

SAR Evaluation for tablet PC

1. Standalone SAR test exclusion considerations

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

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

1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f_{(\text{GHz})}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum *test separation distance* \leq 50 mm and for transmission frequencies between 100 MHz and 6 GHz

- 2) At 100 MHz to 6 GHz and for *test separation distances* $>$ 50 mm, the SAR test exclusion threshold is determined according to the following, and as illustrated in Appendix B of KDB 447498 D01 v06

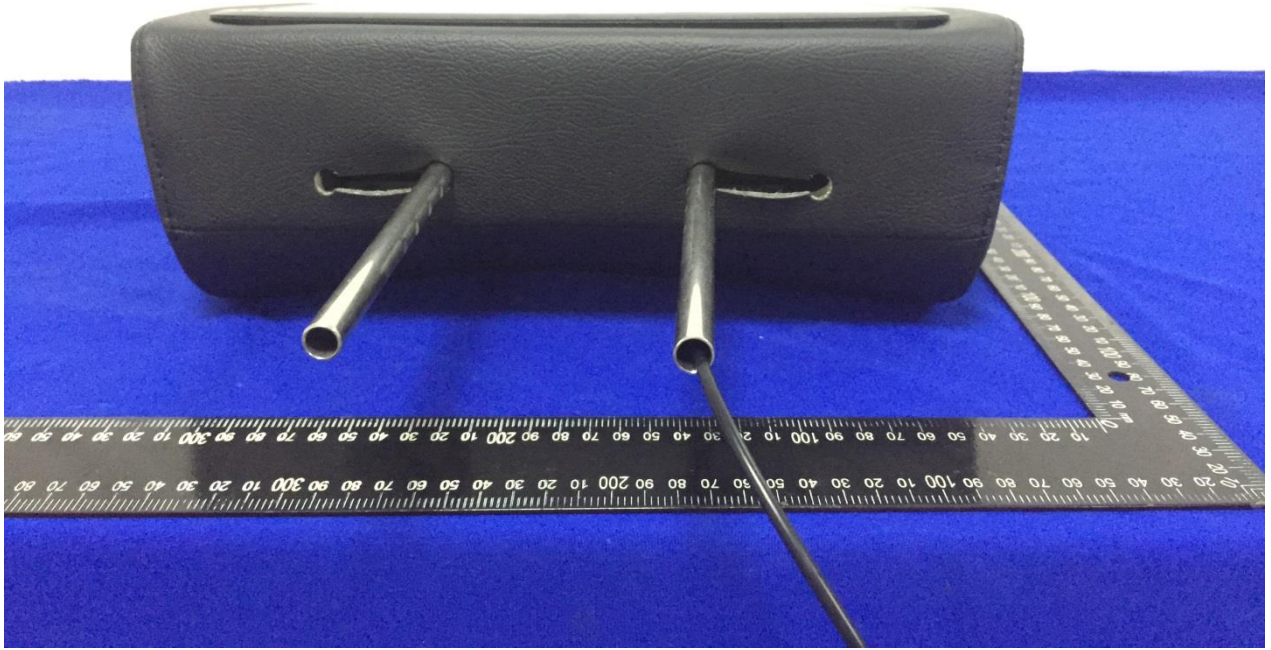
- [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) (f(MHz)/150)] mW, at 100 MHz to 1500 MHz
- [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) :10] mW at $>$ 1500 MHz and \leq 6 GHz

2. EUT Description



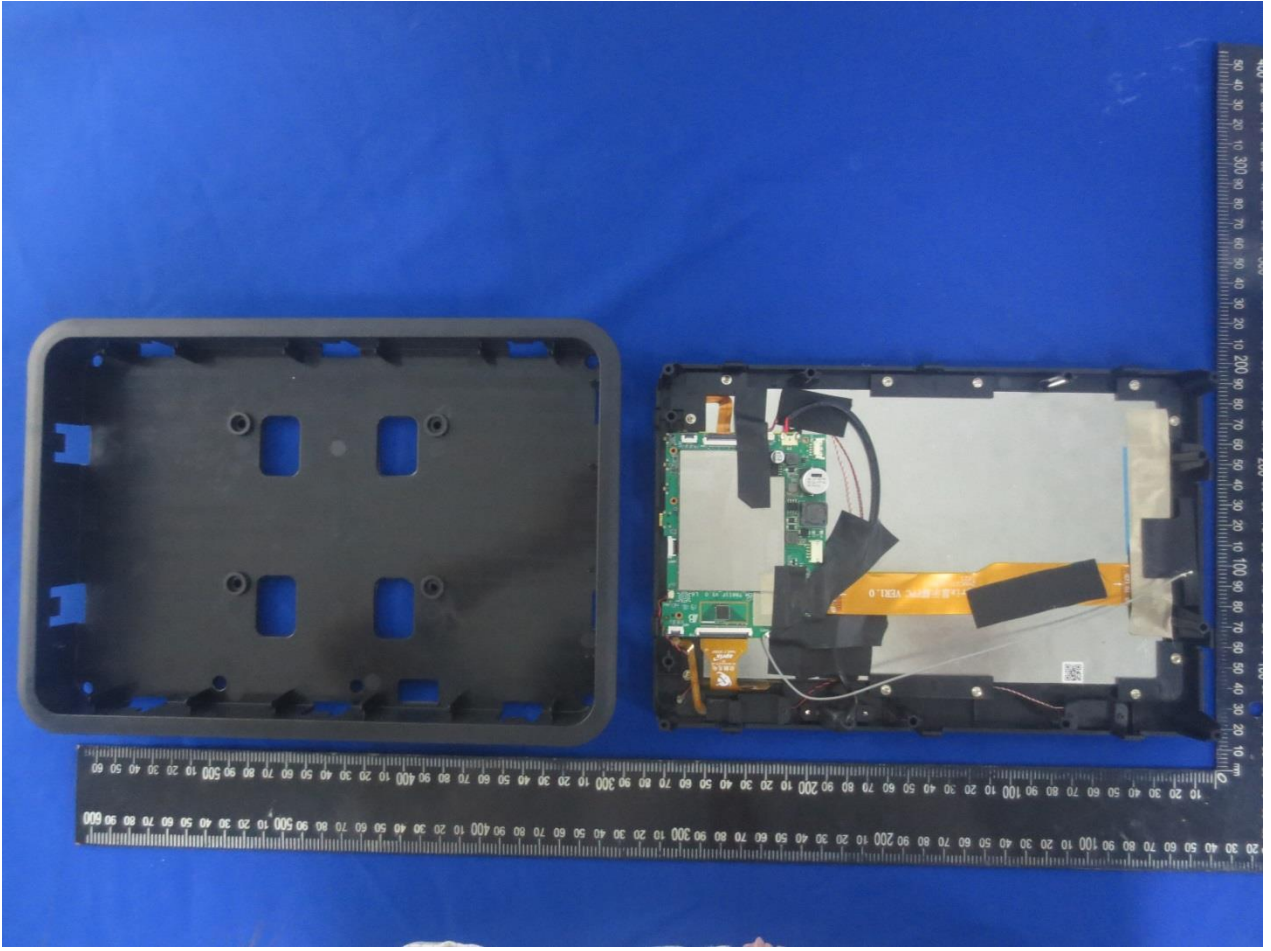














3. Conducted RF Output Power

3.1 WLAN 2.4 GHz Band Conducted Power

Average Power (dBm)				
Channel	Frequency (MHz)	802.11 b	802.11 g	802.11n (HT20)
CH 01	2412	5.12	5.18	3.24
CH 06	2437	5.54	4.51	3.54
CH 11	2462	5.18	4.31	3.38

Average Power (dBm)		
Channel	Frequency (MHz)	802.11n (HT40)
CH 03	2422	3.00
CH 06	2437	2.74
CH 09	2452	2.55

Note:

- Per KDB 248227 D01v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.
- Per KDB 248227 D01v02r02, In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. SAR is not required for the following 2.4 GHz OFDM conditions:
 - When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
 - When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
- Per KDB 248227 D01v02r02, for MIMO configurations, the aggregate maximum output power of all simultaneous transmitting antennas in all transmission chains may be used to determine SAR test exclusion for each frequency band and transmission mode configuration.
- The output power of all data rate were pre-scan, just the worst case (the lowest data rate) of all mode were shown in report.

3.2 WLAN 5.2GHz Band Conducted Power

Average Power (dBm)			
Channel	Frequency (MHz)	802.11 a	802.11 n20
CH 36	5180	3.42	3.30
CH 40	5200	3.08	2.83
CH 48	5240	3.10	2.63

Average Power (dBm)		
Channel	Frequency (MHz)	802.11n 40
CH 38	5190	3.14
CH 46	5230	2.70

Note:

- Per KDB 248227 D01v02r02, choose the highest output power channel to test SAR and determine further SAR exclusion.

2. Per KDB 248227 D01v02r02, for MIMO configurations, the aggregate maximum output power of all simultaneous transmitting antennas in all transmission chains may be used to determine SAR test exclusion for each frequency band and transmission mode configuration.
3. The output power of all data rate were pre-scan, just the worst case (the lowest data rate) of all mode were shown in report.

3.3 Bluetooth Conducted Power

Average Power (dBm)				
Channel	Frequency (MHz)	GFSK	$\pi/4$ -DQPSK	8DPSK
CH 01	2402	2.75	1.91	1.94
CH 39	2441	2.11	1.39	1.45
CH 78	2480	1.67	0.93	0.90

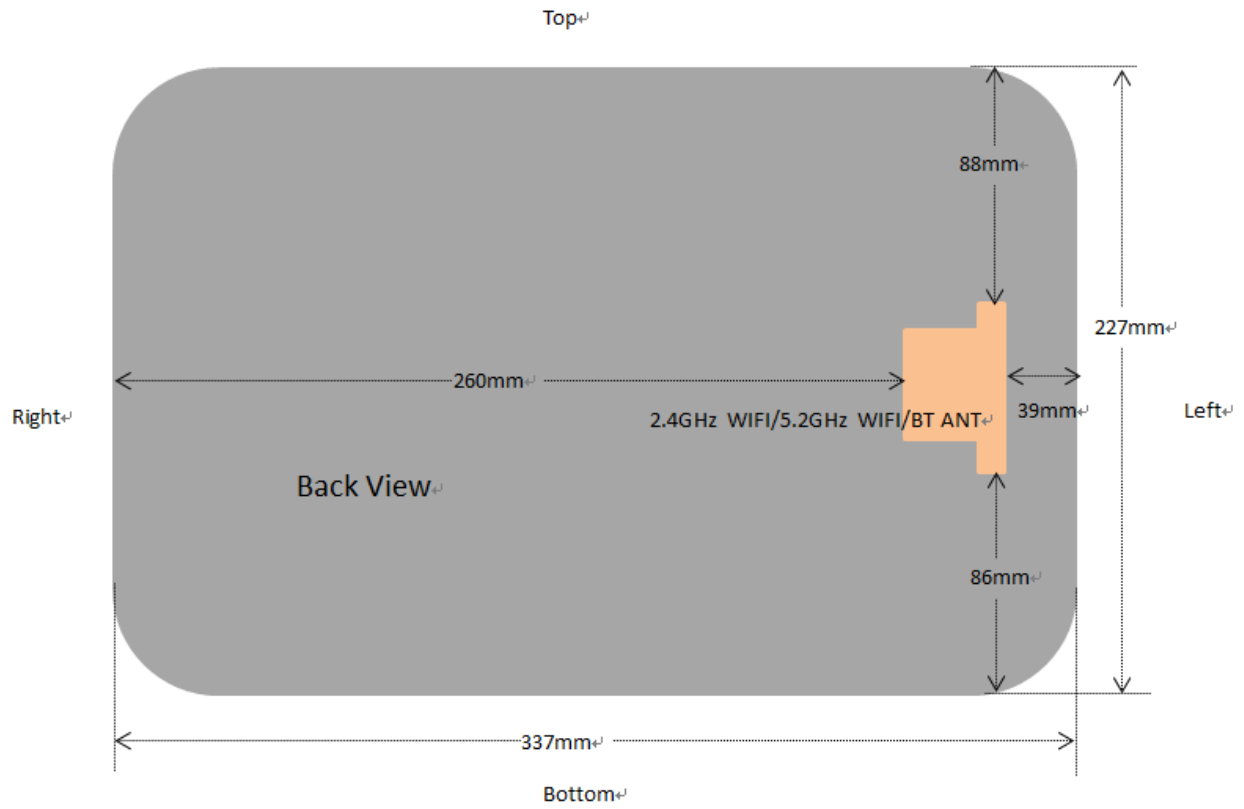
Average Power (dBm)		
Channel	Frequency (MHz)	BLE (BT 4.0)
CH 00	2402	2.91
CH 20	2442	2.25
CH 39	2480	1.81

Note:

1. The output power of all data rate were pre-scan, just the worst case of all mode were shown in report.

4. Exposure Positions Consideration

4.1 EUT Antenna Locations



4.2 SAR Test Exclusion Consideration

SAR exclusion calculations for antenna < 50mm from the user													
Antennas	Freq. (MHz)	Max. tune-up Power		Distance of Antennas to EUT edge/surface (mm)					Calculated Threshold Value (≤ 3.0 SAR is not required)				
		dBm	mW	Back	Top	Bott.	Right	Left	Back	Top	Bott.	Right	Left
2.4GHz WIFI 802.11b	2437	6.0	3.98	115	88	86	260	39	>50mm	>50mm	>50mm	>50mm	0.16
2.4GHz WIFI 802.11g	2412	5.5	3.55	115	88	86	260	39	>50mm	>50mm	>50mm	>50mm	0.14
5.2GHz WIFI 802.11a	5180	3.5	2.24	115	88	86	260	39	>50mm	>50mm	>50mm	>50mm	0.13
Bluetooth	2402	3.0	2.0	115	88	86	260	39	>50mm	>50mm	>50mm	>50mm	0.08

SAR exclusion calculations for antenna > 50mm from the user													
Antennas	Freq. (MHz)	Max. tune-up Power		Distance of Antennas to EUT edge/surface (mm)					Calculated Threshold Value (SAR test exclusion power, mW)				
		dBm	mW	Back	Top	Bott.	Right	Left	Back	Top	Bott.	Right	Left
2.4GHz WIFI 802.11b	2437	6.0	3.98	115	88	86	260	39	746	476	456	2196	/
2.4GHz WIFI 802.11g	2412	5.5	3.55	115	88	86	260	39	746	476	456	2196	/
5.2GHz WIFI 802.11a	5180	3.5	2.24	115	88	86	260	39	716	446	426	2166	/
Bluetooth	2402	3.0	2.0	115	88	86	260	39	746	476	456	2196	/

Test Positions					
Antennas	Back	Top Side	Bottom Side	Right Side	Left Side
2.4GHz WIFI 802.11b	No	No	No	No	No
2.4GHz WIFI 802.11g	No	No	No	No	No
5.2GHz WIFI 802.11a	No	No	No	No	No
Bluetooth	No	No	No	No	No

Note:

- Referring to KDB 616217 D04v01r02, when the overall diagonal dimension of display is > 20 cm, the test distance is 0 mm; the SAR Test Exclusion Threshold in KDB 447498 section 4.3.1 can be applied to determine SAR test exclusion for adjacent edge configurations.
- Per KDB 616217 D04v01r02, SAR evaluation for the front surface of tablet display screens is generally not necessary.
- Per KDB 616217 D04v01r02, additional testing for hotspot SAR is not required.

5. Conclusion

SAR test for this tablet PC is exclusion.