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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT CONSTANT VOLTAGE AND CONSTANT CURRENT CONTROLLER FOR BATTERY CHARGERS AND ADAPTORS

TYPE **BD6550G**

FEATURE

- Constant current and constant voltage control
- High accuracy reference voltage: 1.21V±1%
- An accuracy for current-detecting voltage: ±2%

○ ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

PARAMETER	Symbol	Limit	Unit
Power Supply Voltage	VMAX	-0.3 ～ 14	V
ICT Pin Maximum Voltage	VICTMAX	-0.3 ～ VCC	V
Power Dissipation	Pd	675 *1	mW
Operating Temperature Range	Topr	0 ～ +85	℃
Storage Temperature Range	Tstg	-55 ～ +150	℃

*1 Pd derated at 5.4mW/℃ for temperature above Ta=25℃,
mounted on 70mm×70mm×1.6mm glass-epoxy PCB.

○ OPERATING CONDITIONS (Ta=0～+85℃)

PARAMETER	Symbol	Limit	Unit
Power Supply Voltage	VCC	2.5～12	V

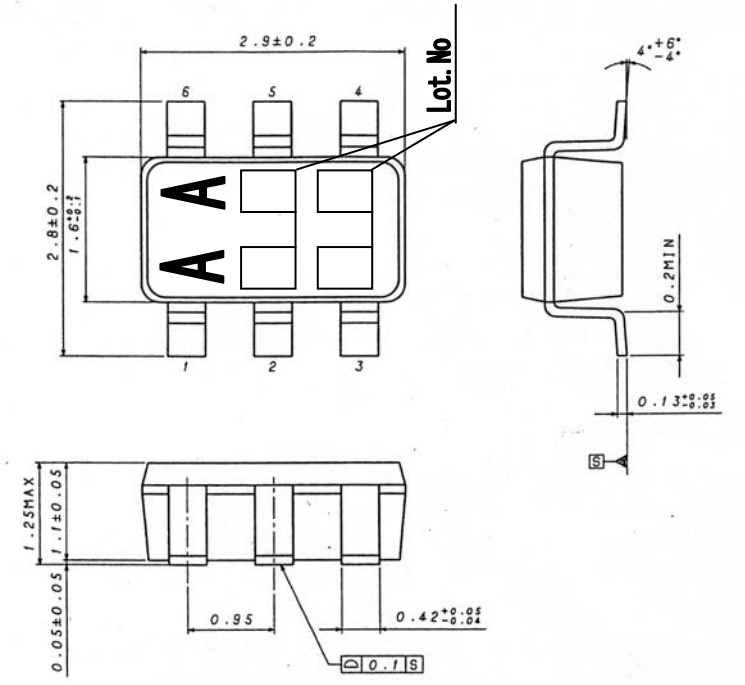
○ ELECTRICAL CHARACTERSTICS (Ta=25℃ and Vcc=+5V (unless otherwise specified))

PARAMETER	Symbol	Limit			UNIT	Conditions
		MIN.	TYP.	MAX.		
【Total Current Consumption】						
Total Supply Current - not taking the output sinking current into account	ICC	-	0.9	2	mA	
【Voltage Control Loop】						
Transconduction Gain(VCT). Sink Current Only	GMV	1	4.0	-	mA/mV	*1
Voltage Control Loop Reference at 1.5mA sinking current	VREF	1.198	1.21	1.222	V	Ta=25℃
		1.186	1.21	1.234		0 < Ta < 85℃ *1
Input Bias Current(VCT)	Ibv	-	50	-	nA	*1
【Current Control Loop】						
Transconduction Gain(ICT). Sink Current Only	GMI	1.5	4.0	-	mA/mV	*1
Current Control Loop Reference at 2.5mA sinking current	VSE	196	200	204	mV	Ta=25℃
		192	200	208		0 < Ta < 85℃ *1
Current out of pin ICT at -200mV	Ibi	-	25	-	μA	
【Output Stage】						
Low output voltage at 10mA sinking current	VOL	-	200	-	mV	VSE=0V, ICT=-0.3V
Output Short Circuit Current, Output to VCC, Sink Current Only	IOS	-	20	50	mA	OUT=VCC, VSE=0V, ICT=-0.3V

● This product is not designed for protection against radio active rays.

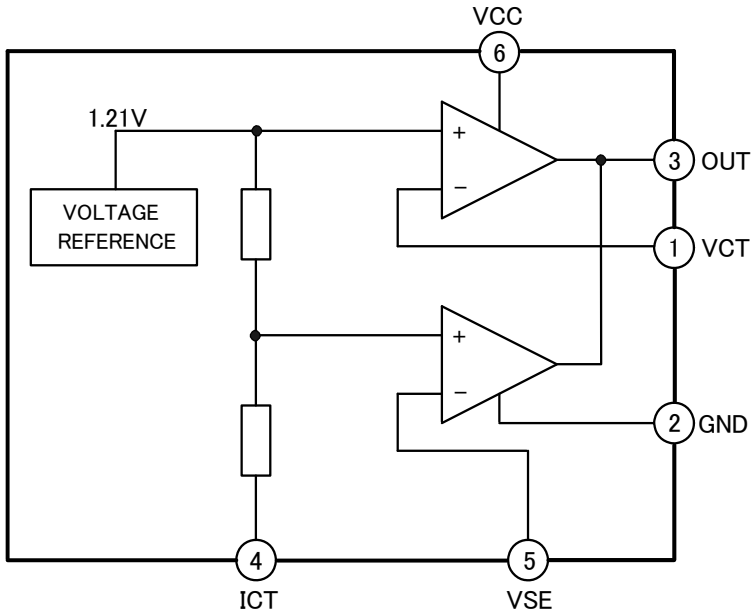
*1 Design Guarantee

○ PACKEGE, MARKING SPECIFICATION



SSOP6 (UNIT:mm)

○ BLOCK DIAGRAM



○ PIN No. & PIN NAME

PIN No.	PIN Name	Function
1	VCT	Input Pin of the Voltage Control Loop
2	GND	Ground Line. 0V Reference For All Voltages
3	OUT	Output Pin. Sinking Current Only
4	ICT	Input Pin of the Current Control Loop(+)
5	VSE	Input Pin of the Current Control Loop(-)
6	VCC	Positive Power Supply Line

○ Operation Notes

1) Absolute maximum ratings

Use of the IC in excess of absolute maximum ratings such as the applied voltage or operating temperature range may result in IC deterioration or damage. Assumptions should not be made regarding the state of the IC (short mode or open mode) when such damage is suffered. A physical safety measure such as a fuse should be implemented when use of the IC in a special mode where the absolute maximum ratings may be exceeded is anticipated.

2) GND potential

Ensure a minimum GND pin potential in all operating conditions. In addition, ensure that no pins other than the GND pin carry a voltage lower than or equal to the GND pin, including during actual transient phenomena. As an exception, the circuit design allows voltages up to -0.3 V to be applied to the ICT pin.

3) Setting of heat

Use a thermal design that allows for a sufficient margin in light of the power dissipation (Pd) in actual operating conditions.

4) Pin short and mistake fitting

Use caution when orienting and positioning the IC for mounting on printed circuit boards. Improper mounting may result in damage to the IC. Shorts between output pins or between output pins and the power supply and GND pin caused by the presence of a foreign object may result in damage to the IC.

5) Actions in strong magnetic field

Use caution when using the IC in the presence of a strong electromagnetic field as doing so may cause the IC to malfunction.

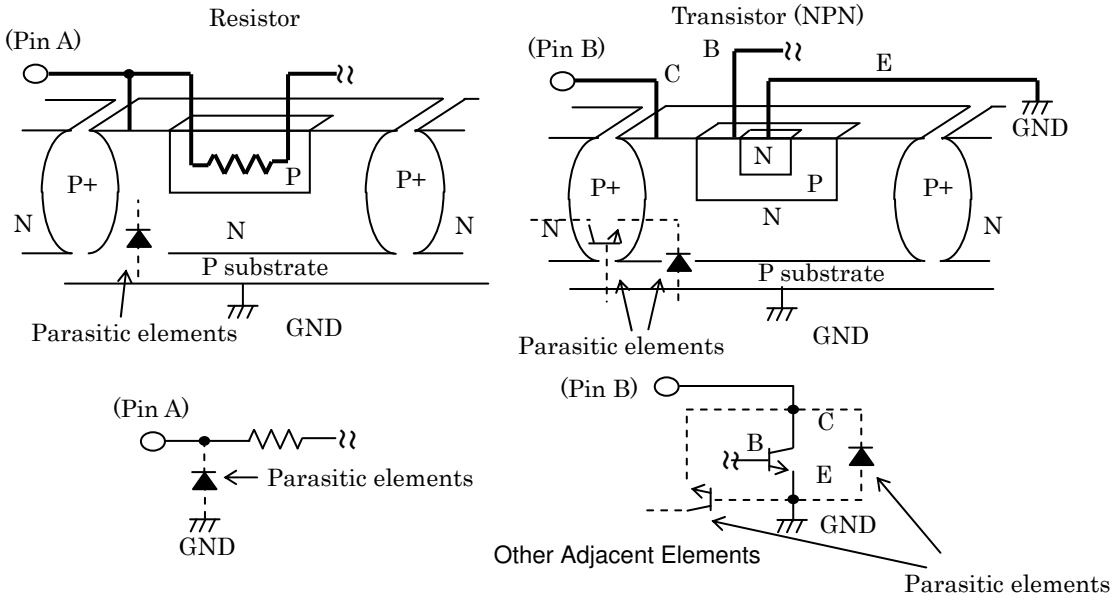
6) Mutual impedance

Power supply and ground wiring should reflect consideration of the need to lower mutual impedance and minimize ripple as much as possible (by making wiring as short and thick as possible or rejecting ripple by incorporating inductance and capacitance).

7) Regarding input pin of the IC

This monolithic IC contains P+ isolation and P substrate layers between adjacent elements in order to keep them isolated. P/N junctions are formed at the intersection of these P layers with the N layers of other elements to create a variety of parasitic elements. For example, when a resistor and transistor are connected to pins as shown in Fig. 19, the P/N junction functions as a parasitic diode when GND > (Pin A) for the resistor or GND > (Pin B) for the transistor (NPN). Similarly, when GND > (Pin B) for the transistor (NPN), the parasitic diode described above combines with the N layer of other elements to operate as a parasitic NPN transistor. The formation of parasitic elements as a result of the relationships of the potentials of different pins is an inevitable result of the IC's architecture. The operation of parasitic elements can cause interference with circuit operation as well as IC malfunction and damage. For these reasons, it is necessary to use caution so that the IC is not used in a way that will trigger the operation of parasitic elements, such as by the application of voltages lower than the GND (P substrate) voltage to I/O pins.

Although the circuit design allows voltages up to -0.3 V to be applied to the ICT pin, voltages lower than this may cause the behavior described above. Use caution when designing the circuit.



Simplified structure of a Monolithic IC

Notes

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