16V Standoff, 3A Charger with 3.1A OTG for Power Bank All-in-One Solution

DESCRIPTION

ETA6983 is a switching Li-Ion battery charger capable of delivering up to 3A of charging current to the battery and also capable of delivering up to 3.1A in boost OTG operation. It includes an externally programmable fuel gauge system for power indication. For charging, it uses a proprietary control scheme that eliminates the current sense resistor for constant current control, thereby improving efficiency and reducing costs. It can also output a 5V voltage in the reversed direction by boosting from the battery. Therefore, it only needs a single inductor to provide power bi-directionally. Together with the build-in Micro-controller functions, such as push-button, auto load detection, and fuel gauging features, ETA6983 is truly an ideal all-in-one solution for battery charging and discharge applications, such as power banks, smart phones, and tablets with only one USB port that can be used for both charging battery and USB OTG function.

ETA6983 is in QFNFC 3x3-20 package.

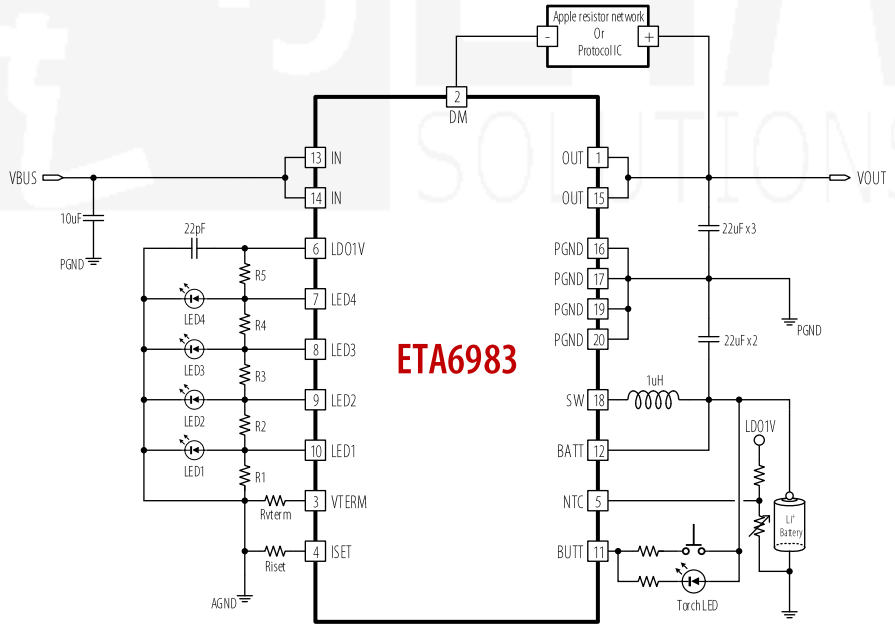
FEATURES

- Bi-Directional Power conversion with Single Inductor
- Switching Charger
- 5V Synchronous Boost
- Up to 97% Efficiency
- Up to 3A Max charging current and 3.1A discharging
- Automatic plug-in detection
- NTC thermistor input
- Tiny QFN3x3 package

APPLICATIONS

- Power Bank
- Smart Phone/ Tablet, MID

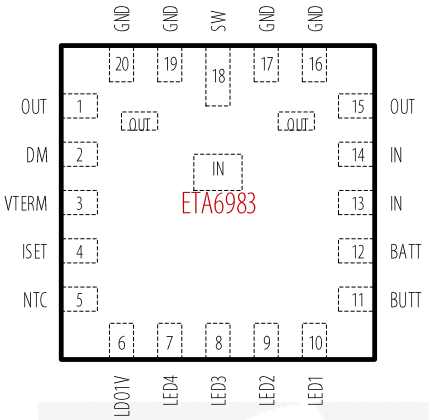
TYPICAL APPLICATION



ORDERING INFORMATION

PART No.	PACKAGE	TOP MARK	Pcs/Reel
ETA6983F3W	FCQFN3x3-20	ETA6983 YWW2L	5000

PIN CONFIGURATION



FCQFN3x3-20

ABSOLUTE MAXIMUM RATINGS

(Note: Exceeding these limits may damage the device. Exposure to absolute maximum rating conditions for long periods may affect device reliability.)

IN Voltage.....–0.3V to 16V
OUT Voltage .....–0.3V to 6V
All Other Pin Voltage.....V_{OUT}–0.3V to V_{OUT}+0.3V
SW, IN, OUT to ground current.....Internally limited
Operating Temperature Range.....–40℃ to 85℃
Storage Temperature Range.....–55℃ to 150℃
Thermal Resistance θ_{JA}
FCQFN3X3-20.....30.....℃/W
Lead Temperature (Soldering, 10ssec) .....260℃
ESD HBM (Human Body Mode) 2KV
ESD MM (Machine Mode) 200V

ELECTRICAL CHACRACTERISTICS

(V_{IN} = 5V, unless otherwise specified. Typical values are at TA = 25oC.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
BUCK MODE					
IN Standoff Voltage			16		V
IN Range		4.5		6	V
IN UVLO Voltage	Rising, Hys=500mV		4.5		V
IN to OUT RDSON			60		mΩ
IN to OUT Input current limit			5		A
IN to OUT Hiccup threshold Voltage	Falling. Vin-Vout>500mV Rising, Hys=100mV		500		mV
Hiccup on time			7		mS
Hiccup off time			200		mS
IN OVP Voltage	Hys=500mV		6.1		V
IN Operating Current as BUCK	Switcher Enable, Switching		5		mA
	Switcher Enable, No Switching		500		μA
BATTERY CHARGER					
Battery CV Voltage	R_{VTERM}=0, I_{BAT} =0mA, default	4.16	4.2	4.24	V
	R_{VTERM}=60K, I_{BAT} =0mA, default	4.3	4.35	4.4	V
Charger Restart Threshold			-170		mV
Battery Pre-Condition Voltage	V_{BAT} Rising Hys=200mV		3		V
Pre-Condition Charge Current			200		mA
Fast Charge Current	R_{ISET} =60KΩ	2.7	3	3.3	A
	R_{ISET} =90KΩ	1.7	2	2.3	
	R_{ISET} =180KΩ	0.8	1	1.2	

PIN DESCRIPTION

PIN #	NAME	DESCRIPTION
1, 15	OUT	USB 5.15V output during boost and charging input pin during charging. This is a power pin, bypass with 3x22uF MLCC caps to the pin and PGND as close as possible.
2	DM	The pin to switch off resistor divider or USB charge port controller IC (such as TPS2514) at USB port when starts to detect the load plug-in and when boost is being started, this DM pin turned on resistor divider or controller IC again. Connect this pin to the negative terminal of resistor divider strings or the GND pin of the controller IC.
3	VTERM	Battery termination voltage setting pin. Connect a resistor between this pin and analog ground to set battery termination voltage following the equation: Vbat=4.2V+10uA*R_{VTERM}/4. Vbat will be 4.2V when this pin is floating.
4	ISET	Buck Charging current setting pin. Connect a resistor between this pin and analog ground to set the current level.
5	NTC	Battery Temperature Monitoring input pin. It sets the valid temperature operating range for both battery charging and discharging.
6	LDO1V	Fuel Gauge 1V LDO output pin. Bypass with a 22pF capacitor to Analog ground. Resistor chain from LDO1V, thru LED1-4 to AGND, will set the battery fuel gauge level.
7	LED4	Fuel gauge LED4 connection pin
8	LED3	Fuel gauge LED3 connection pin
9	LED2	Fuel gauge LED2 connection pin
10	LED1	Fuel gauge LED1 connection pin
11	BUTT	Push Button pin. When the push button is pushed, and input is not present, boost operation is activated. Depending on the loading at OUT, the boost may continue to supply an output voltage or go into sleep mode. When push this button sustain 0.8S, it will turn on or turn off the flashlight alternatively. Beside Push Button feature, this pin also works as Flashlight pin. An internal open drain will turn on Flashlight when this feature is ON.
12	BATT	Battery Voltage sense pin. Connect to the battery positive terminal with a separate sensing wire to avoid voltage drop to achieve accurate battery CV charging
13, 14	IN	DC Input pins. Bypass with a 10uF capacitor from this pin to GND
16, 17, 19, 20	GND	Power Ground pin
18	SW	Switching Pin. Connect with an inductor between this pin and BATT.