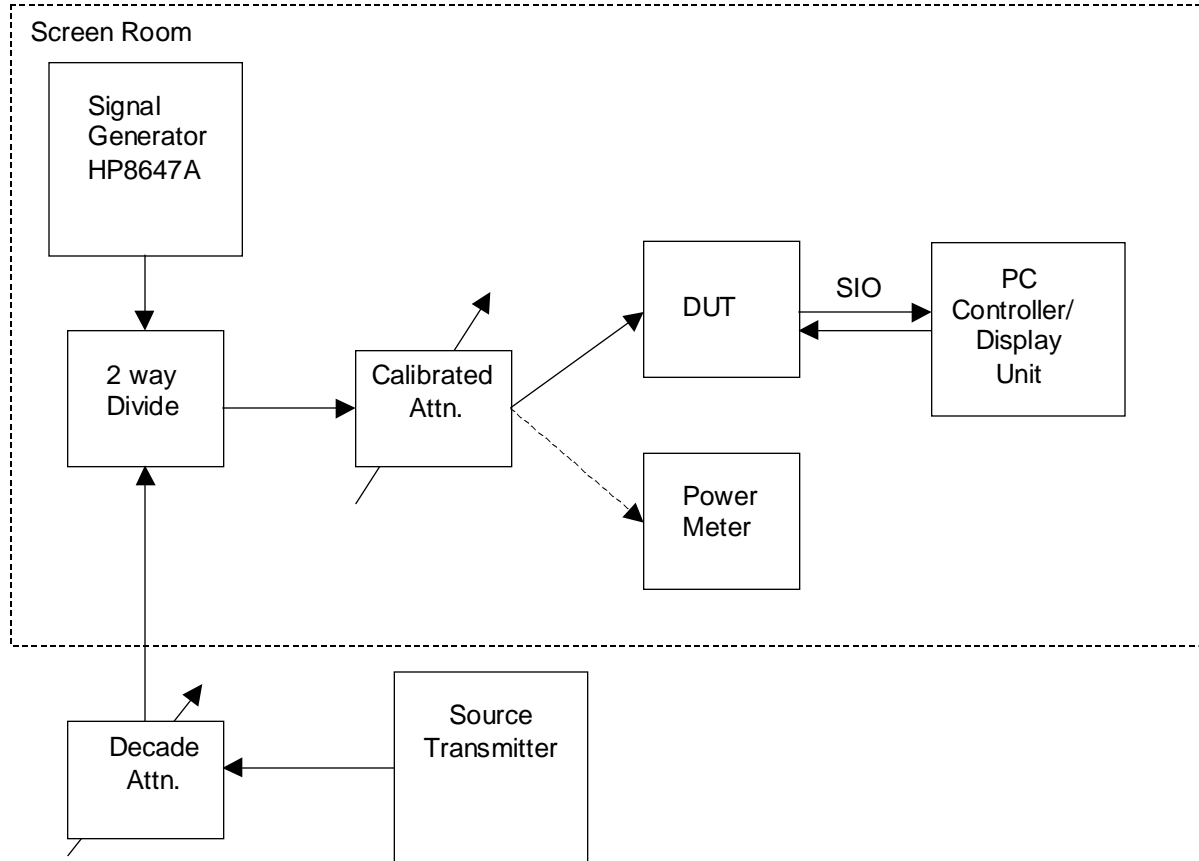# Process Gain Measurement for H6N26061200

Method

The processing gain is measured using the CW jamming method. The equipment arrangement is shown in the block diagram below.

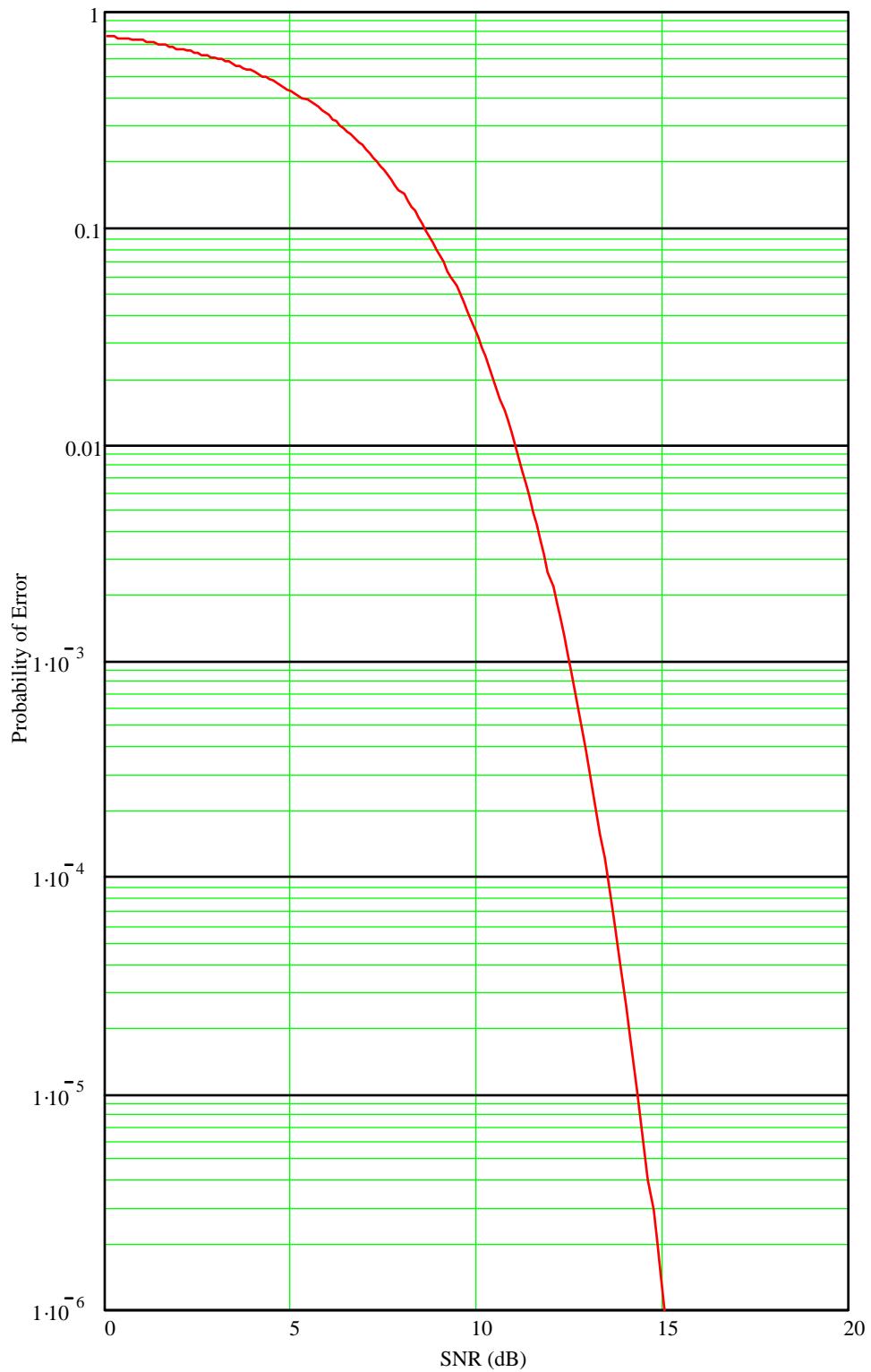## Process Gain Tests Configuration

Procedure

A signal generator is stepped in 50kHz increments across the passband of the system. At each point the generator level required to produce a bit error rate equivalent to 2.7 x 10E-3, the threshold of designed performance for the system, is recorded as the jammer level (J). The output power of the transmitter is measured at the same point and recorded as signal (S). The jammer to signal ratio (J/S) is then calculated with 20% of the worst data points discarded. The lowest remaining J/S ratio is used to calculate the processing gain using the formula:

$$\mathbf{Gp = (S/N)o + Mj + Lsys}$$

The theoretical probability of error vs. S/N is shown in the curve below, obtained from section 4.3.2 of Digital Communications, second edition, John G. Proakis, McGraw-Hill.

16-Orthogonal Signalling Probability of Error Curve

For the threshold error rate of 2.7 x 10E-3, the theoretical Signal to Noise ratio is 11.9 dB.

Results

With:

(S/N)o = 11.9dB

Lsys = 2dB

Mj = 2.3dB

$$Gp = 11.9dB + 2.3dB + 2dB = 16.2dB$$

Tabulated Jamming Test Results

Pass band = 917.58MHz ± 1.2MHz

Jmmr Freq.	Deviation	Jammer	Sig. In	J/S Ratio
(in MHz)	(KHz)	(dBm)	(dBm)	(dB)
916.38	1200	-107.7	-111	3.3
916.43	1150	-108.2	-111	2.8
916.48	1100	-108.2	-111	2.8
916.53	1050	-108.7	-111	2.3
916.58	1000	-108.7	-111	2.3
916.63	950	-108.7	-111	2.3
916.68	900	-108.7	-111	2.3
916.73	850	-108.7	-111	2.3
916.78	800	-108.7	-111	2.3
916.83	750	-108.7	-111	2.3
916.88	700	-108.7	-111	2.3
916.93	650	-108.7	-111	2.3
916.98	600	-108.7	-111	2.3
917.03	550	-108.7	-111	2.3
917.08	500	-108.7	-111	2.3
917.13	450	-109.2	-111	1.8
917.18	400	-109.7	-111	1.3
917.23	350	-108.7	-111	2.3
917.28	300	-109.2	-111	1.8
917.33	250	-108.7	-111	2.3
917.38	200	-108.7	-111	2.3
917.43	150	-107.7	-111	3.3
917.48	100	-108.7	-111	2.3
917.53	50	-107.2	-111	3.8

917.58	0	-107.2	-111	3.8
917.63	-50	-107.2	-111	3.8
917.68	-100	-106.7	-111	4.3
917.73	-150	-107.2	-111	3.8
917.78	-200	-107.7	-111	3.3
917.83	-250	-107.7	-111	3.3
917.88	-300	-107.7	-111	3.3
917.93	-350	-108.2	-111	2.8
917.98	-400	-108.2	-111	2.8
918.03	-450	-107.7	-111	3.3
918.08	-500	-106.7	-111	4.3
918.13	-550	-106.7	-111	4.3
918.18	-600	-107.2	-111	3.8
918.23	-650	-106.2	-111	4.8
918.28	-700	-106.2	-111	4.8
918.33	-750	-106.7	-111	4.3
918.38	-800	-106.2	-111	4.8
918.43	-850	-106.7	-111	4.3
918.48	-900	-106.2	-111	4.8
918.53	-950	-105.7	-111	5.3
918.58	-1000	-105.7	-111	5.3
918.63	-1050	-105.2	-111	5.8
918.68	-1100	-104.7	-111	6.3
918.73	-1150	-104.2	-111	6.8
918.78	-1200	-103.7	-111	7.3

Of the 49 data points, 80% have a J/S ratio of 2.3 dB or better