Dongguan Nore Testing Center Co., Ltd.
Report No.: NTC1507099F/NTC1507099F-1/NTC1507099F-2
FCC ID: 2AAQZMID773-MTK27

RF EXPOSURE EVALUATION EUT Specification

EUT	MID				
Frequency band	⊠WLAN: 2.412GHz ~ 2.462GHz				
(Operating)					
(operating)	WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz				
	□WLAN: 5.745GHz ~ 5825GHz				
	⊠Others(Bluetooth: 2.402GHz ~ 2.480GHz)				
Device category	⊠Portable (<20cm separation)				
	☐Mobile (>20cm separation)				
	□Others				
Antenna diversity	⊠Single antenna				
	☐Multiple antennas				
	☐Tx diversity				
	☐Rx diversity				
	☐Tx/Rx diversity				
Max. output power	1.85dBm(1.53mW) For BT 2.1+EDR;				
	3.46dBm(2.22mW) For BLE;				
	6.59dBm(4.56mW) For WIFI				
Antenna gain	2dBi (declared by manufacturer)				
Evaluation applied	☐MPE Evaluation				
	⊠SAR Evaluation				

Standard Requirement

Portable Device

According to §15.247(i) and §1.1307b(1), 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 levels in excess of the Commission's guidelines. See KDB 447498 D01 General RF Exposure Guidance v05, section 4.3.1.

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [$\sqrt{f(GHz)}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, ¹⁶ where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation17
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is \leq 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Measurement Result

CFSK Low 2402 0.66 ±0.2 1.22 0.3778 3.0	Channel	Channel Frequency (MHz)	Max Output power	Tolerance	Max Tune-UP power	Calculati on Value (Note 1)	Threshold Value		
Low 2402 0.66 ±0.2 1.22 0.3778 3.0 Middle 2441 1.55 ±0.2 1.50 0.4675 3.0 High 2480 1.85 ±0.2 1.60 0.5050 3.0 \ \frac{\pi/4-DQPSK}{\pi/4-DQPSK} \\ Low 2402 -0.16 ±0.2 1.01 0.3128 3.0 Middle 2441 0.75 ±0.2 1.24 0.3889 3.0 High 2480 1.04 ±0.2 1.33 0.4190 3.0 \ \frac{8DPSK}{\pi/4-DQPSK} \\ Low 2402 -0.14 ±0.2 1.01 0.3143 3.0 Middle 2441 0.76 ±0.2 1.25 0.3898 3.0 Middle 2441 0.76 ±0.2 1.25 0.3898 3.0 \ High 2480 1.05 ±0.2 1.33 0.4200 3.0 \ \frac{For BLE GFSK}{\pi/4-DCPSK} \\ Low 2402 2.45 ±0.2 1.84 0.5706 3.0 Middle 2442 3.24 ±0.2 2.21 0.6901 3.0 \ \frac{Test Mode: 802.11b}{\pi/4-DCPSK} \\ Low 2412 6.11 ±0.2 4.28 1.3281 3.0 \ Middle 2437 6.49 ±0.2 4.78 1.4986 3.0 \ \frac{Test Mode: 802.11g}{\pi/4-DCPSK} \\ Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 \ High 2462 5.59 ±0.2 3.79 1.1904 3.0 \ \frac{Test Mode: 802.11n(HT20)}{\pi/4-DCPSK} \\ Low 2412 6.31 ±0.2 4.48 1.3907 3.0 \ Middle 2437 5.24 ±0.2 3.50 1.0926 3.0 \ Middle 2437 5.24 ±0.2 3.81 1.1958 3.0 \ \frac{Test Mode: 802.11n(HT40)}{Test Mode: 802.11n(HT40)} \ Low 2422 4.25 ±0.2 2.79 0.8672 3.0 \ Middle 2437 3.52 ±0.2 2.79 0.8672 3.0 \ Middle 2437 3.52 ±0.2 2.79 0.8672 3.0 \ Middle 2437 3.52 ±0.2 2.36 0.7353 3.0 \ Middle 2437 3.52 ±0.2 2.			(dBm)	0501/	(mW)				
Middle 2441 1.55 ±0.2 1.50 0.4675 3.0 High 2480 1.85 ±0.2 1.60 0.5050 3.0 π/4-DQPSK Low 2402 -0.16 ±0.2 1.01 0.3128 3.0 Middle 2441 0.75 ±0.2 1.24 0.3889 3.0 High 2480 1.04 ±0.2 1.33 0.4190 3.0 SDPSK Low 2402 -0.14 ±0.2 1.25 0.3898 3.0 High 2480 1.05 ±0.2 1.25 0.3898 3.0 For BLE GFSK Low 2402 2.45 ±0.2 1.84 0.5706 3.0 Middle 2442 3.24 ±0.2 2.32 0.7316 3.0 Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 High 246	-	T				1			
High 2480 1.85									
π/4-DQPSK Low 2402 -0.16 ±0.2 1.01 0.3128 3.0 Middle 2441 0.75 ±0.2 1.24 0.3889 3.0 High 2480 1.04 ±0.2 1.33 0.4190 3.0 8DPSK Low 2402 -0.14 ±0.2 1.01 0.3143 3.0 Middle 2441 0.76 ±0.2 1.25 0.3898 3.0 High 2480 1.05 ±0.2 1.33 0.4200 3.0 For BLE GFSK Low 2402 2.45 ±0.2 1.84 0.5706 3.0 Middle 2442 3.24 ±0.2 2.21 0.6901 3.0 High 2480 3.46 ±0.2 2.21 0.6901 3.0 Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 High 246	Middle								
Low 2402 -0.16 ±0.2 1.01 0.3128 3.0 Middle 2441 0.75 ±0.2 1.24 0.3889 3.0 High 2480 1.04 ±0.2 1.33 0.4190 3.0 8DPSK Low 2402 -0.14 ±0.2 1.01 0.3143 3.0 Middle 2441 0.76 ±0.2 1.25 0.3898 3.0 High 2480 1.05 ±0.2 1.33 0.4200 3.0 For BLE GFSK Low 2402 2.45 ±0.2 1.84 0.5706 3.0 Middle 2442 3.24 ±0.2 2.21 0.6901 3.0 Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 High 2462 6.59 ±0.2	High	2480	1.85	±0.2	1.60	0.5050	3.0		
Middle 2441 0.75 ±0.2 1.24 0.3889 3.0 High 2480 1.04 ±0.2 1.33 0.4190 3.0 8DPSK Low 2402 -0.14 ±0.2 1.01 0.3143 3.0 Middle 2441 0.76 ±0.2 1.25 0.3898 3.0 For BLE GFSK Low 2402 2.45 ±0.2 1.84 0.5706 3.0 Middle 2442 3.24 ±0.2 2.21 0.6901 3.0 High 2480 3.46 ±0.2 2.32 0.7316 3.0 Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 High 2462 6.59 ±0.2 3.94 1.2252 3.0 Middle 2437	π/4-DQPSK								
High 2480 1.04 ±0.2 1.33 0.4190 3.0 SDPSK	Low	2402	-0.16	±0.2	1.01	0.3128	3.0		
BDPSK	Middle	2441	0.75	±0.2	1.24	0.3889	3.0		
Low 2402 -0.14 ±0.2 1.01 0.3143 3.0 Middle 2441 0.76 ±0.2 1.25 0.3898 3.0 High 2480 1.05 ±0.2 1.33 0.4200 3.0 For BLE GFSK Low 2402 2.45 ±0.2 1.84 0.5706 3.0 Middle 2442 3.24 ±0.2 2.21 0.6901 3.0 High 2480 3.46 ±0.2 2.32 0.7316 3.0 Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) <t< td=""><td>High</td><td>2480</td><td>1.04</td><td>±0.2</td><td>1.33</td><td>0.4190</td><td>3.0</td></t<>	High	2480	1.04	±0.2	1.33	0.4190	3.0		
Middle 2441 0.76 ±0.2 1.25 0.3898 3.0 For BLE GFSK Low 2402 2.45 ±0.2 1.84 0.5706 3.0 Middle 2442 3.24 ±0.2 2.21 0.6901 3.0 High 2480 3.46 ±0.2 2.32 0.7316 3.0 Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 High 2462 6.59 ±0.2 4.78 1.4986 3.0 Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 High 2462 5.59 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low	8DPSK								
High 2480 1.05 ±0.2 1.33 0.4200 3.0 For BLE GFSK Low 2402 2.45 ±0.2 1.84 0.5706 3.0 Middle 2442 3.24 ±0.2 2.21 0.6901 3.0 High 2480 3.46 ±0.2 2.32 0.7316 3.0 Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 High 2462 6.59 ±0.2 4.78 1.4986 3.0 Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 High 2462 5.59 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low	Low	2402	-0.14	±0.2	1.01	0.3143	3.0		
For BLE GFSK	Middle	2441	0.76	±0.2	1.25	0.3898	3.0		
Low 2402 2.45 ±0.2 1.84 0.5706 3.0 Middle 2442 3.24 ±0.2 2.21 0.6901 3.0 High 2480 3.46 ±0.2 2.32 0.7316 3.0 Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 High 2462 6.59 ±0.2 4.78 1.4986 3.0 Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 Test Mode: 802.11n(HT20) Low 2412 6.31 ±0.2 4.48 1.3907 3.0 Middle 2437 5.24 ±0.2 3.50 1.0926 3.0 High 2462 5.61	High	2480	1.05	±0.2	1.33	0.4200	3.0		
Middle 2442 3.24 ±0.2 2.21 0.6901 3.0 Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 High 2462 6.59 ±0.2 4.78 1.4986 3.0 Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 High 2462 5.59 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low 2412 6.31 ±0.2 4.48 1.3907 3.0 Middle 2437 5.24 ±0.2 3.50 1.0926 3.0 High 2462 5.61 ±0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) <			F	or BLE GFS	SK				
High 2480 3.46 ±0.2 2.32 0.7316 3.0 Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 High 2462 6.59 ±0.2 4.78 1.4986 3.0 Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 High 2462 5.59 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low 2412 6.31 ±0.2 4.48 1.3907 3.0 Middle 2437 5.24 ±0.2 3.50 1.0926 3.0 High 2462 5.61 ±0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) <td< td=""><td>Low</td><td>2402</td><td>2.45</td><td>±0.2</td><td>1.84</td><td>0.5706</td><td>3.0</td></td<>	Low	2402	2.45	±0.2	1.84	0.5706	3.0		
Test Mode: 802.11b Low 2412 6.11 ±0.2 4.28 1.3281 3.0 Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 High 2462 6.59 ±0.2 4.78 1.4986 3.0 Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 High 2462 5.59 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low 2412 6.31 ±0.2 4.48 1.3907 3.0 Middle 2437 5.24 ±0.2 3.50 1.0926 3.0 High 2462 5.61 ±0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ±0.2 2.79 0.8672 3.0	Middle	2442	3.24	±0.2	2.21	0.6901	3.0		
Low 2412 6.11 ±0.2 4.28 1.3281 3.0 Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 High 2462 6.59 ±0.2 4.78 1.4986 3.0 Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 High 2462 5.59 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low 2412 6.31 ±0.2 4.48 1.3907 3.0 Middle 2437 5.24 ±0.2 3.50 1.0926 3.0 High 2462 5.61 ±0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ±0.2 2.79 0.8672 3.0 Middle 2437 3.52 ±0.2 2.36 0.7353 3.0	High	2480	3.46	±0.2	2.32	0.7316	3.0		
Middle 2437 6.49 ±0.2 4.67 1.4570 3.0 High 2462 6.59 ±0.2 4.78 1.4986 3.0 Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 High 2462 5.59 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low 2412 6.31 ±0.2 4.48 1.3907 3.0 Middle 2437 5.24 ±0.2 3.50 1.0926 3.0 High 2462 5.61 ±0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ±0.2 2.79 0.8672 3.0 Middle 2437 3.52 ±0.2 2.36 0.7353 3.0			Tes	t Mode: 802	2.11b				
High 2462 6.59 ±0.2 4.78 1.4986 3.0 Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 High 2462 5.59 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low 2412 6.31 ±0.2 4.48 1.3907 3.0 Middle 2437 5.24 ±0.2 3.50 1.0926 3.0 High 2462 5.61 ±0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ±0.2 2.79 0.8672 3.0 Middle 2437 3.52 ±0.2 2.36 0.7353 3.0	Low	2412	6.11	±0.2	4.28	1.3281	3.0		
Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 High 2462 5.59 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low 2412 6.31 ±0.2 4.48 1.3907 3.0 Middle 2437 5.24 ±0.2 3.50 1.0926 3.0 High 2462 5.61 ±0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ±0.2 2.79 0.8672 3.0 Middle 2437 3.52 ±0.2 2.36 0.7353 3.0	Middle	2437	6.49	±0.2	4.67	1.4570	3.0		
Test Mode: 802.11g Low 2412 5.76 ±0.2 3.94 1.2252 3.0 Middle 2437 5.29 ±0.2 3.54 1.1052 3.0 High 2462 5.59 ±0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low 2412 6.31 ±0.2 4.48 1.3907 3.0 Middle 2437 5.24 ±0.2 3.50 1.0926 3.0 High 2462 5.61 ±0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ±0.2 2.79 0.8672 3.0 Middle 2437 3.52 ±0.2 2.36 0.7353 3.0	High	2462	6.59	±0.2	4.78	1.4986	3.0		
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High 2462 5.59 ± 0.2 3.79 1.1904 3.0 Test Mode: 802.11n(HT20) Low 2412 6.31 ± 0.2 4.48 1.3907 3.0 Middle 2437 5.24 ± 0.2 3.50 1.0926 3.0 High 2462 5.61 ± 0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ± 0.2 2.79 0.8672 3.0 Middle 2437 3.52 ± 0.2 2.36 0.7353 3.0	Low	2412	5.76	±0.2	3.94	1.2252	3.0		
Test Mode: 802.11n(HT20) Low 2412 6.31 ± 0.2 4.48 1.3907 3.0 Middle 2437 5.24 ± 0.2 3.50 1.0926 3.0 High 2462 5.61 ± 0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ± 0.2 2.79 0.8672 3.0 Middle 2437 3.52 ± 0.2 2.36 0.7353 3.0	Middle	2437	5.29	±0.2	3.54	1.1052	3.0		
Test Mode: 802.11n(HT20) Low 2412 6.31 ± 0.2 4.48 1.3907 3.0 Middle 2437 5.24 ± 0.2 3.50 1.0926 3.0 High 2462 5.61 ± 0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ± 0.2 2.79 0.8672 3.0 Middle 2437 3.52 ± 0.2 2.36 0.7353 3.0	High	2462	5.59	±0.2	3.79	1.1904	3.0		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									
High 2462 5.61 ± 0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ± 0.2 2.79 0.8672 3.0 Middle 2437 3.52 ± 0.2 2.36 0.7353 3.0	Low	2412	6.31	±0.2	4.48	1.3907	3.0		
High 2462 5.61 ± 0.2 3.81 1.1958 3.0 Test Mode: 802.11n(HT40) Low 2422 4.25 ± 0.2 2.79 0.8672 3.0 Middle 2437 3.52 ± 0.2 2.36 0.7353 3.0	Middle	2437	5.24	±0.2	3.50	1.0926	3.0		
Test Mode: 802.11n(HT40) Low 2422 4.25 ±0.2 2.79 0.8672 3.0 Middle 2437 3.52 ±0.2 2.36 0.7353 3.0	High	2462	5.61	±0.2	3.81	1.1958	3.0		
Middle 2437 3.52 ± 0.2 2.36 0.7353 3.0	Test Mode: 802.11n(HT40)								
Middle 2437 3.52 ± 0.2 2.36 0.7353 3.0	Low	2422	4.25	±0.2	2.79	0.8672	3.0		
		2437				1			
1 2.02 2.12 0.10 0.0700 0.0	High	2452	4.71	±0.2	3.10	0.9700	3.0		

Note 1: Calculation Value =[(max. power of channel, mW)/(min.

test separation distance, mm)] • [$\sqrt{f(GHz)}$].

Fox example: $1.22/5^* \sqrt{2.402} = 0.3778 \le 3.0$

According to KDB447498 D01 v05, threshold at which no SAR required is ≤3.0 for 1-g SAR, separation distance is 5mm, and no simultaneous SAR measurement is required.