### Evaluates: MAX20360

### **General Description**

The MAX20360 evaluation kit (EV kit) is a fully assembled and tested circuit board that demonstrates the MAX20360 ultra low-power wearable power management integrated circuit (PMIC). The MAX20360 includes voltage regulators such as bucks, boost, buck-boost, and linear regulators, and a complete battery management solution with battery seal, charger, power path, and fuel gauge.

The device is configurable through an I<sup>2</sup>C interface that allows for programming various functions and reading device status. The EV kit GUI application sends commands to the Munich 2 USB-to-I<sup>2</sup>C adapter board (USB2PMB2#) to configure the device.

### **Features**

- USB Power Option
- Flexible Configuration
- On-Board LED Current Sink and Battery Simulation
- Sense Test Point for Output-Voltage Measurement
- Filter Test Point for Haptic-Waveform Measurement
- Windows<sup>®</sup> 8/Windows 10-Compatible GUI Software
- Fully Assembled and Tested

### **EV Kit Contents**

- MAX20360 EV kit
- USB2PMB2# board
- Two USB A to USB micro-B cables

### **EV Kit Files**

FILE	DESCRIPTION
MAX20360EVKitSetupVxxx.exe	PC GUI Program

Ordering Information appears at end of data sheet.

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### **Quick Start**

#### **Required Equipment**

**Note:** In the following sections, software-related items are identified by **bold** text. Text in bold refers to items directly from the install of EV kit software.

- MAX20360 EV kit
- Windows PC with USB ports
- One USB A to USB micro-B cable and Munich 2 adapter board (USB2PMB2#)
- One USB A to USB micro-B cable or power supply (for battery simulation or battery voltage)
- Optional one USB A to USB micro-B cable or power supply (for charger input CHGIN)
- Voltmeter

#### Procedure

The EV kit is fully assembled and tested. To verify board operation, follow these steps:

- Visit <u>https://www.maximintegrated.com</u> to download the latest version of the EV kit software, MAX-20360EVKitSetupVxxx.zip located on the MAX20360 EV Kit web page. Download the EV kit software to a temporary folder and unzip the zip file.
- Install the EV kit software on your computer by running the MAX20360EVKitSetupVxxx.exe program inside the temporary folder.
- 3) Verify that all jumpers are in their default positions, as shown in <u>Table 1</u>.
- Connect the type-A end of a cable to the PC and micro-USB end of a cable to USB2PMB2# board, and connect the USB2PMB2# to J13 located on lower left of the EV kit board.
- 5) Connect a USB A to micro-B cable from the computer to J21 on the upper right corner of the EV kit board to use VBUS to power the battery simulation circuits on the board, or power the battery simulation circuits from the VHC test point. (Use a Li-ion battery or power source to evaluate the device if not using the battery simulation circuits. Connect the battery or power source to J2 on the EV kit board. Skip step 6 if not using the battery simulation.)



- 6) Use a voltmeter to check VHC is approximately 5V; BATSIM test point is approximately 3.7V. To adjust the BATSIM voltage, turn the R58 BATSIM potentiometer. Place shunt on JP9, then confirm that TP1 CSN is the set BATSIM voltage.
- 7) On the computer, open the MAX20360 GUI. It should look like <u>Figure 1</u>, the status bar on the bottom displays **MAX20360 Not Found**.

aneral Charger E	Buck 1 Buck 2	Buck 3	Buck-Boost	Boost and LEDs	Other DC-DC	Load Switches	Haptic Driver	Register Map			
Device Info		Cu	ırrent Limitin	g		Monitor	r Mux		Read All		
Chip Rev PwrRstCfg	0x00 0110		nput Current CHGIN Currer	Limit nt Limiter Blanking	, Time	MON	MON Pin Source MON Resistive Partition Selector				
PFNs and MPCs	5		No Blanking         1:1           0.5ms         2:1								
PFN1 State PFN2 State MPC0 State MPC1 State MPC2 State MPC3 State MPC4 State	Not Active Not Active Low Low Low Low		1ms 10ms SYS Minimum	n Voltage	3.6V	<ul> <li>3:1</li> <li>4:1</li> <li>MON Off Mode Condition</li> <li>Pulled Low by 59kΩ Resistor</li> <li>Hi-Z</li> </ul>					
MPC6 State MPC7 State	Low Low	Inte	errupts and S	Status			Re				
		In	terrupt Name	Mask	Status						
MPC Configurat	ion	Th	mStatInt	$\checkmark$	Thermistor m	nonitoring disabl	ed. ThmStat =	110 (See Data	isheet).		
MPC Select	MPC0 -	ILi	mInt	$\checkmark$	CHGIN input	current below lir	mit.				
MPC0 Outpu	t Value	Us	sbOVPInt	$\checkmark$	CHGIN overv	oltage not detec	ted.				
MPC0 Outpu	t Config	Us	sbOkInt	$\checkmark$	CHGIN input	voltage not pres	ent or outside	of valid range.			
MPC0 Direct	ion	Sy	/sBatLimInt	$\checkmark$	Charge curre	ent actively being	g reduced to re	gulate VSYS co	ollapse.		
MPC0 Resist	tor Presence	Ba	atGoodInt	$\checkmark$	VBAT > VBAT	LOVLO or CHO	GIN input voltage	e not present.			
MPC0 Resist	tor Config	120	CrcFailInt	$\checkmark$							

Figure 1. MAX20360 Not Found Status

- 8) Press the PB1 (/KIN) button until the device enters ON mode. The GUI then shows **Connected** and the registers are read and displayed (Figure 2).
- 9) The EV kit is now ready for additional evaluation.
- 10) To evaluate the battery charger, shunt J4 and plug in the USB micro-B cable to J1 of the EV kit to use USB VBUS power, or externally supply the charging power on TP9 CHGIN.

eneral Charger	Buck 1	Buck 2	Buck 3	Buck-Boost	Boost and LEDs	Other DC-DC	Load Switches	Haptic Driver	Register Ma	ар			
Device Info			Cu	ırrent Limitin	g		Monitor	Mux		Read All			
Chip Rev PwrRstCfg		0x02 1011		nput Current CHGIN Currei	Limit nt Limiter Blanking	450mA	MON	Pin Source Resistive Parti	tion Selecto	Hi-Z •			
PFNs and MPC	s			No Blanking     0.5ms     1ms     1ms									
PFNs and MPCs PFN1 State Active PFN2 State Not Active MPC0 State Low MPC1 State Low MPC3 State Low MPC4 State Low MPC5 State Low MPC6 State Low MPC6 State Low				1ms 10ms SYS Minimum	n Voltage	3.6V	3:1 MON ₽u Hi-						
MPC6 State MPC7 State		Low Low	Inte	errupts and S	Status					Read Interrupts			
				terrupt Name	Mask	Status							
MPC Configura	tion		Th	mStatInt	$\checkmark$	Thermistor n	nonitoring disabl	ed. ThmStat =	111. See Da	atasheet.			
MPC Select	MF	•C0 •	ILi	mInt	$\checkmark$	CHGIN input	current limit act	ve.					
MPC0 Outp	ut Value		Us	sbOVPInt	$\checkmark$	CHGIN overv	oltage not detec	ted.					
MPC0 Outp	ut Confi	3	Us	sbOkInt	$\checkmark$	CHGIN input	voltage not pres	ent or outside	of valid rang	e.			
MPC0 Direc	tion	-	Sy	/sBatLimInt	$\checkmark$	Charge curre	ent is not being r	educed to regu	late VSYS c	ollapse.			
MPC0 Resis	stor Pres	sence	Ba	atGoodInt	$\checkmark$	VBAT > VBA	LOVLO or CHG	IN input voltag	e not preser	ıt.			
MPC0 Resis	stor Con	fig	120	cCrcFailInt	$\checkmark$								

Figure 2. Connected Status

### **Detailed Description of Software**

#### **Software Startup**

Upon starting the program, the EV kit software automatically searches for the USB interface circuit and then for the IC device addresses. The EV kit enters the normal operating mode when the connection is established and addresses are found. If the USB connection is not detected, the status bar displays **Not Connected**. If the USB connection is detected, but the MAX20360 is not found, the status bar shows **MAX20360 Not Found**.

#### **ToolStrip Menu Bar**

The ToolStrip menu bar (<u>Figure 3</u>) is located at the top of the GUI window. This bar comprises **File**, **Device**, **Options**, and **Help** menus; each function is detailed in the following sections.

#### File Menu

The **File** menu contains the option to exit out of the GUI program.

#### **Device Menu**

The **Device** menu provides the ability to connect or disconnect the EV kit to the GUI. The **Advanced**  $\rightarrow$  **I<sup>2</sup>C Read/Write** menu allows to read from or write to a selected register with a specified slave address.

#### **Options Menu**

The **Options** menu provides several settings to access additional features offered by the GUI. The **Disable Polling** option allows registers to be read manually instead of receiving automatic frequent register updates from the IC. The **Lock/Unlock** option allows for the lock or unlock of the charger, bucks, boost, buck-boost, and LDOs through I<sup>2</sup>C.

#### Help Menu

The **Help** menu contains the **About** option, which displays the GUI splash screen indicative of the GUI version being used.

🔞 Wea	arable Pow	er Manager	ment Solution (MAX20360) EV Kit Tool	
File	Device	Ontions	Help	

Figure 3. The ToolStrip Menu Items

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#### **Tab Controls**

The MAX20360 EV kit software GUI provides a convenient way to test the features of the MAX20360. Each tab contains controls relevant to various blocks of the device. Changing these interactive controls triggers a write operation to the MAX20360 to update the register contents. The **Read All** button reads all the configuration registers that are visible on the current tab page. The **Interrupts and Status** section in each tab shows the state of the status registers and their corresponding interrupts. Checking or unchecking the **Mask** option controls which interrupts cause the INT output to be pulled low when asserted. Click the **Read Interrupts** button to read and clear the interrupts visible in the current tab. Asserted interrupts are denoted by bold text in the **Interrupt Name**. All statuses are polled continuously. The polling feature can be disabled in the **Options** section of the menu bar by selecting **Disable Polling**.

#### **General Tab**

The **General** tab (Figure 4) provides information on device info, PFNs and MPCs status and configuration. Charger input current and voltage limit setting, IVMON setting, and some general interrupts and status are also found under this tab.

eneral Charger Buck	1 Buck 2	Buck 3 Buck-Boos	t Boost and LEDs	Other DC-DC	Load Switches	Haptic Driver	Register Map	
Device Info		Current Limi	ting		Monitor	Mux		Read All
Chip Rev PwrRstCfg	0x02 1011	Input Curre CHGIN Cur	nt Limit rent Limiter Blanking	450mA ,	MON MON	Pin Source Resistive Parti	tion Selector	Hi-Z v
PFNs and MPCs		<ul> <li>No Blanl</li> <li>0 5ms</li> </ul>	king		• 1:1			
PFN1 StateActivePFN2 StateNot ActiveMPC0 StateLowMPC1 StateLowMPC2 StateLowMPC3 StateLowMPC4 StateLowMPC5 StateLow		SYS Minim	um Voltage	3.6V	3:1 4:1 MON Pu • Hi-			
MPC6 State MPC7 State	Low Low	Interrupts and	d Status		F	Read Interrupts		
MDC Configuration		Interrupt Nan	ne Mask	Status				
MPC Configuration		ThmStatInt	$\checkmark$	Thermistor m	asheet.			
MPC Select	MPC0 -	ILimInt	$\checkmark$	CHGIN input	current limit acti	ive.		
MPC0 Output Va	alue	UsbOVPInt	$\checkmark$	CHGIN overv	oltage not detec	ted.		
MPC0 Output Co	onfig	UsbOkInt	$\checkmark$	CHGIN input	voltage not pres	ent or outside	of valid range.	
MPC0 Direction		SysBatLimIn	t 🗹	Charge curre	nt is not being r	educed to regu	late VSYS co	llapse.
MPC0 Resistor	Presence	BatGoodInt	$\checkmark$	VBAT > VBAT_UVLO or CHGIN input voltage not present.				
MPC0 Resistor	MPC0 Resistor Config		I2cCrcFailInt					

Figure 4. General Tab

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### **Charger Tab**

The **Charger** tab (Figure 5) provides options to set charger voltage, current, and timer in different charging states. The thermistor monitor configuration can be accessed by clicking the **Advanced** button.

neral Charger Buck	1 Buck 2	Buck 3	Buck-Boost	Boost and LEDs	Other DC-DC	Load Switches	Haptic Driver	Register Map		
Charger Settings									Read	All
C Enable Charge	r				Recharge T	hreshold		BatReg - 70	mV	Ŧ
Charger Auto-S	Stop				Charge Don	e Threshold	0.3 x IFCh	ng		
Charger Auto-F	Restart				Precharge V	/oltage Threshold		3.15V		*
BAT Pull-Down	arge Mode Resistor				Precharge C	Current		0.05 x IFCI	hq	*
Battery Regulation V	/oltage		4.35V		Precharge T	60min		*		
Step Charge Voltage	e Threshold		3.80V	~	Fast Charge	e Timer		600min		*
Step Charge Hyster	tep Charge Hysteresis 400mV •				Maintain Cha	arge Timer		60min		
Step Charge Curren	t Scaling		1.0 x IFC	hg 🔻						
SYS UVLO Falling T	hreshold		2.7V	v	Thermistor I	Ad	vanced.			
nterrupts and Status								R	ead Inter	rrupts
Interrupt Name	Mask	Status								
ChgStatInt	$\checkmark$	Charge	er off.							
ChgJEITASDInt	$\checkmark$	Charge	er operating n	ormally or disable	ed.					
ChgJEITARegInt	$\checkmark$	Charge	er operating n	ormally or disable	ed.					
ChgTmoInt	$\checkmark$	Charge	er operating n	ormally or disable	ed.					
ChgThmSDInt	$\checkmark$	Input lir	miter and cha	irger operating no	rmally.					
Oh = Ot = = l=t		Charge	er sten-chara	e current reductio	n not active					

Figure 5. Charger Tab

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#### Buck1/2/3, Buck Boost Tab

The **Buck1**, **Buck2**, **Buck3**, and **Buck Boost** tabs (Figure 6, 7, 8, and 9) provide options to enable buck/buck boost, set buck/buck boost voltages, inductor current settings, DVS mode and voltage setting, and some additional settings.

erai Charger Buck	1 Buck 2	Buck 3	Buck-Boost	Boost and LEDs	Other DC-DC	Load Switches	Haptic Driver	Register Map			
uck 1 General Setti	ngs			Dyna	Dynamic Voltage Scaling						
Buck 1 Enable Confi Enabled Enabled by MPC Disabled	Enabled by MPC 0 •				k 1 DVS Mode k 1 Alternate Vol k 1 Alternate Vol	tage 1 tage 2		Disabled 0.55V 0.55V			
Output Voltage 1.1V Set Inductor Peak Current Inductor Peak Current Set by Lookup Table Adaptive Peak Current Passive Discharge Low EMI Mode Forced PWM Mode				Buc	k 1 Alternate Vol k 1 Alternate Vol 1 Additional Se	0.55V 0.55V					
				Fas	t Load Transient Enable Integrat Enable FET Sc Enable LX Sen Enable PGOOI	Response Mode or aling se Control D Comparator	2	Disabled	•		
terrupts and Status								Rea	ad Interrupts		
nterrupt Name	Mask	Status									

Figure 6. Buck1 Tab

neral Charger Buck	1 Buck 2	Buck 3	Buck-Boost	Boost and LEDs	Other DC-DC	Load Switches	Haptic Driver	Register Map			
Buck 2 General Set	ings			Dynan	Dynamic Voltage Scaling						
Buck 2 Enable Con Enabled	iguration			Buck	Buck 2 DVS Mode Disabled						
Enabled by MPC	1 *			Buck	2 Alternate Volt	0.55V	Ψ.				
<ul> <li>Disabled</li> </ul>				Buck	Buck 2 Alternate Voltage 2     0.55V       Buck 2 Alternate Voltage 3     0.55V						
Output Voltage				Buck							
		<u>.</u>	1.8V	Buck	Buck 2 Alternate Voltage 4 0.55V						
	Set			Buck 2	Additional Se	ettings					
Inductor Peak Current 0mA •				Fast	Fast Load Transient Response Mode Disabled						
Adaptive Peak	Current	,			Enable Integrator						
Passive Disch	arge				Enable FET Scaling						
Active Dischar	qe				Enable LX Sen:	se Control					
Low EMI Mode					Enable PGOO	O Comparator					
Sorced PWM I	lode										
Interrupts and Status								Rea	d Interrupts		
Interrupt Name	Mask	Status									
ThmBk2Int	nBk2Int I Buck2 operating normally.		mally.								

Figure 7. Buck2 Tab

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neral Charger Buck 1	Buck 2	Buck 3	Buck-Boost	Boost and LEDs	Other DC-DC	Load Switches	Haptic Driver	Register Map			
Buck 3 General Setting	s			Dynan	Dynamic Voltage Scaling						
Buck 3 Enable Configur Enabled Disabled Disabled Output Voltage Inductor Peak Current Adaptive Peak Cur Passive Discharge Low EMI Mode Forced PWM Mod	ation 2    Set  rent Set I rent e	by Looku	0mA ıp Table	Buck Buck Buck Buck	3 DVS Mode 3 Alternate Volt 3 Alternate Volt 3 Alternate Volt 3 Alternate Volt 4 Additional Se Load Transient Enable Integrat Enable FET Sc Enable LX Sen Enable PGOOI	age 1 age 2 age 3 age 4 ettings Response Mode or aling se Control D Comparator		Disabled 0.55V 0.55V 0.55V Disabled			
Interrupts and Status								Re	ead Interrupt	s	
Interrupt Name	Mask	Status									
ThmBk3Int	$\checkmark$	Buck3	operating nor	mally.							

Figure 8. Buck3 Tab

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neral Charger Buck 1 Buck 2 Buck 3 Buck-Boost Boost	t and LEDs	Other DC-DC	Load Switches	Haptic Driver	Register Map	
Inductor Peak Current Setting 2       OmA *         Inductor Peak Current Setting 2       OmA *         Inductor Peak Current Setting 2       OmA *         Inductor Peak Current Setting 2       OmA *	Buck-B Buck-B Buck-B Buck-B Buck-B Buck-B Fast I Switc	Conter DC-DC ic Voltage Sca Boost DVS Mo Boost Alternate Boost Alternate Boost Alternate Boost Alternate Coost Addition Load Transient hing Frequency Enable Voltage Low EMI Enable FET Sc.	Load Switches aling de 2 Voltage 1 2 Voltage 2 2 Voltage 3 2 Voltage 4 al Settings Response Mode 7 Threshold Transistion Ram	P Haptic Driver	Register Map R Disabled 2.5V 2.5V 2.5V 2.5V 2.5V 2.5V 2.5V 2.5V	ead All
Buck Only Mode  Interrupts and Status Interrupt Name Mask Status BBstFaultInt Buck-Boost operating norm	nally.	Enable Zero-Cr	ossing Compara	tor	Read	Interrupts

Figure 9. Buck Boost Tab

### **Boost and LEDs Tab**

The **Boost and LEDs** tab (Figure 10) provide options to enable boost, set boost voltage, inductor current settings, enable LEDs, and LED current sink setting.

neral Charger Buck 1 Buck	k 2 Bu	ick 3 Buck-Boost	Boost ar	nd LEDs	Other DC-DC	Load Switches	Haptic Driver	Register Map				
Boost Settings				LEDs				Rea	id All			
Boost Enable Configuration Enabled Enabled by MPC Disabled	Boost Enable Configuration Enabled Enabled by MPC				Open Detectior Current Step	n Status: 000		0.6mA				
Output Voltage				LED0	LED0 Enable			Off	<b>*</b>			
Inductor Peak Current 100mA +				LED0	Dropout Regu	200mV	• •					
					ED0 Boost Lo	op Enable						
Inductor Peak Current	Set by I	_ookup Table		LED1	Enable			Off	•			
Adaptive Peak Current				LED1	Current		0.6	0.6mA/1.0mA/1.2mA				
Fast Start     Enable FET Scaling				LED2	Enable			Off				
				LED2	Current		0.6	omA/1.0mA/1.2mA	•			
nterrupts and Status								Read Ir	iterrupts			
Interrupt Name Ma	sk S	tatus										
BstFaultInt	И В	oost operating nor	mally.									

Figure 10. Boost and LEDs Tab

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### Other DC-DC Tab

The **Other DC-DC** tab (Figure 11) includes SFOUT, Charge Pump, LDO1, and LDO2 settings.

2 Device Optio	ns Help	0											
neral Charger	Buck 1	Buck 2	Buck 3	Buck-Boost	Boost and LEDs	Other DC-DC	Load Switches	Haptic Driver	Register N	Лар			
SFOUT and CF	þ			LDC	1 Settings		L	LDO 2 Settings Read All					
Safe Output LI Enabled Enabled by Disabled Safe Output LI	afe Output LDO Enable Configuration Enabled Enabled by MPC Disabled afe Output LDO Output Voltage 5.0V 3.3V				00 1 Enable Conf Enabled Enabled by MPC Disabled	iguration		LDO 2 Enable Configuration Enabled Enabled by MPC					
<ul><li>5.0V</li><li>3.3V</li></ul>	5.0V • 3.3V Charge Pump Enable Configuration			O	utput Voltage		0.5V		e		0.9V		
Charge Pump Enable Configuration Enabled Enabled by MPC				Load Switch Mode     Passive Discharge				Set itch Mode Discharge					
Charge Pump 6.6V 5.0V	Disabled Charge Pump Output Voltage     6.6V     5.0V			C	Active Dischar	ge		Active Di	/CCINT				
Passive [	Discharg	e											
Interrupts and S	tatus								(	Read I	nterrup	ts	
Interrupt Name		Mask	Status										
ThmLDO_LSW	Int	$\checkmark$	LDO1,	LDO2, LSW	1, and LSW2 are	operating norm	ally.						
UVLOLDO1Int		$\checkmark$	LDO1	is operating r	iormally.								
UVLOLDO2Int		$\checkmark$	LDO2	is operating r	iormally.								

Figure 11. Other DC-DC Tab

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### Load Switches Tab

The Load Switches tab (Figure 12) includes Load Switch 1 and Load Switch 2 settings.

		VIAX20300) EV KIT TOOI						
2 Device Options F	Help	Buck 3 Buck-Boost	Boost and LEDs	Other DC-DC Load Switches	Haptic Driver Registe	er Map		
inclui charger back	Duoki	Duck C Duck Doott	Doording 2200					
Load Switch 1 Settin	ngs			Load Switch 2 Settings		Rea	d All	
Load Switch 1 Enabled Enabled Enabled by MPC Disabled	le Configura	ation		Load Switch 2 Enable Confi Enabled Enabled by MPC Disabled	guration			
Passive Discha	arge			Passive Discharge				
Active Discharg	ge			Active Discharge				
Low Quiescent Curr	rent			Low Quiescent Current				
Voltage Protection	n Enabled			Voltage Protection Enabled				
Voltage Protection	n Disabled.	Low Quiescent Currer	ıt.	• Voltage Protection Disab	led. Low Quiescent (	Current.		
<ul> <li>Voltage Protection</li> </ul>	n Disabled.	Low Quiescent Currer	ıt.	Voltage Protection Disab	led. Low Quiescent (	Current.		
Voltage Protection	n Disabled.	Low Quiescent Currer	ıt.	Voltage Protection Disab	led. Low Quiescent (	Current.	terrupts	
Voltage Protection     Interrupts and Status	n Disabled.	Low Quiescent Currer	ıt.	Voltage Protection Disab	led. Low Quiescent (	Current.	terrupts	
Voltage Protection     Interrupts and Status     Interrupt Name     ThmLDO_LSWInt	n Disabled. Mask	Low Quiescent Currer Status LDO1, LDO2, LSW	it. 1, and LSW2 are	Voltage Protection Disab	led. Low Quiescent (	Current.	terrupts	
Voltage Protection     Interrupts and Status     Interrupt Name     ThmLDO_LSWInt     LSW1TmoInt	n Disabled. Mask	Low Quiescent Currer Status LDO1, LDO2, LSW LSW1 is operating n	it. 1, and LSW2 are iormally.	Voltage Protection Disab	led. Low Quiescent (	Current.	terrupts	
Voltage Protection     Interrupts and Status     Interrupt Name     ThmLDO_LSWInt     LSW1TmoInt     LSW2TmoInt	n Disabled. Mask Ø	Low Quiescent Currer Status LDO1, LDO2, LSW LSW1 is operating n LSW2 is operating n	I, and LSW2 are formally.	Voltage Protection Disab	led. Low Quiescent (	Current.	terrupts	

Figure 12. Load Switches Tab

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#### Haptic Driver Tab

The **Haptic Driver** tab (Figure 13) provides options to choose actuator type, haptic driver mode and different settings for each mode. To unmask the haptic interrupts, the HptStatIntM bit in 0x0D IntMask3 register also needs to be unmasked.

eral Charger Buck 1 Buck 2 Buck 3 Buck-Boost Boost and LEDs	Other DC-DC Load Switches	Haptic Driver	Register Map		
laptic Driver Settings	RAM Haptic Pattern Mod	e	Read	All	
Haptic Pattern Mode	RAM Address		0x00	Ŧ	
Real-Time I <sup>2</sup> C     External Triggered	Last Sample		ast Sample	•	
Disabled     Acuator Type Selection	Duration	-11	60ms	• •	
● ERM ● LRA	Wait		50ms		
Full-Scale Voltage 3.00V -	Repeat	Rep	oeat 12 Times	*	
Automatic Level Compensation	Start Address	0x00	• Write Pat	tern	
Automatic Braking Resonant Frequency Initial Guess     200Hz	Real-Time I <sup>2</sup> C Mode				
Autotune Status: Resonant frequency locking was not achieved. Resonant Frequency Result: 200.00Hz	Amplitude	00% of VFS	*		
Run Autotune Run	External Triggered Mode				
Haptic Fault: No haptic driver fault detected.		Amplitude	Duratio	on	
Unlock Нарце Driver Unlock	Overdrive -100.	00% of VFS	* 20ms	T	
nterrupts, Statuses, and Interrupt Masks	Active -49.6	61% of VFS	* 500ms	•	
Haptic Interrupts and Statuses Open Status Panel	Braking +100	.00% of VFS	• 160ms	<b>v</b>	

Figure 13. Haptic Driver Tab

#### **Register Map Tab**

The **Register Map** tab (Figure 14) provides all names and values of MAX20360 registers. Click **Read All** on the top right corner to perform a burst read of all registers.

The left table shows the register to be read from or written to. The right table contains descriptions for each register field of the selected 8-bit register. All bits, along with their field names, are displayed at the bottom of the page.

To set a bit, click the bit label. **Bold** text represents logic 1 and regular text represents logic 0. To configure the changes to the device, click the **Write** button at the bottom right.

neral Cha	arger Buck 1	Buck 2	Buck 3	Buck-Boo	st	Boost and LEDs	s Other DC-DC	Load St	witches	Haptic Driver	Register Map			
												Read All		
Register N	lap											1 COUCH / UI		
Slave Address	Register Address	Regis	ster	Value	^	Field	Name		Status of	De	scription	abla		
0xA0	0x00	HptSta	tus0	0x00		Bit [7]	HptHDINDis	t	hreshold	napuc unver H	Din voltage dis	able		
0xA0	0x01	HptStatus1		0x00				5	Status of	haptic driver ov	ercurrent prot	ection on the	<u> </u>	
0xA0	0x02	HptSta	tus2	0x00		Bit [6]	HptDRPOCPLow		ORP low-	side switch.	rerearrent prot			
0xA0	0x03	HptIn	nt0	0x00		D:4 (6)		5	Status of	haptic driver ov	vercurrent prot	ection on the	3	
0xA0	0x04	HptIn	HptInt1			Bit [5]	HPIDRNOCPLOW	C	ORN low-	side switch.				
0xA0	0x05	HptInt2     0;       HptIntMask0     0;       HptIntMask1     0;       HptIntMask2     0;		0x00		Bit [4]		, s	Status of haptic driver ov DRP high-side switch.	vercurrent protection on the				
0xA0	0x06			0x00		Dir [4]		' [						
0xA0	0x07			HptIntMask1 0x00			Bit [3]	HptDRNOCPHigh		Status of	haptic driver ov	vercurrent prot	ection on the	÷
0xA0	0x08			0x00			- pro- trans-	· L	ORN high	-side switch.				
0xA0	0x09	HptControl		0x00		Bit [2]	HptThm	5	Status of haptic driver thermal protection.		on.			
0xA0	0x0A	HptRTI2	2CPat	0x00	0x00	Bit [1]	HptClkOn	S	Status of	haptic driver cl	ock.			
0xA0	0x0B	HptRAMF	PatAdd	Add 0x00	0x00		Bit [0]	HotEral ock	S	Status of	haptic driver B	EMF resonant	frequency	
0xA0	0x0C	HptP	rot	0x04		Dir [0]	ripti rqeock	lo	ocking.					
0xA0	0x0D	HptUn	lock	0x00										
0xA0	0x11	HPTC	fg0	0x0E										
0xA0	0x12	HPTC	fg1	0x8B										
0xA0	0x13	HPTC	fg2	0x8B										
0xA0	0x14	HPTC	fg3	0x19										
0xA0	0x15	HPTC	fq4	0x03	$\checkmark$									
7		6		5		4	3		2		1	0		
HptHD	NDis Hp	tDRPOCPLo	ow Hpt	DRNOCPL	w	HptDRPOCPHi	gh HptDRNOCPH	ligh	HptThn	n Hpt	ClkOn	HptFrqLock		
Note: Click	text to set o	r clear bit a	and "Writ	te" to com	mit t	to device. Bold	text is logic 1. Reg	gular tex	t is logic	0.	Rea	d Write	е	

Figure 14. Register Map Tab

### **Detailed Description of Hardware**

The MAX20360 EV kit evaluates the MAX20360 ultra low-power wearable PMIC, which communicates over the I<sup>2</sup>C interface. The EV kit demonstrates the IC features such as bucks, buck-boost, boost, LED current sink, linear regulators, battery charger, and haptic driver. The EV kit uses the IC in a 72-bump wafer-level package on a proven, six-layer PCB design. The EV kit can use USB VBUS 5V DC for battery and charger input power source. Alternatively, the EV kit can be powered from an external power supply. Figure 15 and Figure 16 show the EV kit and block annotated pictures.



Figure 15. MAX20360 EV Kit Board Picture

Evaluates: MAX20360



Figure 16. MAX20360 EV Kit Block Annotated Picture

### Evaluates: MAX20360

#### **Hardware Setup**

To use the EV kit with the GUI, connect the USB2PMB2# to the PMOD connector in the bottom left corner of the board. The USB2PMB2# also provides 3.3V to the logic voltage VIO of the EV kit when shunting J20. Use the J21 USB VBUS to power the battery simulation circuits on the EV kit to supply BAT of the IC. Turning the R58 potentiometer can change the BATSIM voltage. Connect BATSIM to BAT of the IC with shunt on JP9. Alternatively, instead of using battery simulation circuits on the board, connect a Li-ion battery on J2 connector. Use the J1 USB VBUS as CHGIN source and place shunt on J4.

#### **PFNs and MPCs States**

The PFNs and MPCs can be pulled up to VIO through a 100k $\Omega$  resistor, or connected to ground through 100k $\Omega$  resistor.

#### **Regulators and Peripherals**

All regulator outputs are made available on test points. The inputs to the LDO1, LDO2, Load Switch 1, and Load Switch 2 must be supplied externally through test points. The LDO2 input can be supplied from VCCINT of IC if set through the I<sup>2</sup>C. Bucks, buck-boost, and boost output have sense test points which provide easy voltage measuring.

#### Thermistor and SET Adjustment

When the J6 shunt is installed, THM is pulled up to TPU through a  $10k\Omega$  resistor. Header J19 is used to select the pull-down resistor for THM. When pin 1 and 2 is shunted, potentiometer R14 is used to simulate a thermistor at THM. When pin 2 and 3 is shunted, a fixed  $10k\Omega$  resistor is connected between THM and ground.

Header J18 is used to select the resistor for R<sub>ISET</sub> which sets the fast-charge current I<sub>FCHG</sub>. Shunting pin 1 and 2 selects potentiometer R63. Change R<sub>ISET</sub> to change I<sub>FCHG</sub>. Shunting selects a fixed 10k $\Omega$  resistor, which sets fast-charge current to 0.2A.

### **INT** and **RST** LED Indicators

Shunts can be installed on J7 and J8 to show the status of  $\overline{\text{INT}}$  and  $\overline{\text{RST}}$  as LED indicators, DS2 and DS3. When the corresponding LED illuminates, it verifies the active-low output is pulled low.

#### **Haptic Driver**

Select haptic driver supply using J23. When pin 1 and 2 is shunted, HDIN is powered from SYS. When pin 2 and 3 is shunted, HDIN is sourced from BBOUT. The haptic driver output is available on J5 where an LRA or ERM vibration motor can be connected. By shunting J24 and J25, haptic waveform can be measured with the on board low-pass filters which convert pulse-width-modulation (PWM) to sinewave.

#### **LED Current Sink**

The EV kit includes multiple LEDs to test the LED0, LED1, and LED2 current sinks. The current source for LED1 and LED2 can be connected to SYS by shunting J14. The current source for LED0 can be selected between SYS and BSTOUT by J17. Using J16, select between sinking the current from one LED or three LEDs for LED0.

#### **Jumper Setting**

<u>Table 1</u> shows the detailed jumper setting, and <u>Table 2</u> shows the connector description.

JUMPER	SHUNT POSITION	DESCRIPTION						
J3	1-2*	CSN connect to FGBAT						
J4	1-2	CHGIN connect to USB VBUS from J1						
J6	1-2*	THM connect to TPU for thermistor monitoring						
J7	1-2*	INT connect to pull up VIO and DS2.						
J8	1-2*	RST connect to pull up VIO and DS3.						
	1-2	MPC0 pull down to ground						
J9	1-3	MPC0 connect to GPIO3						
	1-4	MPC0 pull up to VIO						
	1-2	PFN1 pull down to ground						
J10	1-3	PFN1 connect to GPIO1						
	1-4	PFN1 pull up to VIO						

#### Table 1. Jumper Setting

JUMPER	R SHUNT POSITION DESCRIPTION				
	1-2	MPC1 pull down to ground			
J11	1-3	MPC1 connect to GPIO4			
	1-4	MPC1 pull up to VIO			
	1-2	PFN2 pull down to ground			
J12	1-3	PFN2 connect to GPIO2			
	1-4	PFN2 pull up to VIO			
J14	1-2	LED1/LED2 supply from SYS voltage			
14.6	1-2	LED0 connect to one LED			
J 10	2-3	LED0 connect to three LEDs			
147	1-2	LED0 supply from SYS			
JT	2-3	LED0 supply from BSTOUT			
14.0	1-2	ISET connect to potentiometer			
J18	2-3*	ISET connect to $10k\Omega$ (fast-charge current 0.2A)			
140	1-2	THM connect to potentiometer			
119	2-3*	THM connect to 10kΩ (50%/room zone)			
J20	1-2*	VIO connect to 3.3V from PMOD			
J22	1-2*	VHC connect to USB VBUS from J21			
100	1-2*	HDIN connect to SYS			
JZ3	2-3	HDIN connect to BBOUT			
J24	1-2	DRP connect to low-pass filter which convert PWM to sinewave, measure filtered waveform at DRP_F			
J25	1-2	DRN connect to low-pass filter which convert PWM to sinewave, measure filtered waveform at DRN_F			
107	1-2	MPC4 pull up to VIO			
JZI	2-3	MPC4 pull down to ground			
100	1-2	MPC3 pull up to VIO			
JZ8	2-3	MPC3 pull down to ground			
120	1-2	MPC7 pull up to VIO			
330	2-3	MPC7 pull down to ground			
124	1-2	MPC6 pull up to VIO			
331	2-3	MPC6 pull down to ground			
100	1-2	MPC2 pull up to VIO			
333	2-3	MPC2 pull down to ground			
10.4	1-2	MPC5 pull up to VIO			
J34	2-3	MPC5 pull down to ground			
100	1-2	SDA connect to ground			
138	2-3	SCL connect to ground			
JP9	1-2	BATSIM connect to CSN			

### Table 1. Jumper Setting (continued)

\*Default position.

# Evaluates: MAX20360

### **Table 2. Connectors Description**

CONNECTOR	DESCRIPTION
J1	Connect to USB cable for CHGIN voltage
J2	Connect to battery
J5	Connect to LRA/ERM haptic actuator
J13	Connect to USB2PMB2#
J15	Connect to MAX20361 EV kit

# **Ordering Information**

PART	TYPE
MAX20360EVKIT#	EVKIT

#Denotes RoHS compliant.

# Evaluates: MAX20360

### MAX20360 EV Kit Bill of Materials

ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	BATSIM, TP1-TP6, TP10-TP13, TP18-TP21	-	15	5003	KEYSTONE	N/A	TEST POINT; PIN DIA=0.11N; TOTAL LENGTH=0.31N; BOARD HOLE=0.04IN; ORANGE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
2	BBOUT_S, BK1OUT_S-BK3OUT_S, BSTOUT_S, DRN_F, DRP_F, TP14- TP17, TP36, TP37	-	13	5002	KEYSTONE	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; WHITE; PHOSPHOR BRONZE WIRE SILVER;	
з	C1	-	1	CGA2B3X7R1H104K050BB; C1005X7R1H104K050BB; GRM155R71H104KE14; GCM155R71H104KE02; C1005X7R1H104K050BE; UMK105B7104KV-FR; CGA2B3X7R1H104K050BE	GA283X7R1H104K0508B; 1005X7R1H104K050BB; RM155R71H104KE14; ICM155R71H104KE02; TDK;TDK;MURATA;MURATA; D05X7R1H104K050BE; ITDK;TAIYO YUDEN;TDK D05X7R1H104K050BE; DEGC TO +125 DEGC; TC=3 0.1UF CAPACITOR; SMT (0402); C CHIP; 0.1UF; 50V; TCL=10% DEGC TO +125 DEGC; TC=3		CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1UF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R	
4	C2	-	1	C1005X5R1V225K050BC	ТDК	2.2UF	CAP; SMT (0402); 2.2UF; 10%; 35V; X5R; CERAMIC CHIP	
5	C3, C5, C13-C17, C21, C22	-	9	C1005X5R0J475K050BC	ТОК	4.7UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 4.7UF; 6.3V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R	
6	C4	-	1	C1005X5R0J225K050BC; CL05A225KQ5NSN	TDK;SAMSUNG	2.2UF	CAPACITOR; SMT (0402); CERAMIC; 2.2UF; 6.3V; TOL=[10%]; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R	
7	C6-C9, C11, C18, C20, C40	-	8	GRM155R60J226ME11	MURATA	22UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 22UF; 6.3V; TOL=20%; TC=X5R ;	
8	C10, C19	-	2	GRM188R6YA106MA73	MURATA	10UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 10UF; 35V; TOL=20%; TG=-55 DEGC TO +85 DEGC; TC=X5R	
9	C12	-	1	GRM155R71A273KA01; 0402ZC273KAT2A; CC0402KRX7R6BB273	MURATA;AVX;YAGEO	0.027UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.027UF; 10V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R	
10	C23, C27	-	2	GRM31CR71H475KA12; GRJ31CR71H475KE11; GXM31CR71H475KA10	MURATA;MURATA;MURATA	4.7UF	CAPACITOR; SMT (1206); CERAMIC CHIP; 4.7UF; 50V; TOL=10%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=X7R	
11	C24	-	1	C1608X5R1H104K080AA	ТДК	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 50V; TOL=10%; MODEL=C SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R	
12	C25, C33, C35-C38	-	6	C1005X7R1C104K050BC; ATC530L104K16; 0402YC104KAT2A; CGA2B1X7R1C104K050BC; GCM155R71C104KA55; C0402X7R160-104KNE; CL05B104K05KNINC; GRM155R71C104KA88; C1005X7R1C104K; CC00402KR7K7BB104; EMK105B7104KV; c1 05B104KV5	TDK;AMERICAN TECHNICAL CERAMICS;AVK;TDK;MURATA;VEN KEL LTD.;SAMSUNG ELECTRONICS;MURATA;TDK;YAGE O PHICOMP;TAIYO YUDEN;SAMSUNG ELECTRONICS	0.1UF	CAPACITOR; SMT (0402); CERAMIC CHIP; 0.1UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R	
13	C26	-	1	C0603C225K9PAC; GRM188R60J225KE01; C1608X5R0J225K080AB	KEMET;MURATA;TDK	2.2UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 2.2UF; 6.3V; TOL=10%; MODEL=; TG=-55 DEGC TO +85 DEGC; TC=X5R;	
14	C28	-	1	C0603C475K9PAC	KEMET	4.7UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 4.7UF; 6.3V; TOL=10%; MODEL=; TG=-55 DEGC TO +85 DEGC; TC=X5R;	
15	C29	-	1	C0402X7R500-222KNE; GRM155R71H222KA01	VENKEL LTD.;MURATA	2200PF	CAPACITOR; SMT (0402); CERAMIC CHIP; 2200PF; 50V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R	
16	C30	-	1	C0603C104K8RAC	KEMET	0.1UF	CAPACITOR; SMI (0603); CERAMIC CHIP; 0.1UF; 10V; TOL=10%; MODEL=C0603 SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R	
17	C31	-	1	C3216X5R1C476M160AB; GRM31CR61C476ME44	TDK;MURATA	47UF	CAPACITOR; SMT (1206); CERAMIC CHIP; 47UF; 16V; TOL=20%; TG=-55 DEGC TO +85 DEGC; TC=X5R	
18	C32	-	1	C3216X5R1H106K160AB; GRM31CR61H106KA12	TDK;MURATA	10UF	CAPACITOR; SMT (1206); CERAMIC CHIP; 10UF; 50V; TOL=10%; TG=-55 DEGC TO +85 DEGC; TC=X5R	
19	C34	-	1	GRM188R60J105KA01	MURATA	1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 6.3V; TOL=10%; MODEL=GRM SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R;	
20	DS1-DS3, DS10	-	4	LG L29K-G2J1-24	OSRAM	LG L29K-G2J1-24	DIODE; LED; SMT (0603); Vf=1.7V; If(test)=0.002A; -40 DEGC TO +100 DEGC	
21	DS4, DS8, DS9	-	3	LTST-C171TBKT	LITE-ON ELECTRONICS INC.	LTST-C171TBKT	DIODE; LED; SMD LED; BLUE; SMT (0805); PIV=5V; IF=0.020A	
22	DS5-DS7	-	3	LTST-C150KRKT	LITE-ON ELECTRONICS INC.	LTST-C150KRKT	DIODE; LED; STANDARD; RED; SMT (1206); PIV=2V; IF=0.02A; -30 DEGC TO +85 DEGC CONNECTOR: MALE: SMT. MICRO	
23	J1, J21	-	2	ZX62D-B-5P8	HIROSE ELECTRIC CO LTD.	ZX62D-B-5P8	UNIVERSAL SERIES BUS B-TYPE CONNECTOR; RIGHT ANGLE; 5PINS CONNECTOR; MALE: TH: SINGLE	
24	JZ, J5	-	2	800-10-002-10-001000	MILLMAX	800-10-002-10-001000	ROW; STRAIGHT; 2PINS	
25	J3, J4, J6-J8, J14, J20, J22, J24, J25, JP9	-	11	PBC02SAAN	SULLINS ELECTRONICS CORP.	PBC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS	1

## MAX20360 EV Kit Bill of Materials (continued)

ITEM	REF_DES	DNI/DNP	QTY	TY MFG PART # MANUFACTURER VALUE DESCRIPTION		COMMENTS		
26	J9-J12	-	4	TSW-104-07-L-S	SAMTEC	TSW-104-07-L-S	EVKIT PART-CONNECTOR; MALE; THROUGH HOLE; TSW SERIES; SINGLE ROW; STRAIGHT; 4PINS	
27	J13	-	1	PBC06DBAN	SULLINS ELECTRONICS CORP.	PBC06DBAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 12PINS - ALTERNATE PIN NUMBERING	
28	J15	-	1	PEC04SBAN	SULLINS ELECTRONICS CORP.	PEC04SBAN	CONNECTOR; MALE; THROUGH HOLE; 0.100INCH CONTACT CENTERS; MALE BREAKAWAY HEADERS; RIGHT ANGLE; NO MOUNTING; 4PINS	
29	J16-J19, J23, J27, J28, J30, J31, J33, J34, J39	-	12	PBC03SAAN	SULLINS	PBC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS; - 65 DEGC TO +125 DEGC	
30	L1-L3, L5	-	4	DFE201612E-2R2M	MURATA	2.2UH	INDUCTOR; SMT (0806); WIREWOUND CHIP; 2.2UH; TOL=+/-20%; 1.8A	
31	L4	-	1	DFE201612E-4R7M	MURATA	4.7UH	INDUCTOR; SMT (0806); METAL; 4.7UH; 20%; 1.20A	
32	PB1	-	1	1825910-6	TE CONNECTIVITY	1825910-6	SWITCH; SPST; THROUGH HOLE; 24V; 0.05A; TACTILE SWITCH; RCOIL=0 OHM; RINSULATION=100M OHM; TE CONNECTIVITY	
33	R1, R13, R15, R16	-	4	ERJ-2RKF1001	PANASONIC	1К	RESISTOR; 0402; 1K OHM; 1%; 100PPM; 0.10W; THICK FILM	
34	R2, R10, R11, R38-R40, R49, R53	-	8	CRCW040210K0FK; RC0402FR-0710KL	VISHAY DALE;YAGEO PHICOMP	10K	RESISTOR; 0402; 10K; 1%; 100PPM; 0.0625W; THICK FILM	
35	R3, R4, R44, R47, R55, R60	-	6	ERJ-2RKF3000	PANASONIC	300	RESISTOR; 0402; 300 OHM; 1%; 100PPM: 0.1W: THICK FILM	
36	R5	-	1	ERJ-2LWFR010	PANASONIC	0.01	RES; SMT (0402); 0.01; 1%; 0 TO	
37	R6	-	1	ERJ-2GEJ103	PANASONIC	10K	RESISTOR; 0402; 10K OHM; 5%;	
38	R7, R17-R21, R23-R35, R41,	-	25	ERJ-2GEJ104	PANASONIC	100K	RESISTOR; 0402; 100K OHM; 5%;	
39	R8, R9, R12, R42	-	4	CRCW0402499RFK	VISHAY DALE	499	RESISTOR; 0402; 499 OHM; 1%;	
40	R14, R63	-	2	PV36Y105C01B00	MURATA	1M	100PPM, 0.0625W; INICA PILW RESISTOR: THROUGH-HOLE- RADIAL LEAD; PV36 SERIES; 1M OHM; 10%; 100PPM; 0.5W; TRIMMER POTENTIOMETER; 25 TURNS; MOLDER CERAMIC OVER METAL FILM	
41	R22, R36, R37	-	3	CRCW040210R0JNEDHP	VISHAY DRALORIC	10	RESISTOR; 0402; 10 OHM; 5%; 200PPM; 0.2W; THICK FILM	
42	R43	-	1	CRCW04024K70FK; MCR01MZPF4701	VISHAY DALE;ROHM SEMICONDUCTOR	4.7K	RESISTOR, 0402, 4.7K OHM, 1%, 100PPM, 0.0625W, THICK FILM	
43	R51	-	1	ERJ-2GE0R00	PANASONIC	0	RESISTOR; 0402; 0 OHM; 0%; JUMPER: 0.10W: THICK FILM	
44	R52	-	1	ERJ-2RKF5100	PANASONIC	510	RESISTOR; 0402; 510 OHM; 1%; 100PPM: 0.10W: THICK FILM	
45	R54, R56	-	2	WSL0805R1000FEA18	VISHAY DALE	0.1	RESISTOR; 0805; 0.1 OHM; 1%; 75PPM: 0.125W: THICK FILM	
46	R58	-	1	3296Y-1-253LF	BOURNS	25K	RESISTOR: THROUGH-HOLE- RADIAL LEAD; 3296 SERIES; 25K OHM; 10%; 100PPM; 0.5W; SQUARE TRIMMING POTENTIOMETER; 25 TURNS; MOLDER CERAMIC OVER METAL FILM	
47	R59	-	1	ERJ-2RKF1152	PANASONIC	11.5K	RESISTOR; 0402; 11.5K OHM; 1%; 100PPM; 0.10W; THICK FILM	
48	R61	-	1	CRCW04023K40FK	VISHAY DALE	3.4K	RESISTOR; 0402; 3.4K OHM; 1%; 100PPM; 0.063W; THICK FILM	
49	SPACER1-SPACER4	-	4	9032	KEYSTONE	9032	MACHINE FABRICATED; ROUND- THRU HOLE SPACER; NO THREAD; M3.5; 5/8IN; NYLON	
50	SU3, SU4, SU6-SU12, SU14, SU16-SU20, SU23-SU25, SU27, SU28, SU30, SU31, SU33, SU34	-	24	S1100-B;SX1100-B; STC02SYAN	KYCON;KYCON;SULLINS ELECTRONICS CORP.	SX1100-B	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT;PHOSPHOR BRONZE CONTACT=GOLD PLATED	
51	TP7-TP9, VHC	-	4	5000	KEYSTONE	N/A	TEST POINT; PIN DIA=0.11N; TOTAL LENGTH=0.31N; BOARD HOLE=0.04IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
52	TP22-TP33	-	12	5001	KEYSTONE	N/A	TEST POINT; PIN DIA=0.11N; TOTAL LENGTH=0.31N; BOARD HOLE=0.04IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
53	U1	-	1	MAX20360EEWZ+	MAXIM	MAX20360EEWZ+	EVKIT PART - IC; WEARABLE POWER NAMAGEMENT SOLUTION; PACKAGE OUTLINE DRAWING: 21- 100373; WLP 72 PINS; 0.5MM PITCH; PACKAGE CODE: W724A4+1	
54	U2	-	1	OPA569AIDWPR	TEXAS INSTRUMENTS	OPA569AIDWPR	IC; AMP; RAIL-TO-RAIL I/O; POWER AMPLIFIER; WSOIC20-EP 300MIL	
55	U3	-	1	MAX8880EUT+	MAXIM	MAX8880EUT+	IC; VREG; ULTRA-LOW-IQ LOW- DROPOUT LINEAR REGULATOR WITH POK; SOT23-6	
56	U4	-	1	NC7WZ07P6X	FAIRCHILD SEMICONDUCTOR	NC7WZ07P6X	IC; BUF; TINY LOGIC ULTRA-HIGH SPEED DUAL BUFFER: SC70-6	
57	РСВ	-	1	MAX20360	MAXIM	PCB	PCB:MAX20360	-
TOTAL	1	1	227	1		1		

### MAX20360 EV Kit Schematics





# MAX20360 EV Kit Schematics (continued)



## MAX20360 EV Kit Schematics (continued)

### Evaluates: MAX20360



### MAX20360 EV Kit PCB Layouts

MAX20360 EV Kit PCB Layout—Silk Top



MAX20360 EV Kit PCB Layout—Top



MAX20360 EV Kit PCB Layout—Layer2



MAX20360 EV Kit PCB Layout—Layer3

## Evaluates: MAX20360



### MAX20360 EV Kit PCB Layouts (continued)

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MAX20360 EV Kit PCB Layout—Bottom

MAX20360 EV Kit PCB Layout—Layer5



MAX20360 EV Kit PCB Layout—Silk Bottom

## Evaluates: MAX20360

### **Revision History**

REVISION	REVISION	DESCRIPTION	PAGES
NUMBER	DATE		CHANGED
0	8/20	Release for Market Intro	_

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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