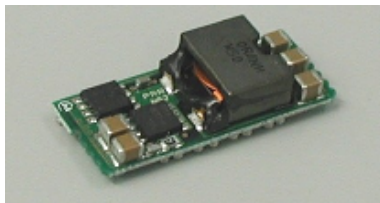# Murata Manufacturing Co., Ltd

Power Supply Reference Guide for XILINX® FPGAs

Inside:
- Power Requirements of Xilinx Solutions in Typical Applications
- DC-DC Converter Selection Tables
- Reference Designs and List of Materials

This information is intended to provide the designer with a general understanding of the power requirements of Xilinx FPGA families in typical applications. Simulation examples are shown in Appendix 1.
The number of logic gates, operating frequency and other factors affect the value of current consumption.
Please refer to the Xilinx Power Consumption Tools, available at
www.xilinx.com/power, for closer approximations specific to individual applications.

* Unless otherwise specified all ICCO estimates represent the total operating current contributions of all I/O banks on the FPGAs measured at 85oC ambient temperature.

	Spartan™-3/3E/3L	Spartan™–IIE	Spartan™–II	Virtex™–5	Virtex™–4	Virtex–II Pro™	Virtex™–II
V_{CCINT}	1.2V @0.2A-5A	1.8V @0.2A-1.5A	2.5V @0.2A-1A	1.0V @0.2A-15A	1.2V @0.2A-20A	1.5V @0.2A-20A	1.5V @0.2A-20A
V_{CCO}	1.2V-3.3V @50mA-3A	1.5V-3.3V @50mA-0.5A	1.5V-3.3V @50mA-0.5A	1.2V-3.3V @50mA-5A	1.2V-3.3V @50mA-3A	1.5V-3.3V @50mA-3A	1.5V-3.3V @50mA-3A
V_{CCAUX}	2.5V @50mA-0.3A	–	–	2.5V @50mA-0.7A	2.5V @50mA-0.7A	2.5V @50mA-0.3A	3.3V @50mA-0.3A
$AV_{CCAUXTX}$	–	–	–	–	1.2V @150mA	2.5V @60mA/MGT	–
$AV_{CCAUXRX}$	–	–	–	–	1.2V @200mA	2.5V @35mA/MGT	–
AV_{TTX}	–	–	–	–	1.2V-1.575V @50mA	1.8V-2.625V @15mA/MGT	–
AV_{TRX}	–	–	–	–	1.0V-2.625V @15mA	1.8V-2.625V @30mA/MGT	–

Cautionary Note:
1. These power requirement numbers are estimated using Xilinx power tools, and, these numbers represent specific applications or implementations of FPGAs.
   Users' specific applications may run at lower or higher power consumption levels.

2. Murata is happy to provide these estimates for use by customers as a guideline, however no guarantee is offered as to the accuracy of the numbers represented herein.

Selection Table for Spartan™-3E/3/3L

Table1. DC-DC Converter Selection Table for Spartan™-3E Device

Xilinx				muRata Solutions	
Device	Type	Voltage	Current	Vin=3.0-5.5V	Vin=10.8-13.2V
XC3S100E XC3S250E XC3S500E XC3S1200E XC3S1600E	V_{CCINT}	1.2V	0.2A-2A	MPD4S014S(1.3A/1A) MPD5S025S(1.6A/1.6A) MPD6S012S(3A) MPDTY102S(2A)	MPD4S014S(1.3A/1A)
	V_{CCO}	1.2V-3.3V	50mA-2A		

Table2. DC-DC Converter Selection Table for Spartan™-3 Device

Xilinx				muRata Solutions	
Device	Type	Voltage	Current	Vin=3.0-5.5V	Vin=10.8-13.2V
XC3S50 XC3S200 XC3S400 XC3S1000 XC3S1500 XC3S2000 XC3S4000 XC3S5000	V_{CCINT}	1.2V	0.2A-5A	MPD4S014S(1.3A/1A) MPD5S025S(1.6A/1.6A) MPD6S012S(3A) MPDTY102S(2A) MPDTY301S(7A) MPDTY302S(7A) MPDTY411S(7A) MPDTY412S(7A) MPDTH03050WAS(6A) MPDTH05050WAS(6A)	MPD4S014S(1.3A/1A) MPDTY303S(8A) MPDTH12050WAS(6A)
	V_{CCO}	1.2V-3.3V	50mA-3A		

Table3. DC-DC Converter Selection Table for Spartan™-3L Device

Xilinx				muRata Solutions	
Device	Type	Voltage	Current	Vin=3.0-5.5V	Vin=10.8-13.2V
XC3S1000L XC3S1500L XC3S4000L	V_{CCINT}	1.2V	0.2A-4A	MPD4S014S(1.3A/1A) MPD5S025S(1.6A/1.6A) MPD6S012S(3A) MPDTY102S(2A) MPDTH03050WAS(6A) MPDTH05050WAS(6A)	MPD4S014S(1.3A/1A) MPDTH12050WAS(6A)
	V_{CCO}	1.2V-3.3V	50mA-3A		

Note : The Xilinx devices' current requirements in these tables were calculated based on intensive design. Please refer to Appendix 1 for details.

Selection Table for Spartan™-II/IIE

Table4. DC-DC Converter Selection Table for Spartan™-IIE Device

Xilinx				muRata Solutions	
Device	Type	Voltage	Current	Vin=3.0-5.5V	Vin=10.8-13.2V
XC2S50E XC2S100E XC2S150E XC2S200E XC2S300E XC2S400E XC2S600E	V_{CCINT}	1.8V	0.2A-1.5A	MPD4S014S(1.3A/1A) MPD5S025S(1.6A/1.6A) MPDTY102S(2A)	MPD4S014S(1.3A/1A)
	V_{CCO}	1.5V-3.3V	50mA-0.5A		

Table5. DC-DC Converter Selection Table for Spartan™-II Device

Xilinx				muRata Solutions	
Device	Type	Voltage	Current	Vin=3.0-5.5V	Vin=10.8-13.2V
XC2S15 XC2S30 XC2S50 XC2S100 XC2S150 XC2S200	V_{CCINT}	2.5V	0.2A-1A	MPD4S014S(1.3A/1A) MPD5S025S(1.6A/1.6A) MPDTY102S(2A)	MPD4S014S(1.3A/1A)
	V_{CCO}	1.5V-3.3V	50mA-0.5A		

Note : The Xilinx devices' current requirements in these tables were calculated based on intensive design. Please refer to Appendix 1 for details.

Selection Table for Virtex™-5

Table6. DC-DC Converter Selection Table for Virtex™-5 Device

Xilinx				muRata Solutions	
Device	**Type**	**Voltage**	**Current**	**Vin=3.0-5.5V**	**Vin=10.8-13.2V**
XC5VLX30 XC5VLX50 XC5VLX85 XC5VLX110 XC5VLX220 XC5VLX330	V_{CCINT}	1.0V	0.2A-15A	MPDTY301S(7A) MPDTY302S(7A) MPDTY311S(16A) MPDTY312S(16A) MPDTY411S(7A) MPDTY412S(7A) MPDTH03050WAS(6A) MPDTH05050WAS(6A) MPDTH03060WAS(10A) MPDTH05060WAS(10A) MPDTH03010WAS(15A) MPDTH05010WAS(15A)	MPDTY303S(8A) MPDTH12050WAS(6A) MPDTH12060WAS(10A) MPDTH12010WAS(12A)
	V_{CCO}	1.2V-3.3V	50mA-5A	MPD6S012S(3A) MPDTY102S(2A) MPDTY301S(7A) MPDTY302S(7A) MPDTY411S(7A) MPDTY412S(7A) MPDTH03050WAS(6A) MPDTH05050WAS(6A)	MPDTY303S(8A) MPDTH12050WAS(6A)
	V_{CCINT}/V_{COO} with Large Load Transient	1.0V-3.3V	0.2A-15A	MPDRX002S(16A)	MPDRX004S(12A) MPDRX103S(12A) MPDRX104S(16A)

Note : The Xilinx devices' current requirements in these tables were calculated based on intensive design. Please refer to Appendix 1 for details.

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