DIO5508
1A Lithium Ion Battery Charger IC

Features

- **Programmable Charge Current Up to 1A**
- **Over Voltage Lockout Protection**
- **Under Voltage Lockout Protection**
- **Reverse current protection between BAT and GND pins**
- **Automatic Recharge Threshold 4.05V (Typ.)**
- **Charge Status Output Pin**
- **2.9V Trickle Charge Threshold**
- **Battery Temperature Monitoring**
- **Chip Enable Input**
- **Soft-Start Limits Inrush Current**
- **Available in EP-SOIC8 and EP-MSOP8 packages**
- **Pb-free, rohs-compliant and Halogen-free**

Applications

- **Wireless phone**
- **MP3/MP4 Player**
- **Bluetooth device**

Descriptions

The DIO5508 is a complete constant-current / constant voltage linear charger for single cell Lithium-Ion batteries. No external sense resistor is needed, and no blocking diode is required due to the internal MOSFET architecture. The charge voltage is fixed at 4.2V, and the charge current can be programmed externally with a single resistor.

The DIO5508 automatically terminates the charge cycle when the charge current drops to 1/10 the programmed value after the final float voltage is reached.

When the input supply (wall adapter or USB supply) is removed, the DIO5508 automatically enters a low current state, dropping the battery drain current to less than 0.5µA. The DIO5508 can be put into shutdown mode, reducing supply current to 40µA (Typ.).

The DIO5508 is available in EP-SOIC8 and EP-MSOP8 packages.
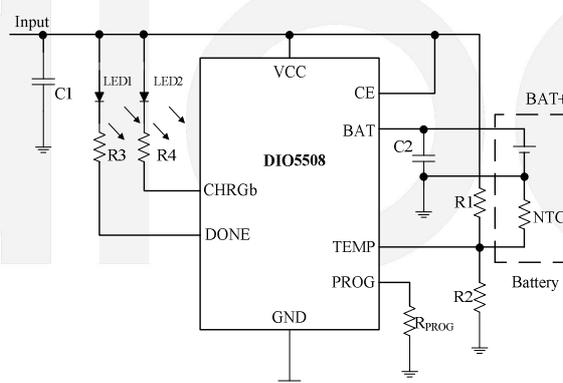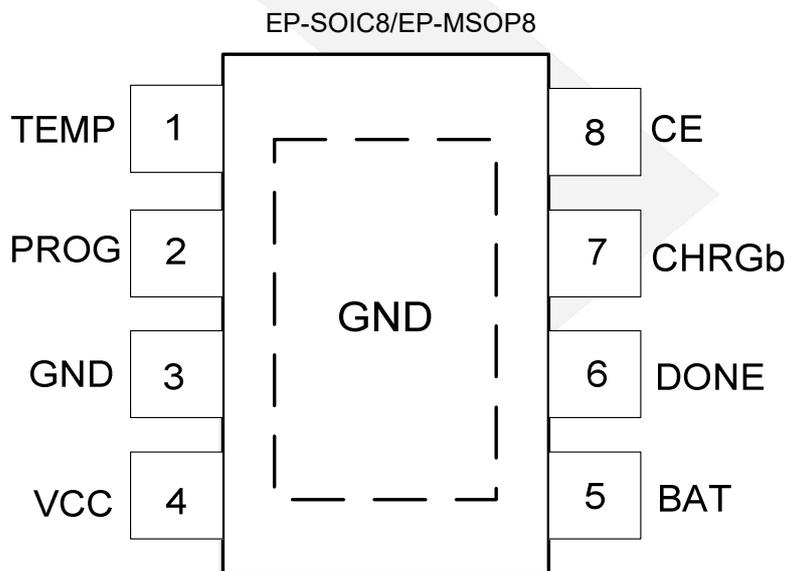
Typical Application Circuit

Figure 1 Typical Application Circuit

Ordering Information

Order Part Number	Top Marking		T$_A$	Package	
DIO5508XS8	DIO5508	Green	-40 to 85°C	EP-SOIC8	Tape & Reel, 2500
DIO5508XM8	DIO5508	Green	-40 to 85°C	EP-MSOP8	Tape & Reel, 3000

Pin Assignment

EP-SOIC8/EP-MSOP8

TEMP	1			8	CE
PROG	2			7	CHRGb
GND	3	GND		6	DONE
VCC	4			5	BAT

Figure 2 Pin Assignment

Pin Descriptions

Pin No.	Name	Function Description
1	TEMP	**Temperature sense Input.** Connecting TEMP pin to NTC thermistor's output in Lithium ion battery pack. If TEMP pin's voltage is below 45% or above 80% of supply voltage V$_{IN}$, this means that battery's temperature is too high or too low, charging is suspended. If TEMP's voltage level is between 45% and 80% of supply voltage, charging will resume. The temperature sense function can be disabled by grounding the TEMP pin.
2	PROG	**Constant Charge Current Setting and Charge Current Monitor Pin.** Charge current setting, charge current monitor and shutdown pin. The charging current is given by I$_{BAT}$= (1/R$_{PROG}$)*1000. The chip will be shutdown when PROG pin floating.

DIO5508

| 3	GND	**Ground Terminal.**
4	VCC	**Positive Input Supply Voltage.**
5	BAT	**Battery Connection Pin.** BAT pin provides charge current to the battery and provides regulation voltage of 4.2V.
6	DONE	**Charge termination Status Output.** Open drain output. In charge termination status, DONE is pulled low by an internal switch; Otherwise DONE pin is in high impedance state.
7	CHRGb	**Charge Status Output.** Open drain Output. When the battery is being charged, the CHRGb pin is pulled low by an internal switch; otherwise CHRGb pin is in high impedance state.
8	CE	**Chip Enable Input.** A high input will put the device in the normal operating mode. Pulling the CE pin to low level will put the DIO5508 into disable mode. The CE pin can be driven by TTL or CMOS logic level.
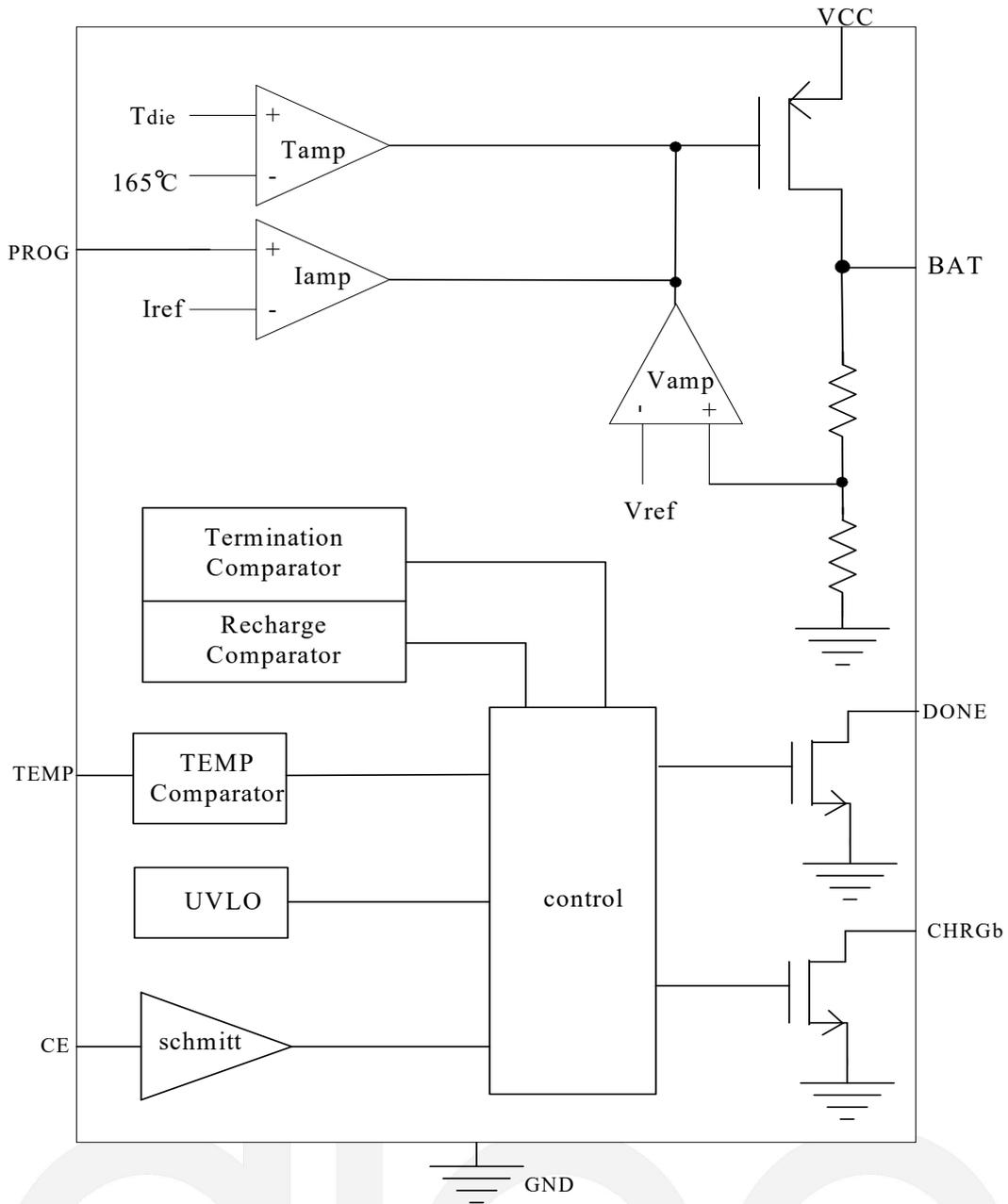
Block Diagram

Figure 3 Block Diagram

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Rating" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maxim rating conditions for extended periods may affect device reliability.

Parameter		Rating	Unit
Supply Voltage		-0.3~10	V
PROG Voltage		-0.3~V_{CC}	V
BAT Voltage		-0.3~10	V
CHRGb, DONE Voltage		-0.3~V_{CC}	V
BAT Pin Current		1000	mA
Thermal Resistance	$R_{\theta JA}$, EP-MSOP8	78	°C/W
	$R_{\theta JB}$, EP-SOIC8	50	
Power Dissipation		0.6	W
Junction Temperature		150	°C
Operation Temperature		-45~85	°C
Storage Temperature		-65~125	°C
Lead Temperature (Soldering 10s)		260	°C

Recommend Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended Operating conditions are specified to ensure optimal performance to the datasheet specifications. DIOO does not Recommend exceeding them or designing to Absolute Maximum Ratings.

Parameter	Rating	Unit
Input Supply Voltage	4.5 to 5.5	V
Operating Temperature Range	-40 to 85	°C

Electrical Characteristics

V_{CC}=5V, T_A = -40 to 85°C, Typical values are measured at T_A = 25°C, unless otherwise specified.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_{SOLYCHRG}$	Charge Mode Supply Current	R_{PROG}=1kΩ		250	2000	µA
		R_{PROG}=10kΩ		200	2000	µA
$I_{BATCHRG}$	Charge Mode Battery Current	R_{PROG}=1kΩ	900	1000	1100	mA
		R_{PROG}=2kΩ	450	500	550	mA
		R_{PROG}=10kΩ	90	100	110	mA
$V_{PROGCHRG}$	PROG Pin Voltage	R_{PROG}=1kΩ	0.93	1.00	1.07	V
		R_{PROG}=10kΩ	0.93	1.00	1.07	V
$I_{SPLYSTBY}$	Standby Mode Supply Current	Charge Terminated		136	500	µA
$I_{BATSTBY}$	Standby Mode Battery Current	Charge Terminated	0	-2.5	-6	µA
$I_{SPLYASD}$	Shutdown Mode Supply Current	V_{CC}<V_{BAT}	20	42	90	µA
I_{BATASD}	Shutdown Mode BAT Pin Current	V_{CC}<V_{BAT}		±0.05	±1	µA
$I_{SPLYUVLO}$	UVLO Mode Supply Current	V_{CC}<V_{UV}	20	42	90	µA
$I_{BATUVLO}$	UVLO Mode BAT Pin Current	V_{CC}<V_{UV}		±0.05	±1	µA
$I_{SPLYOVLO}$	OVLO Mode Supply Current	V_{CC}>V_{OV}		40		µA
$I_{BATOVLO}$	OVLO Mode BAT Pin Current	V_{CC}>V_{OV}		±0.05	±1	µA
$I_{SPLYSHUT}$	Shutdown Mode Supply Current	R_{PROG} not Connected	20	42	70	µA
$I_{BATSHUT}$	Shutdown Mode BAT Pin Current	R_{PROG} not Connected		±0.05	±1	µA
I_{BATMSD}	Manual Shutdown BAT Pin Current	V_{PROG}=1.3V		±0.05	±1	µA
$I_{BATSLEEP}$	Sleep Mode BAT Pin Current	V_{CC}=0V		±0.05	±1	µA
$I_{Charge\_terminated}$	1000mA/100mA charger terminated	R_{PROG}=10kΩ		100		µA
$V_{Charge\_terminated}$		R_{PROG}=1kΩ		0.1		V
V_{FLOAT}	Float Voltage		4.158	4.2	4.242	V
I_{TRIKL}	Trickle Charge Current	R_{PROG}=1kΩ		100		mA
V_{TRIKL}	Trickle Charge Voltage Threshold	R_{PROG}=1kΩ	2.8	2.9	3.0	V
$V_{TRIKL, HYS}$	Trickle Charge Voltage Hysteresis	R_{PROG}=1kΩ		100		mV
V_{UVLO}	UVLO Threshold	From V_{CC} Low to High	3.6	3.8	4.0	V

Electrical Characteristics (continued)

V_{CC}=5V, T_A= 25°C (unless otherwise noted)

| Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{UVLO, HYS}$	UVLO Hysteresis			250		mV
V_{OVLO}	OVLO Threshold	From V_{CC} Low to High		6		V
V_{OVP_Hys}	OVLO Hysteresis			180		mV
V_{MSD}	Manual Shutdown Threshold Voltage	PROG Pin Rising PROG Pin Falling		1.2 1.0	1.3	V V
V_{ASD}	V_{CC}-V_{BAT} Lockout Threshold Voltage	V_{CC} from low to High V_{CC} from High to Low	5	120 50		mV mV
$\Delta_{VRECHRG}$	Auto Recharge Battery Voltage		100	150	200	mV
V_{CHRGb}	CHRGb Pin Output Low Voltage	I_{CHRGb}=5mA		0.3	0.6	V
V_{DONE}	DONE Pin Output Low Voltage	I_{DONE}=5mA		0.3	0.6	V
T_{LIM}	Junction Temperature In CT Mode			165		°C
R_{ON}	Power FET ON Resistance			250		mΩ
T_{SS}	Soft-Start Time	R_{PROG}=2kΩ		50		μs
T_{RECHRG}	Recharge Comparator Filter Time			2		ms
T_{TERM}	Termination Comparator Filter Time			1		ms
I_{PROG}	PORG Pin Pull-up Current		0.35	0.5	0.75	μA
V_{TEMP_EN}	Battery Temperature Detect Function Threshold Volatge	TEMP Pin Rising TEMP Pin Falling	0.18	0.29 0.2	0.32	V V
V_{TEMP_H}	TEMP Pin High Threshold Voltage	TEMP Pin Rising TEMP Pin Falling	72	80 73.5	82	%V_{CC} %V_{CC}
V_{TEMP_L}	TEMP Pin Low Threshold Voltage	TEMP Pin Rising TEMP Pin Falling	43	48.5 45	50	%V_{CC} %V_{CC}
V_{CEL}	Logic Input Low	CE voltage falling, Chip disabled			0.5	V
V_{CEH}	Logic Input High	CE voltage rising, Chip enabled	1.0			V
I_{CEL}	CE Pin Current	CE=GND, V_{CC}=6V	-1			μA
I_{CEH}		CE=V_{CC}=6V			1	

Specifications subject to change without notice.

Typical Performance Characteristics
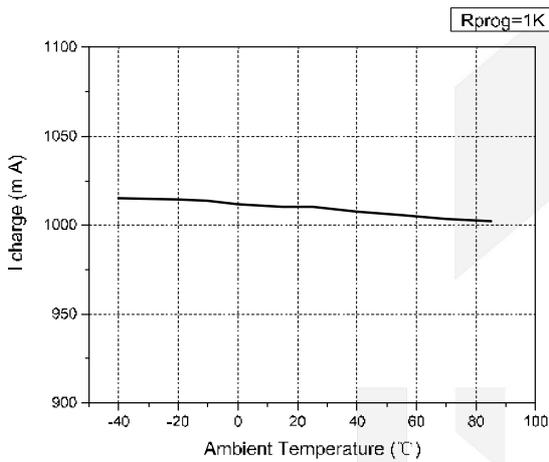
V_{CC}=5V, T_A= 25°C (unless otherwise noted)
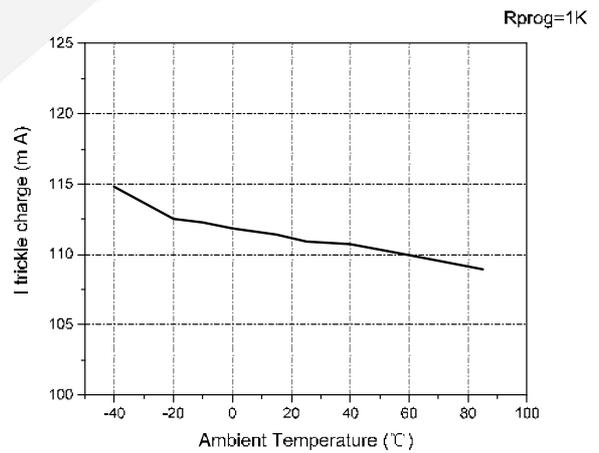
PROG Pin Voltage vs. Ambient Temperature
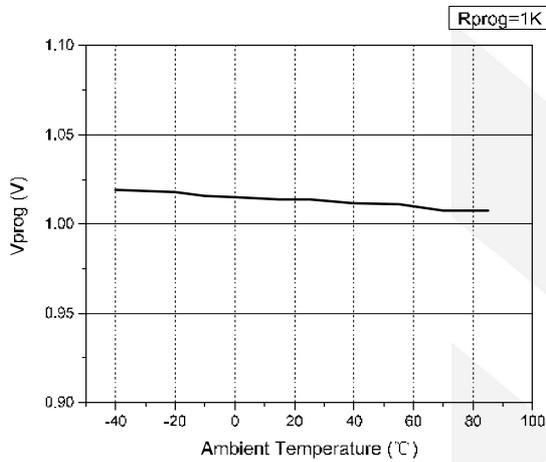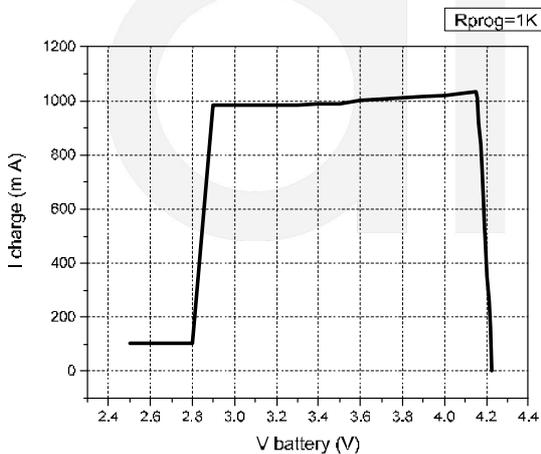

Float Voltage vs. Ambient Temperature
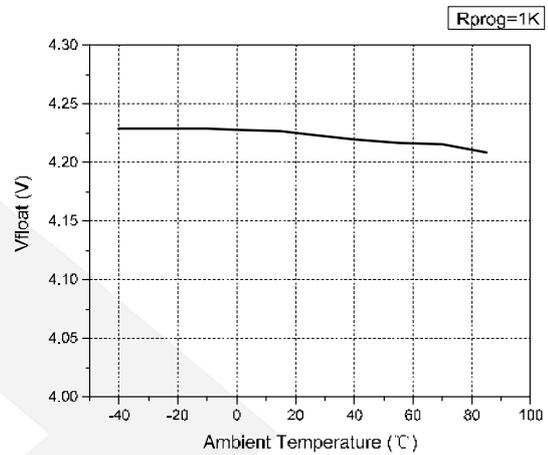
Icharge vs. Ambient Temperature

I trickle charge vs. Ambient Temperature
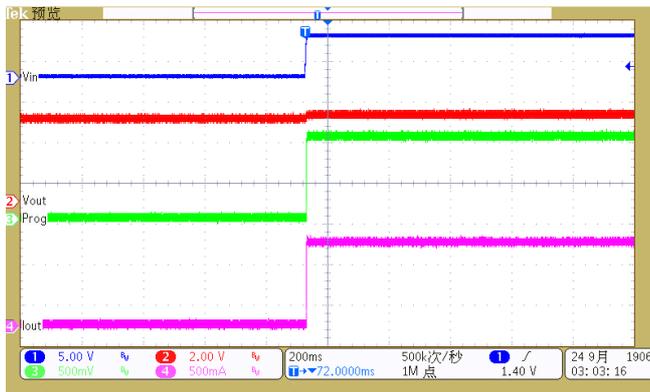

Charge Current vs. Battery Voltage

DIO5508

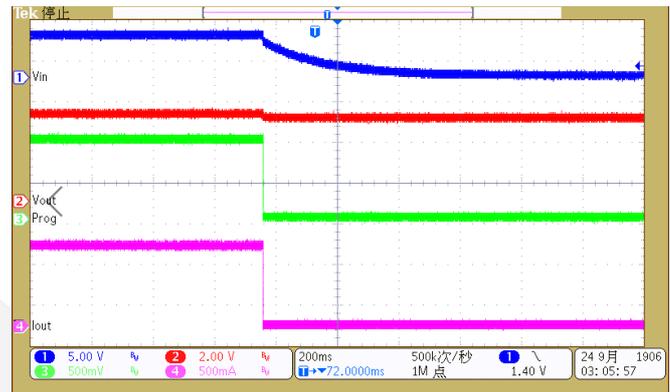## V_{CC} Start-up

(V_{CC}=5V, R_{PROG}=1kΩ,C_{BAT}=10µF,BAT connect to battery)

V_{CC} Shut-down

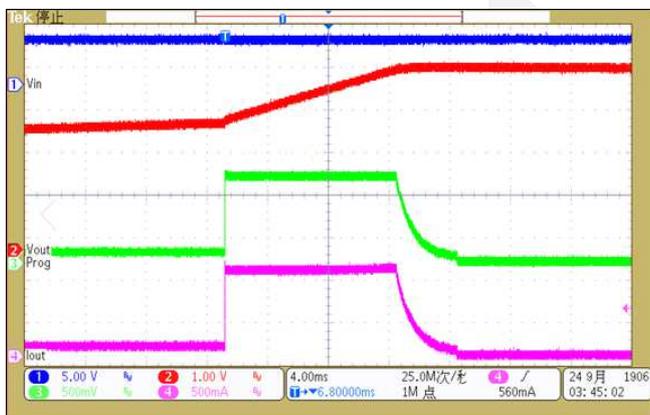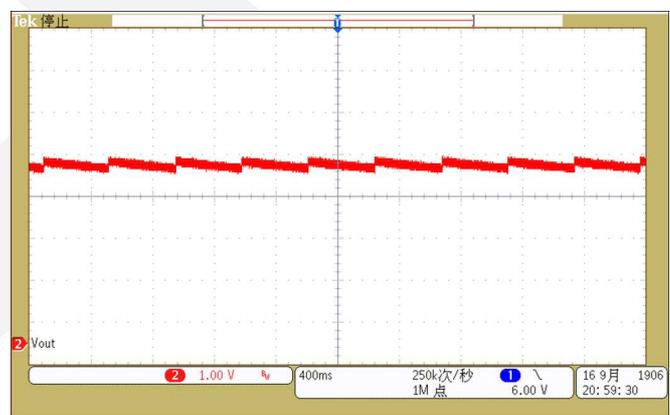**(V_{CC}=5V, R_{PROG}=1kΩ,C_{BAT}=10µF,BAT connect to battery)**

Charging Curve

(V_{CC}=5V, R_{PROG}=1kΩ,C_{BAT}=10µF)

V_{BAT}

(V_{CC}=5V, R_{PROG}=1kΩ,C_{BAT}=10µF)

Operation information

The DIO5508 is a single cell Lithium-Ion battery charger using a constant-current / constant-voltage algorithm. It can deliver up to 100mA of charge current with a final float voltage accuracy of ±1%. The DIO5508 includes an internal P-channel power MOSFET and thermal regulation circuitry. No blocking diode or external current sense resistor is required; thus, the basic charger circuit requires only two external components. Furthermore, the DIO5508 is capable of operating from a USB power source.

Normal charge cycle

A charge cycle begins when the voltage at the VCC pin rises above the UVLO threshold level and a 1% program resistor is connected from the PROG pin to ground or when a battery is connected to the charger output. If the BAT pin is less than 2.9V, the charger enters trickle charge mode. In this mode, the DIO5508 supplies approximately 1/10 the programmed charge current to bring the battery voltage up to a safe level for full current charging.

When the BAT pin voltage rises above 2.9V, the charger enters constant-current mode, where the programmed charge current is supplied to the battery. When the BAT pin approaches the final float voltage, the DIO5508 enters constant-voltage mode and the charge current begins to decrease. The charge cycle ends when the PROG voltage is less than 100mV.

Chip Enable/Disable

The DIO5508 can be disabled by pulling the CE pin to less than 0.5V. For normal operation, pull the CE pin above 1.0V. Applying a voltage between 0.5V to 1.0V to this pin may cause larger operating current, and the DIO5508 may be in uncertain state. When the chip is disabled, the internal linear regulator and the power MOSFET are turned off.

Programming charge current

The charge current is programmed using a single resistor from the PROG pin to ground. The battery charge current of constant current mode is 1000 times the current out of the PROG pin. The program resistor and the charge current of constant current are calculated using the following equations:

$$I_{CHRG} = \left(\frac{1V}{R_{PROG}} \right) \times 1000$$

Charge termination

A charge cycle is terminated when the charge current falls to 1/10 of the programmed value after the final float voltage is reached. This condition is detected by using an internal, filtered comparator to monitor the PROG pin. When the PROG pin voltage falls below 100mV for longer than T_{TERM} (typically 1ms), charging is terminated. The charge current is latched off and the DIO5508 enters standby mode, where the input supply current drops to 136μA. (Note: CC/10 termination is disabled in trickle charging mode and thermal limiting modes).

When charging, transient loads on the BAT pin can cause the PROG pin to fall below 100mV for short periods of time before the DC charge current has dropped to 1/10 of the programmed value. The 1ms filter time (T_{TERM}) on the termination comparator ensures that transient loads of this nature do not result in premature charge cycle termination. Once the average charge current drops below 1/10 of the programmed value, the DIO5508 terminates the charge cycle and ceases to provide any current through the BAT pin, the chip will be put into standby mode. In this state, all loads on the BAT pin must be supplied by the battery.
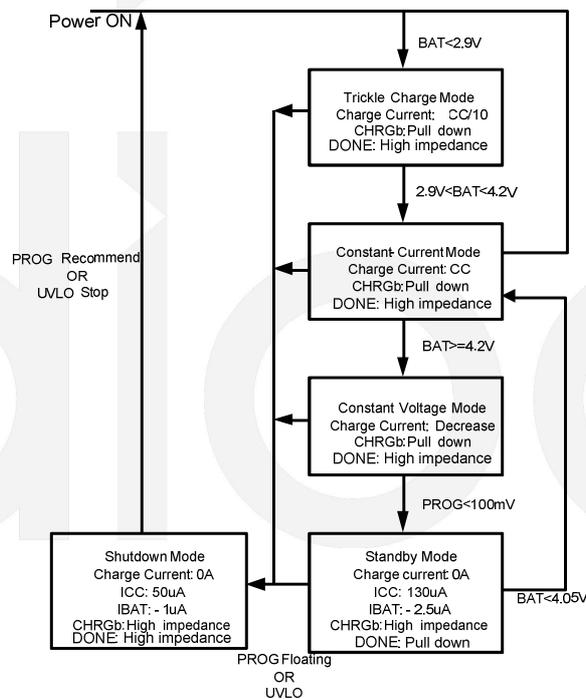
Figure 4. State Diagram of a Typical Charge Cycle

The DIO5508 constantly monitors the BAT pin voltage in standby mode. If this voltage drops below the 4.05V recharge threshold (V_{RECHRG}), another charge cycle begins and current is once again supplied to the battery. The state diagram of a typical charge cycle is as Figure 4.

Charge status indicator

DIO5508 has two open-drain status indicator output CHRGb and DONE. CHRGb is pull-down when the DIO5508 in a charge cycle. In other status CHRGb is in high impedance. CHRGb and DONE are all in high impedance. CHRGb and DONE are all in high impedance when the battery out of the normal temperature.

Represent in failure state, when TEMP pin in typical connecting, and the charger with no battery: red LED and green LED all don't light. The battery temperature sense function is disabled by connecting TEMP pin to GND. If battery is not connected to charger and the BAT pin connects a 10μF capacitor, the frequency of CHRGb flicker about 1-4s.

Charger state	Red GHRGb	Green DONE
Charging	light	Dark
Battery in full state	dark	light
UVLO, Battery temperature is outside TEMP range, battery is note connected (Use TEMP)	dark	dark
BAT pin is connected to 10μF and no battery mode (TEMP=GND)	Green LED bright Red LED flicker and the frequency is 1~4s	

Thermal Limiting

An internal thermal feedback loop reduces the programmed charge current if the die temperature attempts to rise above a preset value of approximately 165°C. This feature protects the DIO5508 from excessive temperature and allows the user to push the limits of the power handling capability of a given circuit board without risk of damaging the DIO5508. The charge current can be set according to typical (not worst-case) ambient temperature with the assurance that the charger will automatically reduce the current in worst-case conditions.

Battery Temperature Sensing

To prevent the damage caused by the very high or very low temperature done to the battery pack, the DIO5508 continuously senses the battery pack temperature by measuring the voltage at TEMP pin determined by the voltage divider circuit and the battery's internal NTC thermistor.

The DIO5508 compares the voltage at TEMP pin (V_{TEMP}) against its internal V_{LOW} and V_{HIGH} thresholds to determine if charging is allowed. In DIO5508, V_{LOW} is fixed at 45%×V_{CC}, while V_{HIGH} is fixed at 80%×V_{CC}. If $V_{TEMP}<V_{LOW}$ or $V_{TEMP}>V_{HIGH}$, it indicates that the battery temperature is too high or too low and the charge cycle is suspended. When the V_{TEMP} is between V_{LOW} and V_{HIGH}, charging cycle resumes. The battery temperature sensing function can be disabled by connecting the TEMP pin to GND.

Selecting R1 and R2

The values of R1 and R2 in the application circuit (Figure1) can be determined according to the assumed temperature monitor range and thermistor's values. The Follows is an example: Assume temperature monitor range is $T_L \sim T_H$, ($T_L < T_H$); the thermistor in battery has negative temperature coefficient (NTC), R_{TL} is

thermistor's resistance at T_L，R_{TH} is the resistance at T_H，so $R_{TL} > R_{TH}$，then

At temperature TL, the voltage at TEMP pin is:

$$V_{TEMPL} = \frac{R_2 // R_{TL}}{R_1 + R_2 // R_{TL}} \times V_{CC}$$

At temperature TH, the voltage at TEMP pin is:

$$V_{TEMPH} = \frac{R_2 // R_{TH}}{R_1 + R_2 // R_{TH}} \times V_{CC}$$

Because $\quad V_{TEMPL} = V_{HIGH} = K_2 \times V_{CC} (K_2 = 0.8)$

$\quad\quad\quad V_{TEMPH} = V_{LOW} = K_1 \times V_{CC} (K_1 = 0.45)$

Then we can have:

$$R_1 = \frac{R_{TL} \times R_{TH}(K_2 - K_1)}{(R_{TL} - R_{TH})K_1 \times K_2}$$

$$R_2 = \frac{R_{TL} \times R_{TH}(K_2 - K_1)}{R_{TL}(K_1 - K_1 \times K_2) - R_{TH}(K_2 - K_1 \times K_2)}$$

Likewise, for positive temperature coefficient thermistor in battery, we have $R_{TH} > R_{TL}$ and we can calculate:

$$R_1 = \frac{R_{TH} \times R_{TL}(K_2 - K_1)}{(R_{TH} - R_{TL})K_1 \times K_2}$$

$$R_2 = \frac{R_{TH} \times R_{TL}(K_2 - K_1)}{R_{TH}(K_1 - K_1 \times K_2) - R_{TL}(K_2 - K_1 \times K_2)}$$

We can conclude that temperature monitor range is independent of power supply voltage V_{CC} and it only depends on R1, R2, R_{TL} and R_{TH}: The values of R_{TH} and R_{TL} can be found in related battery handbook or deduced from testing data. In actual application, if only one terminal temperature is concerned (normally protecting overheating), there is no end to use R2 but R1. It becomes very simple to calculate R1 in this case.

Undervoltage Lockout (UVLO)
An internal undervoltage lockout circuit monitors the input voltage and keeps the charger in shutdown mode until V_{CC} rises above the undervoltage lockout threshold. The UVLO circuit has a built-in hysteresis of 250mV. Furthermore, to protect against reverse current in the power MOSFET, the UVLO circuit keeps the charger in shutdown mode if V_{CC} falls to within 50mV of the battery voltage. If the UVLO comparator is tripped, the charger will not come out of shutdown mode until V_{CC} rises 120mV above the battery voltage.

Overvoltage Lockout (OVLO)
An internal overvoltage lockout circuit monitors the input voltage and keeps the charger in shutdown mode until V_{CC} rises above the overvoltage lockout threshold. The OVLO circuit has a built-in hysteresis of 180mV. Furthermore, to protect against reverse current in the power MOSFET, the OVLO circuit keeps the charger in shutdown mode if V_{CC} falls to within 50mV of the battery voltage. If the OVLO comparator is tripped, the charger will not come out of shutdown mode until V_{CC} rises 120mV above the battery voltage.

Manual Shutdown

At any point in the charge cycle, the DIO5508 can be put into shutdown mode by removing R_{PROG} thus floating the PROG pin. This reduces the battery drain current to less than 1µA and the supply current to less than 50µA. A new charge cycle can be initiated by reconnecting the program resistor.

In manual shutdown, The CHRGb pin and the DONE pin are in a high impedance state if the DIO5508 is in manual shutdown mode or in the undervoltage lockout mode: either VCC is within 120mV of the BAT pin voltage or insufficient voltage is applied to the VCC pin.
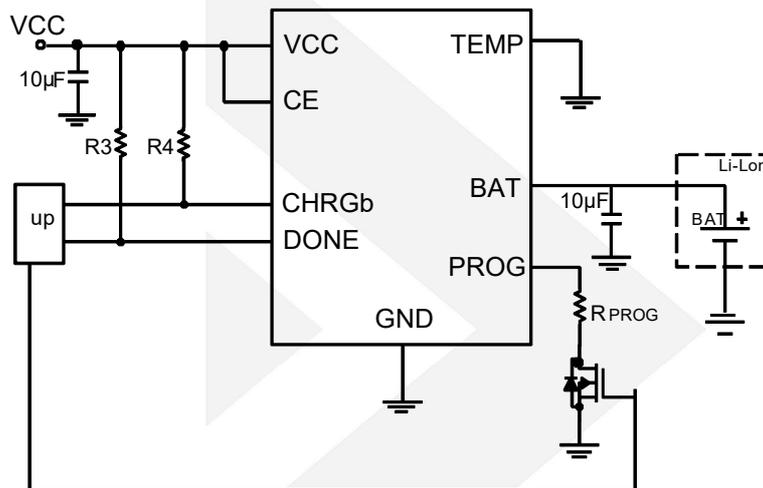
Figure 5. Manual Shutdown Mode Application Circuit

Automatic recharge

Once the charge cycle is terminated, the DIO5508 continuously monitors the voltage on the BAT pin using a comparator with a 2ms filter time (T_{RECHRG}). A charge cycle restarts when the battery voltage falls below 4.05V (Typ.) (which corresponds to approximately 80% to 90% battery capacity). This ensures that the battery is kept at or near a fully charged condition and eliminates the need for periodic charge cycle initiations. CHRGb output enters a pull-down state during recharge cycles.

Application Information

Stability considerations

The constant-voltage mode feedback loop is stable without an output capacitor provided a battery is connected to the charger output. With no battery present, an output capacitor is recommended to reduce ripple voltage. When using high value, low ESR ceramic capacitors, it is recommended to add a 1Ω resistor in series with the capacitor. No series resistor is needed if tantalum capacitors are used.

In constant-current mode, the PROG pin is in the feedback loop, not the battery. The constant-current mode stability is affected by the impedance at the PROG pin. With no additional capacitance on the PROG pin, the charger is stable with program resistor values as high as 50KΩ. However, additional capacitance on this node reduces the maximum allowed program resistor thus it should be avoided.

Thermal Limit

An internal thermal feedback loop reduces the programmed charge current if the die temperature attempts to rise above a preset value of approximately 165°C. This feature protects the DIO5508 from excessive temperature and allows the user to push the limits of the power handling capability of a given circuit board without risk of

damaging the DIO5508. The charge current can be set according to typical (not worst-case) ambient temperature with the assurance that the charger will automatically reduce the current in worst-case conditions.

Power dissipation

The conditions that cause the DIO5508 to reduce charge current through thermal feed-back can be approximated by considering the power dissipated in the IC. Nearly all of this power dissipation is generated by the internal MOSFET.   This is calculated to be approximately:

$$P_D = (V_{CC} - V_{BAT}) \times I_{BAT}$$

It is important to remember that DIO5508 applications do not be designed for worst-case thermal conditions since the IC will automatically reduce power dissipation when the junction temperature reaches approximately 165°C (Constant temperature mode).

VCC bypass capacitor

Many types of capacitors can be used for input bypass, however, caution must be exercised when using multilayer ceramic capacitors. Because of the self-resonant and high Q characteristics of some types of ceramic capacitors, a 10μF ceramic capacitor is recommended for this bypass capacitor. Due to a high voltage transient will be generated under some start-up conditions, such as connecting the charger input to a live power source.

Charge current soft-start

The DIO5508 includes a soft-start circuit to minimize the inrush current at the start of a charge cycle. When a charge cycle is initiated, the charge current ramps from zero to the full-scale current over a period of approximately 100μs. This has the effect of minimizing the transient current load on the power supply during start-up.

Physical Dimensions: EP-SOIC8

INDEX

HEAT SLUG

[BTM]

⊕ 0.25Ⓜ

◠ 0.10

R1 R

(L1)

BASE METAL
WITH PLATING
SECTION B-B
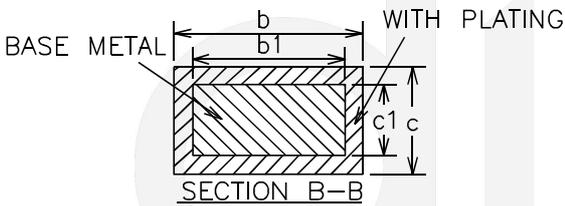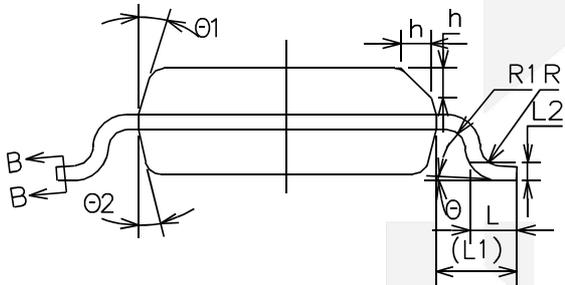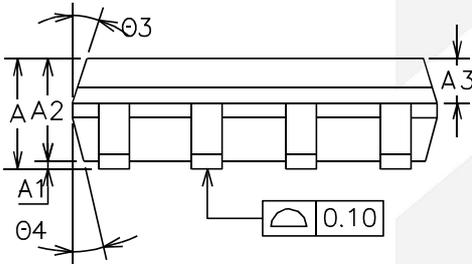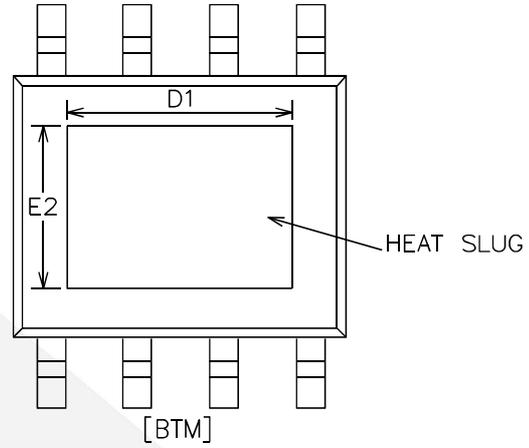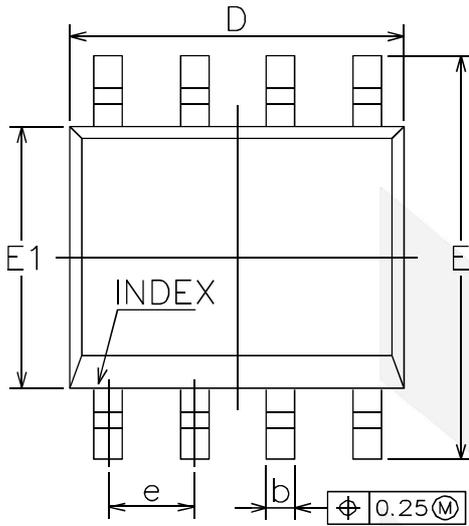
COMMON DIMENSIONS (MM)		
(Units of Measure = Mill meter)		
SYMBOL	MIN.	NOM.	MAX.
A	1.35	1.55	1.70
A1	0	0.10	0.15
A2	1.25	1.40	1.65
A3	0.50	0.60	0.70
b	0.38		0.51
b1	0.37	0.42	0.47
c	0.17		0.25
c1	0.17	0.20	0.23
D	4.80	4.90	5.00
D1	2.09	2.29	2.49
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
E2	2.09	2.29	2.49
e	1.17	1.27	1.37
L	0.45	0.60	0.80
L1	1.04 REF		
L2	0.25 BSC		
R	0.07		
R1	0.07		
h	0.30	0.40	0.50
θ	0°		8°
θ1	15°	17°	19°
θ2	11°	13°	15°
θ3	15°	17°	19°
θ4	11°	13°	15°

Physical Dimensions: EP-MSOP8
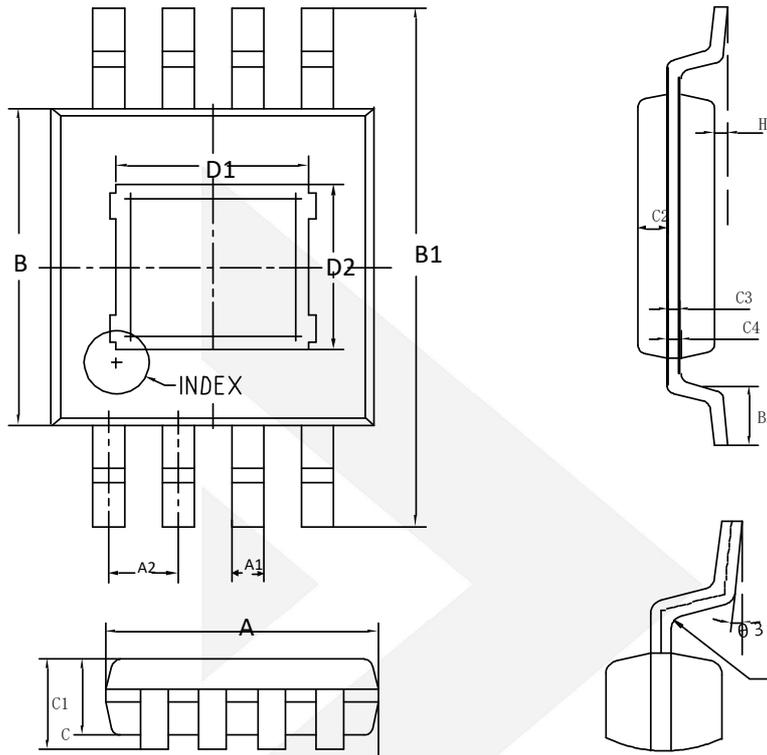
COMMON DIMENSIONS (MM)							
(Units of Measure = Mill meter)							
SYMBOL	MIN.	NOM.	MAX.	SYMBOL	MIN.	NOM.	MAX.
A	2.90	-	3.10	C3	0.152		
A1	0.28	-	0.35	C4	0.15	-	0.23
A2	0.65 TYP			H	0.00	-	0.09
A3	0.375 TYP			θ3	0°~6°		
B	2.90	-	3.10	R	0.15 TYP		
B1	4.70	-	5.10	R1	0.15 TYP		
B2	0.45	-	0.75	D2	1.45	-	1.65
C	0.75	-	0.95	-	-	-	-
C1	-	-	1.10	-			
C2	0.328 TYP			-	-	-	-
D1	1.70	-	1.90	-	-	-	-

CONTACT US

Dioo is a professional design and sales corporation for high-quality and performance analog semiconductors. The company focuses on industry markets, such as, cell phone, handheld products, laptop, and medical equipment and so on. Dioo's product families include analog signal processing and amplifying, LED drivers and charger IC. Go to http://www.dioo.com for a complete list of Dioo product families.

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