SI-8000Y Series Current Mode Control Step-down Switching Mode

■Features

- Compact (equivalent to TO220) full-mold package
- Output current: 8.0 A
- High efficiency: 86%
- Built-in reference oscillator (130 kHz)
- Built-in drooping-type-overcurrent protection and thermal protection circuits
- Built-in soft start circuit (Output ON/OFF available)
- Low current consumption during off

■Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Input Voltage	V_{IN}	45	V
Power Dissipation	P_{D1}	20.8(With infinite heatsink)	W
	P_{D2}	1.8(Without heatsink, stand-alone operation)	W
Junction Temperature	T_j	–30 to +150	°C
Storage Temperature	T_{stg}	–40 to +150	°C
Thermal Resistance (Junction to Case)	θ_{j-c}	6	°C/W
Thermal Resistance (Junction to Ambient Air)	θ_{j-a}	66.7	°C/W

■Applications

- AV equipment
- OA equipment
- Gaming equipment
- Onboard local power supplies

■Recommended Operating Conditions

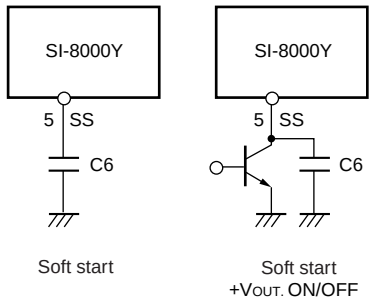
Parameter	Symbol	Raings		Unit
		SI-8010Y	SI-8050Y	
Input Voltage Range	V_{IN}	8 or V_O+3* to 43	8 to 43	V
Output Voltage Range	V_o	1 to 15	5	V
Output Current Range	I_o	0 to 8.0		A
Operating Junction Temperature Range	T_{jop}	–30 to +135		°C
Operating Temperature Range	T_{op}	–30 to +85		°C

*: The minimum value of the input voltage range is 8 V or Vo + 3V, whichever is higher.

■Electrical Characteristics

Parameter		Symbol	Ratings						Unit
			SI-8010Y*			SI-8050Y			
			min.	typ.	max.	min.	typ.	max.	
Output Voltage (Reference voltage for SI-8010Y)		V_O(V_{REF})	0.98	1.00	1.02	4.90	5.00	5.10	V
		Conditions	V_{IN}=30V, Io=0.1A			V_{IN}=30V, Io=0.1A			
Temperature Coefficient of Output Voltage (Reference voltage temperature coefficient for SI-8010Y)		$\Delta V_O/\Delta T$($\Delta V_{REF}/\Delta T$)		±0.1			±0.5		mV/°C
		Conditions	V_{IN}=30V, Io=0.1A, Ta=0 to 100°C			V_{IN}=30V, Io=0.1A, Ta=0 to 100°C			
Efficiency		η		86			86		%
		Conditions	V_{IN}=30V, Io=3A			V_{IN}=30V, Io=3A			
Oscillation Frequency		f_o		130			130		kHz
		Conditions	V_{IN}=30V, Io=3A			V_{IN}=30V, Io=3A			
Line Regulation		ΔV_{OLINE}		30	90		30	90	mV
		Conditions	V_{IN}=10 to 43V, Io=3A			V_{IN}=10 to 43V, Io=3A			
Load Regulation		ΔV_{OLOAD}		30	90		30	90	mV
		Conditions	V_{IN}=30V, Io=0.1 to 8A			V_{IN}=30V, Io=0.1 to 8A			
Overcurrent Protection Starting Current		I_s	8.1			8.1			A
		Conditions	V_{IN}=20V			V_{IN}=20V			
Quiescent Circuit Current		I_q		8			8		mA
		Conditions	V_{IN}=30V, Io=0A, EN/SS=open			V_{IN}=30V, Io=0A, EN/SS=open			
		$I_{q(OFF)}$		200	500		200	500	μA
		Conditions	V_{IN}=30V, EN/SS=0V			V_{IN}=30V, EN/SS=0V			
EN/SS Pin*	Outflow Current at Low Voltage	I_{SSL}		10	30		10	30	μA
		Conditions	V_{IN}=30V, EN/SS=0V			V_{IN}=30V, EN/SS=0V			
	Low Level Voltage	V_{SSL}			0.5			0.5	V
		Conditions	V_{IN}=30V			V_{IN}=30V			
Error Amplifier Voltage Gain		AEA		300			300		V/V
Error Amplifier Transformer Conductance		GEA		800			800		μA/V
Current Sense Amplifier Impedance		1/GCS		0.16			0.16		V/A
Maximum ON Duty		DMAX		92			92		%
Minimum ON Time		DMIN		200			200		nsec

*:R1=8kΩ, R2=2kΩ when Ta=25°C and Vo=5V



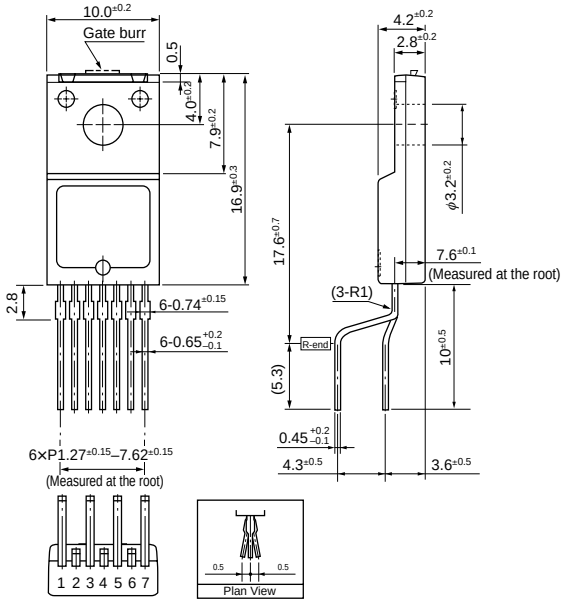
Soft start

Soft start
+V_{OUT}. ON/OFF

Not Recommended for New Designs

■External Dimensions (TO220F-7)

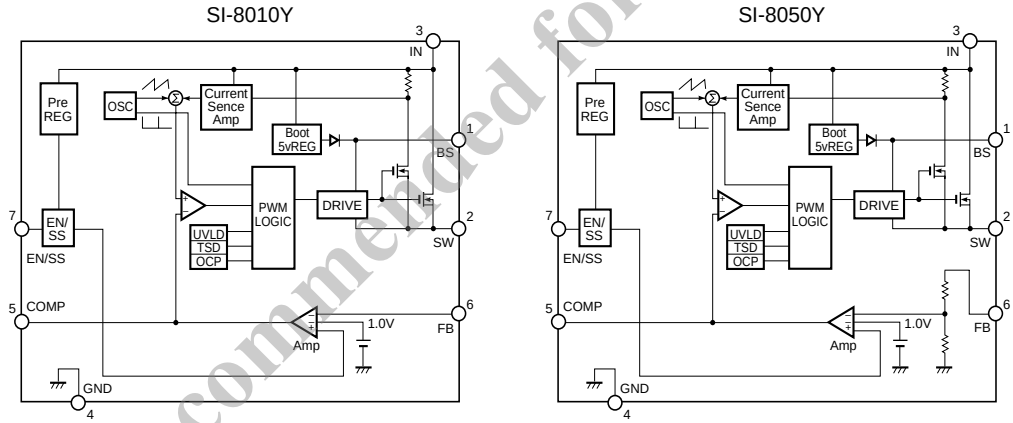
(Unit : mm)



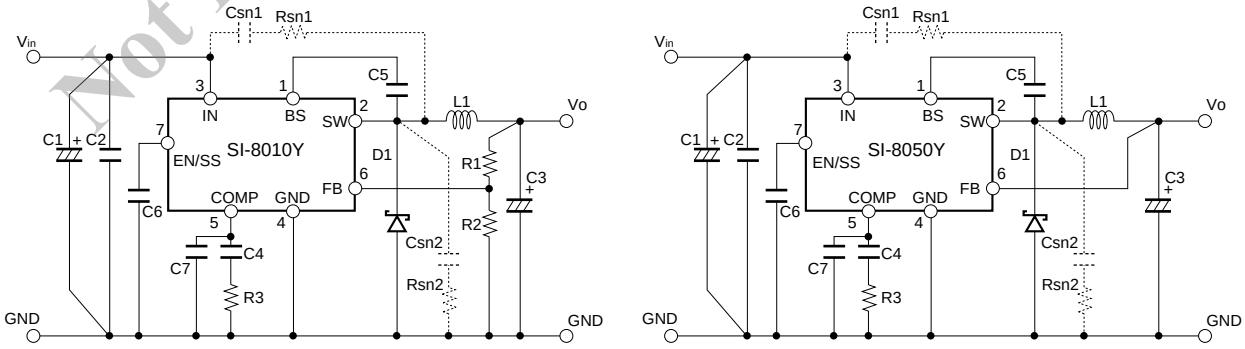
Pin Assignment
① BS
② SW
③ V_{IN}
④ GND
⑤ COMP
⑥ FB
⑦ EN/SS

Plastic Mold Package Type
Flammability: UL94V-0
Product Mass: Approx. 2.3g

■Block Diagram



■Typical Connection Diagram



SI-8010Y
C1:2200μF/50V
C2:4.7μF/50V
C3:470μF/25V
C4:1200pF*1
C5:0.22μF/50V
C7:680pF*1
L1:47μH
D1:FMW-2156 (Sanken)
R1:8kΩ*1
R2:2kΩ
R3:39kΩ*1

Csn1,2=2200pF (When Vin>40V)
Rsn1,2=10Ω (When Vin>40V)

*1: When Vo=5V

SI-8050Y
C1:2200μF/50V
C2:4.7μF/50V
C3:470μF/25V
C4:1200pF
C5:0.22μF/50V
C7:680pF
L1:56μH
D1:FMW-2156 (Sanken)
R3:39kΩ

Csn1,2=2200pF (When Vin>40V)
Rsn1,2=10Ω (When Vin>40V)

Not Recommended for New Designs