

ANNEX 1 PROCESSING GAIN OF DIRECT SEQUENCE SPREAD SPECTRUM MEASUREMENT

1. LIMITS OF PROCESSING GAIN OF A DIRECT SEQUENCE SPREAD SPECTRUM MEASUREMENT

The limit of processing gain is 10dB

1.1 TEST INSTRUMENTS & SUPPORT UNIT

Description & Manufacturer	Model No.	Serial No.
Portable PC (Zenith)	Z-lite	3GSAZW000061
Portable PC (NCR)	3150	17-26106224
PC + IEEE interface card (NCR)	PC6	17-17039925
Power supply (HP)	HP9592B	SN 3009U00102
Power Meter (R&S)	URV5	893430/070
Power Sensor (R&S)	NRV-Z2 828218.02	860925/005
CW Generator (Gigatronics)	7200	746604
Variable Attenuator (Midwest)	1044	NA
Fixed Attenuator (Inmet)	18AH-10	NA
RF Power Splitter (ARRA)	3-9200-2	2001

1.2 METHOD OF MEASUREMENT

The processing gain may be measured using the CW jamming margin method. Figure 1 shows the test configuration.

The test takes place at the product Functional Specification (Ref.[2], Ref.[5]) specified conditions for BER rate measurements, specifying a BER equal or better than 10^{-8} at a receiver input level of -55 dBm. For practical reasons these test are performed at -55 dBm or -53 dBm. This small deviation from the Functional Specification should not cause any deviation from the specified Bit Error Rate, since the received levels are well above the thermal noise.

The test criteria for meeting the minimal processing gain is such that it takes the theoretical calculated SNR for the applied modulation technique and specified BER as a reference. From this given SNR the processing gain is subtracted, yielding the CW Jammer to Signal ratio J/S. From Ref. [4], likewise as Ref.[3] consulted in Ref. [1], it is determined that for a BER of 10^{-8} the SNR (S/N)_o equals:

- 13 dB @ 1 Mbit/s,
- 15 dB @ 2 Mbit/s,
- 15 dB @ 5.5 Mbit/s,
- 18 dB @ 11 Mbit/s.

Thus the J/S ratio for a processing gain of 10 dB that must be met is calculated as:

- 13 + 10 = -3 dB @ 1 Mbit/s (DBPSK),
- 15 + 10 = -5 dB @ 2 Mbit/s (DQPSK),
- 15 + 10 = -5 dB @ 5.5 Mbit/s (CCK),
- 18 + 10 = -8 dB @ 11 Mbit/s (CCK).



Two types of measurement corrections are allowed for as described in Ref.[1]. The first, taking into account 2 dB implementation losses, thus increasing the absolute J/S ratio by 2 dB. The second correction allows for deleting the 20% worst-case frequencies in the processing gain test that causes the test at that CW interference to fail. This implies that for the considered 14 MHz wide measurement interval, the worst case 57 CW jammer frequencies can be ignored, being those that result in received data errors/missing frames (20% of 14 MHz *(1 MHz/50 KHz) + 1 = (20% * 281) + 1 = 57).

The measurements are performed at a 50 KHz CW jammer raster. For each CW jammer frequency 10^8 bits are transmitted by the reference transmitter, and received by the product under test. For practical reasons 50,000 messages are transmitted. After blanking out frame overhead 1927 bits per frame are monitored. This results in $50,000 * 1927 = 96,500,000$ transmitted bits for a BER test, which is a mere 1.4% less than the targeted 10^8 bits. Though it would be more elegant to show BER compliance for at least say ten times 10^8 transmitted/received bits, the time involved with this grows significantly. Since the CW interferer is stepped in a 50 KHz raster, covering the receiver bandwidth of 14 MHz, it is considered that the BER requirement is sufficiently met since such a multitude of measurements are taken.

Consider the implementation losses, we have the following J/S:

- 3 - 2 = -5 dB @ 1 Mbit/s (DBPSK),
- 5 - 0 = -5 dB @ 2 Mbit/s (DQPSK),
- 5 - 1 = -6 dB @ 5.5 Mbit/s (CCK),
- 8 - 1 = -9 dB @ 11 Mbit/s (CCK).

In this test report, we are going to prove that the percentage of worst case is smaller than 20%. Only channel 2, the worst case, is shown here in this test report.



1.2.1 APPLICABLE REFERENCE DOCUMENTS:

1. Document FCC 97-114, Appendix C, Guidance on Measurements for Direct Sequence Spread Spectrum Systems.
2. Hardware Functional Specification for WaveLAN-II Embedded, High Speed, Doc. No. 011735, Rev. A, Source Organization Lucent Technologies WCND Utrecht.
3. Viterbi, A. J., Principles of Coherent Communications, New York, McGraw-Hill 1966.
4. Proakis, J.G., Digital Communications, New York, McGraw-Hill 1989, page 270.
5. Hardware Functional Specification for the Lucent Technologies ORiNOCO Mini PCI, Doc. No. 015143, Source Organization Lucent Technologies WCND Utrecht.

1.2.2 TEST SETUP

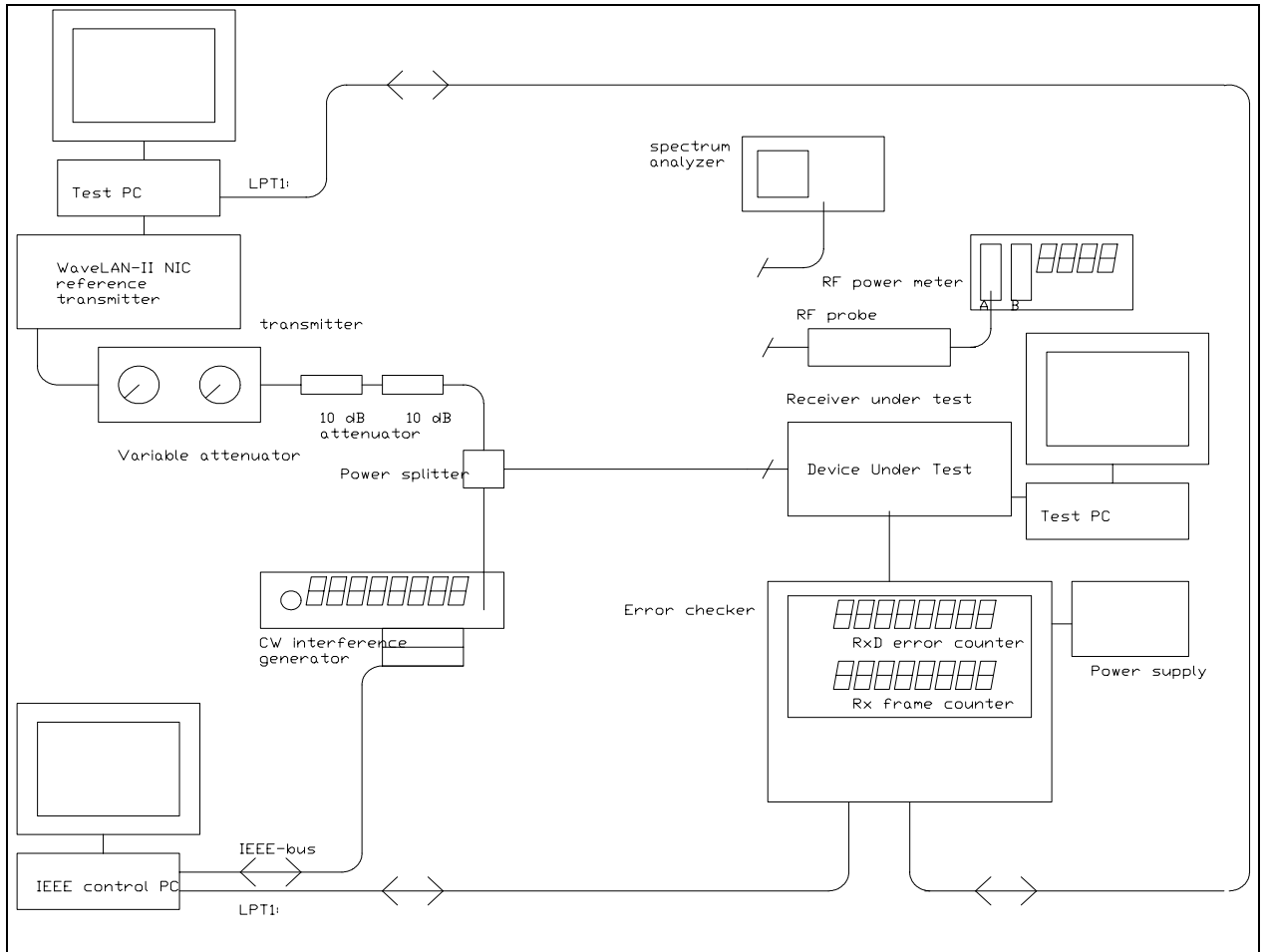


Fig. 1 Test Setup



1.3 TEST PROCEDURES

Obtain the simplex link shown in Fig. 1. Perform all independent instrumentation calibrations prior to this procedure.

1. Issue a request to the transmitter for 1000 frames to be transmitted by computer.
2. The computer reads the number of received frames and number of erroneous received frames.
3. If no missing frames or received data errors detected, ask the computer to increase the CW jamming level by 1 dB, and repeat (1) and (2).
4. Repeat this sequence until error data or missing frames are detected, or required J/S is reached.
5. If the J/S is smaller than required one, then this frequency point fail the test. Denote "1" on the record.
6. Issue a request to the transmitter for 50,000 frames to be transmitted by the computer.
7. If error data is detected, then the limit of BER is not met, denote "1" on the record.
8. Raise the CW jamming frequency by 50KHz, and repeat (1) ~ (7)

1.4 EUT OPERATING CONDITION

The temperature and related humidity: 20°C and 70%

1.5 TEST RESULTS

EUT	802.11b mini-pci card	Model	PA307OU-1MPC
Environmental Conditions	20°C, 70%RH	Tested By	Steven Lu

Channel	Bit Rate	Error Percentage	Limit	Result
2	11 Mbps	52/280 = 18.57%	20%	Pass

S/N (dB)	J/S (dB)	Lsys (dB)	Jammer (dBm)
18	-9	1	-62

Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error
2.41000	0	2.41150	0	2.41295	0	2.41440	1
2.41005	0	2.41155	0	2.41300	0	2.41445	1
2.41010	0	2.41160	0	2.41305	0	2.41450	0
2.41015	1	2.41165	0	2.41310	0	2.41455	0
2.41020	0	2.41170	0	2.41315	0	2.41460	0
2.41025	0	2.41175	0	2.41320	0	2.41465	1
2.41030	0	2.41180	0	2.41325	0	2.41470	0
2.41035	0	2.41185	0	2.41330	0	2.41475	0
2.41040	0	2.41190	0	2.41335	0	2.41480	1
2.41045	0	2.41195	0	2.41340	0	2.41485	1
2.41050	0	2.41200	0	2.41345	0	2.41490	1
2.41055	0	2.41205	0	2.41350	0	2.41495	0
2.41060	0	2.41210	0	2.41355	0	2.41500	0
2.41065	0	2.41215	1	2.41360	0	2.41505	0
2.41070	0	2.41220	1	2.41365	0	2.41510	0
2.41075	0	2.41225	0	2.41370	0	2.41515	0
2.41080	0	2.41230	0	2.41375	0	2.41520	0
2.41085	0	2.41235	0	2.41380	0	2.41525	0
2.41090	0	2.41240	0	2.41385	0	2.41530	0
2.41095	0	2.41245	0	2.41390	0	2.41535	0
2.41100	0	2.41250	0	2.41395	0	2.41540	0
2.41105	1	2.41255	0	2.41400	0	2.41545	0
2.41115	1	2.41260	0	2.41405	0	2.41550	0
2.41120	1	2.41265	0	2.41410	0	2.41555	0
2.41125	1	2.41270	0	2.41415	0	2.41560	0
2.41130	1	2.41275	0	2.41420	0	2.41565	0
2.41135	0	2.41280	0	2.41425	0	2.41570	0
2.41140	0	2.41285	0	2.41430	0	2.41575	1
2.41145	0	2.41290	0	2.41435	1	2.41580	1

Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error
2.41585	0	2.41790	1	2.41995	0	2.42205	0
2.41590	0	2.41795	0	2.42000	0	2.42210	1
2.41595	1	2.41800	0	2.42005	0	2.42215	1
2.41600	0	2.41805	0	2.42010	0	2.42220	1
2.41605	1	2.41810	1	2.42015	1	2.42225	0
2.41610	0	2.41815	0	2.42020	0	2.42230	0
2.41615	0	2.41820	1	2.42025	0	2.42235	0
2.41620	0	2.41825	0	2.42030	0	2.42240	0
2.41625	0	2.41830	0	2.42035	1	2.42245	0
2.41630	0	2.41835	0	2.42040	1	2.42250	0
2.41635	0	2.41840	0	2.42045	0	2.42255	0
2.41640	0	2.41845	0	2.42050	0	2.42260	0
2.41645	0	2.41850	0	2.42055	0	2.42265	1
2.41650	1	2.41855	1	2.42060	0	2.42270	1
2.41655	0	2.41860	0	2.42065	0	2.42275	0
2.41660	0	2.41865	0	2.42070	0	2.42280	0
2.41665	0	2.41870	0	2.42075	0	2.42290	0
2.41670	0	2.41875	0	2.42080	0	2.42295	0
2.41675	0	2.41880	0	2.42085	0	2.42300	0
2.41680	1	2.41885	0	2.42090	0	2.42305	0
2.41685	0	2.41890	0	2.42100	0	2.42310	0
2.41690	1	2.41895	1	2.42105	0	2.42315	0
2.41695	0	2.41900	1	2.42110	0	2.42320	0
2.41700	0	2.41905	1	2.42115	0	2.42325	1
2.41705	0	2.41910	0	2.42120	0	2.42330	0
2.41710	1	2.41915	0	2.42125	0	2.42335	0
2.41715	0	2.41920	1	2.42130	0	2.42340	0
2.41720	0	2.41925	0	2.42135	0	2.42345	1
2.41725	0	2.41930	0	2.42140	0	2.42350	0
2.41730	1	2.41935	1	2.42145	0	2.42355	0
2.41735	1	2.41940	0	2.42150	0	2.42360	0
2.41740	0	2.41945	1	2.42155	0	2.42365	1
2.41745	1	2.41950	0	2.42160	0	2.42370	0
2.41750	1	2.41955	0	2.42165	0	2.42375	0
2.41755	0	2.41960	0	2.42170	0	2.42380	0
2.41760	0	2.41965	0	2.42175	0	2.42385	1
2.41765	1	2.41970	0	2.42180	0	2.42390	0
2.41770	0	2.41975	0	2.42185	0	2.42395	0
2.41775	0	2.41980	0	2.42190	0	2.42390	0
2.41780	0	2.41985	0	2.42195	1	2.42395	0
2.41785	0	2.41990	0	2.42200	0	2.42400	1



Channel	Bit Rate	Error Percentage	Limit	Result
2	5.5 Mbps	45/280 = 16.07%	20%	Pass

S/N (dB)	J/S (dB)	Lsys (dB)	Jammer (dBm)
15	-6	1	-59

Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error
2.41000	0	2.41150	0	2.41295	0	2.41440	0
2.41005	0	2.41155	0	2.41300	0	2.41445	0
2.41010	0		0	2.41305	0	2.41450	0
2.41015	0	2.41165	0	2.41310	0	2.41455	0
2.41020	0	2.41170	0	2.41315	0	2.41460	0
2.41025	0	2.41175	0	2.41320	0	2.41465	1
2.41030	0	2.41180	0	2.41325	0	2.41470	0
2.41035	0	2.41185	0	2.41330	0	2.41475	0
2.41040	0	2.41190	0	2.41335	0	2.41480	0
2.41045	0	2.41195	0	2.41340	0	2.41485	0
2.41050	0	2.41200	0	2.41345	0	2.41490	0
2.41055	0	2.41205	0	2.41350	0	2.41495	0
2.41060	0	2.41210	0	2.41355	0	2.41500	0
2.41065	0	2.41215	0	2.41360	0	2.41505	0
2.41070	0	2.41220	0	2.41365	0	2.41510	0
2.41075	0	2.41225	0	2.41370	0	2.41515	0
2.41080	0	2.41230	0	2.41375	0	2.41520	0
2.41085	0	2.41235	0	2.41380	0	2.41525	1
2.41090	0	2.41240	0	2.41385	0	2.41530	0
2.41095	0	2.41245	0	2.41390	0	2.41535	0
2.41100	0	2.41250	0	2.41395	0	2.41540	1
2.41105	0	2.41255	0	2.41400	1	2.41545	0
2.41115	0	2.41260	0	2.41405	0	2.41550	0
2.41120	0	2.41265	0	2.41410	1	2.41555	0
2.41125	0	2.41270	0	2.41415	1	2.41560	0
2.41130	0	2.41275	0	2.41420	1	2.41565	0
2.41135	0	2.41280	0	2.41425	0	2.41570	0
2.41140	0	2.41285	0	2.41430	0	2.41575	0
2.41145	0	2.41290	0	2.41435	1	2.41580	0



Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error
2.41585	0	2.41790	1	2.41995	0	2.42205	0
2.41590	0	2.41795	0	2.42000	0	2.42210	0
2.41595	0	2.41800	0	2.42005	0	2.42215	0
2.41600	0	2.41805	0	2.42010	0	2.42220	0
2.41605	0	2.41810	0	2.42015	0	2.42225	0
2.41610	1	2.41815	0	2.42020	0	2.42230	0
2.41615	1	2.41820	0	2.42025	0	2.42235	0
2.41620	1	2.41825	0	2.42030	0	2.42240	0
2.41625	1	2.41830	0	2.42035	0	2.42245	0
2.41630	1	2.41835	1	2.42040	0	2.42250	0
2.41635	1	2.41840	0	2.42045	0	2.42255	0
2.41640	1	2.41845	1	2.42050	0	2.42260	0
2.41645	1	2.41850	0	2.42055	0	2.42265	0
2.41650	1	2.41855	0	2.42060	0	2.42270	0
2.41655	1	2.41860	1	2.42065	0	2.42275	0
2.41660	1	2.41865	0	2.42070	0	2.42280	0
2.41665	1	2.41870	0	2.42075	0	2.42290	0
2.41670	1	2.41875	0	2.42080	0	2.42295	0
2.41675	1	2.41880	0	2.42085	0	2.42300	0
2.41680	0	2.41885	0	2.42090	0	2.42305	0
2.41685	0	2.41890	0	2.42100	0	2.42310	0
2.41690	0	2.41895	0	2.42105	0	2.42315	0
2.41695	0	2.41900	0	2.42110	0	2.42320	0
2.41700	0	2.41905	0	2.42115	1	2.42325	0
2.41705	0	2.41910	0	2.42120	0	2.42330	0
2.41710	0	2.41915	0	2.42125	0	2.42335	0
2.41715	0	2.41920	0	2.42130	0	2.42340	0
2.41720	1	2.41925	0	2.42135	0	2.42345	0
2.41725	1	2.41930	0	2.42140	0	2.42350	0
2.41730	1	2.41935	0	2.42145	0	2.42355	0
2.41735	1	2.41940	0	2.42150	0	2.42360	0
2.41740	1	2.41945	0	2.42155	0	2.42365	0
2.41745	1	2.41950	0	2.42160	0	2.42370	0
2.41750	1	2.41955	1	2.42165	0	2.42375	0
2.41755	1	2.41960	0	2.42170	0	2.42380	0
2.41760	1	2.41965	1	2.42175	0	2.42385	0
2.41765	1	2.41970	1	2.42180	0	2.42390	0
2.41770	1	2.41975	0	2.42185	0	2.42395	0
2.41775	1	2.41980	0	2.42190	0	2.42390	0
2.41780	1	2.41985	0	2.42195	0	2.42395	0
2.41785	1	2.41990	0	2.42200	0	2.42400	0



Channel	Bit Rate	Error Percentage	Limit	Result
2	2 Mbps	52/280 = 18.57%	20%	Pass

S/N (dB)	J/S (dB)	Lsys (dB)	Jammer (dBm)
15	-5	0	-60

Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error
2.41000	0	2.41150	0	2.41295	0	2.41440	0
2.41005	0	2.41155	0	2.41300	0	2.41445	0
2.41010	0	2.41160	0	2.41305	0	2.41450	0
2.41015	0	2.41165	0	2.41310	0	2.41455	0
2.41020	0	2.41170	0	2.41315	0	2.41460	0
2.41025	0	2.41175	0	2.41320	0	2.41465	0
2.41030	0	2.41180	0	2.41325	0	2.41470	0
2.41035	0	2.41185	0	2.41330	0	2.41475	0
2.41040	0	2.41190	0	2.41335	0	2.41480	0
2.41045	0	2.41195	0	2.41340	0	2.41485	0
2.41050	0	2.41200	0	2.41345	0	2.41490	0
2.41055	0	2.41205	0	2.41350	0	2.41495	0
2.41060	0	2.41210	0	2.41355	0	2.41500	0
2.41065	0	2.41215	0	2.41360	0	2.41505	0
2.41070	0	2.41220	0	2.41365	0	2.41510	0
2.41075	0	2.41225	0	2.41370	0	2.41515	0
2.41080	0	2.41230	0	2.41375	0	2.41520	0
2.41085	0	2.41235	0	2.41380	0	2.41525	0
2.41090	0	2.41240	0	2.41385	0	2.41530	0
2.41095	0	2.41245	0	2.41390	0	2.41535	0
2.41100	0	2.41250	0	2.41395	0	2.41540	0
2.41105	0	2.41255	0	2.41400	0	2.41545	0
2.41115	0	2.41260	0	2.41405	0	2.41550	0
2.41120	0	2.41265	0	2.41410	0	2.41555	0
2.41125	0	2.41270	0	2.41415	0	2.41560	0
2.41130	0	2.41275	0	2.41420	0	2.41565	0
2.41135	0	2.41280	0	2.41425	0	2.41570	0
2.41140	0	2.41285	0	2.41430	0	2.41575	0
2.41145	0	2.41290	0	2.41435	0	2.41580	0



Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error
2.41585	0	2.41790	0	2.41995	0	2.42205	0
2.41590	0	2.41795	0	2.42000	0	2.42210	0
2.41595	0	2.41800	1	2.42005	0	2.42215	0
2.41600	1	2.41805	0	2.42010	0	2.42220	0
2.41605	0	2.41810	0	2.42015	0	2.42225	0
2.41610	0	2.41815	0	2.42020	0	2.42230	0
2.41615	0	2.41820	0	2.42025	0	2.42235	0
2.41620	0	2.41825	0	2.42030	0	2.42240	0
2.41625	1	2.41830	0	2.42035	0	2.42245	0
2.41630	0	2.41835	0	2.42040	0	2.42250	0
2.41635	0	2.41840	0	2.42045	0	2.42255	0
2.41640	0	2.41845	0	2.42050	0	2.42260	0
2.41645	0	2.41850	0	2.42055	0	2.42265	0
2.41650	1	2.41855	0	2.42060	0	2.42270	0
2.41655	0	2.41860	0	2.42065	0	2.42275	0
2.41660	0	2.41865	0	2.42070	0	2.42280	0
2.41665	0	2.41870	0	2.42075	0	2.42290	0
2.41670	0	2.41875	0	2.42080	0	2.42295	0
2.41675	0	2.41880	0	2.42085	0	2.42300	0
2.41680	0	2.41885	0	2.42090	0	2.42305	0
2.41685	0	2.41890	0	2.42100	0	2.42310	0
2.41690	0	2.41895	0	2.42105	0	2.42315	0
2.41695	1	2.41900	0	2.42110	0	2.42320	0
2.41700	1	2.41905	0	2.42115	0	2.42325	0
2.41705	1	2.41910	0	2.42120	0	2.42330	0
2.41710	0	2.41915	0	2.42125	0	2.42335	0
2.41715	0	2.41920	0	2.42130	0	2.42340	0
2.41720	0	2.41925	0	2.42135	0	2.42345	0
2.41725	0	2.41930	0	2.42140	0	2.42350	0
2.41730	0	2.41935	0	2.42145	0	2.42355	0
2.41735	0	2.41940	0	2.42150	0	2.42360	0
2.41740	0	2.41945	0	2.42155	0	2.42365	0
2.41745	0	2.41950	0	2.42160	0	2.42370	0
2.41750	1	2.41955	0	2.42165	0	2.42375	0
2.41755	0	2.41960	0	2.42170	0	2.42380	0
2.41760	0	2.41965	0	2.42175	0	2.42385	0
2.41765	0	2.41970	0	2.42180	0	2.42390	0
2.41770	0	2.41975	0	2.42185	0	2.42395	0
2.41775	1	2.41980	0	2.42190	0	2.42390	0
2.41780	0	2.41985	0	2.42195	0	2.42395	0
2.41785	0	2.41990	0	2.42200	0	2.42400	0



Channel	Bit Rate	Error Percentage	Limit	Result
2	1 Mbps	52/280 = 18.57%	20%	Pass

S/N (dB)	J/S (dB)	Lsys (dB)	Jammer (dBm)
13	-5	2	-60

Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error
2.41000	0	2.41150	0	2.41295	0	2.41440	0
2.41005	0	2.41155	0	2.41300	0	2.41445	0
2.41010	0	2.41160	0	2.41305	0	2.41450	0
2.41015	0	2.41165	0	2.41310	0	2.41455	0
2.41020	1	2.41170	0	2.41315	0	2.41460	0
2.41025	0	2.41175	0	2.41320	0	2.41465	0
2.41030	0	2.41180	0	2.41325	0	2.41470	0
2.41035	1	2.41185	0	2.41330	0	2.41475	0
2.41040	0	2.41190	0	2.41335	0	2.41480	0
2.41045	0	2.41195	0	2.41340	0	2.41485	0
2.41050	0	2.41200	0	2.41345	0	2.41490	0
2.41055	0	2.41205	0	2.41350	0	2.41495	0
2.41060	0	2.41210	0	2.41355	0	2.41500	0
2.41065	1	2.41215	0	2.41360	0	2.41505	0
2.41070	0	2.41220	0	2.41365	0	2.41510	0
2.41075	0	2.41225	0	2.41370	0	2.41515	0
2.41080	1	2.41230	0	2.41375	0	2.41520	0
2.41085	0	2.41235	0	2.41380	0	2.41525	0
2.41090	0	2.41240	0	2.41385	0	2.41530	0
2.41095	0	2.41245	0	2.41390	0	2.41535	0
2.41100	0	2.41250	0	2.41395	0	2.41540	0
2.41105	0	2.41255	0	2.41400	0	2.41545	0
2.41115	0	2.41260	0	2.41405	0	2.41550	0
2.41120	0	2.41265	0	2.41410	0	2.41555	0
2.41125	0	2.41270	0	2.41415	0	2.41560	0
2.41130	0	2.41275	0	2.41420	0	2.41565	0
2.41135	0	2.41280	0	2.41425	0	2.41570	0
2.41140	0	2.41285	0	2.41430	0	2.41575	0
2.41145	0	2.41290	0	2.41435	0	2.41580	0



Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error	Freq. (GHz)	Detected Error
2.41585	0	2.41790	0	2.41995	0	2.42205	0
2.41590	0	2.41795	0	2.42000	0	2.42210	0
2.41595	0	2.41800	1	2.42005	0	2.42215	0
2.41600	1	2.41805	0	2.42010	0	2.42220	0
2.41605	0	2.41810	0	2.42015	1	2.42225	0
2.41610	0	2.41815	0	2.42020	0	2.42230	0
2.41615	0	2.41820	0	2.42025	0	2.42235	0
2.41620	0	2.41825	0	2.42030	1	2.42240	0
2.41625	1	2.41830	0	2.42035	0	2.42245	0
2.41630	0	2.41835	0	2.42040	0	2.42250	0
2.41635	0	2.41840	1	2.42045	1	2.42255	1
2.41640	0	2.41845	0	2.42050	0	2.42260	1
2.41645	1	2.41850	0	2.42055	0	2.42265	0
2.41650	1	2.41855	0	2.42060	1	2.42270	0
2.41655	0	2.41860	0	2.42065	0	2.42275	0
2.41660	0	2.41865	0	2.42070	0	2.42280	0
2.41665	1	2.41870	0	2.42075	0	2.42290	0
2.41670	1	2.41875	0	2.42080	0	2.42295	0
2.41675	1	2.41880	0	2.42085	0	2.42300	0
2.41680	1	2.41885	0	2.42090	0	2.42305	0
2.41685	1	2.41890	0	2.42100	0	2.42310	0
2.41690	1	2.41895	0	2.42105	0	2.42315	0
2.41695	1	2.41900	1	2.42110	0	2.42320	0
2.41700	1	2.41905	0	2.42115	0	2.42325	0
2.41705	1	2.41910	0	2.42120	0	2.42330	0
2.41710	1	2.41915	0	2.42125	0	2.42335	0
2.41715	1	2.41920	0	2.42130	0	2.42340	0
2.41720	1	2.41925	0	2.42135	0	2.42345	0
2.41725	1	2.41930	0	2.42140	0	2.42350	0
2.41730	1	2.41935	0	2.42145	0	2.42355	0
2.41735	1	2.41940	0	2.42150	0	2.42360	0
2.41740	1	2.41945	0	2.42155	0	2.42365	0
2.41745	1	2.41950	0	2.42160	0	2.42370	0
2.41750	1	2.41955	0	2.42165	0	2.42375	0
2.41755	1	2.41960	0	2.42170	1	2.42380	0
2.41760	1	2.41965	0	2.42175	0	2.42385	0
2.41765	1	2.41970	1	2.42180	0	2.42390	0
2.41770	0	2.41975	0	2.42185	0	2.42395	0
2.41775	1	2.41980	0	2.42190	0	2.42390	0
2.41780	0	2.41985	0	2.42195	0	2.42395	0
2.41785	0	2.41990	1	2.42200	0	2.42400	1