STRUCTURE Silicon Monolithic Integrated Circuit

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

TYPE **B D 6 5 5 1 G**

FEATURE

- Constant voltage and constant current control
- Power supply voltage: 1.8V～12V
- High accuracy reference voltage: 1.21V±1%
- An accuracy for current-detecting voltage: 200mV±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	℃
Maximum Junction Temperature	Tjmax	150	℃
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	1.8～12 *2	V

*2 Except an amplifier for voltage control loop guaranteed above VCC=2.5V.

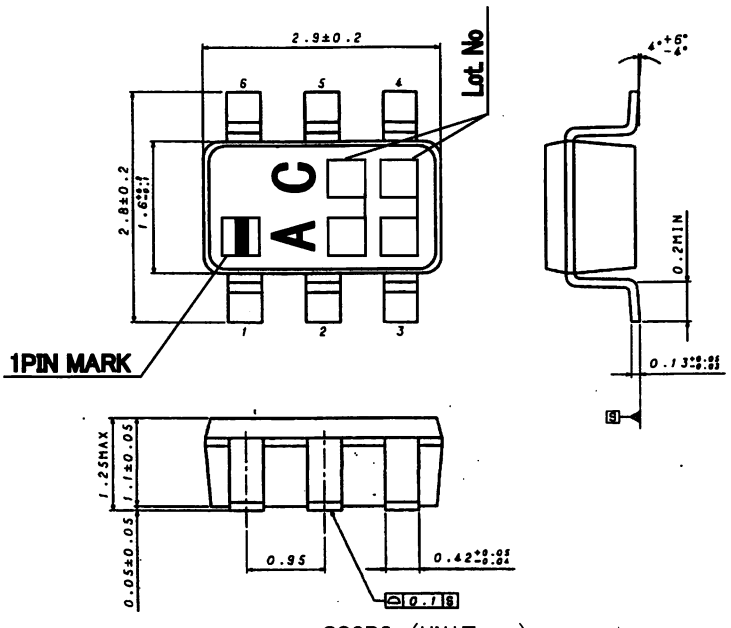
Status of this document
The Japanese version of this document is the official specification.
Please use the translation version of this document as a reference to expedite understanding of the official version.
If these is any uncertainty in translation version of this document, official version takes priority.

○ ELECTRICAL CHARACTERISTICS (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	-	0.6	2	mA	Ta=25℃
【Voltage Control Loop】						
Transconduction Gain(VCT). Sink Current Only	GMV	1.0	4.5	-	mA/mV	Ta=25℃
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℃
【Current Control Loop】						
Transconduction Gain(ICT). Sink Current Only	GMI	1.5	3.5	-	mA/mV	Ta=25℃
Current Control Loop Reference at 2.5mA sinking current	VSE	196	200	204	mV	Ta=25℃
		192	200	208		0 < Ta < 85℃
Current out of pin ICT at -200mV	Ibi	13	23	33	μA	Ta=25℃
【Output Stage】						
Output Short Circuit Current, Output to VCC, Sink Current Only	IOS	-	25	50	mA	Ta=25℃,OUT=VCC, VSE=0V, ICT=-0.3V
【UVLO】						
UVLO Threshold Voltage	VVT	1.8	1.9	2.0	V	VCC=L→H
UVLO Hysteresis Width	DVVT	40	100	160	mV	
Output Short Circuit Current at Full Drive	IOS2	5.0	-	-	mA	Ta=25℃ VCC=OUT=1.8V

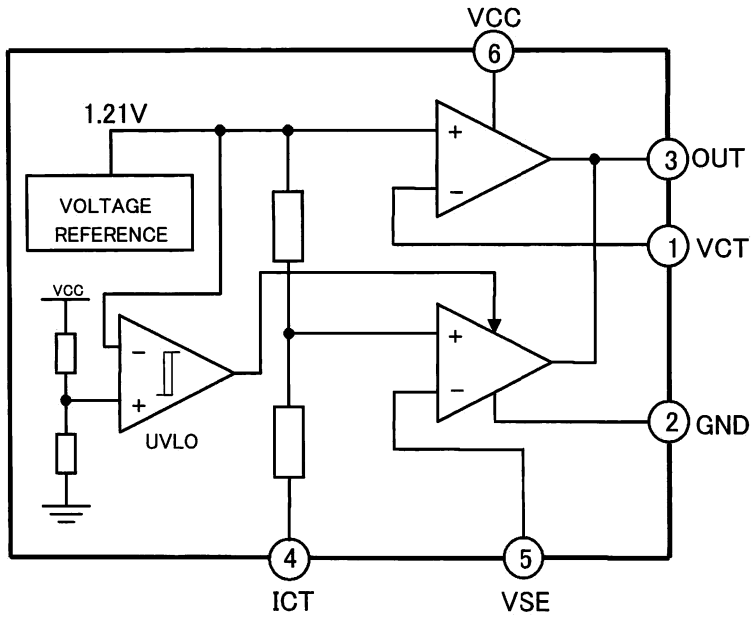
● This product is not designed for protection against radio active rays.

○ 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. This pin doubles low voltage input detection pin.

○ Operation Notes

1) Absolute maximum ratings

An excess in the absolute maximum rating, such as supply voltage, temperature range of operating conditions, etc., can break down the devices, thus making impossible to identify breaking mode, such as a short circuit or an open circuit. If any over rated values will expect to exceed the absolute maximum ratings, consider adding circuit protection devices, such as fuses.

2) GND voltage

The potential of GND pin must be minimum potential in all condition. As an exception, the circuit design allows voltages up to -0.3 V to be applied to the ICT pin.

3) Thermal design

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

4) Inter-pin shorts and mounting errors

Use caution when positioning the IC for mounting on printed circuit boards. The IC may be damaged if there is any connection error or if pins are shorted together.

5) Actions in strong electromagnetic 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).

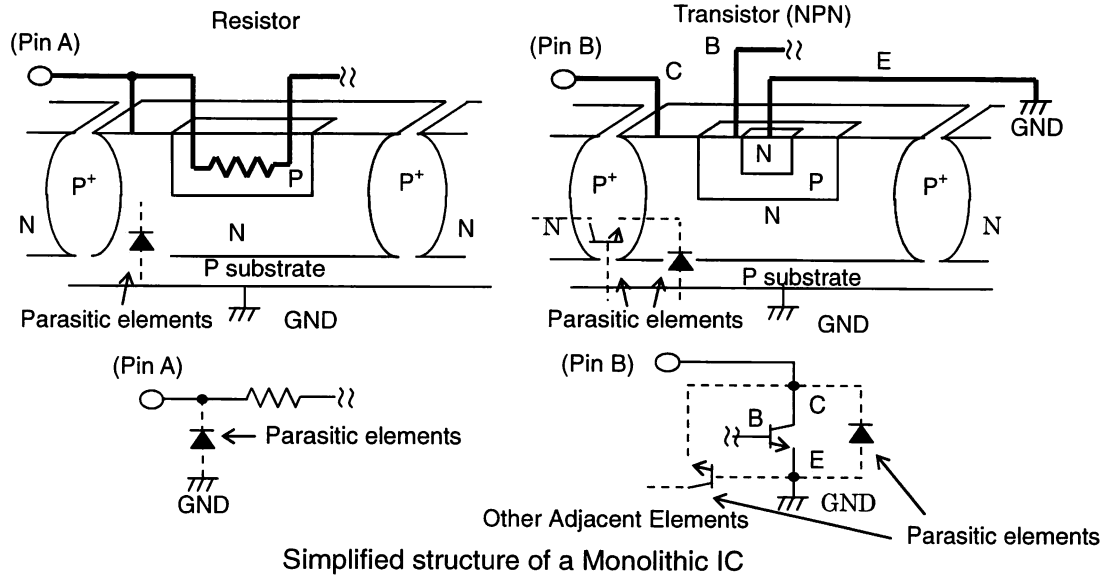
7) Regarding input pin of the IC

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, creating a parasitic diode or transistor. For example, as shown in the figures below, the relation between each potential is as follows:

When GND > Pin A and GND > Pin B, the P-N junction operates as a parasitic diode.

When GND > Pin B, the P-N junction operates as a parasitic transistor.

Parasitic diodes can occur inevitable in the structure of the IC. The operation of parasitic diodes can result in mutual interference among circuits, operational faults, or physical damage. Accordingly, methods by which parasitic diodes operate, such as applying a voltage that is lower than the GND (P substrate) voltage to an input pin, should not be used. 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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