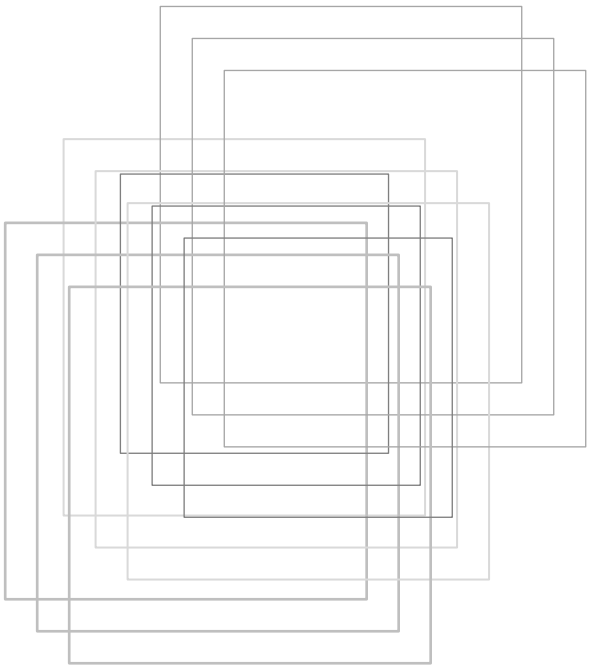

Dynamic Sciences International, Inc.

Application Note

Cable Loss

DSI-600 EMI Test Measurement Receiver System

Application No. 4.0

DSI Application Note

Cable Loss of the DSI-600-40 Receiver

The sensitivity of the Receiver DSI-600-40 is –130dBm @ 1KHz BW @ 18 GHz and –124 dBm at 40GHz.

With a typical horn antenna having an antenna factor of 44 dB/m @ 18 GHz and 47.7 dB/m at 40 GHz, the system can measure a field of 57dBµV/m @ 18 GHz and 67 dB µV/m @40 GHz with a bandwidth of 200 KHz.

This provides a margin of 13 dB below the MIL-STD-461E RE102 test limit for aircraft.

(See below for details of the calculation of universal values)

The cable loss must be less than 7 dB at the frequency of measurement, to meet the requirements of MIL-STD46IE.

The selection of cable types and lengths is up to the user of the system

Calculation Details

$P= V^2/R$ Power at the receiver input
P (dBm) = V(dBV) –20 lg 50 Ohms- V(dBV)-17
P (dBm) = V(dBV)-17+30
P (dBm)=V(dBµV)-120-17+30=V(dBµV)-107

E(dBµV/m)=V (dBµV)+AF (dB/m) =Measured electric field

V=E-AF

P(dBm)= E (dBµV/m) -AF (dB/m) -107-cable loss (dB) = power input

Measurable Field: E (dBµV) = P (dBm)+AF(dB/m) +107+ cable loss

Receiver Sensitivity: P(dBm)=-130dBm @ 18GHz @1KHz BW=-84dBm @200kHz BW
P(dBm) =-124dBm@ 40GHz @1KHz BW=-88dBm@200kHz BW

Antenna Factor: AF (EMCO model 3116) 44.0 dB/m @18GHz 47.7 dB/m @40GHz

MIL-STD-461E, RE102, Aircraft Radiated Emissions

Spec Limit: E=+69.9dBµV/m@18GHz, Extrapolorated
+79.9dBµV/m@40GHz, Extrapolorated

Measurable Field E min (dBµv/m)
= -94+44+107=57dBµV/m @ 18GHz
=- 88+47.7+107=67dBµV/m @ 40GHz
Hence, there is a 13dB Margin between the spec and system sensitivity.