

## Output Power measurement result

### 2.4GHz band- 802.11b/g/n

Ant Port	Data Rates (Mbps)	CH (MHz)	802.11b PW (dBm)	Rated Power for 802.11b (dBm)	802.11g PW (dBm)	Rated Power for 802.11g (dBm)	802.11n-HT20-2.4G PW (dBm)	Rated Power for 802.11n (dBm)
Port1	1(802.11b) 6(802.11g) 6.5(802.11n)	2437	13.25*	13 +2/-2.5	10.77	11.0+2/-2.5	10.32	10.0+2/-2.5
		2412	13.05	13 +2/-2.5	8.73	8.0+2/-2.5	9.93	7.0+2/-2.5
		2462	13.23	13 +2/-2.5	9.22	8.5+2/-2.5	8.74	7.5+2/-2.5
Port2		2437	13.13*	13 +2/-2.5	11.47	11.0+2/-2.5	10.41	10.0+2/-2.5
		2412	13.04	13 +2/-2.5	10.27	8.0+2/-2.5	9.85	7.0+2/-2.5
		2462	13.01	13 +2/-2.5	9.52	8.5+2/-2.5	8.18	7.5+2/-2.5
Remark	1. Per KDB 248227 SAR measurement procedures for 802.11 a/b/g TX, since output power of 802.11g and 802.11n are not ¼ dB higher than 802.11b, than 802.11b mode will be tested to represent 2.4GHz band. 2. Per KDB 248227, the lowest data rate mode was tested. 3. Port1 and Port2 are TX diversity; their antennas are installed along different edge position. Both of them will be tested separately.							

### 5GHz Band- 802.11n-HT40

Ant Port	Data Rates (Mbps)	Band	CH (MHz)	802.11n-HT40PW (dBm)	Rated Power (dBm)
Port1	13.5(802.11n)	5.2GHz	5190	10.64	9.5+2/-2.5
			5210	14.03	14.0+2/-2.5
			5230	16.63*	14.0+2/-2.5
		5.3GHz	5270	16.88*	14.0+2/-2.5
			5290	15.21	14.0+2/-2.5
			5310	14.21	11.5+2/-2.5
		5.6GHz	5510	15.71	14.0+2/-2.5
			5530	16.05	14.0+2/-2.5
			5550	15.89	14.0+2/-2.5
			5570	16.06	14.0+2/-2.5
			5670	16.86*	14.0+2/-2.5
		5.8GHz	5755	15.78*	13.0+2/-2.5
5775	15.55		13.0+2/-2.5		
5795	15.51		13.0+2/-2.5		
Port2	13.5(802.11n)	5.2GHz	5190	10.28	9.5+2/-2.5
			5210	14.05	14.0+2/-2.5
			5230	16.27*	14.0+2/-2.5
		5.3GHz	5270	16.52*	14.0+2/-2.5
			5290	14.85	14.0+2/-2.5
			5310	13.85	11.5+2/-2.5
		5.6GHz	5510	15.39	14.0+2/-2.5
			5530	15.73	14.0+2/-2.5
			5550	15.57	14.0+2/-2.5
			5570	15.74	14.0+2/-2.5
			5670	16.54*	14.0+2/-2.5
		5.8GHz	5755	15.46*	13.0+2/-2.5
5775	15.23		13.0+2/-2.5		
5795	15.19		13.0+2/-2.5		
Remark	1. The channel with “*” are highest output power channel, which will be tested to find out worst SAR configuration. 2. Per KDB 248227, the lowest data rate mode was tested. 3. Port1 and Port2 are TX diversity; their antennas are installed along different edge position. Both of them will be tested separately.				

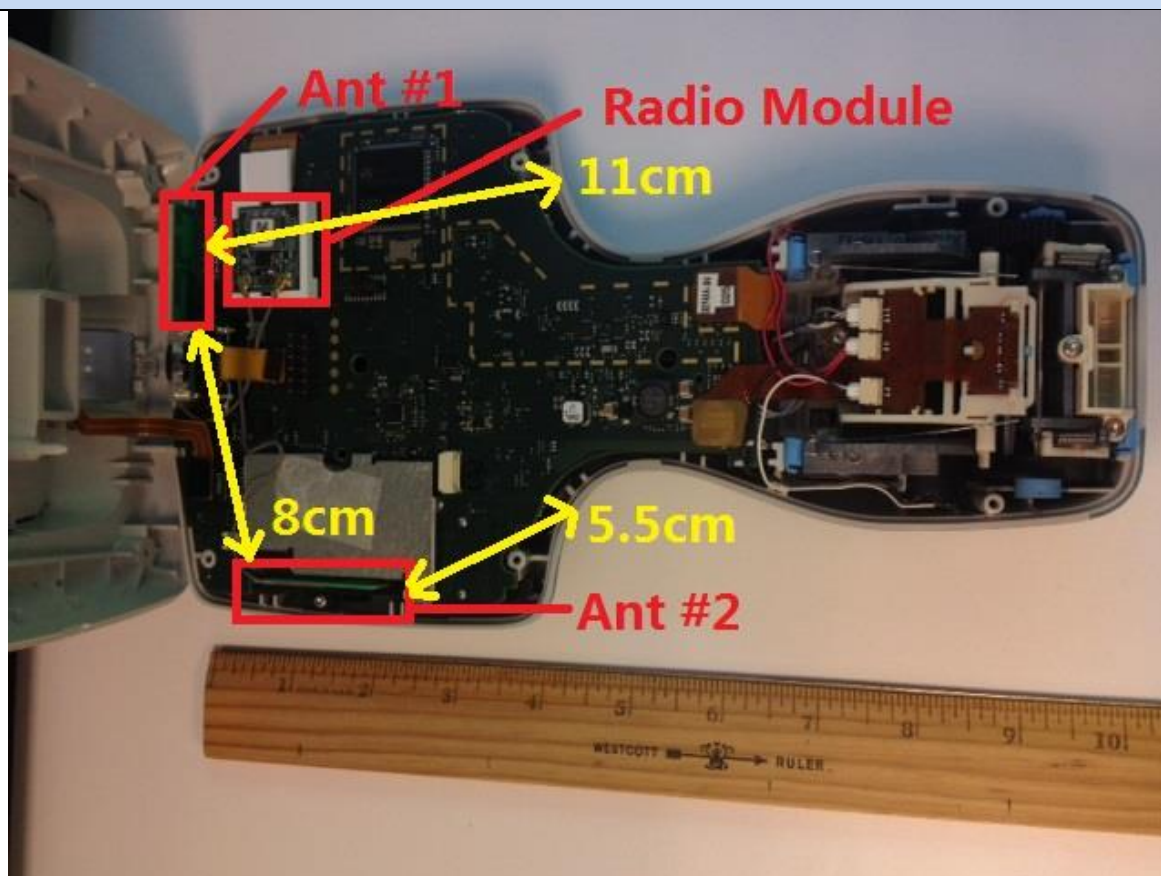
**5GHz Band- 802.11a/n-HT20**

Ant Port	Data Rates (Mbps)	Band	CH (MHz)	802.11a PW (dBm)	Rated Power for 802.11a (dBm)	802.11n-HT20PW (dBm)	Rated Power for 802.11n-HT20 (dBm)
Port1	6(802.11a) 6.5(802.11n)	5.2GHz	5180	14.44	14.0+2/-2.5	14.32	14.0+2/-2.5
			5200	14.61	14.0+2/-2.5	14.62	14.0+2/-2.5
			5220	15.26	14.0+2/-2.5	15.66	14.0+2/-2.5
			5240	15.35	14.0+2/-2.5	15.80*	14.0+2/-2.5
		5.3GHz	5260	14.97	14.0+2/-2.5	15.53	14.0+2/-2.5
			5280	15.03	14.0+2/-2.5	15.96	14.0+2/-2.5
			5300	14.92	14.0+2/-2.5	15.93	14.0+2/-2.5
			5320	15.04	14.0+2/-2.5	16.57*	14.0+2/-2.5
		5.6GHz	5500	14.01	14.0+2/-2.5	15.36	14.0+2/-2.5
			5520	14.03	14.0+2/-2.5	15.56	14.0+2/-2.5
			5540	14.34	14.0+2/-2.5	15.84	14.0+2/-2.5
			5560	14.18	14.0+2/-2.5	15.56	14.0+2/-2.5
			5580	14.11	14.0+2/-2.5	16.36	14.0+2/-2.5
			5660	14.72	14.0+2/-2.5	16.34	14.0+2/-2.5
			5680	14.43	14.0+2/-2.5	16.52	14.0+2/-2.5
			5700	14.05	14.0+2/-2.5	16.54*	14.0+2/-2.5
		5.8GHz	5745	13.28	13.0+2/-2.5	15.75*	13.0+2/-2.5
			5765	13.08	13.0+2/-2.5	15.53	13.0+2/-2.5
			5785	13.01	13.0+2/-2.5	15.25	13.0+2/-2.5
			5805	13.25	13.0+2/-2.5	15.53	13.0+2/-2.5
			5825	13.00	13.0+2/-2.5	15.51	13.0+2/-2.5
Port2	6(802.11a) 6.5(802.11n)	5.2GHz	5180	14.12	14.0+2/-2.5	14.01	14.0+2/-2.5
			5200	14.29	14.0+2/-2.5	14.21	14.0+2/-2.5
			5220	14.94	14.0+2/-2.5	15.25	14.0+2/-2.5
			5240	15.03	14.0+2/-2.5	15.39*	14.0+2/-2.5
		5.3GHz	5260	14.65	14.0+2/-2.5	15.13	14.0+2/-2.5
			5280	14.71	14.0+2/-2.5	15.56	14.0+2/-2.5
			5300	14.60	14.0+2/-2.5	15.53	14.0+2/-2.5
			5320	14.72	14.0+2/-2.5	16.17*	14.0+2/-2.5
		5.6GHz	5500	14.02	14.0+2/-2.5	14.94	14.0+2/-2.5
			5520	4.01	14.0+2/-2.5	15.14	14.0+2/-2.5
			5540	14.02	14.0+2/-2.5	15.42	14.0+2/-2.5
			5560	14.05	14.0+2/-2.5	15.14	14.0+2/-2.5
			5580	14.09	14.0+2/-2.5	15.94	14.0+2/-2.5
			5660	14.40	14.0+2/-2.5	15.92	14.0+2/-2.5
			5680	14.11	14.0+2/-2.5	16.10	14.0+2/-2.5
			5700	14.03	14.0+2/-2.5	16.14*	14.0+2/-2.5
		5.8GHz	5745	13.73	13.0+2/-2.5	15.38*	13.0+2/-2.5
			5765	13.57	13.0+2/-2.5	15.16	13.0+2/-2.5
			5785	13.19	13.0+2/-2.5	14.88	13.0+2/-2.5
			5805	13.43	13.0+2/-2.5	15.16	13.0+2/-2.5
			5825	13.29	13.0+2/-2.5	15.14	13.0+2/-2.5
Remark	1. The channel with “*” are highest output power channel, which will be tested to find out worst SAR configuration. 2. Per KDB 248227, the lowest data rate mode was tested. 3. Port1 and Port2 are TX diversity, their antennas are installed along different edge position. Both of them will be tested separately.						

**Duty Cycle measurement**

Type	ON time (uS)	Cycle time (uS)	Duty cycle	Crest factor
802.11b-1M	165.731	184.849	89.66%	1.115
802.11g-6M	303.687	334.348	90.83%	1.101
802.11a-6M	361.563	385.331	93.83%	1.066
802.11n-HT20-6.5M	300.641	332.024	90.55%	1.104
802.11n-HT40-13.5M	267.134	292.425	91.35%	1.095

#### Antenna Location & Separation distance



#### Remark:

1. EUT uses 2 TX diversity antennas, which won't transmit simultaneously.
2. EUT is handheld device only, the hand will only touch the handle part. No other part will be in touch with human body.
3. The separation between 2 antennas is 8cm.
4. The separation between the Antenna #1 to the device handle part is 11 cm
5. The separation between the Antenna #2 to the device handle part is 5.5 cm.

## Evaluation:

EUT is handheld device, the antenna location shows that both ant #1 will be 11 cm away from the handle part, and ant #2 will be 5.5 cm away from the handle part. (See "Antenna location & Separation distance" for more detail)

The SAR test reduction is calculated at below,

## Formula description

1-g SAR with frequency range in 100M-6GHz	Sep ≤ 50mm	<input type="checkbox"/> [(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0
	Sep > 50mm	<input type="checkbox"/> a) [Power allowed at numeric threshold for 50 mmin step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz <input checked="" type="checkbox"/> b) [Power allowed at numeric threshold for 50 mmin step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

## Calculation

For Ant #1 with separation of 11 cm

CH (MHz)	802.11b PW (dBm)	802.11g PW (dBm)	802.11n-HT20-2.4G PW (dBm)	Max Rated Power/CH	Sep distance (mm)	Power Threshold(mW)	SAR Test Exclusion
2437	13.25*	10.77	8.25	31.62 mW (15 dBm) / 2437MHz	110	696.09	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2412	12.51	8.73	9.93				
2462	13.23	9.22	8.74				

Band	CH (MHz)	802.11n-HT40PW (dBm)	Max Rated Power/CH	Sep distance (mm)	Power Threshold(mW)	SAR Test Exclusion
5.2GHz	5190	10.64	48.75 mW (16.88 dBm) / 5270MHz	110	665.34	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	5210	13.49				
	5230	16.63*				
5.3GHz	5270	16.88*				
	5290	15.21				
	5310	14.21				
5.6GHz	5510	15.71				
	5530	16.05				
	5550	15.89				
	5570	16.06				
	5670	16.86*				
5.8GHz	5755	15.78*				
	5775	15.55				

Band	CH (MHz)	802.11a PW (dBm)	802.11n-HT20PW (dBm)	Max Rated Power/CH	Sep distance (mm)	Power Threshold(mW)	SAR Test Exclusion
5.2GHz	5180	14.44	14.32	45.39 mW (16.57 dBm) / 5320MHz	110	665.03	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	5200	14.61	14.62				
	5220	15.26	15.66				
	5240	15.35	15.80*				
5.3GHz	5260	14.97	15.53				
	5280	15.03	15.96				
	5300	14.92	15.93				
	5320	15.04	16.57*				
5.6GHz	5500	13.91	15.36				
	5520	13.93	15.56				
	5540	14.34	15.84				
	5560	14.18	15.56				
	5580	14.11	16.36				
	5660	14.72	16.34				
	5680	14.43	16.52				
	5700	14.05	16.54*				
5.8GHz	5745	13.28	15.75*				
	5765	13.08	15.53				
	5785	12.90	15.25				
	5805	13.25	15.53				
	5825	13.00	15.51				

**For Ant #2 with separation of 5.5 cm**

CH (MHz)	802.11b PW (dBm)	802.11g PW (dBm)	802.11n-HT20-2.4G PW (dBm)	Max Rated Power/CH	Sep distance (mm)	Power Threshold(mW)	SAR Test Exclusion
2437	12.98*	11.47	7.35	31.62 mW (15 dBm) / 2437MHz	55	146.09	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2412	12.44	10.27	9.85				
2462	12.97	9.52	8.18				

Band	CH (MHz)	802.11n-HT40PW (dBm)	Max Rated Power/CH	Sep distance (mm)	Power Threshold(mW)	SAR Test Exclusion
5.2GHz	5190	10.28	45.08 mW (16.54 dBm) / 5670MHz	55	112.99	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	5210	13.13				
	5230	16.27*				
5.3GHz	5270	16.52*				
	5290	14.85				
	5310	13.85				
5.6GHz	5510	15.39				
	5530	15.73				
	5550	15.57				
	5570	15.74				
	5670	16.54*				
5.8GHz	5755	15.46*				
	5775	15.23				

Band	CH (MHz)	802.11a PW (dBm)	802.11n-HT20PW (dBm)	Max Rated Power/CH	Sep distance (mm)	Power Threshold(mW)	SAR Test Exclusion
5.2GHz	5180	14.12	13.91	41.40 mW (16.17 dBm) / 5320MHz	55	115.03	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	5200	14.29	14.21				
	5220	14.94	15.25				
	5240	15.03	15.39*				
5.3GHz	5260	14.65	15.13				
	5280	14.71	15.56				
	5300	14.60	15.53				
	5320	14.72	16.17*				
5.6GHz	5500	13.59	14.94				
	5520	13.61	15.14				
	5540	14.02	15.42				
	5560	13.86	15.14				
	5580	13.79	15.94				
	5660	14.40	15.92				
	5680	14.11	16.10				
	5700	13.73	16.14*				
5.8GHz	5745	13.73	15.38*				
	5765	13.57	15.16				
	5785	13.19	14.88				
	5805	13.43	15.16				
	5825	13.29	15.14				

## Conclusion

**SAR test exclusion applies. The SAR measurement is not required for this product.**