

## RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

FCC ID: 2AUY9-T101

### EUT Specification

<b>EUT</b>	<b>Sprintshield Touch</b>
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input checked="" type="checkbox"/> Others: 2.402GHz~2.480GHz (BDR &EDR and BLE) <input checked="" type="checkbox"/> Others: GSM &GSM/GPRS and WCDMA
<b>Device category</b>	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )
<b>Antenna diversity</b>	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
<b>Max. output power</b>	BDR &EDR: -0.596dBm (0.0009W), BLE: -0.191dBm (0.0010W), 2.4GHz WiFi: 15.70dBm (0.3715W) GSM &GSM/GPRS: 30.83dBm (1.2106W) WCDMA: 23.25dBm (0.2.113W)
<b>Antenna gain (Max)</b>	BT & 2.4G WiFi: 1.5 dBi GSM &GSM/GPRS and WCDMA: 0 dBi
<b>Evaluation applied</b>	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

Limits for Maximum Permissible Exposure(MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm <sup>2</sup> )	Average Time
<b>(A) Limits for Occupational/Control Exposures</b>				
<b>300-1500</b>	--	--	<b>F/300</b>	<b>6</b>
<b>1500-100000</b>	--	--	<b>5</b>	<b>6</b>
<b>(B) Limits for General Population/Uncontrol Exposures</b>				
<b>300-1500</b>	--	--	<b>F/1500</b>	<b>6</b>
<b>1500-100000</b>	--	--	<b>1</b>	<b>30</b>

## Friis transmission formula: $P_d = \frac{P_{out} * G}{4 * \pi * R^2}$

Where

$P_d$  = Power density in  $mW/cm^2$

$P_{out}$  = output power to antenna in Mw

$G$  = gain of antenna in linear scale

$\pi = 3.1416$

$R$  = distance between observation point and center of the radiator in cm

$P_d$  the limit of MPE,  $1mW/cm^2$ . If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

## Measurement Result

### 2.4GHz WiFi+BT3.0&4.0

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits ( $mW/cm^2$ )
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	( $mW/cm^2$ )	
802.11b	2412	14.83	$14.83 \pm 1$	15.83	1.5	0.0108	1
	2437	14.67	$14.67 \pm 1$	15.67	1.5	0.0104	1
	2462	13.98	$13.98 \pm 1$	14.98	1.5	0.0088	1
802.11g	2412	14.00	$14.00 \pm 1$	15.00	1.5	0.0089	1
	2437	15.61	$15.61 \pm 1$	16.61	1.5	0.0129	1
	2462	15.19	$15.19 \pm 1$	16.19	1.5	0.0117	1
802.11n (HT20)	2412	13.91	$13.91 \pm 1$	14.91	1.5	0.0087	1
	2437	15.70	$15.70 \pm 1$	16.70	1.5	0.0131	1
	2462	15.14	$15.14 \pm 1$	16.14	1.5	0.0116	1
802.11n (HT40)	2422	15.65	$15.65 \pm 1$	16.65	1.5	0.0130	1
	2437	15.31	$15.31 \pm 1$	16.31	1.5	0.0120	1
	2452	15.13	$15.13 \pm 1$	16.13	1.5	0.0115	1
BDR+EDR	2402	-0.740	$-0.740 \pm 1$	0.260	1.5	0.0003	1
	2441	-0.596	$-0.596 \pm 1$	0.404	1.5	0.0003	1
	2480	-1.075	$-1.075 \pm 1$	-0.075	1.5	0.0003	1
	2402	-1.335	$-1.335 \pm 1$	-0.335	1.5	0.0003	1
	2441	-1.316	$-1.316 \pm 1$	-0.316	1.5	0.0003	1
	2480	-1.995	$-1.995 \pm 1$	-0.995	1.5	0.0002	1
BLE	2402	-1.164	$-1.164 \pm 1$	-0.164	1.5	0.0003	1
	2441	-0.591	$-0.591 \pm 1$	0.409	1.5	0.0003	1
	2480	-0.191	$-0.191 \pm 1$	0.809	1.5	0.0003	1

**2G+3G:**

Operating Mode	Channel Frequency (MHz)	Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/ cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
GPRS 850	824.2-848.8	30.83	30±1	31	0	0.2505	0.5495
GPRS 1900	1850.2-1909.8	29.13	29±1	30	0	0.1989	1

Operating Mode	Channel Frequency (MHz)	Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/ cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
WCDMA (Band V)	826.4-846.6	23.25	23±1	24	0	0.0500	0.5509
WCDMA (Band II)	1852.4-1907.6	21.23	21±1	22	0	0.0315	1