

PROCESSING GAIN TEST

CHANNEL18(2442.240MHz)·Base station output to handset input

LOSSES(dB)

Attenuation 50

System Loss 2

S/N ratio 11

Jammer Freq. (MHz)	Signal Level (dBm)	CW Level (dBm)	Mj J/S ratio (dB)	Processing Gain (dB)
2441.240	-36.0	-32.9	3.1	16.1
2441.290	-36.0	-33.1	2.9	15.9
2441.340	-36.0	-33.2	2.8	15.8
2441.390	-36.0	-33.6	2.4	15.4
2441.440	-36.0	-34.6	1.4	14.4
2441.490	-36.0	-36.4	-0.4	12.6
2441.540	-36.0	-35.8	0.2	13.2
2441.590	-36.0	-36.5	-0.5	12.5
2441.640	-36.0	-35.9	0.1	13.1
2441.690	-36.0	-35.0	1.0	14.0
2441.740	-36.0	-34.3	1.7	14.7
2441.790	-36.0	-35.0	1.0	14.0
2441.840	-36.0	-35.6	0.4	13.4
2441.890	-36.0	-35.8	0.2	13.2
2441.940	-36.0	-36.1	-0.1	12.9
2441.990	-36.0	-36.6	-0.6	12.4
2442.040	-36.0	-36.7	-0.7	12.3
2442.090	-36.0	-36.7	-0.7	12.3
2442.140	-36.0	-36.8	-0.8	12.2
2442.190	-36.0	-36.9	-0.9	12.1
2442.240	-36.0	-36.8	-0.8	12.2
2442.290	-36.0	-36.6	-0.6	12.4
2442.340	-36.0	-36.7	-0.7	12.3
2442.390	-36.0	-37.0	-1.0	12.0
2442.440	-36.0	-37.0	-1.0	12.0
2442.490	-36.0	-36.7	-0.7	12.3
2442.540	-36.0	-36.4	-0.4	12.6
2442.590	-36.0	-36.4	-0.4	12.6
2442.640	-36.0	-36.4	-0.4	12.6
2442.690	-36.0	-36.1	-0.1	12.9
2442.740	-36.0	-35.0	1.0	14.0
2442.790	-36.0	-36.6	-0.6	12.4
2442.840	-36.0	-37.0	-1.0	12.0
2442.890	-36.0	-37.0	-1.0	12.0
2442.940	-36.0	-36.7	-0.7	12.3
2442.990	-36.0	-36.6	-0.6	12.4
2443.040	-36.0	-35.9	0.1	13.1
2443.090	-36.0	-35.3	0.7	13.7
2443.140	-36.0	-35.1	0.9	13.9
2443.190	-36.0	-34.7	1.3	14.3
2443.240	-36.0	-33.3	2.7	15.7

Mj J/S ratio =

CW Noize-Sig.Level

ProcessingGain =

Mj J/S ratio + Sytem Loss
+ S/N ratio

SD Test Specification for Processing Gain

The Processing Gain is measured with using the CW jamming margin method. Figure 1 shows the test configuration. The test consists of stepping a signal generator in 50 kHz increments across the passband of the system (up to 1MHz away from the center frequency). At each point, the generator level required to be produced the recommended Bit Error Rate (BER) (Set at BER=1.0E-3) is recorded. This level is the jamming level. The output power of the transmitter unit is measured at the same point. The Jammer to Signal (J/S) ratio is then calculated. Discard the worst 20% of the J/S data point. The lowest remaining J/S ratio is used to calculate the processing gain. The maximum implementation loss a system can claim in calculating processing gain is 2dB. The equation to calculate the processing gain (Gp) is as follows:

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

Where $(S/N)_o$ = signal to noise ratio required for a FSK system with BER of 1.0E-3 = 11dB,

M_j = jamming margin (J/S) in dB,

L_{sys} = system implementation loss = 2dB.

TEST PROCEDURE

- (1) The BB-ASIC (IC4: DU36119)'s test pin of Base Unit is connected with the Signal Generator-A (Use Buffer Amp: Modulation data is pin65). The output of the Signal Generator-A is combined with the output of the Signal Generator-B through a combiner. The output of the combiner is connected to the Handset Unit.
- (2) The BB-ASIC (IC607: ML7073)'s tests pins of Handset are connected with the BER counter (RX clock is pin58 and RX data is pin59).
- (3) While depressing "page"-key, connect AC ADAPTOR to BASE set. And within 3 Sec, please push "page"-key 2 times quickly (less than 500 mSec). Then push and hold (more than 500 mSec) "page"-key 8 times. And then push "page"-key shortly (within 500 mSec) once.
- (4) The Handset is powered by the battery while pushing "*" -key and "#" -key. Those keys are held at least for 2 seconds. Please make sure the beep sound. Then those keys are released and push "#" -key once. And then push "ch" -key once.
- (5) BER counter is JRC NJZ-940 (Continuous mode, PN15, and the receive clock uses an external clock with its leading edge). The Signal Generator-A's setting: FM, 500KHz Deviation, and External AC Coupling.
- (6) The Signal Generator-B is stepped in 50kHz increments. The required BER is 1.0e-3. When this error rate is achieved (displayed on the BER counter), the reading of signal generator is taken. This reading is then subtracted from the signal level of the B/S (while adding in the combiner loss and signal generator calibration factor) to obtain the J/S ratio. The J/S ratio is then combined with the system loss (2dB) and signal to noise ratio (11dB) of the unit to obtain the processing gain.

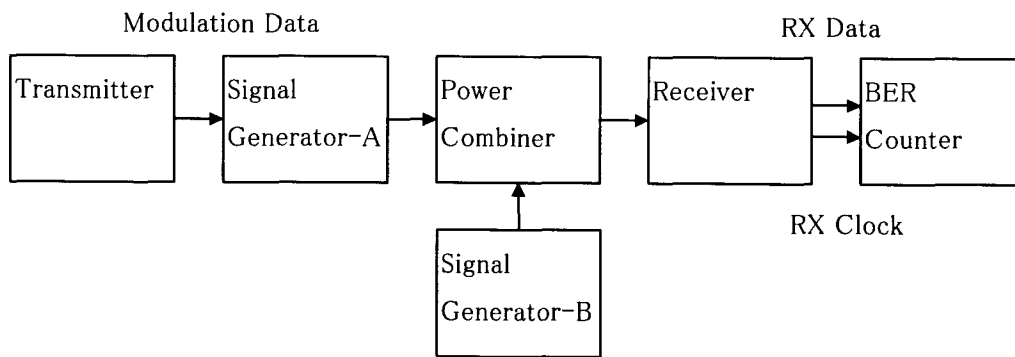


Fig. 1 The test configuration

Processing Gain Test Equipment

	MANU-FACTURER	EQUIPMENT TYPE	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
BER Counter	JRC	NJZ-940	ED24250	N.A	N.A
Signal Generator-A	Hewlett Packard	E4432B	US38441753	Sep 14 2001	Sep 31, 2002
Signal Generator-B	Hewlett Packard	E4432B	US40052579	June 07, 2001	June 31, 2002
Combiner	Mini-Circuit	15542	942705	N/A	N/A