Processing Gain Data

Retlif Testing Laboratories

Customer: Wireless Manufacturing **Job Number**: R-3435N
Test Sample: Wireless Bridge with 2.4GHz Spread Spectrum Transmitter
Model No.: BR1200
FCC ID#: OIA-BR1200

Findings:
The direct sequence spread spectrum transmitter under test uses a Harris PRISM radio chipset. The PRISM chipset has a HSP 3824 baseband processor, which generates the desirable programmed Pseudo Noise (PN) sequence up to 16 bits. The random binary data with a bit rate (rB) bits per second is multiplied by a higher Pseudo random binary waveform which provides the frequency spreading operation.

The PN output chip is at a constant rate (rC) chips/second, which is always higher than the bit rate. The ratio of rC to rB is the processing gain (PG). The higher the PG, the better the DSSS signal resistance is to interference.

The formula for PG is 10LOG (rC/rB) in dB. With the PRISM chipset, the formula becomes 10LOG (X) dB where X equals the number denoting the length of the PN code.

Calculations:

Pseudo Noise Code Length (PN)	Log (PN)	10 Log (PN)	Processing Gain of Direct Sequence Spread Spectrum
10.0	1.0	10.0	10.0dB
11.0	1.0413	10.4139	10.4dB
12.0	1.0791	10.7918	10.8dB
13.0	1.1139	11.1394	11.1dB
14.0	1.1461	11.4612	11.5dB
15.0	1.1760	11.7609	11.8dB
16.0	1.2041	12.0411	12.0dB

THE EUT DSSS TRANMITTER PROCESSING GAIN IS AT LEAST 10dB FOR ANY APPLICATION.