15	2.2	1.660	0.005	1	0.005	Complies
IEEE802.11ac VHT40	14.77	14±1	15	2.2	1.660	0.005	1	0.005	Complies
IEEE 802.11ax HE40	16.4	16±1	17	2.2	1.660	0.007	1	0.007	Complies
IEEE802.11be EHT40	16.95	16±1	17	2.2	1.660	0.007	1	0.007	Complies
IEEE802.11ac VHT80	14.52	14±1	15	2.2	1.660	0.005	1	0.005	Complies
IEEE802.11ax HE80	17.25	17±1	18	2.2	1.660	0.021	1	0.021	Complies
IEEE802.11be EHT80	15.57	15±1	16	2.2	1.660	0.006	1	0.006	Complies
IEEE802.11ac VHT160	16.13	16±1	17	2.2	1.660	0.007	1	0.007	Complies
IEEE802.11ax HE160	14.49	14±1	15	2.2	1.660	0.005	1	0.005	Complies
IEEE802.11be EHT160	14.4	14±1	15	2.2	1.660	0.005	1	0.005	Complies
GSM 850(824-849MHz)	32.55	32±1	33	0.72	1.180	0.208	0.549	0.379	Complies

GPRS 850(824-849MHz)	32.88	32±1	33	0.72	1.180	0.208	0.549	0.379	Complies
EGPRS 850(824-849MHz)	27.44	27±1	28	0.72	1.180	0.066	0.549	0.120	Complies
GSM 1900(1850-1910MHz)	30	30±1	31	1.34	1.361	0.152	1	0.152	Complies
GPRS 1900(1850-1910MHz)	30.07	30±1	31	1.34	1.361	0.152	1	0.152	Complies
EGPRS 1900(1850-1910MHz)	26.02	26±1	27	1.34	1.361	0.060	1	0.060	Complies
WCDMA Band 2(1850-1910MHz)	23.72	23±1	24	1.34	1.361	0.030	1	0.030	Complies
WCDMA Band 4(1710-1755MHz)	23.2	23±1	24	1.45	1.396	0.031	1	0.031	Complies
WCDMA Band 5(824-849MHz)	24.78	24±1	25	0.72	1.180	0.033	0.549	0.060	Complies
LTE Band 2(1850-1910MHz)	23.76	23±1	24	1.34	1.361	0.030	1	0.030	Complies
LTE Band 4(1710-1755MHz)	23.87	23±1	24	1.45	1.396	0.031	1	0.031	Complies
LTE Band 5(824-849MHz)	23.71	23±1	24	0.72	1.180	0.026	0.549	0.047	Complies
LTE Band 7(2500-2570MHz)	23.73	23±1	24	2.74	1.879	0.042	1	0.042	Complies
LTE Band 12(699-716MHz)	23.80	23±1	24	-0.59	0.873	0.019	0.466	0.041	Complies
LTE Band 13(777-787MHz)	24.27	24±1	25	-0.76	0.839	0.023	0.518	0.044	Complies
LTE Band 14(788-798MHz)	24.35	24±1	25	-0.48	0.895	0.025	0.525	0.048	Complies
LTE Band 17(704-716MHz)	23.71	23±1	24	-0.59	0.873	0.019	0.469	0.041	Complies
LTE Band 18(815-830MHz)	23.96	23±1	24	0.8	1.202	0.027	0.543	0.050	Complies
LTE Band 19(830-845MHz)	23.74	23±1	24	0.72	1.180	0.026	0.553	0.047	Complies
LTE Band 25(1850-1915MHz)	23.91	23±1	24	1.34	1.361	0.030	1	0.030	Complies
LTE Band 26(814-849MHz)	24.03	24±1	25	0.8	1.202	0.034	0.543	0.063	Complies
LTE Band 38(2570-2620MHz)	23.65	23±1	24	2.73	1.875	0.042	1	0.042	Complies
LTE Band 40(2305-2315MHz)	13.69	13±1	14	2.17	1.648	0.004	1	0.004	Complies
LTE Band 40(2350-2360MHz)	16.03	16±1	17	2.17	1.648	0.007	1	0.007	Complies
LTE Band 41(2496-2690MHz)	23.73	23±1	24	2.74	1.879	0.042	1	0.042	Complies
LTE Band 42(3400-3600MHz)	22.71	22±1	23	2.53	1.791	0.032	1	0.032	Complies

LTE Band 48(3550-3700MHz)	11.84	11±1	12	2.55	1.799	0.003	1	0.003	Complies
LTE Band 66(1710-1780MHz)	23.92	23±1	24	1.82	1.521	0.034	1	0.034	Complies
LTE Band 71(663-698MHz)	23.51	23±1	24	0.09	1.021	0.023	0.442	0.052	Complies
NR n2(1850-1910MHz)	21.87	23±1	24	1.34	1.361	0.030	1	0.030	Complies
NR n5(824-849MHz)	23.34	23±1	24	0.72	1.180	0.026	0.549	0.047	Complies
NR n7(2500-2570MHz)	21.19	22±1	23	2.74	1.879	0.033	1	0.033	Complies
NR n38(2570-2620MHz)	20.95	22±1	23	2.73	1.875	0.033	1	0.033	Complies
NR n41(2496-2690MHz)	21.12	23±1	24	2.74	1.879	0.042	1	0.042	Complies
NR n66(1710-1780MHz)	22.12	23±1	24	1.82	1.521	0.034	1	0.034	Complies
NR n71(663-698MHz)	21.92	23±1	24	0.09	1.021	0.023	0.442	0.052	Complies
NR n77(3300-4200MHz)	21.89	21±1	22.000	2.810	1.910	0.060	1	0.060	Complies
NR n78(3300-3800MHz)	21.97	21 ±1	22.000	2.550	1.799	0.057	1	0.057	Complies

Simultaneous Transmission Mode (BT+BLE+WiFi+GSM/GPRS+WCDMA+LTE+NR)

Mode	Result	Simultaneous Transmissions Result	Simultaneous Transmissions Limit	Total Result
BT	0.001	0.401	1	Complies
WIFI	0.021			Complies
Cellular Network	0.379			Complies

End of Test Report