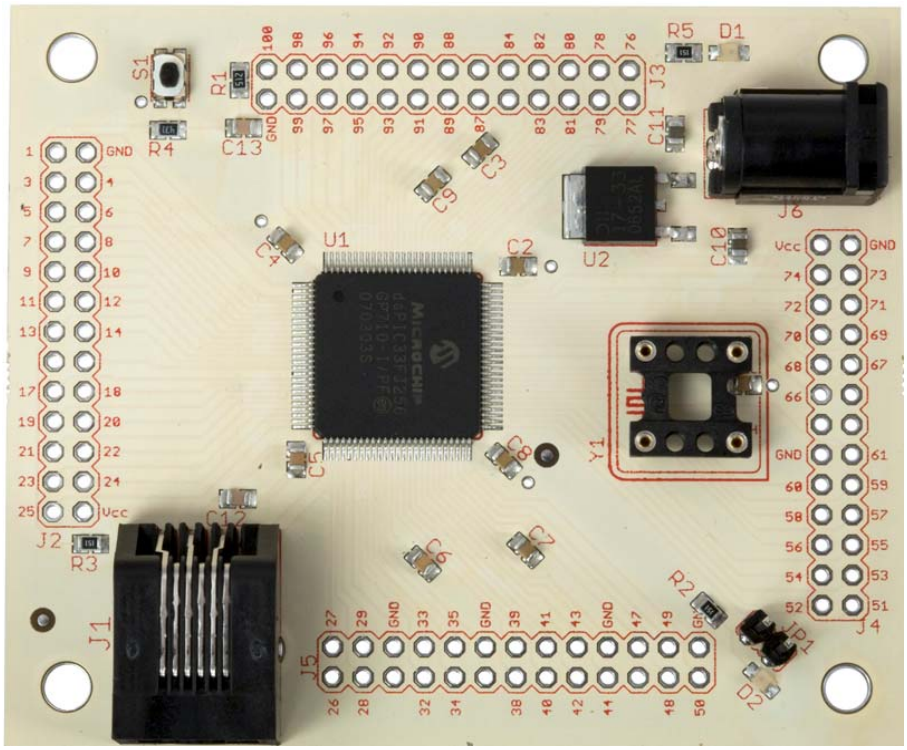
DKSB1001B

dsPIC33 Breakout Board

02 July 2009

Features

- Microchip DSPIC33FJ256GP710-I/PF-ND
- Small footprint: 3.1” x 2.5”
- Half-size DIP oscillator socket
- All I/O pins available
- Extra power pins available
- Large input voltage range: 5V-15V
- Indicator LED for programming checks
- RJ-11 jack for ICD2 programming and debugging
- MCLR on external switch or pin



Quick Start

The board can be programmed with the "blink" program. This program implements a delay routine that toggles Port F, pin 3. The frequency of the loop is approximately 1Hz for the LED signal. The program is designed to test the programmability of the chip and minimally test its operation. This program can be re-installed at any time and is available on Digi-Key's website. The "blink" program is also included in Appendix A.

Functional Description

The DKSB1001B is a break out board for Microchip's dsPIC33 in a 100 pin TQFP. This board offers developers access to a high pin count, small package part, while maintaining maximum flexibility. Each microcontroller pin has its own external output pin on the board. Every I/O is accessible via the unpopulated 0.1" headers.

Power

The 5V regulator has large input range of 5-15VDC. It can supply a maximum of 1.0A.

LEDs

The board has two LEDs. D1 is a power indicator. D2 is a general purpose LED available to the developer. Removing JP1 disconnects D2 from the microcontroller's I/O pin.

Reset

The on-board master reset S1 allows for easy restart of applications. A reset pin is also available on header J2.

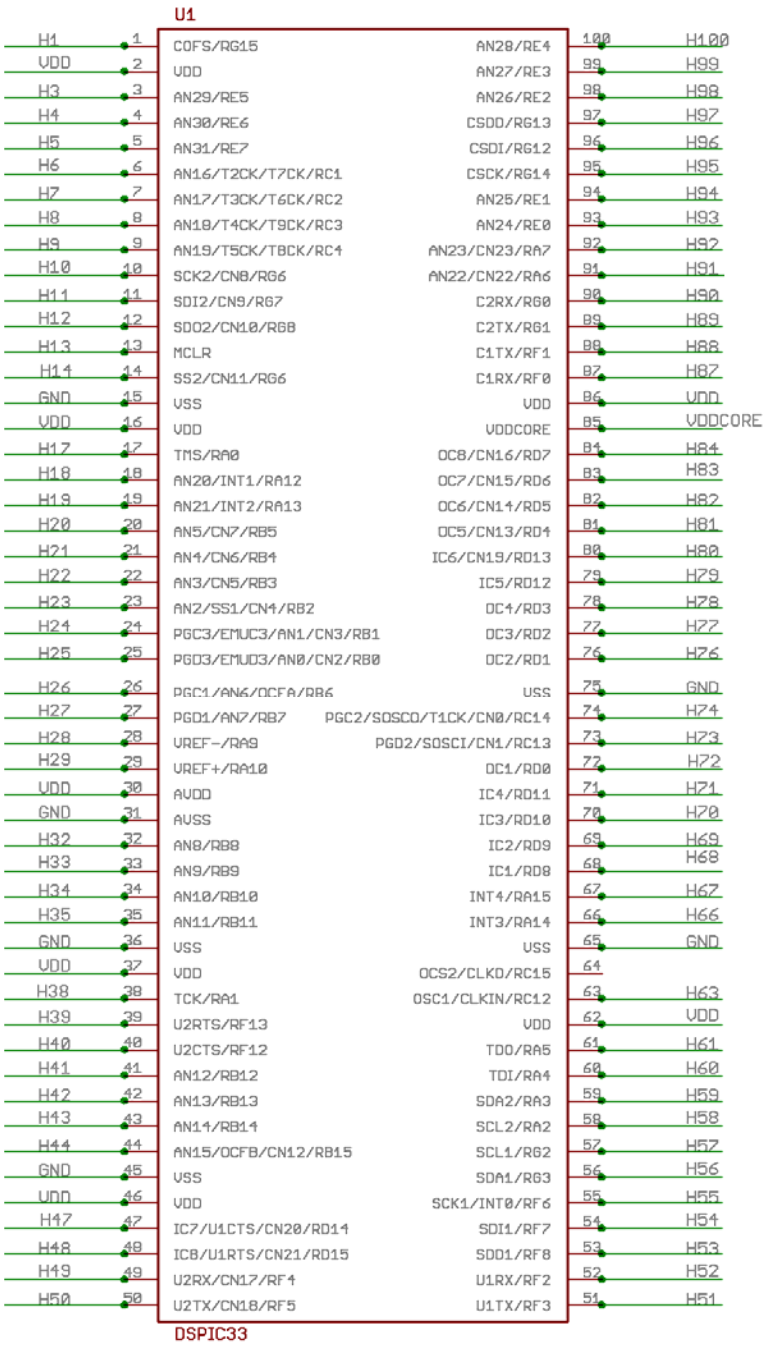
Oscillator

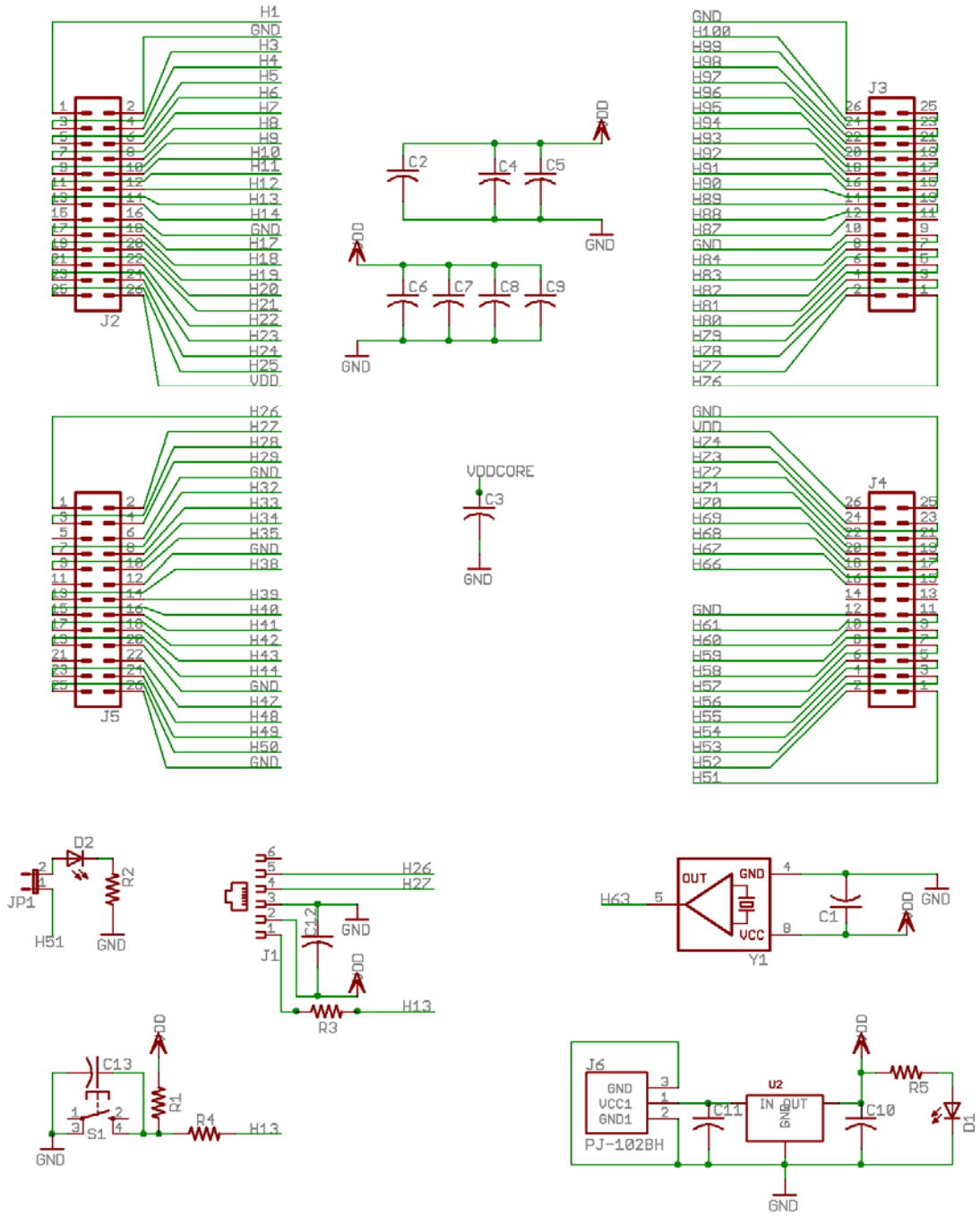
Since it has an internal oscillator, the microcontroller can operate without an external oscillator. However, an external half-size DIP oscillator socket is provided for applications that require precision clocking. Oscillator frequencies up to 50 MHz are available from Digi-Key.

Programming and Debugging

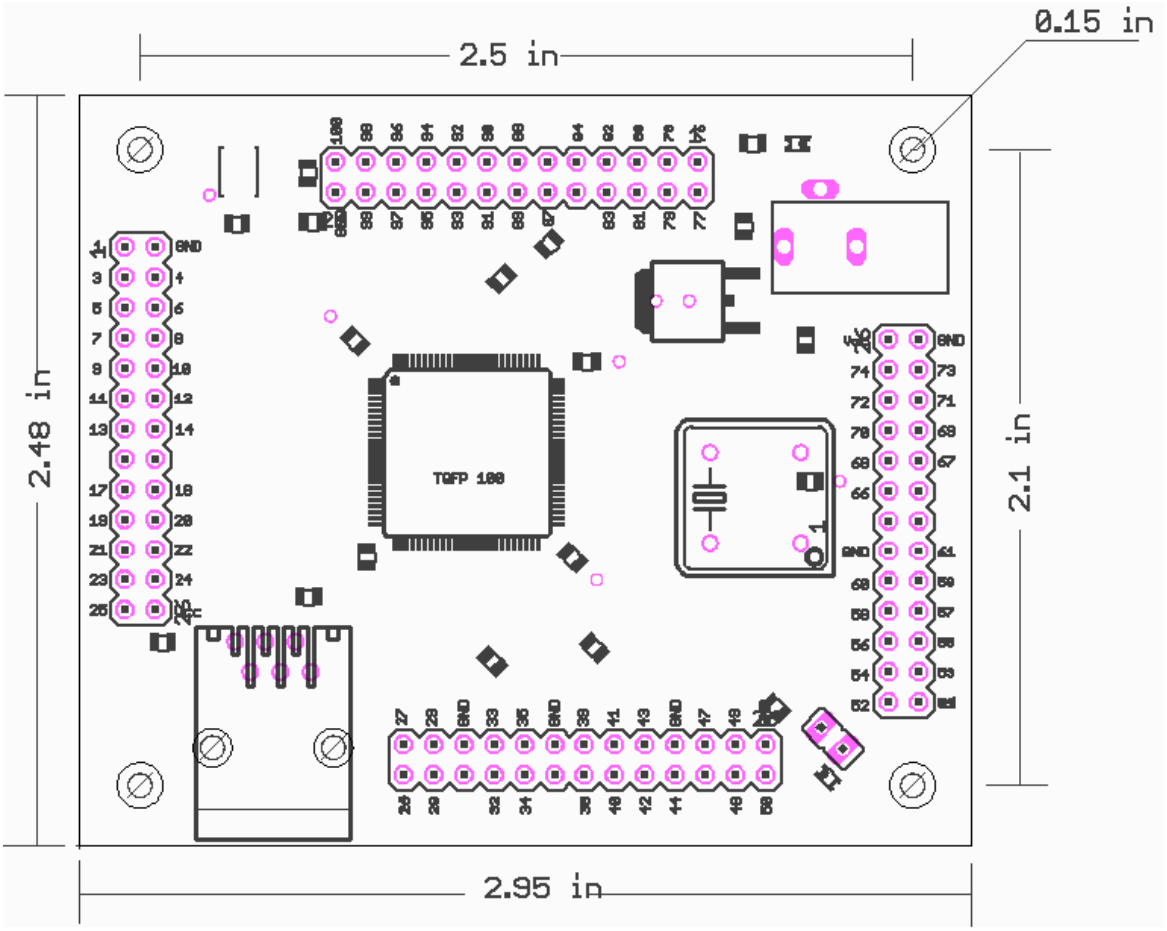
The board employs an RJ-11 socket for programming and debugging with Microchip's standard development tools.

Schematics


U1
H1 1 COFS/RG15
VDD 2 VDD
H3 3 AN29/RE5
H4 4 AN30/RE6
H5 5 AN31/RE7
H6 6 AN16/T2CK/T7CK/RC1
H7 7 AN17/T3CK/T6CK/RC2
H8 8 AN18/T4CK/T9CK/RC3
H9 9 AN19/T5CK/T8CK/RC4
H10 10 SCK2/CN8/RG6
H11 11 SDI2/CN9/RG7
H12 12 SDO2/CN10/RG8
H13 13 MCLR
H14 14 SS2/CN11/RG6
GND 15 VSS
VDD 16 VDD
H17 17 TMS/RA0
H18 18 AN20/INT1/RA12
H19 19 AN21/INT2/RA13
H20 20 AN5/CN7/RB5
H21 21 AN4/CN6/RB4
H22 22 AN3/CN5/RB3
H23 23 AN2/SS1/CN4/RB2
H24 24 PGC3/EMUC3/AN1/CN3/RB1
H25 25 PGD3/EMUD3/AN0/CN2/RB0
H26 26 PGC1/AN6/OCFA/RB6
H27 27 PGD1/AN7/RB7
H28 28 VREF-/RA9
H29 29 VREF+/RA10
VDD 30 AVDD
GND 31 AVSS
H32 32 AN8/RB8
H33 33 AN9/RB9
H34 34 AN10/RB10
H35 35 AN11/RB11
GND 36 VSS
VDD 37 VDD
H38 38 TCK/RA1
H39 39 U2RTS/RF13
H40 40 U2CTS/RF12
H41 41 AN12/RB12
H42 42 AN13/RB13
H43 43 AN14/RB14
H44 44 AN15/OCFB/CN12/RB15
GND 45 VSS
VDD 46 VDD
H47 47 IC7/U1CTS/CN20/RD14
H48 48 IC8/U1RTS/CN21/RD15
H49 49 U2RX/CN17/RF4
H50 50 U2TX/CN18/RF5
AN28/RE4 100 H100
AN27/RE3 99 H99
AN26/RE2 98 H98
CSDO/RG13 97 H97
CSDI/RG12 96 H96
CSCK/RG14 95 H95
AN25/RE1 94 H94
AN24/RE0 93 H93
AN23/CN23/RA7 92 H92
AN22/CN22/RA6 91 H91
C2RX/RG0 90 H90
C2TX/RG1 89 H89
C1TX/RF1 88 H88
C1RX/RF0 87 H87
VDD 86 VDD
VDDCORE 85 VDDCORE
OC8/CN16/RD7 84 H84
OC7/CN15/RD6 83 H83
OC6/CN14/RD5 82 H82
OC5/CN13/RD4 81 H81
IC6/CN19/RD13 80 H80
IC5/RD12 79 H79
OC4/RD3 78 H78
OC3/RD2 77 H77
OC2/RD1 76 H76
VSS 75 GND
PGC2/SOSCO/T1CK/CN0/RC14 74 H74
PGD2/SOSCI/CN1/RC13 73 H73
OC1/RD0 72 H72
IC4/RD11 71 H71
IC3/RD10 70 H70
IC2/RD9 69 H69
IC1/RD8 68 H68
INT4/RA15 67 H67
INT3/RA14 66 H66
VSS 65 GND
OCS2/CLKO/RC15 64
OSC1/CLKIN/RC12 63 H63
VDD 62 VDD
TDO/RA5 61 H61
TDI/RA4 60 H60
SDA2/RA3 59 H59
SCL2/RA2 58 H58
SCL1/RG2 57 H57
SDA1/RG3 56 H56
SCK1/INT0/RF6 55 H55
SDI1/RF7 54 H54
SDO1/RF8 53 H53
U1RX/RF2 52 H52
U1TX/RF3 51 H51
DSPIC33


J2
J3
J4
J5
C2
C3
C4
C5
C6
C7
C8
C9
VDDCORE
VDD
GND
D2
JP1
R2
J1
C12
R3
C13
R1
S1
R4
Y1
C1
J6
PJ-102BH
U2
C11
C10
R5
D1

Layout



Bill of Materials

Ref Des	Part No.	Description	Manufacturers #
U1	DSPIC33FJ256GP710-I/PF-ND	Microchip dsPIC or PIC24 in 100pin 14X14mm	DSPIC33FJ256GP710-I/PF
J6	CP-102BH-ND	CONN PWR JACK 2.5X5.5MM HIGH CUR	PJ-102BH
U2	AP1117D33LDICT-ND	IC REG LDO 1.0A 3.3V TO-252	AP1117D33L-13
Y1	A463-ND	OSCILLATOR SOCKET HALF SIZE 4PIN	1108800
S1	401-1426-1-ND	SWITCH TACT SPST-NO 120GF GW	KMR211GLFS
D1,D2	L71514CT-ND	LED 637NM RED DIFF SMD 0805	CMDA5AR7D1S
J1	A31422-ND	CONN MOD JACK 6-6 RT/A PCB 50AU	5555165-1
JP1	WM8072-ND	CONN HEADER 2POS .100" STR TIN	90120-0122
C1,C2,C3,C4,C5 ,C6,C7,C8,C9	399-1284-1-ND	CAP 1.0UF 16V CERAMIC X7R 0805	C0805C105K4RACTU
C10,C11	587-1295-1-ND	CAP CER 10UF 16V X5R 0805	EMK212BJ106KG-T
C12,C13	PCC1812CT-ND	CAP .1UF 16V CERAMIC X7R 0805	ECJ-2VB1C104K
R1	311-5.1KARCT-ND	RES 5.1K OHM 1/8W 5% 0805 SMD	RC0805JR-075K1L
R2,R3,R5	P150ACT-ND	RES 150 OHM 1/8W 5% 0805 SMD	ERJ-6GEYJ151V
R4	311-470ARCT-ND	RES 470 OHM 1/8W 5% 0805 SMD	RC0805JR-07470RL
JS1	S9001-ND	CONN JUMPER SHORTING GOLD FLASH	SPC02SYAN

Appendix A: Sample Blinking Code

```
/************************************************************************
* File Name:        DKSB1001B.c
* Dependencies:   p33FJ256GP710.h
* Processor:        dsPIC33
* Compiler:         MPLAB® C30 v2.01 or higher
*
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*
* REVISION HISTORY:
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
* Author            Date      Comments on this revision
*~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
*   JP              3/15/07    simple blinker
************************************************************************/

#include "p33FJ256GP710.h"
#include "delay.h"

_FGS(GWRP_OFF & GCP_OFF);
_FOSCSEL(FNOSC_FRC);
_FOSC(FCKSM_CSDCMD & OSCIOFNC_OFF & POSCMD_XT);
_FWDT(FWDTEN_OFF);

int main ( void )
{

     /* set LED pins (RF3) as outputs */
     TRISF = 0xFFF7;

    /* Infinite Loop */
    while ( 1 )
    {
     PORTFbits.RF3 = !PORTFbits.RF3;
     Delay(300);
     };
}
```

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