

Attestation Statements

**Part 1: Processing Gain for
IBM ThinkPad 802.11b Wireless LAN Mini-PCI Adapter**

Part 2: Processing Gain for IBM Bluetooth Daughter Card

**Part 3: Attestation Statements according FCC 15.247
for IBM Bluetooth Daughter Card**

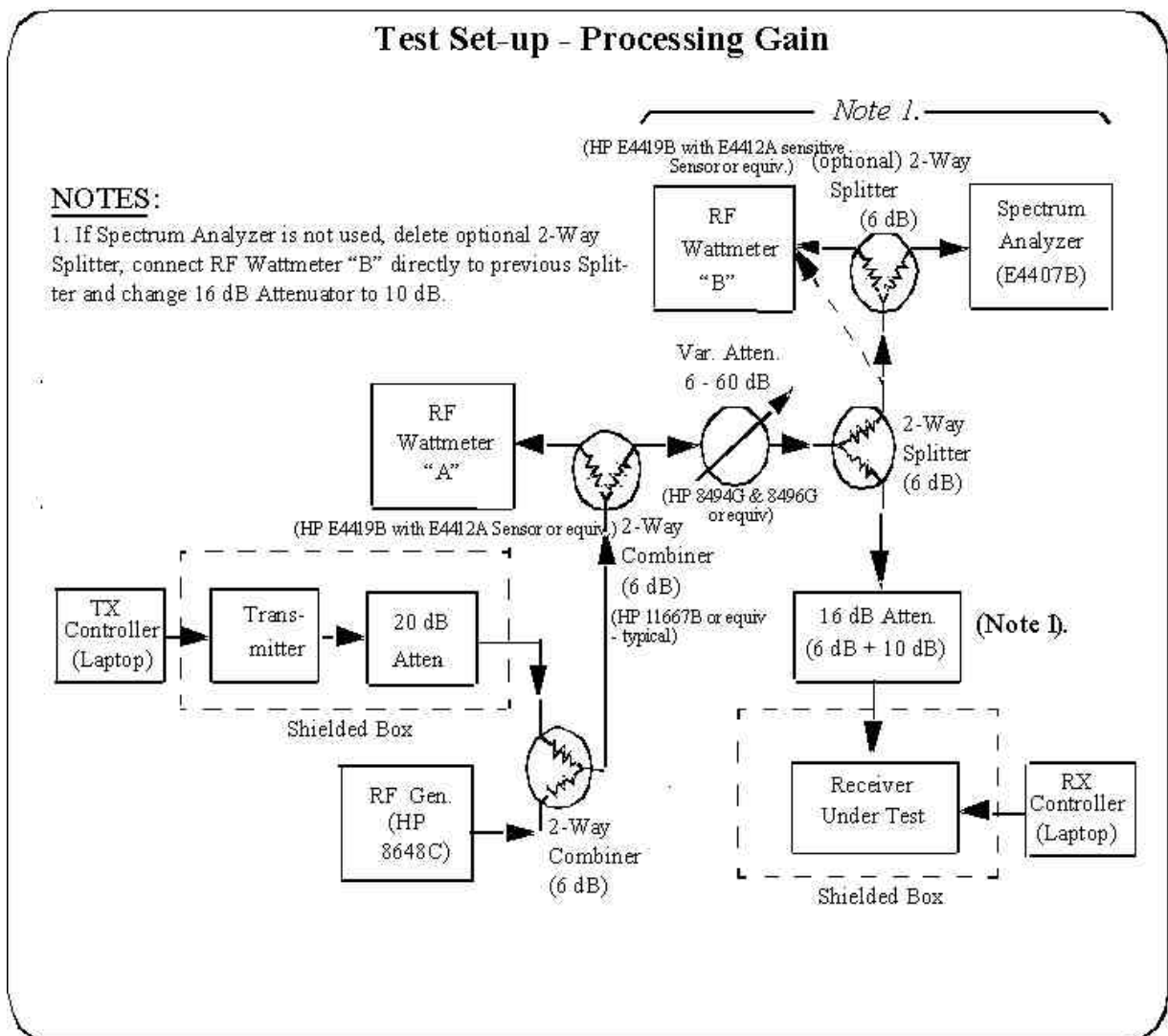
Part 1: Processing Gain for IBM ThinkPad 802.11b Wireless LAN Mini-PCI Adapter

by Actiontec Electronics, Inc.

Chip/symbol rate, symbol/bit rate, Chip/bit, and the measurement results

Bit rate	Chip/symbol rate	Bit/symbol rate	Chip/bit rate	Gp (dB)	Spec (dB)
1 Mbit/sec	11	1, DBPSK	11	13.2	10
2 Mbit/sec	11	2, DQPSK	5.5	12.6	10
5.5 Mbit/sec	8	4, CCK	2	13.4	10
11 Mbit/sec	8	8, CCK	1	12.9	10

Note: Gp is Processing Gain;



DATA-1		11Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2428.50	23.9	16.4	5.5	2.0	-57.2	<=8.0
2428.55	23.9	16.4	5.5	2.0	-57.2	<=8.0
2428.60	23.9	16.4	5.5	2.0	-57.2	<=8.0
2428.65	23.8	16.4	5.4	2.0	-57.3	<=8.0
2428.70	23.8	16.4	5.4	2.0	-57.3	<=8.0
2428.75	24.0	16.4	5.6	2.0	-57.1	<=8.0
2428.80	24.1	16.4	5.7	2.0	-57.0	<=8.0
2428.85	24.1	16.4	5.7	2.0	-57.0	<=8.0
2428.90	24.2	16.4	5.8	2.0	-56.9	<=8.0
2428.95	24.1	16.4	5.7	2.0	-57.0	<=8.0
2429.00	24.4	16.4	6.0	2.0	-56.7	<=8.0
2429.05	24.3	16.4	5.9	2.0	-56.8	<=8.0
2429.10	24.3	16.4	5.9	2.0	-56.8	<=8.0
2429.15	24.3	16.4	5.9	2.0	-56.8	<=8.0
2429.20	24.4	16.4	6.0	2.0	-56.7	<=8.0
2429.25	23.7	16.4	5.3	2.0	-57.4	<=8.0
2429.30	23.3	16.4	4.9	2.0	-57.8	<=8.0
2429.35	23.2	16.4	4.8	2.0	-57.9	<=8.0
2429.40	22.2	16.4	3.8	2.0	-58.9	<=8.0
2429.45	21.3	16.4	2.9	2.0	-59.8	<=8.0
2429.50	21.2	16.4	2.8	2.0	-59.9	<=8.0
2429.55	21.1	16.4	2.7	2.0	-60.0	<=8.0
2429.60	21.1	16.4	2.7	2.0	-60.0	<=8.0
2429.65	21.0	16.4	2.6	2.0	-60.1	<=8.0
2429.70	21.0	16.4	2.6	2.0	-60.1	<=8.0
2429.75	20.8	16.4	2.4	2.0	-60.3	<=8.0
2429.80	20.7	16.4	2.3	2.0	-60.4	<=8.0
2429.85	21.1	16.4	2.7	2.0	-60.0	<=8.0
2429.90	21.0	16.4	2.6	2.0	-60.1	<=8.0
2429.95	21.1	16.4	2.7	2.0	-60.0	<=8.0
2430.00	20.9	16.4	2.5	2.0	-60.2	<=8.0
2430.05	20.9	16.4	2.5	2.0	-60.2	<=8.0
2430.10	20.5	16.4	2.1	2.0	-60.6	<=8.0
2430.15	19.5	16.4	1.1	2.0	-61.6	<=8.0
2430.20	19.5	16.4	1.1	2.0	-61.6	<=8.0
2430.25	19.0	16.4	0.6	2.0	-62.1	<=8.0
2430.30	19.0	16.4	0.6	2.0	-62.1	<=8.0
2430.35	18.7	16.4	0.3	2.0	-62.4	<=8.0
2430.40	18.7	16.4	0.3	2.0	-62.4	<=8.0
2430.45	18.5	16.4	0.1	2.0	-62.6	<=8.0
2430.50	18.4	16.4	0.0	2.0	-62.7	<=8.0
2430.55	18.4	16.4	0.0	2.0	-62.7	<=8.0
2430.60	18.4	16.4	0.0	2.0	-62.7	<=8.0
2430.65	18.1	16.4	-0.3	2.0	-63.0	<=8.0
2430.70	17.9	16.4	-0.5	2.0	-63.2	<=8.0
2430.75	17.4	16.4	-1.0	2.0	-63.7	<=8.0
2430.80	17.4	16.4	-1.0	2.0	-63.7	<=8.0
2430.85	17.1	16.4	-1.3	2.0	-64.0	<=8.0

DATA-1		11Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2430.90	17.1	16.4	-1.3	2.0	-64.0	<=8.0
2430.95	16.9	16.4	-1.5	2.0	-64.2	<=8.0
2431.00	16.8	16.4	-1.6	2.0	-64.3	<=8.0
2431.05	16.7	16.4	-1.7	2.0	-64.4	<=8.0
2431.10	16.7	16.4	-1.7	2.0	-64.4	<=8.0
2431.15	16.3	16.4	-2.1	2.0	-64.8	<=8.0
2431.20	16.5	16.4	-1.9	2.0	-64.6	<=8.0
2431.25	16.4	16.4	-2.0	2.0	-64.7	<=8.0
2431.30	16.3	16.4	-2.1	2.0	-64.8	<=8.0
2431.35	16.3	16.4	-2.1	2.0	-64.8	<=8.0
2431.40	15.8	16.4	-2.6	2.0	-65.3	<=8.0
2431.45	15.9	16.4	-2.5	2.0	-65.2	<=8.0
2431.50	15.7	16.4	-2.7	2.0	-65.4	<=8.0
2431.55	15.5	16.4	-2.9	2.0	-65.6	<=8.0
2431.60	15.4	16.4	-3.0	2.0	-65.7	<=8.0
2431.65	15.2	16.4	-3.2	2.0	-65.9	<=8.0
2431.70	15.1	16.4	-3.3	2.0	-66.0	<=8.0
2431.75	15.0	16.4	-3.4	2.0	-66.1	<=8.0
2431.80	15.0	16.4	-3.4	2.0	-66.1	<=8.0
2431.85	14.9	16.4	-3.5	2.0	-66.2	<=8.0
2431.90	15.0	16.4	-3.4	2.0	-66.1	<=8.0
2431.95	15.1	16.4	-3.3	2.0	-66.0	<=8.0
2432.00	15.1	16.4	-3.3	2.0	-66.0	<=8.0
2432.05	15.1	16.4	-3.3	2.0	-66.0	<=8.0
2432.10	15.0	16.4	-3.4	2.0	-66.1	<=8.0
2432.15	14.8	16.4	-3.6	2.0	-66.3	<=8.0
2432.20	14.9	16.4	-3.5	2.0	-66.2	<=8.0
2432.25	14.9	16.4	-3.5	2.0	-66.2	<=8.0
2432.30	14.8	16.4	-3.6	2.0	-66.3	<=8.0
2432.35	14.6	16.4	-3.8	2.0	-66.5	<=8.0
2432.40	14.3	16.4	-4.1	2.0	-66.8	<=8.0
2432.45	14.5	16.4	-3.9	2.0	-66.6	<=8.0
2432.50	14.6	16.4	-3.8	2.0	-66.5	<=8.0
2432.55	14.5	16.4	-3.9	2.0	-66.6	<=8.0
2432.60	14.3	16.4	-4.1	2.0	-66.8	<=8.0
2432.65	14.3	16.4	-4.1	2.0	-66.8	<=8.0
2432.70	14.2	16.4	-4.2	2.0	-66.9	<=8.0
2432.75	14.1	16.4	-4.3	2.0	-67.0	<=8.0
2432.80	14.1	16.4	-4.3	2.0	-67.0	<=8.0
2432.85	13.8	16.4	-4.6	2.0	-67.3	<=8.0
2432.90	13.5	16.4	-4.9	2.0	-67.6	<=8.0
2432.95	13.7	16.4	-4.7	2.0	-67.4	<=8.0
2433.00	13.6	16.4	-4.8	2.0	-67.5	<=8.0
2433.05	13.5	16.4	-4.9	2.0	-67.6	<=8.0
2433.10	13.5	16.4	-4.9	2.0	-67.6	<=8.0
2433.15	13.5	16.4	-4.9	2.0	-67.6	<=8.0
2433.20	13.6	16.4	-4.8	2.0	-67.5	<=8.0
2433.25	13.7	16.4	-4.7	2.0	-67.4	<=8.0

DATA-1		11Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2433.30	13.7	16.4	-4.7	2.0	-67.4	<=8.0
2433.35	13.6	16.4	-4.8	2.0	-67.5	<=8.0
2433.40	13.5	16.4	-4.9	2.0	-67.6	<=8.0
2433.45	13.4	16.4	-5.0	2.0	-67.7	<=8.0
2433.50	13.4	16.4	-5.0	2.0	-67.7	<=8.0
2433.55	13.4	16.4	-5.0	2.0	-67.7	<=8.0
2433.60	13.4	16.4	-5.0	2.0	-67.7	<=8.0
2433.65	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2433.70	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2433.75	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2433.80	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2433.85	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2433.90	12.7	16.4	-5.7	2.0	-68.4	<=8.0
2433.95	13.4	16.4	-5.0	2.0	-67.7	<=8.0
2434.00	13.4	16.4	-5.0	2.0	-67.7	<=8.0
2434.05	13.4	16.4	-5.0	2.0	-67.7	<=8.0
2434.10	13.3	16.4	-5.1	2.0	-67.8	<=8.0
2434.15	13.2	16.4	-5.2	2.0	-67.9	<=8.0
2434.20	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2434.25	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2434.30	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2434.35	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2434.40	12.6	16.4	-5.8	2.0	-68.5	<=8.0
2434.45	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2434.50	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2434.55	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2434.60	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2434.65	12.7	16.4	-5.7	2.0	-68.4	<=8.0
2434.70	12.7	16.4	-5.7	2.0	-68.4	<=8.0
2434.75	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2434.80	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2434.85	12.3	16.4	-6.1	2.0	-68.8	<=8.0
2434.90	12.1	16.4	-6.3	2.0	-69.0	<=8.0
2434.95	12.4	16.4	-6.0	2.0	-68.7	<=8.0
2435.00	12.4	16.4	-6.0	2.0	-68.7	<=8.0
2435.05	12.4	16.4	-6.0	2.0	-68.7	<=8.0
2435.10	12.6	16.4	-5.8	2.0	-68.5	<=8.0
2435.15	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2435.20	12.7	16.4	-5.7	2.0	-68.4	<=8.0
2435.25	12.7	16.4	-5.7	2.0	-68.4	<=8.0
2435.30	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2435.35	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2435.40	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2435.45	12.6	16.4	-5.8	2.0	-68.5	<=8.0
2435.50	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2435.55	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2435.60	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2435.65	12.8	16.4	-5.6	2.0	-68.3	<=8.0

DATA-1 11Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2435.70	12.4	16.4	-6.0	2.0	-68.7	<=8.0
2435.75	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2435.80	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2435.85	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2435.90	12.6	16.4	-5.8	2.0	-68.5	<=8.0
2435.95	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2436.00	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2436.05	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2436.10	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2436.15	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2436.20	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2436.25	13.2	16.4	-5.2	2.0	-67.9	<=8.0
2436.30	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2436.35	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2436.40	12.4	16.4	-6.0	2.0	-68.7	<=8.0
2436.45	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2436.50	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2436.55	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2436.60	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2436.65	12.6	16.4	-5.8	2.0	-68.5	<=8.0
2436.70	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2436.75	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2436.80	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2436.85	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2436.90	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2436.95	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2437.00	12.7	16.4	-5.7	2.0	-68.4	<=8.0
2437.05	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2437.10	12.7	16.4	-5.7	2.0	-68.4	<=8.0
2437.15	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2437.20	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2437.25	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2437.30	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2437.35	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2437.40	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2437.45	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2437.50	13.3	16.4	-5.1	2.0	-67.8	<=8.0
2437.55	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2437.60	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2437.65	12.6	16.4	-5.8	2.0	-68.5	<=8.0
2437.70	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2437.75	12.6	16.4	-5.8	2.0	-68.5	<=8.0
2437.80	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2437.85	12.6	16.4	-5.8	2.0	-68.5	<=8.0
2437.90	12.2	16.4	-6.2	2.0	-68.9	<=8.0
2437.95	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2438.00	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2438.05	13.1	16.4	-5.3	2.0	-68.0	<=8.0

DATA-1		11Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq.	Gp	(S/N)o	Mj=J/S	Lsys	Jammer	PER
(MHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(%)
2438.10	13.2	16.4	-5.2	2.0	-67.9	<=8.0
2438.15	13.3	16.4	-5.1	2.0	-67.8	<=8.0
2438.20	13.2	16.4	-5.2	2.0	-67.9	<=8.0
2438.25	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2438.30	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2438.35	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2438.40	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2438.45	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2438.50	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2438.55	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2438.60	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2438.65	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2438.70	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2438.75	13.1	16.4	-5.3	2.0	-68.0	<=8.0
2438.80	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2438.85	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2438.90	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2438.95	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2439.00	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2439.05	12.7	16.4	-5.7	2.0	-68.4	<=8.0
2439.10	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2439.15	12.7	16.4	-5.7	2.0	-68.4	<=8.0
2439.20	12.7	16.4	-5.7	2.0	-68.4	<=8.0
2439.25	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2439.30	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2439.35	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2439.40	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2439.45	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2439.50	13.0	16.4	-5.4	2.0	-68.1	<=8.0
2439.55	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2439.60	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2439.65	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2439.70	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2439.75	12.4	16.4	-6.0	2.0	-68.7	<=8.0
2439.80	12.6	16.4	-5.8	2.0	-68.5	<=8.0
2439.85	12.3	16.4	-6.1	2.0	-68.8	<=8.0
2439.90	12.6	16.4	-5.8	2.0	-68.5	<=8.0
2439.95	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2440.00	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2440.05	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2440.10	13.2	16.4	-5.2	2.0	-67.9	<=8.0
2440.15	13.2	16.4	-5.2	2.0	-67.9	<=8.0
2440.20	13.3	16.4	-5.1	2.0	-67.8	<=8.0
2440.25	13.5	16.4	-4.9	2.0	-67.6	<=8.0
2440.30	13.6	16.4	-4.8	2.0	-67.5	<=8.0
2440.35	13.2	16.4	-5.2	2.0	-67.9	<=8.0
2440.40	12.8	16.4	-5.6	2.0	-68.3	<=8.0
2440.45	13.3	16.4	-5.1	2.0	-67.8	<=8.0

DATA-1		11Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2440.50	13.5	16.4	-4.9	2.0	-67.6	<=8.0
2440.55	13.3	16.4	-5.1	2.0	-67.8	<=8.0
2440.60	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2440.65	12.5	16.4	-5.9	2.0	-68.6	<=8.0
2440.70	13.7	16.4	-4.7	2.0	-67.4	<=8.0
2440.75	13.7	16.4	-4.7	2.0	-67.4	<=8.0
2440.80	13.8	16.4	-4.6	2.0	-67.3	<=8.0
2440.85	12.9	16.4	-5.5	2.0	-68.2	<=8.0
2440.90	13.8	16.4	-4.6	2.0	-67.3	<=8.0
2440.95	14.0	16.4	-4.4	2.0	-67.1	<=8.0
2441.00	14.1	16.4	-4.3	2.0	-67.0	<=8.0
2441.05	13.9	16.4	-4.5	2.0	-67.2	<=8.0
2441.10	13.9	16.4	-4.5	2.0	-67.2	<=8.0
2441.15	13.8	16.4	-4.6	2.0	-67.3	<=8.0
2441.20	14.1	16.4	-4.3	2.0	-67.0	<=8.0
2441.25	14.1	16.4	-4.3	2.0	-67.0	<=8.0
2441.30	14.0	16.4	-4.4	2.0	-67.1	<=8.0
2441.35	14.4	16.4	-4.0	2.0	-66.7	<=8.0
2441.40	14.4	16.4	-4.0	2.0	-66.7	<=8.0
2441.45	14.3	16.4	-4.1	2.0	-66.8	<=8.0
2441.50	14.5	16.4	-3.9	2.0	-66.6	<=8.0
2441.55	14.6	16.4	-3.8	2.0	-66.5	<=8.0
2441.60	14.7	16.4	-3.7	2.0	-66.4	<=8.0
2441.65	14.6	16.4	-3.8	2.0	-66.5	<=8.0
2441.70	14.6	16.4	-3.8	2.0	-66.5	<=8.0
2441.75	14.5	16.4	-3.9	2.0	-66.6	<=8.0
2441.80	14.4	16.4	-4.0	2.0	-66.7	<=8.0
2441.85	14.3	16.4	-4.1	2.0	-66.8	<=8.0
2441.90	14.3	16.4	-4.1	2.0	-66.8	<=8.0
2441.95	14.5	16.4	-3.9	2.0	-66.6	<=8.0
2442.00	14.7	16.4	-3.7	2.0	-66.4	<=8.0
2442.05	14.9	16.4	-3.5	2.0	-66.2	<=8.0
2442.10	15.0	16.4	-3.4	2.0	-66.1	<=8.0
2442.15	15.1	16.4	-3.3	2.0	-66.0	<=8.0
2442.20	15.2	16.4	-3.2	2.0	-65.9	<=8.0
2442.25	15.5	16.4	-2.9	2.0	-65.6	<=8.0
2442.30	15.7	16.4	-2.7	2.0	-65.4	<=8.0
2442.35	15.7	16.4	-2.7	2.0	-65.4	<=8.0
2442.40	15.5	16.4	-2.9	2.0	-65.6	<=8.0
2442.45	15.9	16.4	-2.5	2.0	-65.2	<=8.0
2442.50	15.9	16.4	-2.5	2.0	-65.2	<=8.0
2442.55	16.0	16.4	-2.4	2.0	-65.1	<=8.0
2442.60	16.1	16.4	-2.3	2.0	-65.0	<=8.0
2442.65	16.1	16.4	-2.3	2.0	-65.0	<=8.0
2442.70	16.1	16.4	-2.3	2.0	-65.0	<=8.0
2442.75	16.2	16.4	-2.2	2.0	-64.9	<=8.0
2442.80	16.3	16.4	-2.1	2.0	-64.8	<=8.0
2442.85	16.4	16.4	-2.0	2.0	-64.7	<=8.0

DATA-1		11Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2442.90	16.7	16.4	-1.7	2.0	-64.4	<=8.0
2442.95	16.9	16.4	-1.5	2.0	-64.2	<=8.0
2443.00	17.0	16.4	-1.4	2.0	-64.1	<=8.0
2443.05	17.1	16.4	-1.3	2.0	-64.0	<=8.0
2443.10	17.2	16.4	-1.2	2.0	-63.9	<=8.0
2443.15	17.2	16.4	-1.2	2.0	-63.9	<=8.0
2443.20	17.4	16.4	-1.0	2.0	-63.7	<=8.0
2443.25	17.6	16.4	-0.8	2.0	-63.5	<=8.0
2443.30	17.7	16.4	-0.7	2.0	-63.4	<=8.0
2443.35	17.7	16.4	-0.7	2.0	-63.4	<=8.0
2443.40	17.7	16.4	-0.7	2.0	-63.4	<=8.0
2443.45	18.0	16.4	-0.4	2.0	-63.1	<=8.0
2443.50	18.3	16.4	-0.1	2.0	-62.8	<=8.0
2443.55	18.6	16.4	0.2	2.0	-62.5	<=8.0
2443.60	18.6	16.4	0.2	2.0	-62.5	<=8.0
2443.65	18.9	16.4	0.5	2.0	-62.2	<=8.0
2443.70	19.0	16.4	0.6	2.0	-62.1	<=8.0
2443.75	19.1	16.4	0.7	2.0	-62.0	<=8.0
2443.80	19.2	16.4	0.8	2.0	-61.9	<=8.0
2443.85	19.2	16.4	0.8	2.0	-61.9	<=8.0
2443.90	19.4	16.4	1.0	2.0	-61.7	<=8.0
2443.95	19.7	16.4	1.3	2.0	-61.4	<=8.0
2444.00	19.8	16.4	1.4	2.0	-61.3	<=8.0
2444.05	20.1	16.4	1.7	2.0	-61.0	<=8.0
2444.10	20.5	16.4	2.1	2.0	-60.6	<=8.0
2444.15	20.8	16.4	2.4	2.0	-60.3	<=8.0
2444.20	21.1	16.4	2.7	2.0	-60.0	<=8.0
2444.25	21.6	16.4	3.2	2.0	-59.5	<=8.0
2444.30	21.7	16.4	3.3	2.0	-59.4	<=8.0
2444.35	21.8	16.4	3.4	2.0	-59.3	<=8.0
2444.40	21.9	16.4	3.5	2.0	-59.2	<=8.0
2444.45	21.9	16.4	3.5	2.0	-59.2	<=8.0
2444.50	22.0	16.4	3.6	2.0	-59.1	<=8.0
2444.55	23.3	16.4	4.9	2.0	-57.8	<=8.0
2444.60	23.4	16.4	5.0	2.0	-57.7	<=8.0
2444.65	23.6	16.4	5.2	2.0	-57.5	<=8.0
2444.70	24.0	16.4	5.6	2.0	-57.1	<=8.0
2444.75	24.0	16.4	5.6	2.0	-57.1	<=8.0
2444.80	23.9	16.4	5.5	2.0	-57.2	<=8.0
2444.85	23.9	16.4	5.5	2.0	-57.2	<=8.0
2444.90	23.8	16.4	5.4	2.0	-57.3	<=8.0
2444.95	25.0	16.4	6.6	2.0	-56.1	<=8.0
2445.00	25.2	16.4	6.8	2.0	-55.9	<=8.0
2445.05	25.3	16.4	6.9	2.0	-55.8	<=8.0
2445.10	25.4	16.4	7.0	2.0	-55.7	<=8.0
2445.15	25.6	16.4	7.2	2.0	-55.5	<=8.0
2445.20	25.8	16.4	7.4	2.0	-55.3	<=8.0
2445.25	25.9	16.4	7.5	2.0	-55.2	<=8.0

DATA-1		11Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2445.30	26.3	16.4	7.9	2.0	-54.8	<=8.0
2445.35	26.5	16.4	8.1	2.0	-54.6	<=8.0
2445.40	26.6	16.4	8.2	2.0	-54.5	<=8.0
2445.45	26.5	16.4	8.1	2.0	-54.6	<=8.0
2445.50	26.3	16.4	7.9	2.0	-54.8	<=8.0

Calculated by using MS Excel Utility :

PERCENTILE (Gp@2428.50MHz : Gp@2445.50MHz , 20%) ----->

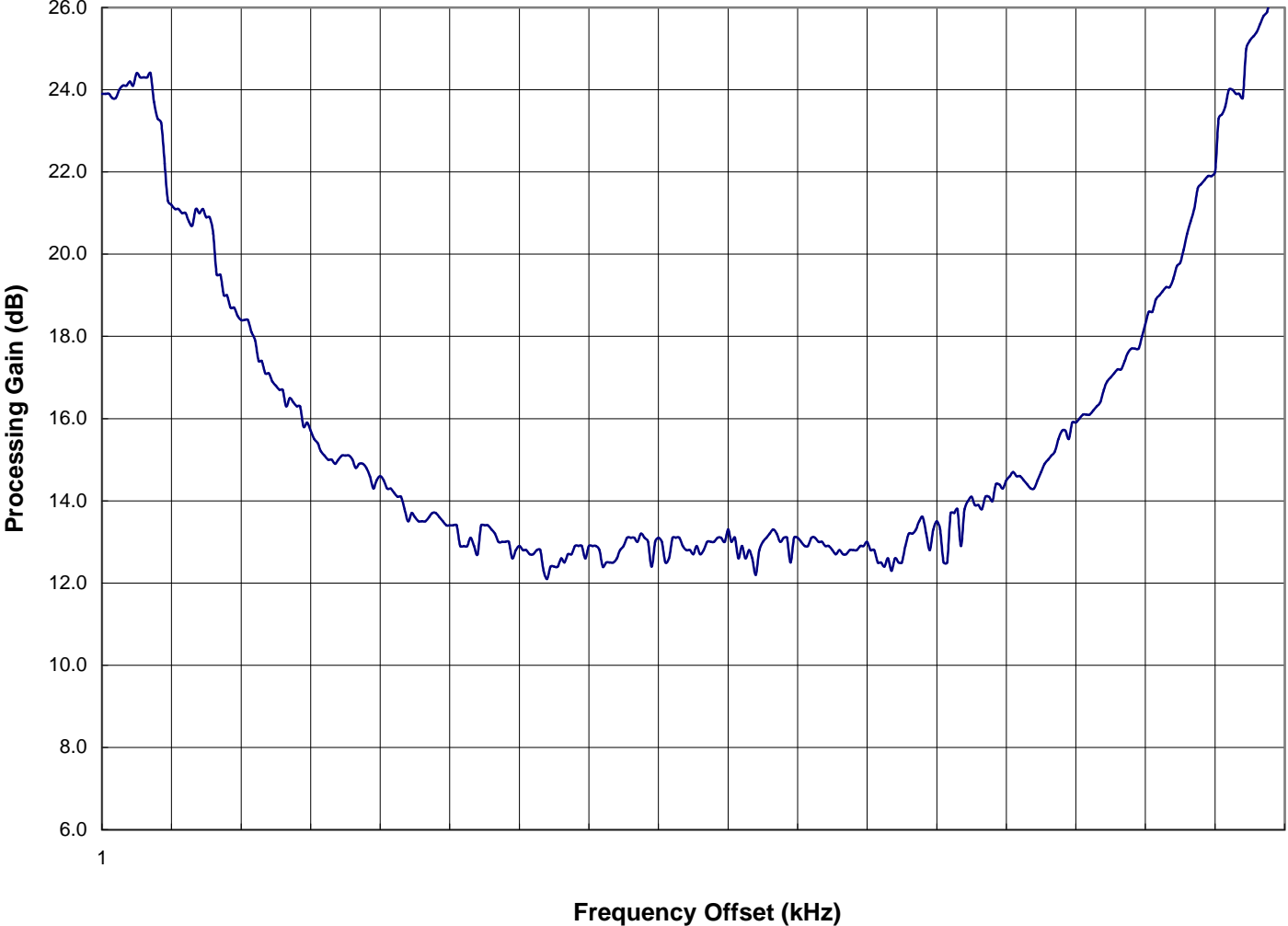
12.9

Test Conditions

TX Card **HWB3163-04 Rev B**
 S/N **99360038**
 RX Card **ISL37400M Rev A**
 S/N **00500038**
 TX Firmware **P10002C0, MS11168A3**
 RX Firmware **ID010000, PK010001, SF010000**
 Software Ver. **3.0.24**
 Mode **11 MB Pseudo IBSS**
 Pkt Size **1024**
 Pkt Dly **1**
 Pkt Burst **6**

Intersil Chips on Card: **ISL3984**
ISL3685
HFA3783
ISL3183
ISL3874

Processing Gain Channel 6 (fc=2437MHz) @ 11Mbps



DATA-2		5.5Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2428.50	22.1	13.4	6.7	2.0	-55.4	<=8.0
2428.55	21.5	13.4	6.1	2.0	-56.0	<=8.0
2428.60	20.9	13.4	5.5	2.0	-56.6	<=8.0
2428.65	20.8	13.4	5.4	2.0	-56.7	<=8.0
2428.70	20.8	13.4	5.4	2.0	-56.7	<=8.0
2428.75	20.8	13.4	5.4	2.0	-56.7	<=8.0
2428.80	20.9	13.4	5.5	2.0	-56.6	<=8.0
2428.85	21.2	13.4	5.8	2.0	-56.3	<=8.0
2428.90	21.2	13.4	5.8	2.0	-56.3	<=8.0
2428.95	21.0	13.4	5.6	2.0	-56.5	<=8.0
2429.00	21.0	13.4	5.6	2.0	-56.5	<=8.0
2429.05	21.2	13.4	5.8	2.0	-56.3	<=8.0
2429.10	21.2	13.4	5.8	2.0	-56.3	<=8.0
2429.15	21.3	13.4	5.9	2.0	-56.2	<=8.0
2429.20	21.4	13.4	6.0	2.0	-56.1	<=8.0
2429.25	21.7	13.4	6.3	2.0	-55.8	<=8.0
2429.30	21.9	13.4	6.5	2.0	-55.6	<=8.0
2429.35	21.9	13.4	6.5	2.0	-55.6	<=8.0
2429.40	22.0	13.4	6.6	2.0	-55.5	<=8.0
2429.45	21.6	13.4	6.2	2.0	-55.9	<=8.0
2429.50	20.8	13.4	5.4	2.0	-56.7	<=8.0
2429.55	20.2	13.4	4.8	2.0	-57.3	<=8.0
2429.60	19.7	13.4	4.3	2.0	-57.8	<=8.0
2429.65	19.6	13.4	4.2	2.0	-57.9	<=8.0
2429.70	19.6	13.4	4.2	2.0	-57.9	<=8.0
2429.75	19.5	13.4	4.1	2.0	-58.0	<=8.0
2429.80	20.1	13.4	4.7	2.0	-57.4	<=8.0
2429.85	20.1	13.4	4.7	2.0	-57.4	<=8.0
2429.90	20.1	13.4	4.7	2.0	-57.4	<=8.0
2429.95	19.9	13.4	4.5	2.0	-57.6	<=8.0
2430.00	20.1	13.4	4.7	2.0	-57.4	<=8.0
2430.05	20.2	13.4	4.8	2.0	-57.3	<=8.0
2430.10	20.1	13.4	4.7	2.0	-57.4	<=8.0
2430.15	20.3	13.4	4.9	2.0	-57.2	<=8.0
2430.20	20.5	13.4	5.1	2.0	-57.0	<=8.0
2430.25	20.7	13.4	5.3	2.0	-56.8	<=8.0
2430.30	20.3	13.4	4.9	2.0	-57.2	<=8.0
2430.35	20.3	13.4	4.9	2.0	-57.2	<=8.0
2430.40	20.3	13.4	4.9	2.0	-57.2	<=8.0
2430.45	20.3	13.4	4.9	2.0	-57.2	<=8.0
2430.50	20.2	13.4	4.8	2.0	-57.3	<=8.0
2430.55	19.8	13.4	4.4	2.0	-57.7	<=8.0
2430.60	19.0	13.4	3.6	2.0	-58.5	<=8.0
2430.65	18.8	13.4	3.4	2.0	-58.7	<=8.0
2430.70	18.7	13.4	3.3	2.0	-58.8	<=8.0
2430.75	18.9	13.4	3.5	2.0	-58.6	<=8.0
2430.80	19.0	13.4	3.6	2.0	-58.5	<=8.0
2430.85	18.8	13.4	3.4	2.0	-58.7	<=8.0

DATA-2		5.5Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2430.90	18.6	13.4	3.2	2.0	-58.9	<=8.0
2430.95	17.2	13.4	1.8	2.0	-60.3	<=8.0
2431.00	18.2	13.4	2.8	2.0	-59.3	<=8.0
2431.05	18.3	13.4	2.9	2.0	-59.2	<=8.0
2431.10	17.5	13.4	2.1	2.0	-60.0	<=8.0
2431.15	17.4	13.4	2.0	2.0	-60.1	<=8.0
2431.20	17.3	13.4	1.9	2.0	-60.2	<=8.0
2431.25	17.9	13.4	2.5	2.0	-59.6	<=8.0
2431.30	17.8	13.4	2.4	2.0	-59.7	<=8.0
2431.35	17.8	13.4	2.4	2.0	-59.7	<=8.0
2431.40	18.0	13.4	2.6	2.0	-59.5	<=8.0
2431.45	18.0	13.4	2.6	2.0	-59.5	<=8.0
2431.50	18.2	13.4	2.8	2.0	-59.3	<=8.0
2431.55	18.3	13.4	2.9	2.0	-59.2	<=8.0
2431.60	18.3	13.4	2.9	2.0	-59.2	<=8.0
2431.65	18.2	13.4	2.8	2.0	-59.3	<=8.0
2431.70	18.0	13.4	2.6	2.0	-59.5	<=8.0
2431.75	17.7	13.4	2.3	2.0	-59.8	<=8.0
2431.80	17.3	13.4	1.9	2.0	-60.2	<=8.0
2431.85	17.0	13.4	1.6	2.0	-60.5	<=8.0
2431.90	16.9	13.4	1.5	2.0	-60.6	<=8.0
2431.95	16.6	13.4	1.2	2.0	-60.9	<=8.0
2432.00	16.5	13.4	1.1	2.0	-61.0	<=8.0
2432.05	16.5	13.4	1.1	2.0	-61.0	<=8.0
2432.10	16.1	13.4	0.7	2.0	-61.4	<=8.0
2432.15	15.4	13.4	0.0	2.0	-62.1	<=8.0
2432.20	16.4	13.4	1.0	2.0	-61.1	<=8.0
2432.25	16.6	13.4	1.2	2.0	-60.9	<=8.0
2432.30	16.5	13.4	1.1	2.0	-61.0	<=8.0
2432.35	16.3	13.4	0.9	2.0	-61.2	<=8.0
2432.40	16.6	13.4	1.2	2.0	-60.9	<=8.0
2432.45	16.8	13.4	1.4	2.0	-60.7	<=8.0
2432.50	17.0	13.4	1.6	2.0	-60.5	<=8.0
2432.55	17.0	13.4	1.6	2.0	-60.5	<=8.0
2432.60	17.0	13.4	1.6	2.0	-60.5	<=8.0
2432.65	16.8	13.4	1.4	2.0	-60.7	<=8.0
2432.70	16.4	13.4	1.0	2.0	-61.1	<=8.0
2432.75	16.2	13.4	0.8	2.0	-61.3	<=8.0
2432.80	15.8	13.4	0.4	2.0	-61.7	<=8.0
2432.85	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2432.90	14.8	13.4	-0.6	2.0	-62.7	<=8.0
2432.95	14.3	13.4	-1.1	2.0	-63.2	<=8.0
2433.00	14.6	13.4	-0.8	2.0	-62.9	<=8.0
2433.05	14.6	13.4	-0.8	2.0	-62.9	<=8.0
2433.10	13.9	13.4	-1.5	2.0	-63.6	<=8.0
2433.15	13.7	13.4	-1.7	2.0	-63.8	<=8.0
2433.20	13.7	13.4	-1.7	2.0	-63.8	<=8.0
2433.25	14.8	13.4	-0.6	2.0	-62.7	<=8.0

DATA-2		5.5Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2433.30	14.0	13.4	-1.4	2.0	-63.5	<=8.0
2433.35	14.4	13.4	-1.0	2.0	-63.1	<=8.0
2433.40	14.6	13.4	-0.8	2.0	-62.9	<=8.0
2433.45	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2433.50	15.4	13.4	0.0	2.0	-62.1	<=8.0
2433.55	15.4	13.4	0.0	2.0	-62.1	<=8.0
2433.60	15.4	13.4	0.0	2.0	-62.1	<=8.0
2433.65	15.1	13.4	-0.3	2.0	-62.4	<=8.0
2433.70	15.0	13.4	-0.4	2.0	-62.5	<=8.0
2433.75	14.7	13.4	-0.7	2.0	-62.8	<=8.0
2433.80	14.5	13.4	-0.9	2.0	-63.0	<=8.0
2433.85	14.2	13.4	-1.2	2.0	-63.3	<=8.0
2433.90	14.2	13.4	-1.2	2.0	-63.3	<=8.0
2433.95	14.0	13.4	-1.4	2.0	-63.5	<=8.0
2434.00	14.0	13.4	-1.4	2.0	-63.5	<=8.0
2434.05	14.0	13.4	-1.4	2.0	-63.5	<=8.0
2434.10	13.7	13.4	-1.7	2.0	-63.8	<=8.0
2434.15	12.3	13.4	-3.1	2.0	-65.2	<=8.0
2434.20	13.5	13.4	-1.9	2.0	-64.0	<=8.0
2434.25	13.5	13.4	-1.9	2.0	-64.0	<=8.0
2434.30	13.5	13.4	-1.9	2.0	-64.0	<=8.0
2434.35	13.5	13.4	-1.9	2.0	-64.0	<=8.0
2434.40	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2434.45	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2434.50	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2434.55	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2434.60	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2434.65	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2434.70	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2434.75	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2434.80	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2434.85	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2434.90	13.6	13.4	-1.8	2.0	-63.9	<=8.0
2434.95	13.6	13.4	-1.8	2.0	-63.9	<=8.0
2435.00	13.8	13.4	-1.6	2.0	-63.7	<=8.0
2435.05	14.0	13.4	-1.4	2.0	-63.5	<=8.0
2435.10	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2435.15	12.9	13.4	-2.5	2.0	-64.6	<=8.0
2435.20	14.0	13.4	-1.4	2.0	-63.5	<=8.0
2435.25	14.5	13.4	-0.9	2.0	-63.0	<=8.0
2435.30	13.5	13.4	-1.9	2.0	-64.0	<=8.0
2435.35	13.5	13.4	-1.9	2.0	-64.0	<=8.0
2435.40	13.8	13.4	-1.6	2.0	-63.7	<=8.0
2435.45	13.7	13.4	-1.7	2.0	-63.8	<=8.0
2435.50	13.7	13.4	-1.7	2.0	-63.8	<=8.0
2435.55	13.5	13.4	-1.9	2.0	-64.0	<=8.0
2435.60	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2435.65	13.2	13.4	-2.2	2.0	-64.3	<=8.0

DATA-2		5.5Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2435.70	13.1	13.4	-2.3	2.0	-64.4	<=8.0
2435.75	13.1	13.4	-2.3	2.0	-64.4	<=8.0
2435.80	13.1	13.4	-2.3	2.0	-64.4	<=8.0
2435.85	13.1	13.4	-2.3	2.0	-64.4	<=8.0
2435.90	13.1	13.4	-2.3	2.0	-64.4	<=8.0
2435.95	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2436.00	13.1	13.4	-2.3	2.0	-64.4	<=8.0
2436.05	13.8	13.4	-1.6	2.0	-63.7	<=8.0
2436.10	12.6	13.4	-2.8	2.0	-64.9	<=8.0
2436.15	12.6	13.4	-2.8	2.0	-64.9	<=8.0
2436.20	14.0	13.4	-1.4	2.0	-63.5	<=8.0
2436.25	14.2	13.4	-1.2	2.0	-63.3	<=8.0
2436.30	14.0	13.4	-1.4	2.0	-63.5	<=8.0
2436.35	13.8	13.4	-1.6	2.0	-63.7	<=8.0
2436.40	13.6	13.4	-1.8	2.0	-63.9	<=8.0
2436.45	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2436.50	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2436.55	12.9	13.4	-2.5	2.0	-64.6	<=8.0
2436.60	12.9	13.4	-2.5	2.0	-64.6	<=8.0
2436.65	12.8	13.4	-2.6	2.0	-64.7	<=8.0
2436.70	12.9	13.4	-2.5	2.0	-64.6	<=8.0
2436.75	12.9	13.4	-2.5	2.0	-64.6	<=8.0
2436.80	13.0	13.4	-2.4	2.0	-64.5	<=8.0
2436.85	12.9	13.4	-2.5	2.0	-64.6	<=8.0
2436.90	13.1	13.4	-2.3	2.0	-64.4	<=8.0
2436.95	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2437.00	13.6	13.4	-1.8	2.0	-63.9	<=8.0
2437.05	13.8	13.4	-1.6	2.0	-63.7	<=8.0
2437.10	14.2	13.4	-1.2	2.0	-63.3	<=8.0
2437.15	14.2	13.4	-1.2	2.0	-63.3	<=8.0
2437.20	14.1	13.4	-1.3	2.0	-63.4	<=8.0
2437.25	13.6	13.4	-1.8	2.0	-63.9	<=8.0
2437.30	13.6	13.4	-1.8	2.0	-63.9	<=8.0
2437.35	13.5	13.4	-1.9	2.0	-64.0	<=8.0
2437.40	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2437.45	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2437.50	13.1	13.4	-2.3	2.0	-64.4	<=8.0
2437.55	13.1	13.4	-2.3	2.0	-64.4	<=8.0
2437.60	13.0	13.4	-2.4	2.0	-64.5	<=8.0
2437.65	13.0	13.4	-2.4	2.0	-64.5	<=8.0
2437.70	13.0	13.4	-2.4	2.0	-64.5	<=8.0
2437.75	13.0	13.4	-2.4	2.0	-64.5	<=8.0
2437.80	13.0	13.4	-2.4	2.0	-64.5	<=8.0
2437.85	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2437.90	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2437.95	12.1	13.4	-3.3	2.0	-65.4	<=8.0
2438.00	14.0	13.4	-1.4	2.0	-63.5	<=8.0
2438.05	14.2	13.4	-1.2	2.0	-63.3	<=8.0

DATA-2		5.5Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2438.10	13.8	13.4	-1.6	2.0	-63.7	<=8.0
2438.15	13.8	13.4	-1.6	2.0	-63.7	<=8.0
2438.20	12.3	13.4	-3.1	2.0	-65.2	<=8.0
2438.25	13.9	13.4	-1.5	2.0	-63.6	<=8.0
2438.30	13.6	13.4	-1.8	2.0	-63.9	<=8.0
2438.35	13.7	13.4	-1.7	2.0	-63.8	<=8.0
2438.40	13.7	13.4	-1.7	2.0	-63.8	<=8.0
2438.45	13.5	13.4	-1.9	2.0	-64.0	<=8.0
2438.50	13.5	13.4	-1.9	2.0	-64.0	<=8.0
2438.55	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2438.60	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2438.65	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2438.70	13.6	13.4	-1.8	2.0	-63.9	<=8.0
2438.75	13.8	13.4	-1.6	2.0	-63.7	<=8.0
2438.80	13.8	13.4	-1.6	2.0	-63.7	<=8.0
2438.85	14.1	13.4	-1.3	2.0	-63.4	<=8.0
2438.90	14.3	13.4	-1.1	2.0	-63.2	<=8.0
2438.95	14.2	13.4	-1.2	2.0	-63.3	<=8.0
2439.00	14.0	13.4	-1.4	2.0	-63.5	<=8.0
2439.05	14.5	13.4	-0.9	2.0	-63.0	<=8.0
2439.10	13.1	13.4	-2.3	2.0	-64.4	<=8.0
2439.15	13.0	13.4	-2.4	2.0	-64.5	<=8.0
2439.20	13.6	13.4	-1.8	2.0	-63.9	<=8.0
2439.25	14.1	13.4	-1.3	2.0	-63.4	<=8.0
2439.30	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2439.35	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2439.40	13.9	13.4	-1.5	2.0	-63.6	<=8.0
2439.45	13.7	13.4	-1.7	2.0	-63.8	<=8.0
2439.50	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2439.55	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2439.60	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2439.65	13.4	13.4	-2.0	2.0	-64.1	<=8.0
2439.70	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2439.75	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2439.80	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2439.85	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2439.90	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2439.95	12.1	13.4	-3.3	2.0	-65.4	<=8.0
2440.00	12.6	13.4	-2.8	2.0	-64.9	<=8.0
2440.05	12.6	13.4	-2.8	2.0	-64.9	<=8.0
2440.10	13.2	13.4	-2.2	2.0	-64.3	<=8.0
2440.15	12.2	13.4	-3.2	2.0	-65.3	<=8.0
2440.20	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2440.25	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2440.30	13.3	13.4	-2.1	2.0	-64.2	<=8.0
2440.35	14.1	13.4	-1.3	2.0	-63.4	<=8.0
2440.40	14.7	13.4	-0.7	2.0	-62.8	<=8.0
2440.45	14.7	13.4	-0.7	2.0	-62.8	<=8.0

DATA-2		5.5Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2440.50	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2440.55	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2440.60	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2440.65	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2440.70	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2440.75	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2440.80	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2440.85	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2440.90	15.2	13.4	-0.2	2.0	-62.3	<=8.0
2440.95	15.1	13.4	-0.3	2.0	-62.4	<=8.0
2441.00	14.9	13.4	-0.5	2.0	-62.6	<=8.0
2441.05	14.9	13.4	-0.5	2.0	-62.6	<=8.0
2441.10	13.7	13.4	-1.7	2.0	-63.8	<=8.0
2441.15	14.7	13.4	-0.7	2.0	-62.8	<=8.0
2441.20	14.7	13.4	-0.7	2.0	-62.8	<=8.0
2441.25	15.1	13.4	-0.3	2.0	-62.4	<=8.0
2441.30	15.0	13.4	-0.4	2.0	-62.5	<=8.0
2441.35	15.0	13.4	-0.4	2.0	-62.5	<=8.0
2441.40	14.9	13.4	-0.5	2.0	-62.6	<=8.0
2441.45	14.9	13.4	-0.5	2.0	-62.6	<=8.0
2441.50	14.9	13.4	-0.5	2.0	-62.6	<=8.0
2441.55	14.9	13.4	-0.5	2.0	-62.6	<=8.0
2441.60	14.9	13.4	-0.5	2.0	-62.6	<=8.0
2441.65	15.0	13.4	-0.4	2.0	-62.5	<=8.0
2441.70	15.0	13.4	-0.4	2.0	-62.5	<=8.0
2441.75	15.0	13.4	-0.4	2.0	-62.5	<=8.0
2441.80	15.8	13.4	0.4	2.0	-61.7	<=8.0
2441.85	15.7	13.4	0.3	2.0	-61.8	<=8.0
2441.90	15.7	13.4	0.3	2.0	-61.8	<=8.0
2441.95	15.3	13.4	-0.1	2.0	-62.2	<=8.0
2442.00	15.3	13.4	-0.1	2.0	-62.2	<=8.0
2442.05	15.3	13.4	-0.1	2.0	-62.2	<=8.0
2442.10	15.3	13.4	-0.1	2.0	-62.2	<=8.0
2442.15	15.3	13.4	-0.1	2.0	-62.2	<=8.0
2442.20	15.7	13.4	0.3	2.0	-61.8	<=8.0
2442.25	16.4	13.4	1.0	2.0	-61.1	<=8.0
2442.30	16.5	13.4	1.1	2.0	-61.0	<=8.0
2442.35	16.5	13.4	1.1	2.0	-61.0	<=8.0
2442.40	17.3	13.4	1.9	2.0	-60.2	<=8.0
2442.45	17.2	13.4	1.8	2.0	-60.3	<=8.0
2442.50	17.2	13.4	1.8	2.0	-60.3	<=8.0
2442.55	18.3	13.4	2.9	2.0	-59.2	<=8.0
2442.60	18.5	13.4	3.1	2.0	-59.0	<=8.0
2442.65	18.5	13.4	3.1	2.0	-59.0	<=8.0
2442.70	18.6	13.4	3.2	2.0	-58.9	<=8.0
2442.75	18.6	13.4	3.2	2.0	-58.9	<=8.0
2442.80	18.5	13.4	3.1	2.0	-59.0	<=8.0
2442.85	18.3	13.4	2.9	2.0	-59.2	<=8.0

DATA-2		5.5Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2442.90	18.3	13.4	2.9	2.0	-59.2	<=8.0
2442.95	18.0	13.4	2.6	2.0	-59.5	<=8.0
2443.00	18.0	13.4	2.6	2.0	-59.5	<=8.0
2443.05	18.0	13.4	2.6	2.0	-59.5	<=8.0
2443.10	17.9	13.4	2.5	2.0	-59.6	<=8.0
2443.15	17.7	13.4	2.3	2.0	-59.8	<=8.0
2443.20	18.0	13.4	2.6	2.0	-59.5	<=8.0
2443.25	18.0	13.4	2.6	2.0	-59.5	<=8.0
2443.30	18.0	13.4	2.6	2.0	-59.5	<=8.0
2443.35	17.9	13.4	2.5	2.0	-59.6	<=8.0
2443.40	18.2	13.4	2.8	2.0	-59.3	<=8.0
2443.45	18.1	13.4	2.7	2.0	-59.4	<=8.0
2443.50	18.1	13.4	2.7	2.0	-59.4	<=8.0
2443.55	18.1	13.4	2.7	2.0	-59.4	<=8.0
2443.60	18.1	13.4	2.7	2.0	-59.4	<=8.0
2443.65	18.2	13.4	2.8	2.0	-59.3	<=8.0
2443.70	18.2	13.4	2.8	2.0	-59.3	<=8.0
2443.75	18.2	13.4	2.8	2.0	-59.3	<=8.0
2443.80	18.1	13.4	2.7	2.0	-59.4	<=8.0
2443.85	18.2	13.4	2.8	2.0	-59.3	<=8.0
2443.90	18.2	13.4	2.8	2.0	-59.3	<=8.0
2443.95	18.4	13.4	3.0	2.0	-59.1	<=8.0
2444.00	18.5	13.4	3.1	2.0	-59.0	<=8.0
2444.05	18.5	13.4	3.1	2.0	-59.0	<=8.0
2444.10	18.7	13.4	3.3	2.0	-58.8	<=8.0
2444.15	18.8	13.4	3.4	2.0	-58.7	<=8.0
2444.20	18.9	13.4	3.5	2.0	-58.6	<=8.0
2444.25	19.1	13.4	3.7	2.0	-58.4	<=8.0
2444.30	19.4	13.4	4.0	2.0	-58.1	<=8.0
2444.35	19.6	13.4	4.2	2.0	-57.9	<=8.0
2444.40	20.3	13.4	4.9	2.0	-57.2	<=8.0
2444.45	20.6	13.4	5.2	2.0	-56.9	<=8.0
2444.50	20.6	13.4	5.2	2.0	-56.9	<=8.0
2444.55	20.5	13.4	5.1	2.0	-57.0	<=8.0
2444.60	20.5	13.4	5.1	2.0	-57.0	<=8.0
2444.65	20.6	13.4	5.2	2.0	-56.9	<=8.0
2444.70	20.9	13.4	5.5	2.0	-56.6	<=8.0
2444.75	20.8	13.4	5.4	2.0	-56.7	<=8.0
2444.80	20.8	13.4	5.4	2.0	-56.7	<=8.0
2444.85	20.8	13.4	5.4	2.0	-56.7	<=8.0
2444.90	20.9	13.4	5.5	2.0	-56.6	<=8.0
2444.95	21.1	13.4	5.7	2.0	-56.4	<=8.0
2445.00	21.1	13.4	5.7	2.0	-56.4	<=8.0
2445.05	21.1	13.4	5.7	2.0	-56.4	<=8.0
2445.10	22.2	13.4	6.8	2.0	-55.3	<=8.0
2445.15	22.3	13.4	6.9	2.0	-55.2	<=8.0
2445.20	22.2	13.4	6.8	2.0	-55.3	<=8.0
2445.25	22.2	13.4	6.8	2.0	-55.3	<=8.0

DATA-2		5.5Mbps CHANNEL 6 Processing Gain					
Gp = (S/N)o + Mj + Lsys							
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)	
2445.30	23.1	13.4	7.7	2.0	-54.4	<=8.0	
2445.35	23.4	13.4	8.0	2.0	-54.1	<=8.0	
2445.40	23.4	13.4	8.0	2.0	-54.1	<=8.0	
2445.45	23.2	13.4	7.8	2.0	-54.3	<=8.0	
2445.50	23.2	13.4	7.8	2.0	-54.3	<=8.0	

Calculated by using MS Excel Utility :

PERCENTILE (Gp@2428.50MHz : Gp@ 2445.50MHz , 20%) ----->

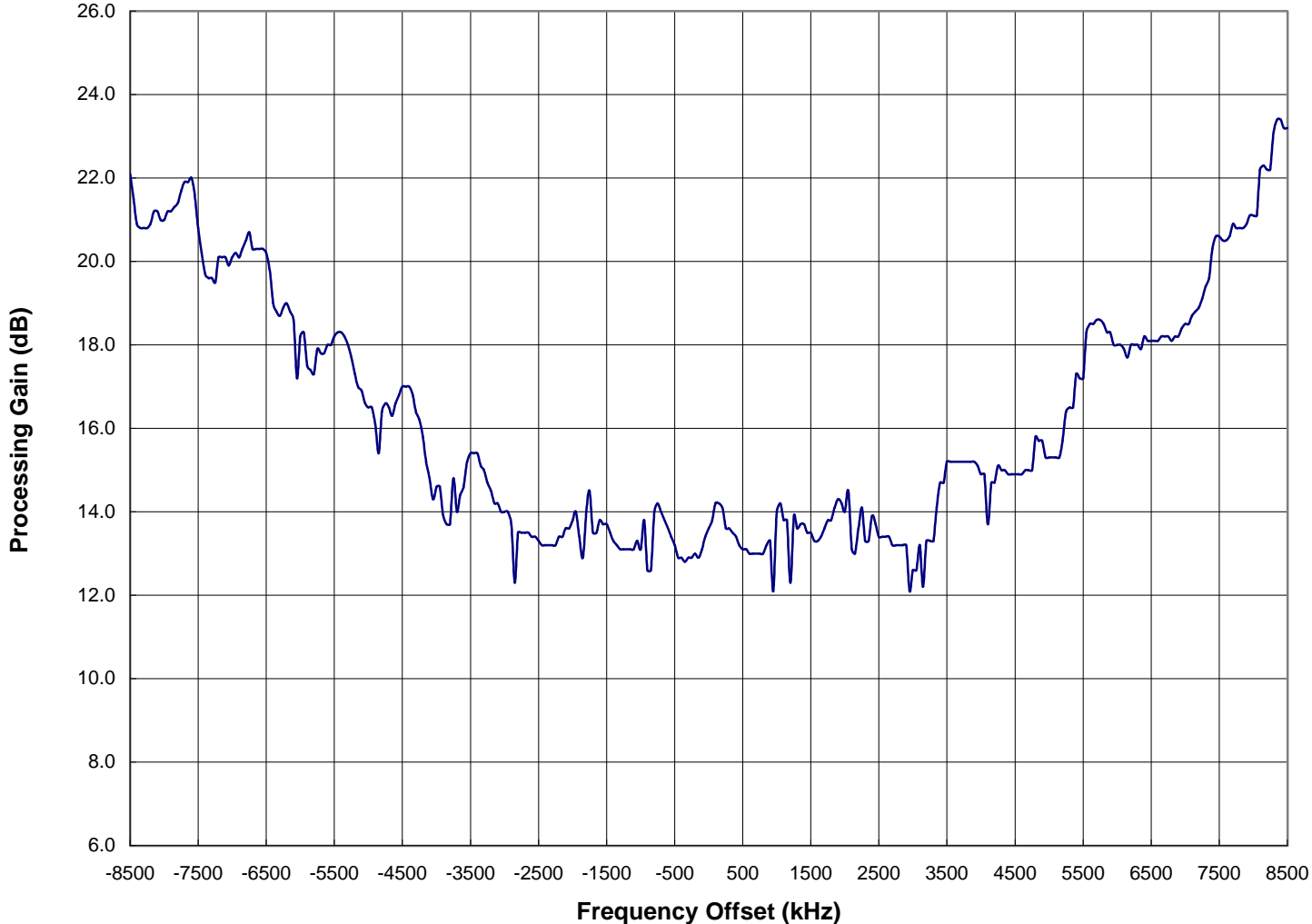
13.4

Test Conditions

TX Card **HWB3163-04 Rev B**
 S/N **99360038**
 RX Card **ISL37400M Rev A**
 S/N **00500038**
 TX Firmware **P10002C0, MS11168A3**
 RX Firmware **ID010000, PK010001, SF010000**
 Software Ver. **3.0.24**
 Mode **5.5 MB Pseudo IBSS**
 Pkt Size **1024**
 Pkt Dly **1**
 Pkt Burst **6**

Intersil Chips on Card: **ISL3984**
ISL3685
HFA3783
ISL3183
ISL3874

Processing Gain
Channel 6 (fc=2437MHz) @ 5.5Mbps



DATA-3 2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq.	Gp	(S/N)o	Mj=J/S	Lsys	Jammer	PER
(MHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(%)
2428.50	21.7	13.3	6.4	2.0	-55.8	<=8.0
2428.55	21.0	13.3	5.7	2.0	-56.5	<=8.0
2428.60	20.6	13.3	5.3	2.0	-56.9	<=8.0
2428.65	20.0	13.3	4.7	2.0	-57.5	<=8.0
2428.70	19.9	13.3	4.6	2.0	-57.6	<=8.0
2428.75	19.7	13.3	4.4	2.0	-57.8	<=8.0
2428.80	19.5	13.3	4.2	2.0	-58.0	<=8.0
2428.85	19.5	13.3	4.2	2.0	-58.0	<=8.0
2428.90	19.5	13.3	4.2	2.0	-58.0	<=8.0
2428.95	19.5	13.3	4.2	2.0	-58.0	<=8.0
2429.00	19.4	13.3	4.1	2.0	-58.1	<=8.0
2429.05	19.4	13.3	4.1	2.0	-58.1	<=8.0
2429.10	19.3	13.3	4.0	2.0	-58.2	<=8.0
2429.15	20.0	13.3	4.7	2.0	-57.5	<=8.0
2429.20	20.2	13.3	4.9	2.0	-57.3	<=8.0
2429.25	20.2	13.3	4.9	2.0	-57.3	<=8.0
2429.30	20.3	13.3	5.0	2.0	-57.2	<=8.0
2429.35	20.3	13.3	5.0	2.0	-57.2	<=8.0
2429.40	20.3	13.3	5.0	2.0	-57.2	<=8.0
2429.45	20.2	13.3	4.9	2.0	-57.3	<=8.0
2429.50	20.1	13.3	4.8	2.0	-57.4	<=8.0
2429.55	19.4	13.3	4.1	2.0	-58.1	<=8.0
2429.60	19.0	13.3	3.7	2.0	-58.5	<=8.0
2429.65	18.8	13.3	3.5	2.0	-58.7	<=8.0
2429.70	18.8	13.3	3.5	2.0	-58.7	<=8.0
2429.75	18.6	13.3	3.3	2.0	-58.9	<=8.0
2429.80	18.4	13.3	3.1	2.0	-59.1	<=8.0
2429.85	18.4	13.3	3.1	2.0	-59.1	<=8.0
2429.90	18.2	13.3	2.9	2.0	-59.3	<=8.0
2429.95	18.3	13.3	3.0	2.0	-59.2	<=8.0
2430.00	18.4	13.3	3.1	2.0	-59.1	<=8.0
2430.05	18.4	13.3	3.1	2.0	-59.1	<=8.0
2430.10	18.4	13.3	3.1	2.0	-59.1	<=8.0
2430.15	18.4	13.3	3.1	2.0	-59.1	<=8.0
2430.20	18.4	13.3	3.1	2.0	-59.1	<=8.0
2430.25	18.5	13.3	3.2	2.0	-59.0	<=8.0
2430.30	18.5	13.3	3.2	2.0	-59.0	<=8.0
2430.35	18.5	13.3	3.2	2.0	-59.0	<=8.0
2430.40	18.4	13.3	3.1	2.0	-59.1	<=8.0
2430.45	18.4	13.3	3.1	2.0	-59.1	<=8.0
2430.50	18.4	13.3	3.1	2.0	-59.1	<=8.0
2430.55	18.5	13.3	3.2	2.0	-59.0	<=8.0
2430.60	18.3	13.3	3.0	2.0	-59.2	<=8.0
2430.65	18.1	13.3	2.8	2.0	-59.4	<=8.0
2430.70	17.0	13.3	1.7	2.0	-60.5	<=8.0
2430.75	16.6	13.3	1.3	2.0	-60.9	<=8.0
2430.80	16.4	13.3	1.1	2.0	-61.1	<=8.0
2430.85	16.4	13.3	1.1	2.0	-61.1	<=8.0

DATA-3 2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2430.90	15.1	13.3	-0.2	2.0	-62.4	<=8.0
2430.95	15.1	13.3	-0.2	2.0	-62.4	<=8.0
2431.00	15.2	13.3	-0.1	2.0	-62.3	<=8.0
2431.05	15.2	13.3	-0.1	2.0	-62.3	<=8.0
2431.10	15.2	13.3	-0.1	2.0	-62.3	<=8.0
2431.15	15.3	13.3	0.0	2.0	-62.2	<=8.0
2431.20	15.3	13.3	0.0	2.0	-62.2	<=8.0
2431.25	16.3	13.3	1.0	2.0	-61.2	<=8.0
2431.30	17.5	13.3	2.2	2.0	-60.0	<=8.0
2431.35	17.9	13.3	2.6	2.0	-59.6	<=8.0
2431.40	17.9	13.3	2.6	2.0	-59.6	<=8.0
2431.45	19.0	13.3	3.7	2.0	-58.5	<=8.0
2431.50	20.5	13.3	5.2	2.0	-57.0	<=8.0
2431.55	23.0	13.3	7.7	2.0	-54.5	<=8.0
2431.60	25.6	13.3	10.3	2.0	-51.9	<=8.0
2431.65	25.6	13.3	10.3	2.0	-51.9	<=8.0
2431.70	22.1	13.3	6.8	2.0	-55.4	<=8.0
2431.75	20.5	13.3	5.2	2.0	-57.0	<=8.0
2431.80	18.5	13.3	3.2	2.0	-59.0	<=8.0
2431.85	17.4	13.3	2.1	2.0	-60.1	<=8.0
2431.90	17.0	13.3	1.7	2.0	-60.5	<=8.0
2431.95	16.9	13.3	1.6	2.0	-60.6	<=8.0
2432.00	16.9	13.3	1.6	2.0	-60.6	<=8.0
2432.05	16.8	13.3	1.5	2.0	-60.7	<=8.0
2432.10	16.5	13.3	1.2	2.0	-61.0	<=8.0
2432.15	15.2	13.3	-0.1	2.0	-62.3	<=8.0
2432.20	15.1	13.3	-0.2	2.0	-62.4	<=8.0
2432.25	14.8	13.3	-0.5	2.0	-62.7	<=8.0
2432.30	14.8	13.3	-0.5	2.0	-62.7	<=8.0
2432.35	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2432.40	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2432.45	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2432.50	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2432.55	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2432.60	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2432.65	12.9	13.3	-2.4	2.0	-64.6	<=8.0
2432.70	12.9	13.3	-2.4	2.0	-64.6	<=8.0
2432.75	13.0	13.3	-2.3	2.0	-64.5	<=8.0
2432.80	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2432.85	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2432.90	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2432.95	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2433.00	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2433.05	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2433.10	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2433.15	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2433.20	13.0	13.3	-2.3	2.0	-64.5	<=8.0
2433.25	13.1	13.3	-2.2	2.0	-64.4	<=8.0

DATA-3 2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2433.30	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2433.35	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2433.40	12.2	13.3	-3.1	2.0	-65.3	<=8.0
2433.45	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2433.50	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2433.55	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2433.60	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2433.65	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2433.70	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2433.75	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2433.80	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2433.85	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2433.90	12.4	13.3	-2.9	2.0	-65.1	<=8.0
2433.95	12.4	13.3	-2.9	2.0	-65.1	<=8.0
2434.00	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2434.05	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2434.10	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2434.15	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2434.20	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2434.25	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2434.30	12.7	13.3	-2.6	2.0	-64.8	<=8.0
2434.35	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2434.40	12.1	13.3	-3.2	2.0	-65.4	<=8.0
2434.45	12.1	13.3	-3.2	2.0	-65.4	<=8.0
2434.50	12.0	13.3	-3.3	2.0	-65.5	<=8.0
2434.55	12.2	13.3	-3.1	2.0	-65.3	<=8.0
2434.60	12.2	13.3	-3.1	2.0	-65.3	<=8.0
2434.65	12.2	13.3	-3.1	2.0	-65.3	<=8.0
2434.70	12.2	13.3	-3.1	2.0	-65.3	<=8.0
2434.75	12.2	13.3	-3.1	2.0	-65.3	<=8.0
2434.80	12.8	13.3	-2.5	2.0	-64.7	<=8.0
2434.85	12.8	13.3	-2.5	2.0	-64.7	<=8.0
2434.90	12.8	13.3	-2.5	2.0	-64.7	<=8.0
2434.95	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2435.00	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2435.05	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2435.10	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2435.15	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2435.20	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2435.25	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2435.30	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2435.35	11.6	13.3	-3.7	2.0	-65.9	<=8.0
2435.40	11.9	13.3	-3.4	2.0	-65.6	<=8.0
2435.45	12.0	13.3	-3.3	2.0	-65.5	<=8.0
2435.50	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2435.55	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2435.60	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2435.65	12.3	13.3	-3.0	2.0	-65.2	<=8.0

DATA-3 2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2435.70	11.9	13.3	-3.4	2.0	-65.6	<=8.0
2435.75	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2435.80	12.8	13.3	-2.5	2.0	-64.7	<=8.0
2435.85	13.0	13.3	-2.3	2.0	-64.5	<=8.0
2435.90	12.4	13.3	-2.9	2.0	-65.1	<=8.0
2435.95	13.3	13.3	-2.0	2.0	-64.2	<=8.0
2436.00	14.9	13.3	-0.4	2.0	-62.6	<=8.0
2436.05	14.9	13.3	-0.4	2.0	-62.6	<=8.0
2436.10	14.4	13.3	-0.9	2.0	-63.1	<=8.0
2436.15	14.2	13.3	-1.1	2.0	-63.3	<=8.0
2436.20	14.1	13.3	-1.2	2.0	-63.4	<=8.0
2436.25	14.0	13.3	-1.3	2.0	-63.5	<=8.0
2436.30	14.1	13.3	-1.2	2.0	-63.4	<=8.0
2436.35	11.2	13.3	-4.1	2.0	-66.3	<=8.0
2436.40	12.7	13.3	-2.6	2.0	-64.8	<=8.0
2436.45	12.7	13.3	-2.6	2.0	-64.8	<=8.0
2436.50	12.2	13.3	-3.1	2.0	-65.3	<=8.0
2436.55	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2436.60	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2436.65	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2436.70	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2436.75	12.8	13.3	-2.5	2.0	-64.7	<=8.0
2436.80	13.0	13.3	-2.3	2.0	-64.5	<=8.0
2436.85	13.9	13.3	-1.4	2.0	-63.6	<=8.0
2436.90	16.1	13.3	0.8	2.0	-61.4	<=8.0
2436.95	17.5	13.3	2.2	2.0	-60.0	<=8.0
2437.00	21.5	13.3	6.2	2.0	-56.0	<=8.0
2437.05	23.0	13.3	7.7	2.0	-54.5	<=8.0
2437.10	23.8	13.3	8.5	2.0	-53.7	<=8.0
2437.15	23.7	13.3	8.4	2.0	-53.8	<=8.0
2437.20	23.8	13.3	8.5	2.0	-53.7	<=8.0
2437.25	22.3	13.3	7.0	2.0	-55.2	<=8.0
2437.30	20.8	13.3	5.5	2.0	-56.7	<=8.0
2437.35	16.7	13.3	1.4	2.0	-60.8	<=8.0
2437.40	17.7	13.3	2.4	2.0	-59.8	<=8.0
2437.45	17.0	13.3	1.7	2.0	-60.5	<=8.0
2437.50	16.2	13.3	0.9	2.0	-61.3	<=8.0
2437.55	15.6	13.3	0.3	2.0	-61.9	<=8.0
2437.60	14.6	13.3	-0.7	2.0	-62.9	<=8.0
2437.65	14.2	13.3	-1.1	2.0	-63.3	<=8.0
2437.70	11.4	13.3	-3.9	2.0	-66.1	<=8.0
2437.75	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2437.80	13.9	13.3	-1.4	2.0	-63.6	<=8.0
2437.85	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2437.90	11.3	13.3	-4.0	2.0	-66.2	<=8.0
2437.95	12.9	13.3	-2.4	2.0	-64.6	<=8.0
2438.00	12.9	13.3	-2.4	2.0	-64.6	<=8.0
2438.05	13.5	13.3	-1.8	2.0	-64.0	<=8.0

DATA-3 2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2438.10	13.9	13.3	-1.4	2.0	-63.6	<=8.0
2438.15	13.9	13.3	-1.4	2.0	-63.6	<=8.0
2438.20	14.0	13.3	-1.3	2.0	-63.5	<=8.0
2438.25	14.0	13.3	-1.3	2.0	-63.5	<=8.0
2438.30	14.3	13.3	-1.0	2.0	-63.2	<=8.0
2438.35	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2438.40	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2438.45	14.4	13.3	-0.9	2.0	-63.1	<=8.0
2438.50	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2438.55	14.1	13.3	-1.2	2.0	-63.4	<=8.0
2438.60	14.1	13.3	-1.2	2.0	-63.4	<=8.0
2438.65	14.1	13.3	-1.2	2.0	-63.4	<=8.0
2438.70	11.8	13.3	-3.5	2.0	-65.7	<=8.0
2438.75	13.3	13.3	-2.0	2.0	-64.2	<=8.0
2438.80	13.3	13.3	-2.0	2.0	-64.2	<=8.0
2438.85	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2438.90	11.7	13.3	-3.6	2.0	-65.8	<=8.0
2438.95	13.0	13.3	-2.3	2.0	-64.5	<=8.0
2439.00	13.3	13.3	-2.0	2.0	-64.2	<=8.0
2439.05	13.3	13.3	-2.0	2.0	-64.2	<=8.0
2439.10	13.5	13.3	-1.8	2.0	-64.0	<=8.0
2439.15	13.5	13.3	-1.8	2.0	-64.0	<=8.0
2439.20	13.5	13.3	-1.8	2.0	-64.0	<=8.0
2439.25	13.5	13.3	-1.8	2.0	-64.0	<=8.0
2439.30	14.5	13.3	-0.8	2.0	-63.0	<=8.0
2439.35	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2439.40	12.4	13.3	-2.9	2.0	-65.1	<=8.0
2439.45	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2439.50	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2439.55	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2439.60	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2439.65	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2439.70	12.1	13.3	-3.2	2.0	-65.4	<=8.0
2439.75	12.7	13.3	-2.6	2.0	-64.8	<=8.0
2439.80	12.9	13.3	-2.4	2.0	-64.6	<=8.0
2439.85	12.9	13.3	-2.4	2.0	-64.6	<=8.0
2439.90	11.6	13.3	-3.7	2.0	-65.9	<=8.0
2439.95	11.7	13.3	-3.6	2.0	-65.8	<=8.0
2440.00	12.1	13.3	-3.2	2.0	-65.4	<=8.0
2440.05	12.1	13.3	-3.2	2.0	-65.4	<=8.0
2440.10	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2440.15	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2440.20	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2440.25	13.0	13.3	-2.3	2.0	-64.5	<=8.0
2440.30	13.3	13.3	-2.0	2.0	-64.2	<=8.0
2440.35	13.1	13.3	-2.2	2.0	-64.4	<=8.0
2440.40	13.0	13.3	-2.3	2.0	-64.5	<=8.0
2440.45	12.9	13.3	-2.4	2.0	-64.6	<=8.0

DATA-3 2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2440.50	12.9	13.3	-2.4	2.0	-64.6	<=8.0
2440.55	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2440.60	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2440.65	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2440.70	12.9	13.3	-2.4	2.0	-64.6	<=8.0
2440.75	12.9	13.3	-2.4	2.0	-64.6	<=8.0
2440.80	13.0	13.3	-2.3	2.0	-64.5	<=8.0
2440.85	13.0	13.3	-2.3	2.0	-64.5	<=8.0
2440.90	12.3	13.3	-3.0	2.0	-65.2	<=8.0
2440.95	12.5	13.3	-2.8	2.0	-65.0	<=8.0
2441.00	12.7	13.3	-2.6	2.0	-64.8	<=8.0
2441.05	12.7	13.3	-2.6	2.0	-64.8	<=8.0
2441.10	12.7	13.3	-2.6	2.0	-64.8	<=8.0
2441.15	12.8	13.3	-2.5	2.0	-64.7	<=8.0
2441.20	13.5	13.3	-1.8	2.0	-64.0	<=8.0
2441.25	13.5	13.3	-1.8	2.0	-64.0	<=8.0
2441.30	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2441.35	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2441.40	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2441.45	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2441.50	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2441.55	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2441.60	13.8	13.3	-1.5	2.0	-63.7	<=8.0
2441.65	13.7	13.3	-1.6	2.0	-63.8	<=8.0
2441.70	13.7	13.3	-1.6	2.0	-63.8	<=8.0
2441.75	13.7	13.3	-1.6	2.0	-63.8	<=8.0
2441.80	13.7	13.3	-1.6	2.0	-63.8	<=8.0
2441.85	13.6	13.3	-1.7	2.0	-63.9	<=8.0
2441.90	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2441.95	12.6	13.3	-2.7	2.0	-64.9	<=8.0
2442.00	12.9	13.3	-2.4	2.0	-64.6	<=8.0
2442.05	13.0	13.3	-2.3	2.0	-64.5	<=8.0
2442.10	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2442.15	13.2	13.3	-2.1	2.0	-64.3	<=8.0
2442.20	14.1	13.3	-1.2	2.0	-63.4	<=8.0
2442.25	14.1	13.3	-1.2	2.0	-63.4	<=8.0
2442.30	14.5	13.3	-0.8	2.0	-63.0	<=8.0
2442.35	16.0	13.3	0.7	2.0	-61.5	<=8.0
2442.40	16.7	13.3	1.4	2.0	-60.8	<=8.0
2442.45	19.3	13.3	4.0	2.0	-58.2	<=8.0
2442.50	21.3	13.3	6.0	2.0	-56.2	<=8.0
2442.55	23.3	13.3	8.0	2.0	-54.2	<=8.0
2442.60	25.0	13.3	9.7	2.0	-52.5	<=8.0
2442.65	25.0	13.3	9.7	2.0	-52.5	<=8.0
2442.70	25.0	13.3	9.7	2.0	-52.5	<=8.0
2442.75	24.2	13.3	8.9	2.0	-53.3	<=8.0
2442.80	22.4	13.3	7.1	2.0	-55.1	<=8.0
2442.85	20.8	13.3	5.5	2.0	-56.7	<=8.0

DATA-3 2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2442.90	18.9	13.3	3.6	2.0	-58.6	<=8.0
2442.95	18.8	13.3	3.5	2.0	-58.7	<=8.0
2443.00	18.2	13.3	2.9	2.0	-59.3	<=8.0
2443.05	18.2	13.3	2.9	2.0	-59.3	<=8.0
2443.10	17.6	13.3	2.3	2.0	-59.9	<=8.0
2443.15	17.1	13.3	1.8	2.0	-60.4	<=8.0
2443.20	16.7	13.3	1.4	2.0	-60.8	<=8.0
2443.25	16.7	13.3	1.4	2.0	-60.8	<=8.0
2443.30	16.6	13.3	1.3	2.0	-60.9	<=8.0
2443.35	16.3	13.3	1.0	2.0	-61.2	<=8.0
2443.40	15.9	13.3	0.6	2.0	-61.6	<=8.0
2443.45	15.9	13.3	0.6	2.0	-61.6	<=8.0
2443.50	15.9	13.3	0.6	2.0	-61.6	<=8.0
2443.55	16.2	13.3	0.9	2.0	-61.3	<=8.0
2443.60	16.4	13.3	1.1	2.0	-61.1	<=8.0
2443.65	16.4	13.3	1.1	2.0	-61.1	<=8.0
2443.70	16.4	13.3	1.1	2.0	-61.1	<=8.0
2443.75	16.4	13.3	1.1	2.0	-61.1	<=8.0
2443.80	17.5	13.3	2.2	2.0	-60.0	<=8.0
2443.85	17.5	13.3	2.2	2.0	-60.0	<=8.0
2443.90	17.5	13.3	2.2	2.0	-60.0	<=8.0
2443.95	17.5	13.3	2.2	2.0	-60.0	<=8.0
2444.00	17.6	13.3	2.3	2.0	-59.9	<=8.0
2444.05	17.6	13.3	2.3	2.0	-59.9	<=8.0
2444.10	18.3	13.3	3.0	2.0	-59.2	<=8.0
2444.15	18.5	13.3	3.2	2.0	-59.0	<=8.0
2444.20	18.7	13.3	3.4	2.0	-58.8	<=8.0
2444.25	18.9	13.3	3.6	2.0	-58.6	<=8.0
2444.30	19.2	13.3	3.9	2.0	-58.3	<=8.0
2444.35	19.2	13.3	3.9	2.0	-58.3	<=8.0
2444.40	19.2	13.3	3.9	2.0	-58.3	<=8.0
2444.45	19.2	13.3	3.9	2.0	-58.3	<=8.0
2444.50	19.8	13.3	4.5	2.0	-57.7	<=8.0
2444.55	20.4	13.3	5.1	2.0	-57.1	<=8.0
2444.60	20.1	13.3	4.8	2.0	-57.4	<=8.0
2444.65	20.3	13.3	5.0	2.0	-57.2	<=8.0
2444.70	20.3	13.3	5.0	2.0	-57.2	<=8.0
2444.75	20.4	13.3	5.1	2.0	-57.1	<=8.0
2444.80	20.5	13.3	5.2	2.0	-57.0	<=8.0
2444.85	20.6	13.3	5.3	2.0	-56.9	<=8.0
2444.90	20.8	13.3	5.5	2.0	-56.7	<=8.0
2444.95	20.9	13.3	5.6	2.0	-56.6	<=8.0
2445.00	20.8	13.3	5.5	2.0	-56.7	<=8.0
2445.05	20.9	13.3	5.6	2.0	-56.6	<=8.0
2445.10	20.8	13.3	5.5	2.0	-56.7	<=8.0
2445.15	21.0	13.3	5.7	2.0	-56.5	<=8.0
2445.20	21.0	13.3	5.7	2.0	-56.5	<=8.0
2445.25	22.2	13.3	6.9	2.0	-55.3	<=8.0

DATA-3 2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2445.30	22.5	13.3	7.2	2.0	-55.0	<=8.0
2445.35	22.7	13.3	7.4	2.0	-54.8	<=8.0
2445.40	22.8	13.3	7.5	2.0	-54.7	<=8.0
2445.45	22.8	13.3	7.5	2.0	-54.7	<=8.0
2445.50	22.8	13.3	7.5	2.0	-54.7	<=8.0

Calculated by using MS Excel Utility :

PERCENTILE (Gp@2428.50MHz : Gp@2445.50MHz , 20%) ----->

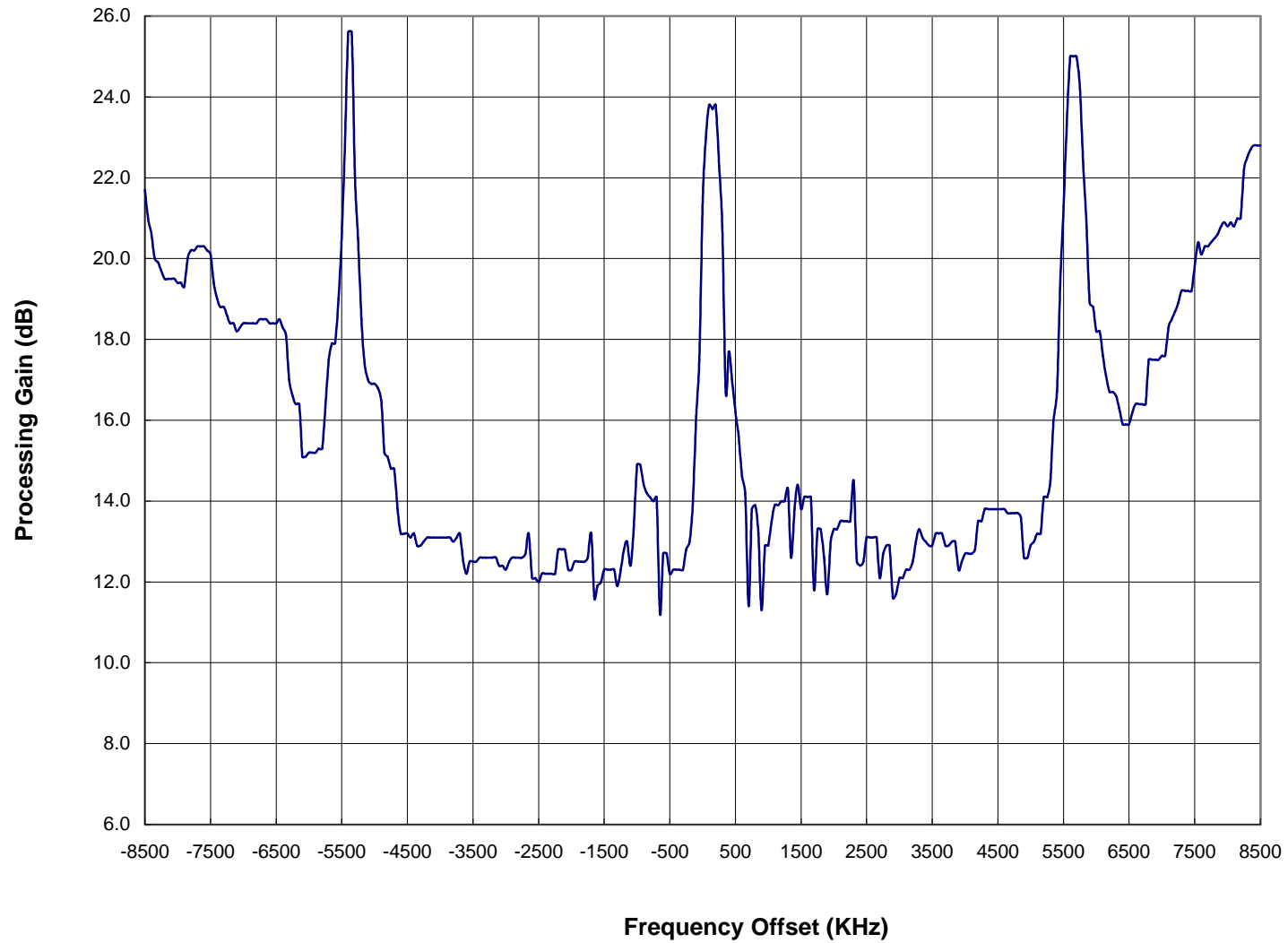
12.6

Test Conditions

TX Card **HWB3163-04 Rev B**
 S/N **99360038**
 RX Card **ISL37400M Rev A**
 S/N **00500038**
 TX Firmware **P10002C0, MS11168A3**
 RX Firmware **ID010000, PK010001, SF010000**
 Software Ver. **3.0.24**
 Mode **2 MB Pseudo IBSS**
 Pkt Size **1024**
 Pkt Dly **1**
 Pkt Burst **6**

Intersil Chips on Card: **ISL3984**
ISL3685
HFA3783
ISL3183
ISL3874

Processing Gain Channel 6 (fc=2437MHz) @ 2Mbps



DATA-4 1Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2428.50	19.0	10.3	6.7	2.0	-54.1	<=8.0
2428.55	18.3	10.3	6.0	2.0	-54.8	<=8.0
2428.60	17.6	10.3	5.3	2.0	-55.5	<=8.0
2428.65	17.0	10.3	4.7	2.0	-56.1	<=8.0
2428.70	16.9	10.3	4.6	2.0	-56.2	<=8.0
2428.75	16.6	10.3	4.3	2.0	-56.5	<=8.0
2428.80	16.4	10.3	4.1	2.0	-56.7	<=8.0
2428.85	16.3	10.3	4.0	2.0	-56.8	<=8.0
2428.90	16.3	10.3	4.0	2.0	-56.8	<=8.0
2428.95	16.2	10.3	3.9	2.0	-56.9	<=8.0
2429.00	16.1	10.3	3.8	2.0	-57.0	<=8.0
2429.05	16.5	10.3	4.2	2.0	-56.6	<=8.0
2429.10	17.3	10.3	5.0	2.0	-55.8	<=8.0
2429.15	17.1	10.3	4.8	2.0	-56.0	<=8.0
2429.20	17.1	10.3	4.8	2.0	-56.0	<=8.0
2429.25	17.6	10.3	5.3	2.0	-55.5	<=8.0
2429.30	17.6	10.3	5.3	2.0	-55.5	<=8.0
2429.35	17.7	10.3	5.4	2.0	-55.4	<=8.0
2429.40	17.7	10.3	5.4	2.0	-55.4	<=8.0
2429.45	17.7	10.3	5.4	2.0	-55.4	<=8.0
2429.50	17.3	10.3	5.0	2.0	-55.8	<=8.0
2429.55	16.9	10.3	4.6	2.0	-56.2	<=8.0
2429.60	16.2	10.3	3.9	2.0	-56.9	<=8.0
2429.65	16.0	10.3	3.7	2.0	-57.1	<=8.0
2429.70	15.9	10.3	3.6	2.0	-57.2	<=8.0
2429.75	16.3	10.3	4.0	2.0	-56.8	<=8.0
2429.80	16.2	10.3	3.9	2.0	-56.9	<=8.0
2429.85	16.2	10.3	3.9	2.0	-56.9	<=8.0
2429.90	16.3	10.3	4.0	2.0	-56.8	<=8.0
2429.95	16.4	10.3	4.1	2.0	-56.7	<=8.0
2430.00	16.3	10.3	4.0	2.0	-56.8	<=8.0
2430.05	16.2	10.3	3.9	2.0	-56.9	<=8.0
2430.10	15.8	10.3	3.5	2.0	-57.3	<=8.0
2430.15	16.0	10.3	3.7	2.0	-57.1	<=8.0
2430.20	16.6	10.3	4.3	2.0	-56.5	<=8.0
2430.25	16.8	10.3	4.5	2.0	-56.3	<=8.0
2430.30	17.6	10.3	5.3	2.0	-55.5	<=8.0
2430.35	17.8	10.3	5.5	2.0	-55.3	<=8.0
2430.40	17.9	10.3	5.6	2.0	-55.2	<=8.0
2430.45	17.4	10.3	5.1	2.0	-55.7	<=8.0
2430.50	16.7	10.3	4.4	2.0	-56.4	<=8.0
2430.55	15.8	10.3	3.5	2.0	-57.3	<=8.0
2430.60	15.4	10.3	3.1	2.0	-57.7	<=8.0
2430.65	15.1	10.3	2.8	2.0	-58.0	<=8.0
2430.70	15.0	10.3	2.7	2.0	-58.1	<=8.0
2430.75	15.3	10.3	3.0	2.0	-57.8	<=8.0
2430.80	15.2	10.3	2.9	2.0	-57.9	<=8.0
2430.85	15.4	10.3	3.1	2.0	-57.7	<=8.0

DATA-4 1Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2430.90	15.6	10.3	3.3	2.0	-57.5	<=8.0
2430.95	15.3	10.3	3.0	2.0	-57.8	<=8.0
2431.00	14.9	10.3	2.6	2.0	-58.2	<=8.0
2431.05	15.0	10.3	2.7	2.0	-58.1	<=8.0
2431.10	15.1	10.3	2.8	2.0	-58.0	<=8.0
2431.15	14.9	10.3	2.6	2.0	-58.2	<=8.0
2431.20	15.4	10.3	3.1	2.0	-57.7	<=8.0
2431.25	16.0	10.3	3.7	2.0	-57.1	<=8.0
2431.30	17.3	10.3	5.0	2.0	-55.8	<=8.0
2431.35	17.7	10.3	5.4	2.0	-55.4	<=8.0
2431.40	18.5	10.3	6.2	2.0	-54.6	<=8.0
2431.45	19.9	10.3	7.6	2.0	-53.2	<=8.0
2431.50	20.4	10.3	8.1	2.0	-52.7	<=8.0
2431.55	21.3	10.3	9.0	2.0	-51.8	<=8.0
2431.60	22.2	10.3	9.9	2.0	-50.9	<=8.0
2431.65	23.9	10.3	11.6	2.0	-49.2	<=8.0
2431.70	22.9	10.3	10.6	2.0	-50.2	<=8.0
2431.75	22.6	10.3	10.3	2.0	-50.5	<=8.0
2431.80	19.0	10.3	6.7	2.0	-54.1	<=8.0
2431.85	19.9	10.3	7.6	2.0	-53.2	<=8.0
2431.90	18.0	10.3	5.7	2.0	-55.1	<=8.0
2431.95	17.6	10.3	5.3	2.0	-55.5	<=8.0
2432.00	16.2	10.3	3.9	2.0	-56.9	<=8.0
2432.05	15.4	10.3	3.1	2.0	-57.7	<=8.0
2432.10	14.7	10.3	2.4	2.0	-58.4	<=8.0
2432.15	14.1	10.3	1.8	2.0	-59.0	<=8.0
2432.20	14.3	10.3	2.0	2.0	-58.8	<=8.0
2432.25	14.3	10.3	2.0	2.0	-58.8	<=8.0
2432.30	14.2	10.3	1.9	2.0	-58.9	<=8.0
2432.35	14.1	10.3	1.8	2.0	-59.0	<=8.0
2432.40	14.3	10.3	2.0	2.0	-58.8	<=8.0
2432.45	14.0	10.3	1.7	2.0	-59.1	<=8.0
2432.50	13.9	10.3	1.6	2.0	-59.2	<=8.0
2432.55	14.0	10.3	1.7	2.0	-59.1	<=8.0
2432.60	14.0	10.3	1.7	2.0	-59.1	<=8.0
2432.65	14.1	10.3	1.8	2.0	-59.0	<=8.0
2432.70	14.0	10.3	1.7	2.0	-59.1	<=8.0
2432.75	14.5	10.3	2.2	2.0	-58.6	<=8.0
2432.80	14.3	10.3	2.0	2.0	-58.8	<=8.0
2432.85	13.9	10.3	1.6	2.0	-59.2	<=8.0
2432.90	14.3	10.3	2.0	2.0	-58.8	<=8.0
2432.95	14.0	10.3	1.7	2.0	-59.1	<=8.0
2433.00	13.9	10.3	1.6	2.0	-59.2	<=8.0
2433.05	14.0	10.3	1.7	2.0	-59.1	<=8.0
2433.10	13.6	10.3	1.3	2.0	-59.5	<=8.0
2433.15	13.7	10.3	1.4	2.0	-59.4	<=8.0
2433.20	13.6	10.3	1.3	2.0	-59.5	<=8.0
2433.25	13.6	10.3	1.3	2.0	-59.5	<=8.0

DATA-4 1Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2433.30	13.3	10.3	1.0	2.0	-59.8	<=8.0
2433.35	13.4	10.3	1.1	2.0	-59.7	<=8.0
2433.40	13.6	10.3	1.3	2.0	-59.5	<=8.0
2433.45	13.2	10.3	0.9	2.0	-59.9	<=8.0
2433.50	13.5	10.3	1.2	2.0	-59.6	<=8.0
2433.55	13.1	10.3	0.8	2.0	-60.0	<=8.0
2433.60	13.3	10.3	1.0	2.0	-59.8	<=8.0
2433.65	13.7	10.3	1.4	2.0	-59.4	<=8.0
2433.70	13.4	10.3	1.1	2.0	-59.7	<=8.0
2433.75	13.7	10.3	1.4	2.0	-59.4	<=8.0
2433.80	13.4	10.3	1.1	2.0	-59.7	<=8.0
2433.85	13.5	10.3	1.2	2.0	-59.6	<=8.0
2433.90	13.4	10.3	1.1	2.0	-59.7	<=8.0
2433.95	13.3	10.3	1.0	2.0	-59.8	<=8.0
2434.00	13.6	10.3	1.3	2.0	-59.5	<=8.0
2434.05	13.2	10.3	0.9	2.0	-59.9	<=8.0
2434.10	12.8	10.3	0.5	2.0	-60.3	<=8.0
2434.15	13.2	10.3	0.9	2.0	-59.9	<=8.0
2434.20	12.9	10.3	0.6	2.0	-60.2	<=8.0
2434.25	12.9	10.3	0.6	2.0	-60.2	<=8.0
2434.30	12.8	10.3	0.5	2.0	-60.3	<=8.0
2434.35	13.0	10.3	0.7	2.0	-60.1	<=8.0
2434.40	13.1	10.3	0.8	2.0	-60.0	<=8.0
2434.45	12.5	10.3	0.2	2.0	-60.6	<=8.0
2434.50	13.0	10.3	0.7	2.0	-60.1	<=8.0
2434.55	13.0	10.3	0.7	2.0	-60.1	<=8.0
2434.60	12.9	10.3	0.6	2.0	-60.2	<=8.0
2434.65	13.1	10.3	0.8	2.0	-60.0	<=8.0
2434.70	13.0	10.3	0.7	2.0	-60.1	<=8.0
2434.75	13.3	10.3	1.0	2.0	-59.8	<=8.0
2434.80	13.2	10.3	0.9	2.0	-59.9	<=8.0
2434.85	13.5	10.3	1.2	2.0	-59.6	<=8.0
2434.90	13.3	10.3	1.0	2.0	-59.8	<=8.0
2434.95	13.5	10.3	1.2	2.0	-59.6	<=8.0
2435.00	13.6	10.3	1.3	2.0	-59.5	<=8.0
2435.05	14.0	10.3	1.7	2.0	-59.1	<=8.0
2435.10	13.9	10.3	1.6	2.0	-59.2	<=8.0
2435.15	13.4	10.3	1.1	2.0	-59.7	<=8.0
2435.20	13.1	10.3	0.8	2.0	-60.0	<=8.0
2435.25	12.9	10.3	0.6	2.0	-60.2	<=8.0
2435.30	12.6	10.3	0.3	2.0	-60.5	<=8.0
2435.35	12.5	10.3	0.2	2.0	-60.6	<=8.0
2435.40	13.3	10.3	1.0	2.0	-59.8	<=8.0
2435.45	13.0	10.3	0.7	2.0	-60.1	<=8.0
2435.50	13.2	10.3	0.9	2.0	-59.9	<=8.0
2435.55	13.4	10.3	1.1	2.0	-59.7	<=8.0
2435.60	13.2	10.3	0.9	2.0	-59.9	<=8.0
2435.65	13.7	10.3	1.4	2.0	-59.4	<=8.0

DATA-4 1Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2435.70	13.1	10.3	0.8	2.0	-60.0	<=8.0
2435.75	13.4	10.3	1.1	2.0	-59.7	<=8.0
2435.80	13.3	10.3	1.0	2.0	-59.8	<=8.0
2435.85	13.6	10.3	1.3	2.0	-59.5	<=8.0
2435.90	13.3	10.3	1.0	2.0	-59.8	<=8.0
2435.95	13.2	10.3	0.9	2.0	-59.9	<=8.0
2436.00	13.4	10.3	1.1	2.0	-59.7	<=8.0
2436.05	13.7	10.3	1.4	2.0	-59.4	<=8.0
2436.10	13.7	10.3	1.4	2.0	-59.4	<=8.0
2436.15	13.3	10.3	1.0	2.0	-59.8	<=8.0
2436.20	13.6	10.3	1.3	2.0	-59.5	<=8.0
2436.25	13.2	10.3	0.9	2.0	-59.9	<=8.0
2436.30	13.1	10.3	0.8	2.0	-60.0	<=8.0
2436.35	13.0	10.3	0.7	2.0	-60.1	<=8.0
2436.40	12.9	10.3	0.6	2.0	-60.2	<=8.0
2436.45	12.8	10.3	0.5	2.0	-60.3	<=8.0
2436.50	12.5	10.3	0.2	2.0	-60.6	<=8.0
2436.55	12.6	10.3	0.3	2.0	-60.5	<=8.0
2436.60	12.7	10.3	0.4	2.0	-60.4	<=8.0
2436.65	13.3	10.3	1.0	2.0	-59.8	<=8.0
2436.70	13.2	10.3	0.9	2.0	-59.9	<=8.0
2436.75	13.1	10.3	0.8	2.0	-60.0	<=8.0
2436.80	14.8	10.3	2.5	2.0	-58.3	<=8.0
2436.85	15.2	10.3	2.9	2.0	-57.9	<=8.0
2436.90	16.3	10.3	4.0	2.0	-56.8	<=8.0
2436.95	20.8	10.3	8.5	2.0	-52.3	<=8.0
2437.00	19.0	10.3	6.7	2.0	-54.1	<=8.0
2437.05	20.4	10.3	8.1	2.0	-52.7	<=8.0
2437.10	20.3	10.3	8.0	2.0	-52.8	<=8.0
2437.15	22.8	10.3	10.5	2.0	-50.3	<=8.0
2437.20	21.8	10.3	9.5	2.0	-51.3	<=8.0
2437.25	20.4	10.3	8.1	2.0	-52.7	<=8.0
2437.30	19.1	10.3	6.8	2.0	-54.0	<=8.0
2437.35	17.9	10.3	5.6	2.0	-55.2	<=8.0
2437.40	16.7	10.3	4.4	2.0	-56.4	<=8.0
2437.45	15.5	10.3	3.2	2.0	-57.6	<=8.0
2437.50	15.1	10.3	2.8	2.0	-58.0	<=8.0
2437.55	14.4	10.3	2.1	2.0	-58.7	<=8.0
2437.60	13.7	10.3	1.4	2.0	-59.4	<=8.0
2437.65	12.7	10.3	0.4	2.0	-60.4	<=8.0
2437.70	12.4	10.3	0.1	2.0	-60.7	<=8.0
2437.75	12.0	10.3	-0.3	2.0	-61.1	<=8.0
2437.80	12.2	10.3	-0.1	2.0	-60.9	<=8.0
2437.85	12.4	10.3	0.1	2.0	-60.7	<=8.0
2437.90	12.5	10.3	0.2	2.0	-60.6	<=8.0
2437.95	12.7	10.3	0.4	2.0	-60.4	<=8.0
2438.00	12.1	10.3	-0.2	2.0	-61.0	<=8.0
2438.05	13.2	10.3	0.9	2.0	-59.9	<=8.0

DATA-4 1Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2438.10	13.7	10.3	1.4	2.0	-59.4	<=8.0
2438.15	13.7	10.3	1.4	2.0	-59.4	<=8.0
2438.20	13.6	10.3	1.3	2.0	-59.5	<=8.0
2438.25	14.1	10.3	1.8	2.0	-59.0	<=8.0
2438.30	14.2	10.3	1.9	2.0	-58.9	<=8.0
2438.35	14.4	10.3	2.1	2.0	-58.7	<=8.0
2438.40	14.3	10.3	2.0	2.0	-58.8	<=8.0
2438.45	14.2	10.3	1.9	2.0	-58.9	<=8.0
2438.50	13.9	10.3	1.6	2.0	-59.2	<=8.0
2438.55	13.5	10.3	1.2	2.0	-59.6	<=8.0
2438.60	12.9	10.3	0.6	2.0	-60.2	<=8.0
2438.65	12.2	10.3	-0.1	2.0	-60.9	<=8.0
2438.70	12.4	10.3	0.1	2.0	-60.7	<=8.0
2438.75	12.4	10.3	0.1	2.0	-60.7	<=8.0
2438.80	12.7	10.3	0.4	2.0	-60.4	<=8.0
2438.85	12.7	10.3	0.4	2.0	-60.4	<=8.0
2438.90	12.1	10.3	-0.2	2.0	-61.0	<=8.0
2438.95	12.2	10.3	-0.1	2.0	-60.9	<=8.0
2439.00	12.3	10.3	0.0	2.0	-60.8	<=8.0
2439.05	12.5	10.3	0.2	2.0	-60.6	<=8.0
2439.10	13.2	10.3	0.9	2.0	-59.9	<=8.0
2439.15	12.2	10.3	-0.1	2.0	-60.9	<=8.0
2439.20	13.4	10.3	1.1	2.0	-59.7	<=8.0
2439.25	13.6	10.3	1.3	2.0	-59.5	<=8.0
2439.30	13.4	10.3	1.1	2.0	-59.7	<=8.0
2439.35	13.5	10.3	1.2	2.0	-59.6	<=8.0
2439.40	13.5	10.3	1.2	2.0	-59.6	<=8.0
2439.45	13.7	10.3	1.4	2.0	-59.4	<=8.0
2439.50	13.6	10.3	1.3	2.0	-59.5	<=8.0
2439.55	13.4	10.3	1.1	2.0	-59.7	<=8.0
2439.60	13.2	10.3	0.9	2.0	-59.9	<=8.0
2439.65	13.7	10.3	1.4	2.0	-59.4	<=8.0
2439.70	12.8	10.3	0.5	2.0	-60.3	<=8.0
2439.75	12.4	10.3	0.1	2.0	-60.7	<=8.0
2439.80	11.8	10.3	-0.5	2.0	-61.3	<=8.0
2439.85	12.6	10.3	0.3	2.0	-60.5	<=8.0
2439.90	12.4	10.3	0.1	2.0	-60.7	<=8.0
2439.95	12.8	10.3	0.5	2.0	-60.3	<=8.0
2440.00	12.6	10.3	0.3	2.0	-60.5	<=8.0
2440.05	12.8	10.3	0.5	2.0	-60.3	<=8.0
2440.10	12.7	10.3	0.4	2.0	-60.4	<=8.0
2440.15	13.6	10.3	1.3	2.0	-59.5	<=8.0
2440.20	13.4	10.3	1.1	2.0	-59.7	<=8.0
2440.25	13.6	10.3	1.3	2.0	-59.5	<=8.0
2440.30	13.9	10.3	1.6	2.0	-59.2	<=8.0
2440.35	14.2	10.3	1.9	2.0	-58.9	<=8.0
2440.40	14.3	10.3	2.0	2.0	-58.8	<=8.0
2440.45	14.2	10.3	1.9	2.0	-58.9	<=8.0

DATA-4 1Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2440.50	13.9	10.3	1.6	2.0	-59.2	<=8.0
2440.55	13.4	10.3	1.1	2.0	-59.7	<=8.0
2440.60	13.8	10.3	1.5	2.0	-59.3	<=8.0
2440.65	13.0	10.3	0.7	2.0	-60.1	<=8.0
2440.70	13.3	10.3	1.0	2.0	-59.8	<=8.0
2440.75	13.8	10.3	1.5	2.0	-59.3	<=8.0
2440.80	13.6	10.3	1.3	2.0	-59.5	<=8.0
2440.85	13.6	10.3	1.3	2.0	-59.5	<=8.0
2440.90	13.2	10.3	0.9	2.0	-59.9	<=8.0
2440.95	13.8	10.3	1.5	2.0	-59.3	<=8.0
2441.00	13.9	10.3	1.6	2.0	-59.2	<=8.0
2441.05	13.7	10.3	1.4	2.0	-59.4	<=8.0
2441.10	13.9	10.3	1.6	2.0	-59.2	<=8.0
2441.15	14.7	10.3	2.4	2.0	-58.4	<=8.0
2441.20	14.2	10.3	1.9	2.0	-58.9	<=8.0
2441.25	14.4	10.3	2.1	2.0	-58.7	<=8.0
2441.30	14.8	10.3	2.5	2.0	-58.3	<=8.0
2441.35	14.6	10.3	2.3	2.0	-58.5	<=8.0
2441.40	14.8	10.3	2.5	2.0	-58.3	<=8.0
2441.45	15.0	10.3	2.7	2.0	-58.1	<=8.0
2441.50	14.3	10.3	2.0	2.0	-58.8	<=8.0
2441.55	15.0	10.3	2.7	2.0	-58.1	<=8.0
2441.60	14.0	10.3	1.7	2.0	-59.1	<=8.0
2441.65	13.3	10.3	1.0	2.0	-59.8	<=8.0
2441.70	14.3	10.3	2.0	2.0	-58.8	<=8.0
2441.75	14.1	10.3	1.8	2.0	-59.0	<=8.0
2441.80	13.9	10.3	1.6	2.0	-59.2	<=8.0
2441.85	13.5	10.3	1.2	2.0	-59.6	<=8.0
2441.90	13.1	10.3	0.8	2.0	-60.0	<=8.0
2441.95	13.3	10.3	1.0	2.0	-59.8	<=8.0
2442.00	13.7	10.3	1.4	2.0	-59.4	<=8.0
2442.05	13.8	10.3	1.5	2.0	-59.3	<=8.0
2442.10	14.3	10.3	2.0	2.0	-58.8	<=8.0
2442.15	14.0	10.3	1.7	2.0	-59.1	<=8.0
2442.20	14.8	10.3	2.5	2.0	-58.3	<=8.0
2442.25	15.2	10.3	2.9	2.0	-57.9	<=8.0
2442.30	16.5	10.3	4.2	2.0	-56.6	<=8.0
2442.35	17.1	10.3	4.8	2.0	-56.0	<=8.0
2442.40	18.2	10.3	5.9	2.0	-54.9	<=8.0
2442.45	19.7	10.3	7.4	2.0	-53.4	<=8.0
2442.50	21.9	10.3	9.6	2.0	-51.2	<=8.0
2442.55	22.8	10.3	10.5	2.0	-50.3	<=8.0
2442.60	24.6	10.3	12.3	2.0	-48.5	<=8.0
2442.65	25.3	10.3	13.0	2.0	-47.8	<=8.0
2442.70	23.7	10.3	11.4	2.0	-49.4	<=8.0
2442.75	22.0	10.3	9.7	2.0	-51.1	<=8.0
2442.80	20.8	10.3	8.5	2.0	-52.3	<=8.0
2442.85	20.5	10.3	8.2	2.0	-52.6	<=8.0

DATA-4		1Mbps CHANNEL 6 Processing Gain				
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2442.90	19.6	10.3	7.3	2.0	-53.5	<=8.0
2442.95	18.3	10.3	6.0	2.0	-54.8	<=8.0
2443.00	17.8	10.3	5.5	2.0	-55.3	<=8.0
2443.05	16.7	10.3	4.4	2.0	-56.4	<=8.0
2443.10	15.0	10.3	2.7	2.0	-58.1	<=8.0
2443.15	15.4	10.3	3.1	2.0	-57.7	<=8.0
2443.20	16.3	10.3	4.0	2.0	-56.8	<=8.0
2443.25	15.8	10.3	3.5	2.0	-57.3	<=8.0
2443.30	15.8	10.3	3.5	2.0	-57.3	<=8.0
2443.35	15.5	10.3	3.2	2.0	-57.6	<=8.0
2443.40	16.1	10.3	3.8	2.0	-57.0	<=8.0
2443.45	15.7	10.3	3.4	2.0	-57.4	<=8.0
2443.50	16.2	10.3	3.9	2.0	-56.9	<=8.0
2443.55	15.1	10.3	2.8	2.0	-58.0	<=8.0
2443.60	14.9	10.3	2.6	2.0	-58.2	<=8.0
2443.65	15.6	10.3	3.3	2.0	-57.5	<=8.0
2443.70	15.9	10.3	3.6	2.0	-57.2	<=8.0
2443.75	15.1	10.3	2.8	2.0	-58.0	<=8.0
2443.80	17.5	10.3	5.2	2.0	-55.6	<=8.0
2443.85	16.8	10.3	4.5	2.0	-56.3	<=8.0
2443.90	17.6	10.3	5.3	2.0	-55.5	<=8.0
2443.95	17.2	10.3	4.9	2.0	-55.9	<=8.0
2444.00	17.2	10.3	4.9	2.0	-55.9	<=8.0
2444.05	17.0	10.3	4.7	2.0	-56.1	<=8.0
2444.10	16.2	10.3	3.9	2.0	-56.9	<=8.0
2444.15	16.3	10.3	4.0	2.0	-56.8	<=8.0
2444.20	17.7	10.3	5.4	2.0	-55.4	<=8.0
2444.25	17.7	10.3	5.4	2.0	-55.4	<=8.0
2444.30	17.9	10.3	5.6	2.0	-55.2	<=8.0
2444.35	17.8	10.3	5.5	2.0	-55.3	<=8.0
2444.40	18.5	10.3	6.2	2.0	-54.6	<=8.0
2444.45	18.1	10.3	5.8	2.0	-55.0	<=8.0
2444.50	17.5	10.3	5.2	2.0	-55.6	<=8.0
2444.55	17.1	10.3	4.8	2.0	-56.0	<=8.0
2444.60	17.1	10.3	4.8	2.0	-56.0	<=8.0
2444.65	17.3	10.3	5.0	2.0	-55.8	<=8.0
2444.70	17.5	10.3	5.2	2.0	-55.6	<=8.0
2444.75	18.1	10.3	5.8	2.0	-55.0	<=8.0
2444.80	18.2	10.3	5.9	2.0	-54.9	<=8.0
2444.85	19.3	10.3	7.0	2.0	-53.8	<=8.0
2444.90	19.2	10.3	6.9	2.0	-53.9	<=8.0
2444.95	18.8	10.3	6.5	2.0	-54.3	<=8.0
2445.00	18.7	10.3	6.4	2.0	-54.4	<=8.0
2445.05	18.2	10.3	5.9	2.0	-54.9	<=8.0
2445.10	18.4	10.3	6.1	2.0	-54.7	<=8.0
2445.15	19.4	10.3	7.1	2.0	-53.7	<=8.0
2445.20	19.5	10.3	7.2	2.0	-53.6	<=8.0
2445.25	19.7	10.3	7.4	2.0	-53.4	<=8.0

DATA-4 1Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)o + Mj + Lsys						
Freq. (MHz)	Gp (dB)	(S/N)o (dB)	Mj=J/S (dB)	Lsys (dB)	Jammer (dBm)	PER (%)
2445.30	20.1	10.3	7.8	2.0	-53.0	<=8.0
2445.35	19.3	10.3	7.0	2.0	-53.8	<=8.0
2445.40	20.2	10.3	7.9	2.0	-52.9	<=8.0
2445.45	20.3	10.3	8.0	2.0	-52.8	<=8.0
2445.50	19.8	10.3	7.5	2.0	-53.3	<=8.0

Calculated by using MS Excel Utility :

PERCENTILE (Gp@2428.50MHz : Gp@2445.50MHz , 20%) ----->

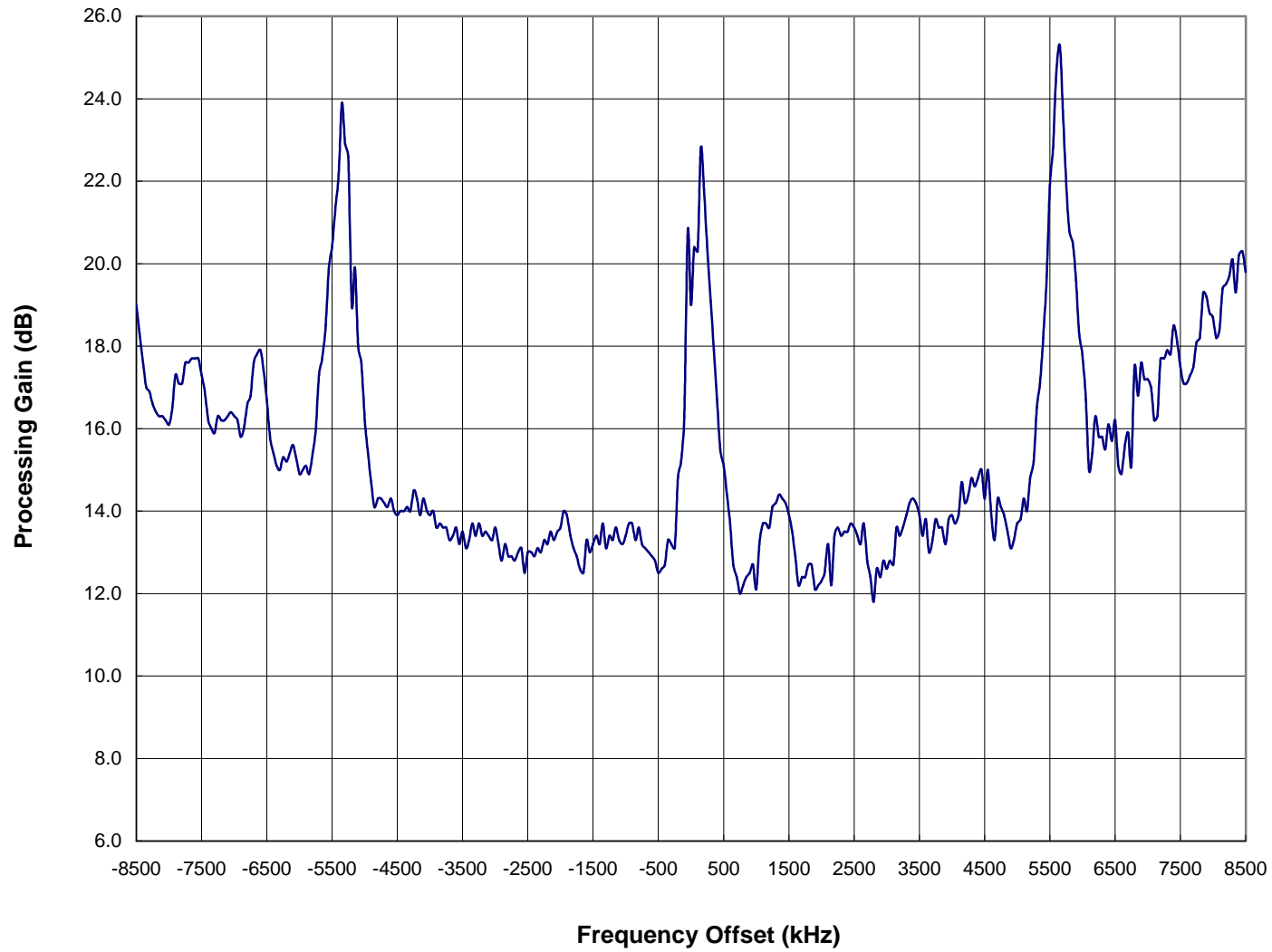
13.2

Test Conditions

TX Card **HWB3163-04 Rev B**
 S/N **99360038**
 RX Card **ISL37400M Rev A**
 S/N **00500038**
 TX Firmware **P10002C0, MS11168A3**
 RX Firmware **ID010000, PK010001, SF010000**
 Software Ver. **3.0.24**
 Mode **1 MB Pseudo IBSS**
 Pkt Size **1024**
 Pkt Dly **1**
 Pkt Burst **0**

Intersil Chips on Card: **ISL3984**
ISL3685
HFA3783
ISL3183
ISL3874

Processing Gain Channel 6 (fc=2437MHz) @ 1Mbps



Part 2: Processing Gain for IBM Bluetooth Daughter Card



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To Whom This May Concern

**Attestation Statements according FCC Part 15.247
for 'IBM Bluetooth Daughter Card'.**

TDK Systems Europe Ltd. wishes to declare the following :

- The design of the previously granted 'Portofino USB Module', also known as 'Bluetooth Ultraport Module from IBM', is largely identical to 'IBM Bluetooth Daughter Card'.
- The design of the RF part of this product uses the same chipset and the same additional components.
- The firmware used is identical to the previous design.

Therefor the documentation provided for the FCC approval for the previous product remains valid for this design.

The relevant documentation is :

Annex Additional declaration part according FCC 15.247 for Bluetooth devices
Issued on 2000-01-11 by 7 Layers of Ratingen, Germany

Results of Processing Gain Tests for FCC Qualification
Issued on 23 March 2001 by Cambridge Silicon Radio of Cambridge, UK.

Peter de Wit, Approvals Manager, TDK Systems Europe Ltd.
(name and function of person signing)

London
(place)

June 5th, 2001
(date)


(signature)

MEMORANDUM

Distribution: Peter Flittner, Robert Young, James Collier

cc:

Prepared By: Alex Busteed

Subject: Results of Processing Gain Tests for FCC Qualification

1 INTRODUCTION

This memo presents the results of the Processing Gain (PG) tests carried out for FCC qualification of the Cambridge Silicon Radio BC01B Bluetooth chip. The FCC states that the PG from a hybrid Bluetooth receiver must be greater than 17 dB when measured in accordance with the Continuous Wave (CW) jamming margin method. Testing of the BC01b has found the PG due to the DS section to be approximately 5 dB and the PG due to the FH part to be approximately 15 dB. It is therefore concluded that the BC01B complies with the FCC PG requirements for radio communication systems.

The rest of this paper outlines the PG measurement technique and discusses the test results. Appendix A contains a list of test equipment and Appendix B contains a printout of the measurement results.

2 METHOD**2.1 PG Definition**

The Processing Gain from a frequency hopping communication system is derived from two parts, the FH section and the DS section. The PG due to FH is given by a simple equation and is constant. However measurement of the PG due to DS is a little more complex. One technique is to use the CW jamming margin method. This method measures PG due to DS using the following algorithm:

A CW signal generator is stepped in 50kHz increments across the passband of the system, recording at each point the generator level required to produce the 0.1% Packet Error Rate (PER). This is the jammer level. This level is then referenced to the output power of the intended Bluetooth signal and the Jammer to Signal Ratio JSR is thus calculated. The worst 4

JSR measurements are discarded and the worst remaining JSR is used to calculate the PG due to DS as follows:

$$G_p = SNR + JSR_{min} + L_{sys}$$

where G_p = the processing gain of the system, SNR = the signal to noise ratio required for 0.1% BER, JSR_{min} = minimum J/S ratio and L_{sys} = system losses.

2.2 PG Measurement Technique

Figure 1 provides an overview of the PG measurement technique. The measurement is performed in two parts, measurement of the system SNR and measurement of JSR_{min} .

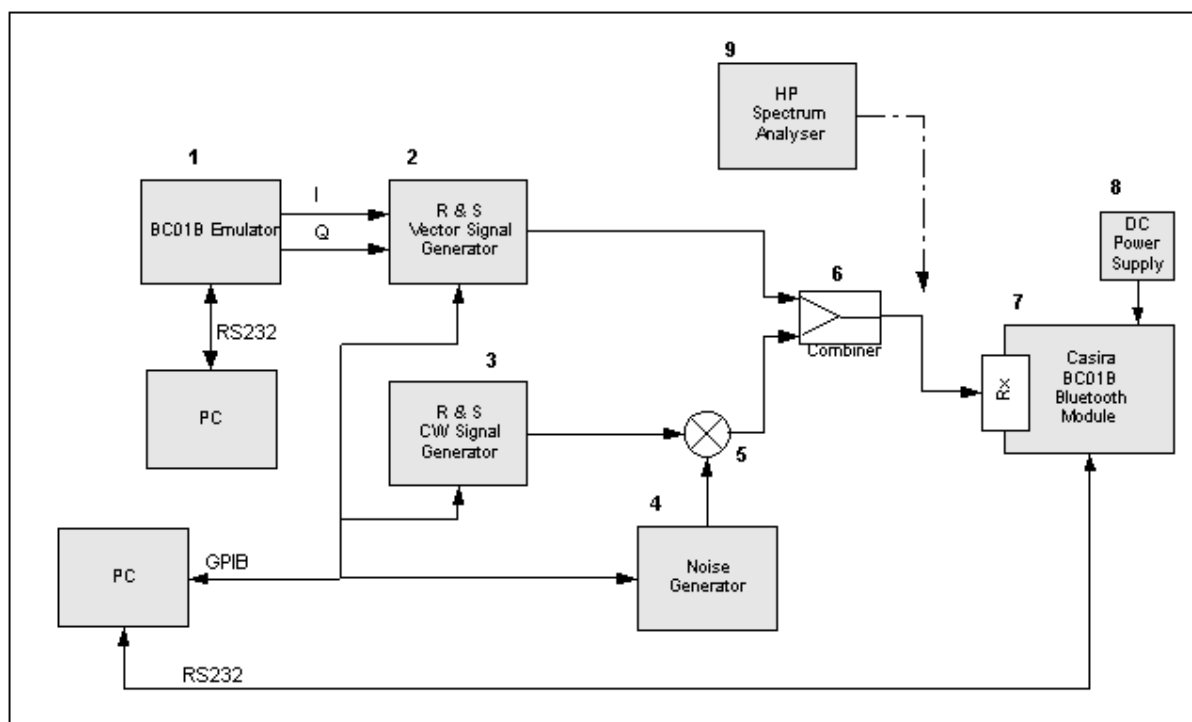


Figure 1: PG Measurement Technique

The system SNR is calculated using the following algorithm. Generate Bluetooth PRBS-9 packets using a BC01B emulator (1) and a Vector Signal Generator (2). Combine this signal with white noise of a constant level, which is generated using a noise source (4) and a CW Signal Generator (3). Then vary the level of the Bluetooth signal until the BER measured by the BC01B (7) is 0.1%. The resulting SNR is the signal level divided by the Noise level.

The JSR for a given jamming frequency is calculated using the following algorithm. Generate Bluetooth PRBS-9 packets using the BC01B emulator (1) and the Vector Signal Generator (2). Combine this signal with a constant CW tone at the jamming frequency using a CW Signal Generator (5) and a combiner (6). Then vary the level of the Bluetooth signal until the PER measured by the Casira Bluetooth Module (7) is 0.1%. The resulting JSR is the signal level divided by the jamming level.

3 RESULTS

3.1 Overview

The measurements found that the PG due to DS caused by the access code in page and inquiry mode is found to be approximately 5dB when the access code is a relatively random mixture of 1's and 0's. A random access code causes the most Inter Symbol Interference (ISI) and hence the worst PG for a hybrid system. Therefore only the results for this access code are used in the PG calculation.

The PG due to FH is given as

$$PG_{FH} = 10 \log_{10} (\text{number of frequency hops})$$

The number of hops in a Bluetooth system is 32, therefore the PG due to FH is approximately 15 dB. When this is added to the PG due to DS, the total PG for the BC01B is approximately 20 dB, above the minimum PG requirement for FCC qualification.

3.2 Detailed Results

Test Date:	17/11/00
Sample Time:	30 seconds
Access Code:	c6967e
Signal Frequency:	2.432GHz
Receiver Sensitivity:	-88.7 dBm
Jammer Signal Level:	-85.7 dBm
Measured SNR:	18.8dB
System Losses:	2dB

To calculate processing gain, ignore the worst 20% of data points and then apply the following formula:

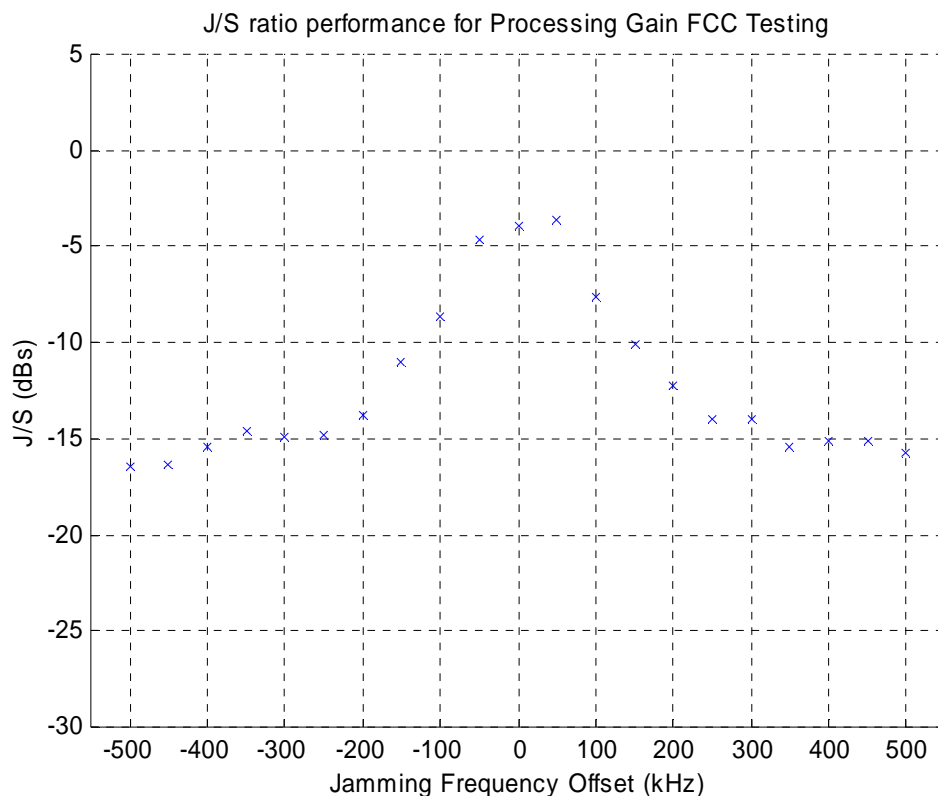
$$G_p = SNR + JSR_{\min} + L_{\text{sys}}$$

Where G_p = Processing Gain of the module
 SNR = signal to noise ratio of the module
 JS_{\min} = minimum J/S ratio after the worst 20% of J/S samples have been discarded
 L_{sys} = System losses

A total of 20 samples were taken by stepping the jamming signal frequency offsets in 50kHz increments over the bandwidth of the receiver. The worst 4 samples were found at -500kHz, -450kHz, -400kHz and 500kHz and were discarded. The remaining minimum J/S ratio was found to be -15.4dB at an offset of +350kHz

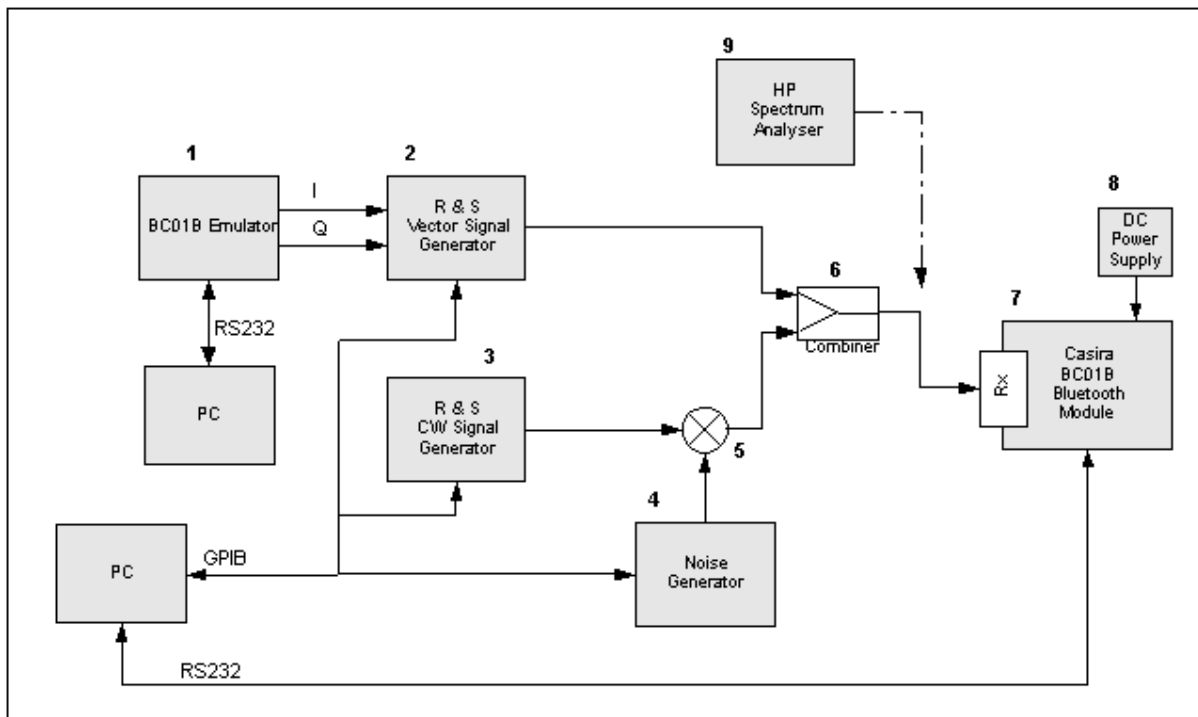
Thus, the processing gain due to direct sequence spreading in page and inquiry mode is

$$G_p = 18.8 - 15.4 + 2 = 5.4dB$$



APPENDIX A - TEST EQUIPMENT LIST

Reference:	Instrument Type	Name
1	BlueCore Emulator Board	N/A
2	Vector Signal Generator	IFR2052
3	CW Signal Generator	IFR2025
4	White Noise Generator	HP33120A
5	RF Mixer	M8HC-7
6	RF Combiner	6 dB loss combiner
7	Bluetooth Motherboard and BC01B Module	Casira Development Kit
8	5V, 4A DC Power Supply	N/A
9	Spectrum Analyser	HP E4405B



APPENDIX B - TEST RESULTS

Timestamp: 14:42.43, 16/11/2000

Signal Freq = 2.432 GHz

Jammer Level = -85.7 dBm

Jammer Offset = -500 kHz

Level = -68.7 dBm	BER = 0.03%	PER = 0.01%	SER1 = 0.01%	SER2 = 0.01%
Level = -70.7 dBm	BER = 0.32%	PER = 0.79%	SER1 = 0.79%	SER2 = 0.79%
Level = -69.7 dBm	BER = 0.11%	PER = 0.18%	SER1 = 0.18%	SER2 = 0.18%
Level = -68.7 dBm	BER = 0.04%	PER = 0.03%	SER1 = 0.02%	SER2 = 0.02%
Level = -69.2 dBm	BER = 0.06%	PER = 0.05%	SER1 = 0.05%	SER2 = 0.05%
Level = -69.7 dBm	BER = 0.11%	PER = 0.16%	SER1 = 0.16%	SER2 = 0.16%
Level = -69.5 dBm	BER = 0.09%	PER = 0.11%	SER1 = 0.11%	SER2 = 0.11%
Level = -69.3 dBm	BER = 0.07%	PER = 0.05%	SER1 = 0.05%	SER2 = 0.05%

J/S = -16.50 dB (SER = 0.05%)

Signal Freq = 2.432 GHz

Jammer Level = -85.7 dBm

Jammer Offset = -450 kHz

Level = -69.2 dBm	BER = 0.06%	PER = 0.05%	SER1 = 0.05%	SER2 = 0.05%
Level = -71.2 dBm	BER = 0.84%	PER = 1.72%	SER1 = 1.69%	SER2 = 1.69%
Level = -70.2 dBm	BER = 0.26%	PER = 0.40%	SER1 = 0.40%	SER2 = 0.40%
Level = -69.2 dBm	BER = 0.07%	PER = 0.06%	SER1 = 0.06%	SER2 = 0.06%
Level = -69.7 dBm	BER = 0.12%	PER = 0.18%	SER1 = 0.18%	SER2 = 0.18%
Level = -69.5 dBm	BER = 0.09%	PER = 0.14%	SER1 = 0.14%	SER2 = 0.14%
Level = -69.3 dBm	BER = 0.07%	PER = 0.08%	SER1 = 0.08%	SER2 = 0.08%

J/S = -16.40 dB (SER = 0.08%)

Signal Freq = 2.432 GHz

Jammer Level = -85.7 dBm

Jammer Offset = -400 kHz

Level = -69.3 dBm	BER = 0.04%	PER = 0.02%	SER1 = 0.02%	SER2 = 0.02%
Level = -71.3 dBm	BER = 0.44%	PER = 0.72%	SER1 = 0.71%	SER2 = 0.71%
Level = -70.3 dBm	BER = 0.13%	PER = 0.11%	SER1 = 0.11%	SER2 = 0.11%
Level = -69.3 dBm	BER = 0.04%	PER = 0.01%	SER1 = 0.01%	SER2 = 0.01%
Level = -69.8 dBm	BER = 0.08%	PER = 0.03%	SER1 = 0.02%	SER2 = 0.02%
Level = -70.3 dBm	BER = 0.13%	PER = 0.10%	SER1 = 0.10%	SER2 = 0.10%

J/S = -15.40 dB (SER = 0.10%)

Signal Freq = 2.432 GHz

Jammer Level = -85.7 dBm

Jammer Offset = -350 kHz

Level = -70.3 dBm	BER = 0.05%	PER = 0.01%	SER1 = 0.01%	SER2 = 0.01%
Level = -72.3 dBm	BER = 0.88%	PER = 1.67%	SER1 = 1.64%	SER2 = 1.64%
Level = -71.3 dBm	BER = 0.19%	PER = 0.10%	SER1 = 0.10%	SER2 = 0.10%
Level = -70.3 dBm	BER = 0.06%	PER = 0.01%	SER1 = 0.01%	SER2 = 0.01%
Level = -70.8 dBm	BER = 0.09%	PER = 0.04%	SER1 = 0.04%	SER2 = 0.04%
Level = -71.3 dBm	BER = 0.17%	PER = 0.12%	SER1 = 0.12%	SER2 = 0.12%

Level = -71.1 dBm BER = 0.13% PER = 0.05% SER1 = 0.05% SER2 = 0.05%

J/S = -14.60 dB (SER = 0.05%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -300 kHz

Level = -71.1 dBm BER = 0.03% PER = 0.15% SER1 = 0.15% SER2 = 0.15%
Level = -69.1 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -70.1 dBm BER = 0.01% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -71.1 dBm BER = 0.03% PER = 0.19% SER1 = 0.19% SER2 = 0.19%
Level = -70.6 dBm BER = 0.02% PER = 0.04% SER1 = 0.04% SER2 = 0.04%
Level = -70.8 dBm BER = 0.02% PER = 0.09% SER1 = 0.09% SER2 = 0.09%

J/S = -14.90 dB (SER = 0.09%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -250 kHz

Level = -70.8 dBm BER = 0.00% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -72.8 dBm BER = 0.05% PER = 2.34% SER1 = 2.29% SER2 = 2.29%
Level = -71.8 dBm BER = 0.01% PER = 0.33% SER1 = 0.33% SER2 = 0.33%
Level = -70.8 dBm BER = 0.00% PER = 0.03% SER1 = 0.03% SER2 = 0.03%
Level = -71.3 dBm BER = 0.01% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -71.1 dBm BER = 0.00% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -70.9 dBm BER = 0.00% PER = 0.03% SER1 = 0.03% SER2 = 0.03%

J/S = -14.80 dB (SER = 0.03%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -200 kHz

Level = -70.9 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -72.9 dBm BER = 0.00% PER = 0.34% SER1 = 0.34% SER2 = 0.34%
Level = -71.9 dBm BER = 0.00% PER = 0.07% SER1 = 0.07% SER2 = 0.07%
Level = -72.4 dBm BER = 0.00% PER = 0.15% SER1 = 0.15% SER2 = 0.15%
Level = -72.2 dBm BER = 0.00% PER = 0.12% SER1 = 0.12% SER2 = 0.12%
Level = -72.0 dBm BER = 0.00% PER = 0.05% SER1 = 0.05% SER2 = 0.05%

J/S = -13.80 dB (SER = 0.07%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -150 kHz

Level = -71.9 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -73.9 dBm BER = 0.00% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -75.9 dBm BER = 0.01% PER = 0.83% SER1 = 0.82% SER2 = 0.82%
Level = -74.9 dBm BER = 0.00% PER = 0.16% SER1 = 0.16% SER2 = 0.16%
Level = -73.9 dBm BER = 0.00% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -74.4 dBm BER = 0.00% PER = 0.08% SER1 = 0.07% SER2 = 0.07%
Level = -74.9 dBm BER = 0.00% PER = 0.18% SER1 = 0.18% SER2 = 0.18%

Level = -74.7 dBm BER = 0.00% PER = 0.10% SER1 = 0.10% SER2 = 0.10%

J/S = -11.00 dB (SER = 0.10%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -100 kHz

Level = -74.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -76.7 dBm BER = 0.00% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -78.7 dBm BER = 0.01% PER = 2.05% SER1 = 2.01% SER2 = 2.01%
Level = -77.7 dBm BER = 0.00% PER = 0.30% SER1 = 0.30% SER2 = 0.30%
Level = -76.7 dBm BER = 0.00% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
Level = -77.2 dBm BER = 0.00% PER = 0.13% SER1 = 0.12% SER2 = 0.12%
Level = -77.0 dBm BER = 0.00% PER = 0.08% SER1 = 0.07% SER2 = 0.07%

J/S = -8.70 dB (SER = 0.07%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = -50 kHz

Level = -77.0 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -79.0 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -81.0 dBm BER = 0.01% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -83.0 dBm BER = 0.16% PER = 0.73% SER1 = 0.72% SER2 = 0.72%
Level = -82.0 dBm BER = 0.03% PER = 0.26% SER1 = 0.26% SER2 = 0.26%
Level = -81.0 dBm BER = 0.01% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
Level = -81.5 dBm BER = 0.02% PER = 0.13% SER1 = 0.13% SER2 = 0.13%
Level = -81.3 dBm BER = 0.02% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -81.1 dBm BER = 0.04% PER = 0.06% SER1 = 0.06% SER2 = 0.06%

J/S = -4.60 dB (SER = 0.06%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +0 kHz

Level = -68.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -70.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -72.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -74.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -76.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -78.7 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -80.7 dBm BER = 0.01% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -82.7 dBm BER = 0.04% PER = 0.04% SER1 = 0.03% SER2 = 0.03%
Level = -84.7 dBm BER = 7.51% PER = 48.26% SER1 = 27.11% SER2 = 28.05%
Level = -83.7 dBm BER = 0.31% PER = 1.01% SER1 = 0.86% SER2 = 0.86%
Level = -82.7 dBm BER = 0.05% PER = 0.24% SER1 = 0.18% SER2 = 0.18%
Level = -81.7 dBm BER = 0.01% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -82.2 dBm BER = 0.02% PER = 0.13% SER1 = 0.10% SER2 = 0.10%
Level = -82.0 dBm BER = 0.02% PER = 2.31% SER1 = 2.24% SER2 = 2.24%
Level = -81.8 dBm BER = 0.02% PER = 0.06% SER1 = 0.05% SER2 = 0.05%

J/S = -3.90 dB (SER = 0.05%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +50 kHz

Level = -81.8 dBm BER = 0.11% PER = 0.02% SER1 = 0.02% SER2 = 0.02%
Level = -83.8 dBm BER = 0.68% PER = 2.16% SER1 = 1.82% SER2 = 1.82%
Level = -82.8 dBm BER = 0.28% PER = 0.35% SER1 = 0.29% SER2 = 0.29%
Level = -81.8 dBm BER = 0.09% PER = 0.02% SER1 = 0.02% SER2 = 0.02%
Level = -82.3 dBm BER = 0.15% PER = 0.25% SER1 = 0.22% SER2 = 0.22%
Level = -82.1 dBm BER = 0.12% PER = 0.09% SER1 = 0.07% SER2 = 0.07%

J/S = -3.60 dB (SER = 0.07%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +100 kHz

Level = -82.1 dBm BER = 1.55% PER = 15.88% SER1 = 13.44% SER2 = 13.51%
Level = -80.1 dBm BER = 0.28% PER = 5.78% SER1 = 5.47% SER2 = 5.47%
Level = -78.1 dBm BER = 0.03% PER = 0.09% SER1 = 0.09% SER2 = 0.09%

J/S = -7.60 dB (SER = 0.09%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +150 kHz

Level = -78.1 dBm BER = 0.41% PER = 13.58% SER1 = 11.96% SER2 = 12.16%
Level = -76.1 dBm BER = 0.09% PER = 0.42% SER1 = 0.42% SER2 = 0.42%
Level = -74.1 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -75.1 dBm BER = 0.01% PER = 0.02% SER1 = 0.02% SER2 = 0.02%
Level = -76.1 dBm BER = 0.04% PER = 0.41% SER1 = 0.41% SER2 = 0.41%
Level = -75.6 dBm BER = 0.03% PER = 0.10% SER1 = 0.10% SER2 = 0.10%

J/S = -10.10 dB (SER = 0.10%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +200 kHz

Level = -75.6 dBm BER = 0.26% PER = 7.53% SER1 = 7.00% SER2 = 7.00%
Level = -73.6 dBm BER = 0.02% PER = 0.17% SER1 = 0.17% SER2 = 0.17%
Level = -71.6 dBm BER = 0.00% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -72.6 dBm BER = 0.00% PER = 0.03% SER1 = 0.03% SER2 = 0.03%
Level = -73.6 dBm BER = 0.02% PER = 0.14% SER1 = 0.14% SER2 = 0.14%
Level = -73.1 dBm BER = 0.01% PER = 0.04% SER1 = 0.04% SER2 = 0.04%
Level = -73.3 dBm BER = 0.01% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -73.5 dBm BER = 0.03% PER = 0.09% SER1 = 0.09% SER2 = 0.09%

J/S = -12.20 dB (SER = 0.09%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +250 kHz

Level = -73.5 dBm BER = 0.25% PER = 3.58% SER1 = 3.46% SER2 = 3.46%
 Level = -71.5 dBm BER = 0.01% PER = 0.03% SER1 = 0.03% SER2 = 0.03%
 Level = -72.5 dBm BER = 0.06% PER = 0.57% SER1 = 0.57% SER2 = 0.57%
 Level = -72.0 dBm BER = 0.02% PER = 0.12% SER1 = 0.12% SER2 = 0.12%
 Level = -71.5 dBm BER = 0.01% PER = 0.04% SER1 = 0.04% SER2 = 0.04%
 Level = -71.7 dBm BER = 0.01% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
 Level = -71.9 dBm BER = 0.02% PER = 0.10% SER1 = 0.10% SER2 = 0.10%

J/S = -14.00 dB (SER = 0.05%)

Signal Freq = 2.432 GHz
 Jammer Level = -85.7 dBm
 Jammer Offset = +300 kHz

Level = -71.7 dBm BER = 0.08% PER = 0.10% SER1 = 0.10% SER2 = 0.10%

J/S = -14.00 dB (SER = 0.10%)

Signal Freq = 2.432 GHz
 Jammer Level = -85.7 dBm
 Jammer Offset = +350 kHz

Level = -71.7 dBm BER = 0.25% PER = 1.43% SER1 = 1.41% SER2 = 1.41%
 Level = -69.7 dBm BER = 0.02% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
 Level = -70.7 dBm BER = 0.08% PER = 0.14% SER1 = 0.14% SER2 = 0.14%
 Level = -70.2 dBm BER = 0.03% PER = 0.74% SER1 = 0.74% SER2 = 0.74%
 Level = -69.7 dBm BER = 0.02% PER = 0.02% SER1 = 0.02% SER2 = 0.02%
 Level = -69.9 dBm BER = 0.02% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
 Level = -70.1 dBm BER = 0.03% PER = 0.03% SER1 = 0.03% SER2 = 0.03%
 Level = -70.3 dBm BER = 0.03% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
 Level = -70.5 dBm BER = 0.06% PER = 0.13% SER1 = 0.13% SER2 = 0.13%

J/S = -15.40 dB (SER = 0.06%)

Signal Freq = 2.432 GHz
 Jammer Level = -85.7 dBm
 Jammer Offset = +400 kHz

Level = -70.3 dBm BER = 0.07% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
 Level = -72.3 dBm BER = 1.28% PER = 4.62% SER1 = 4.42% SER2 = 4.42%
 Level = -71.3 dBm BER = 0.24% PER = 0.48% SER1 = 0.47% SER2 = 0.47%
 Level = -70.3 dBm BER = 0.06% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
 Level = -70.8 dBm BER = 0.12% PER = 0.15% SER1 = 0.15% SER2 = 0.15%
 Level = -70.6 dBm BER = 0.11% PER = 0.08% SER1 = 0.08% SER2 = 0.08%

J/S = -15.10 dB (SER = 0.08%)

Signal Freq = 2.432 GHz
 Jammer Level = -85.7 dBm
 Jammer Offset = +450 kHz

Level = -70.6 dBm BER = 0.17% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
 Level = -68.6 dBm BER = 0.01% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
 Level = -69.6 dBm BER = 0.04% PER = 0.00% SER1 = 0.00% SER2 = 0.00%

Level = -70.6 dBm BER = 0.17% PER = 0.08% SER1 = 0.07% SER2 = 0.07%
Level = -71.6 dBm BER = 0.60% PER = 0.70% SER1 = 0.69% SER2 = 0.69%
Level = -71.1 dBm BER = 0.31% PER = 0.30% SER1 = 0.29% SER2 = 0.29%
Level = -70.6 dBm BER = 0.19% PER = 0.11% SER1 = 0.11% SER2 = 0.11%
Level = -70.1 dBm BER = 0.09% PER = 0.03% SER1 = 0.02% SER2 = 0.02%
Level = -70.3 dBm BER = 0.10% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -70.5 dBm BER = 0.16% PER = 0.06% SER1 = 0.06% SER2 = 0.06%
Level = -70.7 dBm BER = 0.20% PER = 0.05% SER1 = 0.05% SER2 = 0.05%
Level = -70.9 dBm BER = 0.26% PER = 0.15% SER1 = 0.15% SER2 = 0.15%

J/S = -15.10 dB (SER = 0.07%)

Signal Freq = 2.432 GHz
Jammer Level = -85.7 dBm
Jammer Offset = +500 kHz

Level = -68.7 dBm BER = 0.01% PER = 0.00% SER1 = 0.00% SER2 = 0.00%
Level = -70.7 dBm BER = 0.12% PER = 0.19% SER1 = 0.19% SER2 = 0.19%
Level = -69.7 dBm BER = 0.03% PER = 0.01% SER1 = 0.01% SER2 = 0.01%
Level = -70.2 dBm BER = 0.07% PER = 0.12% SER1 = 0.12% SER2 = 0.12%
Level = -70.0 dBm BER = 0.04% PER = 0.06% SER1 = 0.06% SER2 = 0.06%

J/S = -15.70 dB (SER = 0.06%)

Part 3: Attestation Statements according FCC 15.247 for **IBM Bluetooth Daughter Card**



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To Whom This May Concern

**Attestation Statements according FCC Part 15.247
for 'IBM Bluetooth Daughter Card'.**

TDK Systems Europe Ltd. wishes to declare the following :

- The design of the previously granted 'Portofino USB Module', also known as 'Bluetooth Ultraport Module from IBM', is largely identical to 'IBM Bluetooth Daughter Card'.
- The design of the RF part of this product uses the same chipset and the same additional components.
- The firmware used is identical to the previous design.

Therefor the documentation provided for the FCC approval for the previous product remains valid for this design.

The relevant documentation is :

Annex Additional declaration part according FCC 15.247 for Bluetooth devices
Issued on 2000-01-11 by 7 Layers of Ratingen, Germany

Results of Processing Gain Tests for FCC Qualification
Issued on 23 March 2001 by Cambridge Silicon Radio of Cambridge, UK.

Peter de Wit, Approvals Manager, TDK Systems Europe Ltd.
(name and function of person signing)

London
(place)

June 5th, 2001
(date)


(signature)



Annex

Additional declaration part according FCC 15.247 for Bluetooth devices

Version: 2000-01-11

*Registergericht • registered in:
Ratingen HRB 3264
Aufsichtsratsvorsitzende •
Chairman of the Supervisory Board:
Dr. Sabine Grobecker*

*Vorstand • Board of Directors:
Dr. Wolfgang Dahm
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1 Output power and channel separation of a Bluetooth device in the different operating modes:

The different operating modes (data-mode, acquisition-mode) of a Bluetooth device don't influence the output power and the channel spacing. There is only one transmitter which is driven by identical input parameters concerning these two parameters.

Only a different hopping sequence will be used.

For this reason the check of these RF parameters in one op-mode is sufficient.

2 Frequency range of a Bluetooth device:

Hereby we declare that the maximum frequency of this device is: **2402 – 2480 MHz**.

This is according the Bluetooth Core Specification V 1.0B (+ critical errata) for devices which will be operated in the USA.

This was checked during the Bluetooth Qualification tests (Test Case: TRM/CA/04-E).

Other frequency ranges (e.g. for Spain, France, Japan) which are allowed according the Core Specification are **not** supported by this device.

3 Co-ordination of the hopping sequence in data mode to avoid simultaneous occupancy by multiple transmitters:

Bluetooth units which want to communicate with other units must be organised in a structure called piconet. This piconet consist of max. 8 Bluetooth units. One unit is the master the other seven are the slaves. The master co-ordinates frequency occupation in this piconet for all units. As the master hop sequence is derived from it's BD address which is unique for every Bluetooth device, additional masters intending to establish new piconets will always use different hop sequences.

4 Example of a hopping sequence in data mode:

Example of a 79 hopping sequence in data mode:

40, 21, 44, 23, 42, 53, 46, 55, 48, 33, 52, 35, 50, 65, 54, 67,
56, 37, 60, 39, 58, 69, 62, 71, 64, 25, 68, 27, 66, 57, 70, 59,
72, 29, 76, 31, 74, 61, 78, 63, 01, 41, 05, 43, 03, 73, 07, 75,
09, 45, 13, 47, 11, 77, 15, 00, 64, 49, 66, 53, 68, 02, 70, 06,
01, 51, 03, 55, 05, 04

5 Equally average use of frequencies in data mode and behaviour for short transmissions:

The generation of the hopping sequence in connection mode depends essentially on two input values:

1. LAP/UAP of the master of the connection
2. Internal master clock

The LAP (lower address part) are the 24 LSB's of the 48 BD_ADDRESS. The BD_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP (upper address part) are the 24 MSB's of the 48 BD_ADDRESS.

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For synchronisation with other units only offset are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5 μ s. The clock has a cycle of about one day (23h30). In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire LAP (24 bits), 4 LSB's (4 bits) (Input 1) and the 27 MSB's of the clock (Input 2) are used. With this input values different mathematical procedures (permutations, additions, XOR-operations) are performed to generate the sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following behaviour: The first connection between the two devices is established, a hopping sequence was generated. For transmitting the wanted data the complete hopping sequence was not used. The connection ended.

The second connection will be established. A new hopping sequence is generated. Due to the fact that the Bluetooth clock has a different value, because the period between the two transmission is longer (and it cannot be shorter) than the minimum resolution of the clock (312.5 μ s). The hopping sequence will always differ from the first one.

6 Receiver input bandwidth and behaviour for repeated single or multiple packets:

The input bandwidth of the receiver is 1 MHz.

In every connection one Bluetooth device is the master and the other one is the slave. The master determines the hopping sequence (see chapter 5). The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master.

Additionally the type of connection (e.g. single or multislot packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings.

Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

7 Dwell time in data mode

The dwell time of 0.3797s within a 30 second period in data mode is independent from the packet type (packet length). The calculation for a 30 second period is as follows:

Dwell time = time slot length * hop rate / number of hopping channels * 30s

Example for a DH1 packet (with a maximum length of one time slot)

Dwell time = $625 \mu\text{s} * 1600 \text{ 1/s} / 79 * 30\text{s} = 0.3797\text{s}$ (in a 30s period)

For multislot packet the hopping is reduced according to the length of the packet.

Example for a DH5 packet (with a maximum length of five time slots)

Dwell time = $5 * 625 \mu\text{s} * 1600 * 1/5 * 1/\text{s} / 79 * 30\text{s} = 0.3797\text{s}$ (in a 30s period)

This is according to the Bluetooth Core Specification V 1.0B (+ critical errata) for all Bluetooth devices. Therefore all Bluetooth devices **comply** with the FCC dwell time requirement in data mode.

This was checked during the Bluetooth Qualification tests.

The Dwell time in hybrid mode is measured and stated in the test report.

8 Channel Separation in hybrid mode

The nominal channel spacing of the Bluetooth system is 1MHz independent of the operating mode.

The maximum "initial carrier frequency tolerance" which is allowed for Bluetooth is $f_{\text{center}} = 75 \text{ kHz}$.

This was checked during the Bluetooth Qualification tests (Test Case: TRM/CA/07-E) for three frequencies (2402, 2441, 2480 MHz).

Additionally an example for the channel separation is given in the test report

9 Derivation and examples for a hopping sequence in hybrid mode

For the generation of the inquiry and page hop sequences the same procedures as described for the data mode are used (see chapter 5), but this time with different input vectors:

- For the inquiry hop sequence, a predefined fixed address is always used. This results in the same 32 frequencies used by all devices doing an inquiry but every time with a different start frequency and phase in this sequence.
- For the page hop sequence, the device address of the paged unit is used as input vector. This results in the use of a subset of 32 frequencies which is specific for that initial state of the connection establishment between the two units. A page to different devices would result in a different subset of 32 frequencies.

So it is ensured that also in hybrid mode the frequency use is equally averaged.

Example of a hopping sequence in inquiry mode:

48, 50, 09, 13, 52, 54, 41, 45, 56, 58, 11, 15, 60, 62, 43, 47, 00, 02, 64, 68, 04, 06, 17, 21, 08, 10, 66, 70, 12, 14, 19, 23

Example of a hopping sequence in paging mode:

08, 57, 68, 70, 51, 02, 42, 40, 04, 61, 44, 46, 63, 14, 50, 48, 16, 65, 52, 54, 67, 18,
58, 56, 20, 53, 60, 62, 55, 06, 66, 64

10 Receiver input bandwidth and synchronisation in hybrid mode:

The receiver input bandwidth is the same as in the data mode (1 MHz). When two Bluetooth devices establish contact for the first time, one device sends an inquiry access code, the other device is scanning for this inquiry access code. If two devices have been connected previously and want to start a new transmission, a similar procedure takes place. The only difference is, instead of the inquiry access code, an special access code, derived from the BD_ADDRESS of the paged device will be, will be sent by the master of this connection.

Due to the fact that both units have been connected before (in the inquiry procedure) the paging unit has timing and frequency information about the page scan of the paged unit. For this reason the time to establish the connection is reduced considerable.

11 Spread rate / data rate of the direct sequence signal

The Spread rate / Data rate in inquiry and paging mode can be defined via the access code. The access code is the only criterion for the system to check if there is a valid transmission or not. If you regard the presence of a valid access code as one bit of information, and compare it with the length of the access code of 68 bits, the Spread rate / Data rate will be 68/1.

12 Spurious emission in hybrid mode

The Dwell in hybrid mode is shorter than in data mode. For this reason the spurious emissions average level in data mode is worst case. The spurious emissions peak level is the same for both modes.