

MAX14640–MAX14644/MAX14651

USB Host Adapter Emulators

General Description

The MAX14640–MAX14644/MAX14651 are next-generation USB 2.0 host charger adapter emulators that combine USB Hi-Speed analog switches with a USB adapter emulator circuit.

The MAX14640/MAX14651 feature an I²C interface to fully configure the charging behavior with different address options. The MAX14641–MAX14644 are controlled by two GPIO inputs (CB1/CB0) and support USB data and automatic charger mode. In charging downstream port (CDP) pass-through mode, the devices emulate the CDP function while supporting normal USB traffic. The MAX14641/MAX14642/MAX14643 have a CEN output for an active-high CLS enable input, and the MAX14644 has a CEN output for an active-low CLS enable input to restart the peripheral connected to the USB host.

The MAX14640–MAX14644/MAX14651 feature 2A high-current autodetect mode. The MAX14641 features 1A high-current forced mode instead of regular DCP mode. The MAX14640/MAX14651 can be configured through I²C to support various dedicated charger modes such as DCP, Apple® 1A/2A forced, or Apple 1A/2A automatic mode.

All the devices support CDP and standard downstream port (SDP) charging while in the active state (S0) and support the dedicated charging port (DCP) charging while in the standby state (S3/S4/S5). All devices support low-speed remote wake-up by monitoring DM, and the MAX14642 also supports remote wake-up in sleep mode (S3).

The MAX14640–MAX14644/MAX14651 are available in an 8-pin (2mm x 2mm) TDFN-EP package and are specified over the -40°C to +85°C extended temperature range.

Ordering Information and Typical Operating Circuit appear at end of data sheet.

Benefits and Features

- ◆ **Improved Charger Interoperability**
 - ◇ **USB (CDP) Emulation**
 - Smart CDP
 - Foolproof CDP
 - Meets New USB Battery Charging (BC) Revision 1.2 Specification
 - ◇ **Backward Compatible with Previous USB BC Revisions**
 - ◇ **Meets China YD/T1591-2009 Charging Specification**
 - ◇ **Supports Standby-Mode Charging for Apple BC Revision 1.2 Compatible Devices**
- ◆ **Provide Greater Application Flexibility**
 - ◇ **I²C Controls Multiple Modes (MAX14640/MAX14651)**
 - ◇ **CB0 and CB1 Pins Control Multiple Automatic and Manual Charger States**
- ◆ **Enhance Performance with High Level of Integrated Features**
 - ◇ **Supports Remote Wake-Up**
 - ◇ **Low-Capacitance USB 2.0 Hi-Speed Switch to Change Charging Modes**
 - ◇ **Automatic Current-Limit Switch Control**
 - ◇ **±15kV ESD Protection on DP/DM**
- ◆ **Minimize PCB Area**
 - ◇ **2mm x 2mm, 8-Pin TDFN Package**

Applications

Laptop/Desktop Computers

USB Hubs

Universal Chargers Including iPod®/iPhone®/iPad®

Selector Guide

| PART NUMBER | I/O MODE | CEN POLARITY | REMOTE WAKE-UP IN AM | FORCED CHARGER MODE | BIAS IN FM |
|-------------|-------------------------|--------------|----------------------|---------------------|-------------|
| MAX14640 | I ² C (0x35) | N/A | Optional | Yes | DP/DM short |
| MAX14651 | I ² C (0x15) | N/A | Optional | Yes | DP/DM short |
| MAX14641 | GPIO | CEN | No | No | Apple 1A |
| MAX14642 | GPIO | CEN | Yes | Yes | DP/DM short |
| MAX14643 | GPIO | CEN | No | Yes | DP/DM short |
| MAX14644 | GPIO | CEN | No | Yes | DP/DM short |

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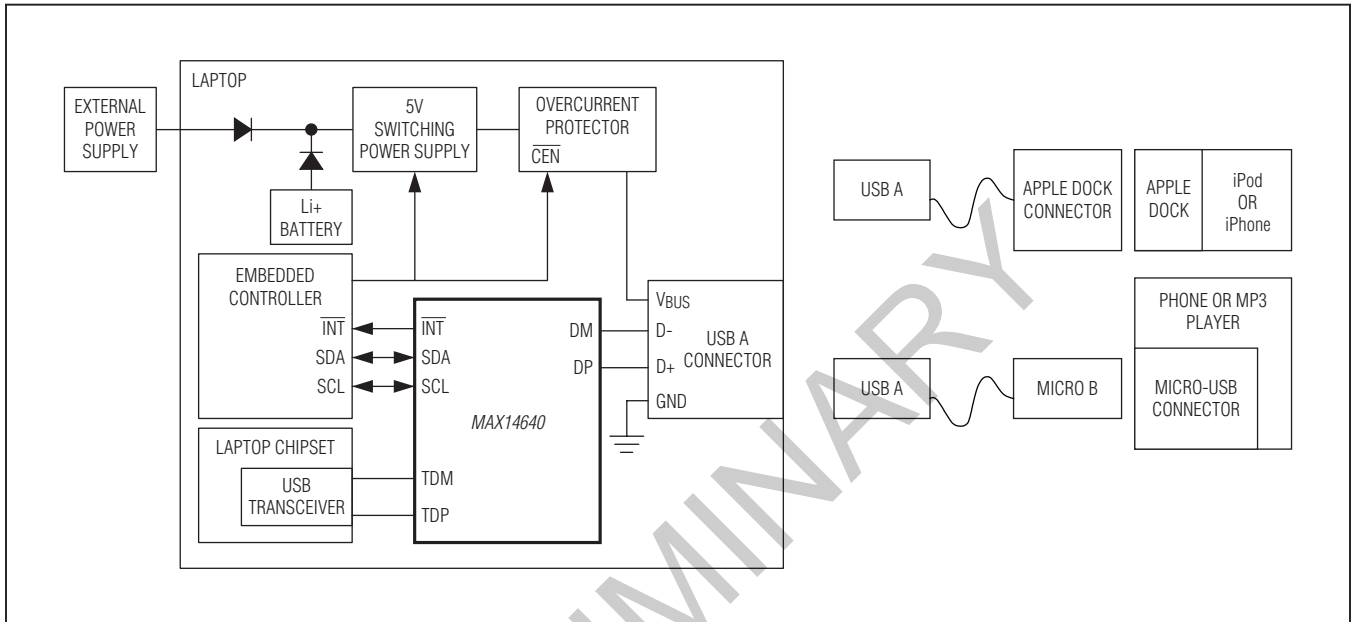
For related parts and recommended products to use with this part, refer to: www.maximintegrated.com/MAX14640.related

For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim's website at www.maximintegrated.com.

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Typical Operating Circuit



Ordering Information

| PART | TEMP RANGE | PIN-PACKAGE |
|---------------|----------------|-------------|
| MAX14640ETA+T | -40°C to +85°C | 8 TDFN-EP* |
| MAX14941ETA+T | -40°C to +85°C | 8 TDFN-EP* |
| MAX14942ETA+T | -40°C to +85°C | 8 TDFN-EP* |
| MAX14943ETA+T | -40°C to +85°C | 8 TDFN-EP* |
| MAX14944ETA+T | -40°C to +85°C | 8 TDFN-EP* |
| MAX14651ETA+T | -40°C to +85°C | 8 TDFN-EP* |

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

*EP = Exposed pad.

T = Tape and reel.

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. |
|--------------|--------------|-------------------------|-------------------------|
| 8 TDFN | T822+2 | 21-0168 | 90-0065 |

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Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

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Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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