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MAX5725 Evaluation System

Evaluates: MAX5725

General Description

The MAX5725 evaluation system demonstrates the MAX5725 ultra small, 8-channel, low-power, 12-bit buffered output DAC with internal reference. The MAX5725 peripheral module (PMod) and the USBPMBP2 module form a system (MAX5725SYS1#). Windows 7/8/10-compatible software provides a user-friendly interface that demonstrates features of the MAX5725.

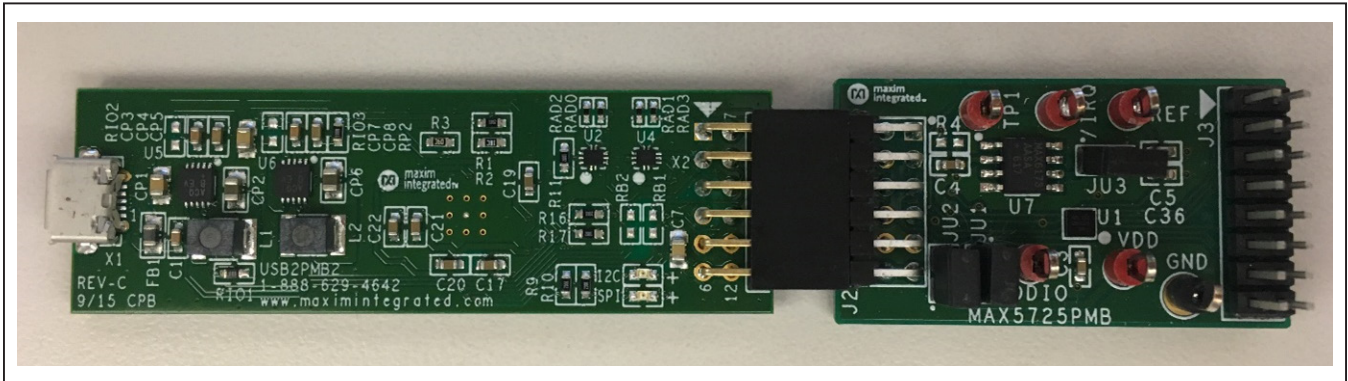
The MAX5725 peripheral module comes installed with the 20-bump WLP package, MAX5725AWP+.

Features

- 2x6-Pin PMod™-Compatible Connector (SPI)
- On-Board Voltage Reference (MAX6173)
- Proven PCB Layout
- Fully Assembled and Tested
- Windows 7/8/10-Compatible Software

[Ordering Information](#) appears at end of data sheet.

MAX5725 EV System



Windows are registered trademarks and registered service marks of Microsoft Corporation.

Pmod is a trademark of Digilent Inc.

Quick Start

Required Equipment

- MAX5725 EV System (includes MAX5725PMB and USBPMBP2 module with micro USB cable)
- Voltmeter
- Oscilloscope

Note: In the following sections, software-related items are identified by bolding. Text in **bold** refers to items directly from the EV system software. Text in **bold and underlined** refers to items from the Windows operating system.

Procedure

The EV system is fully assembled and tested. Follow the steps below to verify board operation:

- 1) Visit <http://www.maximintegrated.com/> and search for MAX5725 product page. Click the **DESIGN RESOURCES** tab. The software associated with this part appears under the MAX5725 product.

- 2) Align the X2 connector of the USBPMBP2 with the J2 connector of the MAX5725 Pmod.
- 3) Verify that a shunt is placed on the JU1 and JU2 headers and no shunt on the JU3 header.
- 4) Connect the voltmeter at the REF test point.
- 5) Connect the oscilloscope probe to pin 1 of header J3.
- 6) Connect the USB cable from the PC to the USB-PMBP2 board.
- 7) Open the GUI, MAX5725EVKIT.exe ([Figure 1](#)).
- 8) Click **Scan Adapters**. Then select the option **PMODxxxxxx** (where xxxxxx is numeric) and click **Connect**.
- 9) To evaluate the MAX5725, click **Sample Continuously**.

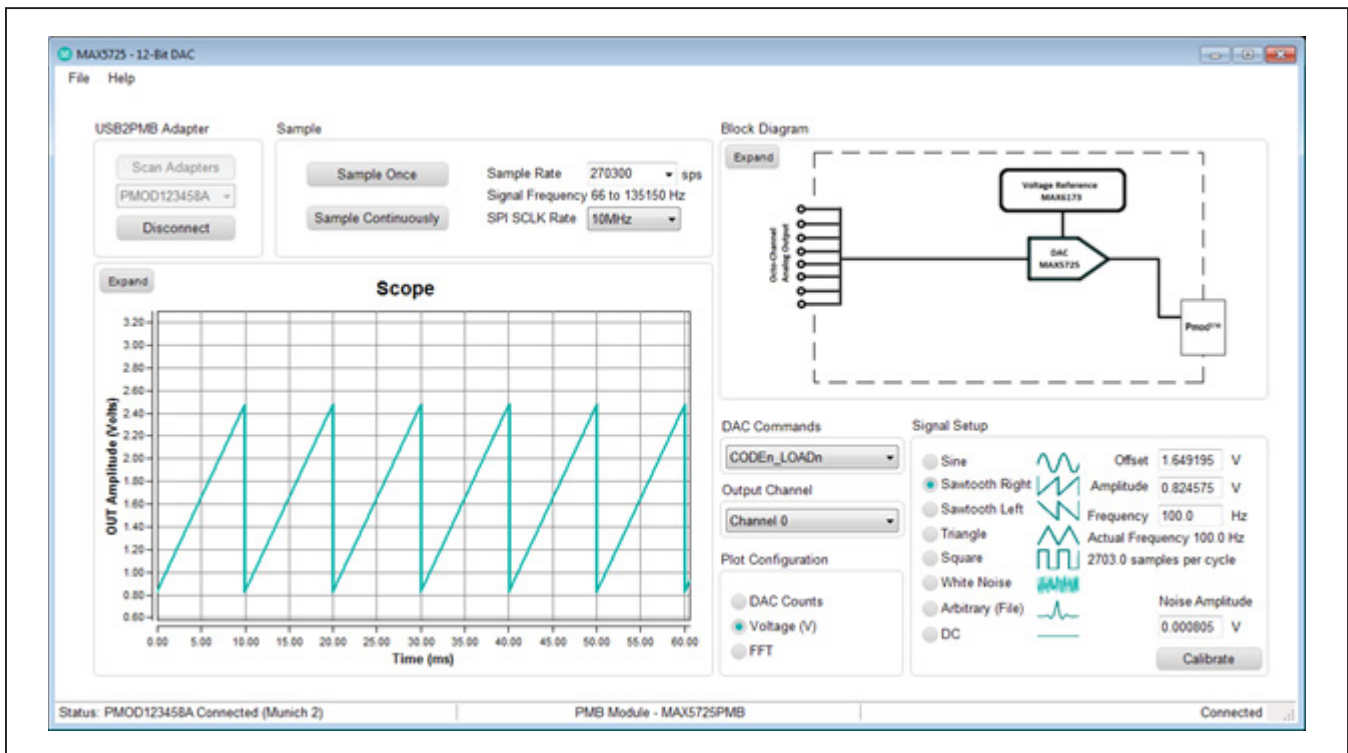


Figure 1. MAX5725 EV System Main Window

General Description of Software

The main window of the MAX5725 peripheral module controls the evaluation of the MAX5725 IC. Waveform generator is included that allows the user to quickly evaluate the device.

USB2PMB Adapter

The controls within the **USB2PMB** group box allows the user to select the appropriate USB2PMB devices. When **Scan Adapters** is enabled, it updates the dropdown list with all USB2PMB devices. **PMODxxxxxx** (where xxxxxx is numeric) appears within the dropdown list with the EV system connected to the PC. Make the appropriate selection respective of the IC and click **Connect**.

DAC Command

The **DAC Commands** drop down list allows the users to select the internal registers to code or load specific DAC channel(s).

Output Channel

To select an individual channel or all channels, click **Output Channel** drop down list.

Signal Setup

The **Signal Setup** controls are used to quickly evaluate the EV system, which is similar to a functional generator. It provides waveforms in sine, left and right sawtooth, triangle, square, and white noise. A user can adjust Amplitude, Offset, and Frequency for each waveform.

Sampling

The **Sample** group box allows for a single or continuous sampling. It also adjusts the SPI SCLK and sampling rate. The **Scope** captures data **DAC Counts**, **Voltage(V)**, and **FFT** graphing options.

Calibration

The **Calibration** button provides access to all other registers within the MAX5725 IC. The **Calibration** window allows the user to set internal or external references, power down modes, reset options, default scale options, watchdog timer, and \overline{LDAC} and \overline{CLR} control. For a detailed description of each register function, refer to the *MAX5725 IC* datasheet.

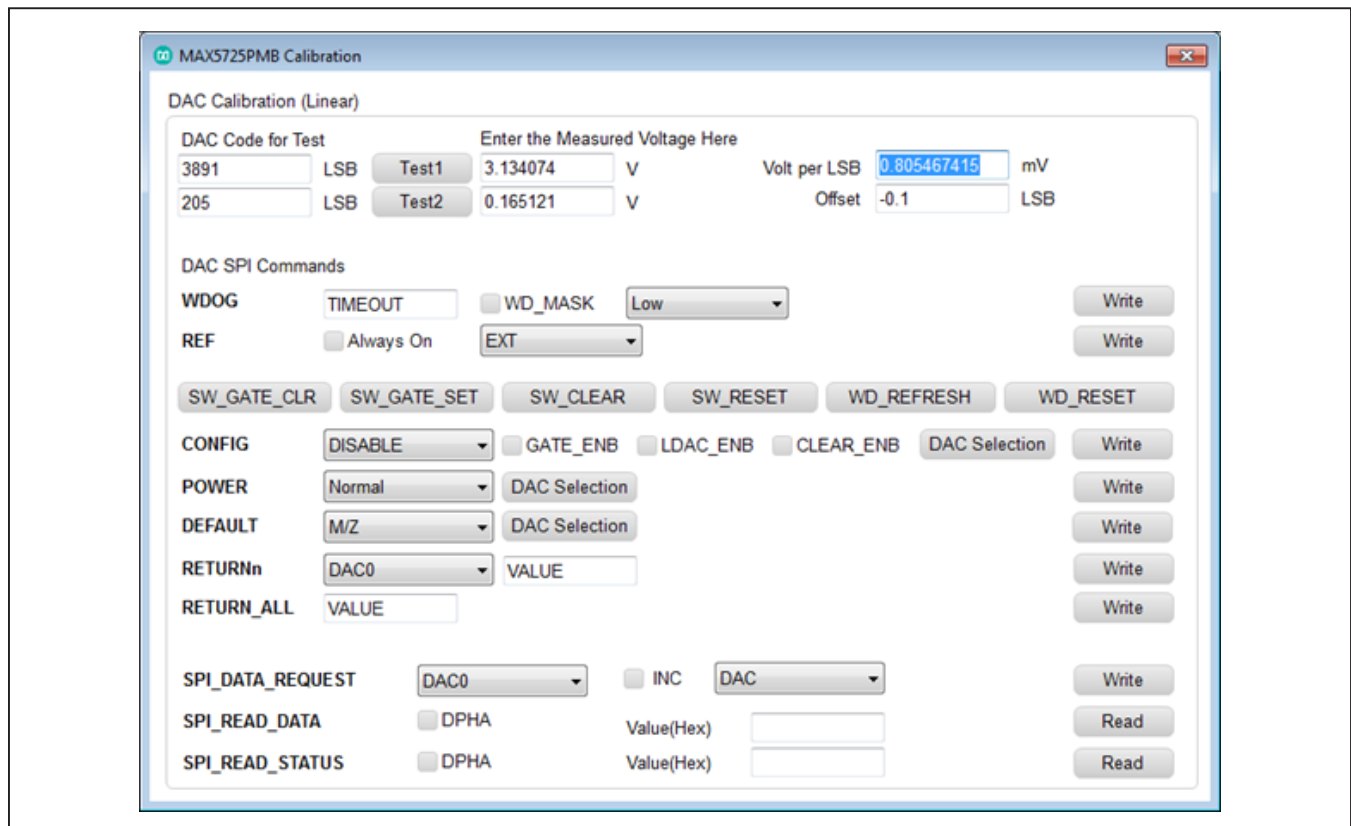


Figure 2. MAX5725 EV System Calibration Window

General Description of Hardware

The MAX5725 EV system demonstrates the 8-channel 12-bit ADC. The USBPMBP2 module and the MAX5725 Pmod completes the system. The USBPMB2 acts as the master and generates all the SPI communications.

User-Supplied SPI

To evaluate the EV system with a user-supplied SPI bus, the connector J2 is a compatible 2x6 pin PMod connector.

User-Supplied VDD

The MAX5725 supply (VDD) is powered by USB and regulated to 3.3V by default when a PMod compatible master module is connected to the J2 connector of the Pmod. For a user-supplied VDD, a PMod master module is not allowed on the J2 connector. The user needs to apply a voltage between +2.7V to +5.5V at the VDD test point.

User-Supplied VDDIO

The MAX5725 I/O supply (VDDIO) is powered by USB and regulated to 3.3V by default when a PMod compatible master module is connected to the J2 connector of the Pmod. For a user supplied VDDIO, remove the shunt from the JU2 header and apply a voltage between +1.8 and +5.5V at the VDDIO test point.

User-Supplied Reference (REF)

The MAX5725PMB comes with an on-board MAX6173, 2.5V voltage reference. To use this feature, a 5V DC supply must be applied at the TP1 test point and a shunt must be installed on the JU3 header. To use a user-supplied external reference, do not place a shunt on the JU3 header and apply +1.24V to VDD at the REF test point.

Ordering Information

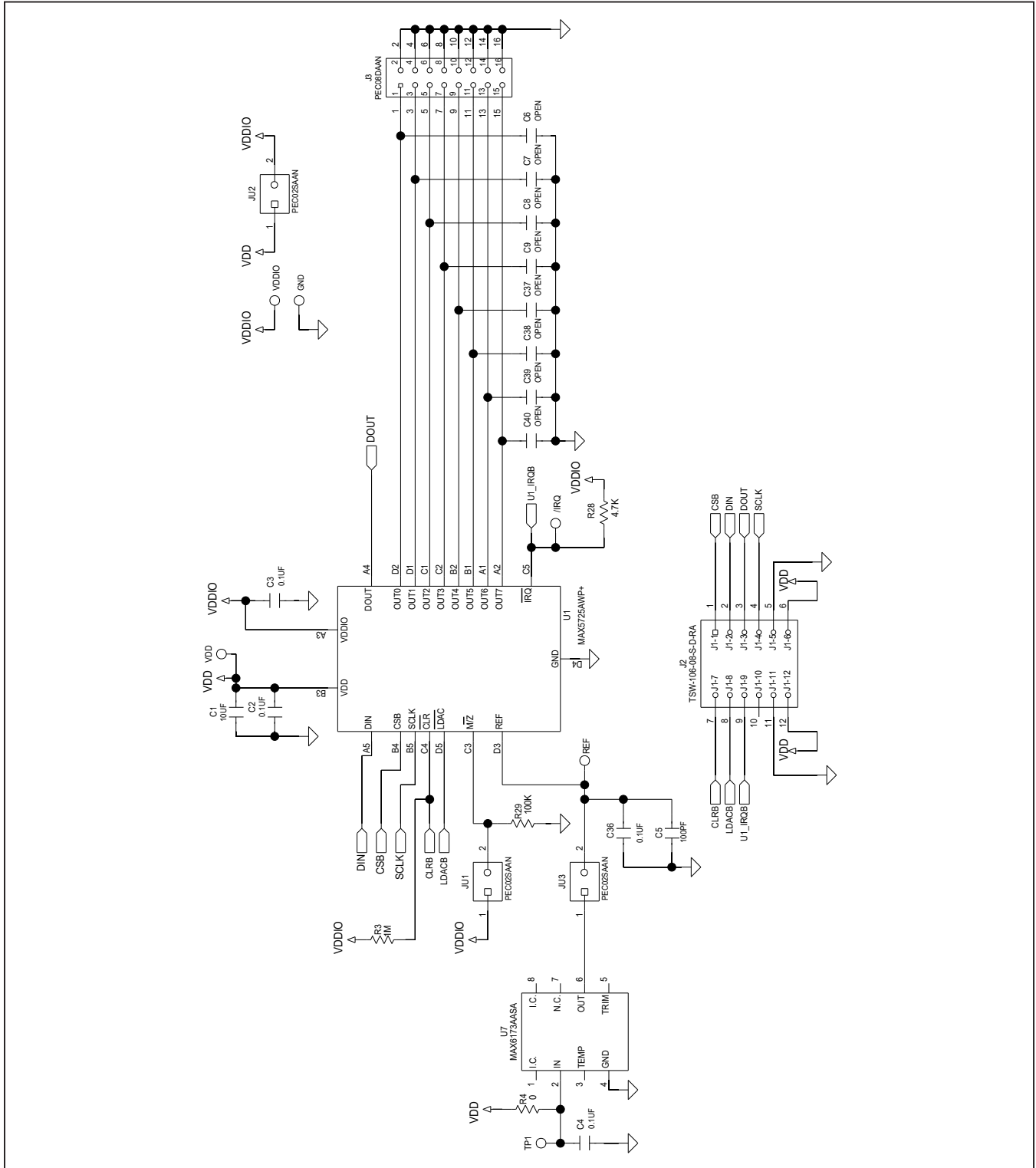
PART	TYPE
MAX5725SYS1#	EV System
MAX5725PMB#	Peripheral Module
USBPMB2#	Adapter Board

#Denotes RoHS compliant.

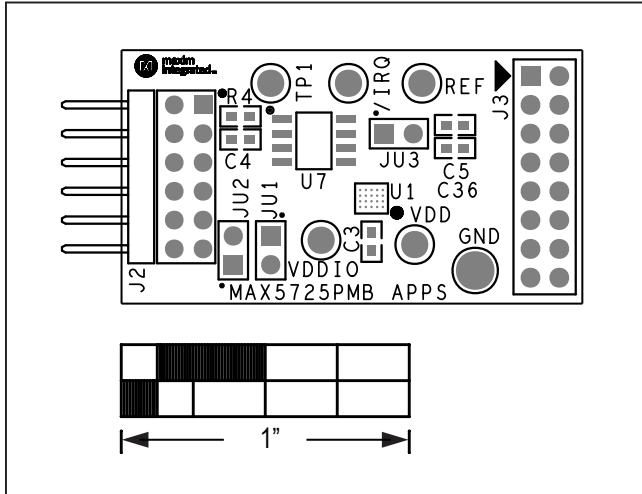
MAX5725 EV Kit Bill of Materials

ITEM	REF_DES	DN/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	REF, TP1, VDD, /IRQ, VDDIO	-	5	5010	KEystone	N/A	TESTPOINT WITH 1.80MM HOLE DIA, RED, MULTIPURPOSE;	
2	C1	-	1	GRM21BR71A106KE51	MURATA	10UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 10UF; 10V; TOL=10%; MODEL=GRM SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R	
3	C2-C4, C36	-	4	C0603C104K4RAC; GCM188R71C104KA37; C1608X7R1C104K; GRM188R71C104K; C0603X7R160-104KNE	KEMET/MURATA/TDK/VENKEL LTD.	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R;	
4	C5	-	1	C0603C101J5GAC; ECJ-1VC1H101J; C1608C0G1H101J080AA; GRM1885C1H101JA01	KEMET/PANASONIC/TDK/MURATA	100PF	CAPACITOR; SMT (0603); CERAMIC CHIP; 100PF; 50V; TOL=5%; MODEL=COG; TG=-55 DEGC TO +125 DEGC; TC=COG	
5	GND	-	1	5011	KEystone	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
6	J2	-	1	TSW-106-08-S-D-RA	SAMTEC	TSW-106-08-S-D-RA	CONNECTOR; THROUGH HOLE; DOUBLE ROW; RIGHT ANGLE; 12PINS;	
7	J3	-	1	PEC08DAAN	SULLINS ELECTRONICS CORP.	PEC08DAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 16PINS; -65 DEGC TO +125 DEGC	
8	JU1-JU3	-	3	PEC02SAAN	SULLINS	PEC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS	
9	R3	-	1	CRCW06031M00FK; MCR03EZPFX1004	VISHAY DALE/ROHM	1M	RESISTOR; 0603; 1M OHM; 1%; 100PPM; 0.10W; THICK FILM	
10	R28	-	1	CRCW06034K70FK	VISHAY DALE	4.7K	RESISTOR; 0603; 4.7K; 1%; 100PPM; 0.10W; THICK FILM	
11	R29	-	1	ERJ3EKF1003	PANASONIC	100K	RESISTOR; 0603; 100K OHM; 1%; 100PPM; 0.1W; THICK FILM	
12	U1	-	1	MAX5725AWP+	MAXIM	MAX5725AWP+	IC; DAC; ULTRA-SMALL; OCTAL-CHANNEL; 12-BIT BUFFERED OUTPUT DAC WITH INTERNAL REFERENCE AND SPI INTERFACE; WLP20	
13	U7	-	1	MAX6173AASA+	MAXIM	MAX6173AASA	IC; VREF; HIGH-PRECISION VOLTAGE REFERENCE WITH TEMPERATURE SENSOR; NSOIC8 150MIL	
14	PCB	-	1	MAX5725PMB_APPS_A	MAXIM	PCB	PCB:MAX5725PMB_APPS_A	
15	R4	DNP	0	RC1608J000CS; CR0603-J/-000ELF; RC0603JR-070RL	SAMSUNG ELECTRONICS/ BOURNS/YAGEO PH	0	RESISTOR; 0603; 0 OHM; 5%; JUMPER; 0.10W; THICK FILM	
16	C6-C9, C37-C40	DNP	0	N/A	N/A	OPEN	CAPACITOR; SMT (0603); OPEN; FORMFACTOR	
TOTAL			23					

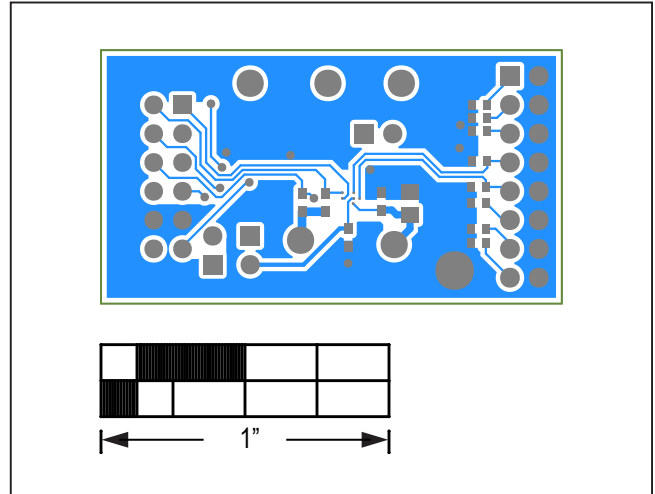
MAX5725PMB Schematic



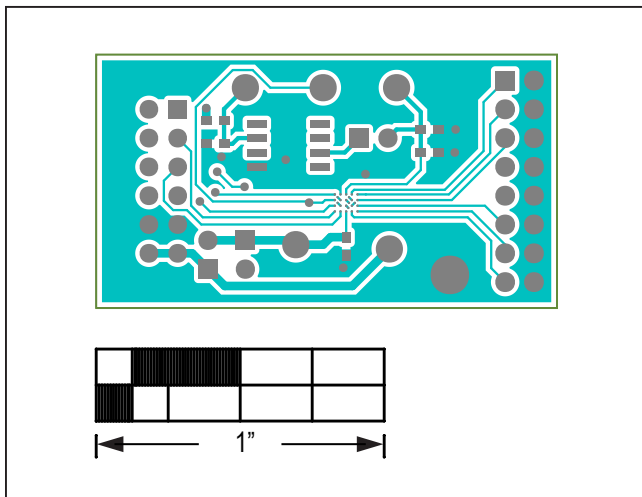
MAX5725PMB Layout



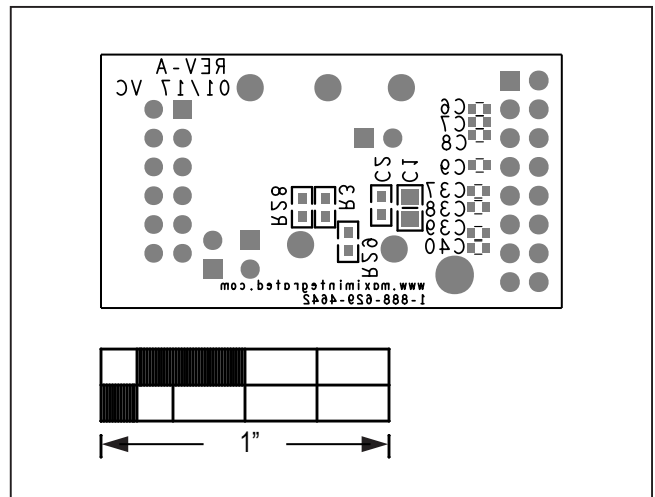
Silk Top



Bottom



Top



Silk Bottom

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	8/21	Initial release	—

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