ITS answers

1) We followed the procedures of EIA/TIA 603 for radiated spurious emissions. The substitution method using a half wave dipole is called out. The standard goes on to state that other antenna types are allowed, provided they can be referenced to a half wave dipole. Since we used a horn antenna above 1 GHz, we adjusted the readings by the additional gain of the transmit horn above that of a typical dipole (2.14 dBi).

2) The limits specified are not written at 3 meters. Instead we are comparing spurious radiated emissions to the 90.210 emissions mask requirement that all emissions offset by 250% or more of the transmitter bandwidth must be attenuated by 43 + 10 Log P(mW) dB below the fundamental power. Therefore limits are specified at the antenna port. We applied this limit (which calculates very conveniently to -13 dBm) to the EIRP values obtained using the substitution method. Note that the actual readings are compared to the actual limit of -13 dBm, and comply (scaling was only used in selection criterion, not EIRP results). Note also that the selected emissions tested were the highest emissions of all the spurious, so any other spurious would meet the requirements. The 20 dB distance scaling factor is part of a poorly thought out selection criterion to attempt to select the highest emissions since they are most likely to be non-compliant, yet pass over the emissions which are low enough not to require measurement. The selection criterion was simply that we wanted to measure any emissions within 20 dB of the limit, so any emission over -33 dBm. However, the limit was specified at the antenna port as stated above, and measurements were being made at 10 meters. Since 1 meter is close to the EUT, and we were measuring at ten meters from the EUT, an additional adjustment of 20 dB scaling to the -33 dBm selection criterion was made to account for the fact that the emissions seen at 10m would be lower than at 1m. Therefore the selection criterion was -53 dBm adjusted for the dipole that was assumed to be there as part of the procedure, or ~2.2 db gain, giving a selection threshhold of any emission over 51.8 dBuV (-53 dBm + 107 = 54 dBuV) [54 dBuV - 2.2 dB gain = 51.8 dBuV]. We should have simply used -33 dBm/ 4*Pi*r^2 but we did not, however the methodology employed is still correct from a substitution testing standpoint, since substitution testing ignores test distance anyway the actual data was not adjusted for any distance factors and represents the highest level of spurious emissions from the device.

Regards,

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