



3301 E. Deseret Drive, St. George, UT 84790
www.wilsonelectronics.com • info@wilsonelectronics.com
phone 1-800-204-4104 • fax 1-435-656-2432

April 19, 2019

To: Whom it May Concern

Subject: Calculated Mobile Station Coupling Losses (MSCL)

FCCID: PWO460053

The following formulas were used to calculate MSCL with a 45 degree polarity mismatch between the inside antenna and the mobile device:

Distance (feet): 6

Path Loss dB = 36.6 dB + 20Log(F MHz) dB + 20Log(D_{miles}) dB

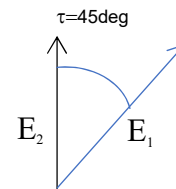
Polarity Loss dB = 10Log(E₁/E₂)² dB = P_L dB

P_L dB = 10Log(E₁²/(E₁Sin(45_{deg}))²) dB = 20Log(1/Sin(45_{deg})) dB = 3.01dB

Where:

E₁ = Maximum Possible Magnitude of the Electric Field from the Mobile Device

E₂ = Magnitude of the electric field from the Mobile device with a 45deg polarity mismatch = E₁Sin(t).



MSCL dB = Path Loss dB + Polarity Loss dB - Antenna Gain dB

The results of the calculations are shown in the following table:

Uplink Center Frequency MHz	707-710	782	836.5	1732.5	1880-1882.5
Path Loss (dB)	34.72	35.58	36.16	42.49	43.20
Polarity Loss (dB)	3	3	3	3	3
Inside Antenna Gain with Coax Loss (dBi)	-2.43	-1.69	-3.09	-0.33	-1.29
MSCL (dB)	40.15	40.27	42.25	45.82	47.49

Note: Antenna Gain with Coax Loss as measured.

Sincerely

Patrick L. Cook