MAX20335 Evaluation Kit

Evaluates: MAX20335

General Description

The MAX20335 evaluation kit (EV kit) is a fully assembled and tested circuit for evaluating the MAX20335 wearable charge-management solution with I^{2}C capability for low-power wearable application. The device includes a linear battery charger, smart power selector, two ultra-low quiescent current buck regulators, and three low-dropout (LDO) linear regulators.

Refer to the MAX20335 IC data sheet for detailed information regarding the operation and features of the devices.

Features

- RoHS Compliant
- Proven PCB Layout
- Full Assembled and Tested
- I^{2}C Serial Interface

Quick Start

Required Equipment

- Adjustable power supply with 0V to 5V capability
- Digital multimeter (DMM)
- I^{2}C controller device
- GPIO controller device
- Cables with grabber connections

Optional Equipment

- Second power supply for LDOs

Procedure

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

Caution: Do not turn on the power supply and external devices until all connections are completed.

1) Connect PFN1 (J2 pin 11) to the GPIO controller output. Alternatively, PFN1 can be connected to a 3V IO supply through a 10k pullup resistor. This procedure assumes that a GPIO controller is used.

2) Connect the I^{2}C Controller device to GND, SDA (J1 pin 6) and SCL (J1 pin 7).
3) Set the power supply voltage to 3.7V and turn off the supply.
4) Connect the positive terminal of the 3.7V power supply to BAT (J1 pin 4) and the negative terminal to GND (J3 pin 1).
5) Turn on the 3.7V power supply.
6) Turn on the GPIO controller device and I2C controller device.
7) Set GPIO controller to output logic-high to PFN1 to power on the MAX20335.
8) Measure the voltage on SYS (J1 pin 3) and confirm that it equals the battery voltage.
9) To enable Buck1 output, use the I^{2}C controller to set Buck1En[1:0] to "01" by writing value "0xE9" to register 0x0D. Measure B1OUT (J2 pin 6) and confirm that it equals 1.2V.
10) To enable Buck2 output, Use the I^{2}C controller to set Buck2En[1:0] to "01" by writing value "0xE9" to register 0x0F. Measure B2OUT (J2 pin 5) and confirm that it equals 1.8V.
11) **Optional:** To test any one of the LDOs, set the second power supply voltage to the desired LDO input voltage. Turn it off and then connect the positive terminal to the LDO input and the negative terminal to GND. Turn it on. To enable the LDO output, use the I2C controller to write value "0xE2" to the register LDO1Cfg, LDO2Cfg, or LDO3Cfg corresponding to the LDO under test. Measure the voltage of the LDO output and confirm that it matches the default setting: 0.8V (LDO1), 0.9V (LDO2), and 0.9V (LDO3).
12) The EV Kit is ready for additional evaluation.

Detailed Description of Hardware

The MAX20335 evaluation kit (EV Kit) evaluates the MAX20335 wearable charge-management solution.

See Table 1 thru Table 3 for pin descriptions of the three connectors (J1–J3).

*Ordering Information **appears at end of data sheet.***

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Table 1. Connector J1

PIN	MAX20335	DESCRIPTION
1	GND	Ground
2	MON	Voltage Monitor Output
3	N.C.	Not Connected
4	INT	Open-drain Active-low Interrupt Output
5	RST	Power-On Reset Output.
6	SDA	I2C Serial Data Input / Output
7	SCL	I2C Serial Clock Input
8	MPC1	Multipurpose Configuration Input 1
9	MPC0	Multipurpose Configuration Input 0
10	PFN2	Power Function Control Input / Output
11	PFN1	Power Function Control Input
12	GND	Ground

Table 2. Connector J2

PIN	SIGNAL	DESCRIPTION
1	L3IN	LDO3 Input
2	L3OUT	LDO3 Output
3	L2OUT	LDO2 Output
4	L1OUT	LDO1 Output
5	B2OUT	Buck Regulator 2 Output
6	B1OUT	Buck Regulator 1 Output
7	L2IN	LDO2 Input
8	L1IN	LDO1 Input

Table 3. Connector J3

PIN	SIGNAL	DESCRIPTION
1	GND	Ground
2	CHRGIN	Charger Input
3	SYS	System Load Connection
4	BAT	Battery
5	THM	Battery Temperature Thermistor Connection
6	CAP	Bypass for Internal LDO
7	SET	External Resistor Connection for Configuring Battery Charge Current
8	LED	LED Current Sink Input
9	N.C.	Not Connected
10	N.C.	Not Connected
11	N.C.	Not Connected
12	GND	Ground

Component Suppliers

SUPPLIER	WEBSITE
Murata Americas	www.murata.com
TDK Corp	www.component.tdk.com

**Note:** *Indicate that you are using the MAX20335 when contacting these component suppliers.*

MAX20335 EV System Bill of Materials

| ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	C1-C9	-	9	C1005X5R1V225M050BC	TDK	2.2UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 2.2UF; 35V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R
2	C10-C12	-	3	C1608X5R0J226M080AC	TDK	22UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 22UF; 6.3V; TOL=20%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R
3	J1, J3	-	2	PBC12SAAN	SULLINS ELECTRONICS CORP.	PBC12SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 12PINS; -65 DEGC TO +125 DEGC
4	J2	-	1	PBC08SAAN	SULLINS ELECTRONICS CORP.	PBC08SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 8PINS; -65 DEGC TO +125 DEGC
5	L1, L2	-	2	DFE201610E-2R2M	TOKO	2.2UH	INDUCTOR; SMT (2016); METAL ALLOY CHIP; 2.2UH; TOL=+/-20%; 2.6A
6	R3	-	1	ERA-2AED221	PANASONIC	220	RESISTOR; 0402; 220 OHM; 0.5%; 25PPM; 0.063W; THIN FILM
7	U1	-	1	MAX20335	MAXIM	MAX20335	EVKIT PART - IC; PWRM; WEARABLE CHARGE MANAGEMENT SOLUTION; WLP36;
8	PCB	-	1	MAX	MAXIM	PCB	PCB:MAX
9	Q1	DNP	0	SI8439DB-T1-E1	VISHAY SILICONIX	SI8439DB-T1-E1	TRAN; P-CHANNEL 8V (D-S) MOSFET; PCH; SMT; PD-(2.7W); I-(-9.2A); V-(-8V)
10	R1, R2	DNP	0	RG1005P-102-D	SUSUMU CO LTD.	1K	RESISTOR; 0402; 1K OHM; 0.5%; 25PPM; 0.0625W; THIN FILM
TOTAL			20				

MAX20335 EV System Schematic
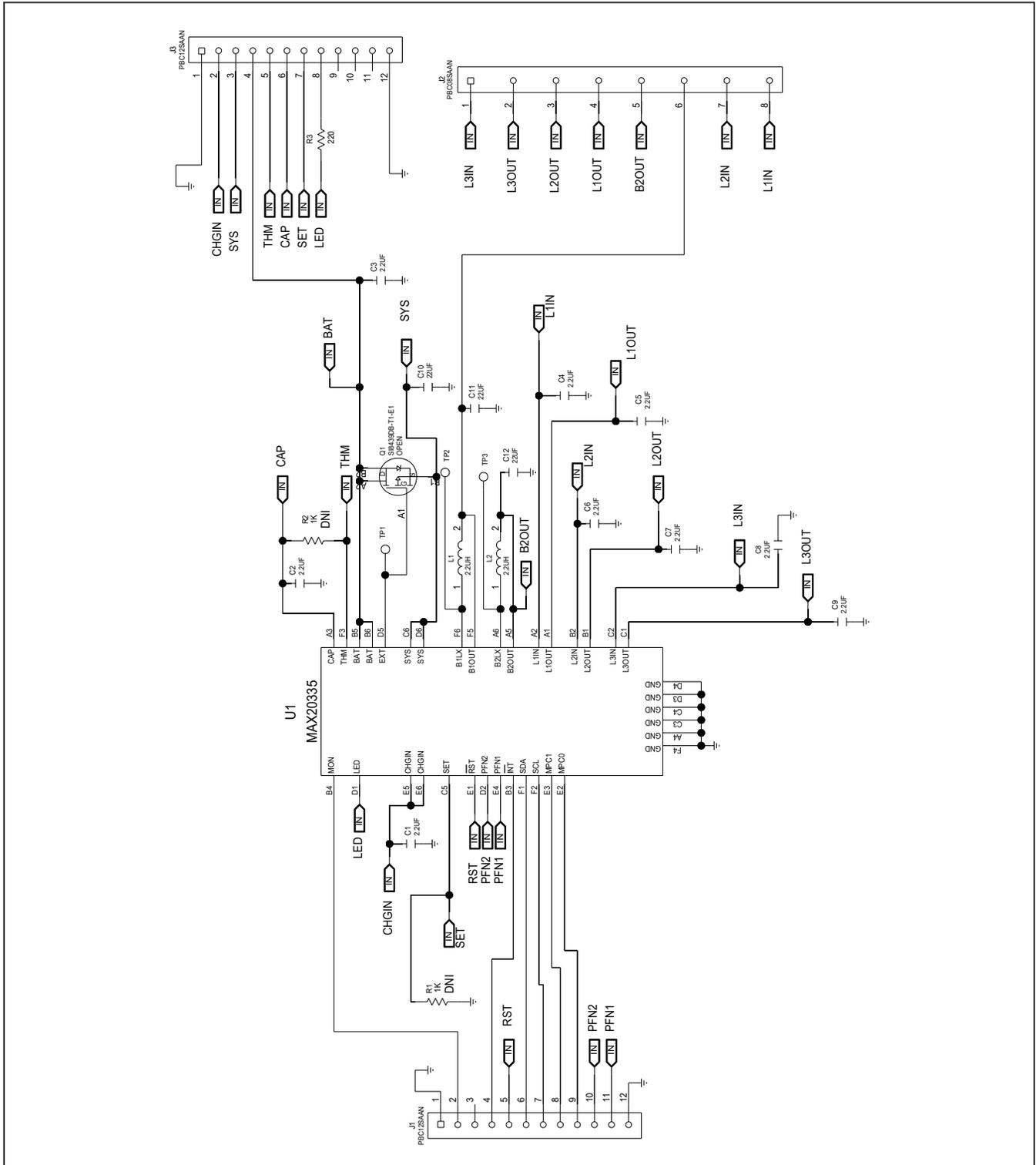
MAX20335 EV System PCB Layout
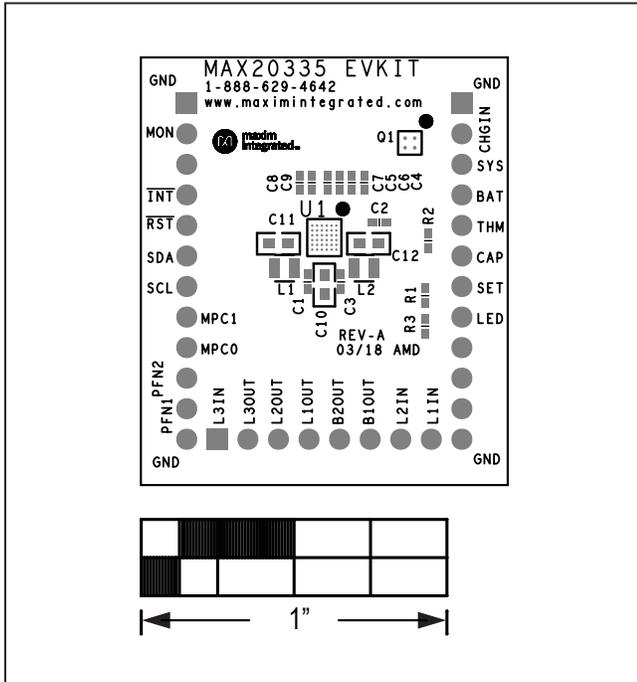
MAX20335 EV Kit—Top Silkscreen
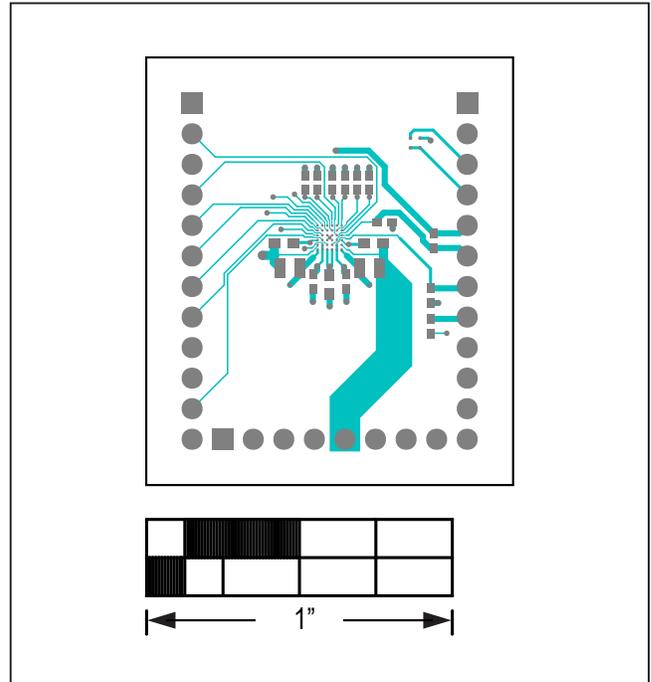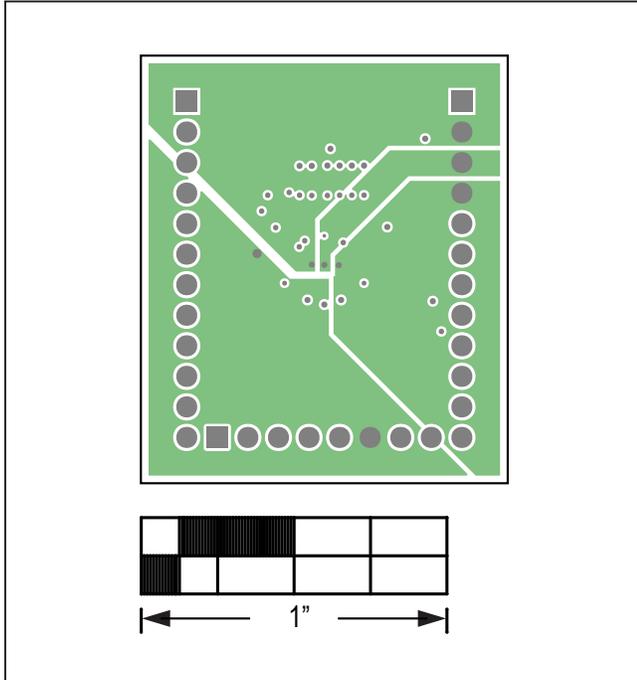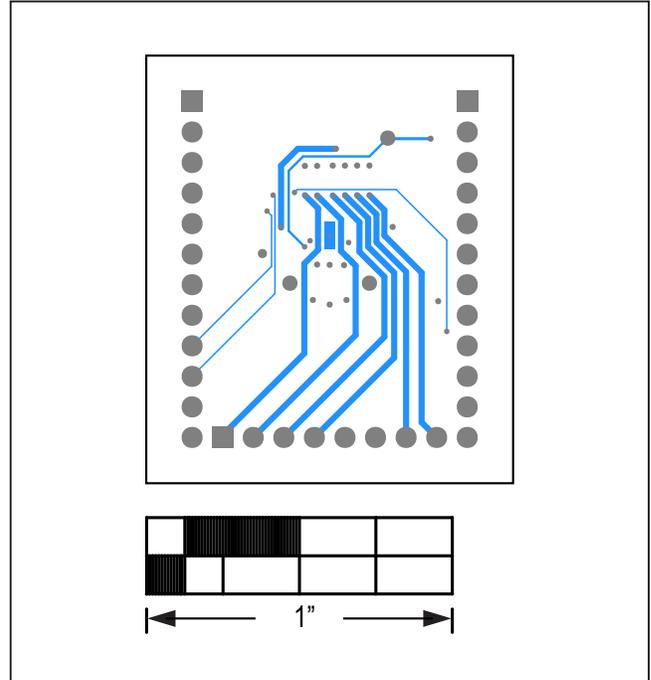

MAX20335 EV Kit—Top
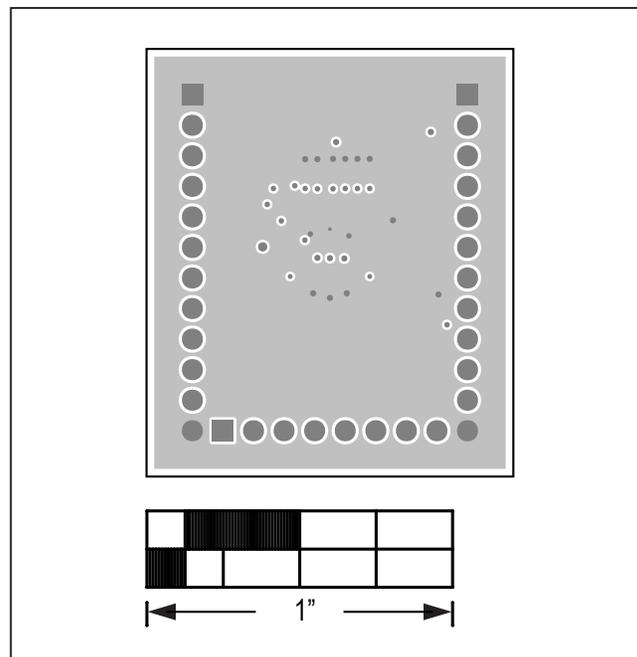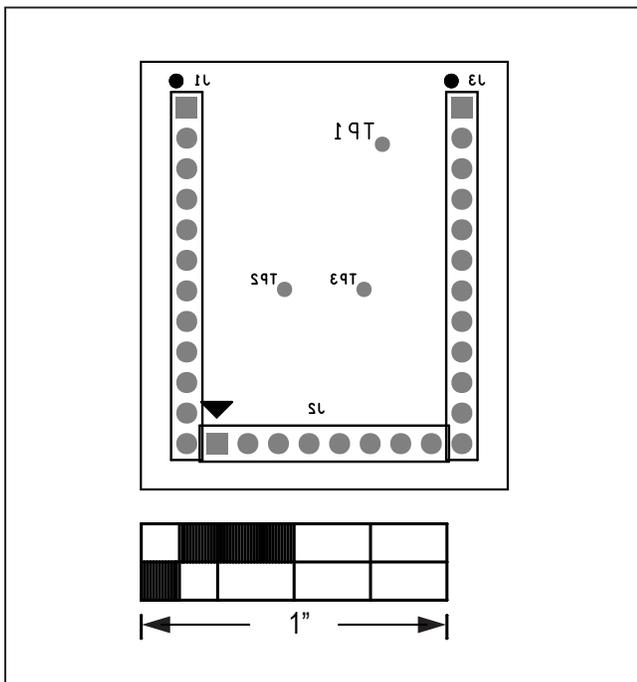

MAX20335 EV Kit—Layer 2

MAX20335 EV System PCB Layout (continued)

MAX20335 EV Kit—Layer 3

MAX20335 EV Kit—Bottom

MAX20335 EV Kit—Bottom Silkscreen

Ordering Information

PART	TYPE
MAX20335EVKIT#	EV Kit

#Denotes RoHS compliant.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	4/18	Initial release	—
1	2/19	Added *Quick Start* section	1

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