

MAX2202X Evaluation Kit

Evaluates: MAX22025-MAX22028

General Description

The MAX2202XEVKIT# evaluation kit (EV kit) is a fully assembled and tested PCB that demonstrates the functionality of the MAX22028 isolated RS-485 transceiver with AutoDirection. The EV kit operates from a single 3.3V supply and features an on-board isolated power supply to power the secondary side of the circuit.

The MAX2202X EV kit ships with the MAX22028 installed. The board can also be used to evaluate the MAX22025, MAX22026, and MAX22027.

Features

- Operates from a Single 3.3V Supply
- Terminal Block Connector for Easy RS-485 Evaluation
- 3500V_{RMS} Isolation for 60s
- Fully Assembled and Tested

Quick Start

Required Equipment

- MAX2202X EV kit
- 3.3V, 500mA DC power supply
- Signal/function generator
- Oscilloscope

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.
- 2) Connect the DC power supply to the V_{DDA} test point (TP1). Connect the ground terminal to the GNDA test point (TP2).
- 3) Ensure that the jumpers are in their default positions (see [Table 1](#)).
- 4) Turn on the power supply.
- 5) Connect the oscilloscope to the A and B test points (TP7 and TP6, respectively).
- 6) Set the signal/function generator to output a 100kHz 0V-to-3.3V square wave.
- 7) Connect the signal/function generator to the TXD test point (TP4).
- 8) Verify that the A and B outputs switch as the signal toggles.

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

Detailed Description of Hardware

The MAX2202X EV kit is a fully assembled and tested circuit board for evaluating the MAX2202X isolated RS-485 transceiver with AutoDirection control. The EV kit is powered from a single 3.3V power supply.

Powering the MAX2202X EV Kit

The power on the EV kit is derived from a single 3.3V source. Connect an external supply to the V_{DDA} test point (TP1) to supply the 3.3V to the logic-side (A-side) of the circuit. The on-board MAX258 (U3) transformer driver and external transformer (T1) generate an isolated supply for powering the isolated side (B-side) of the board. The MAX8881 (U4) generates a regulated 5V for the B-side of the board.

To use an external supply on the isolated side of the board, remove the shunt on the J3 jumper and apply the voltage to the V_{DDB} test point (TP8).

Evaluating the Isolated RS-485 Interface

The MAX2202X EV kit includes test points to access A (TP7) and B (TP6) for easy evaluation. To verify operation in a RS-485 system, connect the transceiver to the network using the J1 terminal block and use the TXD and RXD test points (TP4 and TP5, respectively) to connect the board to a logic controller. Alternatively, connect an external controller to drive TXD using the J7 SMA connector and connect the controller to RXD using the J6 SMA connector.

External Protection

For harsh industrial environments, external protection might be necessary to protect the RS-485 transceiver during high voltage transient events. The MAX2202X EV kit includes pads for additional on-board protection that can be used when evaluating the device in a RS-485 network. Solder a diode to the U2 pad to add additional protection on the A and B lines when needed.

Table 1. Jumper Table

JUMPER	SHUNT POSITION	DESCRIPTION
J2	Open	On-board termination is not connected between A and B.
	Closed*	On-board termination is connected between A and B.
J3	Open	V _{DDB} is not powered by the on-board isolated power circuit.
	Closed*	V _{DDB} is powered by the on-board isolated power circuit.

*Default position.

Ordering Information

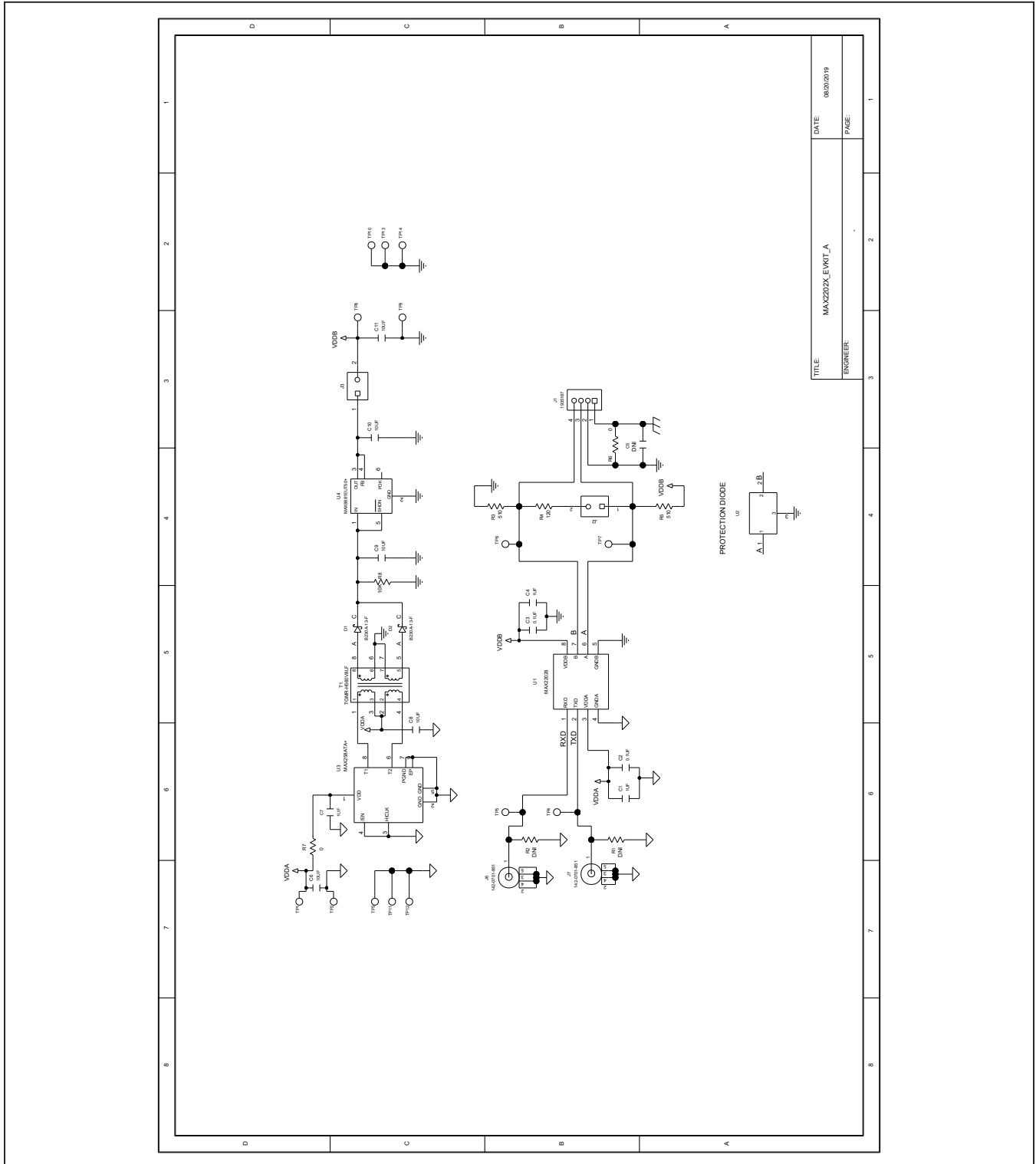
PART	TYPE
MAX2202XEVKIT#	EV Kit

#Denotes RoHS-compliance.

MAX2202XEVKIT# EV Kit Bill of Materials

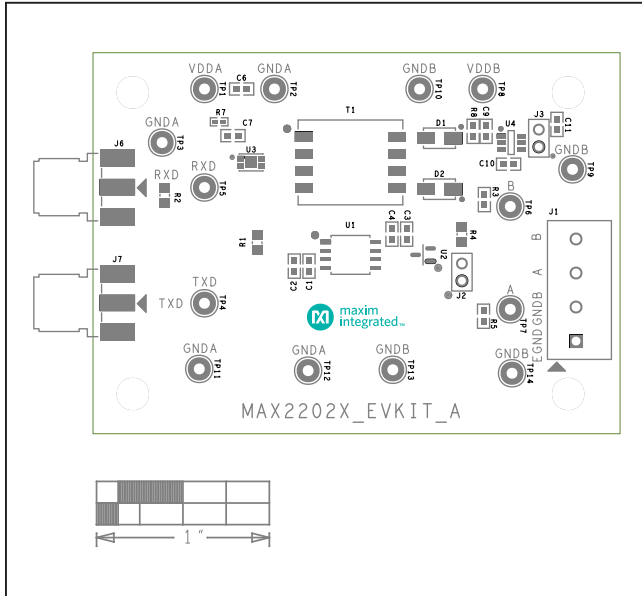
ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	C1, C4, C7	-	3	C0603C105K4RAC;GRM188R71C105KA12;C1608X7R1C105K080AC;EMK107B7105KA;GCM188R71C105KA64;CGA3E1X7R1C105K080AC;0603YC105KAT2A	KEMET;MURATA;TDK;TAIYO YUDEN;MURATA;TDK;AVX	1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 16V; TOL=10%; MODEL=-; TG=-55 DEGC TO +125 DEGC; TC=X7R
2	C2, C3	-	2	CC0603KRX7R0BB104;GRM188R72A104KA35;GCI188R72A104KA01;HMK107B7104KA;0603C104KAT2A;GRM188R72A104K	YAGEO;MURATA;MURATA;TAIYO YUDEN;AVX;MURATA	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 100V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R
3	C6, C8-C11	-	5	GRM188R61C106MA73	MURATA	10UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 10UF; 16V; TOL=20%; MODEL=GRM SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R
4	D1, D2	-	2	B230A-13-F	DIODES INCORPORATED	B230A-13-F	DIODE; SCH; SMT (DO-214AA); PIV=100V; IF=2A; -65 DEGC TO +150 DEGC
5	J1	-	1	1935187	PHOENIX CONTACT	1935187	CONNECTOR; FEMALE; THROUGH HOLE; GREEN TERMINAL BLOCK; STRAIGHT; 4PINS
6	J2, J3	-	2	TSW-102-23-G-5	SAMTEC	TSW-102-23-G-5	CONNECTOR; THROUGH HOLE; SINGLE ROW; STRAIGHT; 2PINS; -55 DEGC TO +125 DEGC
7	J6, J7	-	2	142-0701-851	JOHNSON COMPONENTS	142-0701-851	CONNECTOR; END LAUNCH JACK RECEPTACLE; BOARDMOUNT; STRAIGHT THROUGH; 2PINS;
8	MH1-MH4	-	4	9032	KEYSTONE	9032	MACHINE FABRICATED; ROUND-THRU HOLE SPACER; NO THREAD; M3.5; 5/8IN; NYLON
9	R3, R5	-	2	CRCW0603S10RJN	VISHAY DALE	510	RESISTOR; 0603; 510 OHM; 5%; 200PPM; 0.10W; THICK FILM
10	R4	-	1	CRCW0805120RFK	VISHAY DALE	120	RESISTOR; 0805; 120 OHM; 1%; 100PPM; 0.125W; THICK FILM
11	R6	-	1	CRCW2512000Z0EGHP	VISHAY DRALORIC	0	RES; SMT (2512); 0; JUMPER; 1.5W
12	R7	-	1	RC0402JR-070RL; CR0402-16W-000RJT	YAGEO PHYCOMP;VENKEL LTD.	0	RESISTOR; 0402; 0 OHM; 5%; JUMPER; 0.063W; THICK FILM
13	R8	-	1	CRCW060310K0FK;ERI-3EKF1002	VISHAY DALE-PANASONIC	10K	RESISTOR; 0603; 10K; 1%; 100PPM; 0.10W; THICK FILM
14	SU1, SU2	-	2	QPC02SXGN-RC	SULLINS ELECTRONICS CORP.	QPC02SXGN-RC	CONNECTOR; FEMALE; 0.100IN CC; OPEN TOP; JUMPER; STRAIGHT; 2PINS
15	T1	-	1	TGMR-H560V8LF	HALO ELECTRONICS INC	TGMR-H560V8LF	TRANSFORMER; SMT; 1:1.2:2; ISOLATION MODULE
16	TP1, TP8	-	2	5010	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SIL;
17	TP2, TP3, TP9-TP14	-	8	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;
18	TP4-TP7	-	4	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;
19	U1	-	1	MAX22028AWA+	MAXIM	MAX22028	EVKIT PART - IC: MAX22028AWA+; COMPACT; ISOLATED HALF-DUPLEX RS-485/RS-422 TRANSCEIVERS WITH AUTO-DIRECTION; PACKAGE OUTLINE DRAWING: 21-0262; PACKAGE CODE: W8MS+1; PACKAGE LAND PATTERN: 90-0258
20	U2	-	1	SM712.TCT	SEMTECH	SM712.TCT	IC; PROT; ASYMMETRICAL TVS DIODE FOR EXTENDED COMMON-MODE RS-485; SOT23-3
21	U3	-	1	MAX258ATA+	MAXIM	MAX258ATA+	IC; DRV; 0.5A; PUSH-PULL TRANSFORMER DRIVER FOR ISOLATED POWER SUPPLY; TDFN8-EP 2X3
22	U4	-	1	MAX8881EUT50+	MAXIM	MAX8881EUT50+	IC; VREG; ULTRA-LOW-IO, LOW-DROPOUT LINEAR REGULATORS WITH POK; SOT23-6
23	PCB	-	1	MAX2202X	MAXIM	PCB	PCB:MAX2202X
24	C5	DNP	0	2220Y2K00104KXTWS2	SYFER TECHNOLOGY	0.1UF	CAP; SMT (2220); 0.1UF; 10%; 2000V; X7R; CERAMIC CHIP
25	R1, R2	DNP	0	CRCW080549R9FK;ERJ-6ENF49R9	VISHAY DALE-PANASONIC	49.9	RESISTOR; 0805; 49.9 OHM; 1%; 100PPM; 0.125W; THICK FILM
TOTAL			49				

MAX2202XEVKIT# EV Kit Schematic

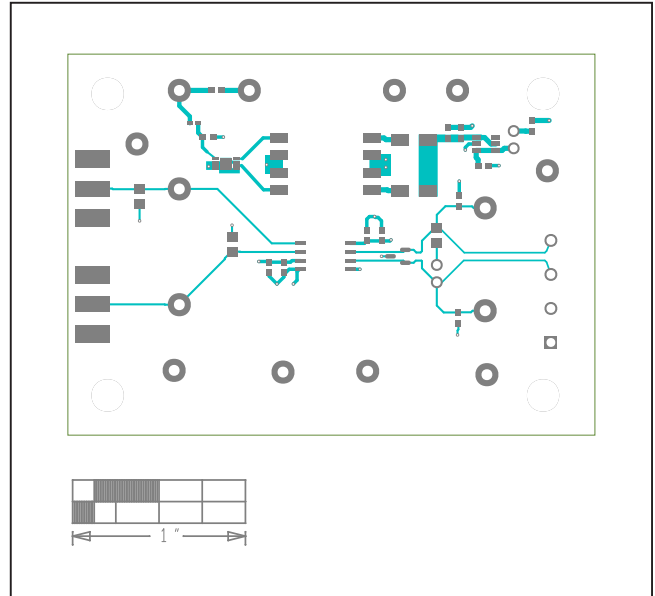


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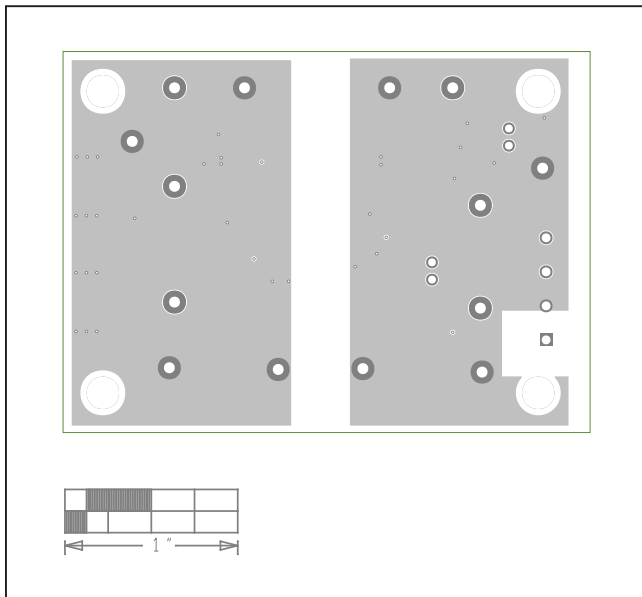
Evaluates: MAX22025-MAX22028



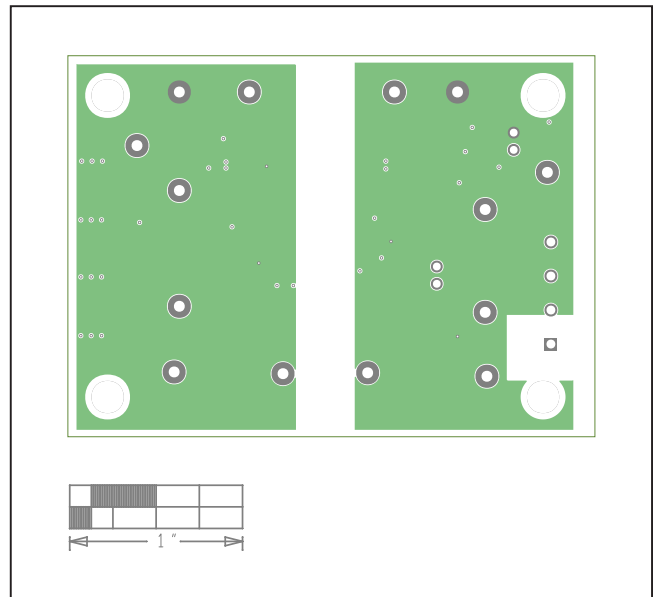
MAX2202XEVKIT# EV Kit—Top Silkscreen



MAX2202XEVKIT# EV Kit—Top Layer

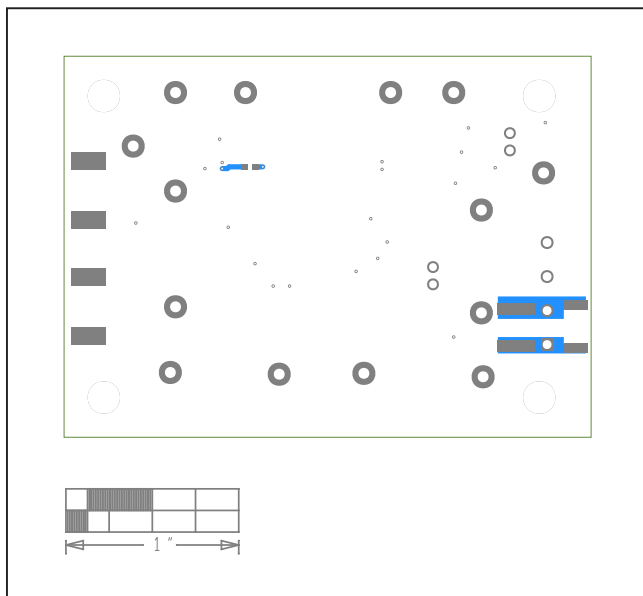


MAX2202XEVKIT# EV Kit—Layer 2

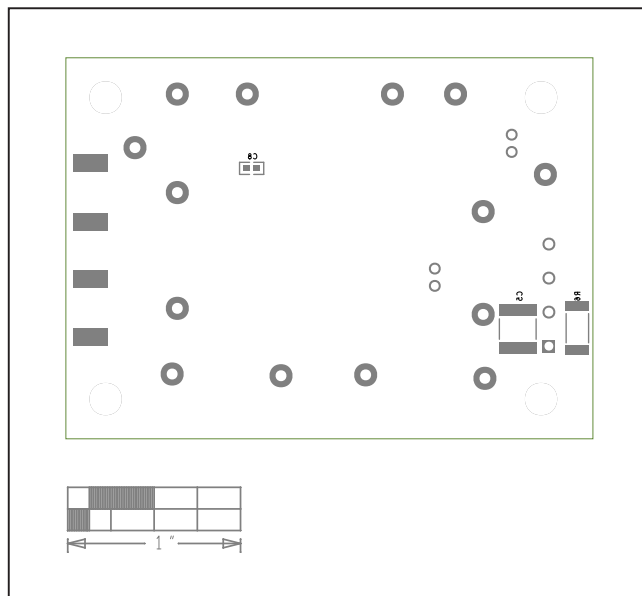


MAX2202XEVKIT# EV Kit—Layer 3

MAX2202XEVKIT# EV Kit PCB Layout Diagrams (continued)



MAX2202XEVKIT# EV Kit—Bottom Layer



MAX2202XEVKIT# EV Kit—Bottom Silkscreen

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	9/19	Initial release	—
1	11/19	Updated the General Description section and replaced the Bill of Materials and Schematic	1, 3-4

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