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To: Whom it May Concern

Subject: Calculated Mobile Station Coupling Losses (MSCL)

FCCID: **PWO460050**

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<sub>miles</sub>) dB

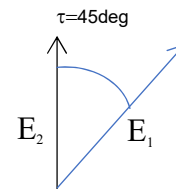
Polarity Loss dB = 10Log(E<sub>1</sub>/E<sub>2</sub>)<sup>2</sup> dB = P<sub>L</sub> dB

P<sub>L</sub> dB = 10Log(E<sub>1</sub><sup>2</sup>/(E<sub>1</sub>Sin(45<sub>deg</sub>))<sup>2</sup>) dB = 20Log(1/Sin(45<sub>deg</sub>)) dB = 3.01dB

Where:

E<sub>1</sub> = Maximum Possible Magnitude of the Electric Field from the Mobile Device

E<sub>2</sub> = Magnitude of the electric field from the Mobile device with a 45deg polarity mismatch = E<sub>1</sub>Sin(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        |
| <b>MSCL (dB)</b>                         | <b>40.15</b> | <b>40.27</b> | <b>42.25</b> | <b>45.82</b> | <b>47.49</b> |

Note: Antenna Gain with Coax Loss as measured.

Sincerely

Patrick L. Cook