

InHand Electronics, Inc.

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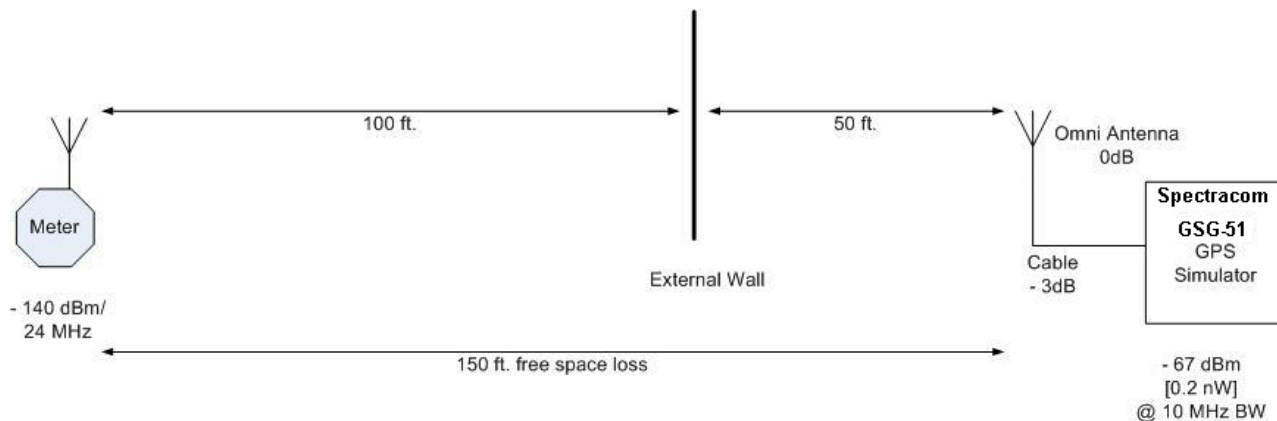
Power Level Considerations

The NTIA restricts the maximum signal level to -140 dBm (24 MHz BW) as received from an isotropic antenna at a distance of 100 feet from the building where the test is being conducted. Therefore, the maximum power level output from the GSG Signal Generator is limited to conform with this regulation.

Antenna distance to nearest exterior wall: 50 ft.

Antenna gain: 0 dB (omni antenna)

Cable loss, antenna to GSG simulator: 3 dB (3 ft RG-58 plus connector loss)



Using the free space loss calculation for radio propagation:

$$\text{Loss (dB)} = 20 \log_{10} (4\pi * \text{Distance} / \lambda)$$

Where λ = wavelength: @ 1575 MHz= 19 cm = 0.62 ft

Distance = 150 ft total => 50 ft from antenna exterior wall + 100 ft to restricted perimeter

$$\text{Loss} = 70 \text{ dB} = 20 \log_{10} (4\pi * 150 / 0.62)$$

Transmit Power -67 dBm

Cable Loss -3 dB

Transmit Antenna Gain 0 dB

Free space loss: 150 ft -70 dB

Receive Antenna Gain 0 dB -140 dBm

Using the free space calculation is a worst case scenario as the wall and any other obstructions will likely reduce the signal even more. Therefore, setting the power output of the GSG-51 Simulator = -67 dBm or less will guarantee compliance.

Reference: http://en.wikipedia.org/wiki/Path_loss

Equipment to be Tested

InHand Electronics, Inc is a manufacturer of handheld devices for Consumer, Aerospace and Defense, Healthcare, Transportation, Industrial Control and many other applications. Many of our products contain a GPS receiver. To test our equipment - including GPS receivers and their antennas - in our production test facility, it is desirable to radiate a simulated GPS signal.