Evaluation Kit for ADM1184
±0.8% Accurate Quad Voltage Monitor

EVAL-ADM1184

FEATURES

Evaluation kit for the ADM1184 ±0.8% accurate quad voltage monitor
LEDs provide a clear visual indication of device operation
Dedicated power and enable/disable switches
On-board test points allow examination of ADM1184 operation

GENERAL DESCRIPTION

The EVAL-ADM1184 evaluation kit demonstrates the operation of the ADM1184 as a quad voltage monitor in a multiple supply system.

The ADM1184 monitors four separate voltage rails. Each rail is adjustable using the on-board rotary switches or dedicated switches, allowing the user to investigate the result of altering each of the monitored input voltages and to simulate fault conditions.

LEDs provide a visual indication of the status of the main supply voltage, of the four monitored voltage rails, of the four outputs (OUT1 to OUT3), and of the system power-good signal (PWRGD).

EVALUATION KIT CONTENTS

ADM1184 main evaluation board
2 ADM1184 samples

DIGITAL PHOTO OF ADM1184 EVALUATION BOARD

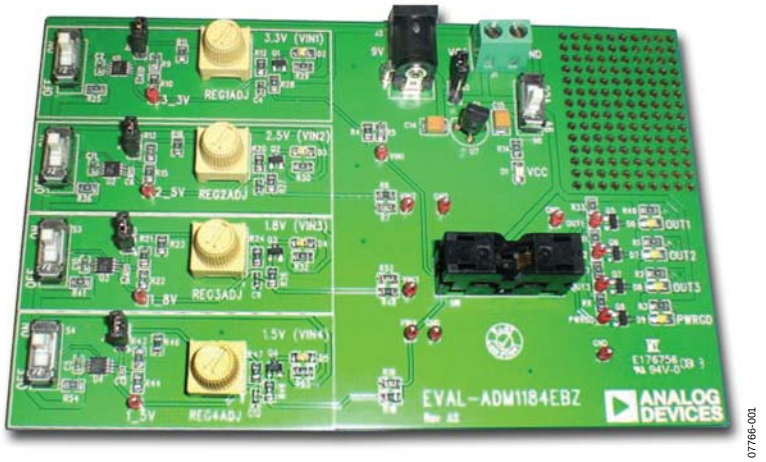

Figure 1.

One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A.
Tel: 781.329.4700 **www.analog.com**
Fax: 781.461.3113

TABLE OF CONTENTS

REVISION HISTORY

10/08—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

CONNECTOR, SWITCH, JUMPER, LED, AND TEST POINT FUNCTIONS

Table 1. Connector Functions

Pin	Name	Function
J1	Power connector	J1-1: Connects the positive terminal of the bench power supply to the evaluation board
		J1-2: Connects the ground terminal of the bench power supply to the evaluation board
J3	Terminal block	J3-1: Connects a 9 V power supply to the evaluation board
		J3-2: Connects a 9 V power supply to ground

Table 2. Switch Functions

Switch	Description	Position	Function
S0	Switch for powering board on/off	9 V	Set to this position when powering the board via J3
		V_{CC}	Set to this position when powering the board via J1
S1	Switch for turning on/off the 3.3 V rail which is monitored by the VIN1 pin	On position	Enables Regulator U1
		Off position	Disables Regulator U1
S2	Switch for turning on/off the 2.5 V rail which is monitored by the VIN2 pin	On position	Enables Regulator U2
		Off position	Disables Regulator U2
S3	Switch for turning on/off the 1.8 V rail which is monitored by the VIN3 pin	On position	Enables Regulator U3
		Off position	Disables Regulator U3
S4	Switch for turning on/off the 1.5 V rail which is monitored by the VIN4 pin	On position	Enables Regulator U4
		Off position	Disables Regulator U4
VR1	Rotary switch	N/A	Reduces the 3.3 V supply level when the switch is turned clockwise
VR2	Rotary switch	N/A	Reduces the 2.5 V supply level when the switch is turned clockwise
VR3	Rotary switch	N/A	Reduces the 1.8 V supply level when the switch is turned clockwise
VR4	Rotary switch	N/A	Reduces the 1.5 V supply level when the switch is turned clockwise

Table 3. Jumper Functions

Jumper	Description	Default
J2	Connects J1-1 to J3-1	Not inserted
J5	Connects VR2 to the feedback pin of Regulator U2	Inserted
J6	Connects VR3 to the feedback pin of Regulator U3	Inserted
J8	Connects VR1 to the feedback pin of Regulator U1	Inserted
J12	Connects VR4 to the feedback pin of Regulator U4	Inserted

Table 4. LED Functions

LED	Name	Function
D1	VCC	A red LED indicates that the board is powered on
D2	3.3 V (VIN1)	A yellow LED indicates the status of the 3.3 V supply voltage
D3	2.5 V (VIN2)	A yellow LED indicates the status of the 2.5 V supply voltage
D4	1.8 V (VIN3)	A yellow LED indicates the status of the 1.8 V supply voltage
D5	1.5 V (VIN4)	A yellow LED indicates the status of the 1.5 V supply voltage
D6	OUT1	A green LED indicates when the OUT1 output is asserted
D7	OUT2	A green LED indicates when the OUT2 output is asserted
D8	OUT3	A green LED indicates when the OUT3 output is asserted
D9	PWRGD	A green LED indicates when the PWRGD output is asserted

Table 5. Test Point Functions

Test Point	Function
1_5V	Connected to the 1.5 V rail
1_8V	Connected to the 1.8 V rail
2_5V	Connected to the 2.5 V rail
3_3V	Connected to the 3.3 V rail
GND	Connected to ground
GND1	Connected to ground
GND2	Connected to ground
GND3	Connected to ground
OUT1	Connected to the OUT1 pin of the ADM1184 device
OUT2	Connected to the OUT2 pin of the ADM1184 device
OUT3	Connected to the OUT3 pin of the ADM1184 device
PWRGD	Connected to the PWRGD pin of the ADM1184 device
VIN1	Connected to VIN1 pin of the ADM1184 device
VIN2	Connected to VIN2 pin of the ADM1184 device
VIN3	Connected to VIN3 pin of the ADM1184 device
VIN4	Connected to VIN4 pin of the ADM1184 device

EVALUATION BOARD OPERATION

ADM1184 SAMPLES

Two loose ADM1184 samples are included in the evaluation kit. If the board does not have a device soldered in place, place a single sample in the socket labeled U6 before powering on the evaluation board.

POWERING THE EVALUATION BOARD

There are two methods of powering the EVAL-ADM1184: connect a 9 V power supply through J3 or connect a bench supply through J1. When using a 9 V power supply, be sure to place S2 to the 9 V position; alternatively, when using a bench supply, adjust S2 to the V_{CC} position.

THEORY OF OPERATION

Four voltage rails are monitored by the ADM1184. Resistor networks external to the VIN1, VIN2, VIN3, and VIN4 pins set the trip points for the monitored rails, 3.3 V, 2.5 V, 1.8 V, and 1.5 V.

Output OUT1 to Output OUT3 are solely dependent on their associated input (that is, VIN1, VIN2, or VIN3). Before the voltage on a VINx input reaches 0.6 V, the corresponding output is switched to ground. When VINx detects 0.6 V, OUTx is asserted after a 30 µs delay.

When all four monitored supplies exceed their programmed thresholds a system power good signal (PWRGD) is asserted. There is an internal 190 ms delay associated with the assertion of the PWRGD output. After PWRGD is asserted, if any of the four monitored supplies drops below its programmed threshold, the corresponding OUTx output and the PWRGD output are deasserted. If the supply monitored by VIN4 drops below it's programmed threshold, the PWRGD output is only deasserted.

SIMULATING A POWER-UP SEQUENCE

Begin with all four rotary positions turned fully counter-clockwise. Power on each of the four voltage rails by switching the associated dedicated switch, S1 to S4, to the on position. The rails may be powered on in any order. Yellow LEDs (D2, D3, D4, and D5) provide a visual indication of the status of each of the four voltage rails, while green LEDs (D6, D7, D8, and D9) indicate when the OUT1 to OUT3 outputs and the system PWRGD signal are asserted. The 190 ms delay associated with the assertion of the power-good signal is easily observed.

OBSERVING FAULT CONDITIONS

Fault conditions may be investigated by using the four rotary switches, VR1 to VR4. By turning a rotary switch clockwise, the associated input voltage is reduced.

Each rotary switch (VR1 to VR4) controls the voltage at each of the VIN1 to VIN4 inputs. As the rotary switch is turned clockwise, the voltage monitored by VINx is reduced. When the voltage at the VINx input pin drops below 0.6 V, OUTx is switched to ground. The PWRGD output is also deasserted immediately.

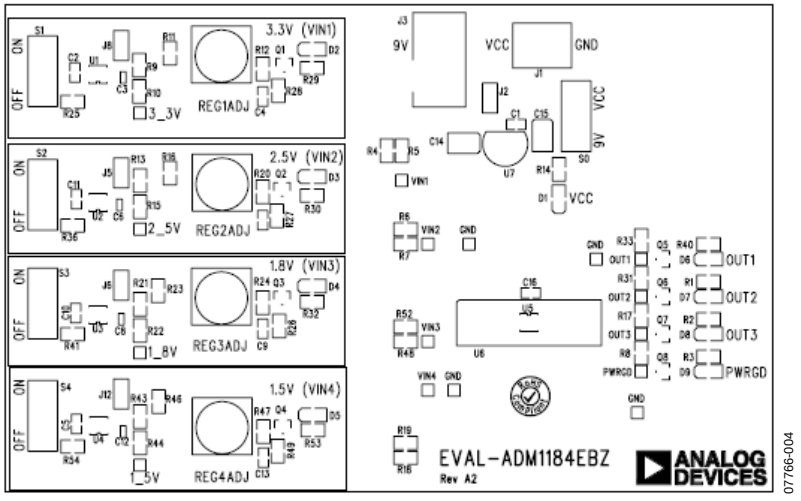

Figure 2. ADM1184 Evaluation Board Silkscreen

EVALUATION BOARD SCHEMATICS

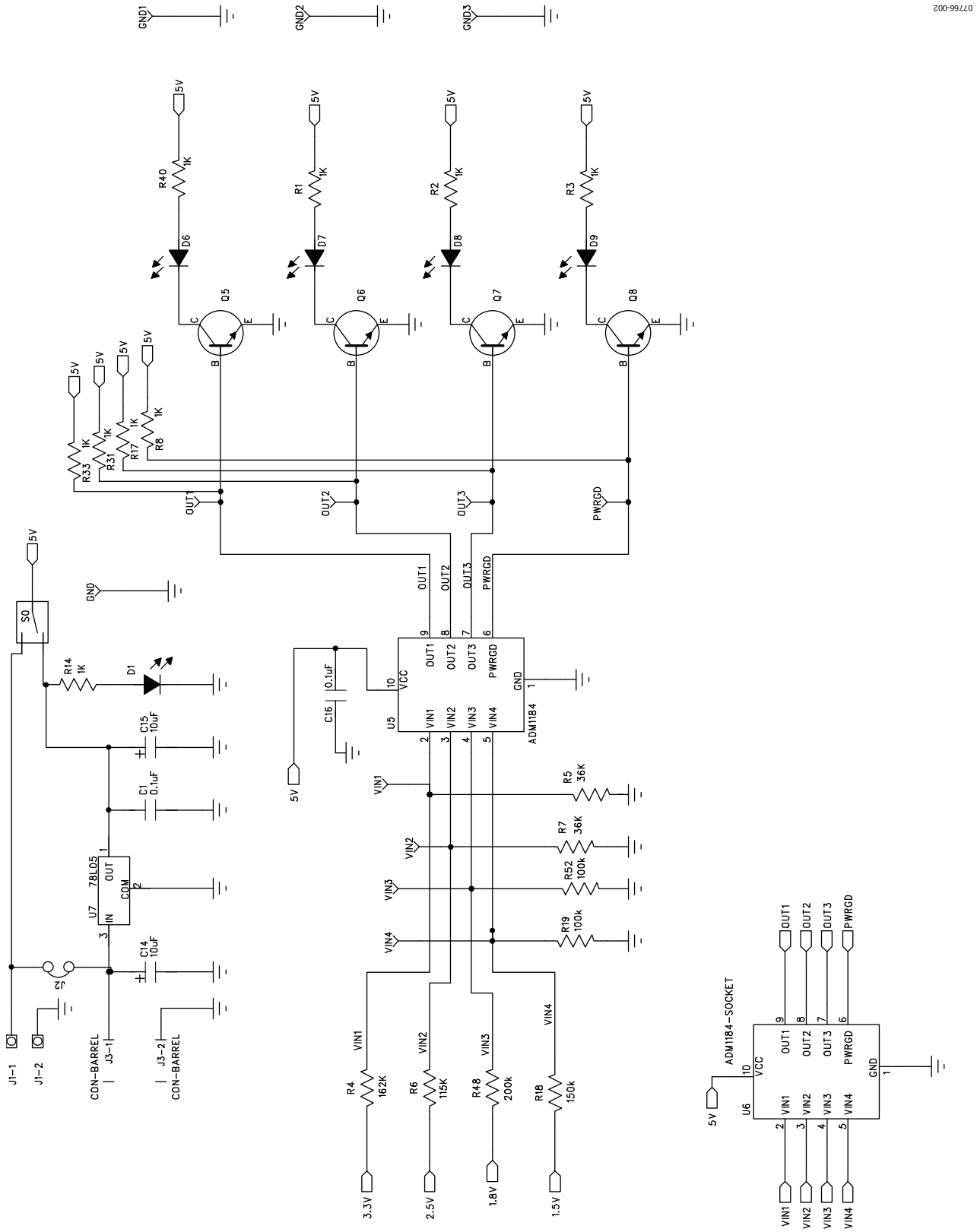

Figure 3. ADM1184 Evaluation Board Schematic, Page 1

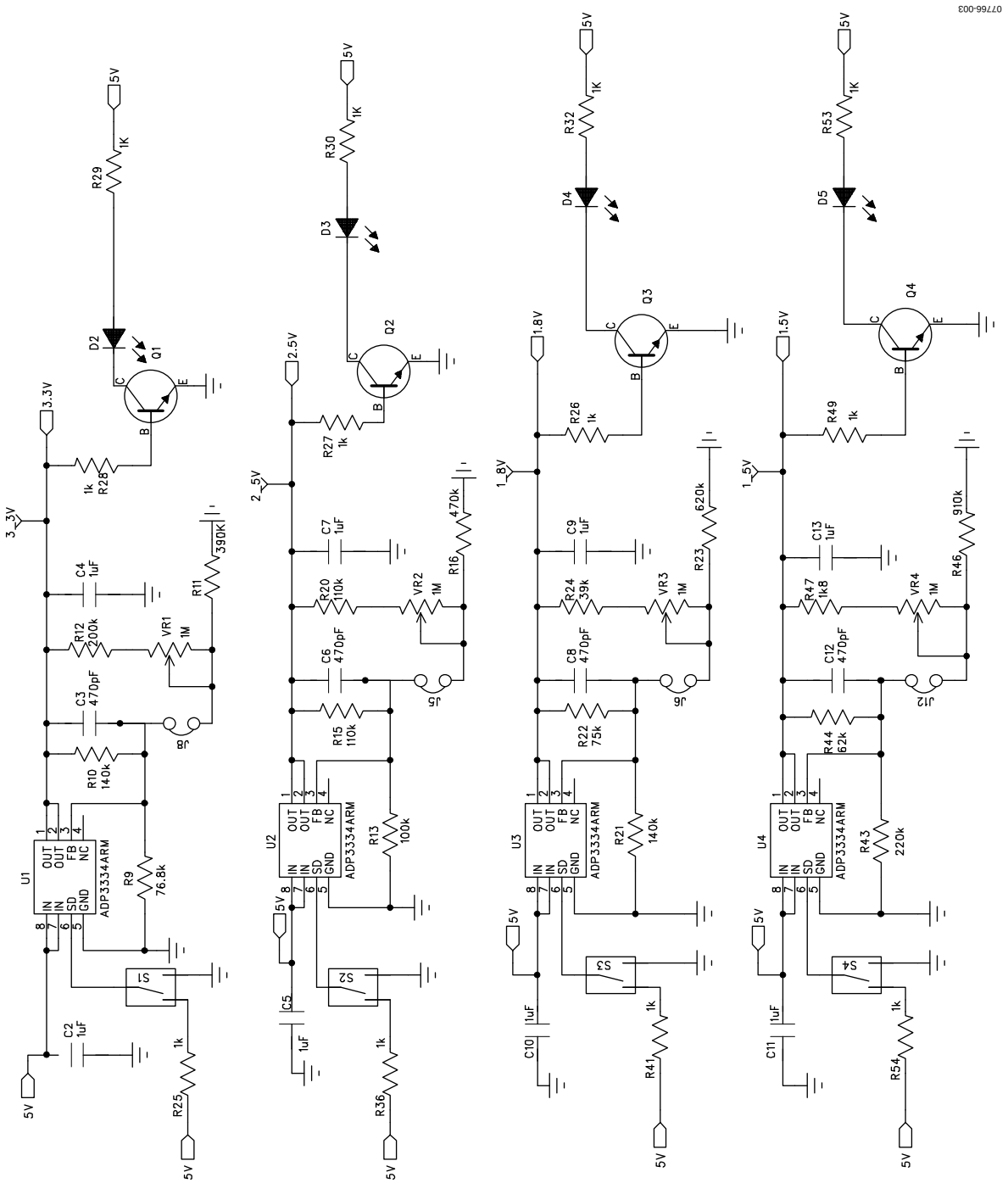

Figure 4. ADM1184 Evaluation Board Schematic, Page 2

ORDERING INFORMATION

BILL OF MATERIALS

Table 6.

Qty	Reference Designator	Description	Part No.[1]
2	C1, C16	0.1 µF, 0603 capacitor	FEC 432210
8	C2, C4, C5, C7, C9, C10, C11, C13	1 µF, 0603 capacitor	FEC 3188840
4	C3, C6, C8, C12	470 pF, 0402 capacitor	FEC 3019366
2	C14, C15	10 µF, 0603 capacitor	FEC 9753893
1	D1	0805 red LED	FEC 1021302
4	D2, D3, D4, D5	0805 yellow LED	FEC 1318247
4	D6, D7, D8, D9	0805 green LED	FEC 1318243
1	J1	2-pin terminal block, connector/power	FEC 151789
5	J2, J5, J6, J8, J12	Jumper, SIP-2P	FEC 1022247
1	J3	DC barrel power connector, connector\barrel	FEC 224959
8	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8	NPD SMD transistor, SOT-23	FEC 1081239
21	R1, R2, R3, R8, R14, R17, R25, R26, R27, R28, R29, R30, R31, R32, R33, R36, R40, R41, R49, R53, R54	1 kΩ, 0805 resistor	FEC 9332383
1	R4	162 kΩ, 0805 resistor	FEC 1160272
2	R5, R7	36 kΩ, 0805 resistor	FEC 1108905
1	R6	115 kΩ, 0805 resistor	FEC 1140356
1	R9	76.8 kΩ, 0805 resistor	FEC 1141007
2	R10, R21	140 kΩ, 0805 resistor	FEC 1160268
1	R11	390 kΩ, 0805 resistor	FEC 9333185
2	R12, R48	200 kΩ, 0805 resistor	FEC 9332782
3	R13, R19, R52	100 kΩ, 0805 resistor	FEC 9332405
2	R15, R20	110 kΩ, 0805 resistor	FEC 9332464
1	R16	470 kΩ, 0805 resistor	FEC 9333282
1	R18	150 kΩ, 0805 resistor	FEC 9332626
1	R22	75 kΩ, 0603 resistor	FEC 9331522
1	R23	620 kΩ, 0805 resistor	FEC 9333444
1	R24	39 kΩ, 0805 resistor	FEC 9333177
1	R43	220 kΩ, 0805 resistor	FEC 9332839
1	R44	62 kΩ, 0805 resistor	FEC 9333436
1	R46	910 kΩ, 0805 resistor	FEC 9333657
1	R47	1.8 kΩ, 0805 resistor	FEC 9332715
5	S0, S1, S2, S3, S4	SPDT slide switch, SW-SPDT-SLIDE	FEC 1123875
4	VR1, VR2, VR3, VR4	Trimmer potentiometer, 1 M, VRES_ROTARY	FEC 9608290
16	1_5V, 1_8V, 2_5V, 3_3V, GND, GND1, GND2, GND3, OUT1, OUT2, OUT3, PWRGD, VIN1, VIN2, VIN3, VIN4	Testpoint	FEC 8731144
4	U1, U2, U3, U4	ADP3334ARM adjustable LDO regulator, MS08	Free issue by Analog Devices
1	U5	ADM1184 quad voltage monitor MS010	Free issue by Analog Devices
1	U6	10-pin MSOP socket, MS010-SKT	Abrel Products 6560102211
1	U7	3-terminal 0.1 A positive voltage regulator, TO-92	FEC 9489444

[1] FEC = Farnell Electronics.

ORDERING GUIDE

Model	Description
EVAL-ADM1184EBZ[1]	ADM1184 Evaluation Kit

[1] Z = RoHS Compliant Part.

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.

EB07766-0-10/08(0)