

ZLUSBREF01

USB to SMBus Reference Design

AN1469

REV.0.00

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Description

The USB to SMBus™ Interface board allows communication between a Zilker Labs Digital-DC™ evaluation board and a PC. This interface board has been designed to bridge PMBus commands from a PC application program to the SMBus. The PMBus command set is used to configure a Digital-DC device as well as monitor the power supply. PMBus™ commands are accessed using the Zilker Labs interface software from a PC running Microsoft Windows. Refer to AN13 – *PMBus Command Set* for more information on PMBus commands.

The USB to SMBus interface board is used by connecting the SMBus interface connector directly to a Zilker Labs evaluation board. The SMBus connector is found on the lower left-hand side of each evaluation board. Refer to the Zilker Labs' product evaluation board quick start guide and product data sheet for more information.

Features

- SMBus control via USB
- SMBus 2.0 and I²C 2.1 compatible
- PMBus compliant
- Self powered from USB
- Pre-installed firmware
- Provides SMBus reference rail

Applications

This board has been designed to operate for the following conditions:

- Interface to Digital-DC EVBs
- $f_{\text{SMBus}} = 100 \text{ kHz}$
- Temperature range: 0°C to +70°C



Figure 1. USB to SMBus Interface

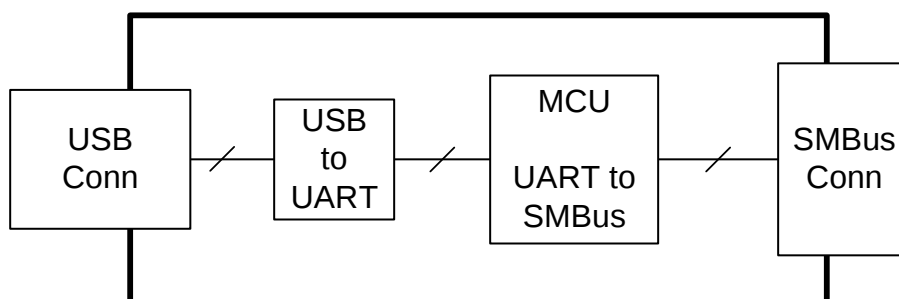


Figure 2. Block Diagram

Schematics

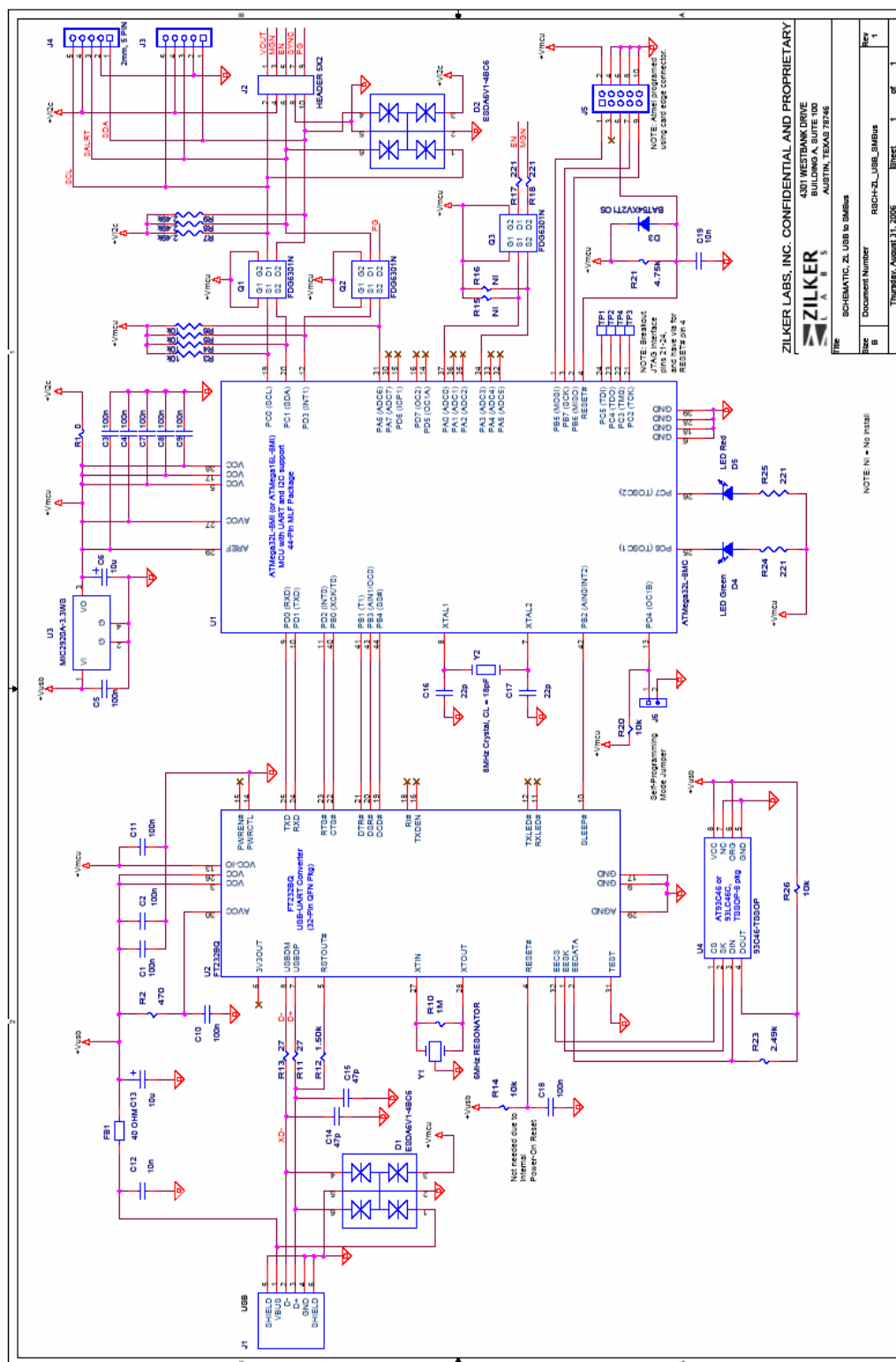


Figure 1. USB to SMBus

Bill of Materials

Item	Quan	Reference	Value	Tol	Rating	Type	PCB Footprint	Manufacturer	Part Number
1	11	C1,C2,C3,C4,C5,C7,C8,C9,C10,C11	100n	10%	10V	X7R	SM0603	KEMET	C0603C104K8RACTU
2	2	C6,C13	10u	20%	6.3V		SM0603	PANASONIC-ECG	ECJ-1VB0J106M
3	2	C12,C19	10n	10%	25V	X7R	SM0603	PANASONIC-ECG	ECJ-1VB1E103K
4	2	C14,C15	47p	5%	50V	COG	SM0603	TDK	C1608C0G1H470J
5	2	C16,C17	22p	5%	50V	COG	SM0603	MURATA	GRM1885C1H220JA01D
6	2	D1,D2	ESDA6V1-4BC6		6.1V, 80W		SOT23_6L	ST MICRO	ESDA6V1-4BC6
7	1	D3	BAT54XV2T1OS		200mA		SOD-523	ON SEMI	BAT54XV2T1OS
8	1	D4	LED Green		20mA	CLR	SM0805_DIO_1C2A	CHICAGO MINI	CMD17-21VGC
9	1	D5	LED Red		20mA	CLR	SM0805_DIO_1C2A	CHICAGO MINI	CMD17-21VRC
10	1	FB1	40 OHM		1.5A	MLF	SM0805	STEWART	MI0805K400R-00 MI0805K400R-01
11	1	J1	USB TYPE B				USB1B	MOLEX	67068-0000
12	1	J2	HEADER 5X2				HDRF5DUALRA100X100	SAMTEC	SSQ-105-02-T-D-RA
13	1	J3	5 PIN			SN	HDR5LK100	AMP	640456-5
14	1	J4	2mm, 5 PIN			SN	SIP_5P_2.0MM	Sullins	PRPN051PAEN
15	1	J6	2 PIN			SN	SIP2/100	TYCO	644456-2
16	3	Q1,Q2,Q3	FDG6301N		25V	DUAL N-CH	SC70-6	FAIRCHILD SEMI	FDG6301N
17	1	R1	0			THK FILM	SM0805	YAGEO	RC0805JR-070RL
18	1	R2	470	5%	63mW	THK FILM	SM0402	ROHM	MCRMZPF4700
19	2	R3,R5	10k	1%	100mW	THK FILM	SM0603	ROHM	MCR03EZPF1002
20	5	R4,R6,R20,R26	10k	1%	63mW	THK FILM	SM0402	YAGEO	RC0402FR-0710KL
21	3	R7,R8,R9	2.49k	1%	100mW	THK FILM	SM0603	ROHM	MCR03EZPF2491
22	1	R10	1M	1%	63mW	THK FILM	SM0402	ROHM	MCR01MZPF1004
23	2	R11,R13	27	5%	63mW	THK FILM	SM0402	YAGEO	RC0402JR-0727RL
24	1	R12	1.50k	1%	63mW	THK FILM	SM0402	YAGEO	RC0402FR-071K5L
25	4	R17,R18,R24,R25	221	1%	63mW	THK FILM	SM0402	YAGEO	RC0402FR-07221L
26	1	R21	4.75k	0.01	63mW	THK FILM	SM0402	PANASONIC-ECG	ERJ-2RKF4751X
27	1	R23	2.49k	0.01	63mW	THK FILM	SM0402	PANASONIC-ECG	ERJ-2RKF2491X
28	1	U1	ATMega32L-8MC			MCU	MLF44_7X7_DP	ATMEL	ATMEGA32L-8MC
29	1	U2	FT232BQ				TQFP32/.8P/9X9	FTDI	FT232BQ
30	1	U3	MIC2920A-3.3WS		400mA		SOT223_1234_REV1	MICREL	MIC2920A-3.3WS TR
31	1	U4	93C46-TSSOP		1.8 - 5.5V	93C46	TSSOP8/.65P/6.4	ATMEL	AT93C46-10TI-1.8
32	1	Y1	6MHz RESONATOR	0.01		COMM	CERALOCK	MURATA	CSTCR6M00G53-R0
33	1	Y2	8MHz Crystal, CL = 18pF	30ppm		CSM-7	X575CT	ECS INC	ECS-80-18-5P
	NI	TP1,TP2,TP3,TP4	T POINT S				TP_020H		
	NI	R15,R16	NI	1%			SM0402		
	NI	J5	AVRISP_10PinConn				HDR10DUAL100X100		
	NI	R14	10k	1%	63mW	THK FILM	SM0402	YAGEO	RC0402FR-0710KL
	NI	C18	100n	0.1	10V	X7R	SM0603	KEMET	C0603C104K8RACTU

NI = Not Installed

References

- [1] AN13 – *PMBus Command Set*, Zilker Labs, Inc., 2007.
- [2] *ZL2005 Data Sheet*, Zilker Labs, Inc., 2006.
- [3] *ZL2105 Data Sheet*, Zilker Labs, Inc., 2007.
- [4] *ZL2005EV1 Quick Start Guide*, Zilker Labs, Inc., 2006.
- [5] *ZL2105EV1 Quick Start Guide*, Zilker Labs, Inc., 2006.

Ordering Information

Orderable Part Number	Description
ZLUSBREF01	USB to SMBus Interface

Revision History

Date	Rev. #	
3/27/2007	0.5	Preliminary Release
4/26/2007	1.0	Final Release

NOTES

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