MAX14656

USB Charger Detection
with Integrated Overvoltage Protector

General Description

The MAX14656 is a USB charger detector compliant with USB Battery Charging Specification Revision 1.2. The USB charger detection circuitry detects USB standard downstream ports (SDPs), USB charging downstream ports (CDPs), or dedicated charger ports (DCPs), and controls an external lithium-ion (Li+) battery charger.

The device implements USB Battery Charging Specification Revision 1.2-compliant detection logic. The device also includes Apple® charger detection that allows identification of resistor divider networks on D+/D-.

The internal double-pole double-throw (DPDT) USB switch is compliant to Hi-Speed USB, full-speed USB, low-speed USB, and UART signals. The device's internal switch features low on-resistance, low on-resistance flatness, and very low capacitance. The ID pin controls the DPDT switch position. The MAX14656 features high-ESD protection up to ±15kV Human Body Model (HBM) on CD+, CD-, and ID pins.

The MAX14656 is available in a 16-bump, 0.4mm pitch, 1.8mm x 1.9mm WLP package and operates over the -40ºC to +85ºC extended temperature range.

Applications

- DSCs and Camcorders
- Tablet PCs
- Smartphones
- e-Readers

Benefits and Features

- Consumes Less Power
  - Low Battery Standby Current 5µA (typ)
- Delivers USB Compliance and Flexibility
  - Compliant to USB Battery Charging Specification Revision 1.2
  - Data Contact Detection for Foolproof Connector Insertion Detection
  - Dedicated Charger Detection
  - Standard Downstream Port Detection
  - Charging Downstream Port Detection
  - Apple Charger Detection
  - Sony® Charger Detection*
- Facilitates System Design
  - Integrated Precision 1.5A Overvoltage Protection (OVP)
  - Negative Audio Capable DPDT Hi-Speed USB Switches
  - Automatic Switch and Charger Interface Control
  - Full Control by I^{2}C Interface
  - Interrupt for Device Status Change
- Saves Board Space
  - V_{BUS} Connection Capable of 36V
  - ±15kV HBM ESD Protection
  - 1.8mm x 1.9mm WLP Package

*Contact factory for the list of compatible chargers.

Apple is a registered trademark of Apple, Inc.
Sony is a registered trademark and registered service mark of Kabushiki Kaisha TA Sony Corporation.
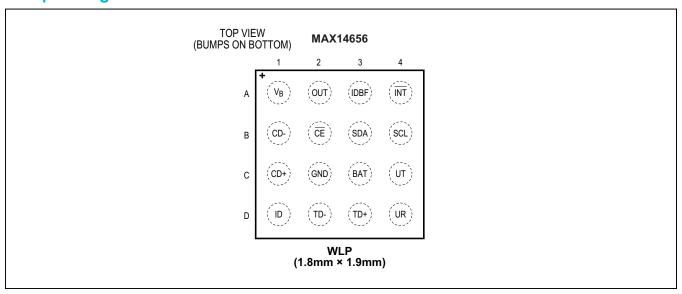
maxim integrated™

ABRIDGED
DATA SHEET

USB Charger Detection
with Integrated Overvoltage Protector

Bump Configuration

TOP VIEW
(BUMPS ON BOTTOM) **MAX14656**

	1	2	3	4
A	V$_B$	OUT	IDBF	$\overline{INT}$
B	CD-	$\overline{CE}$	SDA	SCL
C	CD+	GND	BAT	UT
D	ID	TD-	TD+	UR

WLP
(1.8mm × 1.9mm)

Bump Description

BUMP	NAME	FUNCTION
A1	V$_B$	USB Connector V$_{BUS}$ Connection. Bypass V$_B$ with a 1µF capacitor to GND.
A2	OUT	Overvoltage-Protected USB Transceiver V$_{BUS}$ Power Output. Bypass OUT with a 1µF capacitor to GND.
A3	IDBF	Push-Pull Digital ID Buffer Output
A4	$\overline{INT}$	Active-Low, Open-Drain, Interrupt Request Fault Output. Connect $\overline{INT}$ to an external pullup resistor.
B1	CD-	USB Connector D- Connection
B2	$\overline{CE}$	Active-Low, Open-Drain, Charger Control Enable Output. Connect $\overline{CE}$ to an external pullup resistor.
B3	SDA	I^{2}C Serial-Data Input/Output. Connect SDA to an external pullup resistor.
B4	SCL	I^{2}C Serial-Clock Input. Connect SCL to an external pullup resistor.
C1	CD+	USB Connector D+ Connection
C2	GND	Ground
C3	BAT	Battery Connection Input. Bypass BAT with a 1µF capacitor to GND.
C4	UT	UART Tx Line from Device
D1	ID	USB Connector ID Connection. Bypass ID with a 1nF (max) capacitor to GND.
D2	TD-	USB Transceiver D- Connection
D3	TD+	USB Transceiver D+ Connection
D4	UR	UART Rx Line from Device