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To: Whom it May Concern

Subject: Calculated Mobile Station Coupling Losses (MSCL) For FCCID: PWO460003

The following formulas were used to calculate MSCL with a 6' foot path loss and a 45 degree polarity mismatch between the inside antenna and the mobile device:

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

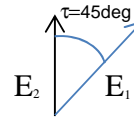
$$\text{Polarity Loss dB} = 10\text{Log}(E_1/E_2)^2 \text{ dB} = P_L \text{ dB}$$

$$P_L \text{ dB} = 10\text{Log}(E_1^2 / (E_1 \sin(45_{\text{deg}}))^2) \text{ dB} = 20\text{Log}(1/\sin(45_{\text{deg}})) \text{ dB} = 3.01 \text{ dB}$$

Where:

E_1 = Maximum Possible Magnitude of the Electric Field from the Mobile Device

E_2 = Magnitude of the electric field from the Mobile device with a 45deg polarity mismatch = $E_1 \sin(\tau)$.



$$\text{MSCL dB} = \text{Path Loss dB} + \text{Polarity Loss dB} - \text{Antenna Gain dB}$$

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)	34.70	35.57	36.16	42.48	43.19
Polarity Loss (dB)	3	3	3	3	3
Antenna Gain with Coax Loss	2.8	2.76	2.9	4.98	4.98
MSCL (dB)	34.90	35.81	36.26	40.50	41.21

Sincerely

Patrick L. Cook
 Senior Electrical Engineer