

## AT&T Radiated Performance Requirements

**For Public Release at [www.att.com/iotdevices](http://www.att.com/iotdevices); TRP and TIS requirements for IoT devices.**

The tables below describe the TRP and TIS requirements which must be met for devices undergoing AT&T approval. Not all bands listed in these tables are mandatory for IoT devices. However, devices are required to meet the requirements for all bands supported by the wireless module being used.

All testing must be performed in accordance with the current "CTIA Test Plan for Wireless Device Over-The-Air Performance" as specified by the requirements defined in PTCRB. The test plan can be downloaded from CTIA [here](#).

All requirements accurate according to 13340 v18.1.

**Table 1: LTE Requirements Category 1 and higher: Free-Space**

Band	Minimum TRP Requirement	Minimum TIS Requirement (Primary Antenna)	Minimum TIS Requirement (Secondary Antenna) <sup>1,2</sup>	Comments
2	+20.0 dBm	-91 dBm/10 MHz	-87 dBm/10 MHz	
4	+20.0 dBm	-93 dBm/10 MHz	-89 dBm/10 MHz	
5	+18.0 dBm	-89 dBm/10 MHz	-85 dBm/10 MHz	
12	+18.0 dBm	-91 dBm/5 MHz	-87 dBm/5 MHz	
14	+17.0 dBm	-87 dBm/10 MHz	-83 dBm/10 MHz	
17	+18.0 dBm	-88 dBm/10 MHz	-84 dBm/10 MHz	
30	+19.0 dBm	-91 dBm/10 MHz	-87 dBm/10 MHz	
66	+20.0 dBm	-93 dBm/10 MHz	-89 dBm/10 MHz	

**Note:** Devices supporting Carrier Aggregation should reference document **20193** for bands and combinations to be tested

<sup>1</sup> Secondary antenna branch TIS must be no more than 4 dB below primary antenna

<sup>2</sup> Secondary antenna branch mandatory for LTE Category 1 and higher devices

**Table 2a: LTE Requirements Category-M1: Free-Space<sup>3</sup>**

Band	Minimum TRP Requirement Power Class 3	Minimum TRP Requirement Power Class 5	Minimum TIS Requirement (Primary Antenna)	Comments
2	+20.0 dBm	+17.0 dBm	-96 dBm/720 kHz	per 36.521-1, Clause 6.2.2EA
4	+20.0 dBm	+17.0 dBm	-98 dBm/720 kHz	per 36.521-1, Clause 6.2.2EA
12	+18.0 dBm	+15.0 dBm	-93 dBm/720 kHz	per 36.521-1, Clause 6.2.2EA

<sup>3</sup> Note: TRP/TIS applicable for all LTE-M devices with an embedded antenna or external antenna cabled less than 20cm. Testing shall be performed according to the requirements of CTIA Test Plan for Wireless Device Over-The-Air Performance version 3.7.kl1cdfv or later. Testing is required for AT&T certification.

**Table 2b: Small Form Factor<sup>4</sup> Devices: LTE Requirements Category-M1: Free-Space<sup>43</sup>**

Band	Minimum TRP Requirement Power Class 3	Minimum TRP Requirement Power Class 5	Minimum TIS Requirement (Primary Antenna)	Comments
2	+12.0 dBm	+9.0 dBm	-88 dBm/720 kHz	per 36.521-1, Clause 6.2.2EA
4	+12.0 dBm	+9.0 dBm	-90 dBm/720 kHz	per 36.521-1, Clause 6.2.2EA
12	+10.0 dBm	+7.0 dBm	-85 dBm/720 kHz	per 36.521-1, Clause 6.2.2EA

<sup>4</sup> Small Form Factor device is a device under 107mm in the longest direction.

**Table 3: LTE Requirements, Category 1 and higher: Wrist Phantom**

Band	Minimum TRP Requirement	Minimum TIS Requirement (Primary Antenna)	Minimum TIS Requirement (Secondary Antenna) <sup>5,6</sup>	Comments
2	+12.0 dBm	-83 dBm/10 MHz	-78 dBm/10 MHz	
4	+12.0 dBm	-83 dBm/10 MHz	-78 dBm/10 MHz	
5	+10.0 dBm	-81 dBm/10 MHz	-76 dBm/10 MHz	
12	+10.0 dBm	-83 dBm/5 MHz	-78 dBm/5 MHz	
17	+10.0 dBm	-80 dBm/10 MHz	-75 dBm/10 MHz	

<sup>5</sup> Secondary antenna branch TIS must be no more than 5 dB below primary antenna

<sup>6</sup> Secondary antenna branch can be waived for wrist worn devices that do not support VoLTE

**Table 4: UMTS Requirements: Free-Space**

Band	Minimum TRP Requirement	Minimum TIS Requirement (Primary)	Minimum TIS Requirement (Secondary Antenna) <sup>7,8</sup>	Comments
2	+18.5 dBm	-102 dBm/3.84 MHz	-98 dBm/3.84 MHz	
5	+17.0 dBm	-100 dBm/3.84 MHz	-96 dBm/3.84 MHz	

<sup>7</sup> Secondary antenna branch optional for 3G devices

<sup>8</sup> Secondary antenna branch TIS must no more than 4 dB below primary antenna

**Table 5: UMTS Requirements: Wrist Phantom**

Band	Minimum TRP Requirement	Minimum TIS Requirement (Primary)	Comments
2	+11.0 dBm	-91 dBm/3.84 MHz	Wearable devices only
5	+11.0 dBm	-94 dBm/3.84 MHz	Wearable devices only

Updated: 5/18/2018

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