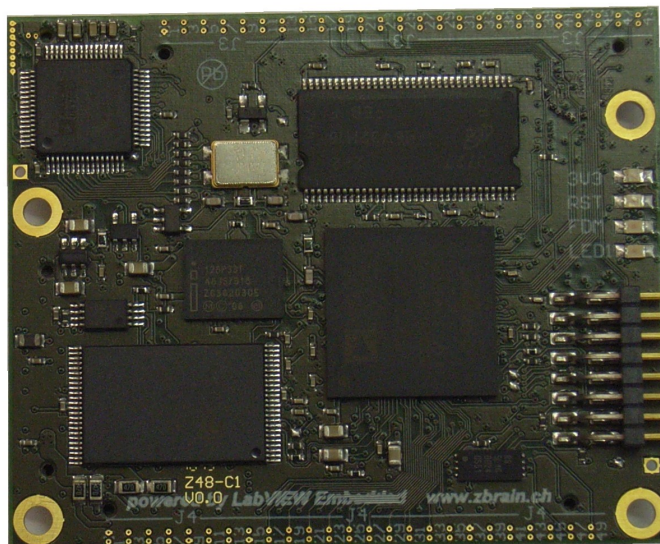


Preliminary

Z48-C1



Mixed Signal Coremodule

Hardware Manual

Issue date: 15.02.2011

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1 Imprint

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Warning: *ESD (electrostatic discharge) sensitive device.
Proper ESD handling required.*

2 Introduction

Z48-C1 is a member of the *Zbrain-System product family*, powered by LabVIEW Embedded.

Z48-C1 is a mixed signal core module, based on the powerful ADSP-BF548 processor. Its *8 analog inputs* feature industrial input range, high input impedance and over voltage protection, which allows for direct connection to real world signals without the need for external circuitry.

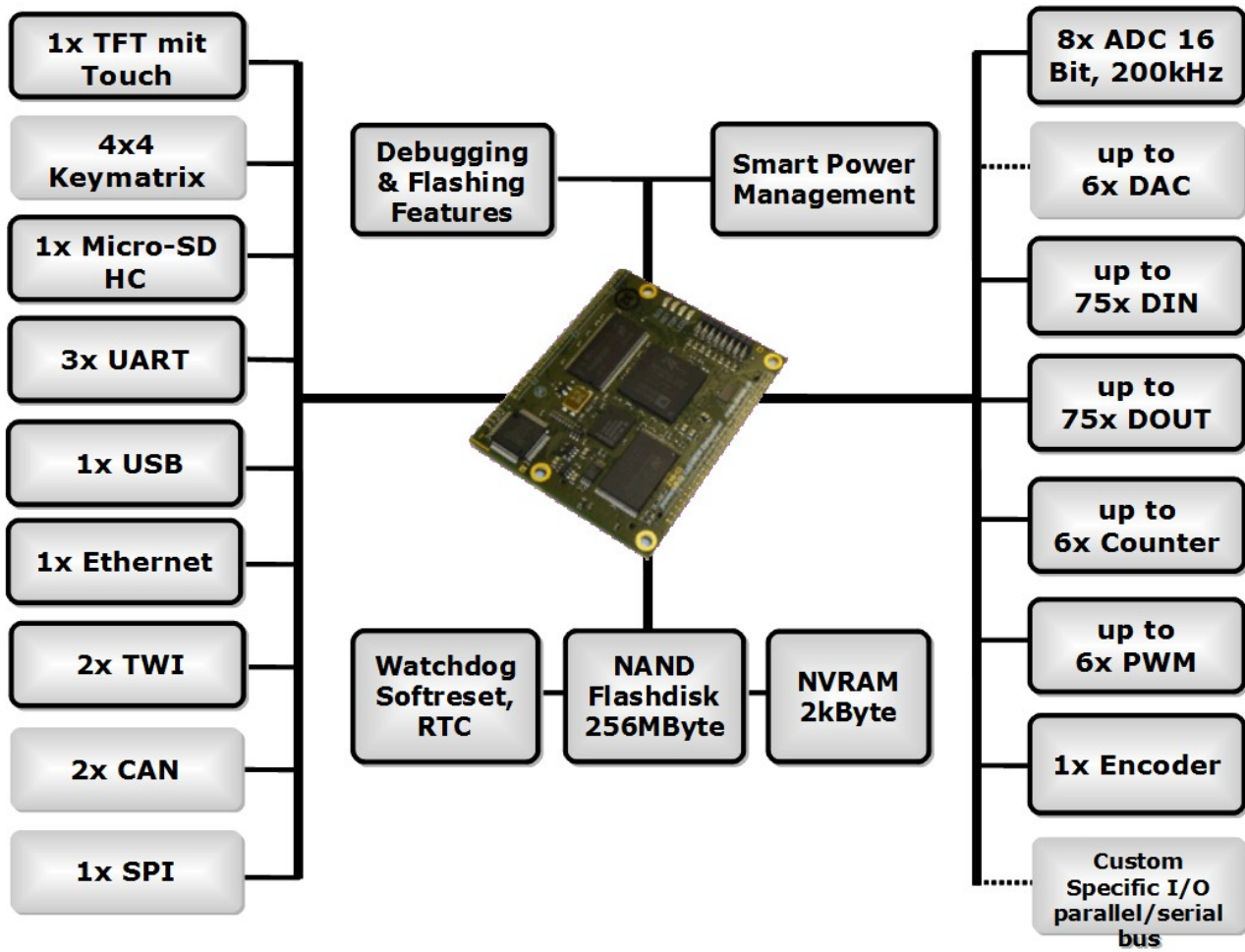
All *digital IO* signals are 3.3V TTL level and need to be driven on the base board.

Integration is very easy thanks to highly reliable 2mm pitch standard connectors, single 3.3V supply, and on board in programming interface.

3 Key Features

- Powered by LabVIEW Embedded (LabVIEW for Microprocessor)
- 525MHz ADSP-BF548 processor
- flexible LCD TFT interface with touch and backlight control
- 256MByte onboard flash disk for LCD graphics
- 8x industrial range analog inputs, protected and filtered
- up to 74 DIO (multiplexed with other functions)
- up to 7 Timer inputs / PWM outputs
- 3x serial UART interfaces (e.g. for RS232, RS485, RS422)
- 2x TWI, 1x SPI
- SD card interface
- Ethernet
- USB
- CAN (not supported yet)
- 4x4 key matrix
- rotary encoder interface
- dynamic power management
- on board test points for analog and digital io

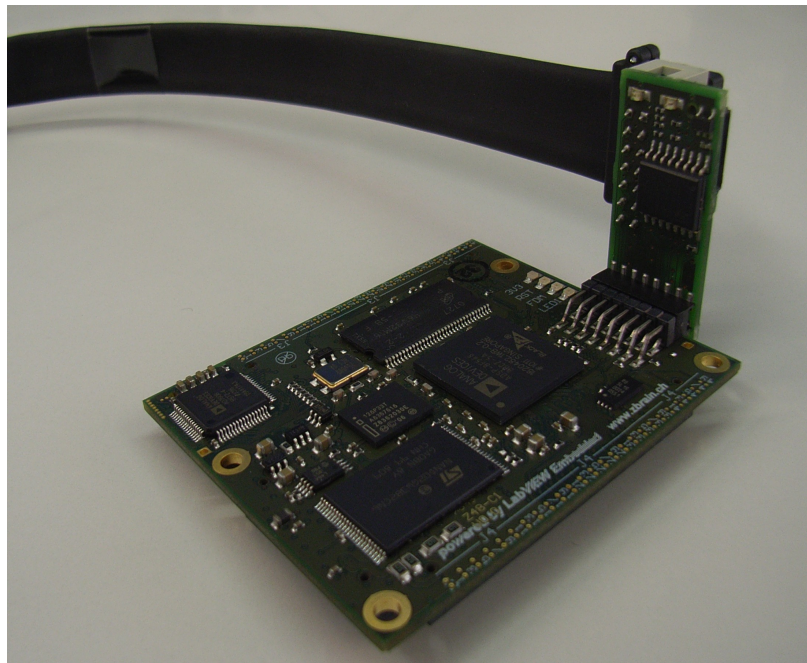
4 Block Diagram



5 Programming

At delivery the board the fast Debug Mode (FDM) interpreter is pre flashed and indicates its activity by toggeling the FDM-LED. If the LED isn't toggeling, the FDM interpreter can be downloaded through the Emulator.

Z48-C1 features a universal programming dongle (ProgDongle) for FDM programming, emulator connection, series production and field updates. This eliminates the need for any additional programming connectors on the base board.

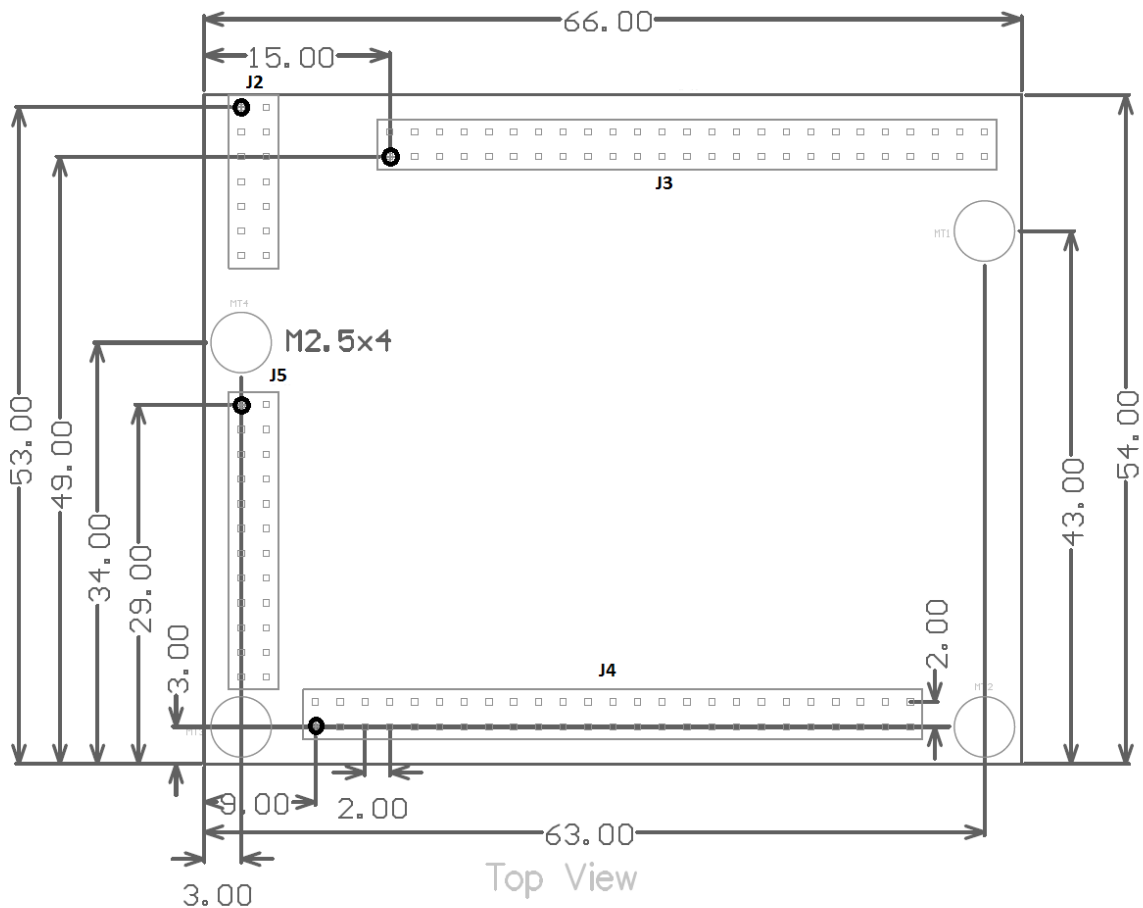


ProgDongle connected to Z48-C1

note: reserve enough space on the baseboard to be able to plug the ProgDongle in and out.

6 Dimensions

TOP VIEW :



notes:

- **Top View**
- dimensions (circles) mark Pin 1
- All dimensions given in mm
- All connections are within **2mm grid**, which allows for easy setups on vero boards

7 Recommended Baseboard Connectors

The connection to the baseboard is achieved through highly reliable SAMTEC SMM series sockets with a *standard pitch of 2.0mm*. These sockets feature "Tiger Eye" 4 point contacts for highest contact reliability.

Recommended baseboard connectors:

Connector	N. of Pins	Through Hole	Surface Mount
J3, J4	50	SAMTEC TMM-125-01-L-D	SAMTEC TMM-125-01-L-D-SM
J2	14	SAMTEC TMM-107-01-L-D	SAMTEC TMM-107-01-L-D-SM
J5	24	SAMTEC TMM-112-01-L-D	SAMTEC TMM-112-01-L-D-SM

(please order any quantity directly at www.samtec.com)

Note:

- Any similar connector can be used, but non SAMTEC TMM series connectors may have longer pins. In this case make sure to use distance holder (Pins should not touch pcb)

Some alternative connectors:

100pol THR : SAMTEC TMM-150-01-G-D (DigiKey [SAM1173-50-ND](#))

100pol SMD: SAMTEC TMM-150-01-G-D-SM (DigiKey [SAM1167-50-ND](#))

14pol : Molex 87758-1416 (farnell [7472358](#))

50pol : Molex 87758-5016 (farnell [7472382](#))

8 Connector Pin Assignment

8.1 Legend

[I]	= Input	pu	= internal pull up
[O]	= Output	pd	= internal pull down
[IO]	= Bidirectional		
AI	= Analog Input	DIO	= Digital IO
TMR	= Timer Input or PWM output	ENC	= Encoder input
TWI	= Two wire interface	UART	= Serial interface
SPI	= SPI interface	CAN	= CAN interface
SD	= SD card interface	KEY	= Keyboard Matrix
ETH	= Ethernet interface	USB	= USB interface
VRTC	= RTC backup input	/MR	= Manual reset input
TOUCH	= Resistive touch panel inputs		

Notes:

- **All pins are TTL 3.3V level, unless noted otherwise**
($I_{max} = 2mA$, NOT short circuit protected, take special care when configuring pins as outputs, $U_{oh} > 2.7V$, $U_{ol} < 0.4V$)
- **All pins except AIN and USB unprotected processor pins**
- **All inputs can be left open**
- Mounting holes are connected to GND. Mounting holes on baseboard can also be connected to GND or left floatend

All programmable IO pins are high impedance during power up and reset. They remain high impedance until defined otherwise by software.

8.2 Connector J2 (Analog)

Pin	Function/Name	notes
J2-1	AI0 [I]	+5V / +-10V Analog Input
J2-2	AI1 [I]	+5V / +-10V Analog Input
J2-3	AI2 [I]	+5V / +-10V Analog Input
J2-4	AI3 [I]	+5V / +-10V Analog Input
J2-5	AI4 [I]	+5V / +-10V Analog Input
J2-6	AI5 [I]	+5V / +-10V Analog Input
J2-7	AI6 [I]	+5V / +-10V Analog Input
J2-8	AIGND [I]	Analog Reference Potential, must be connected to GND or AGND
J2-9	AI7 [I]	+5V / +-10V Analog Input
J2-10	NC	
J2-11	NC	
J2-12	NC	
J2-13	NC	
J2-14	AIGND [I]	Analog Reference Potential, must be connected to GND or AGND

8.3 Connector J3 (Digital I)

Pin	1. Function	2. Function	3. Function	notes
J3-1	GND			
J3-2	DIO0 [IO]			
J3-3	DIO1 [IO]			
J3-4	DIO2 [IO]	TMR A [IO]		
J3-5	DIO3 [IO]	TMR B [IO]		
J3-6	DIO4 [IO]	TMR C [IO]		
J3-7	DIO5 [IO]	TMR D [IO]		
J3-8	DIO6 [IO]	TMR E [IO]		
J3-9	DIO7 [IO]			
J3-10	DIO8 [IO]	ENC CDG [I]	TMR H [IO]	
J3-11	DIO9 [IO]	ENC CUD [I]	TMR I [IO]	
J3-12	DIO10 [IO]	ENC CMZ [I]	SPI1 SEL1 [O]	
J3-13	GND			
J3-14	DIO11 [IO]	TWI0 SCL [O]		5V tolerant
J3-15	DIO12 [IO]	TWI0 SDA [IO]		5V tolerant
J3-16	DIO13 [IO]	TWI1 SCL [O]		5V tolerant
J3-17	DIO14 [IO]	TWI1 SDA [IO]		5V tolerant
J3-18	DIO15 [IO]	UART1 RX [I]		47k pu
J3-19	DIO16 [IO]	UART1 TX [O]		
J3-20	DIO17 [IO]	UART1 RTS [O]	UART1 /RXEN [O]	
J3-21	DIO18 [IO]	UART1 CTS [I]	UART1 TXEN [O]	
J3-22	DIO19 [IO]	UART2 RX [I]		47k pu
J3-23	DIO20 [IO]	UART2 TX [O]		
J3-24	DIO21 [IO]	SPI1 SEL2 [O]		
J3-25	DIO22 [IO]	SPI1 SEL3 [O]		
J3-26	DIO23 [IO]	SPI1 SCK [O]		
J3-27	DIO24 [IO]	SPI1 MISO [I]		
J3-28	DIO25 [IO]	SPI1 MOSI [O]		
J3-29	DIO26 [IO]	CAN0 RX [I]		
J3-30	DIO27 [IO]	CAN0 TX [O]		
J3-31	DIO28 [IO]	CAN1 RX [I]	UART2 /RXEN [O]	
J3-32	DIO29 [IO]	CAN1 TX [O]	UART2 TXEN [O]	
J3-33	DIO30 [IO]	UART3 RX [I]		47k pu
J3-34	DIO31 [IO]	UART3 TX [O]		
J3-35	DIO32 [IO]	UART3 RTS [O]	UART3 /RXEN [O]	
J3-36	DIO33 [IO]	UART3 CTS [I]	UART3 TXEN [O]	
J3-37	VRTC [I]			2.7..3.6V
J3-38	/MR [I]			1k pu
J3-39	VCC (3.3V)			
J3-40	VCC (3.3V)			
J3-41	GND			
J3-42	GND			
J3-43	DIO34 [IO]			
J3-44	DIO35 [IO]	SD /CD [I]		
J3-45	DIO36 [IO]	SD D0 [IO]		
J3-46	DIO37 [IO]	SD D1 [IO]		
J3-47	DIO38 [IO]	SD D2 [IO]		
J3-48	DIO39 [IO]	SD D3 [IO]		
J3-49	DIO40 [IO]	SD CLK [O]		
J3-50	DIO41 [IO]	SD CMD [O]		

8.4 Connector J4 (Digital II)

Pin	1. Function	2. Function	3. Function	Notes
J4-1	ETH TPI- [I]			Pu 47E
J4-2	GND			
J4-3	ETH TPI+ [I]			Pu 47E
J4-4	ETH CTR [IO]			Pu 10E
J4-5	ETH TPO- [O]			Pu 47E
J4-6	ETH LED1 [O]			
J4-7	ETH TPO+ [O]			Pu 47E
J4-8	ETH LED2 [O]			
J4-9	GND			
J4-10	USB VBUS [I]			
J4-11	USB D- [IO]			
J4-12	reserved			
J4-13	USB D+ [IO]			
J4-14	DI042 [IO]	LCD FS1 [O]	PPIO FS1 [IO]	
J4-15	GND			
J4-16	DI043 [IO]	LCD FS2 [O]	PPIO FS2 [IO]	
J4-17	DI044 [IO]	LCD CLK [O]	PPIO CLK [IO]	
J4-18	DI045 [IO]	LCD R0 [O]	PPIO D0 [IO]	
J4-19	DI046 [IO]	LCD R1 [O]	PPIO D1 [IO]	
J4-20	DI047 [IO]	LCD R2 [O]	PPIO D2 [IO]	
J4-21	DI048 [IO]	LCD R3 [O]	PPIO D3 [IO]	
J4-22	DI049 [IO]	LCD R4 [O]	PPIO D4 [IO]	
J4-23	DI050 [IO]	LCD R5 [O]	PPIO D5 [IO]	
J4-24	DI051 [IO]	LCD G0 [O]	PPIO D6 [IO]	
J4-25	DI052 [IO]	LCD G1 [O]	PPIO D7 [IO]	
J4-26	DI053 [IO]	LCD G2 [O]	PPIO D8 [IO]	
J4-27	DI054 [IO]	LCD G3 [O]	PPIO D9 [IO]	
J4-28	DI055 [IO]	LCD G4 [O]	PPIO D10 [IO]	
J4-29	DI056 [IO]	LCD G5 [O]	PPIO D11 [IO]	
J4-30	DI057 [IO]	LCD B0 [O]	PPIO D12 [IO]	
J4-31	DI058 [IO]	LCD B1 [O]	PPIO D13 [IO]	
J4-32	DI059 [IO]	LCD B2 [O]	PPIO D14 [IO]	
J4-33	DI060 [IO]	LCD B3 [O]	PPIO D15 [IO]	
J4-34	DI061 [IO]	LCD B4 [O]	PPIO D16 [IO]	
J4-35	DI062 [IO]	LCD B5 [O]	PPIO D17 [IO]	
J4-36	DI063 [IO]	LCD BL [O]	TMR F [IO]	
J4-37	DI064 [IO]	LCD DE [O]		
J4-38	GND			
J4-39	TOUCH YU			
J4-40	TOUCH YD			
J4-41	TOUCH XR			
J4-42	TOUCH XL			
J4-43	DI065 [IO]	KEY R0 [IO]		
J4-44	DI066 [IO]	KEY R1 [IO]		
J4-45	DI067 [IO]	KEY R2 [IO]		
J4-46	DI068 [IO]	KEY R3 [IO]		
J4-47	DI069 [IO]	KEYC0 [IO]		
J4-48	DI070 [IO]	KEY C1 [IO]		
J4-49	DI071 [IO]	KEY C2 [IO]		
J4-50	DI072 [IO]	KEY C3 [IO]		

8.5 Connector J5 (Processor Data Bus)

Pin	1. Function	2. Function	3. Function	Notes
J5-1	D0 [IO]			
J5-2	D1 [IO]			
J5-3	D2 [IO]			
J5-4	D3 [IO]			
J5-5	D4 [IO]			
J5-6	D5 [IO]			
J5-7	D6 [IO]			
J5-8	D7 [IO]			
J5-9	D8 [IO]			
J5-10	D9 [IO]			
J5-11	D10 [IO]			
J5-12	D11 [IO]			
J5-13	D12 [IO]			
J5-14	D13 [IO]			
J5-15	D14 [IO]			
J5-16	D15 [IO]			
J5-17	/ARE [O]			
J5-18	/AWE [O]			
J5-19	/CS [O]			
J5-20	A1 [O]			
J5-21	A2 [O]			
J5-22	A3 [O]			
J5-23	DIO73 [IO]	TMR G [IO]		
J5-24	DIO74 [IO]	DMARQ1 [I]		

9 Port & Signal Descriptions

Note: All pins are TTL 3.3V level, unless specified otherwise
(Imax = 2mA, NOT short circuit protected, direct processor pins)

Description	Specifications
<p>AI[0..7] Analog In, Voltage Analog Inputs with a software selectable +-5V / +-10V input range Simultaneous Sampling of all 8 channels. Built in 2nd order analog anti aliasing filter (22kHz@-3dB) Software selectable digital filter options (down to 1.5kHz) Samplerate up to 200kHz (DMA)</p> <p>NOTE : AIGND is the reference potential for the analog inputs AI[0..7]. AIGND must be connected to GND or AGND on the baseboard. It must have a potential similar to GND</p>	<p>+-5V, +-10V 16 Bit, simultaneous</p> <p>Input imp typ 1M Ohm OVP -15..+15V temperature stability +-7ppm/°C No missing codes</p>
<p>DIO[0..74] Digital IO standard digital IO pins, direction software controlled</p>	<p>3.3V TTL (see pin assignment)</p>
<p>TMR[A..F] Timer Inputs and Outputs (direction software controlled) PWM output, Measurement input and Counter capability</p>	<p>32Bit, 25Mhz, 20ns resolution</p>
<p>Encoder Interface connects to a quadrature A/B signal encoders, optional with zero marker (ENC CMZ)</p>	
<p>TWI[0..1] Two Wire Interface (I2C-interface) Standard TWI interface for easy IO extensions → both signals need external pull up resistors (2k)</p>	<p>typ 100kbps</p>
<p>UART[1..3] standard asynchronous serial interface supports e.g. RS232, RS485, RS422 or serial USB via FTDI</p> <p>-> use RXEN/TXEN for RS485/422 driver control -> use RTS/CTS for hardware flow control (only UART 1&3)</p>	<p>up to 3Mbaud</p>
<p>SPI Interface interfaces to external SPI devices, e.g. DA converters etc. Up to 3 chip selects</p> <p>CAN[0..1] CAN Interface <i>not implemented yet</i></p> <p>SD card Interface directly interfaces to SD and micro SD cards up to xxGByte. DMA support → class 2 sd cards or higher required → 33E series resistors recommended</p> <p>KEY[0..4] 4x4 key matrix <i>not implemented yet</i></p>	

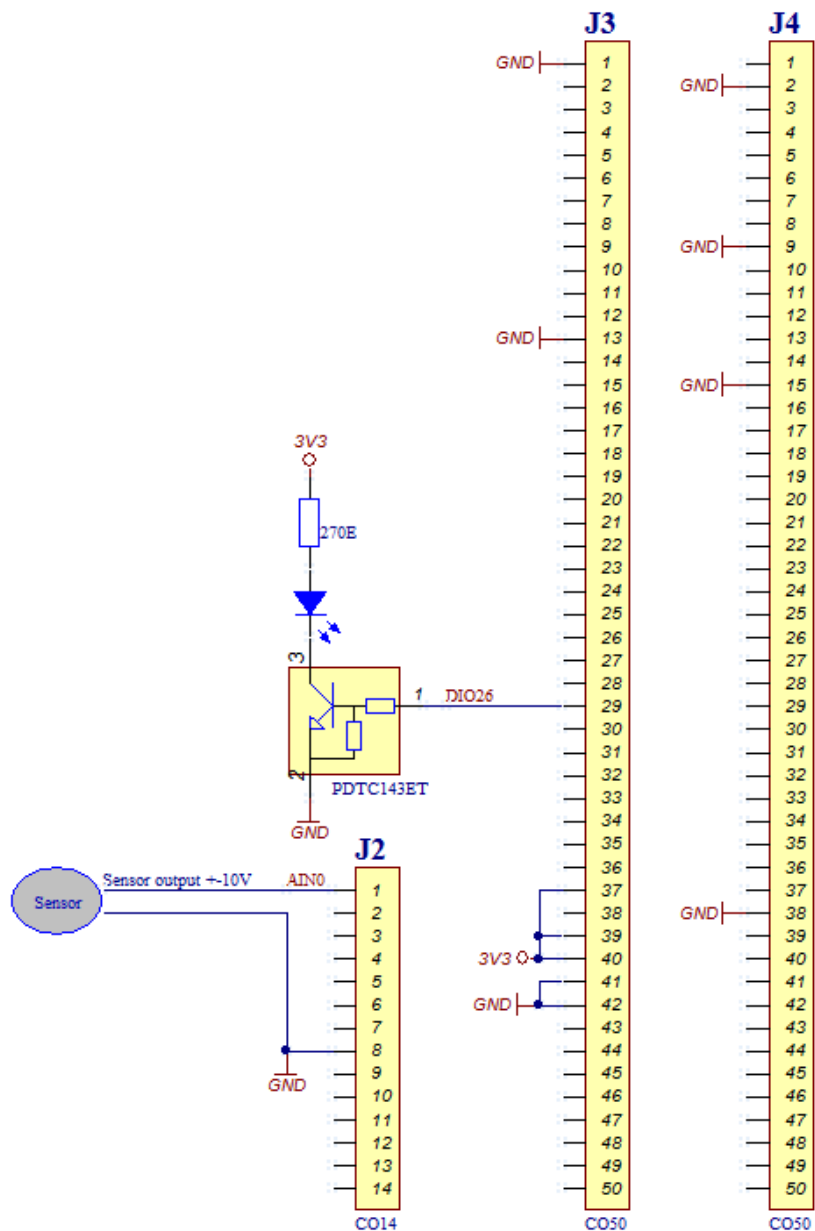
Description	Specifications
<p>Ethernet Interface fully featured ethernet interface with onboard PHY. software setable MAC adress. connects directly to external magnetics.</p> <p>USB Interface slave only onboard protection circuits, connects directly to USB connectors on baseboard</p>	<p>100Mbit only</p> <p>USB 1.0</p>
<p>/MR Manual Reset active low external reset input. (optional) Integrated debouncer circuit. → simply connect an reset button to GND if needed</p>	<p>40ms debounced</p>
<p>VRTC backup battery input backup voltage for internal real time clock, can be connected to a backup battery. (VRTC keeps the RTC running, even if VCC is not present).</p> <p>run time calculation: $t = \text{capacity} / I_{rtc}$</p> <p>battery suggestions: CR2430, distrelec 971592, 1.6 years ER6K, distrelec 970388, 10years</p> <p>note: - no current will be drawn from the backup battery, as long as VCC is present - use an external RTC if lower I_{rtc} (1uA) is required</p>	<p>2.7..3.6V $I_{rtc} = 20\mu A$ typ</p>
<p>VCC power supply input 3.3V use a regulated 3.3V supply</p>	<p>3.3V / 0.8A +-5% max 100mV p-to-p</p>
<p>GND → please connect all GND pins to a GND plane on the base board → If an AGND is used, connect AGND and GND at a single point close to J4</p>	

10 Basic application example

Integration into a custom baseboard is very easy. Just connect VCC (3.3V) to the board and the system is running and ready to go.

Add additional circuitry according to your needs.

In this basic example the Z48-C1 reads an analog sensor and controls an LED.



11 Technical Data

Dimensions	54 x 66 mm
Weight	
Power Supply	3.3V, Typ. 1..3W
Temperature Range Ambient	-20..75°C
Humidity	10..90%, non condensing
ROHS	Compliant
Warranty	2 years product warranty

12 Ordering Information

Z48-C1z

[z = assembly option]
A : standard assembly

Valid Ordering Codes:

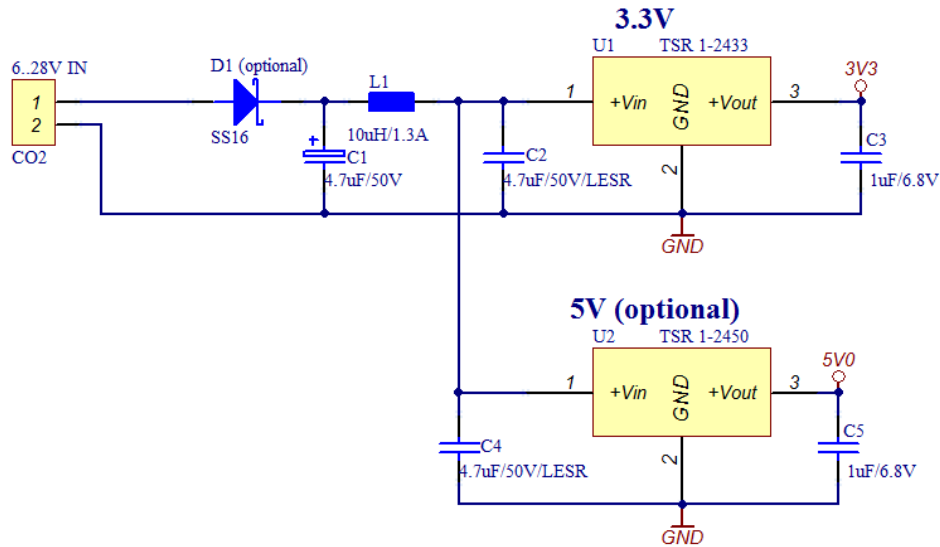
Ordering Code	Processor	AIN	Flash	SDRAM	FRAM
Z48-C1A	BF548, 525Mhz	8x16Bit	16MByte Burst 256MByte NAND	64MByte	2kByte

13 Accessories

Picture	Ordering Code	Description	Availability
	DEV-Z48-C1	Dev-Baseboard for Z48-C1	Q1 2011
	ProgDongle_STD	Programming Dongle	y
	RS232 DSUB adapter cable	RS232 DSUB adapter cable	y

14 Appendix A: Reference Schematics

14.1 Power & VRTC



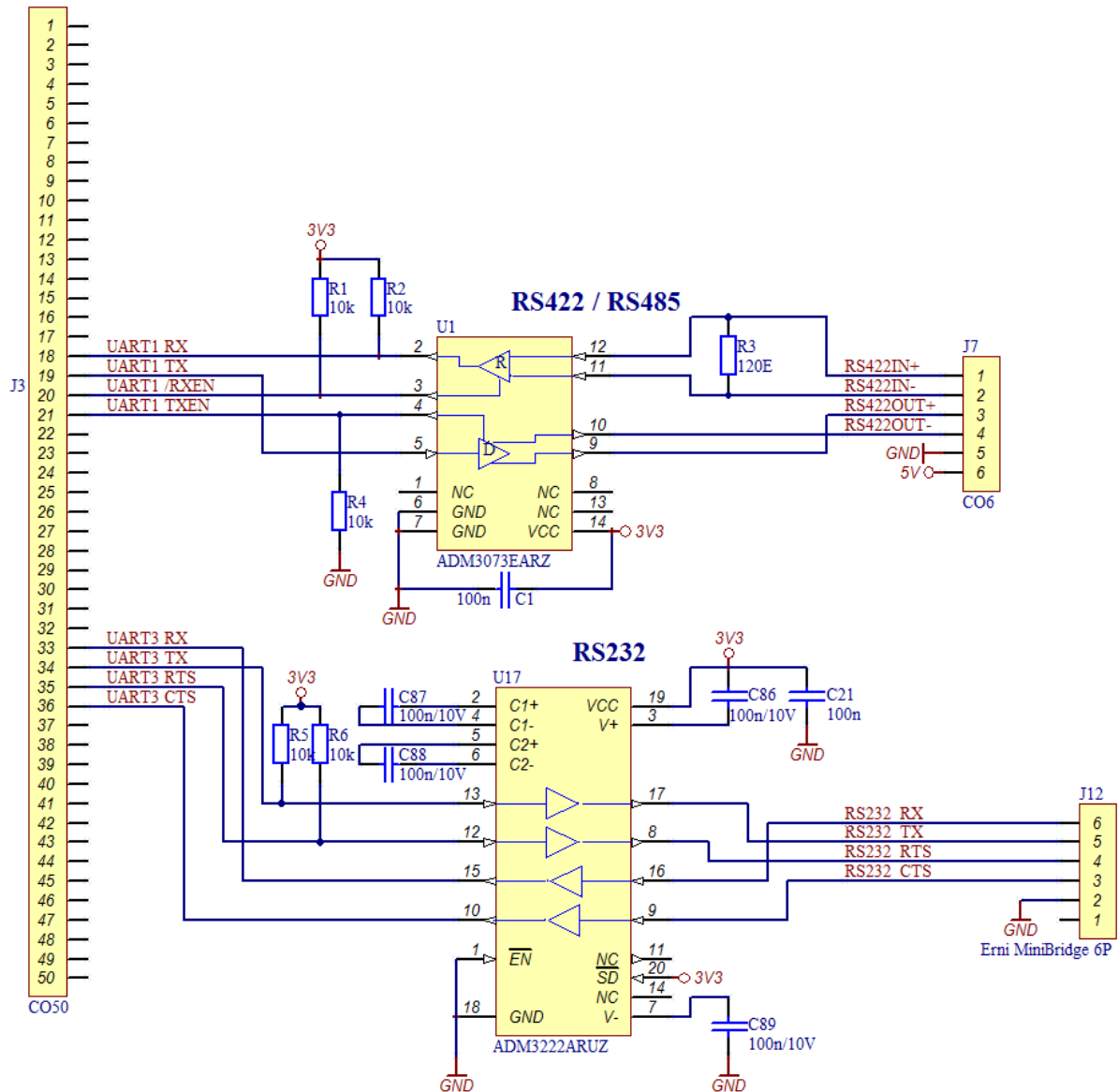
Notes

- C1 is NOT a LESR type. It's a standard elko. LESR types (ceramics) could cause voltage peaks due to line inductivities
- 5V is optional for external circuitry

Key components

U1	TSR 1-2433	DCDC converter 3.3V	TRACO	www.tracopower.com
U2	TSR 1-2450	DCDC converter 5.0V	TRACO	www.tracopower.com
L1	WE-TPC 744042100	coil	Würth	Distrelec 351337
C1	MCGPR35V475M5X11	Elco 4.7uF	Multicomp	Farnell 9451234
C2	MCCA000587	Ceramic 4.7uF	Multicomp	Farnell 1759471
D1	SS16	diode	Multicomp	Farnell 4085167RL

14.2 RS232 / RS422 / RS485



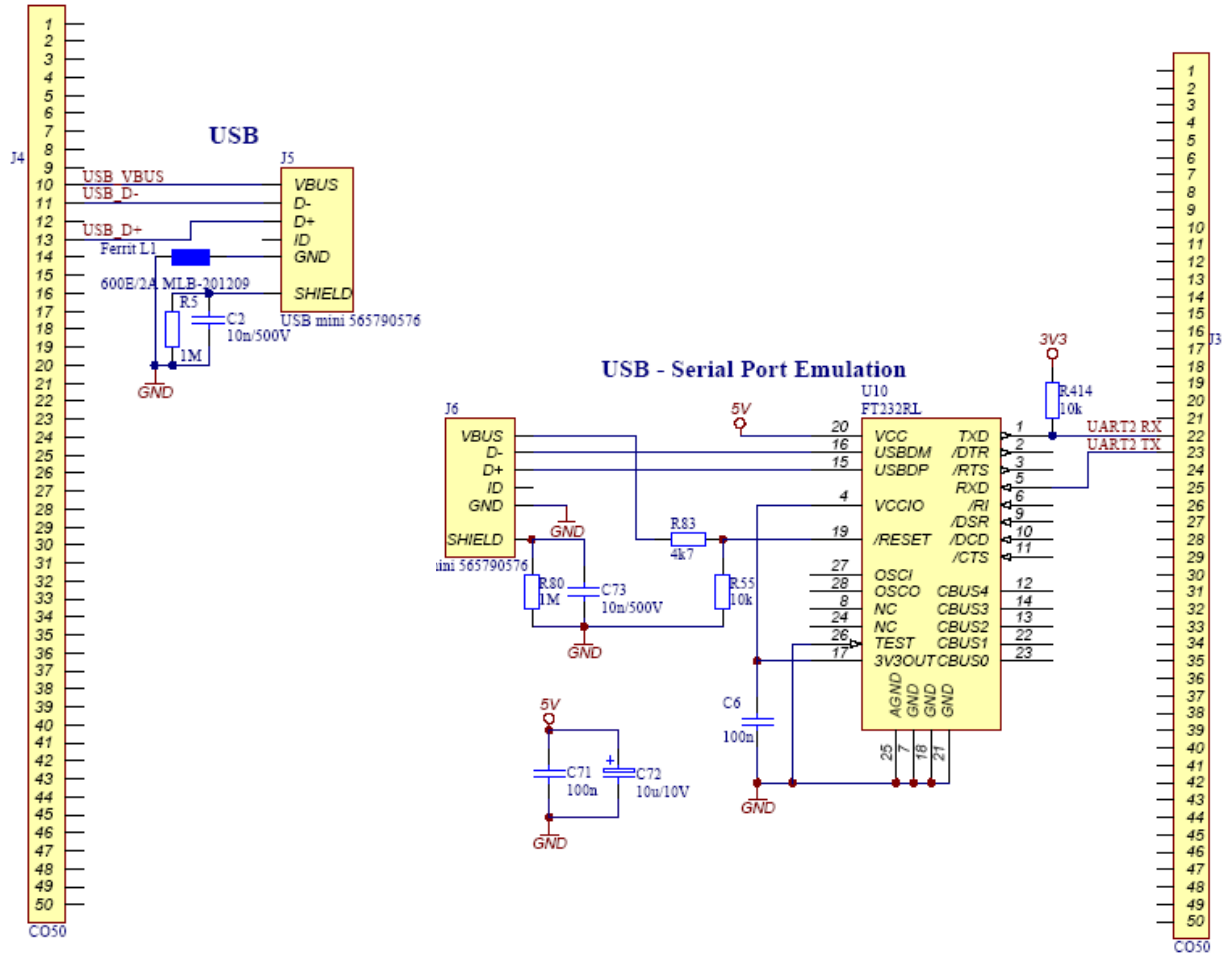
Notes

- The serial RS232 line supports baud rates up to 115k
- The RS422/485 circuit with the ADM3073 supports up to 500kbps.
Use a "non slew rate limited" device such as the ADM3076 (pin compatible) to achieve datarates up to 3Mbps via RS422/485. (EMI noise will be increased)
- R1,2,4,5,6 guarantee defined states when Z48-C1 is in reset (e.g. during power up)
- Connect RS422+ and - lines to turn the RS422 (4wire) bus into a RS485 (2wire) bus

Key components

U1	ADM3073EARZ	RS422/485 driver	Analog Devices	Arrow
U17	ADM3222ARUZ	RS232 driver	Analog Devices	Arrow
J12	Minibridge Connector 6P	RS232 connector (same as on ZMC)	Erni 214013	Www.erni.com

14.3 USB



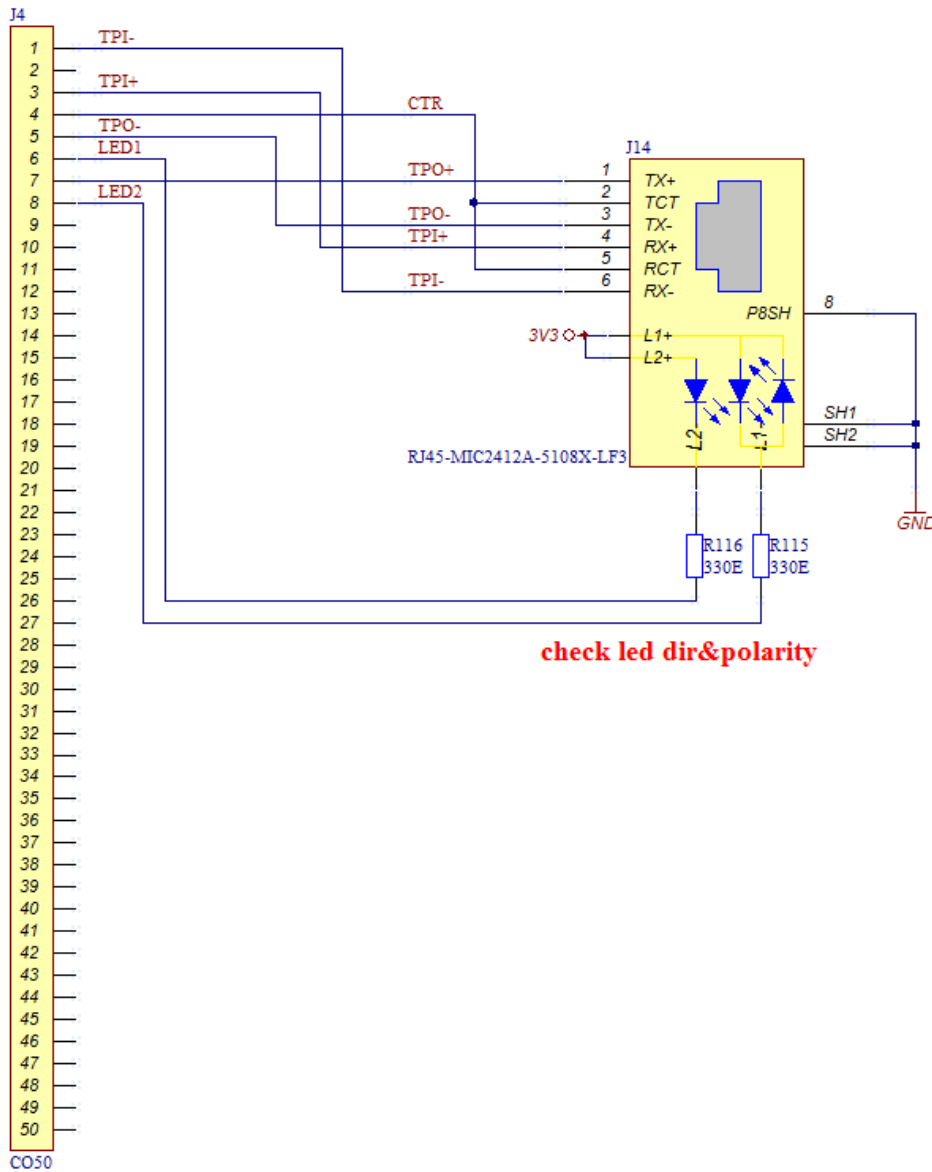
Notes

- The protective circuits of the USB master (left) is provided by the core module
- Use the "true" USB features (left) to realize a mass storage device (access sd card by a logical drive) or USB bulk transfers. The later is not yet supported by the Zbrain SDK.
- Use the "emulated" USB features (right) for easy serial data transmission via USB

Key components

J5/6	MOLEX – 56579-0576	USB mini connector	MOLEX	Farnell 9786490
L1	MLB-201209-0600PN	Ferrite	Kitagawa	Distrelec 330138
U10	FT232RL	USB serial transmitter	FTDI	Reselec AG

14.4 Ethernet



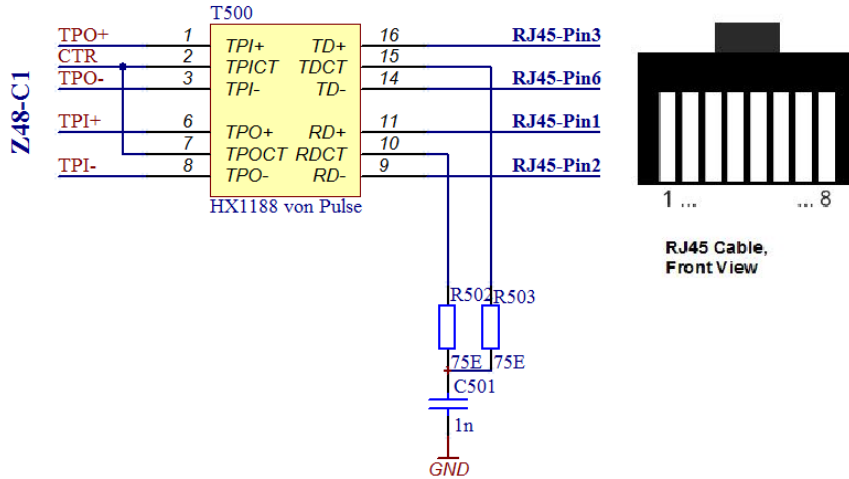
Notes

- keep ethernet traces as short as possible (within 20..40mm)
- route signals as pairs with constant distance, constant width and matched length
- separate each pair from the other
- do not route any other signals in this area
- try to avoid the use of vias
- LED1 and LED2 signals are not critical

Key components

J14	MIC2412A-5108X-LF3	RJ45 connector with integrated magnetics	Würth 7498011241	
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14.5 Ethernet with external magnetics



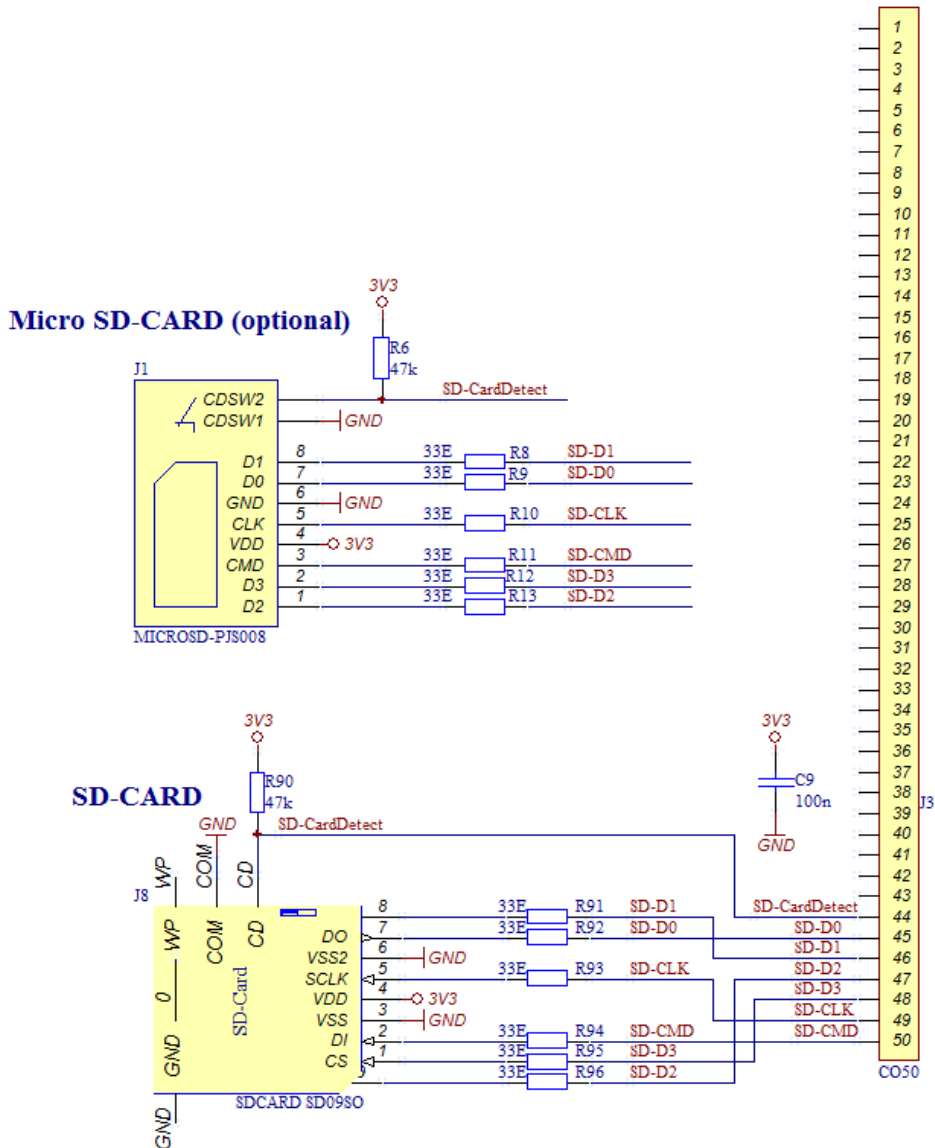
Notes

- Use any connector (RJ45)
- route signals as pairs with constant distance, constant width and matched length
- separate each pair from the other
- do not route any other signals in this area
- try to avoid the use of vias

Key components

T500	HX1188	magnetics	Pulse	
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14.6 SDCard



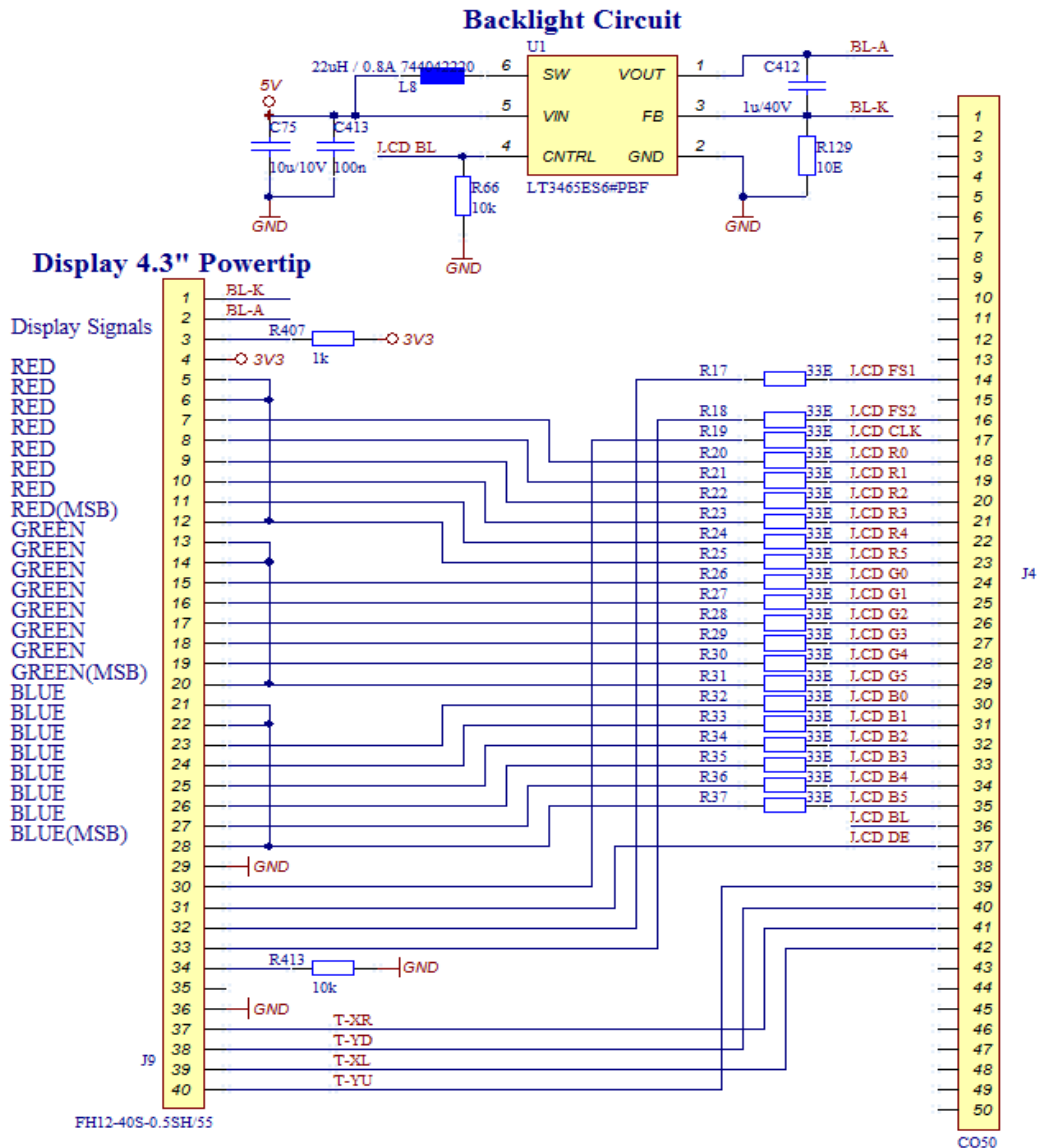
Notes

- route signals as a group
- try to keep traces < 10cm
- CardDetect Signal is optional

Key components

J8	SD09S0	SD card connector	admatec	www.admatec.de
J8	PJS008	Micro SD card connector		Distrelec 650251

14.7 Display 4.3" Powertip PH480272 with Touch



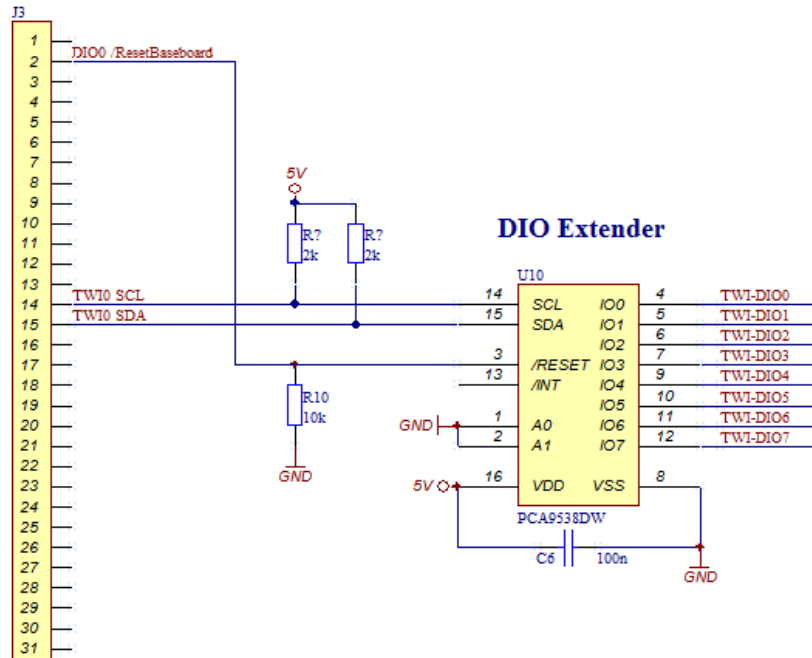
Notes

- Route LCD signals and Touch signals as two separate groups
- Keep backlight signals away from any other signals
- Trace length greatly effects EMI radiation, try to keep trace length <10cm
- The 33E series resistors R[17..37] help to reduce EMI radiation. 33E is a good starting point, but this may vary depending on application. Locate this resistors right next to J4

Key components

J9	FH12-40S-0.5SH/55	Display connector	HIROSE	Farnell 1324556
LCD	PH480272T-005	Display 4.3"	Powertip	Hutmacher&Schlund
U1	LT3465ES6#PBF	Backlight Driver	Linear Technology	Farnell 1226269
L8	22uH/0.8A	Coil	Würth 744042220	Distrelec 351338

14.8 Digital IO Extender (TWI)



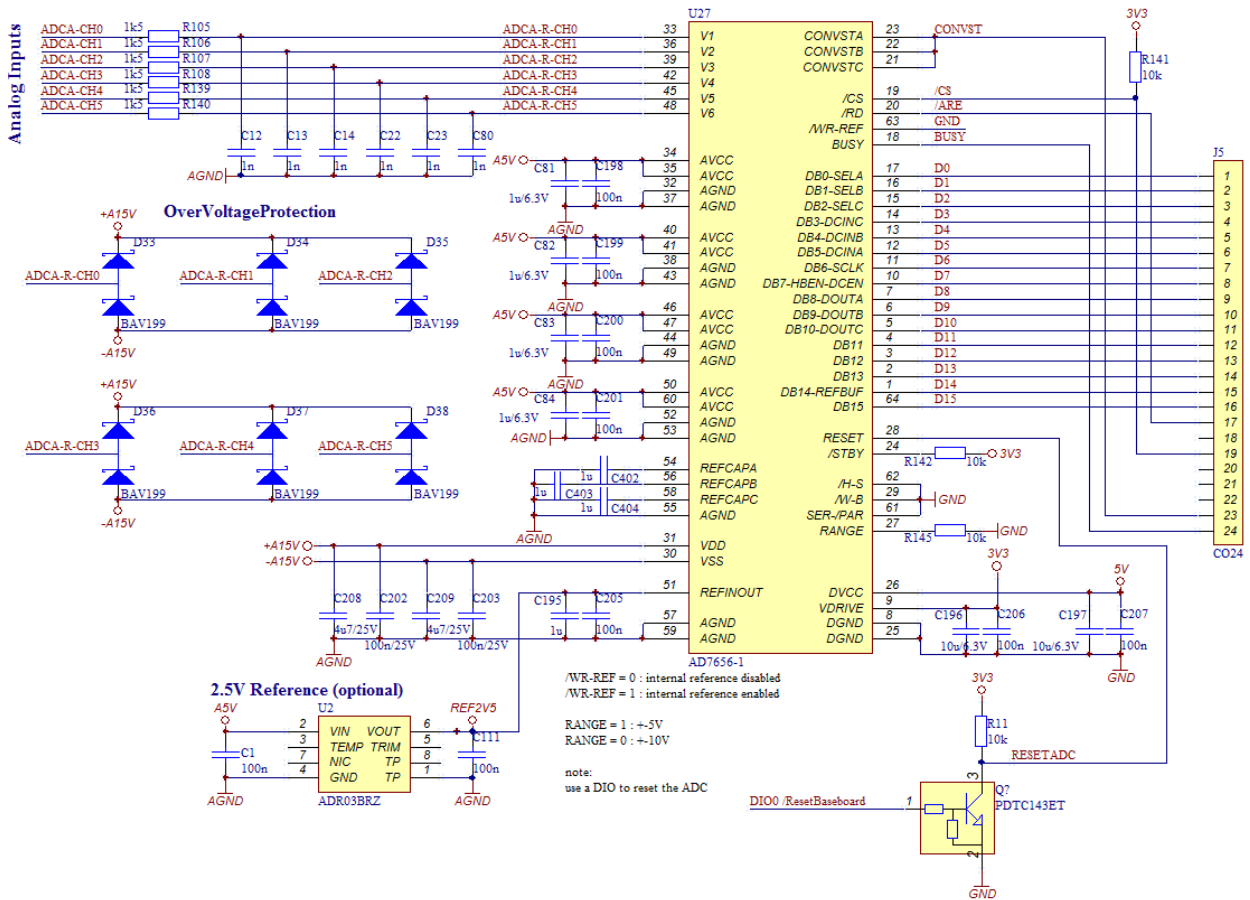
Notes

- For easiest integration, 4 devices in total can be placed on the I2C bus. Each device is then addressed by hardware (pullup, pulldown) on the A0/A1 address pins.
- Alternatively, the A0/A1 can be used as chip selects to address the device programmatically. Either GPIO pin can be used. The addressing scheme is in the responsibility of the application programmer.
- The DIO extender itself can be used as an addressing device to programmatically select cascaded devices.

Key components

U10	PCA9538DW	Texas Instruments	
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14.9 Offboard 6x Highspeed Analog IN



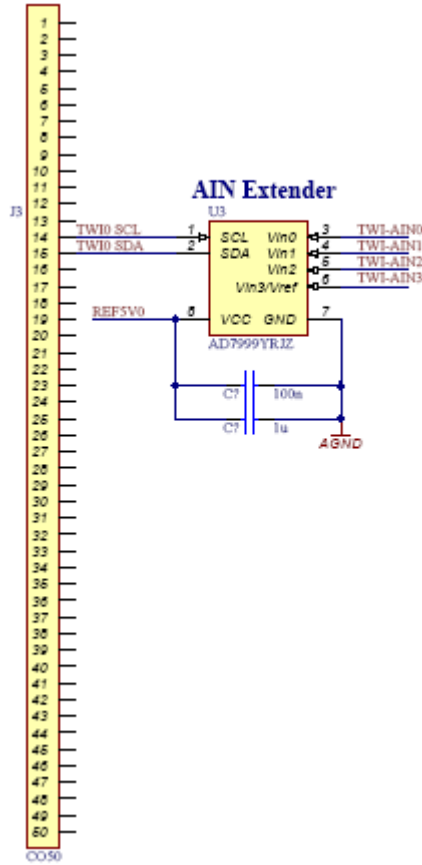
Notes

- Datarates up to 200kHz
- Keep interface lines to J5 as short as possible (< 20mm)
- Make sure all supplies (3.3V, 5V, +-15) are applied simultaneously
- The range pin switches between +/-5V and +/-10V and can either be hardwired or linked with a GPIO pin.
- The 2.5V reference can be removed, if /WR-REF is set to 1
- Connect AGND and DGND at a single point, in copper or by using a 0E resistor
- RESETADC can controlled by any GPIO pin. In this example its controlled by inverting the /ResetBaseboard signal e.g. used for the TWI circuits.

Key components

U27	AD7656-1 (16Bit) AD7657-1 (14Bit)	Analog Digital Converter	Analog Devices
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14.10 Analog IN Extender (TWI)



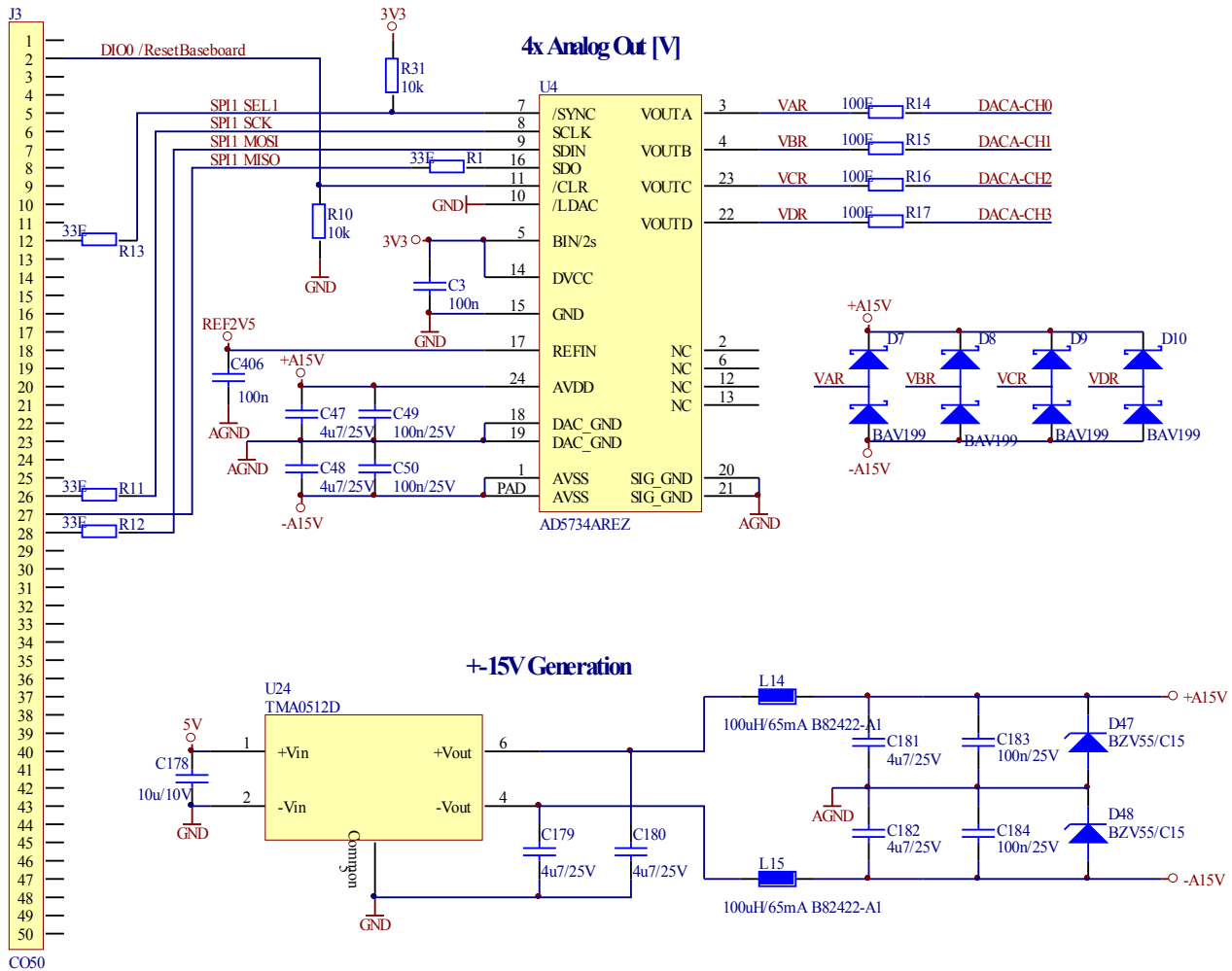
Notes

- Data rates up to 500Hz
- For easy AIN extension connect either one or a combination of the AD799X family to the TWI bus
- The AD7999x family features low-power ADC's in a 8-Lead SOT-23 package
- Each part operates from a single 3.0V to 5.5V power supply. AIN ranges from [GND...VCC]. A reference voltage can be used to supply the part.
- AD7991 and AD7995 come in two versions and each version has an individual I2C address. This allows two of the same devices to be connected to the same I2C bus.
- AD7999 comes only in one address version
- Note that the TWI lines must be pulled up by 2k (in this manual the pullups are located at the digital TWI extension, refer to chapter 9.7)

Key components

U3	AD7999YR1Z-1 (8Bit) AD7995YR1Z-0 (10Bit) AD7995YR1Z-1 (10Bit) AD7991YR1Z-0 (12Bit) AD7991YR1Z-1 (12Bit)	Analog Devices	Arrow
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14.11 Analog +/-10V on SPI Bus



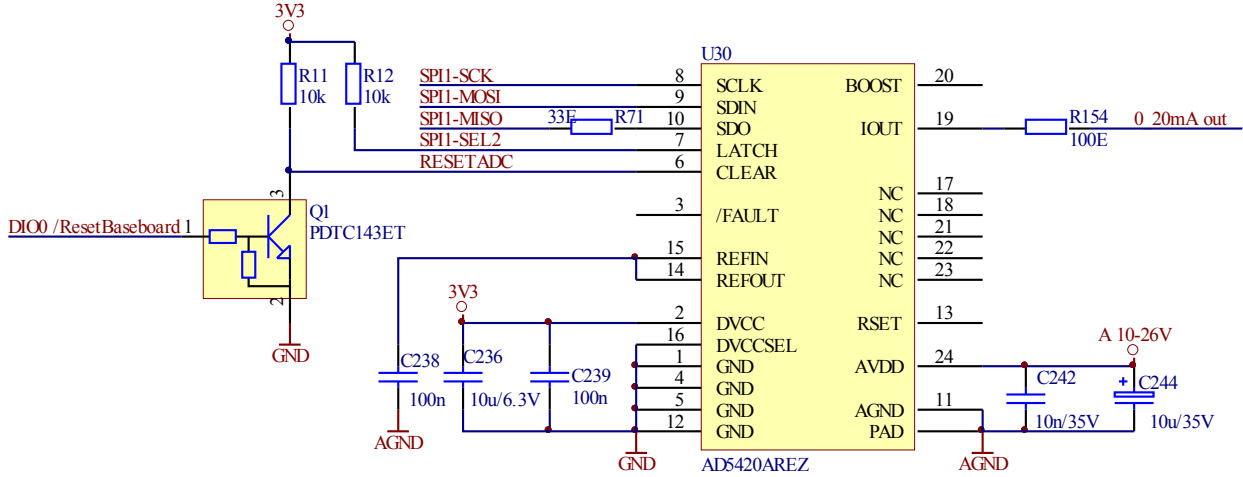
Notes

- 2.5V reference needed
- Software selectable output ranges
- keep SPI lines short, route them as a group
- locate R1 close to U4
- locate R11, R12, R13 close to J3

Key components

U4	AD5734RBREZ	Analog Devices	Arrow
D7-10	BAY199	Infineon, NXP, ON Semiconductor	

14.12 Analog Out 0..20mA on SPI Bus



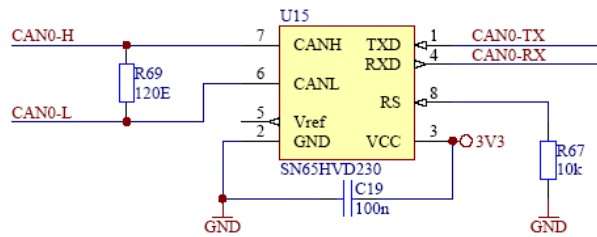
Notes

- Use same Reset-Circuit as Analog In HS
- Use 33E series resistors in SCK, MOSI and SEL line from previous circuit
- Software selectable output ranges
- Use SPI1-SEL3 for a second channel
- keep SPI lines short, route them as a group
- locate R71 close to U30

Key components

U30	AD5420AREZ	Analog Devices	Arrow
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14.13 CAN



Notes

- no software support for CAN in current Zbrain_SDK yet

Key components

U15	SN65HVD230		
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15 Product Anomalies

Version	Changes
V0.0	ADC supply incorrect

16 Product Changes

Version	Changes
V0.1	

17 Document Revision History

Date		Revision
02.02.11	ab	Preliminary release
14.02.11	ab	Product Changes and Anomalies added

18 Contact Information

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