Microwave Data Systems Inc.

PRODUCT NOTES

NUMBER: 05-3638A01
February 2001

Carrier/Interference Curves

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LEDR CARRIER-TO-INTERFERENCE (C/I) CURVES

Summary

When planning a digital radio system, it is necessary to understand the interference suppression performance of the radio to be installed. A carrier to interference (C/I) measurement clearly illustrates how a link's bit error rate (BER) performance degrades in the presence of an interferer signal close in frequency to the wanted carrier. This document presents measurements of the C/I rejection performance of a LEDR digital microwave radio, allowing such path planning to take place.

Test Set-Up

The measurements presented were taken with a LEDR radio, configured to pass 768 kbps in a 200 kHz channel bandwidth, using 32-QAM modulation. Three C/I measurements were made with the interferer co-channel (at the same frequency as the wanted carrier), 1st-adjacent channel (on the frequency of the first channel adjacent to the carrier) and 2nd-adjacent channel.

Results

Figure 1 shows the BER performance of the link with no interference present. Figure 2 shows the C/I performance of the same link with a co-channel interferer. It can be seen that the presence of such an interferer 35 dB below the wanted carrier (C/I=35 dB) will have negligible effect on BER performance. The effect of the interferer will only be noticed once it rises to 30 dB below the wanted carrier.

Figures 3 and 4 show the corresponding C/I performance of the radio with a 1st-adjacent channel and 2nd-adjacent channel interferer (200 kHz and 400 kHz away from the wanted carrier respectively). In these cases, the level of the interferer has to be at least 10 dB larger than the wanted carrier (C/I=-10 dB) before any effect on the link performance is observed.

Note that these results in Figures 1 to 4 can be scaled for any bandwidth LEDR radio. For a 100 kHz radio, simply deduct 3 dB off all RSSI values. Use a similar scaling of 6 dB and 9 dB for the 50 kHz and 25 kHz versions respectively.

Figure 1: LEDR 900S - 200kHz
Measured BER vs RSSI

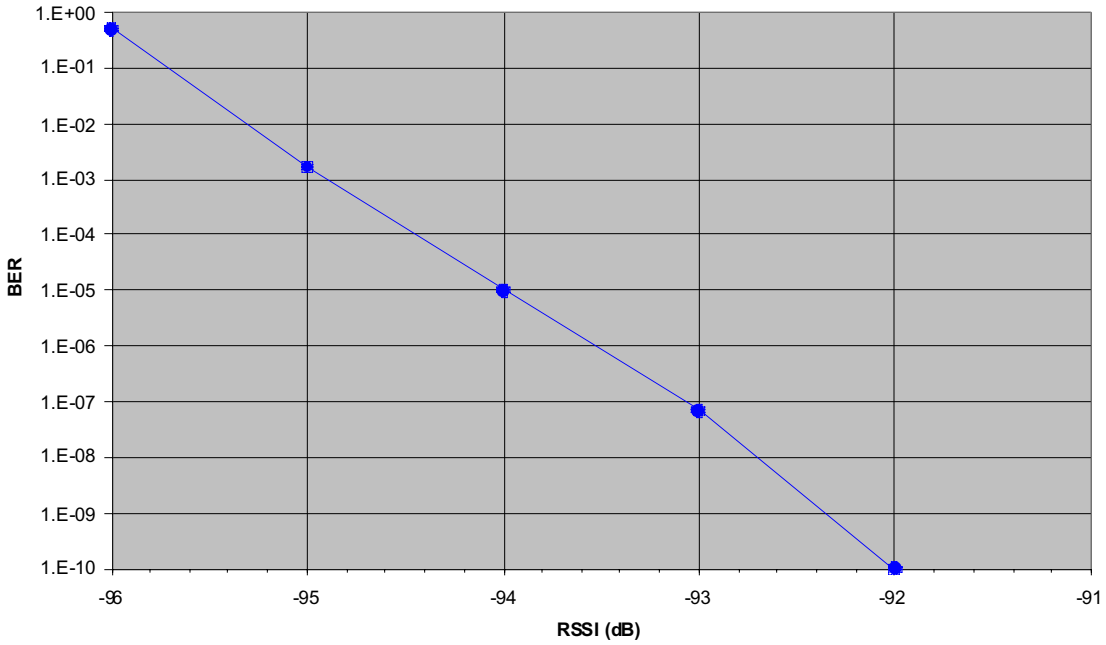

Figure 2: LEDR 900S - 200kHz
Measured BER vs RSSI with co-channel interferer

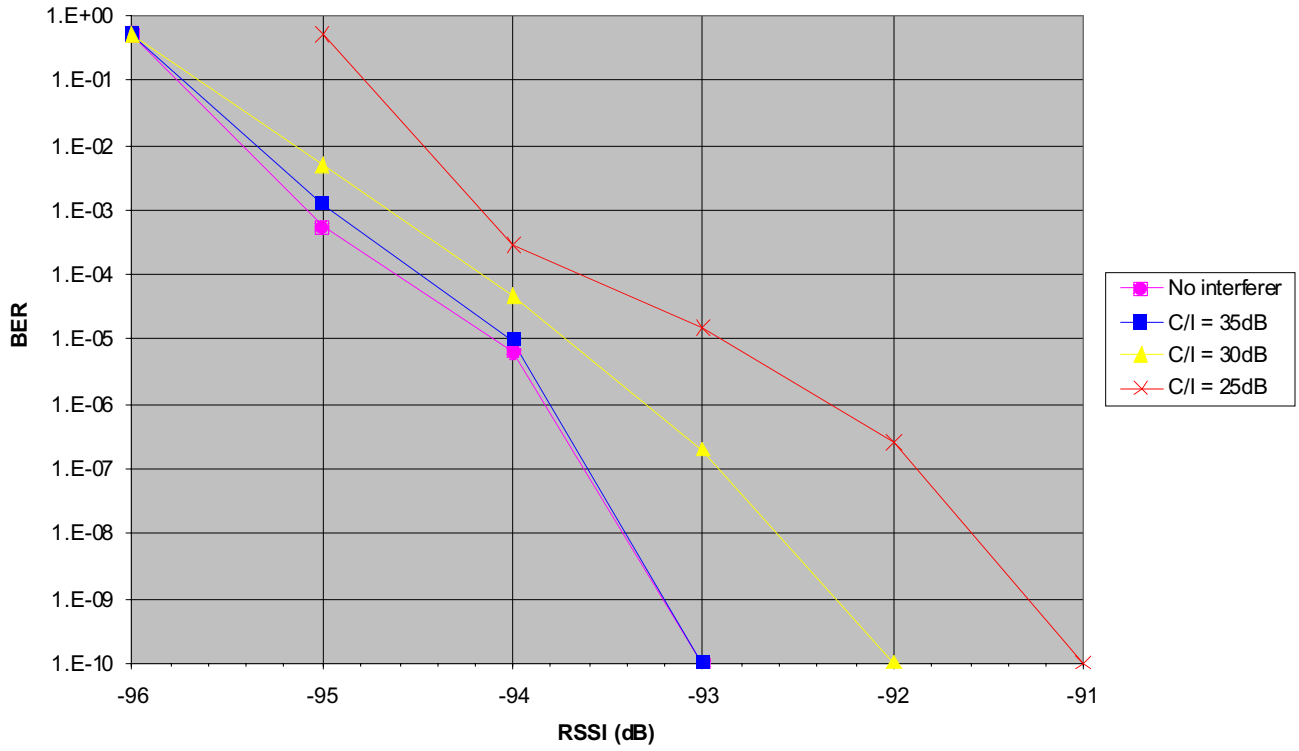

Figure 3: LEDR 900S - 200kbd
Measured BER vs RSSI with
1st adjacentchannel interferer

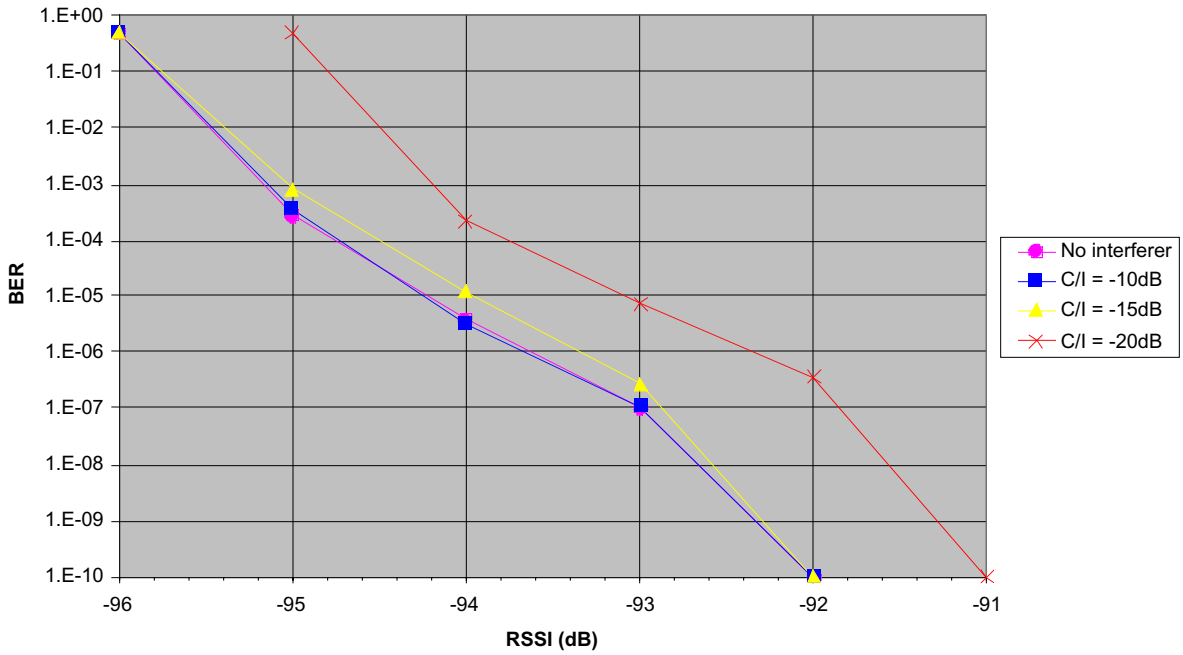

Figure 4: LEDR 900S - 200kbd
Measured BER vs RSSI with
2nd adjacentchannel interferer