

Processing gain additional test

The test consists of stepping a signal generator in 50 kHz increments across the passband of the radio Unit. At each increment, the generator signal level required to reduce the bit error rate [BER] to it's minimum specified value is recorded [minimum BER level of $10E-8$ is specified] This level is called the JAMMER LEVEL. Also each increment, Transmitter side of output signals are monitored by spectrum Analyzer.

Signal to noise ratio can be derived from the BER probability, the jammer to signal ratio and system losses.

$$GP = (S/N)_0 + M_j + LSYS$$

Where

GP = processing gain

$(S/N)_0$ = theoretical maximum signal to noise ratio, before any error occur. This can be derived from the curves show in bellow Fig 1.

LSYS = system losses associated with the rest of the radio. This is assumed to be a maximum of 2 dB per Radio unit.

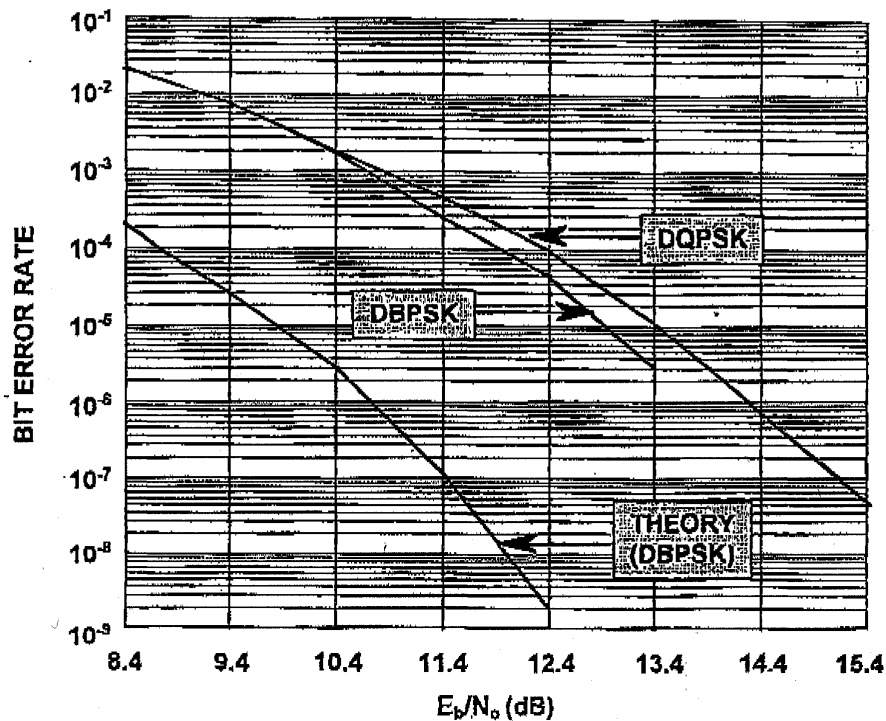
M_j = jammer to signal ratio

Test result showed Fig 2

Note : due to get $10E-8$ BER test is required minimum time for each 50 KHz increment .There for only tested at F_c = center frequency of 2.4 GHz band.

Hope test result is good enough to explain to FCC questions dated Sep.11 1998.

BER vs E_b/N_o Performance



Fc = 2.435 GHz							
Signal gen.(MHz)	(S/N) ₀ (dB)	LSYS (dB)	ssg.peak -dBm)	TX peak -dBm)	Mj (dB)	proccsing gain(dB)	BER
fc-5.00	12	2	63	60	3	17	10E-8
fc-4.00	12	2	62	60	2	16	10E-8
fc-3.95	12	2	62	60	2	16	10E-8
fc-3.90	12	2	62	60	2	16	10E-8
fc-3.85	12	2	62	60	2	16	10E-8
fc-3.80	12	2	62	60	2	16	10E-8
fc-3.75	12	2	62	60	2	16	10E-8
fc-3.70	12	2	62	60	2	16	10E-8
fc-3.65	12	2	62	60	2	16	10E-8
fc-3.60	12	2	62	60	2	16	10E-8
fc-3.55	12	2	62	60	2	16	10E-8
fc-3.50	12	2	62	60	2	16	10E-8
fc-3.45	12	2	62	60	2	16	10E-8
fc-3.40	12	2	62	60	2	16	10E-8
fc-3.35	12	2	62	60	2	16	10E-8
fc-3.30	12	2	62	60	2	16	10E-8
fc-3.25	12	2	62	60	2	16	10E-8
fc-3.20	12	2	62	60	2	16	10E-8
fc-3.15	12	2	62	60	2	16	10E-8
fc-3.10	12	2	62	60	2	16	10E-8
fc-3.05	12	2	62	60	2	16	10E-8
fc-3.00	12	2	62	60	2	16	10E-8
fc-2.95	12	2	62	60	2	16	10E-8
fc-2.90	12	2	62	60	2	16	10E-8
fc-2.85	12	2	62	60	2	16	10E-8
fc-2.80	12	2	62	60	2	16	10E-8
fc-2.75	12	2	62	60	2	16	10E-8
fc-2.70	12	2	62	60	2	16	10E-8
fc-2.65	12	2	62	60	2	16	10E-8
fc-2.60	12	2	62	60	2	16	10E-8
fc-2.55	12	2	62	60	2	16	10E-8
fc-2.50	12	2	62	60	2	16	10E-8
fc-2.45	12	2	62	60	2	16	10E-8
fc-2.40	12	2	62	60	2	16	10E-8
fc-2.35	12	2	62	60	2	16	10E-8
fc-2.30	12	2	62	60	2	16	10E-8
fc-2.25	12	2	62	60	2	16	10E-8
fc-2.20	12	2	62	60	2	16	10E-8
fc-2.15	12	2	62	60	2	16	10E-8
fc-2.10	12	2	62	60	2	16	10E-8
fc-2.05	12	2	62	60	2	16	10E-8
fc-2.0	12	2	62	60	2	16	10E-8
fc-1.95	12	2	62	60	2	16	10E-8
fc-1.90	12	2	62	60	2	16	10E-8
fc-1.85	12	2	62	60	2	16	10E-8
fc-1.80	12	2	62	60	2	16	10E-8

fc-1.75	12	2	62	60	2	16	10E-8
fc-1.70	12	2	62	60	2	16	10E-8
fc-1.65	12	2	62	60	2	16	10E-8
fc-1.60	12	2	62	60	2	16	10E-8
fc-1.55	12	2	62	60	2	16	10E-8
fc-1.50	12	2	62	60	2	16	10E-8
fc-1.45	12	2	61	60	1	15	10E-8
fc-1.40	12	2	61	60	1	15	10E-8
fc-1.35	12	2	61	60	1	15	10E-8
fc-1.30	12	2	61	60	1	15	10E-8
fc-1.25	12	2	61	60	1	15	10E-8
fc-1.20	12	2	61	60	1	15	10E-8
fc-1.15	12	2	61	60	1	15	10E-8
fc-1.10	12	2	61	60	1	15	10E-8
fc-1.05	12	2	61	60	1	15	10E-8
fc-1.0	12	2	61	60	1	15	10E-8
fc-0.95	12	2	61	60	1	15	10E-8
fc-0.90	12	2	61	60	1	15	10E-8
fc-0.85	12	2	61	60	1	15	10E-8
fc-0.80	12	2	61	60	1	15	10E-8
fc-0.75	12	2	61	60	1	15	10E-8
fc-0.70	12	2	61	60	1	15	10E-8
fc-0.65	12	2	61	60	1	15	10E-8
fc-0.60	12	2	61	60	1	15	10E-8
fc-0.55	12	2	60	60	0	14	10E-8
fc-0.50	12	2	60	60	0	14	10E-8
fc-0.45	12	2	60	60	0	14	10E-8
fc-0.40	12	2	60	60	0	14	10E-8
fc-0.35	12	2	59	60	-1	13	10E-8
fc-0.30	12	2	59	60	-1	13	10E-8
fc-0.25	12	2	59	60	-1	13	10E-8
fc-0.20	12	2	59	60	-1	13	10E-8
fc-0.15	12	2	59	60	-1	13	10E-8
fc-0.10	12	2	59	60	-1	13	10E-8
fc-0.05	12	2	58	60	-2	12	10E-8
fc	12	2	58	60	-2	12	10E-8
fc+0.05	12	2	58	60	-2	12	10E-8
fc+0.10	12	2	58	60	-2	12	10E-8
fc+0.15	12	2	58	60	-2	12	10E-8
fc+0.20	12	2	59	60	-1	13	10E-8
fc+0.25	12	2	59	60	-1	13	10E-8
fc+0.30	12	2	59	60	-1	13	10E-8
fc+0.35	12	2	59	60	-1	13	10E-8
fc+0.40	12	2	59	60	-1	13	10E-8
fc+0.45	12	2	60	60	0	14	10E-8
fc+0.50	12	2	60	60	0	14	10E-8
fc+0.55	12	2	60	60	0	14	10E-8
fc+0.60	12	2	60	60	0	14	10E-8
fc+0.65	12	2	60	60	0	14	10E-8
fc+0.70	12	2	60	60	0	14	10E-8

fc+0.75	12	2	61	60	1	15	10E-8
fc+0.80	12	2	61	60	1	15	10E-8
fc+0.85	12	2	61	60	1	15	10E-8
fc+0.90	12	2	61	60	1	15	10E-8
fc+0.95	12	2	61	60	1	15	10E-8
fc+1.00	12	2	61	60	1	15	10E-8
fc+1.05	12	2	61	60	1	15	10E-8
fc+1.10	12	2	61	60	1	15	10E-8
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