

RF Exposure Evaluation

FCC ID: 2AFPV-M1

1. Client Information

Applicant : Shenzhen Yuan Co., Ltd.
Address : 2308 Floor 23.Zhantao Technology Building, Minzhi Road, Minzhi Street ,Baoan District, Shenzhen City, China
Manufacturer : Shenzhen Yuan Co., Ltd.
Address : 2308 Floor 23.Zhantao Technology Building, Minzhi Road, Minzhi Street ,Baoan District, Shenzhen City, China

2. General Description of EUT

EUT Name	:	DLP LED Projector
Models No.	:	M1, M1BK, M1BL, M1R, M1Y, M1W, M1S+, M1MAX
Models Difference	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.
Product Description		Operation Frequency: WiFi 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz Bluetooth 2402~2480MHz
	Number of Channel:	WiFi 802.11b/g/n(HT20):11 channels 802.11n(HT40): 7 channels Bluetooth 79 Channels
	Max Peak Output Power:	WiFi 802.11b: 9.21dBm Bluetooth $\pi/4$ -DQPSK:7.345dBm
	Antenna Gain:	2.5 dBi Embedded Antenna
	Modulation Type:	WiFi: 802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK,QPSK,16QAM, 64QAM) Bluetooth: GFSK 1Mbps(1 Mbps) $\pi/4$ -DQPSK(2 Mbps) 8-DPSK(3 Mbps)
Power Supply	:	DC Voltage supplied from Host System by USB cable. DC power supplied by AC/DC Adapter. DC power by Li-ion Battery
Power Rating	:	DC 5.0V by USB cable. DC 3.7V Li-ion Battery. AC/DC Adapter: Input:100~240V, 0.4A, 50/60Hz Output:5V, 2A

TB-RF-074-1.0

Connecting I/O Port(S)	:	Please refer to the User's Manual
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Note:

More test information about the EUT please refer the RF Test Report.

SAR Test Exclusion Calculations

1. FCC: According to KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v05r02.

- (1) Clause 4.3: General SAR test reduction and exclusion guidance

- Sub clause 4.31: Standalone SAR test exclusion considerations

- 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6GHz at test separation distance ≤ 5 mm are determined by:

- $$\frac{[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation, mm})] * [\sqrt{f_{(\text{GHz})}}]}{\leq 3.0 \text{ for 1-g SAR}}$$

- $$\frac{[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation, mm})] * [\sqrt{f_{(\text{GHz})}}]}{\leq 7.5.0 \text{ for 10-g SAR}}$$

2. Calculation:

Test separation: 5mm						
WiFi Mode(802.11b)						
Frequency (GHz)	Conducted Power (dBm)	Ant Gain (dBi)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.412	9.21	2.5	±0.5	9.354	2.905	3.0
2.437	9.18	2.5	±0.5	9.290	2.900	3.0
2.462	9.16	2.5	±0.5	9.247	2.902	3.0
WiFi Mode(802.11g)						
Frequency (GHz)	Conducted Power (dBm)	Ant Gain (dBi)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.412	9.05	2.5	±0.5	9.016	2.800	3.0
2.437	9.11	2.5	±0.5	9.141	2.854	3.0
2.462	9.12	2.5	±0.5	9.162	2.875	3.0
WiFi Mode(802.11n(HT20))						
Frequency (GHz)	Conducted Power (dBm)	Ant Gain (dBi)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.412	8.96	2.5	±0.5	8.831	2.743	3.0
2.437	8.97	2.5	±0.5	8.851	2.763	3.0
2.462	9.02	2.5	±0.5	8.954	2.810	3.0
WiFi Mode(802.11n(HT40))						
Frequency (GHz)	Conducted Power (dBm)	Ant Gain (dBi)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.422	8.98	2.5	±0.5	8.872	2.761	3.0
2.437	8.94	2.5	±0.5	8.790	2.744	3.0
2.452	8.95	2.5	±0.5	8.810	2.759	3.0

Bluetooth Mode (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Ant Gain (dBi)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2402	4.394	2.5	± 0.5	3.086	0.957	3.0
2441	3.706	2.5	± 0.5	2.634	0.823	3.0
2480	6.535	2.5	± 0.5	5.052	1.591	3.0
Bluetooth Mode (π /4-DQPSK)						
Frequency (GHz)	Conducted Power (dBm)	Ant Gain (dBi)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2402	5.307	2.5	± 0.5	3.808	1.180	3.0
2441	4.548	2.5	± 0.5	3.197	0.999	3.0
2480	7.345	2.5	± 0.5	6.088	1.918	3.0
Bluetooth Mode (8-DPSK)						
Frequency (GHz)	Conducted Power (dBm)	Ant Gain (dBi)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	5.496	2.5	± 0.5	3.977	1.233	3.0
2.441	4.738	2.5	± 0.5	3.340	1.044	3.0
2.480	3.450	2.5	± 0.5	2.483	0.782	3.0

So standalone SAR measurements are not required.