DLP Design

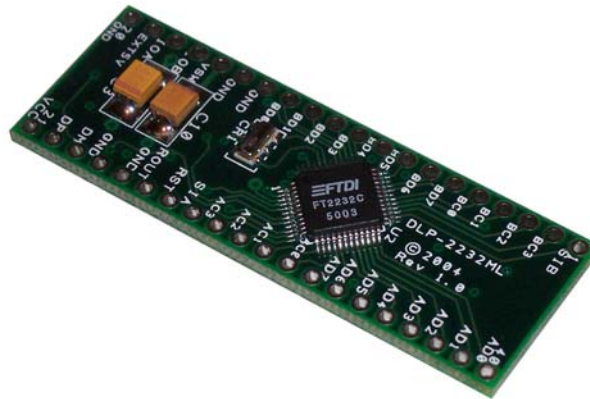**DLP-2232ML-G LOW-PROFILE USB MODULE**

* Lead Free *

1.0 Introduction

The DLP-2232ML-G utilizes FTDI's third-generation USB UART/FIFO I.C., the FT2232D. This low-cost, RoHS compliant development tool features two Multi-Purpose UART/FIFO controllers that can be configured individually in several different modes. In addition to the UART interface, FIFO interface, and Bit-Bang IO modes of the second-generation FT232BM and FT245BM devices, the FT2232D offers a variety of additional modes of operation including a Multi-Protocol Synchronous Serial Engine interface designed specifically for synchronous serial protocols such as JTAG and SPI bus.

The DLP-2232ML-G features a quality four-layer printed circuit board with a solid ground plane, an integral 93C56 EEPROM on board for easy OEM customization and a standard 40-pin, 0.6in wide footprint. Integral power control and on-board MOSFET power switch make the DLP-2232ML-G a perfect choice for USB bus-powered, high-power designs as well as self- and low-powered products.

NOTE: With the exception of the mechanical connectors, mechanical dimensions and the host connection interface signals, the DLP-2232ML-G and DLP-2232M-G are the same product. The supporting electronics for the USB connector are already on the DLP-2232ML-G board, just add a type B connector to your design and you're ready to go.

For a complete list of features and specifications please refer to the datasheet for the DLP-2232M-G.
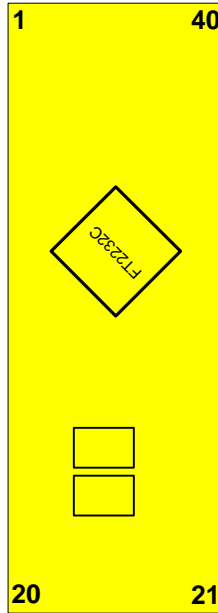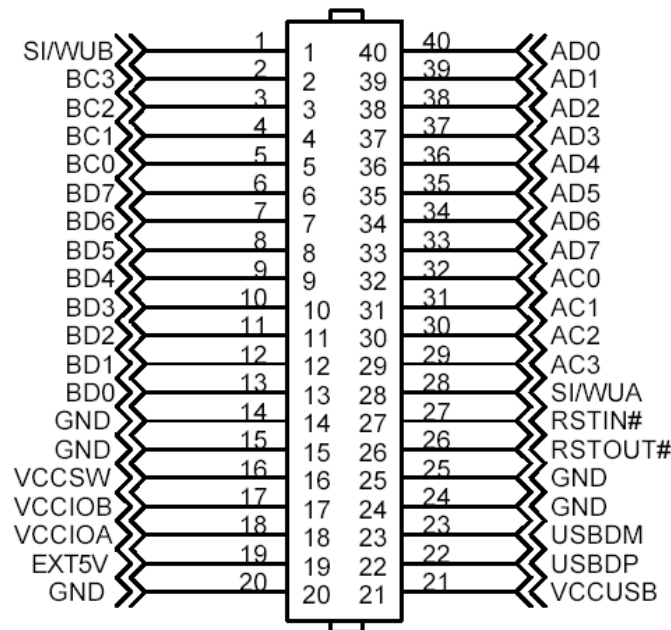
2.0 Module Pin-Out

Figure 2.   Pin-Out (40 Pin DIP Header)

2.1 Pin Definitions
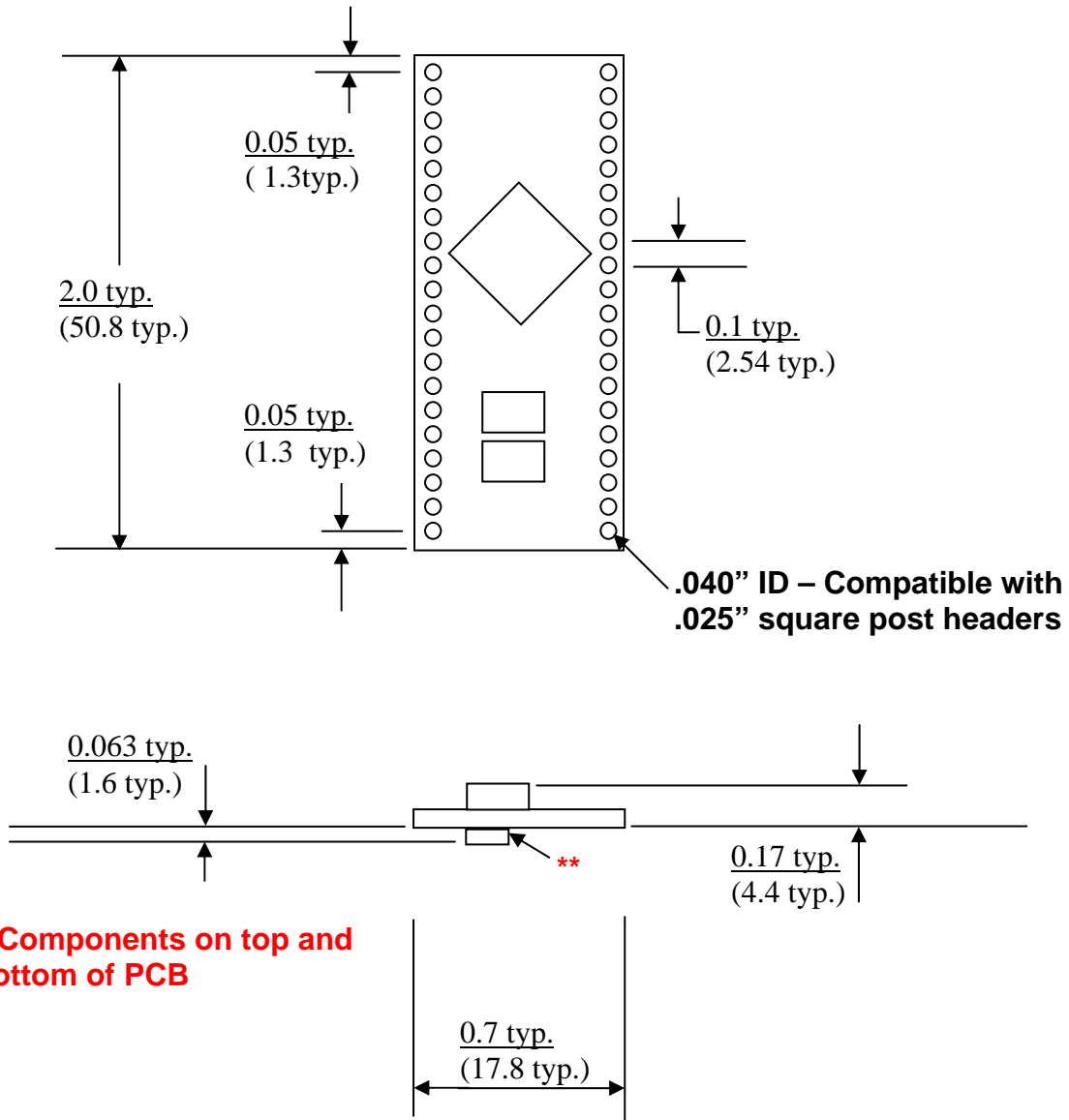
Since the DLP-2232ML-G does not have a USB connector, the USBDM and USBDP
signal lines are brought out on pins 23 and 22 as shown here.

With the exception of the 2 USB communications lines (USBDP and USBDM) and pin
20, the pinout for the DLP-2232ML-G is the same as the DLP-2232M-G module. Please
refer to the datasheet for the DLP-2232M-G for a complete description of the pinout.

3.0 Mechanical Dimensions   Inches (mm)

0.05 typ.
(1.3typ.)

2.0 typ.
(50.8 typ.)

0.1 typ.
(2.54 typ.)

0.05 typ.
(1.3 typ.)

**.040" ID – Compatible with
.025" square post headers**

0.063 typ.
(1.6 typ.)

0.17 typ.
(4.4 typ.)

**

****Components on top and
bottom of PCB**

0.7 typ.
(17.8 typ.)

4.0 Disclaimer

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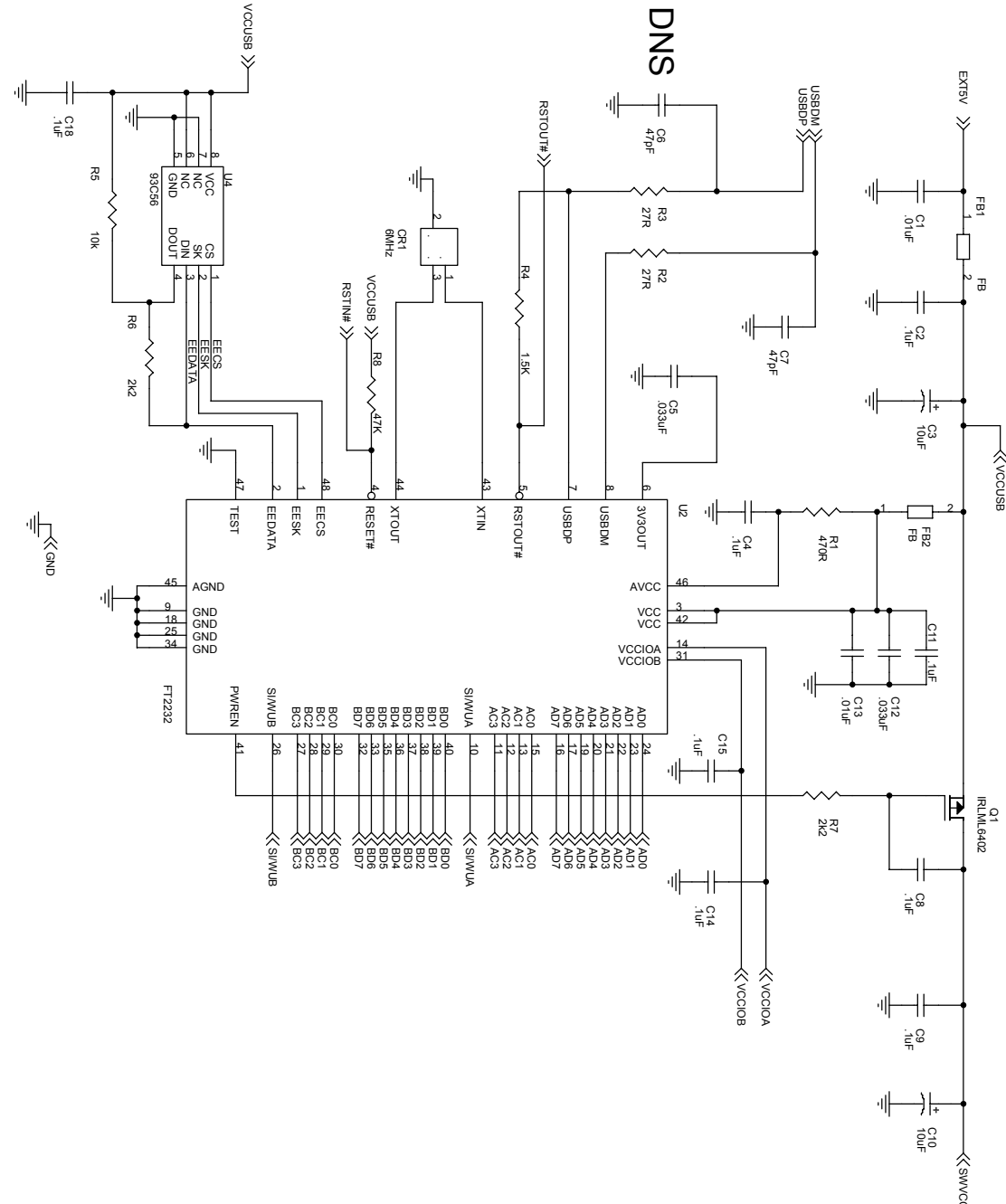
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This document provides preliminary information that may be subject to change without notice.

5.0 Contact Information

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DLP-2232ML MODULE

DNS

VCCUSB

C18
.1uF

R5
R5
10k

R6
2k2

93C56
U4
8 CS
7 VCC
6 NC
5 NC
4 GND

1 EECS
2 EESK
3 EEDATA
CS
SK
DIN
DOUT

CR1
6MHz
2
1
3

RSTIN#
VCCUSB
R8
47K

RSTOUT#

C6
47pF

R3
27R

R4
1.5K

R2
27R

C5
.033uF

USBDM
USBDP

C7
47pF

EXT5V

C1
.01uF

FB1
1 FB 2

C2
.1uF

C3
10uF
+

VCCUSB

U2
FT2232

47 TEST
2 EEDATA
1 EESK
48 EECS
40 RESET#
44 XTOUT
43 XTIN
5 RSTOUT#
7 USBDP
8 USBDM
6 3V3OUT

46 AVCC
3 VCC
42 VCC

14 VCCIOA
31 VCCIOB

45 AGND
9 GND
18 GND
25 GND
34 GND

41 PWREN
26 SI/WUB

30 BC0
29 BC1
28 BC2
27 BC3
33 BD6
32 BD7
39 BD0
38 BD1
37 BD2
36 BD3
35 BD4
34 BD5
10 SI/WUA
15 AC0
12 AC1
13 AC2
11 AC3
23 AD0
22 AD1
21 AD2
20 AD3
19 AD4
17 AD5
16 AD6
24 AD7

C4
.1uF
R1
470R
FB2
FB

C11 .1uF
C13 .01uF
C12 .033uF

C15
.1uF

C14
.1uF

VCCIOB
VCCIOA

Q1
IRLML6402

R7
2K2

C8
.1uF

C9
.1uF

C10
10uF
+

SWVCC

SI/WUB
BC0
BC1
BC2
BC3
BD0
BD1
BD2
BD3
BD4
BD5
BD6
BD7
SI/WUA

GND

JP5
CONN PCB 20x2

SI/WUB
BC3
BC2
BC1
BC0
BD7
BD6
BD5
BD4
BD3
BD2
BD1
BD0
GND
GND
VCCSW
VCCIOB
VCCIOA
EXT5V
GND

1 40 AD0
2 39 AD1
3 38 AD2
4 37 AD3
5 36 AD4
6 35 AD5
7 34 AD6
8 33 AD7
9 32 AC0
10 31 AC1
11 30 AC2
12 29 AC3
13 28 SI/WUA
14 27 RSTIN#
15 26 RSTOUT#
16 25 GND
17 24 GND
18 23 USBDM
19 22 USBDP
20 21 VCCUSB

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