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DM320016 – PCAP Touch Pad Development Kit with Gestures Product Brief

INTRODUCTION

Microchip's Projected Capacitive Touch Pad Development Kit with Gestures showcases the high performance and the flexible design of Microchip's MTCH6301 projected capacitive touch controller. This development kit also allows designers to test functionality, including multi-touch and gestures.

After connecting to a PC with the included PICKit™ Serial Analyzer (PKSA), developers may also interact with the MTCH6301 user parameters through the Projected Capacitive Configuration Utility (PCU), GUI program. For this program and more information about Microchip's touch portfolio, please visit www.microchip.com/mTouch.

DEVELOPMENT KIT FEATURES

- Includes a modified MTCH6301 to provide touch input and also drive the dot-matrix LCD
- Multi-touch detection up to eight touches
- Microchip's CVD capacitive sensing method
- Sleep with wake-on-touch
- Dual-touch drawing
- Single-touch gestures
- PCU software allows observation of signals and tuning of firmware parameters

BASIC REQUIREMENTS

- Two AAA Batteries
- 32- or 64-bit Windows® XP or Windows 7 development environment
- PICKit Serial Analyzer (Included):
 - Updated with `PKSpCap406.hex`
- USB *mini* Cable (Included)
- Male 6-pin Connector (Included)
- PCU, v 2.03 or later (available from the DM320016 device page).

GETTING STARTED

There are two switches mounted on the board: switch SW1 toggles the power and switch SW2 selects the Demo or Development mode. The included PKSA has been programmed to function as a USB-to-I²C™ communication bridge. The PKSA is necessary to communicate with the development software, PCU.

DEMO MODE OPERATION

This mode is intended for stand-alone use to demonstrate the gestures and multi-touch capabilities of Microchip's MTCH6301 projected capacitive controller. Toggle SW1 to **ON** and toggle SW2 to **DEMO** to use the Demo mode. The display will provide visual feedback, as the touch pad area is activated with a finger.

Note: Demo mode is for stand-alone use. The PC software, GUI, will not connect to the device while in this mode.

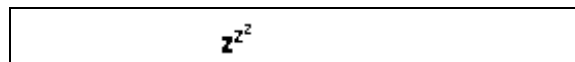
Single or Two-finger Draw

Draw on the touch pad and see the fully-processed touch coordinates on the display. Performing a double-tap gesture will clear the display.

Sleep Mode

The device will automatically go into Sleep mode after eight seconds of inactivity (see [Figure 1](#)).

FIGURE 1: SLEEP MODE



Mini Map

The Mini Map displays the finger location and the number of touches detected (see [Figure 2](#)).












FIGURE 2: MINI MAP



Single-Touch Gestures

Perform one of these single-touch gestures decoded in firmware and see the icon in the display below.

FIGURE 3: SINGLE-TOUCH GESTURES

	Single Tap
	Double Tap
	Tap and Hold
	Swipe Up
	Swipe Up and Hold
	Swipe Down
	Swipe Down and Hold
	Swipe Left
	Swipe Left and Hold
	Swipe Right
	Swipe Right and Hold

DEVELOPMENT MODE OPERATION

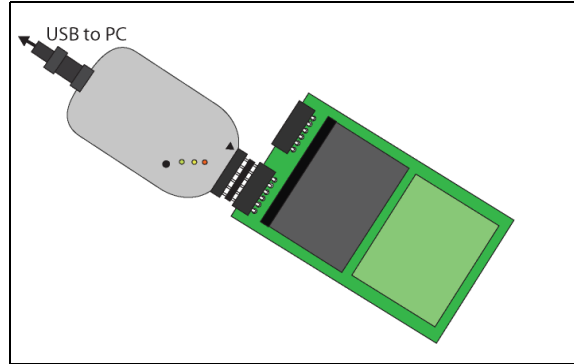
This mode is intended to allow the device to connect to a PC through the PKSA for evaluation with Microchip's PCU. The PCU must be installed on your local machine to utilize this mode. Please download this utility from the DM320016 device page.

- Toggle SW1 to **OFF** (PKSA will supply power)
- Toggle SW2 to **DEV**
- Connect PKSA to PKS header using the included 6-pin header
- Connect USB *mini* cable between PKSA and host PC
- Launch PCU utility and confirm the board is connected

The PCU will connect automatically and display the green **CONNECTED** status, and all tabs and parameter adjustments are accessible.

Please reference the PCU manual (www.microchip.com/pagehandler/en-us/technology/mtouch-screens/resources/software.html) and the MTCH6301 device page (<http://www.microchip.com/wwwproducts/Devices.aspx?product=MTCH6301>) for more details to evaluate this design.

FIGURE 4: KIT CONFIGURATION



PROGRAMMING

There is a header included on the board for programming the MTCH6301. This header is marked PGM.

Supported Microchip programming devices include:

- PICKit™ 3
- ICD 3

RESTORING FACTORY DEFAULTS

While using the PCU software, it is possible to adjust particular settings outside of expected operating ranges. It may be necessary to force the board to factory default settings to restore functionality.

To restore the DM320016 to factory defaults:

- Detach the DM320016 from all devices before turning SW1 to the **OFF** position and the SW2 switch to the **DEV** position
- Connect the PKSA to the PKS header
- Open the PCAP Configuration Utility and click the **SHOW ADVANCED PARAMETERS** check box in the lower left-hand corner, which will display a list of additional options
- Click the **RESTORE FACTORY DEFAULTS** button
- Wait for the **CONTROLLER FACTORY DEFAULTS RESTORED** text to appear
- Close the utility and disconnect the DM320016

Once the DM320016 stops receiving power from the PKSA, the factory defaults will be restored. To verify that the device has been restored, move SW2 so that **DEMO** is selected and change SW1 to the **ON** position. Normal operation should be restored.

APPENDIX A:
FIGURE A-1: SCHEMATICS

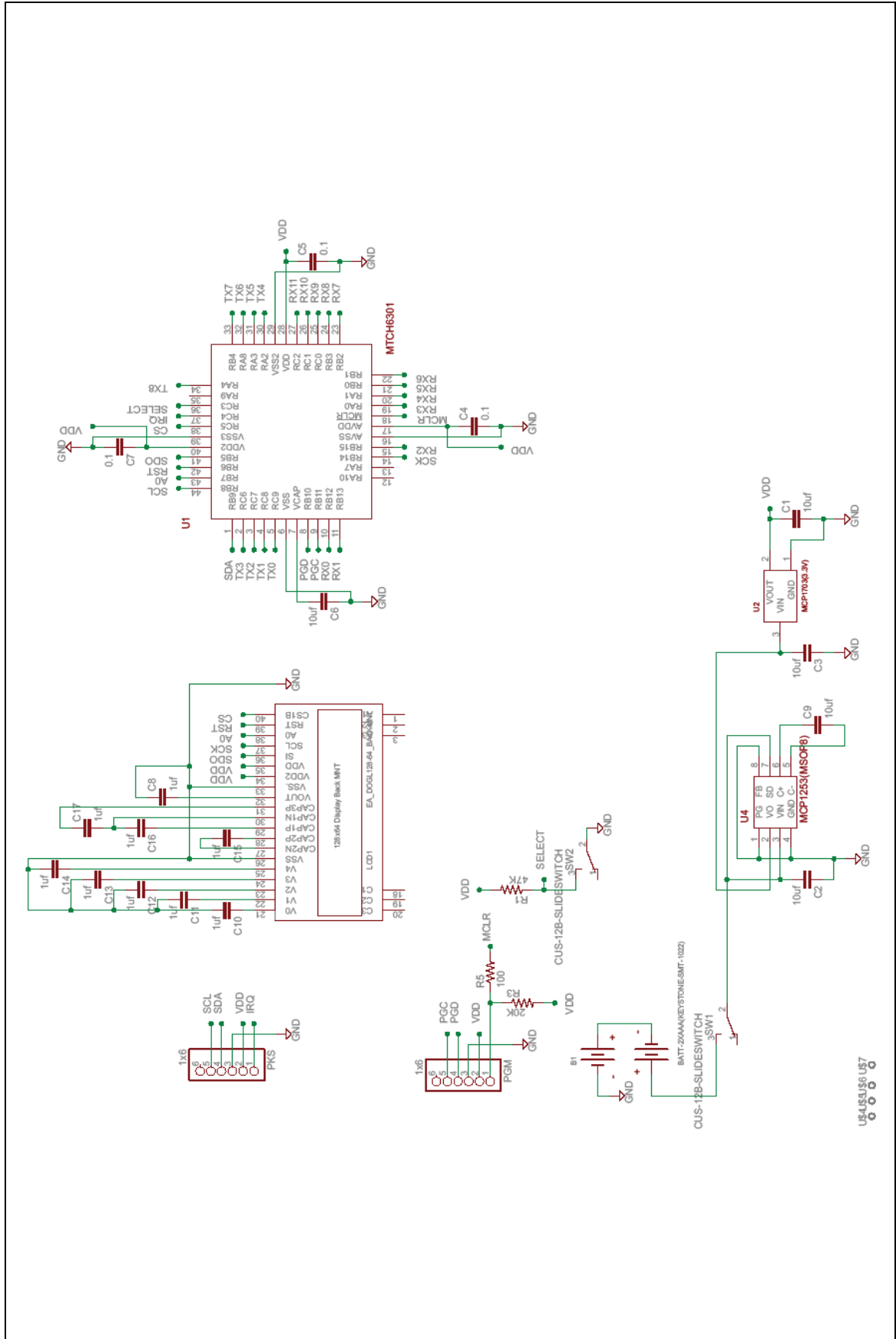


TABLE 1: BILL OF MATERIALS/ASSEMBLY

No.	Designator	Quantity	Description	OEM		Source	Distributor	\$ ea.	\$ Total	Equiv. Allowed
				Manufacturer	Part number		Part No.			
1	B1	1	Holder Battery AAA SMD Dual	Keystone Electronics	1022				0.000	√
2	C1, C2, C3, C6, C9	5	CAP CER 10 uF 6.3V 20% X5R 0603	TDK Corporation	C1608X5R0J106M				0.000	√
3	C4, C5, C7	3	CAP CER 0.1 uF 50V 10% X7R 0603	Murata Electronics North America	GCM188R71H104- KA57D				0.000	√
4	C8, C10, C11, C12, C13, C14, C15, C16, C17	9	CAP CER 1 uF 10V 10% X5R 0603	Murata Electronics North America	GRM188R61A105- KA61D				0.000	√
5	PGM, PKS	2	CONN Female 6 Pos. 100" r/a TIN	Sullins Connector Solutions	PPTC061LGBN-RC				0.000	√
6	LCD1	1	LCD Graphic Display Modules & Accessories FSTN(+) Transflectv White Background	ELECTRONIC ASSEMBLY	EA DOGL128W-6				0.000	
7	R1	1	RES 47 K Ω 1/10W 5% 0603 SMD	Panasonic – ECG	ERJ-3GEYJ473V				0.000	√
8	R3	1	RES 20 K Ω 1/10W 5% 0603 SMD	Panasonic – ECG	ERJ-3GEYJ203V				0.000	√
9	R5	1	RES 100 Ω 1/10W 5% 0603 SMD	Panasonic – ECG	ERJ-3GEYJ101V				0.000	√
10	SW1, SW2	2	Switch Slide SPDT Low Prof SMD	Copal Electronics Inc.	CUS-12TB				0.000	√
11	U1	1	IC MCU 32-bit 32-Kb Flash 44 TQFP	Microchip Technology	MTCH6301-I/PT				0.000	
12	U2	1	IC REG LDO 3.3V 250 mA SOT-23A	Microchip Technology	MCP1703T-3302E/CB				0.000	
13	U4	1	IC Mult Config 3.3/5V 12A 8 MSOP	Microchip Technology	MCP1253T-33X50I/MS				0.000	
14	LENS	1	0.060" Clear Acrylic with 3M 7952 MP Adhesive Back, 2.36x3.06"						0.000	√
15	BATTERY	2	2xAAA Batteries	ENERGIZER	AAA				0.000	√

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