MAX14663

Portable Medical Power Management Solution with Cable Detection

General Description

The MAX14663 is a complete power solution for portable medical devices, including blood glucose meters.

The MAX14663 integrates a high-efficiency single-cell Li-ion switching charger targeted at space-limited portable applications with small batteries.

The MAX14663 features a fully integrated electronic battery seal to put the portable device in an ultra-low power state to preserve battery charge during prolonged storage to extend battery shelf life, and to enhance customer experience with immediate out-of-box use.

The MAX14663 embeds a Maxim proprietary ModelGauge™ (fuel gauge) to provide an accurate estimate of the available capacity for rechargeable Li-ion batteries.

A step-up boost converter and LED current sinks are also integrated for powering OLED displays or LED backlights.

The MAX14663 features a cable detector to identify the presence of an unpowered, unconnected USB cable for the portable device system to decide on the mode of operation to prevent potential loss of accuracy and measurement errors.

The MAX14663 operates over the -20°C to +70°C temperature range and is available in a (5mm x 5mm), 40-pin, TQFN-EP package.

ModelGauge™ is a registered trademark of Maxim Integrated Products, Inc.

Applications

- Portable Blood Glucose Meters
- Portable Medical Devices
- USB Connected Devices

Benefits and Features

- High-Efficiency Switching Charger Tailored for Small Capacity Batteries
- Integrated Step-Up Converter
- 3-Channel Programmable-LED Current Sinks
- Battery Isolation Switch
  - Extends Battery Shelf Life
  - Hardware/Software Configurable
  - Integrated Power-Key Monitor
- Manual Reset Controller
- Integrated Host-Side Fuel Gauge
  - ModelGauge Algorithm
  - Calculates Accurate State of Charge
  - Tolerates Temperature & Load Variation
  - No Error Accumulation
  - Learning Not Necessary
  - Current-Sense Resistor Not Required
- Fully Integrated Cable Detection Controller
- Overvoltage Protection
- Thermal Protection
- Programmable Interrupt Generation (I^2C)
- 28V Tolerant VB Input Connection
- High ESD Protection (VB, DP, DM, $\overline{KIN}$)
  - ±15kV HBM ESD Protection
  - ±10kV Air-Gap Protection
  - ±8kV Contact Discharge Protection

For related parts and recommended products to use with this part, refer to www.maximintegrated.com/MAX14663.related.

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

19-6817; Rev 0; 9/13

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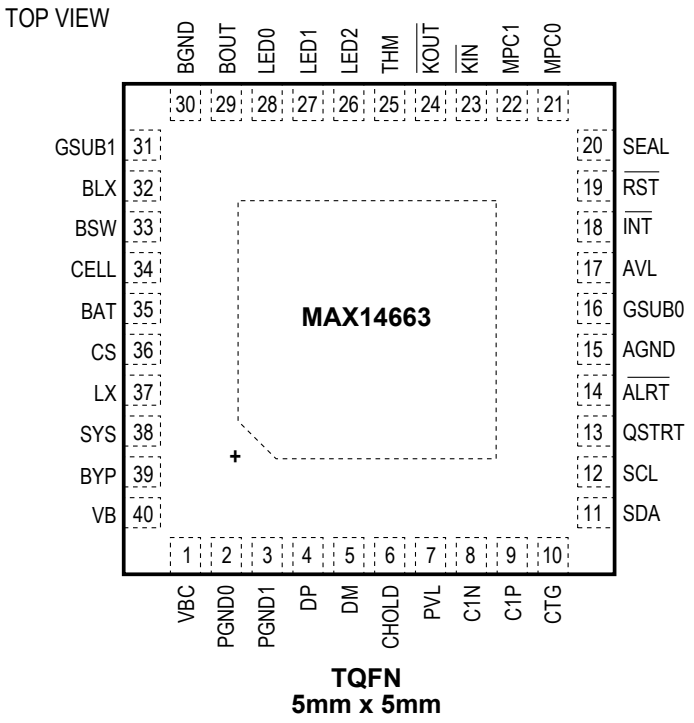
Pin Configuration



TQFN
5mm x 5mm

Pin Description

PIN	NAME	I/O	FUNCTION
1	VBC	I/O	VB Bypass Cap Connection. Use as current injection/measuring point in cable detection algorithm.
2	PGND0	GND	Charger Power Ground
3	PGND1	GND	Charger Power Ground
4	DP	I	ESD Protection for D+
5	DM	I	ESD Protection for D-
6	CHOLD	O	Charge Pump Output
7	PVL	O	Charger Power Regulated Voltage 5.25V
8	C1N	O	Charge-Pump Capacitor Negative
9	C1P	O	Charge-Pump Capacitor Positive
10	CTG	I	Connect to Ground

Pin Description (continued)

PIN	NAME	I/O	FUNCTION
11	SDA	I/O	I²C Data
12	SCL	I/O	I²C Clock
13	QSTRT	I	Quick-Start Input. Allows reset of the fuel gauge through hardware. Connect to GND if not used.
14	$\overline{ALRT}$	O	Fuel Gauge Interrupt
15	AGND	GND	Analog Ground
16	GSUB0	GND	Substrate. Connect to ground.
17	AVL	O	Charger Analog 4.5V Regulated supply
18	$\overline{INT}$	O	Interrupt Output, Active-Low, Open-Drain
19	$\overline{RST}$	O	Reset Output, Active-Low, Open-Drain
20	SEAL	I	Battery-Storage Seal Input
21	MPC0	I	Multi-Purpose Control Input 0 (Charger/Cable Detect/LED)
22	MPC1	I	Multi-Purpose Control Input 1 (Charger/Cable Detect/LED)
23	$\overline{KIN}$	I	Key Input, Active-Low, Internal Pullup
24	$\overline{KOUT}$	O	Debounced Key Output, Active-Low, Open-Drain
25	THM	I	Thermistor Temperature Sensing pin
26	LED2	O	Programmable Current Sink
27	LED1	O	Programmable Current Sink
28	LED0	O	Programmable Current Sink
29	BOUT	I	Boost-Converter Output
30	BGND	GND	Boost Power Ground
31	GSUB1	O	Substrate. Connect to ground.
32	BLX	O	Boost-Converter Switching-Node Pin
33	BSW	O	Boost-Converter Output Power Switch Input
34	CELL	I	Fuel Gauge Voltage Input
35	BAT	I/O	Li-ION Battery Connection
36	CS	I	Charger Current Sense
37	LX	O	Switching Charger Switch Node
38	SYS	I/O	System Power Connection
39	BYP	O	Reverse-Protected Bypass Pin
40	VB	I	USB VBUS Supply

Ordering Information

PART	TEMP RANGE	PIN-PACKAGE
MAX14663ETL+	-40ºC to +85ºC	40 TQFN –EP*

+Denotes a lead(Pb)-free/RoHS-compliant package.

**EP = Exposed pad.*

Chip Information

PROCESS: BiCMOS

Package Information

For the latest package outline information and land patterns (footprints), go to **www.maximintegrated.com/packages**. Note that a "+", "#", or "-" in the package code indicates RoHS status only. Package drawings may show a different suffix character, but the drawing pertains to the package regardless of RoHS status.

PACKAGE TYPE	PACKAGE CODE	OUTLINE NO.	LAND PATTERN NO.
40 TQFN	T4055+1	**21-0140**	**90-0016**