

## MAX32665/MAX32666 Evaluation Kits

## Evaluate: MAX32665–MAX32668

### General Description

The MAX32665/MAX32666 EV kits provide platforms for evaluating the capabilities of the MAX32665/MAX32666 high-efficiency Arm® microcontroller and audio DSP for wearable and hearable device applications.

These EV kits evaluate all variants of the CTBGA IC. There is a socketed version for the secure IC and direct mount version for the nonsecure IC.

### EV Kit Contents

- MAX32665/MAX32666 EV kits containing a MAX32665/MAX32666 with a preprogrammed demo
- Bluetooth® hinged whip antenna
- JTAG debugger with ribbon cable
- Two standard A to Micro B USB cables

### Ordering Information

PART	TYPE	SOCKET
MAX32665EVKIT#*	EV Kit	No
MAX32666EVKIT#	EV Kit	Yes

#Denotes RoHS compliant.

\*Future product—contact factory for availability.

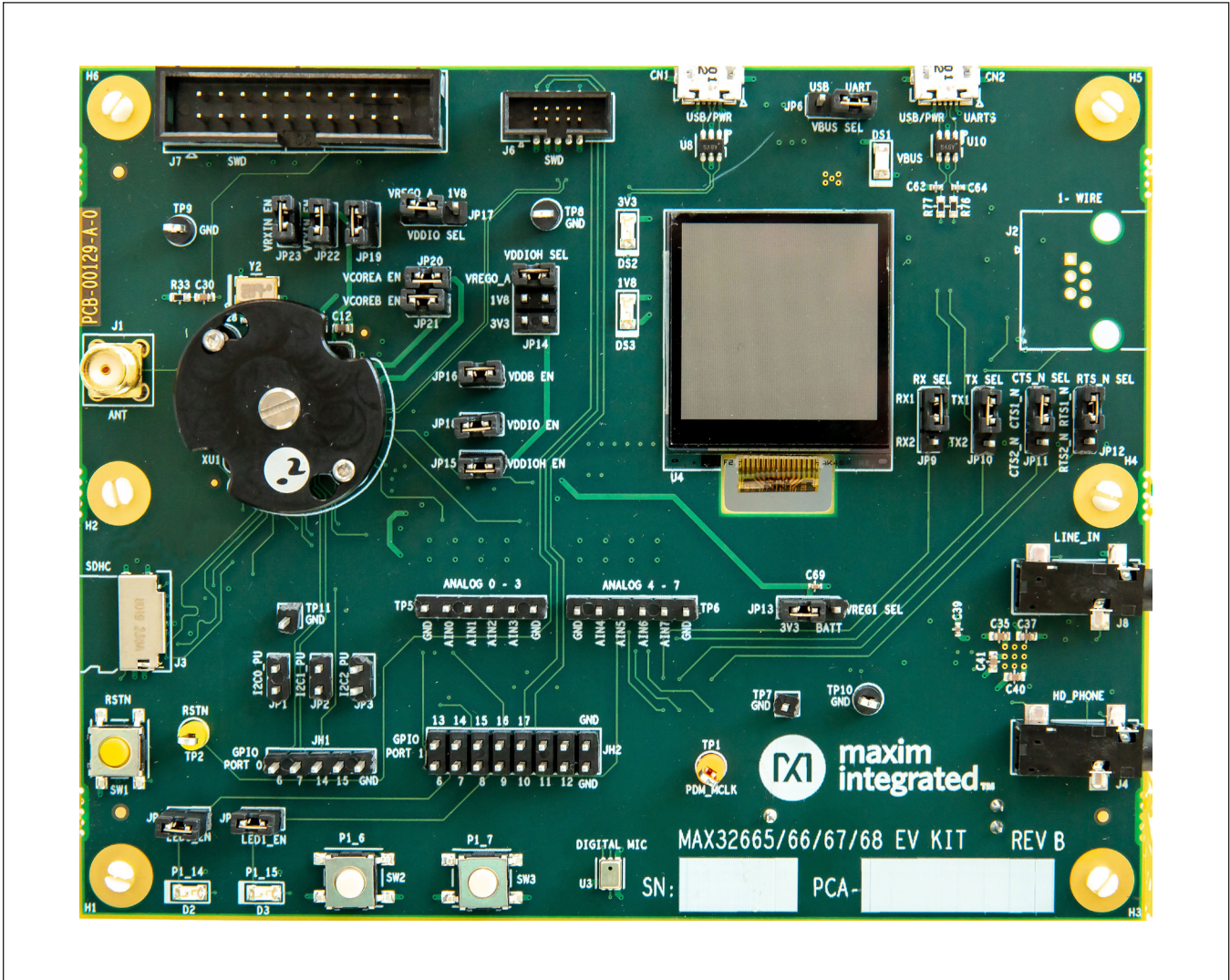
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### Benefits and Features

- Bluetooth SMA connector with a 2.4GHz Hinged Whip Antenna
- 1.28in 128 x 128 Monochrome TFT Display
- 64MB XIP Flash
- 1MB XIP RAM
- Stereo Audio Codec with Line-In and Line-Out 3.5mm Jacks
- Digital Audio Microphone
- USB 2.0 Micro B Interface
- USB 2.0 Micro B to Serial UARTs
  - Selection with Jumpers Between UART1 and UART2
- Micro SD Card Interface
- Select GPIOs Accessed Through a 0.1in Header
- Access to the 8 Analog Inputs Through a 0.1in Header
- Arm® or SWD JTAG 20-Pin Header
- One-Wire RJ11 Port
- MAX32665 Can Be Solely Sourced by a Coin Cell Battery
- Board Power Provided by Either USB Port
- Individual Power Measurement on All IC Rails Through Jumpers
- On-Board 1.8V and 3.3V Regulators
- Two General-Purpose LEDs and Two General-Purpose Pushbutton Switches

MAX32665/MAX32666 EV Kit Board



## Quick Start

### Procedure

Follow the steps below to verify board operation:

- 1) While observing safe ESD practices, carefully remove the MAX32665/MAX32666 EV kit board out of its packaging. Quickly inspect the board to ensure that no damage occurred during shipment. Jumpers/shunts are preinstalled prior to testing and packaging.
- 2) The MAX32665/MAX32666 is preprogrammed with a demo program. To run the demo, power up the board by plugging in the provided USB cable to connector CN2. Verify that the blue LED (DS1) and the green LEDs (DS2 and DS3) are illuminated.
- 3) Once power is applied, the demo initiates and flashes the red LED (DS2) upon successful completion.

## Detailed Description of Hardware

### Power Supply

The EV kit is powered by +5V and is made available through VBUS on the Micro-USB type-B connectors CN1 or CN2. The board is default jumpered for power provided by CN2. A blue LED (DS1) illuminates when the board is powered. Green LEDs (DS3) and (DS2) illuminate when the 1V8 and 3V3 LDOs are powered, respectively. The MAX32665 can be sourced by a coin cell battery or on board 3.3V through the JP13 header.

### Current Monitoring

Two pin headers provide convenient current monitoring points for VDDA (JP19), VDDIO (JP18), VDDIOH (JP15), VCOREA (JP20), VCOREB (JP21), VTXIN (JP22), VRXIN (JP23). VREGI can be measured at the VREGI SEL (JP13) three-pin header.

### Clocking

The MAX32665/MAX32666 clocking is provided by an external 32.768kHz crystal (Y1) for RTC operations and an external 32MHz crystal (Y2).

### TFT LCD Display

The display provided is a 1.28in 128 x 128 monochrome TFT. It has three-wire serial control, with a white backlight.

### Universal Serial Bus

A USB Micro B connector (CN1) is provided for prototyping USB slave applications. The USB 2.0 high-speed interface (480Mbps) transceiver is embedded in the MAX32665/MAX32666.

### UART Interfaces

The EV kit provides a USB-to-UART bridge chip, FTDI FT230X. This bridge eliminates the requirement for a physical RS-232 COM port. Instead, the IC's UART access is through the Micro-USB type-B connector, CN2. The USB-to-UART bridge can be connected to UART 1 or UART 2 of the IC with jumpers JP9 (Rx), JP10 (Tx), JP11 (CTS), and JP12 (RTS). Virtual COM port drivers and guides for installing Windows® drivers are available at the FTDI chip website.

### Bluetooth 5 Interface

A SMA connector is provided to attach the included Bluetooth 2.4GHz hinged whip antenna.

### Audio Stereo Codec Interface

The MAX32665/MAX32666 interface to the MAX9867 external audio codec IC through its I<sup>2</sup>C and I<sup>2</sup>S (PCM) ports. Line-in and line-out 3.5mm jacks are provided for audio access.

### Digital Microphone

The MAX32665/MAX32666 interface to a miniature digital microphone embedded on an IC through its PDM port.

*Windows is a registered trademark and registered service mark of Microsoft Corporation.*

### JTAG Serial Wire Debug (SWD) Support

SWD debug can be accessed through an Arm standard 20-pin connector (J7) or a Cortex® 10-pin connector (J6). Logic levels are fixed to VDDIOH (1.8V or 3.3V).

### Reset Pushbutton

Pushbutton SW1 manually resets the MAX32665/MAX32666.

### Indicator LEDs

The indicator LEDs D2 (red) and D3 (green) are connected to GPIO P1.14 and P1.15, respectively.

### GPIO Pushbuttons

The two pushbuttons (SW2 and SW3) are connected to GPIO P1.6 and P1.7, respectively. If the pushbutton is pressed, the attached port pin is pulled low.

### GPIO Headers

Select GPIOs are accessible through a 0.1in spaced header pins. The IC provides support for both 1.8V and 3.3V peripherals through power rails VDDIO and VDDIOH. GPIO voltages can be programmed on pin-by-pin basis. Refer to the IC's operating guide for more detail.

**Table 1. Jumper Settings**

JUMPER	SIGNAL	SETTINGS	DESCRIPTION
JP1	I2C0_SCL/SDA	Open	Disconnects I2C0 SCL and SDA 1.5K pullups from VDDIOH
		Close*	Connects I2C0 SCL and SDA 1.5K pullups to VDDIOH
JP2	I2C1_SCL/SDA	Open*	Disconnects I2C1 SCL and SDA 1.5K pullups from VDDIOH
		Close	Connects I2C1 SCL and SDA 1.5K pullups to VDDIOH
JP3	I2C2_SCL/SDA	Open*	Disconnects I2C2 SCL and SDA 1.5K pullups from VDDIOH
		Close	Connects I2C2 SCL and SDA 1.5K pullups to VDDIOH
JP4	P1_14	Open	Disconnects LED D2 from P1_14
		Close*	Connects LED D2 to P1_14
JP5	P1_15	Open	Disconnects LED D3 from P1_15
		Close*	Connects LED D3 to P1_15
JP6	VBUS	2-1	Connects VBUS to USB connector CN1 to supply board power
		2-3*	Connects VBUS to USB connector CN2 to supply board power
JP7	N/A	N/A	N/A
JP8	N/A	N/A	N/A
JP9	P0_20	2-1*	Connects the USB to serial UART to GPIO P0_20 (RX1)
	P0_28	2-3	Connects the USB to serial UART to GPIO P0_28 (RX2)
JP10	P0_21	2-1*	Connects the USB to serial UART to GPIO P0_21 (TX1)
	P0_29	2-3	Connects the USB to serial UART to GPIO P0_29 (TX2)
JP11	P0_22	2-1*	Connects the USB to serial UART to GPIO P0_22 (CTS1_N)
	P0_30	2-3	Connects the USB to serial UART to GPIO P0_30 (CTS2_N)
JP12	P0_23	2-1*	Connects the USB to serial UART to GPIO P0_23 (RTS1_N)
	P0_31	2-3	Connects the USB to serial UART to GPIO P0_31 (RTS2_N)
JP13	VREGI	2-1	Connects VREGI to the coin cell battery
		2-3*	Connects VREGI to 3V3

\*Default setting

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**Table 1. Jumper Settings (continued)**

JUMPER	SIGNAL	SETTINGS	DESCRIPTION
JP14	VDDIOH	1-2*	Connects VDDIOH to VREGO_A
		3-4	Connects VDDIOH to 1V8
		5-6	Connects VDDIOH to 3V3
JP15	VDDIOH	Open	Disconnects power from VDDIOH
		Close*	Connects power to VDDIOH
JP16	VDDB	Open	Disconnects power from VDDB
		Close*	Connects power to VDDB
JP17	VDDIO	2-1*	Connects VDDIO to VREGO_A
		2-3	Connects VDDIO to 1V8
JP18	VDDIO	Open	Disconnects power from VDDIO
		Close*	Connects power to VDDIO
JP19	VDDA	Open	Disconnects power from VDDA
		Close*	Connects power to VDDA
JP20	VCORE_A	Open	Disconnects power from VCORE_A
		Close*	Connects power to VCORE_A
JP21	VCORE_B	Open	Disconnects power from VCORE_B
		Close*	Connects power to VCORE_B
JP22	VTXIN	Open	Disconnects power from VTXIN
		Close*	Connects power to VTXIN
JP23	VRXIN	Open	Disconnects power from VRXIN
		Close*	Connects power to VRXIN

\*Default setting

MAX32665/MAX32666  
Evaluation Kits

Evaluate: MAX32665–MAX32668

MAX32665/MAX32666 EV Kit Bill of Materials

QTY	PART REFERENCE	VALUE	BOM DESCRIPTION	MANUFACTURER PN	MANUFACTURER
1	BATT_HD1	BA2032	HOLDER COIN CELL CR2032 EJECT	BA2032	Memory Protection Devices
2	C1 C2	47uF	CAP CER 47UF 6.3V 20% X5R 0805	C2012X5R0J476M125AC	TDK Corporation
19	C3 C4 C5 C6 C13 C14 C17 C18 C19 C21 C22 C23 C24 C25 C26 C27 C75 C76 C77	1uF	CAP CER 1UF 6.3V X5R 0402	GRM155R60J105KE19D	Murata
5	C7 C8 C10 C11 C12	22uF	CAP CER 22UF 6.3V 20% X5R 0603	C1608X5R0J226M080AC	TDK Corporation
1	C9	4.7nF	CAP CER 4700PF 16V 10% X7R 0201	CGA1A2X7R1C472K030BA	TDK Corporation
3	C15 C16 C20	100nF	CAP CER 0.1UF 6.3V 10% X5R 0201	GRM033R60J104KE19D	Murata
2	C28 C29	16pF	CAP CER 16PF 50V 5% NPO 0402	GRM1555C1H160JA01D	Murata
3	C30 C58 C66	100nF	CAP CER 0.1UF 25V 10% X8R 0603	C1608X8R1E104K080AA	TDK Corporation
9	C31 C39 C48 C49 C60 C65 C68 C72 C74	100nF	CAP CER 0.1UF 10V 10% X5R 0402	GRM155R61A104KA01D	Murata
9	C32 C50 C51 C52 C53 C54 C55 C56 C57	DNI	DNI		
7	C33 C35 C36 C37 C38 C40 C41	1uF	CAP CER 1uF 16V 10% X7R 0603	GCM188R71C105KA64D	Murata
1	C34	2.2uF	CAP CER 2.2UF 10V 10% X5R 0603	C0603C225K8PACTU	Kemet
2	C42 C43	18pF	CAP CER 18PF 50V 5% NPO 0402	GRM1555C1H180JA01D	Murata
2	C44 C46	100nF	CAP CER 1206 0.1UF 25V COG 10%	C1206X104K3GCECAUTO	KEMET
1	C45	10uF	CAP CER 10UF 6.3V 20% X5R 0603	GRM188R60J106ME84D	Murata Electronics
2	C59 C70	1uF	CAP CER 1UF 35V 10% X5R 0603	GMK107B1J05KA-T	Taiyo Yuden
1	C61	10nF	CAP CER 10nF 25V 10% X7R 0603	GRM188R71E103KA01D	Murata
1	C62	4.7uF	CAP CER 4.7uF 10V 10% X5R 0603	C0603C475K8PACTU	Kemet
2	C63 C64	47pF	CAP CER 47PF 50V 1% NPO 0402	C1005C0G1H470F050BA	TDK Corporation
1	C67	100nF	CAP CER 0.1uF 16V 10% X7R 0603	C0603C104K4RACTU	Kemet
1	C69	10nF	CAP CER 10000PF 16V 10% X7R 0402	GRM155R71C103KA01D	Murata Electronics
2	C71 C73	10uF	CAP CER 10UF 6.3V 20% X5R 0402	GRJ155R60J106ME11D	Murata Electronics
2	CN1 CN2	MICRO USB B R/A	CONN RCPT SPOS MICRO USB B R/A	47346-0001	Molex
1	D1	SMF5.0A-TP	TVS 200W 5V UNIDIR SOD-123FL	SMF5.0A-TP	Micro Commercial Co
1	D2	RED	LED 660NM RED WTR CLR 1206 SMD	SML-LX1206SRC-TR	Lumex Opto
3	D3 DS2 DS3	GRN	LED 565NM WTR CLR GREEN 1206 SMD	SML-LX1206GC-TR	Lumex Opto
1	DS1	BLUE	LED 469NM BLUE DIFF 1206 SMD	HSMR-C150	Avago Technologies US Inc.
6	H1 H2 H3 H4 H5 H6	DNI	DNI MTG 125DRL 300PAD		
1	J1	SMA	CONN SMA JACK STR 50 OHM PCB	5-1814832-1	TE Connectivity
1	J2	6P MOD JACK	CONN MOD JACK R/A 6P6C	43860-0002	Molex Inc
1	J3	047571-0001	CONN MICRO SD CARD PUSH-PULL R/A	047571-0001	Molex
2	J4 J8	SJ-3523-SMT-TR	CONN JACK STEREO 3.5MM SMD R/A	SJ-3523-SMT-TR	CUI Inc
1	J5	503480-1000	CONN FFC FPC 10POS 0.50MM R/A	503480-1000	Molex, LLC
1	J6	10P CORTEX DEBUG	IDC BOX HEADER 0.050 10 POS SMD	3220-10-0300-00	CNC Tech
1	J7	20P 10x2	CONN HEADER 2.54MM 20POS GOLD	SBH11-PBPC-D10-ST-BK	Sullins
1	JH1	5P 1x5	CONN HEADER .100 SINGL STR 5POS	PEC05SAAN	Sullins
1	JH2	16P 2x8	CONN HEADER .100 DUAL STR 16POS	PEC08DAAN	Sullins
13	JP1 JP2 JP3 JP4 JP5 JP15 JP16 JP18 JP19 JP20 JP21 JP22 JP23	JUMPER	CONN HEADER .100 SINGL STR 2POS (2x1)	PEC02SAAN	Sullins
7	JP6 JP9 JP10 JP11 JP12 JP13 JP17	3P 3x1	CONN HEADER .100 SINGL STR 3POS	PEC03SAAN	Sullins
1	JP14	6P 2x3	CONN HEADER .100 DUAL STR 6POS	PEC03DAAN	Sullins
1	L1	2.2uH	FIXED IND 2.2UH 1A 150 MOHM SMD 0805	MLP2012H2R2MT051	TDK Corporation
2	L2 L3	HZ1206C202R-10	FERRITE CHIP SIGNAL 2000 OHM SMD	HZ1206C202R-10	Laird-Signal Integrity
1	L4	BLM21PG221SN1D	FERRITE CHIP 220 OHM 0805	BLM21PG221SN1D	Murata Electronics

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Evaluation Kits

Evaluate: MAX32665–MAX32668

MAX32665/MAX32666 EV Kit Bill of Materials (continued)


QTY	PART REFERENCE	VALUE	BOM DESCRIPTION	MANUFACTURER PN	MANUFACTURER
1	PCB1	PCB			
1	Q1	FDV304P	MOSFET P-CH 25V 460MA SOT-23	FDV304P	Fairchild Semiconductor
2	Q2 Q4	SSM3J327R,LF	MOSFET P-CH 20V 6A SOT23-3	SSM3J327R,LF	Toshiba Semiconductor
2	Q3 Q5	BSS806N	MOSFET N-CH 20V 2.3A SOT23	BSS806N H6327	Infineon Technologies
33	R1 R2 R3 R4 R5 R6 R8 R9 R10 R11 R12 R14 R16 R18 R19 R21 R25 R26 R27 R28 R29 R15 R20 R24 R56 R59 R60 R63 R64 R67 R68 R71 R72	0	RES SMD 0 OHM JUMPER 1/10W 0603	RC0603JR-070RL	Yageo
4	R7 R47 R48 R55	100	RES SMD 100 OHM 1% 1/10W 0603	RC0603FR-07100RL	Yageo
2	R13 R17	0	RES 0.0 OHM 1/10W JUMP 0402 SMD	ERJ-2GEOR00X	Panasonic
1	R22	4.7K	RES 4.7K OHM 1/10W 0402 SMD	ERJ-2RKF4701X	Panasonic
1	R30	47K	RES 47K OHM 1/10W 1% 0603 SMD	ERJ-3EKF4702V	Panasonic
1	R31	1K	RES 1K OHM 1/10W 1% 0603 SMD	ERJ-3EKF1001V	Panasonic
1	R33	10	RES 10 OHM 1/10W 1% 0603 SMD	ERJ-3EKF10R0V	Panasonic
6	R34 R35 R36 R37 R38 R39	1.5K	RES 1.5K OHM 1/10W 1% 0603 SMD	ERJ-3EKF1501V	Panasonic
14	R32 R40 R41 R42 R43 R44 R45 R46 R47 R48 R75 R78 R79 R83	10K	RES 10K OHM 1/10W 1% 0603 SMD	ERJ-3EKF1002V	Panasonic
1	R49	470	RES 470 OHM 1/10W 1% 0603 SMD	ERJ-3EKF4700V	Panasonic
3	R50 R86 R87	332	RES 332 OHM 1/10W 1% 0603 SMD	ERJ-3EKF3320V	Panasonic
1	R53	150	RES SMD 150 OHM 1% 1/10W 0402	ERJ-2RKF1500X	Panasonic
1	R54	1M	RES SMD 1M OHM 1% 1/10W 0402	ERJ-2RKF1004X	Panasonic
8	R61 R62 R65 R66 R69 R70 R73 R74	49.9	RES 49.9 OHM 1/10W 1% 0603 SMD	ERJ-3EKF49R9V	Panasonic
2	R76 R77	27	RES 27 OHM 1/10W 1% 0603 SMD	ERJ-3EKF27R0V	Panasonic
1	R80	1M	RES SMD 1M OHM 5% 1/8W 0805	ERJ-6GEYJ105V	Panasonic
3	R81 R82 R84	DNI	DNI 0402		
1	R85	2.7K	RES 2.7K OHM 1/10W 1% 0603 SMD	ERJ-3EKF2701V	Panasonic
2	R23 R88	150K	RES 150K OHM 1/10W 1% 0603 SMD	ERJ-3EKF1503V	Panasonic
1	SW1	B3S-1002 BY OMZ	SWITCH TACTILE SPST-NO 0.05A 24V	B3S-1002 BY OMZ	Omron Electronics
2	SW2 SW3	B3S-1000	SWITCH TACTILE SPST-NO 0.05A 24V	B3S-1000	Omron Electronics
1	TP1	ORG	TEST POINT PC MULTI PURPOSE ORG	5013	Keystone Electronics
1	TP2	YLW	TEST POINT PC MULTI PURPOSE YEL	5014	Keystone Electronics
2	TP5 TP6	6P 1x6	CONN HEADER .100 SINGL STR 6POS	PEC065AAN	Sullins
2	TP7 TP11	1P	CONN HEADER .100 SINGL STR 1POS	PEC015AAN	Sullins
3	TP8 TP9 TP10	BLK	TEST POINT PC MULTI PURPOSE BLK	5011	Keystone Electronics
1	U1	MAX32665 121P BGA	MAX32665 121P BGA	MAX32665 121P_BGA	Maxim Integrated
1	U2	SN74LVC1GU04DCKT	IC SINGLE INVERTER GATE SC70-5	SN74LVC1GU04DCKT	Texas Instruments
1	U3	SPH0644HM4H-1	SILICON DIGITAL MICROPHONE	SPH0644HM4H-1	Knowles
1	U4	LS013B7DH03	LCD TFT 1.28" 128X128 FPC	LS013B7DH03	Sharp Microelectronics
1	U6	MX25U6435FM2I-10G	IC FLASH 64MBIT 104MHZ 8SOP	MX25U6435FM2I-10G	Macronix
1	U7	N01S818HAT22I	IC SRAM 1MBIT 20MHZ 8TSSOP	N01S818HAT22I	ON Semiconductor
2	U8 U10	MAX3207EAUT+T	ESD PROT DIFF SOT23-6	MAX3207EAUT+T	Maxim Integrated
1	U9	FT230XS-R	IC USB SERIAL BASIC UART 16SSOP	FT230XS-R	FTDI
1	U11	MAX1806EUA33+	IC REG LDO 3.3V/ADJ 0.5A 8UMAX	MAX1806EUA33+	Maxim Integrated
1	U12	MAX1806EUA18+	Low Dropout Linear Regulator	MAX1806EUA18+	Maxim Integrated
1	U13	MAX9867ETJ+T	IC STEREO AUD CODEC LP 32TQFN	MAX9867ETJ+T	Maxim Integrated
1	XU1	MAX32665 121P BGA	MAX32665 121P BGA SKT C17954	C17954	Ironwood Electronics, Inc.
1	Y1	32.768KHz	CRYSTAL 32.768KHZ 6.0PF SMD	ABS07-32.768KHZ-6-T	Abracon Corp
1	Y2	32 MHz	CRYSTAL 32.0000MHZ 12PF SMD	FA-20H 32.0000MF12Y-W3	Epson
1	Y3	12.288Mhz	CRYSTAL 12.2880MHZ 18PF SMD	ABM3-12.288MHZ-B4Y-T	Abracon Corporation

## MAX32665/MAX32666 EV Kit Schematics

**NOTES:**

PCB1  
PCB-00129-B-0

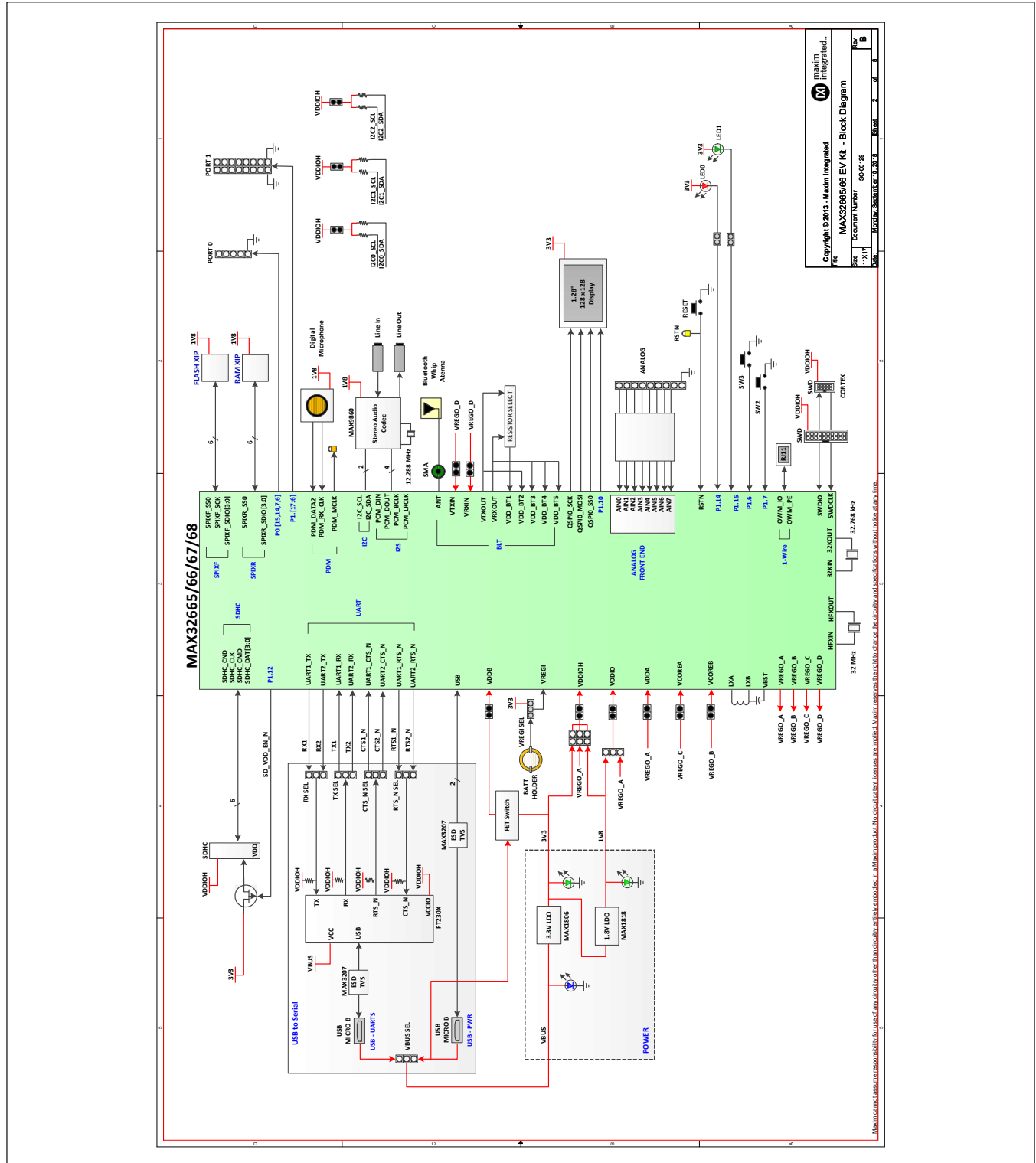
DAUGHTERBOARD STANDOFF HOLES

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MAX32665/66 EV Kit - Rev History & Notes			
REV	Document Number	REV	
10X17	SC-00129	B	
DATE	Wednesday, October 24, 2018	Sheet	1 of 8

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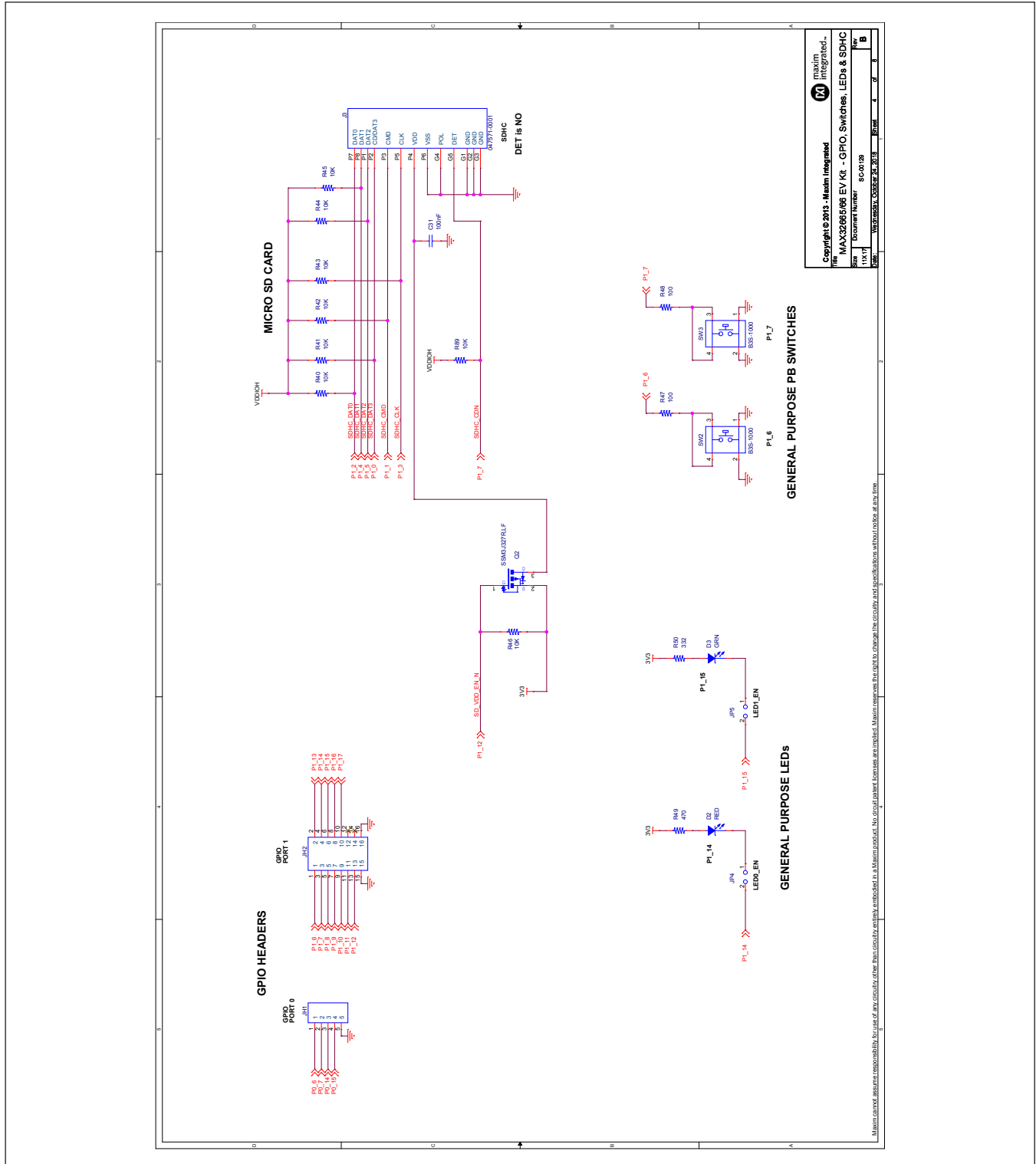


MAX32665/MAX32666 EV Kit Schematics (continued)

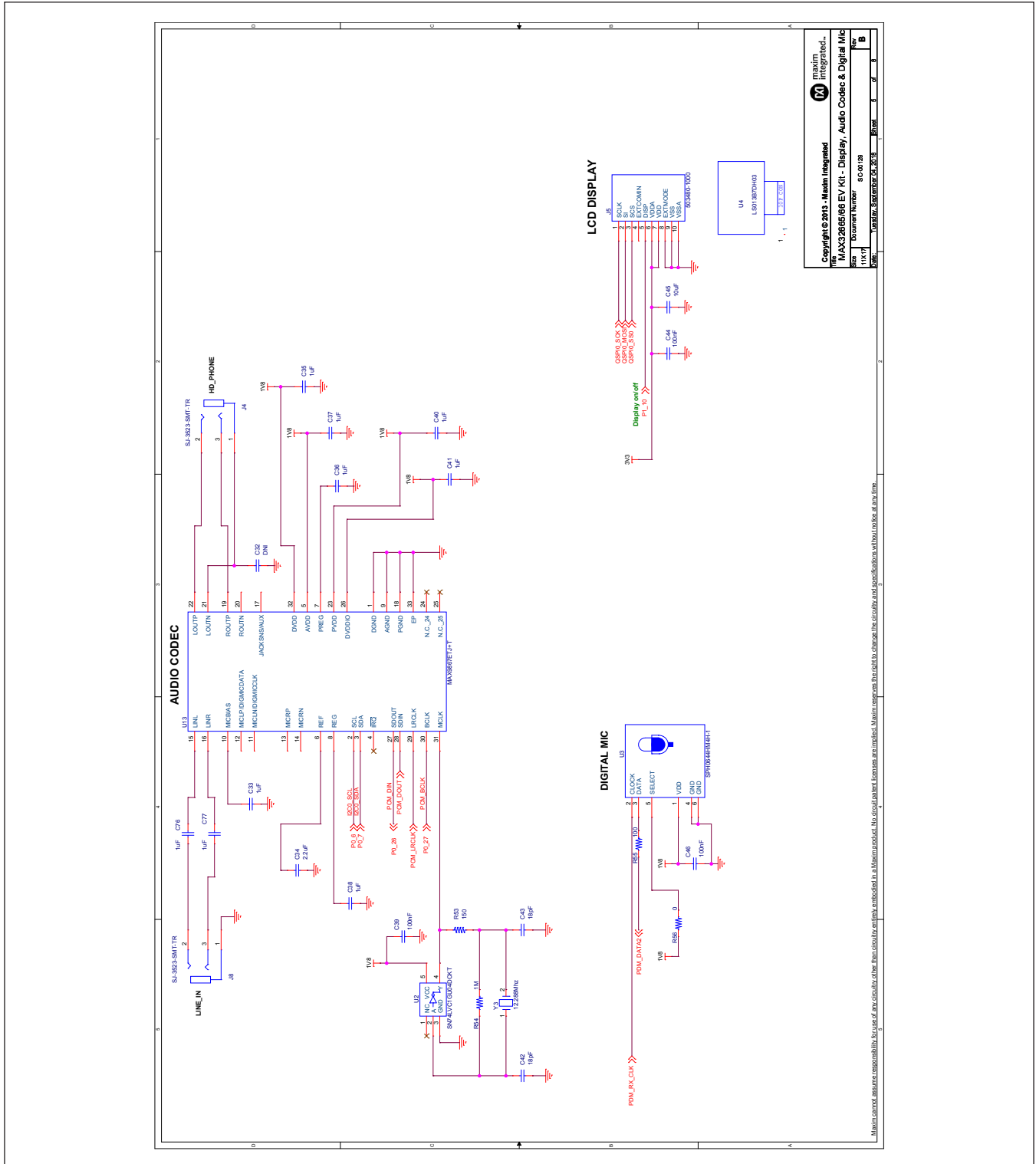




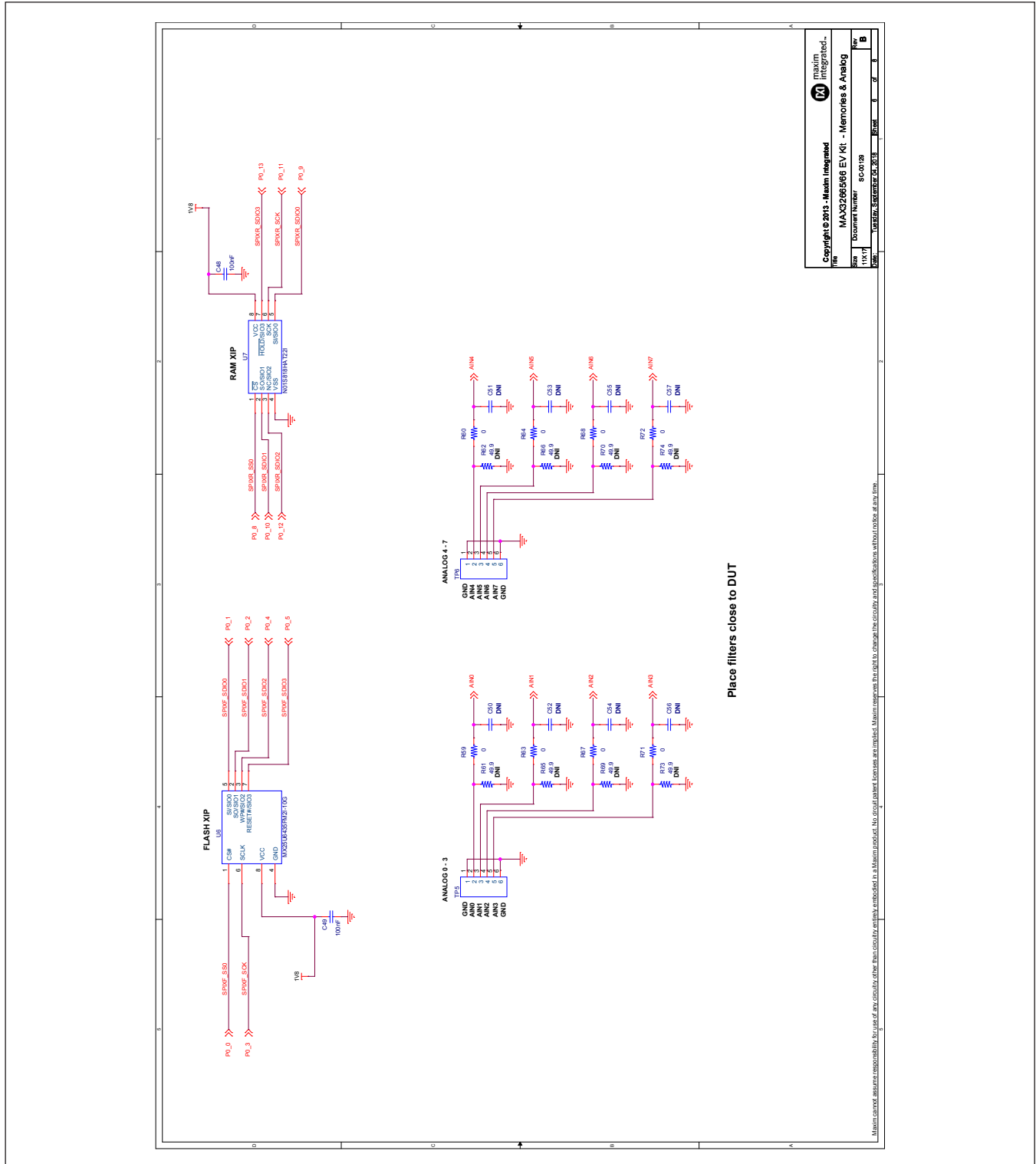
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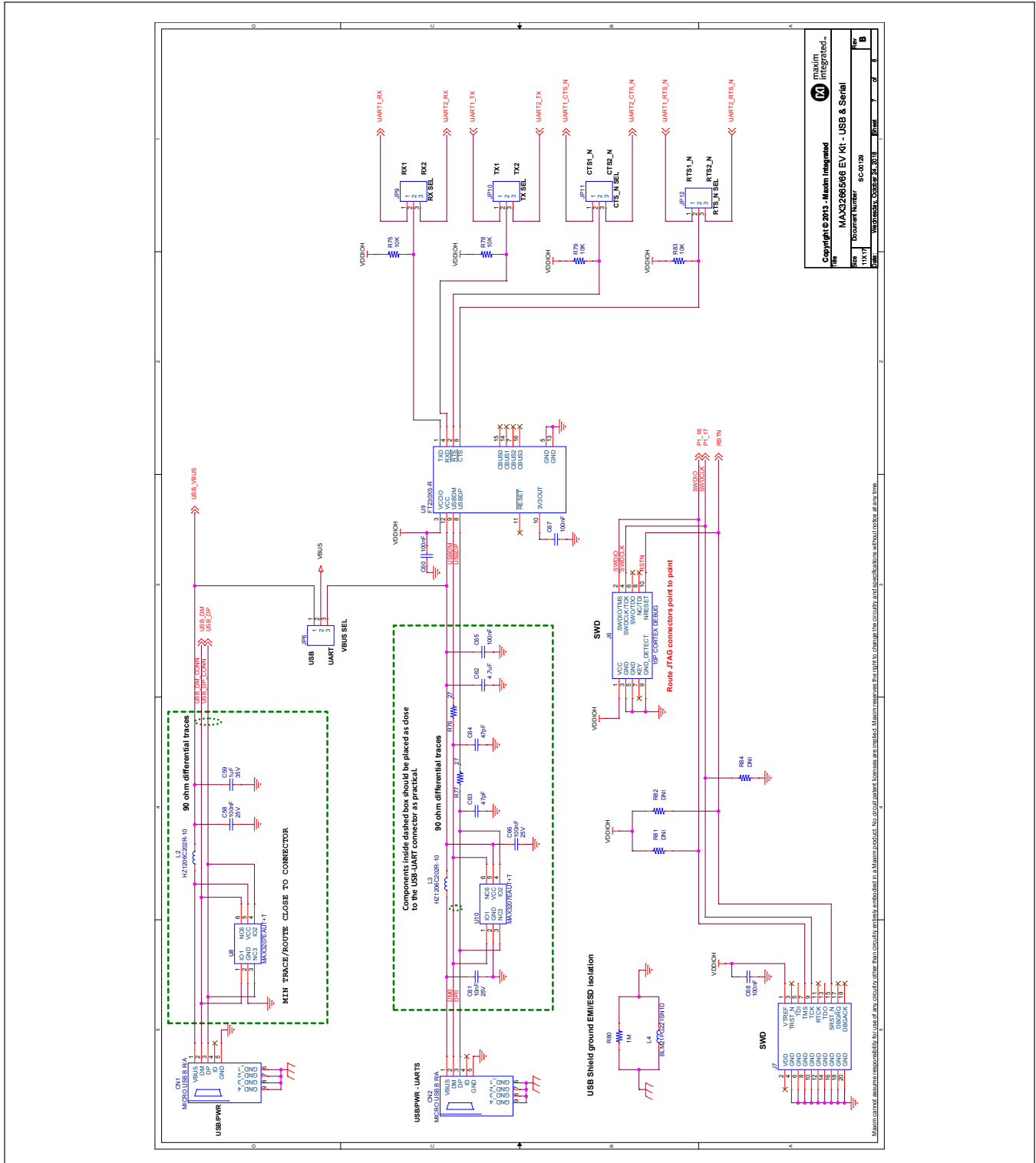
MAX32665/MAX32666 EV Kit Schematics (continued)



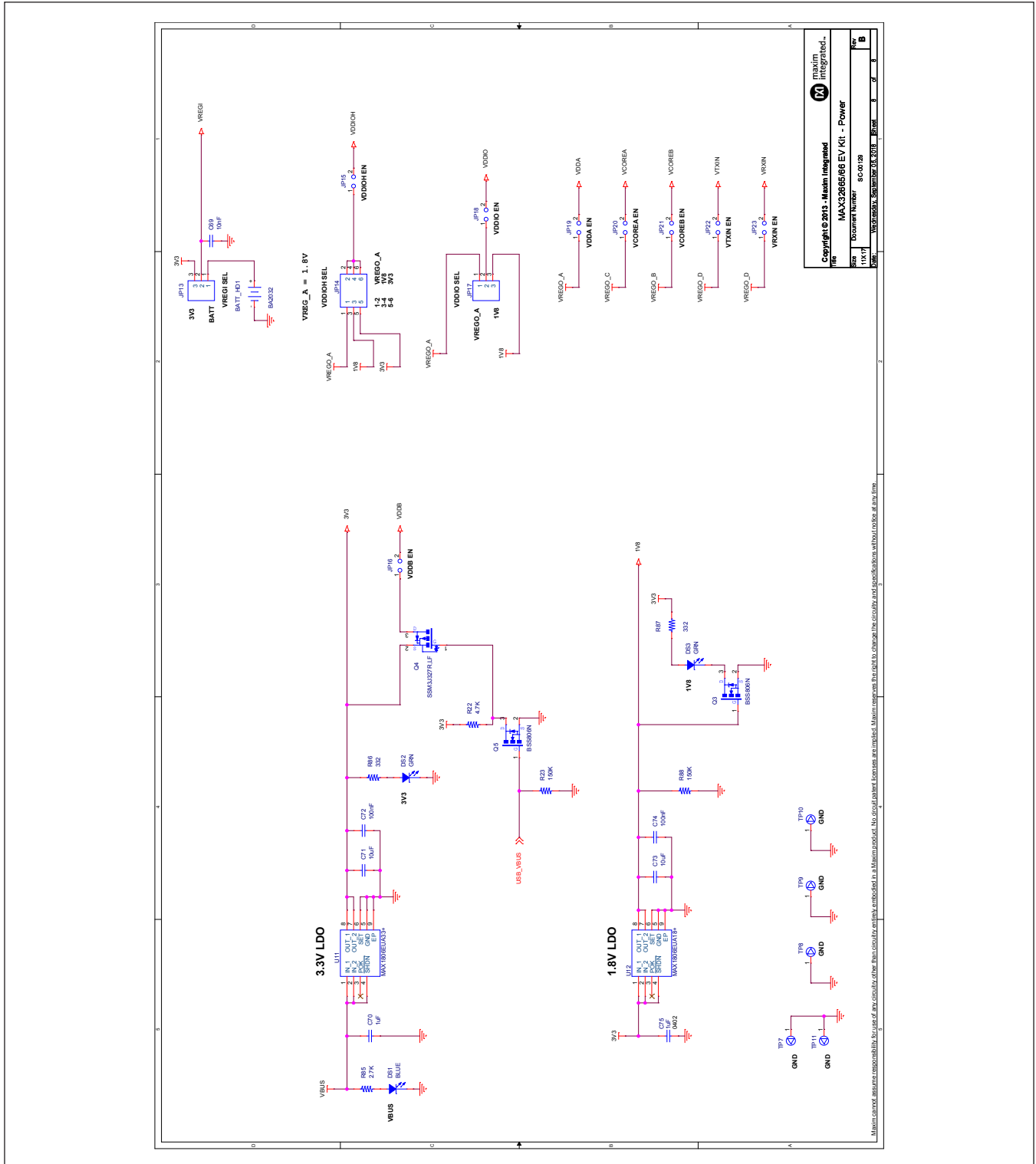
MAX32665/MAX32666 EV Kit Schematics (continued)



MAX32665/MAX32666 EV Kit Schematics (continued)



MAX32665/MAX32666 EV Kit Schematics (continued)



## Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	11/18	Initial release	—
1	12/18	Updated <i>Ordering Information</i>	1

For pricing, delivery, and ordering information, please visit Maxim Integrated's online storefront at <https://www.maximintegrated.com/en/storefront/storefront.html>.

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