

MAX14775E Evaluation Kit

Evaluates: MAX14775E/MAX14776E

General Description

The MAX14775E evaluation kit (EV kit) is a fully assembled and tested PCB that demonstrates the functionality of the MAX14775 20Mbps RS-485/RS-422 fault-protected transceiver.

The MAX14775E EV kit may also be used to evaluate the MAX14776E.

Features

- Operates From a Single 3V to 5V Supply
- Terminal Block Connectors for Easy RS-485/RS-422 Evaluation
- Fully Assembled and Tested

Quick Start

Required Equipment

- MAX14775E EV kit
- 3.3V, 500mA DC power supply
- Signal/function generator
- Oscilloscope

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

Startup Procedure

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

- 1) Set the DC power supply to 3.3V and connect the DC power supply between the VCC and GND connectors on the EV kit.
- 2) Ensure that all jumpers are in their default positions (see [Table 1](#)).
- 3) Connect the oscilloscope probes to the A, B, and RO test points on the EV kit.
- 4) Turn on the power supply.
- 5) Set the signal/function generator to output a 1MHz 0-to-3.3V square wave.
- 6) Connect the signal/function generator to the DI test point.
- 7) Using the oscilloscope, verify that the A, B and RO outputs switch as the signal on DI toggles.

Detailed Description of Hardware

The EV kit is a fully assembled and tested circuit board for evaluating the MAX14775E high speed RS-485/RS-422 transceiver (U1). The EV kit has been designed to allow for evaluating the MAX14775E alone or in a standard RS-485 network.

Driver and Receiver Enable Selection

The EV kit features three jumpers (J1, J4, and J5) to enable/disable the driver and receiver outputs. Set J4 to 2-3 to enable the receiver. Set J5 to 1-2 to enable the driver. To actively control both enables, remove J4 and J5 shunts and close J1, which connects DE and $\overline{RE}$ together.

Resistors R2–R4 Configuration

For end-of-the-line transceivers, close J2 to connect a 120Ω termination resistor (R2) between the A and B RS-485 receiver inputs on the MAX14775E.

Pullup and pulldown resistors are generally used on the receiver inputs to guarantee a known state in the event that all nodes on the bus are in receive mode, or the cable becomes disconnected. The exact value for these resistors will vary with the application. R1 and R3 pads are provided for pullup and pulldown resistors on the A and B lines, if needed. The use of any of these resistors is purely optional. Note that the MAX14775E features true fail-safe receiver inputs, which ensures that RO is high when the receiver inputs are shorted, open, or connected to an idle bus.

Surge Protection

Some industrial applications require extra components on the A and B lines to protect against high voltage surges. Pads for D1 and D2 TVS diodes are included on the MAX14775E EV kit for this purpose. The use of these diodes is completely optional for normal operation.

Table 1. Jumper Table (J1-J5)

JUMPER	SHUNT POSITION	DESCRIPTION
J1	Open*	DE and $\overline{RE}$ are not connected together.
	Closed	DE and $\overline{RE}$ are connected together.
J2	Open*	A and B are connected through the on-board 120Ω termination resistor.
	Closed	A and B are not connected through the on-board termination resistor.
J4	1-2	$\overline{RE}$ is high. The RS-485 receiver is disabled.
	2-3*	$\overline{RE}$ is low. The RS-485 receiver is enabled.
J5	1-2*	DE is high. The RS-485 driver outputs are enabled.
	2-3	DE is low. The RS-485 driver outputs are disabled.

*Default position.

Ordering Information

PART	TYPE
MAX14775EEVKIT#	EV Kit

#Denotes RoHS compliant.

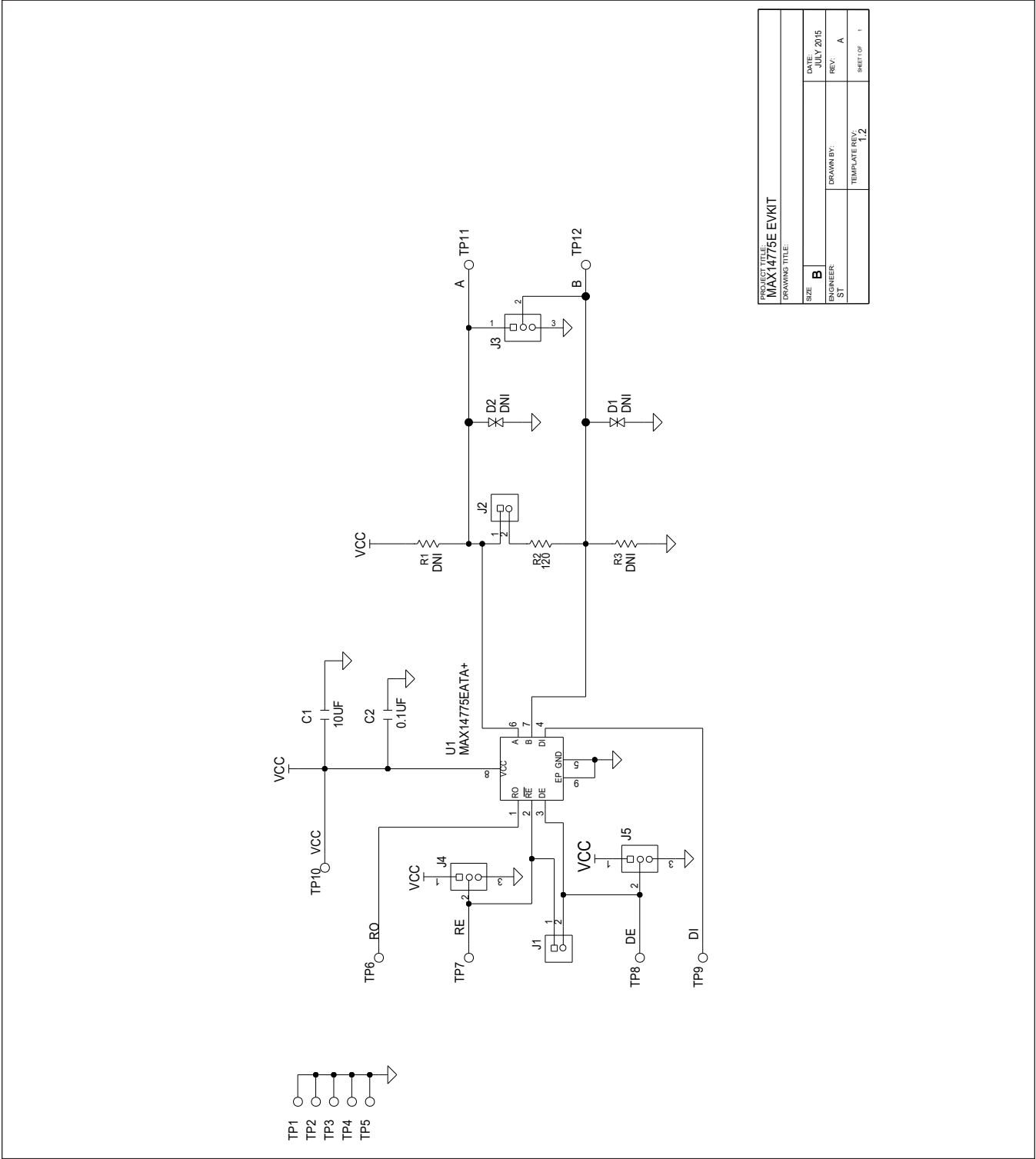
MAX14775E Evaluation Kit

Evaluates: MAX14775E/MAX14776E

MAX14775E EV Kit Bill of Materials

ITEM	REF DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	C1	-	1	C1608X5R1A106M080AC	TDK	10UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 10UF; 10V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R
2	C2	-	1	C0603C104K8RAC	KEMET	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 10V; TOL=10%; MODEL=C0603 SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R
3	J1, J2	-	2	PCC02SAAN	SULLINS	PCC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 2PINS; -65 DEGC TO +125 DEGC
4	J3	-	1	1935789	PHOENIX CONTACT	1935789	CONNECTOR; FEMALE; THROUGH HOLE; SCREW COMPACT TERMINAL BLOCK; RIGHT ANGLE; 3PINS
5	J4, J5	-	2	PEC03SAAN	SULLINS	PEC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS;
6	R2	-	1	MCR10EZPJ121	ROHM SEMICONDUCTOR	120	RESISTOR; 0805; 120 OHM; 5%; 200PPM; 0.125W; METAL FILM
7	TP1-TP5	-	5	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;
8	TP6-TP9, TP11, TP12	-	6	5014	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
9	TP10	-	1	5010	KEYSTONE	N/A	TESTPOINT WITH 1.80MM HOLE DIA, RED, MULTIPURPOSE;
10	U1	-	1	MAX14775EATA+	MAXIM	MAX14775EATA+	IC; TXRX; +/-65V FAULT PROTECTED 20MBPS HALF-DUPLEX RS-485/RS-422 TRANSCEIVER; TDFN8-EP
11	PCB	-	1	MAX14775E	MAXIM	PCB	PCB:MAX14775E
12	D1, D2	DNP	0	SMAJ30CA	ST MICROELECTRONICS	30V	DIODE; TVS; SMA (DO-214AC); VRM=30V; IPP=8.3A
13	R1, R3	DNP	0	CRCW08051K00FK;ERJ-6ENF1001V;MCR10EZH10 01;RC0805FR-071KL	VISHAY DALE;PANASONIC;ROHM;YAGEO	1K	RESISTOR; 0805; 1K; 1%; 100PPM; 0.125W; THICK FILM
TOTAL			22				

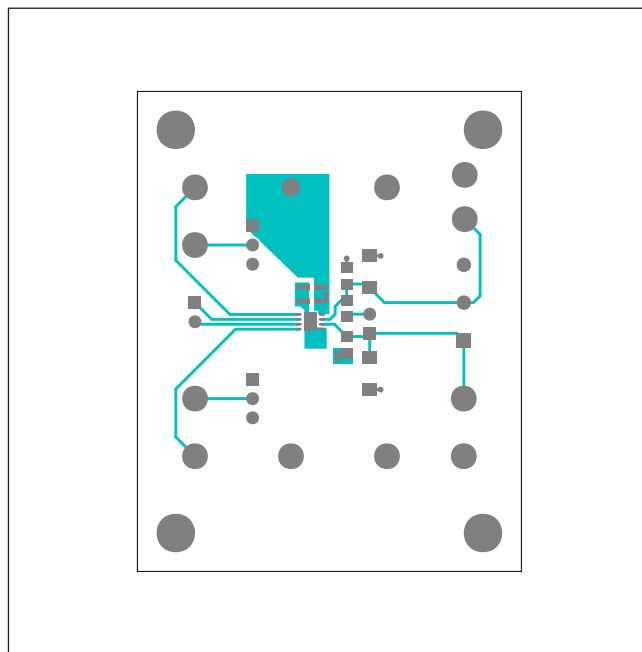
MAX14775E EV Kit Schematic



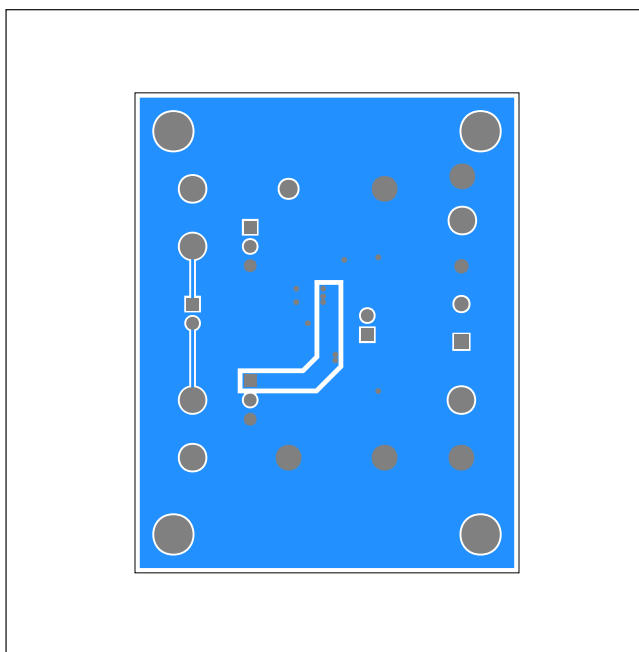
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DRAWING TITLE:			
SIZE: B	DATE: JULY 2015		
ENGINEER: ST	REV: A		
DRAWN BY:		TEMPLATE REV: 1,2	SHEET OF 1

The diagram shows the MAX14775E EVK1T circuit board layout. At the top center is the MAXIM integrated logo. The board features several test points (TP1-TP10), a power supply section with VCC and GND pins, and a central IC (U1) surrounded by resistors (R1, R2, R3) and capacitors (C1, C2). There are also two jumpers (J1, J2) and a large multi-pin connector (J3) with pins A, B, and GND. The board is labeled with 'REV-A 10/16' and 'MAX14775E_EVK1T'.

MAX14775E EV Kit—Top Silkscreen



MAX14775E EV Kit—Top



MAX14775E EV Kit—Bottom

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	11/16	Initial release	—
1	10/18	Updated Bill of Materials and Schematic	3–4

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