

RF Exposure Evaluation

FCC ID: 2ANZF-TQL-111

1. Client Information

Applicant	:	Shenzhen TQL Technology Co., Ltd
Address	:	Room 1202C, Block D, CFG Building, Baoyuan Road, Xixiang, Bao'an District, Shenzhen City, China
Manufacturer	:	Shenzhen TQL Technology Co., Ltd
Address	:	Room 1202C, Block D, CFG Building, Baoyuan Road, Xixiang, Bao'an District, Shenzhen City, China

2. General Description of EUT

EUT Name	:	T-ONE Smartpen
Models No.	:	TQL-111 , TQL-111S , TQL-111W , TQL-111B , TQL-111G , TQL-111RG
Model Difference	:	All these models are identical in the same PCB layout and electrical circuit, the only difference is model name, appearance and color for commercial.
Product Description	Operation Frequency:	Bluetooth V4.2: 2402~2480 MHz
	RF Output Power:	Bluetooth: 1.654dBm(Max) BLE: -1.404 dBm(Max)
	Antenna Gain:	2dBi Chip Antenna
Power Rating	:	DC 5.0V 500mAh by USB. DC 3.7V by 260mAh Li-ion battery
Software Version	:	N/A
Hardware Version	:	N/A
Connecting I/O Port(S)	:	Please refer to the User's Manual

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 v06.

- (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:

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

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

2. Calculation:

Test separation: 5mm						
Bluetooth Mode (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	1.654	1±1	2	1.585	0.491	3.0
2.441	1.181	1±1	2	1.585	0.495	3.0
2.480	-0.021	0±1	1	1.259	0.397	3.0
Bluetooth Mode (π/4-DQPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	1.589	1±1	2	1.585	0.491	3.0
2.441	1.166	1±1	2	1.585	0.495	3.0
2.480	-0.065	0±1	1	1.259	0.397	3.0
Bluetooth Mode (8-DPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	1.654	1±1	2	1.585	0.491	3.0
2.442	1.181	1±1	2	1.585	0.495	3.0
2.480	-0.021	0±1	1	1.259	0.397	3.0

BLE Mode (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dbm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-3.070	-2±1	-1	0.790	0.245	3.0
2.442	-1.653	-2±1	-1	0.790	0.247	3.0
2.480	-1.404	-2±1	-1	0.790	0.249	3.0

Test separation: 5mm	
The worst RF Exposure Evaluation	
Worst Calculation Value	Threshold Value
0.495	3.0

The worst RF Exposure Evaluation is **0.495 / cm² < limit 3.0**, So standalone SAR measurements are not required.

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