Evaluation Board User Guide
UG-174

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Evaluation Kit for the ADM2914 and the ADM12914

FEATURES

Input voltage of 8 V to 20 V
6 adjustable input voltages including 2 negative
Full features evaluated on a single board
LED indicated voltage and output status
Configurations can be easily adjusted with bare hands
Development area allows custom add-on circuits
Test points for easy probing

PACKAGE CONTENTS

EVAL-ADM2914EBZ evaluation board

GENERAL DESCRIPTION

The ADM2914/ADM12914 are quad voltage monitoring devices designed to simultaneously monitor undervoltage and overvoltage conditions on up to four supply rails. There are four undervoltage and four overvoltage comparators integrated internally to provide common $\overline{UV}$ and $\overline{OV}$ output signals. This device integrates the required comparators and digital gating necessary to achieve single common $\overline{UV}$ and $\overline{OV}$ reset signals. Each input is compared with a 0.5 V reference. Users can program the monitoring voltage level through the external voltage dividers.

When monitoring negative supplies, it has a 1 V buffered reference output that can be used. The tristate SEL pin is used to configure the polarity of the third and fourth inputs that determine if they are used for monitoring positive or negative supplies.

The ADM2914 and ADM12914 are available in two models: the ADM2914-1/ADM12914-1 and the ADM2914-2/ADM12914-2.

- The ADM2914-1/ADM12914-1 offer a latching $\overline{OV}$ output that can be cleared by toggling the $\overline{LATCH}$ input pin.
- The ADM2914-2/ADM12914-2 have a disable pin that is used as an override to disable both outputs signals.

An internal shunt regulator enables the ADM2914/ADM12914 devices to be used on higher voltage systems. However, this requires a resistor to be placed between the main supply rail and the V_{CC} pin to limit the current flow into the V_{CC} pin to no greater than 10 mA.

This evaluation board is designed to fully evaluate the features of the ADM2914 and the ADM12914, including supply monitoring for both positive and negative rails, monitoring polarity selection, timer function, and $\overline{LATCH}$/DIS functions.

TABLE OF CONTENTS

REVISION HISTORY

6/10—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

SWITCH, JUMPER, LED, AND CONNECTOR FUNCTIONS

Table 1. Switch Functions

Switch	Description	Default
S1	Input polarity selection switch.	
	6V2 = all inputs positive.	6V2
	N/C = V1 to V3 positive and V4 negative.	
	GND = V1 and V2 positive, and V3 and V4 negative.	
S2	$\overline{\text{LATCH}}$/DIS control switch.	
ADM2914-1	6V2 = $\overline{\text{OV}}$ output not latched/clear latched $\overline{\text{OV}}$ output.	6V2
	GND = $\overline{\text{OV}}$ output latched.	
ADM2914-2	6V2 = disable outputs, $\overline{\text{OV}}$ and $\overline{\text{UV}}$ outputs are not asserted except UVLO.	GND
	GND = enable outputs.	
S3	Timer capacitor control switch.	
S3-1	Connect the TIMER pin to C7 and C16.	
	On = connect.	Disconnected
	Off = disconnect.	
S3-2	Connect the TIMER pin to C15.	
	On = connect.	Connected
	Off = disconnect.	
S3-3	Connect the TIMER pin to C14.	
	On = connect.	Disconnected
	Off = disconnect.	
S3-4	Connect the TIMER pin to V_{CC}.	
	On = connect.	Disconnected
	Off = disconnect.	
S4	IC input selection.	
	Main supply = connect the V_{CC} pin of the ADM2914 to the main input of the board. This requires the shunt resistor R_{SHUNT} to be placed.	5 V
	5 V = Connect the V_{CC} pin of the ADM2914 to the output of U3 (adjustable 5 V).	
S5	Input selection switch.	
	+/+ = The inputs of the ADM2914 are connected to monitors adjustable 1 V, 2.5 V, 3.3 V, and 5 V.	+/+
	+/− = The inputs of the ADM2914 are connected to monitors adjustable +1 V, +2.5 V, +3.3 V, and −5 V.	
	−/− = The inputs of the ADM2914 are connected to monitors adjustable +1 V, +2.5 V, −3.3 V, and −5 V.	

Table 2. Jumper Functions

Jumper	Description	Default
J9	Deassert to disable the adjustable 1 V output.	Asserted
J10	Deassert to disable the adjustable 2.5 V output.	Asserted
J2	Deassert to disable the adjustable 3.3 V output. Disabling the 3.3 V output also disables the −3.3 V, +2.5 V, and +1 V outputs.	Asserted
J4	Deassert to disable the adjustable 5 V output. Disabling the 5 V output may disable the input supply to the ADM2914 unless it is powered from the main supply.	Asserted
J6	Deassert to disable the adjustable −5 V output.	Asserted
J5	Deassert to disable the adjustable −3.3 V output.	Asserted

Table 3. LED Functions

LED	Corresponding Node	Description
D6	6V2	The LEDs used to indicate the status of the on-board voltage rails.
D7	1V	The LEDs used to indicate the status of the on-board voltage rails.
D8	2.5V	The LEDs used to indicate the status of the on-board voltage rails.
D4	3.3V	The LEDs used to indicate the status of the on-board voltage rails.
D3	5V	The LEDs used to indicate the status of the on-board voltage rails.
D2	$\overline{OV}$	The LEDs used to indicate the status of the ADM2914 outputs.
D1	$\overline{UV}$	The LEDs used to indicate the status of the ADM2914 outputs.

Table 4. Connector Functions

Connector	Description
J1	Input power connector. Connect J1 to the 8.5 V to 20 V voltage source.
J3	Input power connector for wall adaptor. Connect J3 to the 8.5 V to 20 V power adaptor. Tip negative.

EVALUATION BOARD OVERVIEW

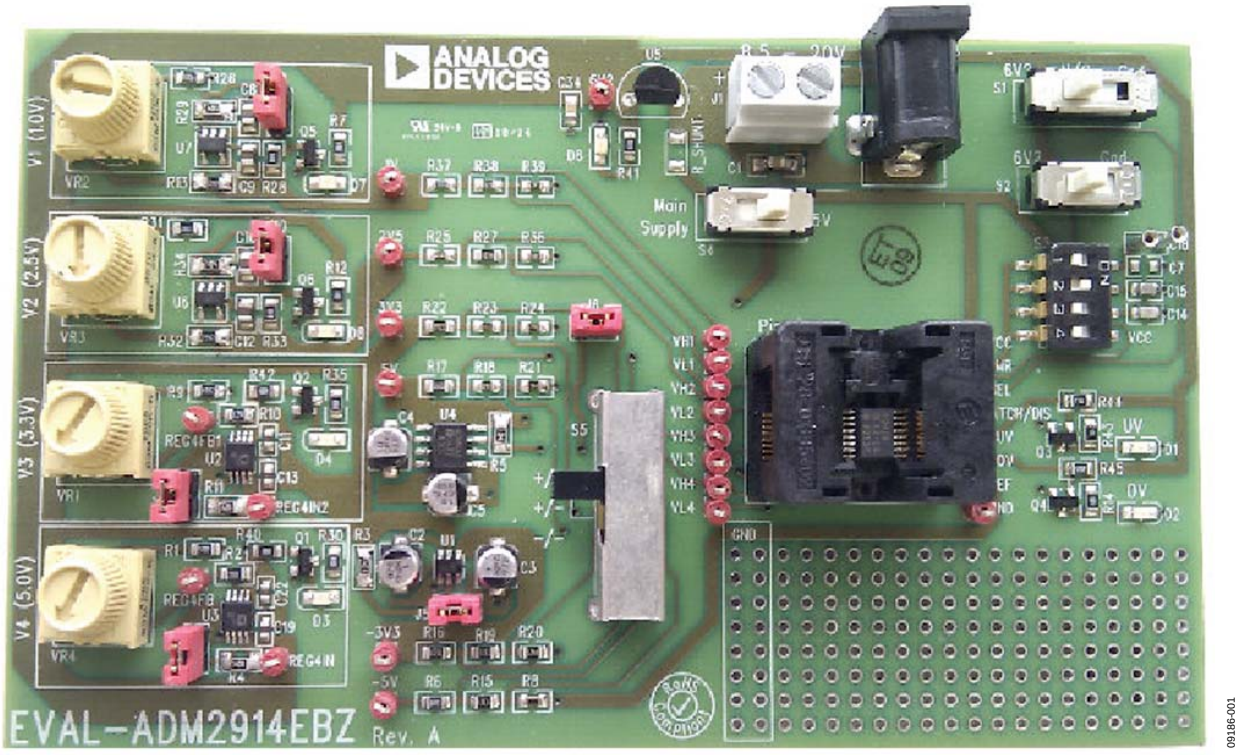

Figure 1. Evaluation Board

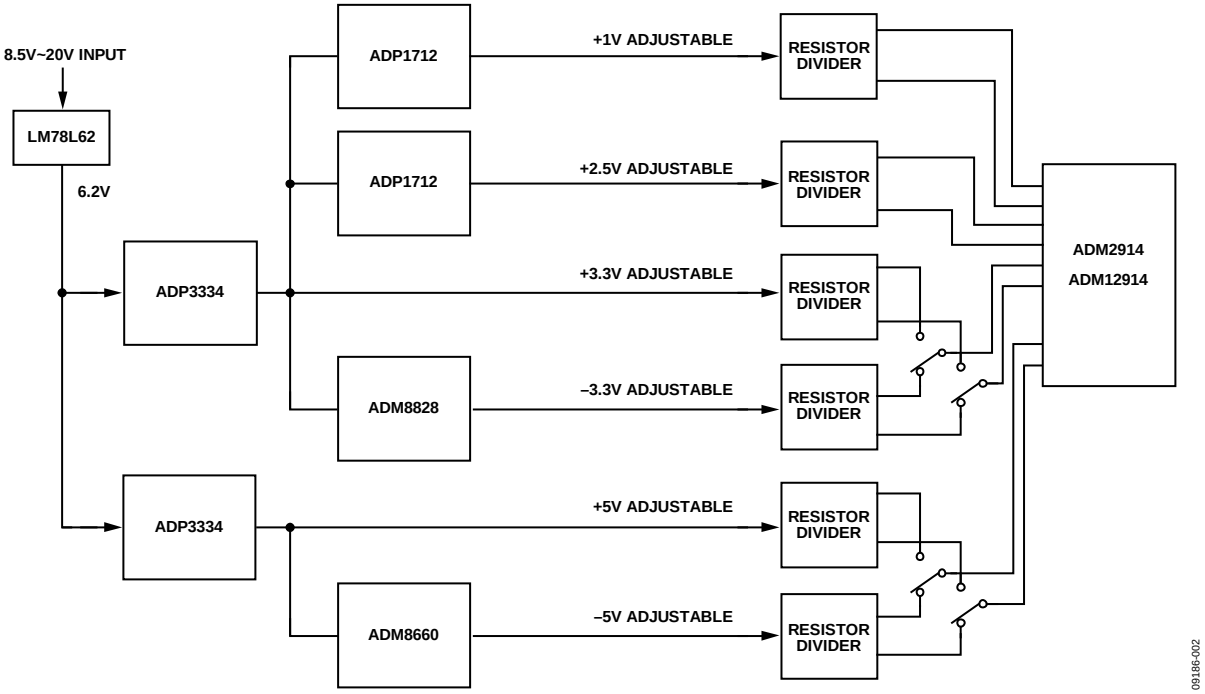

Figure 2. Evaluation Board Power Architecture

EVALUATION BOARD SCHEMATICS

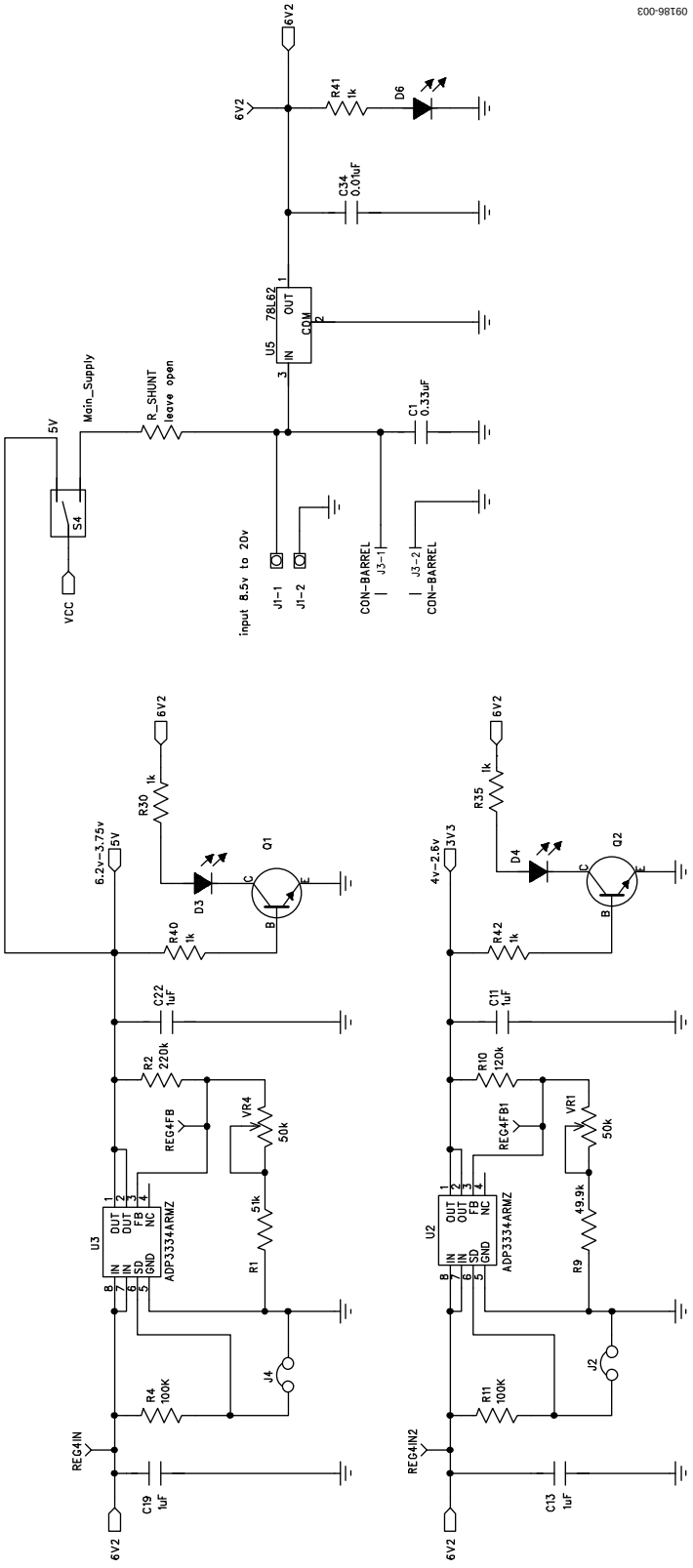

Figure 3. Evaluation Board Schematic 1

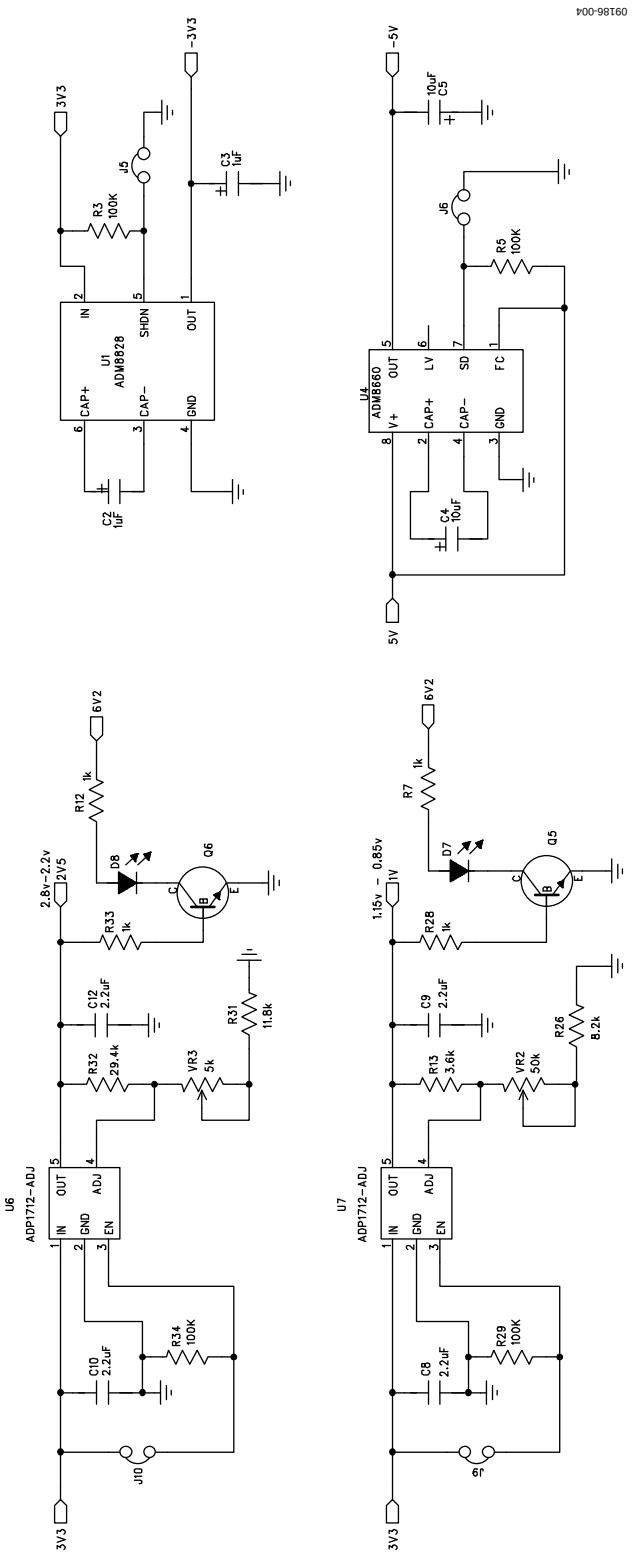

Figure 4. Evaluation Board Schematic 2

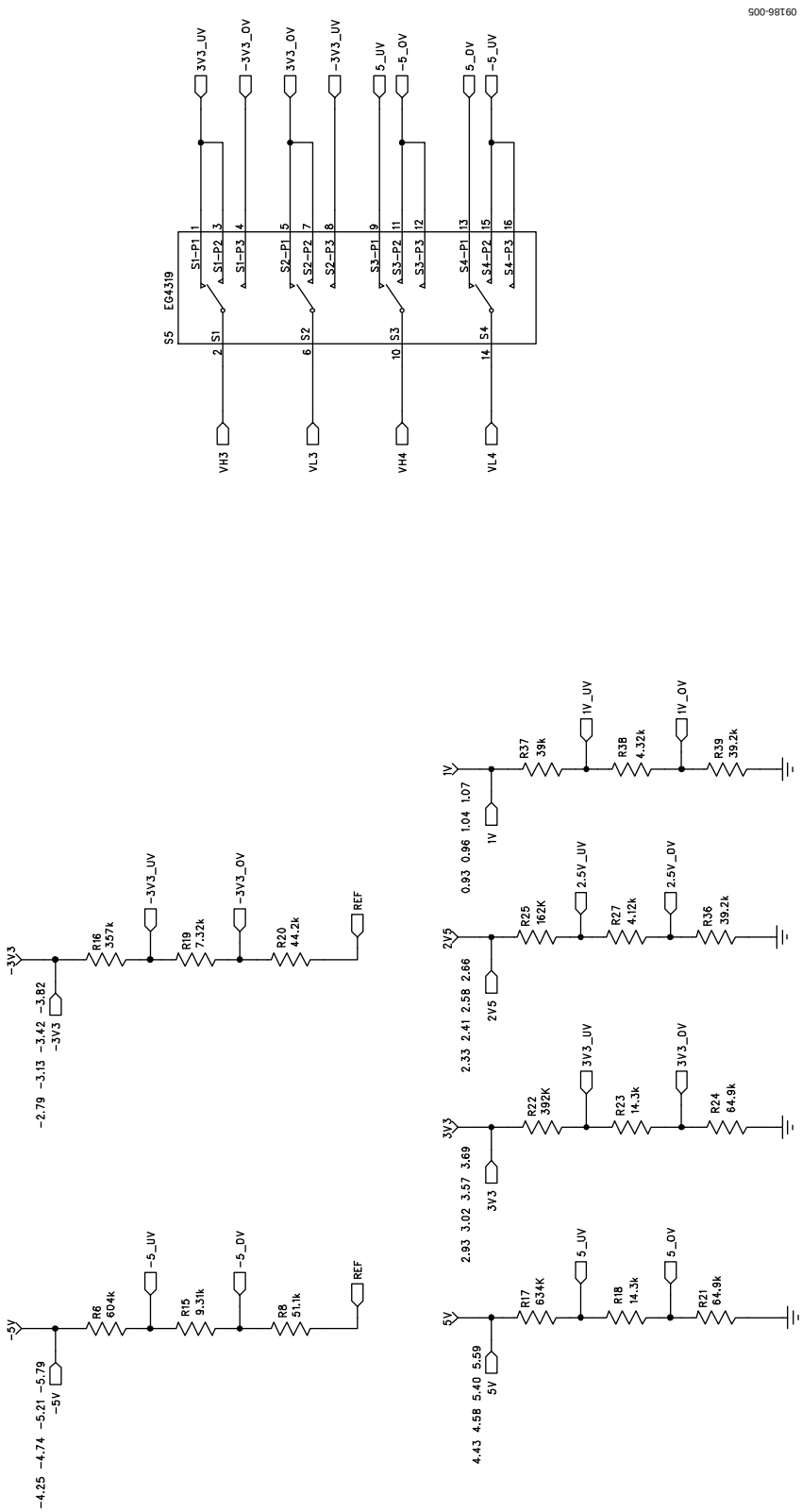

Figure 5. Evaluation Board Schematic 3

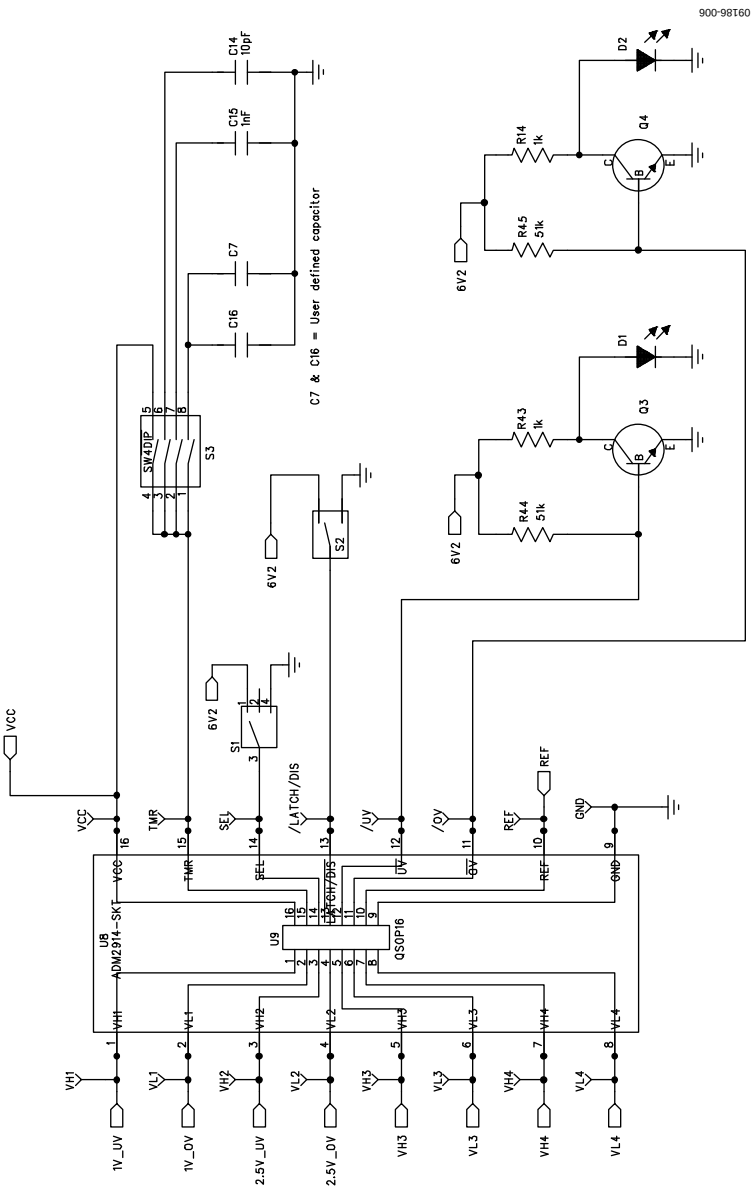

Figure 6. Evaluation Board Schematic 4

ORDERING INFORMATION

BILL OF MATERIALS

Table 5.

Name	Part Description	Part Number	Stock Code
−3V3, −5V, $\overline{\text{LATCH}}$/DIS, $\overline{\text{OV}}$, $\overline{\text{UV}}$, 1V, 2V5, 3V3, 5V, 6V2, REF, REG4FB, REG4FB1, REG4IN, REG4IN2, SEL, TMR, VCC, VH1 to VH4, VL1 to VL4	Red test point	20-313137	FEC 873 1144
C1	Capacitor, 0.33 µF, 1206, 10%, 25 V	C1206C334K3RACTU	FEC 1650900
C2, C3	50 V electrolytic capacitor, Case B, low ESR, 1 µF, 20%	EEEFC1H1R0R	FEC 9694528
C4, C5	16 V electrolytic capacitor, Case B, 10 µF, 20%	EEEFK1C100R	FEC 9695648
C7	0805, capacitor footprint (not inserted), user defined	Not inserted	Not inserted
C8 to C10, C12	Capacitor, 0805, 2.2 µF, 10 V, X7R, ±10%	CC0805KKX7R6BB225	FEC 9402152
C11, C13, C19, C22	Capacitor, 0603, 1µF, 10 V	CC0603ZRY5V6BB105	FEC 3188840
C14	Capacitor, 0805, 10 pF, 100 V, 5%	MCCA000390	FEC 9406239
C15	Capacitor, 0805, 1 nF, 50 V, 5%	08055A102JAT2A	FEC 317457
C16	Through-hole capacitor (not inserted), user defined	Not inserted	Insert low profile sockets
C34	Capacitor, 0805, 0.01 µF, 10%	CC0805KRX7R8BB103	FEC 3019767
D1 to D4, D6 to D8	Green, 0805, chip LED	KP-2012SGC	FEC 1318243
GND	Red test point	20-313137	FEC 8731144
J1	2-pin terminal block (5 mm pitch)		FEC 151-785
J2, J4 to J6, J9, J10	2-pin (0.1" pitch) header and shorting shunt, jumper socket red	M20-9990246 and M7566-05	FEC 1022247 and FEC 150411
J3	2.1 mm, dc barrel power connector	DC10A	FEC 224959
Q1 to Q6	General-purpose NPN SMD transistor, BC850C, SOT-23	BC850C	FEC 1081241
R1, R44, R45	51 kΩ resistor, 0805, ±1%	MC 0.1W 0805 1% 51K	FEC 9333339
R2	220 kΩ resistor, 0805, ±1%	MC 0.1W 0805 1% 220K	FEC 9332839
R3 to R5, R1,1 R29, R34	100 kΩ resistor, 0805, ±5%	RC0805JR-07100KL	FEC 9234250
R6	604 kΩ resistor, 0805, ±0.1%	MCTC0525B6043T5E	FEC 1576103
R7, R12, R14, R28, R30, R33, R35, R40 to R43	1 kΩ resistor, 0.1 W, 0805, ±1%	WCR0805-1K0FI	FEC 1099800
R8	51.1 kΩ resistor, 0603, ±0.1%	PCF0603R 51K1BI.T1	FEC 1160386
R9	49.9 kΩ resistor, 0805, ±1%	CRCW080549K9FKEA	FEC 1469934
R10	120 kΩ resistor, 0805, ±1%	MC 0.1W 0805 1% 120K	FEC 9332510
R13	3.6 kΩ resistor, 0805, ±1%	MC 0.1W 0805 1% 3K6	FEC 9333118
R15	9.31 kΩ resistor, 0805, ±0.1%	MCTC0525B9311T5E	FEC 1575897
R16	357 kΩ resistor, 0805, ±0.1%	PCF0805R-357KBT1	FEC 1353265
R17	634 kΩ resistor, 0805, ±0.1%	PCF0805R 634KBI.T1	FEC 1160299
R18, R23	14.3 kΩ resistor, 0603, ±0.1%	PCF0603R-14K3BT1	FEC 1353120
R19	7.32 kΩ resistor, 0805, ±0.1%	PCF0805R 7K32BI.T1	FEC 1160193
R20	44.2 kΩ resistor, 0805, ±0.1%	PCF0805R-44K2BT1	FEC 1353276
R21, R24	64.9 kΩ resistor, 0603, ±0.1%	PCF0603R-64K9BT1	FEC 1353180
R22	392 kΩ resistor, 0805, ±0.1%	PCF0805R 392KBI.T1	FEC 1160287
R25	162 kΩ resistor, 0603, ±0.1%	PCF0603R-162KBT1	FEC 1353121
R26	8.2 kΩ resistor, 0805, ±1%	MC 0.1W 0805 1% 8K2	FEC 9333584
R27	4.12 kΩ resistor, 0805, ±0.1%	PCF0805R-4K12BT1	FEC 1353280
R31	11.8 kΩ resistor, 125 mW, ±1%	CRCW080511K8FKEA	FEC 1258438
R32	29.4 kΩ resistor, 125 mW, ±1%	CRCW080529K4FKEA	FEC 1152323
R36, R39	39.2 kΩ resistor, 0603, ±0.1%	PCF0603R-39K2BT1	FEC 1353166

Name	Part Description	Part Number	Stock Code
R37	39 kΩ resistor, 0603, ±0.1%	ERA3AEB393V	FEC 1577627
R38	4.32 kΩ resistor, 0603, ±0.1%	PCF0603R 4K32BI.T1	FEC 1160343
R_SHUNT	Resistor, 1206	Not populated	Not applicable
S1	Slide switch, SP 3 POS, VERT	STSSS9131	FEC 1123876
S2, S4	Slide switch, SP 2 POS, VERT	STSSS9121	FEC 1123875
S3	4-way SMD switch (SW\4DIP)	A6S-4101	FEC 9901868
S5	Switch slide 4P3T, 30 V, right angle	EG4319	Digi-Key EG1915-ND
U1	ADM8828, switched-capacitor voltage inverter with shutdown, SOT-23-6	ADM8828ARTZ	ADM8828ARTZ
U2, U3	ADP3334 adjustable LDO regulator, MSOP-8	ADP3334ARMZ	ADP3334ARMZ
U4	ADM8660, CMOS switched-capacitor voltage converter SOIC-8	ADM8660ARZ	ADM8660ARZ
U5	6.2 V voltage regulator, 78L62, TO-92-3	LM78L62ACZ	FEC 9490213
U6, U7	ADP1712 adjustable LDO, TSOT-5	ADP1712AUJZ-R7	ADP1712AUJZ-R7
U8	ADM2914, 16-lead QSOP	OTS-16(28)-0.635-02	Abrel OTS-16(28)-0.635-02
U9	4-channel supervisory circuit footprint, QSOP-16	Not populated	Not applicable
VR1, VR2, VR4	50 kΩ trimmer	M63M503KB30T607	FEC 9608257
VR3	5 kΩ trimmer	M63M502KB30T607	FEC 9608222
X1 to X16	Patchwork area, keep holes free of solder	Not applicable	Not applicable

NOTES

ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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