

# Single Inductor, 3A Battery Charger with 2.4A USB OTG, 0.1us True OVP and Adjustable Fuel Gauge All-in-One Solution

### DESCRIPTION

ETA6887 is a switching Li-lon battery charger capable of delivering up to 3A of charging current to the battery and also capable of delivering up to 2.4A in boost OTG operation. It employs a charge pump to achieve a very fast input OVP, and also 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 pushbutton, auto load detection, and fuel gauging features, ETA6887 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.

#### ETA6887 is in QFN4x4-28 package.

## TYPICAL APPLICATION

IN

#### FEATURES

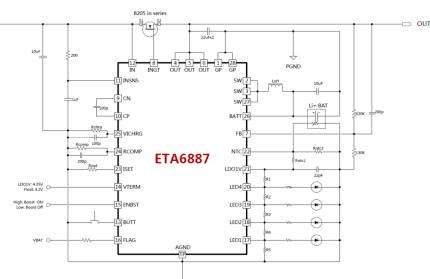
- Bi-Directional Power conversion with Single Inductor
- Input OVP with 0.1us reaction time
- Input standoff voltage up to 20V
- Switching Charger
- 5V Synchronous Boost
- Up to 95% Efficiency
- Up to 3A Max charging current and 2.4A discharging
- No External Sense resistor
- NTC thermistor input

#### APPLICATIONS

- Power Bank
- Smart Phone / Tablet, MID

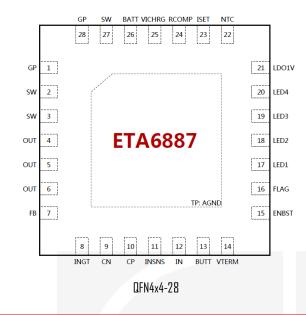
#### ORDERING INFORMATION

PART	PACKAGE	TOP MARK
ETA6887Q43	QFN4x4-28	ETA6887 <u>YWW</u> 2 <u>L</u>





## **PIN CONFIGURATION**



## ELECTRICAL CHACRACTERISTICS

## **ABSOLUTE MAXIMUM RATINGS**

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

OUT Voltage0.3V to 6V
IN, INGT Voltage0.3V to 20V
All Other Pin VoltageVout-0.3V to Vout+0.3
SW,IN,OUT to ground currentInternally limited
Operating Temperature Range40°C to 85°C
Storage Temperature Range55°C to 150°C
Thermal Resistance $\Theta_{JC}$ $\Theta_{JA}$
QFN4X4-28ºC/W
Lead Temperature (Soldering, 10ssec)
ESD HBM (Human Body Mode)2KV
ESD MM (Machine Mode)200V

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
BUCK MODE					•
IN Standoff Voltage		_		20	٧
IN Range		4.5		5.5	٧
IN UVLO Voltage	Rising, Hys=500mV		4.5	A N L C	٧
PUMP Hiccup threshold Voltage	Falling.Vin-Vout<300mV Rising.Hys=50mV	LU	300	)NS	mV
PUMP Hiccup on time		7			mS
PUMP Hiccup off time		200		mS	
PUMP frequence		500		KHZ	
PUMP Voltage	Vingt-Vout	3.5		٧	
INSNS Clamp Voltage			6.4		٧
INSNS OVP Voltage	Hys=300mV	6.0		٧	
	Switcher Enable, Switching	5		mA	
IN Operating Current as BUCK	Switcher Enable, No Switching		500		μA
BATTERY CHARGER					
	VTERM=D, I <sub>BAT</sub> =OmA, default	4.16	4.2	4.24	٧
Battery CV Voltage	VTERM=LDDIV, I <sub>BAT</sub> =OmA, default	4.3	4.35	4.4	٧
Charger Restart Threshold	From DONE to Fast Charge		-150		тV
Battery Pre-Condition Voltage	VBAT Rising Hys=200mV	3		٧	
Pre-Condition Charge Current			200		mA

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## ETA6887



Charge Termination Eurrent         Rucese=IODK Current=IODK Current=IODF         200         mA           Charge Termination Blanking time         12         S           BODST MODE	PARAMETER	CONDITIONS	MIN	ТҮР	MAX	UNITS
Charge Termination Blanking time         I2         S           BODST MODE         BATT Ok Threshold         Rising, HYS=0.5 V         3.2         V           Dutput Voltage Range         5.0         5.05         5.1         V           Dutescent Current At BATT         Boost On         IOO         µA           Shutdown Supply Current At BATT         Idle Mode         30         50         µA           Switching Frequency         VBATT         V         0.8         1.0         1.2         MHz           Jout Current Limit         3         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A         A	Fast Charge Current	Riset =62KΩ	3		A	
BODST MODE         Rising. HYS=0.5 V         3.2         V           BATT 0k Threshold         Rising. HYS=0.5 V         3.2         V           Dutput Voltage Range         5.0         5.05         5.1         V           Duisecent Current At BATT         Boost On         100         µA           Shutdown Supply Current At BATT         Idle Mode         30         50         µA           Switching Frequency         VBATT         VBATT         4.4         Mtz           Switching Frequency         VBATT         4.4         A         Mtz           Maximum Duty Cycle         90         %         %         Highside Pmos Rdson         Isw = 500mA         55         mQ           Short Circuit Hiccup Fumer         0n Time         25         ms         Stort Circuit Hiccup Timer         0n Time         750         ms           Load current threshold into sleep mode         30         mA         FLAB_ON_LEOS         VLED Hash Frequency         250         Hz           SISET_FB           0.15         V           Idl Pash Frequency         250         Hz         StET FB         VIC Harge         0.8         V           SISET FB           2	Charge Termination Current	Rvichrg=100K,Cvichrg=100pF		200		mA
BATT Dk Threshold     Rising, HYS=D.5 V     3.2     V       Dutput Voltage Renge     5.0     5.05     5.1     V       Quiescent Current At BATT     Boost On     100     μA       Shutdown Supply Current At BATT     Idle Mode     30     50     μA       Switching Frequency     VBATT     4.4V     0.8     1.0     1.2     MHz       Iout Current Limit     3     A     A     A     A       Maximum Duty Cycle     90     96     Highside Pmos Rdson     Isw =500mA     55     mΩ       Lowside Nmos Rdson     Isw =500mA     50     mΩ     So     So     So       Short Circuit Hiccup Current     4     A     A     A       Short Circuit Hiccup Timer     0n Time     25     ms       Clad current threshold into sleep mode     30     mA     A       Short Circuit Hiccup Timer     0ff Time     750     ms       ILEO Moutput Low Voltage     Ism=0mA     0.15     V       ILEO Hash Frequency     250     Hz     SV       SIET Voltage     0.8     V     SV       SIET Voltage     0.8     V     SV       ILEO Hash Frequency     22     %iddol     %iddol       NTC Threshold (Loid	Charge Termination Blanking time			12		S
Dutput Voltage Range         S.0         S.05         S.1         V           Duiescent Current At BATT         Boost On         IOD         µA           Shutdown Supply Current At BATT         Idle Mode         30         S0         µA           Switching Frequency         VBATT         Idle Mode         30         S0         µA           Iout Current Limit         3         A         Maximum Duty Cycle         90         %           Iouside Nmos Rdson         Isw = 500mA         S0         mΩ          MD           Short Circuit Hiccup Timer         In Time         25         ms         ms          MD           Load current threshold into sleep mode         In Time         750         ms           MA           MD         TEAG.M. LOS         ms          VIEED File           SIST FB         Visit File         S	BOOST MODE					
Linescent Current At BATT     Boost Dn     IDD     µA       Shutdown Supply Current At BATT     Idle Mode     30     50     µA       Switching Frequency     VBATT     44V     0.8     1.0     1.2     MHz       Iout Current Limit     3     A       Maximum Duty Cycle     90     %     1       Highside Pmas Rdsan     Isw = 500mA     55     mQ       Lowside Nmas Rdsan     Isw = 500mA     50     mQ       Short Circuit Hiccup Current     4     A       Short Circuit Hiccup Timer     0n Time     25     ms       Daf time     750     ms     1015     V       Lead current threshold into sleep mode     300     mA       FLAG. DM LEOS     Istat=10mA     0.15     V       IED Flash Frequency     250     Hz       ISET,FB     Istat=10mA     0.15     V       ISE Valtage     0.8     V     V       TC Threshold, Cold     Charger Suspended     52     %idad       NTC Thereshold, Hot     Charger Suspended     52     %idad       NTC Thereshold, Cold     Charger Suspended     3     %idad       NTC Thereshold, Hot     Charger Suspended     3     %idad       NTC Inveshold Kold     Tie NTC to LDD	BATT Ok Threshold	Rising, HYS=0.5 V		3.2		V
Butdown Supply Current At BATT         Idle Mode         30         50         μA           Switching Frequency         VBATT         4.4V         0.8         1.0         1.2         MHz           laut Current Limit         3         A         Maximum Duty Cycle         90         %6           Highside Pmos Rdsan         Isw =500mA         55         mQ           Lowside Nmas Rdson         Isw =500mA         50         mQ           Short Circuit Hiccup Current         4         A           Short Circuit Hiccup Timer         0n Time         25         ms           Dad current threshold into sleep mode         300         mA           FLAG, DM, LEOS         Istat=10mA         0.15         V           IED Flash Frequency         250         Hz         Istat=10mA         0.15         V           ISET, FB         Istat=10mA         0.15         V         Istat=10mA         0.15         V           ISET Valtage         0.8         V         0.8         V         Istat=10mA         0.15         V           IED Flash Frequency         250         Hz         Istat=10mA         0.15         V         V           IET, FB         Valtage         0.8 <t< td=""><td>Output Voltage Range</td><td></td><td>5.0</td><td>5.05</td><td>5.1</td><td>٧</td></t<>	Output Voltage Range		5.0	5.05	5.1	٧
Witching Frequency         VBATT<4.4V         D.8         I.0         1.2         MHz           laut Current Limit         3         A         A         Maximum Duty Cycle         90         %6           Highside Pmos Rdson         Isw =500mA         55         mQ         Integration of the state of	Quiescent Current At BATT	Boost On			100	μA
laut Current Limit 3 A Maximum Duty Cycle 90 % Highside Pmos Rdson Isw =500mA 55 mΩ Lowside Nmos Rdson Isw =500mA 50 mΩ Short Circuit Hiccup Current 4 A Short Circuit Hiccup Timer 0 50 mS Load current threshold into sleep mode 0 30 mA FLAG, DM, LEDS Flag.DM Dutput Low Voltage Istat=10mA 0.15 V LED Flash Frequency 250 Hz ISET,FB F8 Vhold feedback voltage 0.8 V ISET Threshold, Cold Charger Suspended 52 %/dol NTC Threshold, Hot Charger Suspended 13 %/dol NTC Threshold Hot Charger Suspended 13 %/dol NTC Threshold Hot Charger Suspended 13 %/dol NTC Threshold Hot Tie NTC to LODIV NTC Input Leakage 0 5 µA LOBIC INPUT: ENBST, VTERM, BUTT Logic Input Leakage 0 5 µA LOBIC INPUT: ENBST, VTERM, BUTT Logic Input Leakage 0 5 µA	Shutdown Supply Current At BATT	Idle Mode		30	50	μA
laut Current Limit 3 A Maximum Duty Cycle 90 % Highside Pmos Rdson Isw =500mA 55 mΩ Lowside Nmos Rdson Isw =500mA 50 mΩ Short Circuit Hiccup Current 4 A Short Circuit Hiccup Timer 0 50 mS Load current threshold into sleep mode 0 30 mA FLAG, DM, LEDS Flag.DM Dutput Low Voltage Istat=10mA 0.15 V LED Flash Frequency 250 Hz ISET,FB F8 Vhold feedback voltage 0.8 V ISET Threshold, Cold Charger Suspended 52 %/dol NTC Threshold, Hot Charger Suspended 13 %/dol NTC Threshold Hot Charger Suspended 13 %/dol NTC Threshold Hot Charger Suspended 13 %/dol NTC Threshold Hot Tie NTC to LODIV NTC Input Leakage 0 5 µA LOBIC INPUT: ENBST, VTERM, BUTT Logic Input Leakage 0 5 µA LOBIC INPUT: ENBST, VTERM, BUTT Logic Input Leakage 0 5 µA	Switching Frequency	VBATT<4.4V	0.8	1.0	1.2	MHz
Highside Prass Rdsan         Isw =500mA         55         mΩ           Lawside Nmos Rdsan         Isw =500mA         50         mΩ           Short Circuit Hiccup Current         4         A           Bhort Circuit Hiccup Timer         0n Time         25           Off Time         750         ms           Load current threshold into sleep mode         300         mA           FLAG, DM, LEOS	lout Current Limit			3		A
Lowside Nmos RdsonIsw =500mA50mΩShort Circuit Hiccup CurrentOn Time25msShort Circuit Hiccup TimerOn Time750msLoad current threshold into sleep mode30mAFLAG, DM, LEDSFlag_DM Output Low VoltageIstat=10mA0.15VLED Flash Frequency250HzISET,FBStat=10mA0.8VFBVhold feedback voltage0.8VISET,FBStat=10mA0.15VINC Threshold, ColdCharger Suspended52%ldalNTC Threshold, HotCharger Suspended13%ldalNTC Threshold Hysteresis2%ldalVNTC Inreshold Hysteresis1e NTC to LDDIVTNTC Input Leakage05µALOGIC INPUT: ENBST, VTERM, BUTT1.2VLogic Input Ligh1.2VLogic Input Leakage0.4VTHERMAL PROTECTION0.4V	Maximum Duty Cycle			90		%
Short Circuit Hiccup CurrentIn Time25Bhort Circuit Hiccup TimerIn Time750Off Time750msLoad current threshold into sleep mode30mAFLAG, DM, LEDSIstai=10mA0.15VLED Flash Frequency250HzISET,FBStai=10mA0.8VISET,FBVhold feedback voltage0.8VISET Voltage0.8VNTC Threshold, ColdCharger Suspended52%ldolNTC Threshold, HotCharger Suspended13%ldolNTC Threshold Hysteresis2%ldolMICNTC Inseshold Hysteresis12V%ldolNTC Inseshold Hysteresis12VVLOGIC INPUT: ENBST, VTERM, BUTT1.2VLogic Input Leakage0.4VVTHERMAL PROTECTION0.4VVCharging Thermal Regulation threshold85°C	Highside Pmos Rdson	lsw =500mA		55		mΩ
Dn Time         25         ms           Diff Time         750         ms           Load current threshold into sleep mode         30         mA           FLAG, DM, LEDS         30         mA           Flag,DM Output Low Voltage         Istat=10mA         0.15         V           LED Flash Frequency         250         Hz         ISET,FB         Vhold feedback voltage         0.8         V           FB         Vhold feedback voltage         0.8         V         V           ISET, Voltage         0.8         V         V           ISET Voltage         0.8         V         V           ISET Voltage         0.8         V         V           ISET Threshold, Cold         Charger Suspended         52         %ildol           NTC Threshold, Hot         Charger Suspended         13         %ildol           NTE Threshold Hot         Charger Suspended         13         %ildol           NTE Threshold Hot         Charger Suspended         13         %ildol           NTE Threshold Hot         Charger Suspended         13         %ildol           NTE Input Leakage         0         5         µA           LOGIC INPUT: ENBST, VTERM, BUTT         U	Lowside Nmos Rdson	lsw =500mA		50		mΩ
Dn Time         25         ms           Diff Time         750         ms           Load current threshold into sleep mode         30         mA           FLAG, DM, LEDS         30         mA           Flag,DM Output Low Voltage         Istat=10mA         0.15         V           LED Flash Frequency         250         Hz         ISET,FB         Vhold feedback voltage         0.8         V           FB         Vhold feedback voltage         0.8         V         V           ISET, Voltage         0.8         V         V           ISET Voltage         0.8         V         V           ISET Voltage         0.8         V         V           ISET Threshold, Cold         Charger Suspended         52         %ildol           NTC Threshold, Hot         Charger Suspended         13         %ildol           NTE Threshold Hot         Charger Suspended         13         %ildol           NTE Threshold Hot         Charger Suspended         13         %ildol           NTE Threshold Hot         Charger Suspended         13         %ildol           NTE Input Leakage         0         5         µA           LOGIC INPUT: ENBST, VTERM, BUTT         U	Short Circuit Hiccup Current			4		A
Uff lime         75U           Load current threshold into sleep mode         30         mA           FLAG, DM, LEDS          0.15         V           EBg.DM Output Low Voltage         IstAT=10mA         0.15         V           LED Flash Frequency         250         Hz           ISET,FB           0.8         V           ISET Voltage         0.8         V          0.8         V           ISET Voltage         0.8         V           0.8         V           ISET Voltage         0.8         V           0.8         V           ISET Voltage         0.8         V		On Time		25		ms
FLAG, DM, LEDS         Flag, DM Dutput Low Voltage       IstAt=10mA       0.15       V         LED Flash Frequency       250       Hz         ISET, FB       IstAt=10mA       0.8       V         FB       Vhold feedback voltage       0.8       V         ISET Voltage       0.8       V         MTC THERMISTOR MONITOR       0.8       V         NTC Threshold, Cold       Charger Suspended       52       %Idol         NTC Threshold, Hot       Charger Suspended       13       %Idol         NTC Threshold Hysteresis       2       %Idol       NIC Disable Threshold       1         NTC Input Leakage       0       5       µA         LOGIC INPUT: ENBST, VTERM, BUTT       1.2       V         Logic Input Lew       0.4       V         THERMAL PROTECTION       85       °C	Short Circuit Hiccup Timer	Off Time		750		
Flag.DM Dutput Low VoltageIstat=10mAD.15VLED Flash Frequency250HzISET,FBISET,FBFBVhold feedback voltageD.8VISET Voltage0.8VNTC THERMISTOR MONITOR0.8VNTC Threshold, ColdCharger Suspended52%IdalNTC Threshold, HotCharger Suspended13%IdalNTC Threshold Hysteresis2%IdalNTC Disable ThresholdTie NTC to LDDIVVNTC Input Leakage05µALDGIC INPUT: ENBST, VTERM, BUTT1.2VLogic Input High1.2VLogic Input Low0.4VTHERMAL PROTECTION85°C	Load current threshold into sleep mode			30		mA
LED Flash Frequency250HzLED Flash Frequency250HzISET,FBISET Voltage0.8VFBVhold feedback voltage0.8VISET Voltage0.8VNTC ThERMISTOR MONITOR0.8VNTC Threshold, ColdCharger Suspended52%ldolNTC Threshold, HotCharger Suspended13%ldolNTC Threshold Hysteresis2%ldolNTC Threshold Hysteresis2%ldolNTC Disable ThresholdTie NTC to LDOIVVNTC Input Leakage05µALOGIC INPUT: ENBST, VTERM, BUTT1.2VLogic Input High1.2VLogic Input Low0.4VTHERMAL PROTECTION85°C	FLAG, DM, LEDS					
ISET,FB       Vhold feedback voltage       0.8       V         FB       Vhold feedback voltage       0.8       V         ISET Voltage       0.8       V         ISET Voltage       0.8       V         NTC THERMISTOR MONITOR       0.8       V         NTC Threshold, Cold       Charger Suspended       52       %ldol         NTC Threshold, Hot       Charger Suspended       13       %ldol         NTC Threshold Hysteresis       2       %ldol       %ldol         NTC Disable Threshold       Tie NTC to LDDIV       V       V         NTC Input Leakage       0       5       µA         LOGIC INPUT: ENBST, VTERM, BUTT       1.2       V         Logic Input High       1.2       V         Logic Input Low       0.4       V         THERMAL PROTECTION       85       °C	Flag,DM Output Low Voltage	Istat=10mA			0.15	۷
FBVhold feedback voltage0.8VISET Voltage0.8VNTC THERMISTOR MONITOR0.8VNTC Threshold, ColdCharger Suspended52%ldolNTC Threshold, HotCharger Suspended13%ldolNTC Threshold Hysteresis2%ldol%ldolNTC Inseshold Hysteresis12%ldol%ldolNTC InsesholdTie NTC to LDOIV05µALOGIC INPUT: ENBST, VTERM, BUTT1.2VLogic Input High1.2VLogic Input Low0.4VTHERMAL PROTECTION85°C	LED Flash Frequency			250		Hz
ISET Voltage 0.8 V NTC THERMISTOR MONITOR NTC Threshold, Cold Charger Suspended 52 %61dol NTC Threshold, Hot Charger Suspended 13 %61dol NTC Threshold Hysteresis 2 %61dol NTC Threshold Hysteresis 2 %61dol NTC Disable Threshold Tie NTC to LDDIV NTC Input Leakage 0 0 5 µA LOGIC INPUT: ENBST, VTERM, BUTT Logic Input High 1.2 V Logic Input High 0.4 V THERMAL PROTECTION	ISET,FB					
NTC THERMISTOR MONITOR       NTC THERMISTOR MONITOR         NTC Threshold, Cold       Charger Suspended       52       %ldol         NTC Threshold, Hot       Charger Suspended       13       %ldol         NTC Threshold Hysteresis       Charger Suspended       13       %ldol         NTC Threshold Hysteresis       Tie NTC to LDOIV       %ldol         NTC Input Leakage       O       5       µA         LOGIC INPUT: ENBST, VTERM, BUTT       I.2       V         Logic Input Low       0.4       V         THERMAL PROTECTION       85       °C	FB	Vhold feedback voltage		0.8		٧
NTC Threshold, ColdCharger Suspended52%ldolNTC Threshold, HotCharger Suspended13%ldolNTC Threshold Hysteresis2%ldolNTC Disable ThresholdTie NTC to LOOIV%ldolNTC Input Leakage05µALOGIC INPUT: ENBST, VTERM, BUTT1.2VLogic Input Low0.4VTHERMAL PROTECTION85°C	ISET Voltage			0.8		٧
NTC Threshold, HotCharger Suspended13%IdolNTC Threshold Hysteresis2%IdolNTC Disable ThresholdTie NTC to LDDIVNTC Input Leakage05μALOGIC INPUT: ENBST, VTERM, BUTTLogic Input High1.2VLogic Input Low0.4VTHERMAL PROTECTIONCharging Thermal Regulation threshold	NTC THERMISTOR MONITOR					
NTC Threshold Hysteresis2%ldotNTC Disable ThresholdTie NTC to LDOIVNTC Input Leakage05μALOGIC INPUT: ENBST, VTERM, BUTTLogic Input High1.2VLogic Input Low0.4VTHERMAL PROTECTIONCharging Thermal Regulation threshold85°C	NTC Threshold, Cold	Charger Suspended	/LU	52	/N.	%ldo1
NTC Threshold Hysteresis2%ldotNTC Disable ThresholdTie NTC to LDOIVNTC Input Leakage05μALOGIC INPUT: ENBST, VTERM, BUTTLogic Input High1.2VLogic Input Low0.4VTHERMAL PROTECTIONCharging Thermal Regulation threshold85°C	NTC Threshold, Hot	Charger Suspended		13		%ldo1\
NTC Input Leakage05μALOGIC INPUT: ENBST, VTERM, BUTTLogic Input High1.2VLogic Input Low0.4VTHERMAL PROTECTION85°C	NTC Threshold Hysteresis			2		%ldo1
LOGIC INPUT: ENBST, VTERM, BUTT       Logic Input High       1.2       V       Logic Input Low       0.4       V       THERMAL PROTECTION       Charging Thermal Regulation threshold	NTC Disable Threshold	Tie NTC to LDOIV				
LOGIC INPUT: ENBST, VTERM, BUTT         Logic Input High       1.2       V         Logic Input Low       0.4       V         THERMAL PROTECTION         Charging Thermal Regulation threshold       85       °C	NTC Input Leakage			0	5	μA
Logic Input Low D.4 V THERMAL PROTECTION Charging Thermal Regulation threshold 85 °C	LOGIC INPUT: ENBST, VTERM, BUTT					
Logic Input Low D.4 V THERMAL PROTECTION Charging Thermal Regulation threshold 85 °C	Logic Input High		1.2			٧
Charging Thermal Regulation threshold 85 °C	Logic Input Low			0.4	٧	
	THERMAL PROTECTION	•	I			
	Charging Thermal Regulation threshold			85		<u>]</u>
	Thermal Shutdown	Rising, Hys=30°C		160		<u>]</u>



## PIN DESCRIPTION

PIN #	NAME	DESCRIPTION		
1.28	GP	Power Ground pin		
2.3.27	WZ	Switching Pin. Connect with an inductor between this pin and BATT.		
4,5.6	OUT	USB 5V output during boost and charging input pin during charging. This is a power pin, bypass with 2x22uF MLCC caps to the pin and PGND as close as possible.		
7	FB	Input Holding Voltage (V <sub>HOLD</sub> ) feedback pin. A resistor divider from OUT to AGND thru this pin, sets the input voltage at which level the chip tries to keep from further dropping by reducing charge current.		
8	INGT	A gate driver pin to control the external NMOS power path.		
9	CN	Charging pump Cap's negative terminal		
10	CP	Charging pump Cap's positive terminal		
11	INSNS	Input sense pin. Internally clamped to 6.4V. Connect a resistor from INSNS to IN, and 1uF cap to Analog ground.		
12	IN	Input DVP sense pins. Bypass with a 10uF capacitor from this pin to ground.		
13	BUTT	Push Button pin. When the button is kept pressing shorter than 1 second, the LEDs will be turned on for five seconds. When keep pressing the button longer than 1 second, the chip will toggle between boost ON and OFF. When boost is ON, the LEDs will be on for 25S.		
14	VTERM	Battery termination voltage select. VTERM=D, Battery CV voltage=4.2V, VTERM=IdoIV, Battery CV voltage=4.35V. Internally pulled down to AGND		
15	ENBST	Manual Force Boost operation pin. When ENBST=1, force Boost Operation. When ENBST=0, force Boost Off.		
16	FLAG	Flag pin is used to indicate the boost is turn on or off. Connect a pull-up resistor between FLAG and VBATT. The FLAG is low when boost is ON, and high when boost is off.		
17	LED1	Fuel gauge LED1 connection pin		
18	LED2	Fuel gauge LED2 connection pin		
19	LED3	Fuel gauge LED3 connection pin		
20	LED4	Fuel gauge LED4 connection pin		
21	LDD1V	Fuel Gauge IV LDD output pin. Bypass with a 22pF capacitor to Analog ground. Resistor chain from LDDIV, thru LED1-4 to AGND, will set the battery fuel gauge level.		
22	NTC	Battery Temperature Monitoring input pin. It sets the valid temperature operating range for both battery charging and discharging.		
23	ISET	Buck Charging current setting pin. Connect a resistor between this pin and analog ground to set the current level.		
24	RCOMP	Battery serial resistance compensation pin. Connect a resistor and a cap in parallel between this pin and analog ground to set the amount of serial resistance to be compensated. When short to GA, compensation is disabled.		