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Application Note

MC92600 WarpLink Quad

Configuring Unused Channels to Minimize Power

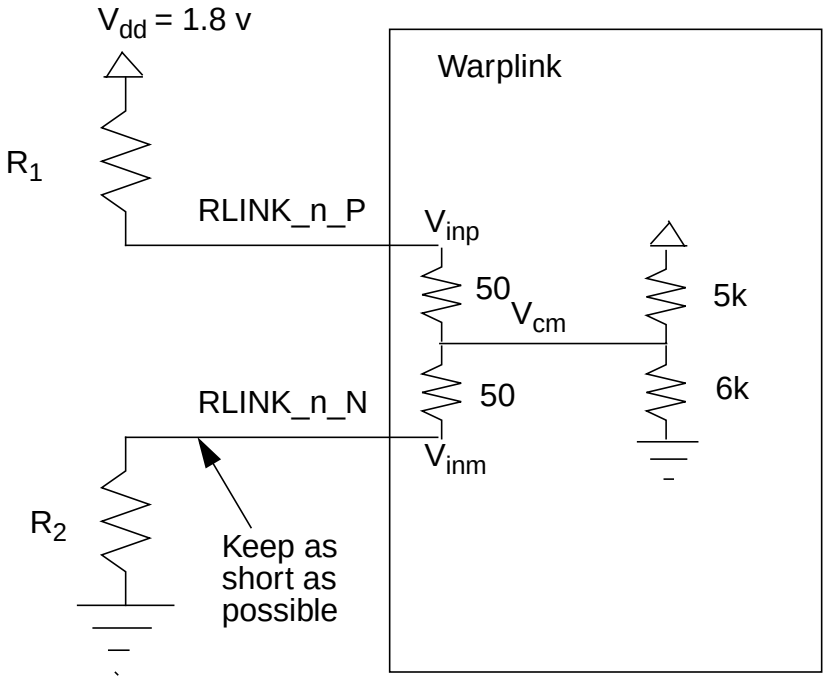
This application note details how to configure an unused Warplink Channel to minimize power consumption of this device.

1.1 Configuration Requirements

Warning: Warplink is designed to allow word alignment (32 bit alignment) for all 4 channels. If a channel is not used then Word Alignment is not supported for the remaining channels.

All outputs associated with an unused channel should left be unconnected. All inputs (other than Receiver Link Inputs) should be tied to ground. The Receiver Link Inputs (RLINK_n_N and RLINK_n_P) should be terminated as shown in Figure 1.

Figure 1: Unused RLINK Termination



Lower values of R_1 and R_2 improve noise margin (AC power) at the expense of DC power. Higher values of R_1 and R_2 reduce noise margin but save DC power. The minimum value of V_{inp} - V_{inm} necessary to give adequate noise margins is 35mV. The best values for R_1 and R_2 are: $R_1 = R_2 = 2.2k$ ohms. This achieves $V_{inp} - V_{inm} = 38mV$.

Other values will work with slightly more power being drawn as long as the following relationships are met:

$$\frac{V_{dd}}{2} \le V_{cm} \le \frac{2 \cdot V_{dd}}{3} \qquad \frac{R_2}{2} \le R_1 \le R_2 \qquad R_1 + R_2 \le 4.4k$$

It does not matter which signal is pulled down. The important point is that the other should be pulled up. RLINK_n_P may be pulled down and RLINK_n_N pulled up. RLINK_n_N may be pulled down and RLINK_n_P pulled up.

Note : Multiple links may share the same R_1 and R_2 (in parallel) by adjusting R_1 and R_2 according to:

$$R_{1new} = \frac{R_1}{x} \qquad R_{2new} = \frac{R_2}{x}$$

Where “x” is the number of links sharing R1 and R2.

Table 1 lists the connections for the inputs and outputs of each unused channel to minimize power. All unused channels must be connected as shown.

Table 1: Warplink Pinout and Termination

Warplink Pinout*	Input/Output	Disposition
XMIT_n_0	I	GND
XMIT_n_1	I	GND
XMIT_n_2	I	GND
XMIT_n_3	I	GND
XMIT_n_4	I	GND
XMIT_n_5	I	GND
XMIT_n_6	I	GND
XMIT_n_7	I	GND
XMIT_n_K	I	GND
XMIT_n_IDLE_B	I	GND
XLINK_n_P	O (link)	N/C
XLINK_n_N	O (link)	N/C
RECV_n_0	O	N/C
RECV_n_1	O	N/C
RECV_n_2	O	N/C
RECV_n_3	O	N/C
RECV_n_4	O	N/C
RECV_n_5	O	N/C
RECV_n_6	O	N/C
RECV_n_7	O	N/C
RECV_n_K	O	N/C
RECV_n_9	O	N/C
RECV_n_IDLE	O	N/C
RECV_n_ERR	O	N/C
RECV_n_RCLK	O	N/C
RLINK_n_P	I (link)	See Figure 1
RLINK_n_N	I (link)	See Figure 1

* “n” is a placeholder for the channel identifier “A” through “D”.

1.2 Power Consumption Estimates

Tables 2 and 3 contain estimated power consumption for various Warplink configurations assuming the guidelines defined in Section 1.1 of this document are followed.

Table 2: Power Estimates (mW) for 8b10b Mode

Supply	Condition*	1 active channel	2 active channels	3 active channels	4 active channels
3.3V	Typical	41.0	82.0	123.0	164.0
1.8V	Typical	391.0	519.0	648.0	777.0
Total	Typical	432.0	601.0	771.0	941.0
3.3V	Worst Case	49.0	98.0	147.0	196.0
1.8V	Worst Case	453.0	603.0	753.0	902.0
Total	Worst Case	502.0	701.0	900.0	1098.0

Table 3: Power Estimates (mW) 10 bit mode

Supply	Condition*	1 active channel	2 active channels	3 active channels	4 active channels
3.3V	Typical	48.0	96.0	144.0	192.0
1.8V	Typical	391.0	519.0	648.0	777.0
Total	Typical	439.0	615.0	792.0	969.0
3.3V	Worst Case	57.0	114.0	171.0	228.0
1.8V	Worst Case	453.0	603.0	753.0	902.0
Total	Worst Case	510.0	737.0	924.0	1130.0

* Typical power conditions for 3.3V logic is 3.3V, 40^{o} C, and typical process

Typical power conditions for 1.8V logic is 1.8V, 40^{o} C, and typical process

Worst Case power conditions for 3.3V logic is 3.6V, 105^{o} C, and best case process

Worst Case fpower conditions or 1.8V logic is 1.95V, 105^{o} C, and best case process

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