



## 900mA, Single-Input, Single Cell Li-Ion and Li-Pol Battery Charger with Auto Start

### Features

#### ◆ CHARGING

- 1% Charge Voltage Accuracy
- 10% Charge Current Accuracy
- Pin Selectable USB 100mA and 500mA Maximum Input Current Limit

#### ◆ Programmable Termination and Pre-charge Threshold

#### ◆ PROTECTION

- 30V Input Rating; with 6.6V or 7.1V Input Overvoltage Protection
- Input Voltage Dynamic Power Management
- 125°C Thermal Regulation; 150°C Thermal Shutdown Protection
- OUT Short-Circuit Protection and ISET short detection
- Operation over JEITA Range via Battery NTC-1/2 Fast Charge Current at Cold 4.06V at Hot
- Fixed 10 Hour Safety Timer

#### ◆ SYSTEM

- Automatic Termination and Timer Disable

Mode (TTDM) for Absent Battery Pack With Thermistor

- Status Indication—Charging/Done
- Available in Small 2mm×2mm DFN-10 or 3.0mm×4.9mm eMSOP-10 Package
- Integrated Auto Start Function for Production Line Testing

### Applications

- Smart Phones
- PDAs
- MP3 Players
- Low-Power Handheld Devices

### Order Information

Part Number	V <sub>O(REG)</sub>	V <sub>OVP</sub>	PreTerm	ASI/ASO	TS/BAT_EN	PG	Package
HL7040FN01	4.20V	6.6V	Yes	No	TS (JEITA)	Yes	2mm×2mm DFN-10
HL7040FN02	4.20V	7.1V	No	Yes	BAT_EN Termination Disabled		
HL7040FN03	4.35V	6.6V	Yes	No	TS (JEITA)		
HL7040FN04	4.40V	6.6V	Yes	No	TS (JEITA)		
HL7040SP01	4.20V	6.6V	Yes	No	TS (JEITA)	Yes	3mm×3mm eMSOP-10
HL7040SP03	4.35V	6.6V	Yes	No	TS (JEITA)		



## Typical Application Diagram

$I_{OUT\_FAST\_CHG} = 517mA$ ;  $I_{OUT\_PRE\_CHG} = 108mA$ ;  $I_{OUT\_TERM} = 54mA$

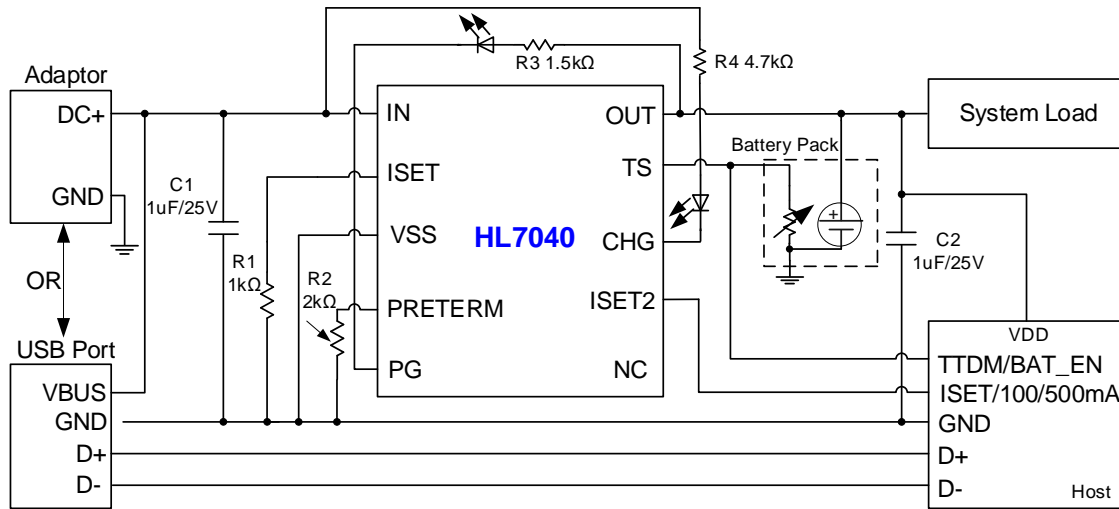


Figure 1. HL7040FN01/03/04, HL7040SP01/03 Typical Application Diagram

$I_{OUT\_FAST\_CHG} = 517mA$ ;  $I_{OUT\_PRE\_CHG} = 108mA$

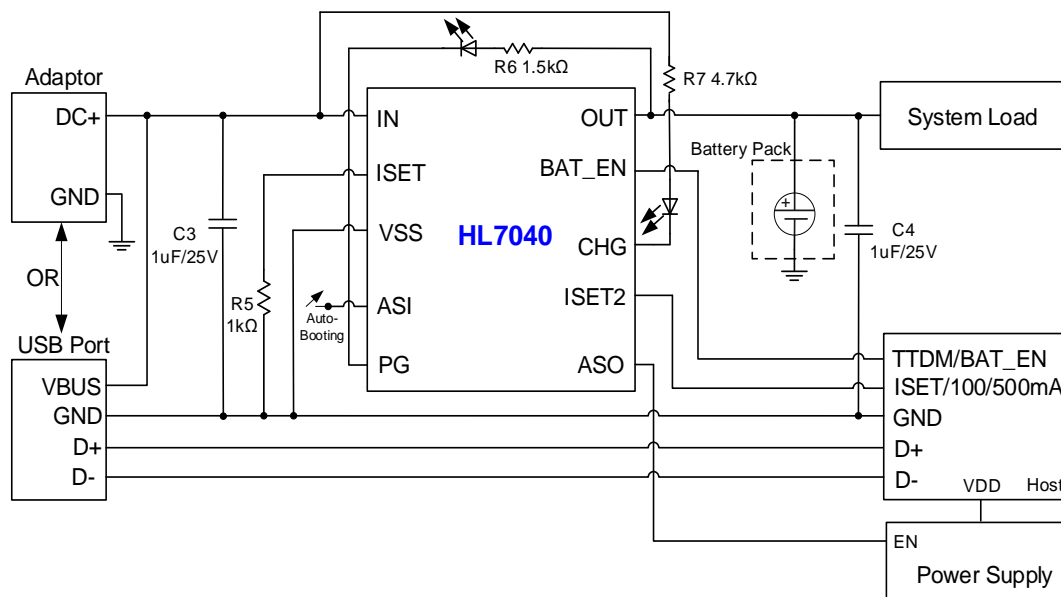


Figure 2. HL7040FN02 Typical Application Diagram

Component	Part Number	Value	Size	Vendor
C1, C2, C3, C4	C2012X5R1E105K	1μF/25V	0805	TDK
R1, R5	-	1kΩ	-	-
R2	-	2kΩ	-	-
R3, R6,	-	1.5kΩ	-	-
R4, R7	-	4.7kΩ	-	-

Table 1. Recommended Component List



## Description

The HL7040 series of devices are highly integrated Li-Ion and Li-Pol linear chargers devices targeted at space limited portable applications. The devices operate from either a USB port or AC adapter. The high input voltage range with input overvoltage protection supports low-cost unregulated adapters.

The HL7040 has a single power output that charges the battery. A system load can be placed in parallel with the battery as long as the average system load does not keep the battery from charging fully during the 10 hour safety timer.

The battery is charged in three phases: conditioning, constant current and constant voltage. In all charge phases,

an internal control loop monitors the IC junction temperature and reduces the charge current if an internal temperature threshold is exceeded.

The charger power stage and charge current sense functions are fully integrated. The charger function has high accuracy current and voltage regulation loops, charge status display, and charge termination. The pre-charge current and termination current threshold are programmed via an external resistor on the HL7040.

The fast charge current value is also programmable via an external resistor.

HL7040 is available in a 10-pin DFN or 10-pin eMSOP package.



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