## FCC Part 15, Compliance Processing Gain Performance Test

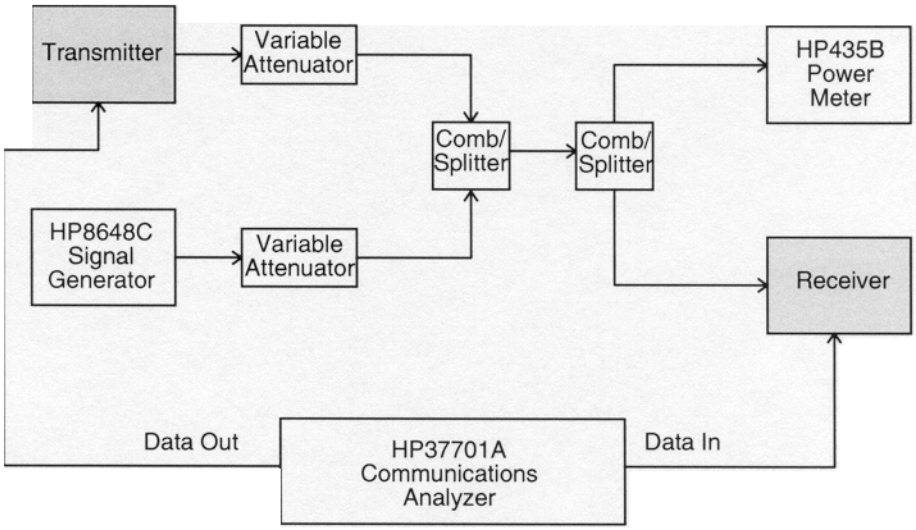
Test method recommended by FCC 97-114 is the CW Jamming Margin Method.

| Characteristic | Value |
|---|---|
| Data rate | 2T1 (3.208 Mb/s) |
| Chip rate | 11 chips/bit |
| Designed processing gain | 10.4 dB |

### *Test Setup*

Test setup is shown in Figure D-12.

***Figure D-12 Processing gain test setup***



## *Jamming Margin (J/S Ratio) (for BER $10^{-5}$)*

The test was performed in Direction B. 50-kHz increments were used in this test; the worst 20% were discarded. See Table D-8.

After the worst 20% (64 points marked with (x)) were discarded, the lowest J/S ratio was −1.2 dB (marked with (**)).

Hence $M_j = -1.2$ dB.

The S/N ratio for ideal noncoherent receiver is calculated from

$$Pe = \tfrac{1}{2} e^{(-\frac{1}{2}(S/N)_o}$$

where $Pe = 10^{-5}$.

Hence $(S/N)_o = 13.3$ dB.

The processing gain can be calculated as

$$G_p = (S/N)_o + M_j + L_{sys}$$

where $L_{sys}$ = System Loss.

No more than 2-dB loss is allowed (we assumed 0 dB).

Hence $G_p = 13.3 - 1.2 + 0.0 = 12.1$ dB, better than the designed coding gain of 10.4 dB and better than the FCC's minimum requirement of 10 dB.

*Table D-8 Jamming margin (J/S ratio) (for BER $10^{-5}$) for 2T1*

| Freq. Offset (MHz) | J/S (dB) | Freq. Offset (MHz) | J/S (dB) | Freq. Offset (MHz) | J/S (dB) | Freq. Offset (MHz) | J/S (dB) |
|---|---|---|---|---|---|---|---|
| −10.00 | 0.4 | −8.00 | −1.2 | −6.00 | (x) −1.6 | −4.00 | (x) −1.5 |
| .05 | 0.4 | .05 | −1.1 | .05 | (x) −1.6 | .05 | (x) −1.4 |
| .10 | 0.4 | .10 | −1.2 | .10 | (x) −1.7 | .10 | (x) −1.3 |
| .15 | 0.4 | .15 | (x) −1.3 | .15 | (x) −1.7 | .15 | (x) −1.3 |
| .20 | 0.4 | .20 | (x) −1.7 | .20 | (x) −1.7 | .20 | (x) −1.3 |
| .25 | 0.4 | .25 | (x) −1.5 | .25 | (x) −1.7 | .25 | (x) −1.3 |
| .30 | 0.5 | .30 | (x) −1.6 | .30 | (x) −1.7 | .30 | (x) −1.3 |
| .35 | 0.4 | .35 | (x) −1.7 | .35 | (x) −1.5 | .35 | (x) −1.3 |
| .40 | 0.3 | .40 | (x) −1.8 | .40 | (x) −1.4 | .40 | (x) −1.3 |
| .45 | 0.3 | .45 | (x) −1.7 | .45 | (x) −1.3 | .45 | (x) −1.4 |
| .50 | 0.3 | .50 | (x) −1.7 | .50 | −1.2 | .50 | (x) −1.5 |
| .55 | 0.3 | .55 | (x) −1.8 | .55 | −1.2 | .55 | (x) −1.2 |
| .60 | 0.3 | .60 | (x) −1.8 | .60 | (x) −1.3 | .60 | −1.0 |
| .65 | 0.3 | .65 | (x) −1.8 | .65 | (x) −1.3 | .65 | −1.0 |
| .70 | 0.3 | .70 | (x) −1.8 | .70 | −1.2 | .70 | −0.9 |
| .75 | 0.4 | .75 | (x) −1.6 | .75 | −1.2 | .75 | −0.8 |
| .80 | 0.5 | .80 | (x) −1.5 | .80 | (x) −1.6 | .80 | −0.5 |
| .85 | 0.4 | .85 | (x) −1.5 | .85 | (x) −1.5 | .85 | −0.6 |
| .90 | 0.3 | .90 | (x) −1.4 | .90 | (x) −1.3 | .90 | −0.7 |
| .95 | 0.2 | .95 | (x) −1.4 | .95 | (x) −1.5 | .95 | −0.8 |
| −9.00 | 0.1 | −7.00 | (x) −1.3 | −5.00 | (x) −1.6 | −3.00 | −0.9 |
| .05 | −0.1 | .05 | (x) −1.3 | .05 | (x) −1.6 | .05 | −0.9 |
| .10 | −0.1 | .10 | −1.0 | .10 | (x) −1.6 | .10 | −0.9 |
| .15 | −0.2 | .15 | −1.1 | .15 | (x) −1.5 | .15 | −1.0 |
| .20 | −0.2 | .20 | −1.1 | .20 | (x) −1.6 | .20 | (x) −1.2 |
| .25 | −0.1 | .25 | −1.2 | .25 | (x) −1.7 | .25 | (x) −1.2 |
| .30 | −0.1 | .30 | (**) −1.2 | .30 | (x) −1.7 | .30 | (x) −1.2 |
| .35 | −0.1 | .35 | −1.1 | .35 | (x) −1.6 | .35 | −1.1 |
| .40 | 0.0 | .40 | −1.1 | .40 | (x) −1.6 | .40 | −1.0 |
| .45 | −0.1 | .45 | (x) −1.3 | .45 | (x) −1.6 | .45 | −1.0 |
| .50 | −0.2 | .50 | (x) −1.4 | .50 | (x) −1.6 | .50 | −0.9 |
| .55 | −0.2 | .55 | (x) −1.3 | .55 | (x) −1.7 | .55 | −0.6 |
| .60 | −0.3 | .60 | (x) −1.4 | .60 | (x) −1.7 | .60 | −0.3 |
| .65 | −0.3 | .65 | (x) −1.6 | .65 | (x) −1.6 | .65 | −0.5 |
| .70 | −0.4 | .70 | (x) −1.7 | .70 | (x) −1.7 | .70 | −0.7 |
| .75 | −0.4 | .75 | (x) −1.7 | .75 | (x) −1.3 | .75 | −0.4 |
| .80 | −0.4 | .80 | (x) −1.7 | .80 | −0.7 | .80 | −0.3 |
| .85 | −0.4 | .85 | (x) −1.5 | .85 | (x) −1.6 | .85 | −0.2 |
| .90 | −0.6 | .90 | (x) −1.4 | .90 | (x) −1.9 | .90 | −0.1 |
| .95 | −0.6 | .95 | (x) −1.5 | .95 | (x) −1.7 | .95 | −0.1 |

| Freq. Offset (MHz) | J/S (dB) | Freq. Offset (MHz) | J/S (dB) | Freq. Offset (MHz) | J/S (dB) | Freq. Offset (MHz) | J/S (dB) |
|---|---|---|---|---|---|---|---|
| −2.00 | −0.1 | 0.00 | 1.0 | +2.00 | 1.3 | +4.00 | 1.5 |
| .05 | −0.2 | .05 | 0.9 | .05 | 1.3 | .05 | 1.6 |
| .10 | −0.3 | .10 | 0.9 | .10 | 1.4 | .10 | 1.5 |
| .15 | −0.2 | .15 | 0.8 | .15 | 1.3 | .15 | 1.4 |
| .20 | −0.1 | .20 | 0.7 | .20 | 1.3 | .20 | 1.5 |
| .25 | −0.1 | .25 | 0.9 | .25 | 1.3 | .25 | 1.4 |
| .30 | −0.1 | .30 | 1.1 | .30 | 1.3 | .30 | 1.3 |
| .35 | 0.0 | .35 | 0.9 | .35 | 1.4 | .35 | 1.3 |
| .40 | 0.1 | .40 | 0.8 | .40 | 1.2 | .40 | 1.2 |
| .45 | 0.0 | .45 | 1.0 | .45 | 1.2 | .45 | 1.2 |
| .50 | 0.0 | .50 | 1.2 | .50 | 1.3 | .50 | 1.1 |
| .55 | −0.2 | .55 | 1.1 | .55 | 1.1 | .55 | 1.1 |
| .60 | −0.4 | .60 | 1.0 | .60 | 1.0 | .60 | 1.2 |
| .65 | −0.4 | .65 | 1.0 | .65 | 1.1 | .65 | 1.2 |
| .70 | −0.4 | .70 | 1.0 | .70 | 1.2 | .70 | 1.2 |
| .75 | −0.5 | .75 | 0.9 | .75 | 1.3 | .75 | 1.3 |
| .80 | −0.7 | .80 | 0.8 | .80 | 1.4 | .80 | 1.4 |
| .85 | −0.7 | .85 | 0.6 | .85 | 1.2 | .85 | 1.4 |
| .90 | −0.7 | .90 | 0.4 | .90 | 1.3 | .90 | 1.5 |
| .95 | −0.4 | .95 | −0.1 | .95 | 1.4 | .95 | 1.4 |
| −1.00 | −0.2 | +1.00 | −0.2 | +3.00 | 1.5 | +5.00 | 1.3 |
| .05 | −0.2 | .05 | −0.1 | .05 | 1.5 | .05 | 1.7 |
| .10 | −0.1 | .10 | −0.6 | .10 | 1.5 | .10 | 1.8 |
| .15 | 0.0 | .15 | 0.1 | .15 | 1.5 | .15 | 1.7 |
| .20 | 0.1 | .20 | 0.2 | .20 | 1.6 | .20 | 1.7 |
| .25 | 0.2 | .25 | 0.3 | .25 | 1.7 | .25 | 1.7 |
| .30 | 0.3 | .30 | 0.4 | .30 | 1.6 | .30 | 1.6 |
| .35 | 0.3 | .35 | 0.5 | .35 | 1.5 | .35 | 1.8 |
| .40 | 0.4 | .40 | 0.7 | .40 | 1.6 | .40 | 2.0 |
| .45 | 0.5 | .45 | 0.8 | .45 | 1.6 | .45 | 1.7 |
| .50 | 0.6 | .50 | 1.0 | .50 | 1.6 | .50 | 1.6 |
| .55 | 0.4 | .55 | 1.0 | .55 | 1.7 | .55 | 1.7 |
| .60 | 0.2 | .60 | 1.1 | .60 | 1.8 | .60 | 1.6 |
| .65 | 0.3 | .65 | 0.6 | .65 | 1.7 | .65 | 1.6 |
| .70 | 0.5 | .70 | 0.3 | .70 | 1.8 | .70 | 1.7 |
| .75 | 0.7 | .75 | 0.5 | .75 | 1.6 | .75 | 1.8 |
| .80 | 0.9 | .80 | 1.1 | .80 | 1.7 | .80 | 1.8 |
| .85 | 0.8 | .85 | 1.1 | .85 | 1.7 | .85 | 1.7 |
| .90 | 0.7 | .90 | 1.1 | .90 | 1.8 | .90 | 1.8 |
| .95 | 0.8 | .95 | 1.2 | .95 | 1.7 | .95 | 1.8 |

| Freq. Offset (MHz) | J/S (dB) | Freq. Offset (MHz) | J/S (dB) | Freq. Offset (MHz) | J/S (dB) | Freq. Offset (MHz) | J/S (dB) |
|---|---|---|---|---|---|---|---|
| +6.00 | 1.8 | +7.00 | 3.2 | +8.00 | 3.8 | +9.00 | 6.7 |
| .05 | 1.8 | .05 | 3.1 | .05 | 4.1 | .05 | 6.8 |
| .10 | 1.8 | .10 | 3.0 | .10 | 4.6 | .10 | 7.1 |
| .15 | 2.0 | .15 | 3.0 | .15 | 5.2 | .15 | 7.2 |
| .20 | 2.1 | .20 | 3.0 | .20 | 6.0 | .20 | 7.4 |
| .25 | 2.0 | .25 | 3.1 | .25 | 6.0 | .25 | 7.4 |
| .30 | 1.9 | .30 | 3.1 | .30 | 5.2 | .30 | 7.3 |
| .35 | 1.9 | .35 | 2.8 | .35 | 5.3 | .35 | 7.7 |
| .40 | 1.9 | .40 | 2.5 | .40 | 5.5 | .40 | 7.9 |
| .45 | 2.2 | .45 | 2.6 | .45 | 5.6 | .45 | 8.0 |
| .50 | 2.6 | .50 | 2.8 | .50 | 5.7 | .50 | 6.9 |
| .55 | 2.5 | .55 | 2.5 | .55 | 5.7 | .55 | 8.2 |
| .60 | 2.5 | .60 | 2.2 | .60 | 5.8 | .60 | 8.0 |
| .65 | 2.7 | .65 | 2.4 | .65 | 5.8 | .65 | 8.1 |
| .70 | 3.0 | .70 | 2.5 | .70 | 5.9 | .70 | 8.2 |
| .75 | 2.9 | .75 | 3.0 | .75 | 6.0 | .75 | 8.8 |
| .80 | 2.7 | .80 | 3.3 | .80 | 6.2 | .80 | 9.2 |
| .85 | 2.7 | .85 | 3.3 | .85 | 6.4 | .85 | 9.2 |
| .90 | 2.8 | .90 | 3.2 | .90 | 6.6 | .90 | 9.2 |
| .95 | 2.9 | .95 | 3.5 | .95 | 6.6 | .95 | 9.8 |
| | | | | | | +10.00 | 10.2 |

## Jitter Transfer Function

*Figure D-13 Jitter transfer (DS1)*