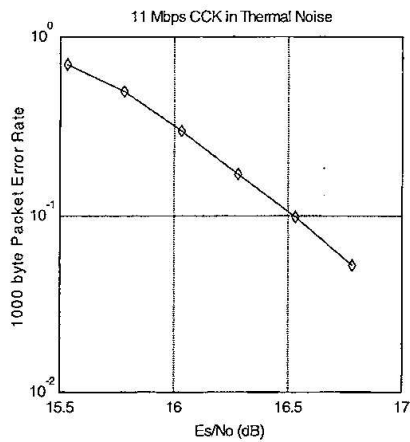


Processing Gain Testing

1.1 1000 byte PER vs. Es/No



The reference PER is specified as 8%. The corresponding Es/No (signal to noise ratio per symbol) is 16.4 dB. The Es/No required to achieve the desired BER with maximum system implementation losses is 18.4 dB. The minimum processing gain is again, 10 dB, therefore:

$$G_p = \left(\frac{E_s}{N_o} \right)_{output} + \left(\frac{J}{S} \right) + L_{system} = 16.4dB + 2.0dB + \left(\frac{J}{S} \right) \geq 10dB$$

$$G_p = 18.4dB + \left(\frac{J}{S} \right) \geq 10dB$$

The minimum jammer to signal ratio is as follows:

$$\left(\frac{J}{S} \right) \geq -8.4dB$$

For the case of the HFA3861A, the bit rates are 1, 2, 5.5, and 11 Mbps. The corresponding symbol rates are 1, 1, 1.375, and 1.375 MSps. The chip rate

The jamming level will be controlled on -8.4dB.

The PER should be lower than 8% for a processing gain higher than 10dB.

Maximums, only 20% of the total frequency points, is allowed to have a processing gain lower than 10dB.

Jamming Margin test results.
Tested on RD0314 S/N 0229022F

Jammer level: -8.4dB relative to On channel 11Mbps modulated signal
2002/1/4 Chris Irwin

	Channel 1 2412 MHz	Channel 7 2442 MHz	Channel 11 2462 MHz		
Number of jammer frequencies exceeding 8%:	14	15	19		
Percentage of frequencies exceeding 8%:	4.0%	4.3%	5.4%		
Max allowed:	20%	20%	20%		
Result:	PASS	PASS	PASS		
	Jammer freq BER	Jammer freq BER	Jammer freq BER		
2403500000	0.0%	2433500000	0.0%	2453500000	0.0%
2403550000	0.0%	2433550000	0.0%	2453550000	0.0%
2403600000	0.0%	2433600000	0.0%	2453600000	0.0%
2403650000	0.0%	2433650000	0.0%	2453650000	0.0%
2403700000	0.0%	2433700000	0.0%	2453700000	0.0%
2403750000	0.0%	2433750000	0.0%	2453750000	0.0%
2403800000	0.0%	2433800000	0.0%	2453800000	0.0%
2403850000	0.0%	2433850000	0.0%	2453850000	0.0%
2403900000	0.0%	2433900000	0.0%	2453900000	0.0%
2403950000	0.0%	2433950000	0.0%	2453950000	0.0%
2404000000	0.0%	2434000000	0.0%	2454000000	0.0%
2404050000	0.0%	2434050000	0.0%	2454050000	0.0%
2404100000	0.0%	2434100000	0.0%	2454100000	0.0%
2404150000	0.0%	2434150000	0.0%	2454150000	0.0%
2404200000	0.0%	2434200000	0.0%	2454200000	0.0%
2404250000	0.0%	2434250000	0.0%	2454250000	0.0%
2404300000	0.0%	2434300000	0.0%	2454300000	0.0%
2404350000	0.0%	2434350000	0.0%	2454350000	0.0%
2404400000	0.0%	2434400000	0.0%	2454400000	0.0%
2404450000	0.0%	2434450000	0.0%	2454450000	0.0%
2404500000	0.0%	2434500000	0.0%	2454500000	0.0%
2404550000	0.0%	2434550000	0.0%	2454550000	0.0%
2404600000	0.0%	2434600000	0.0%	2454600000	0.0%
2404650000	0.0%	2434650000	0.0%	2454650000	0.0%
2404700000	0.0%	2434700000	0.0%	2454700000	0.0%
2404750000	0.0%	2434750000	0.0%	2454750000	0.0%
2404800000	0.0%	2434800000	0.0%	2454800000	0.0%
2404850000	0.0%	2434850000	0.0%	2454850000	0.0%
2404900000	0.0%	2434900000	0.0%	2454900000	0.0%
2404950000	0.0%	2434950000	0.0%	2454950000	0.0%
2405000000	0.0%	2435000000	0.0%	2455000000	0.0%
2405050000	0.0%	2435050000	0.0%	2455050000	0.0%
2405100000	0.0%	2435100000	0.0%	2455100000	0.0%
2405150000	0.0%	2435150000	0.0%	2455150000	0.0%
2405200000	0.0%	2435200000	0.0%	2455200000	0.0%
2405250000	0.0%	2435250000	0.0%	2455250000	0.0%
2405300000	0.0%	2435300000	0.0%	2455300000	0.0%
2405350000	0.0%	2435350000	0.0%	2455350000	0.0%
2405400000	0.0%	2435400000	0.0%	2455400000	0.0%
2405450000	0.0%	2435450000	0.0%	2455450000	0.0%
2405500000	0.0%	2435500000	0.0%	2455500000	0.0%
2405550000	0.0%	2435550000	0.0%	2455550000	0.0%
2405600000	0.0%	2435600000	0.0%	2455600000	0.0%
2405650000	0.0%	2435650000	0.0%	2455650000	0.0%
2405700000	0.0%	2435700000	0.0%	2455700000	0.0%
2405750000	0.0%	2435750000	0.0%	2455750000	0.0%
2405800000	0.0%	2435800000	0.0%	2455800000	0.0%
2405850000	0.0%	2435850000	0.0%	2455850000	0.0%
2405900000	0.0%	2435900000	0.0%	2455900000	0.0%
2405950000	0.0%	2435950000	0.0%	2455950000	0.0%
2406000000	0.0%	2436000000	0.0%	2456000000	0.0%
2406050000	0.0%	2436050000	0.0%	2456050000	0.0%
2406100000	0.0%	2436100000	0.0%	2456100000	0.0%
2406150000	0.0%	2436150000	0.0%	2456150000	0.0%
2406200000	0.0%	2436200000	0.0%	2456200000	0.0%
2406250000	0.0%	2436250000	0.0%	2456250000	0.0%
2406300000	0.0%	2436300000	0.0%	2456300000	0.0%
2406350000	0.0%	2436350000	0.0%	2456350000	0.0%
2406400000	0.0%	2436400000	0.0%	2456400000	0.0%
2406450000	0.0%	2436450000	0.0%	2456450000	0.0%
2406500000	0.0%	2436500000	0.0%	2456500000	0.0%
2406550000	0.0%	2436550000	0.0%	2456550000	0.0%
2406600000	0.0%	2436600000	0.0%	2456600000	0.0%
2406650000	0.0%	2436650000	0.0%	2456650000	0.0%
2406700000	0.0%	2436700000	0.0%	2456700000	0.0%
2406750000	0.0%	2436750000	0.0%	2456750000	0.0%
2406800000	0.0%	2436800000	0.0%	2456800000	0.0%
2406850000	0.0%	2436850000	0.0%	2456850000	0.0%
2406900000	0.0%	2436900000	0.0%	2456900000	0.0%
2406950000	0.0%	2436950000	0.0%	2456950000	0.0%
2407000000	0.0%	2437000000	0.0%	2457000000	0.0%
2407050000	0.0%	2437050000	0.0%	2457050000	0.0%
2407100000	0.0%	2437100000	0.0%	2457100000	0.0%
2407150000	0.0%	2437150000	0.0%	2457150000	0.0%
2407200000	0.0%	2437200000	0.0%	2457200000	0.0%
2407250000	0.0%	2437250000	0.0%	2457250000	0.0%
2407300000	0.0%	2437300000	0.0%	2457300000	0.0%
2407350000	0.0%	2437350000	0.0%	2457350000	0.0%
2407400000	0.0%	2437400000	0.0%	2457400000	0.0%
2407450000	0.0%	2437450000	0.0%	2457450000	1.0%
2407500000	0.0%	2437500000	0.0%	2457500000	1.0%
2407550000	0.0%	2437550000	0.0%	2457550000	0.0%
2407600000	0.0%	2437600000	0.0%	2457600000	1.0%
2407650000	0.0%	2437650000	0.0%	2457650000	0.0%
2407700000	0.0%	2437700000	0.0%	2457700000	1.0%
2407750000	0.0%	2437750000	0.0%	2457750000	0.0%
2407800000	0.0%	2437800000	0.5%	2457800000	0.0%
2407850000	0.0%	2437850000	0.5%	2457850000	0.0%

2407900000	0.0%	2437900000	0.0%	2457900000	0.0%
2407950000	0.0%	2437950000	0.0%	2457950000	0.0%
2408000000	0.0%	2438000000	0.0%	2458000000	0.0%
2408050000	0.0%	2438050000	0.0%	2458050000	0.0%
2408100000	0.0%	2438100000	0.0%	2458100000	0.0%
2408150000	0.0%	2438150000	0.0%	2458150000	0.0%
2408200000	0.0%	2438200000	0.0%	2458200000	0.0%
2408250000	0.0%	2438250000	0.0%	2458250000	0.0%
2408300000	0.0%	2438300000	0.0%	2458300000	0.0%
2408350000	0.0%	2438350000	0.0%	2458350000	0.0%
2408400000	0.0%	2438400000	0.0%	2458400000	0.0%
2408450000	0.0%	2438450000	1.0%	2458450000	1.0%
2408500000	0.0%	2438500000	0.0%	2458500000	1.0%
2408550000	1.0%	2438550000	0.0%	2458550000	1.0%
2408600000	0.0%	2438600000	0.0%	2458600000	0.5%
2408650000	0.0%	2438650000	0.0%	2458650000	0.0%
2408700000	0.0%	2438700000	0.0%	2458700000	0.0%
2408750000	0.0%	2438750000	0.0%	2458750000	1.0%
2408800000	0.0%	2438800000	0.0%	2458800000	1.0%
2408850000	0.0%	2438850000	0.0%	2458850000	0.0%
2408900000	0.5%	2438900000	0.0%	2458900000	0.0%
2408950000	1.0%	2438950000	0.0%	2458950000	1.0%
2409000000	1.0%	2439000000	0.0%	2459000000	0.0%
2409050000	1.0%	2439050000	0.0%	2459050000	2.0%
2409100000	0.5%	2439100000	0.5%	2459100000	1.0%
2409150000	1.0%	2439150000	0.5%	2459150000	1.0%
2409200000	0.0%	2439200000	0.5%	2459200000	0.0%
2409250000	1.0%	2439250000	1.0%	2459250000	0.0%
2409300000	0.5%	2439300000	1.0%	2459300000	1.0%
2409350000	0.0%	2439350000	0.0%	2459350000	1.0%
2409400000	0.0%	2439400000	0.0%	2459400000	0.0%
2409450000	0.5%	2439450000	0.0%	2459450000	0.0%
2409500000	1.0%	2439500000	1.5%	2459500000	1.0%
2409550000	0.5%	2439550000	0.5%	2459550000	0.0%
2409600000	1.0%	2439600000	0.5%	2459600000	2.0%
2409650000	3.0%	2439650000	1.0%	2459650000	3.0%
2409700000	0.5%	2439700000	2.0%	2459700000	2.0%
2409750000	1.5%	2439750000	3.0%	2459750000	2.0%
2409800000	1.5%	2439800000	1.5%	2459800000	3.0%
2409850000	2.0%	2439850000	1.0%	2459850000	2.0%
2409900000	5.0%	2439900000	5.0%	2459900000	6.0%
2409950000	5.0%	2439950000	7.0%	2459950000	8.0%
2410000000	2.0%	2440000000	6.0%	2460000000	7.0%
2410050000	4.0%	2440050000	5.0%	2460050000	6.0%
2410100000	2.0%	2440100000	4.0%	2460100000	7.0%
2410150000	3.0%	2440150000	4.0%	2460150000	5.0%
2410200000	5.0%	2440200000	6.0%	2460200000	7.0%
2410250000	7.0%	2440250000	7.0%	2460250000	11.0%
2410300000	4.0%	2440300000	3.0%	2460300000	5.0%
2410350000	3.0%	2440350000	3.0%	2460350000	5.0%
2410400000	3.0%	2440400000	3.0%	2460400000	4.0%
2410450000	3.0%	2440450000	3.0%	2460450000	3.0%
2410500000	1.0%	2440500000	3.0%	2460500000	2.0%
2410550000	1.0%	2440550000	2.0%	2460550000	2.0%
2410600000	1.0%	2440600000	2.0%	2460600000	1.0%
2410650000	1.0%	2440650000	1.0%	2460650000	1.0%
2410700000	0.5%	2440700000	0.0%	2460700000	1.0%
2410750000	3.0%	2440750000	2.0%	2460750000	3.0%
2410800000	1.0%	2440800000	1.0%	2460800000	1.5%
2410850000	0.0%	2440850000	0.5%	2460850000	0.0%
2410900000	0.0%	2440900000	0.0%	2460900000	0.0%
2410950000	0.0%	2440950000	0.5%	2460950000	0.0%
2411000000	0.0%	2441000000	1.0%	2461000000	2.0%
2411050000	0.5%	2441050000	1.0%	2461050000	1.0%
2411100000	1.0%	2441100000	1.0%	2461100000	1.0%
2411150000	2.0%	2441150000	1.0%	2461150000	2.0%
2411200000	2.0%	2441200000	2.5%	2461200000	6.0%
2411250000	3.0%	2441250000	3.0%	2461250000	3.0%
2411300000	3.0%	2441300000	4.0%	2461300000	5.0%
2411350000	3.0%	2441350000	4.0%	2461350000	7.5%
2411400000	7.0%	2441400000	7.0%	2461400000	10.0%
2411450000	14.0%	2441450000	11.0%	2461450000	15.0%
2411500000	14.0%	2441500000	14.0%	2461500000	15.0%
2411550000	14.0%	2441550000	15.0%	2461550000	21.0%
2411600000	18.0%	2441600000	16.0%	2461600000	17.0%
2411650000	16.0%	2441650000	16.0%	2461650000	20.0%
2411700000	13.0%	2441700000	13.0%	2461700000	20.0%
2411750000	17.0%	2441750000	21.0%	2461750000	20.0%
2411800000	16.0%	2441800000	17.0%	2461800000	20.0%
2411850000	18.0%	2441850000	20.0%	2461850000	25.0%
2411900000	20.0%	2441900000	20.0%	2461900000	22.0%
2411950000	17.0%	2441950000	16.0%	2461950000	19.0%
2412000000	9.0%	2442000000	13.0%	2462000000	14.0%
2412050000	16.0%	2442050000	14.0%	2462050000	20.0%
2412100000	10.0%	2442100000	10.0%	2462100000	10.0%
2412150000	7.0%	2442150000	7.0%	2462150000	9.0%
2412200000	7.5%	2442200000	8.0%	2462200000	10.0%
2412250000	6.0%	2442250000	5.0%	2462250000	6.0%
2412300000	4.0%	2442300000	5.0%	2462300000	5.0%
2412350000	3.0%	2442350000	3.0%	2462350000	3.0%
2412400000	2.0%	2442400000	2.0%	2462400000	3.0%
2412450000	2.0%	2442450000	3.0%	2462450000	5.0%
2412500000	2.5%	2442500000	4.0%	2462500000	2.0%
2412550000	2.0%	2442550000	2.5%	2462550000	4.0%
2412600000	2.0%	2442600000	2.0%	2462600000	3.0%
2412650000	1.0%	2442650000	3.0%	2462650000	4.0%
2412700000	3.0%	2442700000	4.0%	2462700000	5.0%
2412750000	3.0%	2442750000	3.0%	2462750000	3.0%

2412800000	3.0%	2442800000	4.5%	2462800000	5.0%
2412850000	2.5%	2442850000	3.0%	2462850000	4.0%
2412900000	2.0%	2442900000	3.0%	2462900000	4.0%
2412950000	3.0%	2442950000	4.0%	2462950000	5.0%
2413000000	5.0%	2443000000	5.0%	2463000000	4.0%
2413050000	3.0%	2443050000	4.0%	2463050000	4.0%
2413100000	3.0%	2443100000	3.0%	2463100000	3.0%
2413150000	5.0%	2443150000	3.0%	2463150000	4.0%
2413200000	2.5%	2443200000	3.0%	2463200000	3.0%
2413250000	3.0%	2443250000	3.0%	2463250000	3.0%
2413300000	2.0%	2443300000	1.5%	2463300000	3.0%
2413350000	0.0%	2443350000	1.0%	2463350000	1.0%
2413400000	0.5%	2443400000	1.0%	2463400000	2.0%
2413450000	2.0%	2443450000	1.5%	2463450000	3.0%
2413500000	1.0%	2443500000	2.0%	2463500000	1.0%
2413550000	1.0%	2443550000	1.0%	2463550000	2.0%
2413600000	1.0%	2443600000	1.0%	2463600000	2.0%
2413650000	0.0%	2443650000	0.0%	2463650000	1.0%
2413700000	0.0%	2443700000	1.0%	2463700000	1.0%
2413750000	0.5%	2443750000	1.0%	2463750000	1.0%
2413800000	1.5%	2443800000	1.0%	2463800000	3.0%
2413850000	2.0%	2443850000	2.0%	2463850000	2.0%
2413900000	2.0%	2443900000	2.5%	2463900000	4.0%
2413950000	2.0%	2443950000	3.0%	2463950000	4.0%
2414000000	2.0%	2444000000	4.0%	2464000000	4.0%
2414050000	5.0%	2444050000	6.0%	2464050000	5.0%
2414100000	2.0%	2444100000	4.0%	2464100000	4.0%
2414150000	3.0%	2444150000	4.0%	2464150000	6.0%
2414200000	5.0%	2444200000	5.0%	2464200000	6.0%
2414250000	3.0%	2444250000	6.0%	2464250000	7.5%
2414300000	3.0%	2444300000	5.0%	2464300000	7.0%
2414350000	3.0%	2444350000	3.0%	2464350000	5.0%
2414400000	2.0%	2444400000	1.5%	2464400000	3.0%
2414450000	1.5%	2444450000	2.5%	2464450000	3.0%
2414500000	1.0%	2444500000	2.0%	2464500000	2.0%
2414550000	1.0%	2444550000	2.0%	2464550000	2.0%
2414600000	2.0%	2444600000	1.0%	2464600000	1.0%
2414650000	1.0%	2444650000	0.0%	2464650000	1.0%
2414700000	0.5%	2444700000	0.5%	2464700000	0.0%
2414750000	1.0%	2444750000	2.0%	2464750000	1.0%
2414800000	0.0%	2444800000	0.5%	2464800000	0.0%
2414850000	0.0%	2444850000	0.0%	2464850000	0.0%
2414900000	0.0%	2444900000	0.0%	2464900000	0.0%
2414950000	0.5%	2444950000	0.0%	2464950000	0.0%
2415000000	0.0%	2445000000	0.0%	2465000000	0.0%
2415050000	0.0%	2445050000	0.0%	2465050000	0.0%
2415100000	0.0%	2445100000	0.0%	2465100000	0.0%
2415150000	0.0%	2445150000	0.0%	2465150000	0.0%
2415200000	0.0%	2445200000	0.0%	2465200000	0.0%
2415250000	0.0%	2445250000	0.5%	2465250000	0.0%
2415300000	0.0%	2445300000	0.0%	2465300000	0.0%
2415350000	1.0%	2445350000	0.5%	2465350000	0.0%
2415400000	0.5%	2445400000	0.0%	2465400000	1.0%
2415450000	2.0%	2445450000	1.0%	2465450000	1.0%
2415500000	0.5%	2445500000	1.0%	2465500000	2.0%
2415550000	0.0%	2445550000	2.0%	2465550000	1.0%
2415600000	1.0%	2445600000	1.0%	2465600000	1.0%
2415650000	0.5%	2445650000	1.0%	2465650000	1.0%
2415700000	0.5%	2445700000	1.0%	2465700000	1.0%
2415750000	0.5%	2445750000	0.0%	2465750000	1.0%
2415800000	0.0%	2445800000	0.0%	2465800000	1.0%
2415850000	0.0%	2445850000	0.0%	2465850000	0.0%
2415900000	0.0%	2445900000	0.0%	2465900000	0.0%
2415950000	0.0%	2445950000	0.0%	2465950000	0.0%
2416000000	0.0%	2446000000	0.0%	2466000000	0.0%
2416050000	0.0%	2446050000	0.0%	2466050000	0.0%
2416100000	0.0%	2446100000	0.0%	2466100000	0.0%
2416150000	0.0%	2446150000	0.0%	2466150000	0.0%
2416200000	0.0%	2446200000	0.5%	2466200000	0.0%
2416250000	1.0%	2446250000	1.0%	2466250000	1.0%
2416300000	0.5%	2446300000	0.0%	2466300000	1.0%
2416350000	0.0%	2446350000	0.0%	2466350000	0.5%
2416400000	0.0%	2446400000	0.0%	2466400000	0.0%
2416450000	0.0%	2446450000	0.0%	2466450000	0.0%
2416500000	0.0%	2446500000	0.0%	2466500000	0.0%
2416550000	0.0%	2446550000	0.0%	2466550000	0.0%
2416600000	0.0%	2446600000	0.0%	2466600000	0.0%
2416650000	0.0%	2446650000	0.0%	2466650000	0.0%
2416700000	0.0%	2446700000	0.0%	2466700000	0.0%
2416750000	0.0%	2446750000	0.0%	2466750000	0.0%
2416800000	0.0%	2446800000	0.0%	2466800000	0.0%
2416850000	0.0%	2446850000	0.0%	2466850000	0.0%
2416900000	0.0%	2446900000	0.0%	2466900000	0.0%
2416950000	0.0%	2446950000	0.0%	2466950000	0.0%
2417000000	0.0%	2447000000	0.0%	2467000000	0.0%
2417050000	0.0%	2447050000	0.0%	2467050000	0.0%
2417100000	0.0%	2447100000	0.0%	2467100000	0.0%
2417150000	0.0%	2447150000	0.0%	2467150000	0.0%
2417200000	0.0%	2447200000	0.0%	2467200000	0.0%
2417250000	0.0%	2447250000	0.0%	2467250000	0.0%
2417300000	0.0%	2447300000	0.0%	2467300000	0.0%
2417350000	0.0%	2447350000	0.0%	2467350000	0.0%
2417400000	0.0%	2447400000	0.0%	2467400000	0.0%
2417450000	0.0%	2447450000	0.0%	2467450000	0.0%
2417500000	0.0%	2447500000	0.0%	2467500000	0.0%
2417550000	0.0%	2447550000	0.0%	2467550000	0.0%
2417600000	0.0%	2447600000	0.0%	2467600000	0.0%
2417650000	0.0%	2447650000	0.0%	2467650000	0.0%

