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To: Whom it May Concern

Subject: Calculated Mobile Station Coupling Losses (MSCL) For FCCID: PWO460008

The following formulas were used to calculate MSCL with a 1.5' foot path loss and a 45 degree polarity mismatch between the inside antenna and the mobile device:

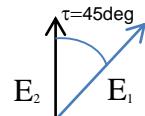
Path Loss dB =  $36.6 \text{ dB} + 20\log(F \text{ MHz}) \text{ dB} + 20\log(D_{\text{miles}}) \text{ dB}$

Polarity Loss dB =  $10\log(E_1/E_2)^2 \text{ dB} = P_L \text{ dB}$   
 $P_L \text{ dB} = 10\log(E_1^2/(E_1 \sin(45_{\text{deg}}))^2) \text{ dB} = 20\log(1/\sin(45_{\text{deg}})) \text{ dB} = 3.01 \text{ dB}$

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 =  $E_1 \sin(\tau)$ .



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)	22.69	23.53	24.12	30.44	31.16
Polarity Loss (dB)	3	3	3	3	3
Antenna Gain with Coax Loss	0.22	0.04	-1.96	-3.68	-2.10
MSCL (dB)	<b>25.47</b>	<b>26.49</b>	<b>29.08</b>	<b>37.12</b>	<b>36.26</b>

Note: Antenna Gain with Coax Loss as measured.

Sincerely

Patrick L. Cook  
Senior Electrical Engineer