

MAX11301WING Expansion Board

Evaluates: MAX11301 PIXI
Mixed-Signal IO

General Description

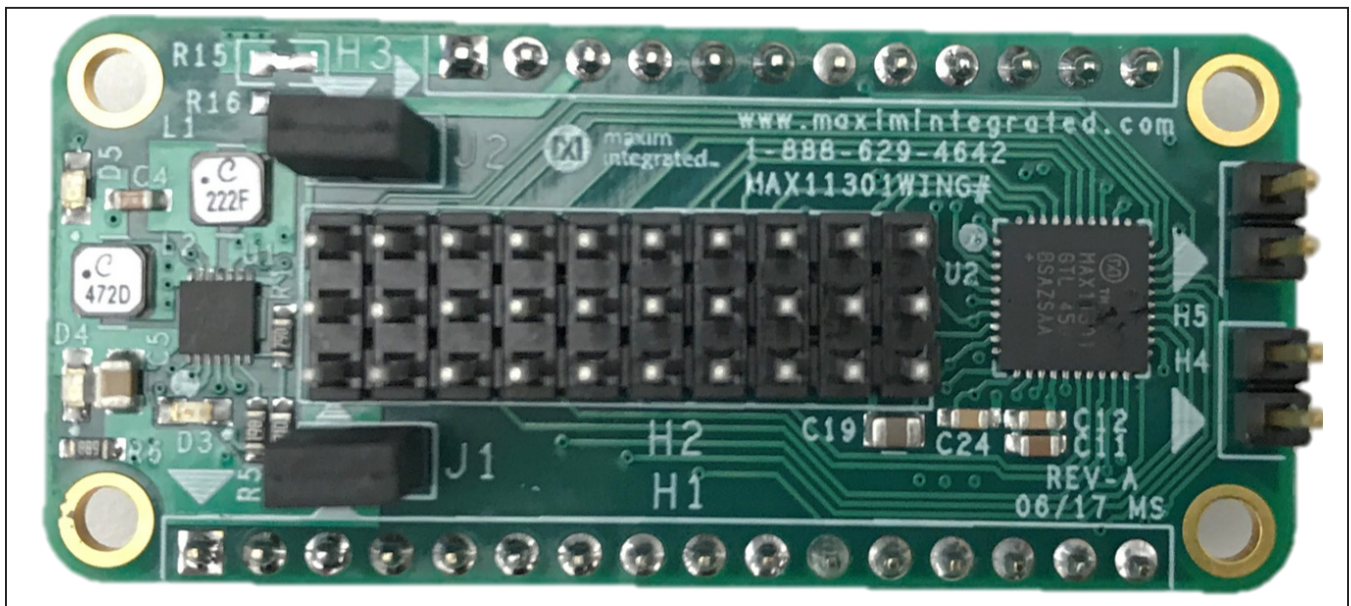
The MAX11301WING is an expansion board designed to help engineers and students alike to rapidly prototype mixed signal applications using the MAX11301. The form factor is a small 0.9in x 2.0in dual-row header footprint compatible with breadboards, feather boards from Maxim and Adafruit®, and additional expansion boards, also called wings.

Ordering Information appears at end of data sheet.

Benefits and Features

- Expansion Board
 - 0.9in x 2.0in DIP Form Factor
 - Breadboard Compatible
 - Feather Compatible
 - $\pm 7.5V$ Split Rail Supply
 - Supports $\pm 5V$ Output Swings
 - 50mA Limit
 - External Power Supply Selectable
 - All 20 MAX11301 Ports Accessible
 - Connections for External Temperature Sensors
- MAX11301 Features
 - 20 Configurable Mixed-Signal Ports
 - Up to 20 12-Bit ADC Inputs
 - Up to 20 12-Bit DAC Outputs
 - Up to 20 GPIO
 - Analog Switch Between Adjacent PIXI® Ports
 - Internal/External Temperature Sensors

MAX11301WING Board Photo



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Adafruit is a registered trademark of Adafruit Industries.



Detailed Description

The MAX11301WING expansion board is designed to provide a compact rapid development platform for the MAX11301 mixed signal IO IC. Header H2 provides access to all 20 IO ports of the MAX11301 along with generous ground connection points. Headers H4 and H5 provide an interface to D0P/N and D1P/N of the MAX11301 for two diode connected transistors implementing temperature sensors. Installation of shunts on J1 and J2 connect AVDDIO and AVSSIO to VBST and VINV. VBST and VINV are set to ±7.5VDC, respectively, and can provide 50mA each. Removing the shunts on J1 and J2 allows for an external power supply to source AVDDIO and AVSSIO. The dual inline pinout and form factor for this board are based on the Adafruit feather series of boards. It is intended to be compatible with many of their boards, but it is not guaranteed to work with all of them.

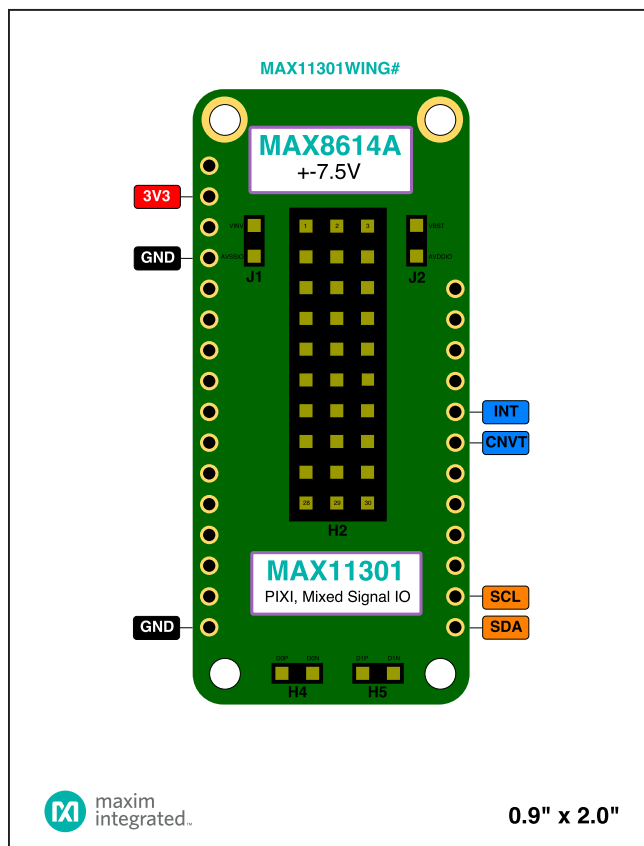


Figure 1. DIP Pinout

Firmware Development

The simplest way to develop firmware for the MAX11301WING is through the Mbed™ development site. At the Mbed site you can import examples into their online IDE, then edit, compile, and load them into your Mbed-compatible Feather board without installing any software. Go to <https://os.mbed.com/platforms/MAX32630FTHR/> to get started programming with the MAX32630FTHR now. To support software development with the MAX11301, an example library has been developed and can be found at the following link, https://os.mbed.com/teams/MaximIntegrated/code/MAX113XX_Pixi/.

To support the configuration of the MAX113XX PIXI device, Maxim has developed a configuration GUI that outputs a header file containing register definitions for the user configuration. The Mbed library referenced above requires a configuration file from this configuration GUI. The configuration GUI can be found at the following link: https://www.maximintegrated.com/en/products/analog/data-converters/digital-to-analog-converters/MAX11301.html/tb_tab2.

Additionally, a MAX11301WING_Demo has been created to help expedite prototyping and configures three PIXI ports: +5V DAC, -5V DAC, and a bipolar ADC with an analog range of -5V to +5V. Visit the following link to obtain the source code for the MAX11301WING_Demo: https://os.mbed.com/teams/Maxim-Integrated/code/MAX11301WING_Demo/. For additional information for getting started with the MAX11301WING, refer to the MAX11301 Quick Start, which is located on the Design Resource tab of the product page.

Table 1. DIP Header H1 Pins

PIN	PORT	DESCRIPTION
1, 3, 5–15	N.C.	Not Connected
2	3V3	3.3V Input
4, 16	GND	System Ground

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Table 2. DIP Header H3 Pins

PIN	PORT	DESCRIPTION
1	SYS	Battery connection. Install R15 (default) for SYS to source VCC (Note 1)
2, 4, 7–10	N.C.	Not Connected
3	VBUS	5V USB connection. Install R16 for VBUS to source VCC (Note 1)
5	$\overline{\text{INT}}$	Active-low, open-drain interrupt output
6	$\overline{\text{CNVT}}$	Active-low, ADC trigger control input
11	SCL	I ² C serial clock signal
12	SDA	I ² C serial data signal

Note 1: Do not install R15 and R16 at the same time. This action shorts VBUS and SYS.

Table 3. Header H2 Pins

PIN	PORT	DESCRIPTION
1	PORT0	MAX11301 P0
4	PORT1	MAX11301 P1
7	PORT2	MAX11301 P2
10	PORT3	MAX11301 P3
13	PORT4	MAX11301 P4
16	PORT5	MAX11301 P5
19	PORT6	MAX11301 P6
22	PORT7	MAX11301 P7
25	PORT8	MAX11301 P8
28	PORT9	MAX11301 P9
3	PORT10	MAX11301 P10
6	PORT11	MAX11301 P11
9	PORT12	MAX11301 P12
12	PORT13	MAX11301 P13
15	PORT14	MAX11301 P14
18	PORT15	MAX11301 P15
21	PORT16	MAX11301 P16
24	PORT17	MAX11301 P17
27	PORT18	MAX11301 P18
30	PORT19	MAX11301 P19
2, 5, 8, 11, 14, 17, 20, 23, 26, 29	GND	System Ground

Table 4. Header H4 and H5 Pins

PIN	PORT	DESCRIPTION
H4-1	D0P	Positive connection of diode connected transistor (2N3904 or equivalent)
H4-2	D0N	Negative connection of diode connected transistor (2N3904 or equivalent)
H5-1	D1P	Positive connection of diode connected transistor (2N3904 or equivalent)
H5-2	D1N	Negative connection of diode connected transistor (2N3904 or equivalent)

Table 5. Jumpers

PIN	DEFAULT	DESCRIPTION
J1	Installed	Connects VINV (-7.5V) to AVSSIO
J2	Installed	Connects VBST (+7.5V) to AVDDIO
R15	Installed	Connects SYS to VCC
R16	Uninstalled	Connects VBUS to VCC

Ordering Information

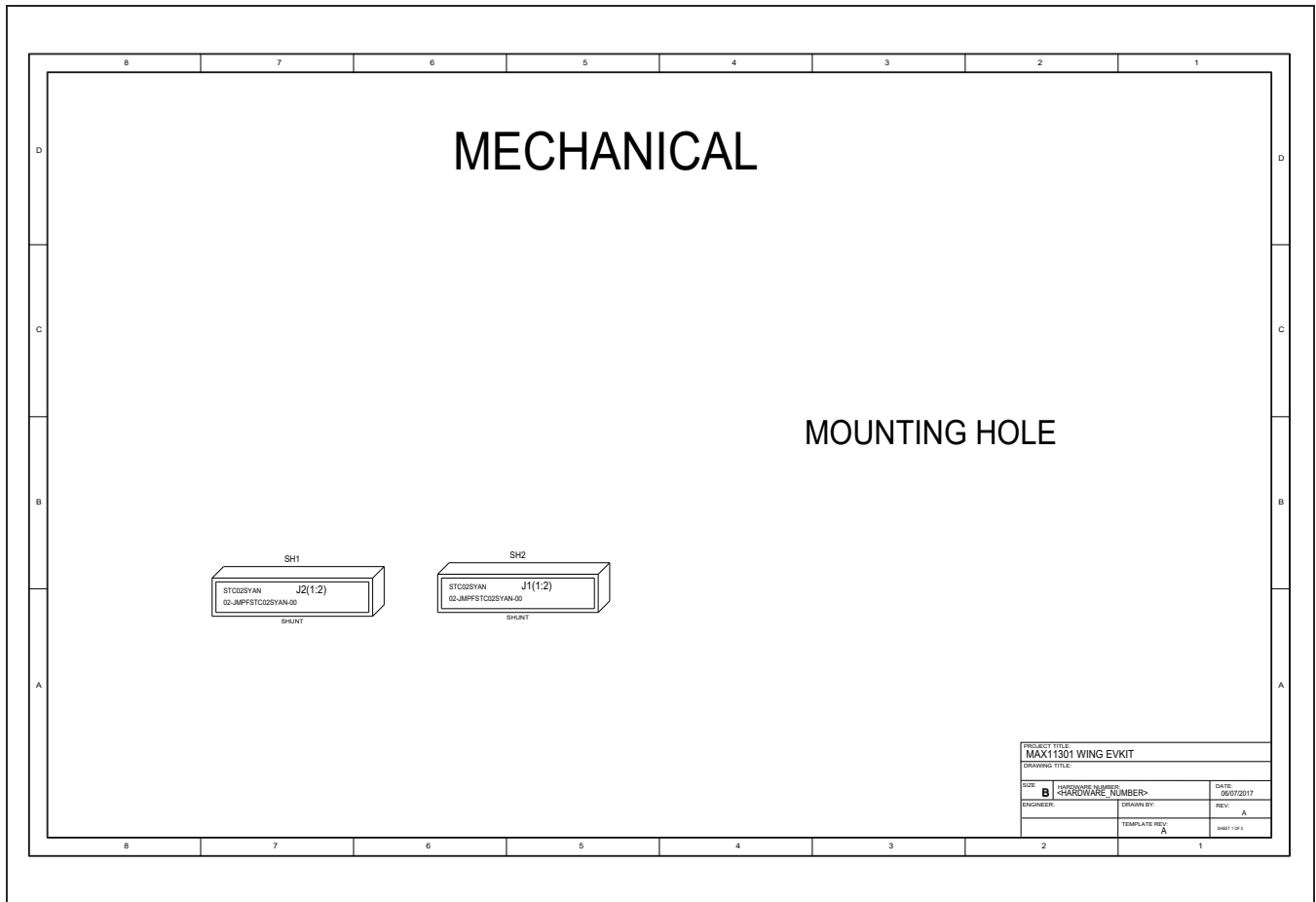
PART	TYPE
MAX11301WING#	Expansion Board

#Denotes RoHS compliance.

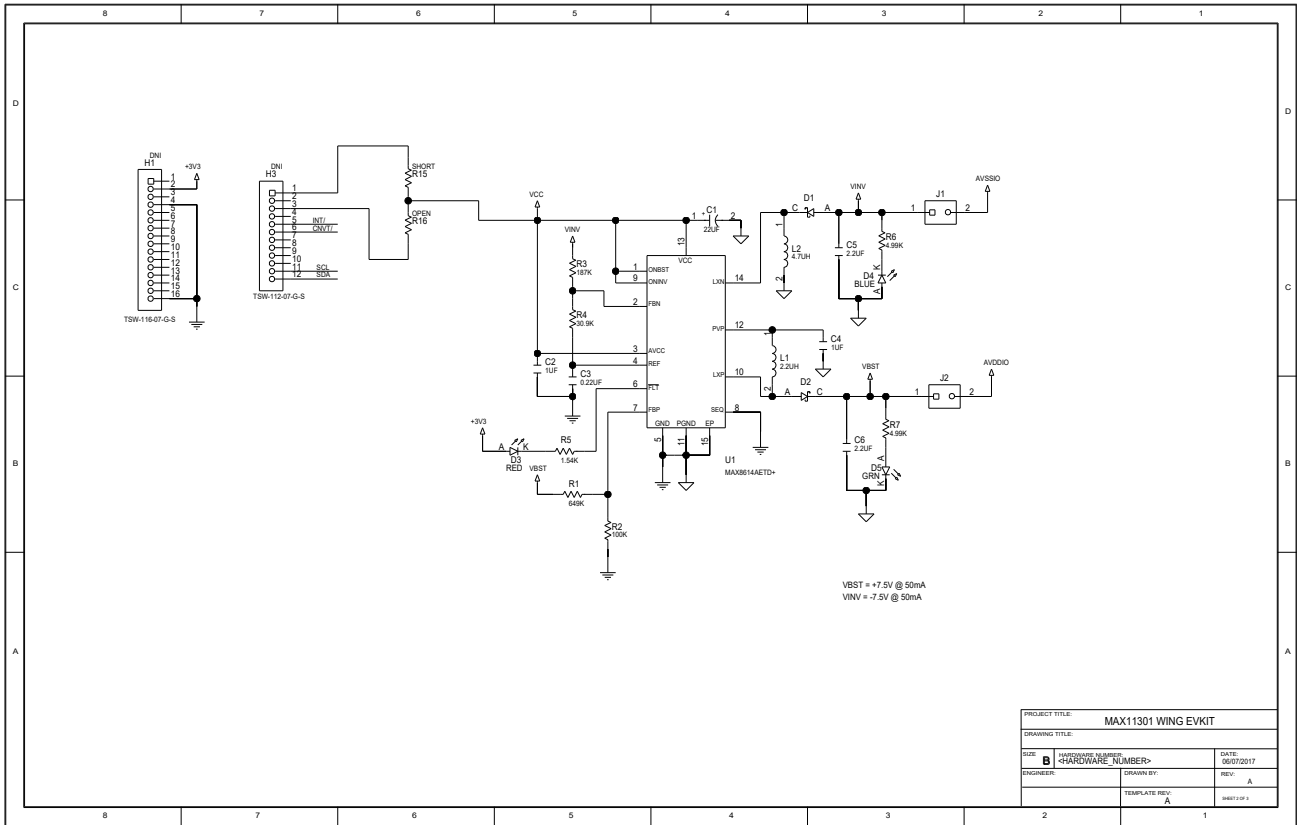
MAX11301WING EV Kit Bill of Materials

QTY	REF DES	MFG	PART NUMBER	DESCRIPTION
1	C1	AVX	F381A226MSA	CAPACITOR; SMT (2012); CONDUCTIVE POLYMER; 22UF; 10V; TOL=20%
8	C2, C4, C7-C9, C11, C14, C17	MURATA	GRM188R71E105KA12D	CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 25V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
1	C3	AVX	0603ZC224JAT2A	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.22UF; 10V; TOL=5%; TG=-55 DEGC TO +125 DEGC; TC=X7R
2	C5, C6	AVX	08053C225KAT2A	CAPACITOR; SMT (0805); CERAMIC CHIP; 2.2UF; 25V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
7	C10, C12, C13, C16, C20, C22, C24	AVX	06033C104JAT2A	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 25V; TOL=5%; TG=-55 DEGC TO +125 DEGC; TC=X7R
2	C15, C18	SAMSUNG ELECTRONICS	CL31B106KOHNNN	CAPACITOR; SMT (1206); CERAMIC CHIP; 10UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
3	C19, C21, C23	AVX	0805YC475KAT2A	CAPACITOR; SMT (0805); CERAMIC CHIP; 4.7UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
2	D1, D2	CENTRAL SEMICONDUCTOR	CFSH05-20L	DIODE; SCH; SMT (SOD882); PIV=20V; IF=0.5A
1	D3	KINGBRIGHT	APT1608LSECK/J3-PRV	DIODE; LED; HYPER RED WATER CLEAR; RED; SMT (0603); VF=1.8V; IF=0.002A
1	D4	KINGBRIGHT	APT1608LVBC/D	DIODE; LED; BLUE WATER CLEAR; BLUE; SMT (0603); VF=2.65V; IF=0.002A
1	D5	KINGBRIGHT	APT1608LZGCK	DIODE; LED; GREEN WATER CLEAR; GREEN; SMT (0603); VF=2.65V; IF=0.002A
1	H2	SAMTEC	TSW-110-26-T-T	CONNECTOR; MALE; THROUGH HOLE; TSW SERIES; STRAIGHT; 30PINS
4	H4, H5, J1, J2	SAMTEC	TSW-102-07-G-S	CONNECTOR; MALE; THROUGH HOLE; 0.025 IN SQ POST HEADER; STRAIGHT; 2PINS
1	L1	COILCRAFT	LPS3010-222MR	INDUCTOR; SMT; MAGNETICALLY SHIELDED; 2.2UH; TOL=+/-20%; 1.1A
1	L2	COILCRAFT	LPS3010-472MR	INDUCTOR; SMT; MAGNETICALLY SHIELDED; 4.7UH; TOL=+/-20%; 0.95A
1	R1	YAGEO	RC0603FR-07649KL	RESISTOR; 0603; 649K OHM; 1%; 100PPM; 0.1W; THICK FILM
1	R2	YAGEO	RC0603FR-07100KL	RESISTOR; 0603; 100K OHM; 1%; 100PPM; 0.1W; THICK FILM
1	R3	YAGEO	RC0603FR-07187KL	RESISTOR; 0603; 187K OHM; 1%; 100PPM; 0.1W; THICK FILM
1	R4	YAGEO	RC0603FR-0730K9L	RESISTOR; 0603; 30.9K OHM; 1%; 100PPM; 0.1W; THICK FILM
1	R5	PANASONIC	ERJ-3EKF1541	RESISTOR; 0603; 1.54K OHM; 1%; 100PPM; 0.1W; THICK FILM
2	R6, R7	YAGEO	RC0603FR-074K99L	RESISTOR; 0603; 4.99K OHM; 1%; 100PPM; 0.1W; THICK FILM
2	R8, R9	YAGEO	RC0603FR-073K3L	RESISTOR; 0603; 3.3K OHM; 1%; 100PPM; 0.1W; THICK FILM
1	R10	YAGEO	RC0603FR-0710KL	RESISTOR; 0603; 10K OHM; 1%; 100PPM; 0.1W; THICK FILM
3	RG, R13, R14	SAMSUNG ELECTRONICS	RC1608J000CS	RESISTOR; 0603; 0 OHM; 5%; JUMPER; 0.10W; THICK FILM
2	SH1, SH2	SULLINS ELECTRONICS CORP.	STC02SYAN	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.256IN; BLACK; INSULATION=PBT CONTACT=PHOSPHOR BRONZE; COPPER PLATED TIN OVERALL
1	U1	MAXIM	MAX8614AETD+	IC; CONV; DUAL-OUTPUT (+ AND -) DC-DC CONVERTER FOR CCD; TDFN14
1	U2	MAXIM	MAX11301GTL+	IC; DATACON; PIXI; 20-PORT PROGRAMMABLE MIXED-SIGNAL I/O WITH 12-BIT ADC; 12-BIT DAC; ANALOG SWITCHES; AND GPIO; TQFN40-EP
1	U3	MAXIM	MAX1726EUK50+	IC; VREG; ULTRA-LOW IQ LOW-DROPOUT LINEAR REGULATOR; SOT23-5

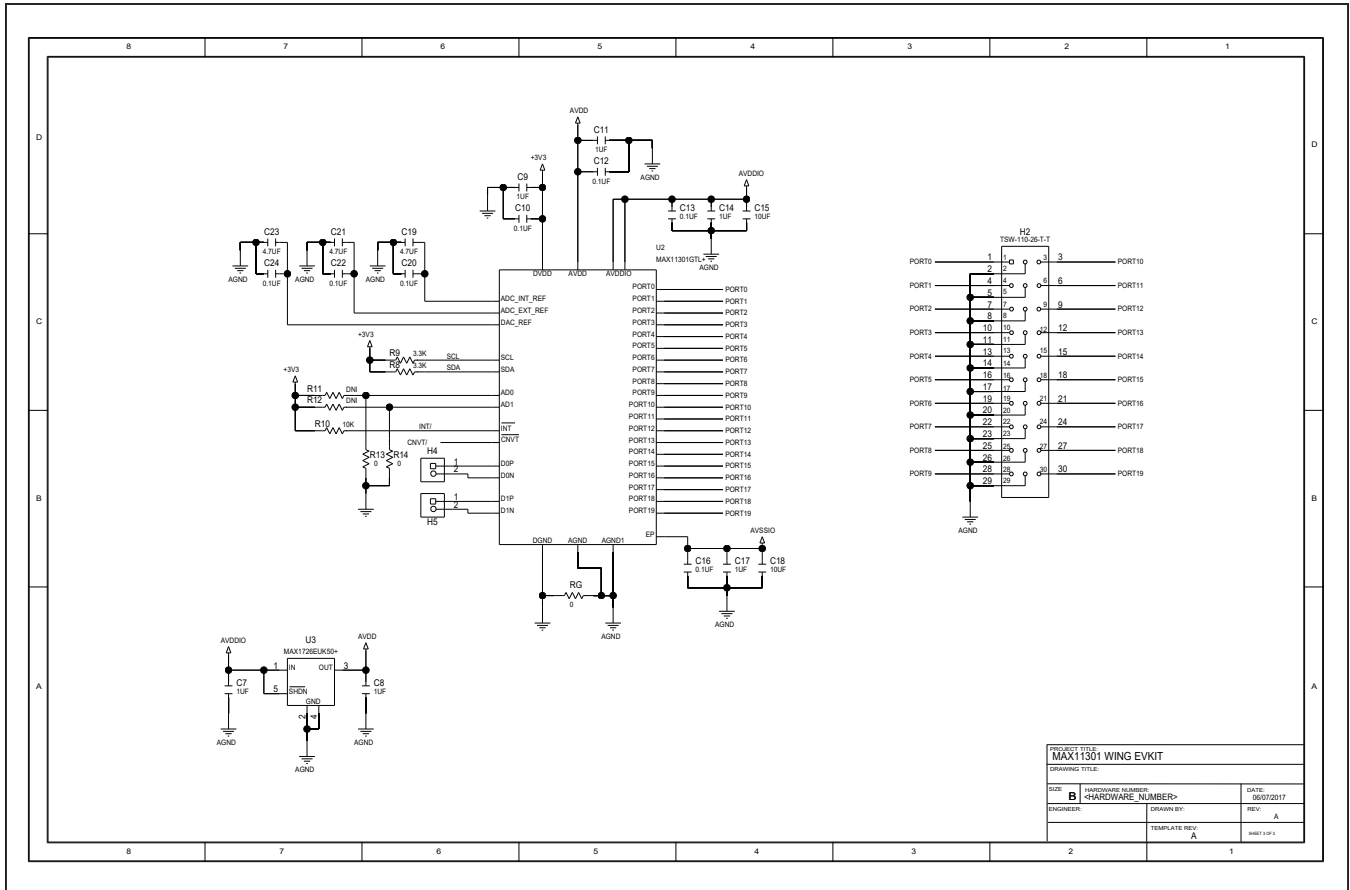
MAX11301WING EV Kit Schematic



MAX11301WING EV Kit Schematic (continued)



MAX11301WING EV Kit Schematic (continued)



Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	1/18	Initial release	—
1	2/18	Updated Figure 1 and schematics	2, 5–7

For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim Integrated's website at www.maximintegrated.com.

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