EVAL-ADM3252EEBZ User Guide
UG-440

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

Evaluating the ADM3252E Isolated, Dual Channel, RS-232 Line Driver/Receiver

FEATURES

2.5 kV fully isolated (power and data) RS-232 transceiver
Convenient connections for power and signal via screw terminal blocks
3.3 V or 5 V operation
Test points for measuring all signals
All external components required included for correct operation

EVALUATION KIT CONTENTS

ADM3252E evaluation board

GENERAL DESCRIPTION

The EVAL-ADM3252EEBZ evaluation board can be used for easy evaluation of the ADM3252E isolated RS-232 transceiver. Screw terminal blocks provide convenient connections for the power and signal connections. Test points are included on the power and signal lines on both sides of the isolation barrier. All required external components are included on the evaluation board.

RADIATED EMISSIONS

The EVAL-ADM3252EEBZ shown in Figure 1 uses some of the techniques described in the AN-0971 Application Note, *Recommendations for Control of Radiated Emissions with isoPower Devices*, to reduce radiated emissions. These emissions are generated by the high frequency switching elements used by the *iso*Power® technology to transfer power through its transformer. The evaluation board is designed to meet the EN55022 Class B emission standard. See the Radiated Emissions Results section for more details.

EVAL-ADM3252EEBZ EVALUATION BOARD

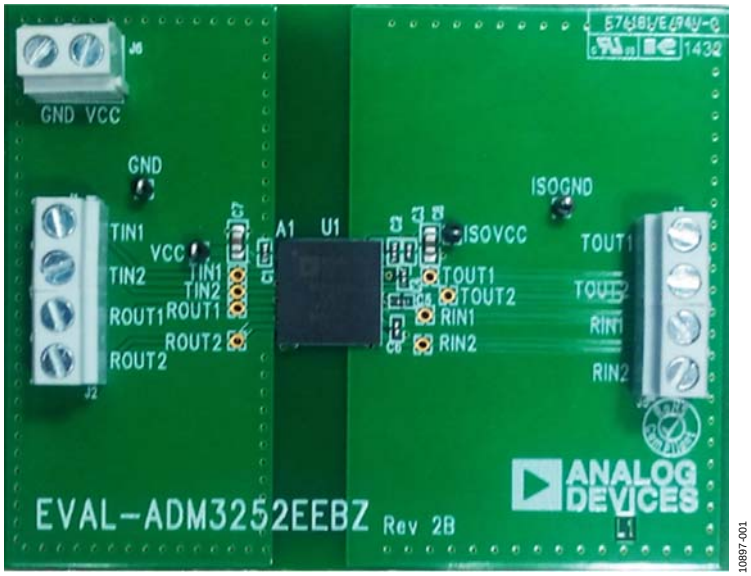

Figure 1.

PLEASE SEE THE LAST PAGE FOR AN IMPORTANT WARNING AND LEGAL TERMS AND CONDITIONS.

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REVISION HISTORY

11/15—Rev. 0 to Rev. A

Changes to Figure 1 and Radiated Emissions Section 1
Deleted Figure 4; Renumbered Sequentially 5
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Changes to Figure 5 and Figure 6 6
Changes to Figure 7 7
Added Radiated Emissions Results Section, Table 3, Figure 8, and Figure 9; Renumbered Sequentially 8
Added Table 4 9

7/12—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

CONNECTOR AND TEST POINT FUNCTIONS

Table 1. Connector Functions

Connector	Name	Function
J6	Power connector	J6-1 (VCC) connects positive supply of bench supply to the V_{CC} plane J6-2 (GND) connects ground terminal of bench supply to the GND plane
J1	Signal connector	J1-1 (TIN1) connects to T_{IN1} pin of ADM3252E J1-2 (TIN2) connects to T_{IN2} pin of ADM3252E
J2	Signal connector	J2-1 (ROUT1) connects to R_{OUT1} pin of ADM3252E J2-2 (ROUT2) connects to R_{OUT2} pin of ADM3252E
J3	Signal connector	J3-1 (TOUT1) connects to T_{OUT1} pin of ADM3252E J3-2 (TOUT2) connects to T_{OUT2} pin of ADM3252E
J5	Signal connector	J5-1 (RIN1) connects to R_{IN1} pin of ADM3252E J5-2 (RIN2) connects to R_{IN2} pin of ADM3252E

Table 2. Test Point Functions

Test Point	Function
GND	Connects to GND plane at logic side
VCC	Connects to V_{CC} plane at logic side
TIN1	Connects to T_{IN1} pin of ADM3252E
TIN2	Connects to T_{IN2} pin of ADM3252E
ROUT1	Connects to R_{OUT1} pin of ADM3252E
ROUT2	Connects to R_{OUT2} pin of ADM3252E
ISOVCC	Connects to V_{ISO} plane at RS-232 side
ISOGND	Connects to GND plane at RS-232 side
TOUT1	Connects to T_{OUT1} pin of ADM3252E
TOUT2	Connects to T_{OUT2} pin of ADM3252E
RIN1	Connects to R_{IN1} pin of ADM3252E
RIN2	Connects to R_{IN2} pin of ADM3252E

EVALUATION BOARD SCHEMATICS AND ARTWORK

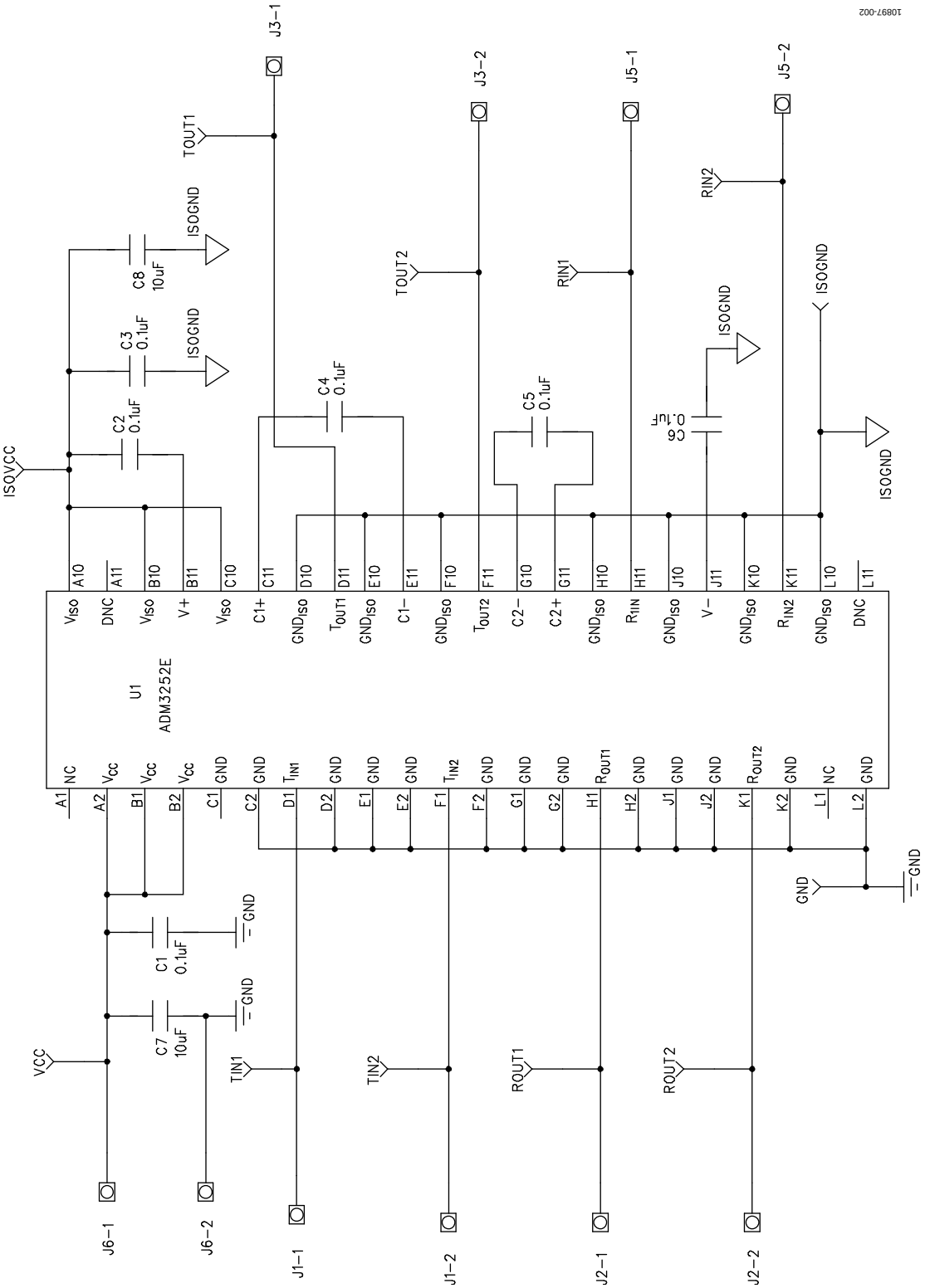

Figure 2. ADM3252E Evaluation Board Schematic

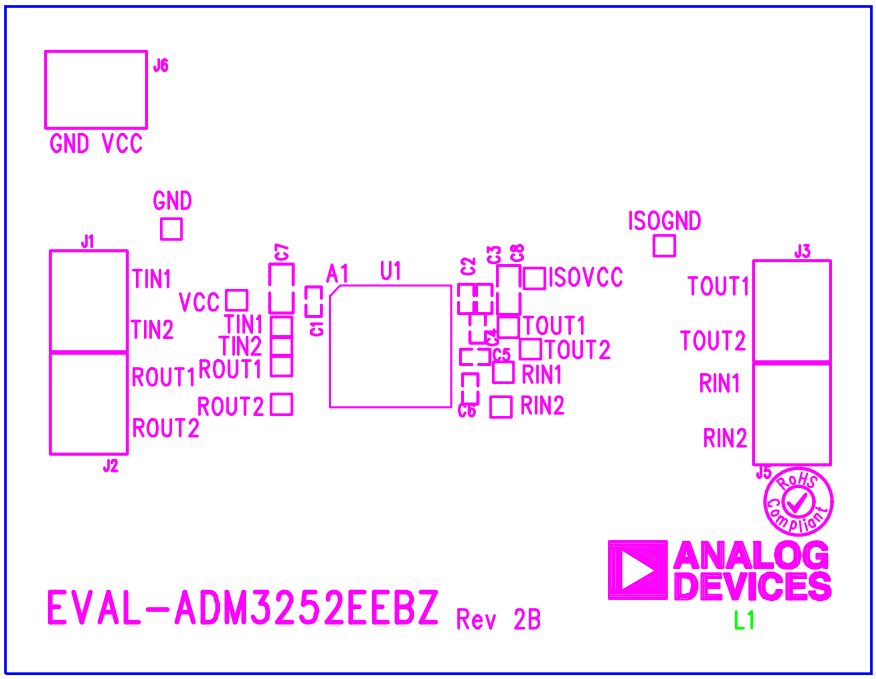

Figure 3. EVAL-ADM3252EEBZ Silkscreen

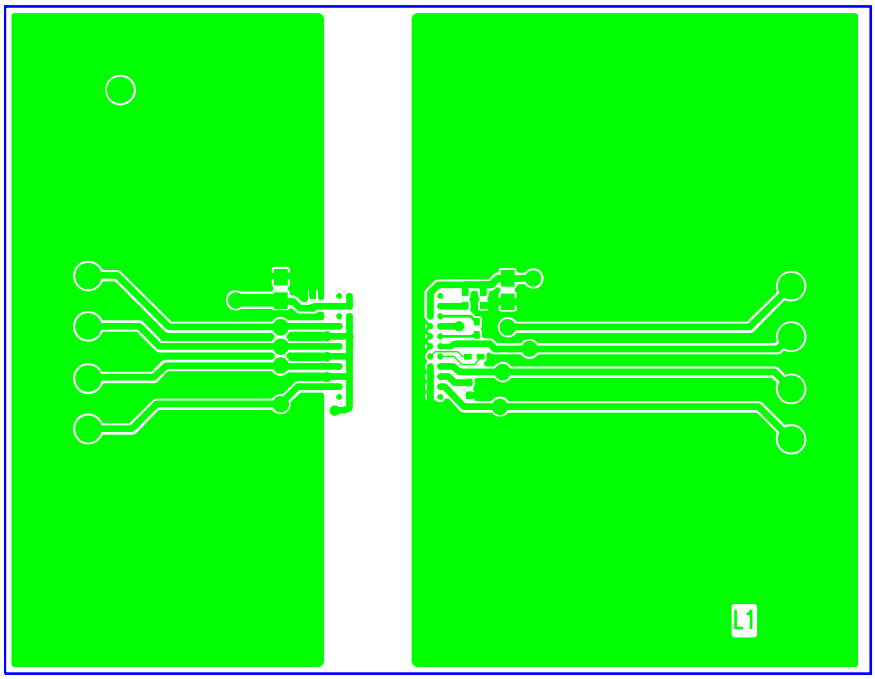

Figure 4. EVAL-ADM3252EEBZ Top Layer

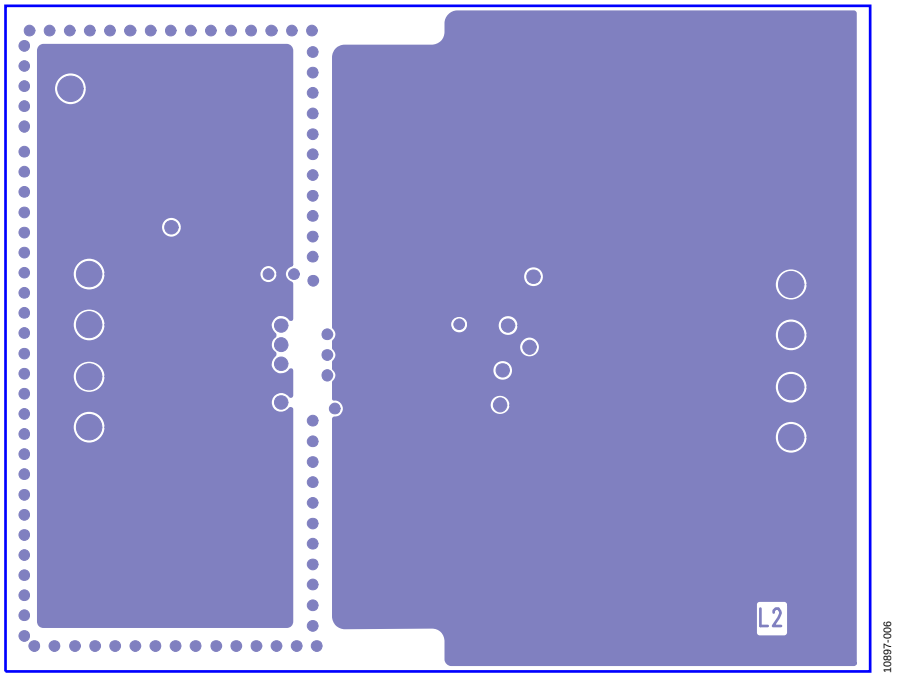

Figure 5. EVAL-ADM3252EEBZ Internal Layer 2

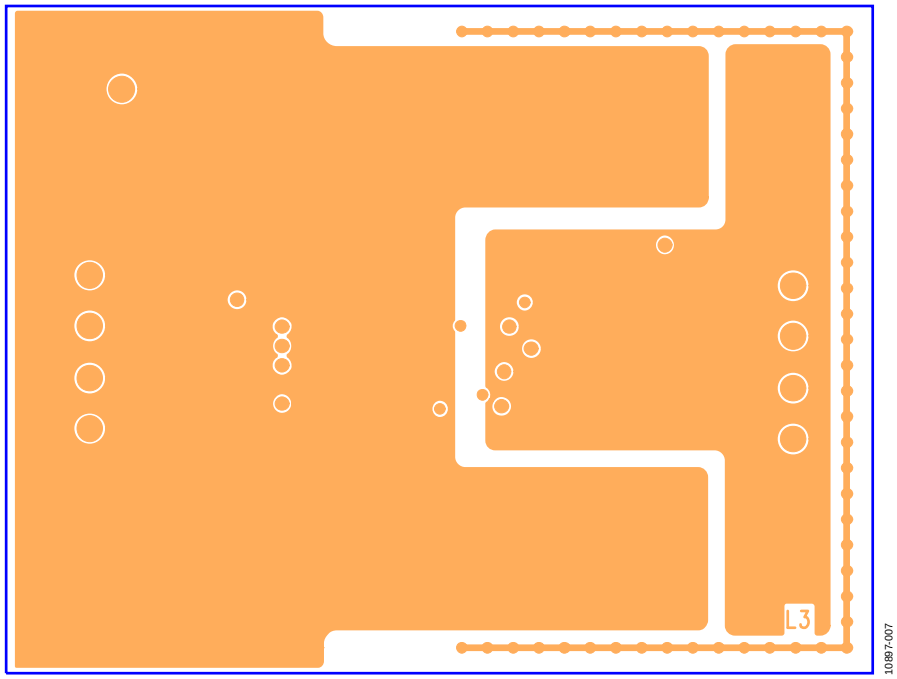

Figure 6. EVAL-ADM3252EEBZ Internal Layer 3

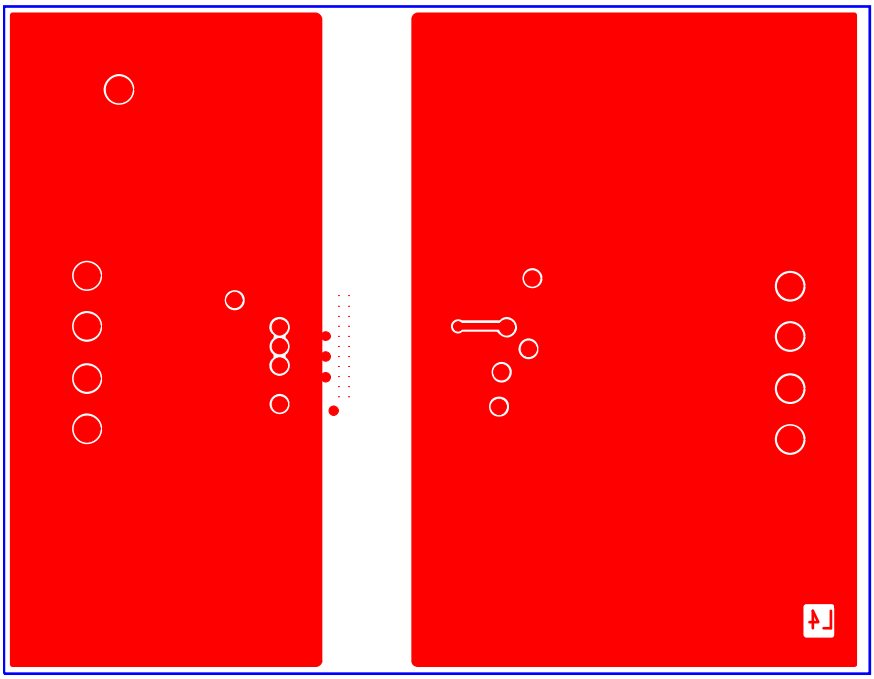

Figure 7. EVAL-ADM3252EEBZ Bottom Layer

RADIATED EMISSIONS RESULTS

The EVAL-ADM3252EEBZ evaluation board was tested to EN55022: 2010 (radiated emissions standard). The device was configured and tested with a 3 V, 3.3 V, and 5.5 V dc supply at a data rate of 460 kbps. Each T_{OUTx} pin was loaded with 500 nF of load capacitance and 5 kΩ of load resistance.

Measurements were carried out in an anechoic chamber at 10 m from 30 MHz to 2 GHz. Table 3 shows the list of test equipment used. Figure 8 and Figure 9 show the results of the horizontal and vertical scans. Table 4 shows the tabulated results. There were no emissions detected above 1 GHz.

Table 3. Radiated Emissions Test Equipment

Instrument	Manufacturer	Model
Measuring Receiver	Rohde & Schwarz	ESVS30
Bilog Antenna	Chase	Not applicable
Spectrum Analyzer	Agilent	E4408B
Horn Antenna	EMCO	EMCO 3115

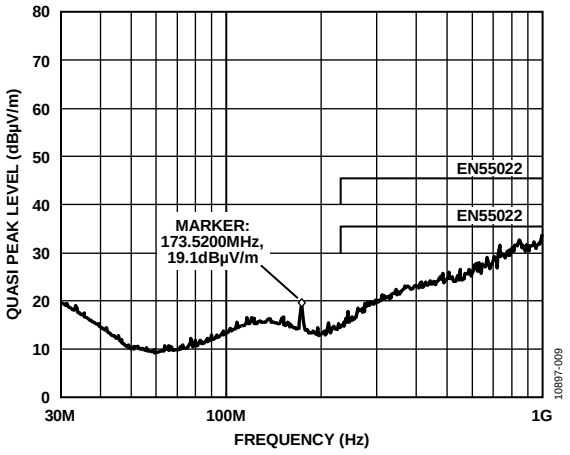

Figure 8. Horizontal Scan from 30 MHz to 1000 MHz

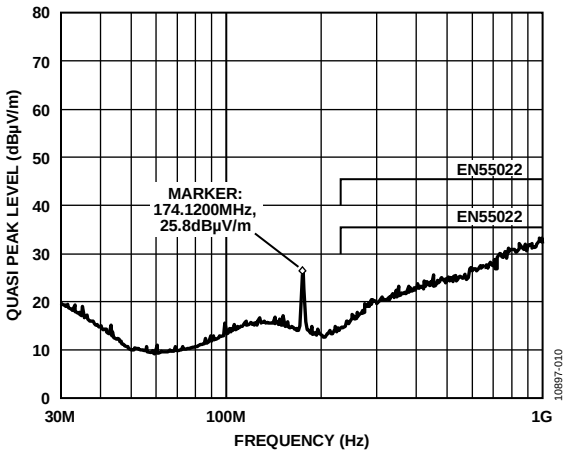

Figure 9. Vertical Scan from 30 MHz to 1000 MHz

Table 4. Radiated Emissions, Class B Limits—Anechoic Chamber at 10 m

V_{CC} (V)	Frequency (MHz)	Quasi Peak Level (µV/m)	EN55022 Class B (µV/m)	Antenna Polarity	Antenna Height (m)	Pass/Fail
3.3	173.672	16.6	30	Vertical	3.3	Pass
3.3	173.500	23.3	30	Horizontal	4.0	Pass
3.0	172.588	15.5	30	Vertical	2.7	Pass
3.0	172.848	28.1	30	Horizontal	4.0	Pass
5.5	174.656	10.6	30	Vertical	1.0	Pass
5.5	190.476	10.6	30	Vertical	1.0	Pass
5.5	190.476	18.1	30	Horizontal	4.0	Pass

ORDERING INFORMATION

BILL OF MATERIALS

Table 5.

Reference Designator	Description	Supplier Part Number
C1, C2, C3, C4, C5, C6	Capacitor, 0.1 µF, 16 V, 0402	Farnell 1288252
C7, C8	Capacitor, 10 µF, 35 V, 0805	Farnell 146-3361
GND, ISOGND, ISOVCC	Test point, black	Farnell 240-333
J1, J2, J3, J5, J6	2-pin terminal block (5 mm pitch)	Farnell 151789
U1	ADM3252E, 44-ball CSP_BGA	Analog Devices, Inc., ADM3252E

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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