FCC ID: S7A-SP56

Standalone SAR test exclusion considerations: Tx_1

Date: May 14, 2018

RF feauture	Mode	Transmitting Frequency(MHz)	Test separation distance (mm)[Note1]	ANT Gain (dBi)	Max. power with tune-up tolerance (dBm)[Note2]	Max. power with tune-up tolerance (mW)	Power thresholds	SAR test exclusion thresholds
2.4G WLAN	802.11b	2412.00	34.5	0.20	8.50	7.0795	0.32	3.00
2.4G WLAN	802.11g	2437.00	34.5	0.20	8.50	7.0795	0.32	3.00
2.4G WLAN	802.11n(HT20)	2437.00	34.5	0.20	8.50	7.0795	0.32	3.00

Note1. The mimum sapartion distance between antenna and user is 34.5mm. But we applied a closer distance to calculate the worst results.

Exact antenna dimensions and separation distances are sown in the "Attestation letter" in the FCC filing.

Note2. Please refer to the operation descriptoin for Max.tune-up power.

KDB 447498 D01 clasue 4.3.1 Step 1) SAR test exclusion thresholds for 100MHz to 6GHz at test separationn distances ≤ 50 mm

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1g SAR and ≤ 7.5 for 10g extremity SAR

Sample Calculation

= [(7.0795mW / 34.5mm)] X [√2.412GHz] = 0.32

Note. The calculation result was rounded to two decimal place for comparison.

Conclusion : SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required

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Standalone SAR test exclusion considerations: Tx_2

Date: May 14, 2018

RF feauture	Mode	Transmitting Frequency(MHz)	Test separation distance (mm)[Note1]	ANT Gain (dBi)	Max. power with tune-up tolerance (dBm)[Note2]	Max. power with tune-up tolerance (mW)	Power thresholds	SAR test exclusion thresholds
BT	1Mbps	2441.00	34.5	0.93	16.50	44.6684	2.02	3.00
BT	2Mbps	2441.00	34.5	0.93	5.50	3.5481	0.16	3.00
BT	3Mbps	2441.00	34.5	0.93	5.50	3.5481	0.16	3.00
LE	-	2480.00	34.5	0.93	6.50	4.4668	0.20	3.00

Note1. The mimum sapartion distance between antenna and user is 34.5mm. But we applied a closer distance to calculate the worst results.
Exact antenna dimensions and separation distances are sown in the "Attestation letter" in the FCC filing.

Note2. Please refer to the operation descriptoin for Max.tune-up power.

KDB 447498 D01 clasue 4.3.1 Step 1) SAR test exclusion thresholds for 100MHz to 6GHz at test separationn distances ≤ 50 mm

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1g SAR and ≤ 7.5 for 10g extremity SAR

Sample Calculation

= [(44.6684mW / 34.5mm)] X [√2.441GHz] = 2.02

Note. The calculation result was rounded to two decimal place for comparison.

Conclusion : SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required

FCC ID: S7A-SP56

Simultaneous transmission SAR test exclusion considerations

Date: May 14, 2018

▪ Configurations for simultaneous operations

- Configuration 1: Tx_1 (2.4G WLAN) + Tx_2 (BT) * The worst case
- Configuration 2:
- Configuration 3:
- Configuration 4:

RF feauture	Mode	Transmitting Frequency(MHz)	Test separation distance (mm)	ANT Gain (dBi)	Max. power with tune-up tolerance (dBm)	Max. power with tune-up tolerance (mW)	Standalone SAR value(W/kg)	Sum of SAR value(W/kg)	Requirement (W/kg)
Tx_1(2.4G WLAN)	802.11b	2412.00	34.5	0.20	8.50	7.0795	0.04	0.31	1.60
Tx_2(BT)	1Mbps	2441.00	34.5	0.93	16.50	44.6684	0.27		

Note. The measurement results comply with the limit per Part 2.1093.

KDB 447498 D01 clasue 4.3.2

b) When an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:

1) [(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)/x] W/kg, for test separation distances ≤ 50 mm; where x = 7.5 for 1-g SAR and x = 18.75 for 10-g SAR.

2) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distance is > 50 mm.

Sample Calculation

Standalone SAR value(W/kg)= [(7.0795mW / 34.5mm)] X [√2.412GHz / 7.5] = 0.04

Sum of SAR value(W/kg)= 0.26 + 0.23 = 49

Conclusion : SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required