ZPUino User Manual
Gadget Factory Papilio One 500
SID Variant

April 11, 2012

Contents

1 Board information

FPGA:	Xilinx Spartan 3E 500, VQ100 (xc3s500e-4-vq100)
Frequency:	96MHz (from on-board 32MHz oscillator)
Memory size:	32KiB
Bootloader size:	4KiB
Stack size:	2KiB
SPI flash:	Any supported
Reset type:	UART Serial reset
GPIO count:	49
UART:	2 (one connected to FTDI2232, other PPS)
SPI:	2 (one connected to SPI flash, other PPS)
SigmaDelta	1 2-channel 16-bit (PPS)
Timers:	2 (one 16-bit, one 24-bit)
PWM outputs:	2
SID Audio:	one 18-bit with independent DAC
SPI sketch offset:	0x00046000

Table 1.1: Gadget Factory Papilio One 500 SID Variant

IO	Index	Mapping	Alias
I	0	USPI MISO	IOPIN_USPI_MISO
I	1	UART2 RX	none
O	0	SigmaDelta channel 0	IOPIN_SIGMADELTA0
O	1	Timer 0 PWM 0	IOPIN_TIMER0_OC
O	2	Timer 1 PWM 0	IOPIN_TIMER1_OC
O	3	USPI MOSI	IOPIN_USPI_MOSI
O	4	USPI SCK	IOPIN_USPI_SCK
O	5	SigmaDelta channel 1	IOPIN_SIGMADELTA1
O	6	UART2 TX	none
O	8	SID audio	none

Table 1.2: Gadget Factory Papilio One 500 SID Variant PPS mappings

Number	Name	Function	PPS	Alias
0	FPGA_PIN_P18	GPIO	I/O	WING_A_0
1	FPGA_PIN_P23	GPIO	I/O	WING_A_1
2	FPGA_PIN_P26	GPIO	I/O	WING_A_2
3	FPGA_PIN_P33	GPIO	I/O	WING_A_3
4	FPGA_PIN_P35	GPIO	I/O	WING_A_4
5	FPGA_PIN_P40	GPIO	I/O	WING_A_5
6	FPGA_PIN_P53	GPIO	I/O	WING_A_6
7	FPGA_PIN_P57	GPIO	I/O	WING_A_7
8	FPGA_PIN_P60	GPIO	I/O	WING_A_8
9	FPGA_PIN_P62	GPIO	I/O	WING_A_9
10	FPGA_PIN_P65	GPIO	I/O	WING_A_10
11	FPGA_PIN_P67	GPIO	I/O	WING_A_11
12	FPGA_PIN_P70	GPIO	I/O	WING_A_12
13	FPGA_PIN_P79	GPIO	I/O	WING_A_13
14	FPGA_PIN_P84	GPIO	I/O	WING_A_14
15	FPGA_PIN_P86	GPIO	I/O	WING_A_15

Table 1.3: Gadget Factory Papilio One 500 SID Variant pin mappings

Number	Name	Function	PPS	Alias
16	FPGA_PIN_P85	GPIO	I/O	WING_B_0
17	FPGA_PIN_P83	GPIO	I/O	WING_B_1
18	FPGA_PIN_P78	GPIO	I/O	WING_B_2
19	FPGA_PIN_P71	GPIO	I/O	WING_B_3
20	FPGA_PIN_P68	GPIO	I/O	WING_B_4
21	FPGA_PIN_P66	GPIO	I/O	WING_B_5
22	FPGA_PIN_P63	GPIO	I/O	WING_B_6
23	FPGA_PIN_P61	GPIO	I/O	WING_B_7
24	FPGA_PIN_P58	GPIO	I/O	WING_B_8
25	FPGA_PIN_P54	GPIO	I/O	WING_B_9
26	FPGA_PIN_P41	GPIO	I/O	WING_B_10
27	FPGA_PIN_P36	GPIO	I/O	WING_B_11
28	FPGA_PIN_P34	GPIO	I/O	WING_B_12
29	FPGA_PIN_P32	GPIO	I/O	WING_B_13
30	FPGA_PIN_P25	GPIO	I/O	WING_B_14
31	FPGA_PIN_P22	GPIO	I/O	WING_B_15

Table 1.4: Gadget Factory Papilio One 500 SID Variant pin mappings (cont.)

Number	Name	Function	PPS	Alias
32	FPGA_PIN_P91	GPIO	I/O	WING_C_0
33	FPGA_PIN_P92	GPIO	I/O	WING_C_1
34	FPGA_PIN_P94	GPIO	I/O	WING_C_2
35	FPGA_PIN_P95	GPIO	I/O	WING_C_3
36	FPGA_PIN_P98	GPIO	I/O	WING_C_4
37	FPGA_PIN_P2	GPIO	I/O	WING_C_5
38	FPGA_PIN_P3	GPIO	I/O	WING_C_6
39	FPGA_PIN_P4	GPIO	I/O	WING_C_7
40	FPGA_PIN_P5	GPIO	I/O	WING_C_8
41	FPGA_PIN_P9	GPIO	I/O	WING_C_9
42	FPGA_PIN_P10	GPIO	I/O	WING_C_10
43	FPGA_PIN_P11	GPIO	I/O	WING_C_11
44	FPGA_PIN_P12	GPIO	I/O	WING_C_12
45	FPGA_PIN_P15	GPIO	I/O	WING_C_13
46	FPGA_PIN_P16	GPIO	I/O	WING_C_14
47	FPGA_PIN_P17	GPIO	I/O	WING_C_15

Table 1.5: Gadget Factory Papilio One 500 SID Variant pin mappings (cont.)

Number	Name	Function	Alias	
48	FPGA_PIN_P24	GPO	N/A	FPGA_PIN_FLASHCS SPI_FLASH_SEL_PIN

Table 1.6: Gadget Factory Papilio One 500 SID Variant pin mappings (cont.)

IO Slot	Device	Notes
0	SPI	Connected to SPI flash
1	UART	Connected to FT2232
2	GPIO	
3	Timers	1×16 bit (one PWM), 1×24 bit (one PWM)
4	Interrupt	Hardcoded
5	SigmaDelta	Mapped to PPS
6	SPI	Mapped to PPS
7	CRC16	
8-10	*empty*	
11	UART	Mapped to PPS
12-13	*empty*	
14	SID	Mapped to PPS
15	*empty*	

Table 1.7: Gadget Factory Papilio One 500 SID Variant IO slot usage