



RF EXPOSURE Test Report

Report No.: MTi220601010-01E4

Date of issue: 2022-08-24

Applicant: SHENZHEN ZHUOPAI ELECTRONIC
TECHNOLOGY CO., LTD

Product name: Tesla instrument display

Model(s): T3, T5

FCC ID: 2A7EP-T3

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>



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TEST RESULT CERTIFICATION	
Applicant's name	SHENZHEN ZHUOPAI ELECTRONIC TECHNOLOGY CO., LTD
Address	1001-1003, Floor 10, Building A9, Tianrui Industrial Park, No.35, Fuyuan Road, Xinhe Community, Fuhai Street, Baoan District, Shenzhen
Manufacturer's Name	SHENZHEN ZHUOPAI ELECTRONIC TECHNOLOGY CO., LTD
Address	1001-1003, Floor 10, Building A9, Tianrui Industrial Park, No.35, Fuyuan Road, Xinhe Community, Fuhai Street, Baoan District, Shenzhen
Product description	
Product name	Tesla instrument display
Trademark	N/A
Model Name	T3
Series Model	T5
Standards	N/A
Test procedure	KDB 447498 D01 v06
Date of Test	
Date (s) of performance of tests	2022-06-24 ~2022-08-24
Test Result	Pass

Testing Engineer

:

Cindy Qin

(Cindy Qin)

Technical Manager

:

Leon Chen

(Leon Chen)

Authorized Signatory

:

Tom Xue

(Tom Xue)



RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) 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
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

MPE Calculation Method

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

R = distance between observation point and center of the radiator in cm (20cm)

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.



Measurement Result

BT:

Operation Frequency: 2402-2480MHz,

Power density limited: 1mW/ cm²

2.4GWiFi:

Operation Frequency: WIFI 802.11b/g/n HT20: 2412-2462MHz,

802.11n HT40: 2422-2452MHz,

Power density limited: 1mW/ cm²

Antenna Type: FPC Antenna;

antenna gain: 3.96dBi

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(3.96/10)}=2.49$

BR+EDR:

Channel Freq. (MHz)	modulation	conducted power	Tune- up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power	Gain		(mW/cm2)	(mW/cm 2)	
				(dBm)	(mW)	(dBi)			Numer ic
2402	GFSK	7.78	8±1	9	7.943	3.96	2.49	0.0039	1
2441		10.3	10±1	11	12.589	3.96	2.49	0.0062	1
2480		10.76	10±1	11	12.589	3.96	2.49	0.0062	1
2402	π/4- DQPSK	7.97	8±1	9	7.943	3.96	2.49	0.0039	1
2441		9.47	10±1	11	12.589	3.96	2.49	0.0062	1
2480		10.33	10±1	11	12.589	3.96	2.49	0.0062	1
2402	8DPSK	8.36	9±1	10	10.000	3.96	2.49	0.0050	1
2441		9.9	9±1	10	10.000	3.96	2.49	0.0050	1
2480		10.65	10±1	11	12.589	3.96	2.49	0.0062	1

2.4GWiFi :

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm2)	(mW/cm2)
		Ant A	Ant A	(dBm)	(mW)	Numeric		
2412	802.11b	13.16	13±1	14	25.119	2.49	0.01244	1
2437		12.14	13±1	14	25.119	2.49	0.01244	1
2462		12.32	13±1	14	25.119	2.49	0.01244	1
2412	802.11g	12.65	13±1	14	25.119	2.49	0.01244	1
2437		12.58	13±1	14	25.119	2.49	0.01244	1
2462		12.30	13±1	14	25.119	2.49	0.01244	1
2412	802.11n H20	12.52	13±1	14	25.119	2.49	0.01244	1
2437		12.53	13±1	14	25.119	2.49	0.01244	1
2462		12.21	13±1	14	25.119	2.49	0.01244	1
2422	802.11n H40	12.18	13±1	14	25.119	2.49	0.01244	1
2437		12.07	13±1	14	25.119	2.49	0.01244	1
2452		12.24	13±1	14	25.119	2.49	0.01244	1

5GWiFi:

802.11a: 20 MHz

802.11n: 20 MHz, 40 MHz

802.11ac: 20 MHz, 40 MHz, 80MHz

Antenna Type: FPC Antenna;

Antenna gain: U-NII-1: 5.13dBi U-NII-3: 5.11dBi

R=20cm

 $mW=10^{(dBm/10)}$

 U-NII-1: antenna gain Numeric= $10^{(dBi/10)}=10^{(5.13/10)}=3.26$

 U-NII-3: antenna gain Numeric= $10^{(dBi/10)}=10^{(5.11/10)}=3.24$



5GWiFi:

UNII-1

Frequency (MHz)	Modulation mode	conduct ed power	Tune- up powe r	Max		Anten na	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
		Ant A	Ant A	(dBm)	(mW)	Numer ic		
		Ant A	Ant A	Ant A	Ant A	Ant A	Ant A	
5180	11a	12.777	13±1	14	25.119	3.26	0.01629	1
5200	11a	13.087	13±1	14	25.119	3.26	0.01629	1
5240	11a	12.547	13±1	14	25.119	3.26	0.01629	1
5180	11n (HT20)	12.904	13±1	14	25.119	3.26	0.01629	1
5200	11n (HT20)	12.314	13±1	14	25.119	3.26	0.01629	1
5240	11n (HT20)	12.844	13±1	14	25.119	3.26	0.01629	1
5190	11n (HT40)	13.303	13±1	14	25.119	3.26	0.01629	1
5230	11n (HT40)	12.763	13±1	14	25.119	3.26	0.01629	1
5180	11ac (HT20)	13.062	13±1	14	25.119	3.26	0.01629	1
5200	11ac (HT20)	12.832	13±1	14	25.119	3.26	0.01629	1
5240	11ac (HT20)	12.422	13±1	14	25.119	3.26	0.01629	1
5190	11ac (HT40)	13.545	13±1	14	25.119	3.26	0.01629	1
5230	11ac (HT40)	13.585	13±1	14	25.119	3.26	0.01629	1
5210	11ac (HT80)	14.374	14±1	15	31.623	3.26	0.02051	1

UNII-3

Freque ncy (MHz)	Modulation mode	conduct ed power	Tune- up powe r	Max		Anten na	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
		Ant A	Ant A	(dBm)	(mW)	Numer ic		
		Ant A	Ant A	Ant A	Ant A	Ant A	Ant A	
5745	11a	12.767	13±1	14	25.119	3.24	0.01619	1
5785	11a	12.487	13±1	14	25.119	3.24	0.01619	1
5825	11a	12.977	13±1	14	25.119	3.24	0.01619	1
5745	11n (HT20)	12.514	13±1	14	25.119	3.24	0.01619	1
5785	11n (HT20)	12.594	13±1	14	25.119	3.24	0.01619	1
5825	11n (HT20)	13.034	13±1	14	25.119	3.24	0.01619	1
5755	11n (HT40)	13.093	13±1	14	25.119	3.24	0.01619	1
5795	11n (HT40)	13.263	13±1	14	25.119	3.24	0.01619	1
5745	11ac (HT20)	12.482	13±1	14	25.119	3.24	0.01619	1
5785	11ac (HT20)	12.282	13±1	14	25.119	3.24	0.01619	1
5825	11ac (HT20)	12.882	13±1	14	25.119	3.24	0.01619	1
5755	11ac (HT40)	12.625	13±1	14	25.119	3.24	0.01619	1
5795	11ac (HT40)	13.055	13±1	14	25.119	3.24	0.01619	1
5775	11ac (HT80)	14.184	14±1	15	31.623	3.24	0.02038	1



Conclusion:

Transmitter simultaneously: $BT+WIFI=0.0062+0.02051=0.02671$

For the max result: $0.02671 \leq 1.0$ SAR, No SAR is required.

----END OF REPORT----