

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

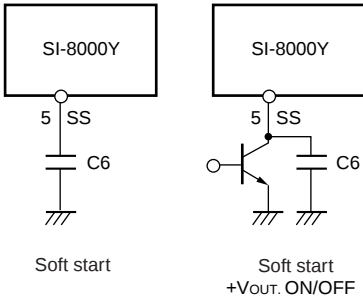
Parameter	Symbol	Raings		Unit
		SI-8010Y	SI-8050Y	
Input Voltage Range	V _{IN}	8 or Vo+3* to 43	8 to 43	V
Output Voltage Range	V _o	1 to 15	5	V
Output Current Range	I _o	0 to 8.0		A
Operating Junction Temperature Range	T _{jop}	−30 to +135		°C
Operating Temperature Range	T _{op}	−30 to +85		°C

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

Electrical Characteristics

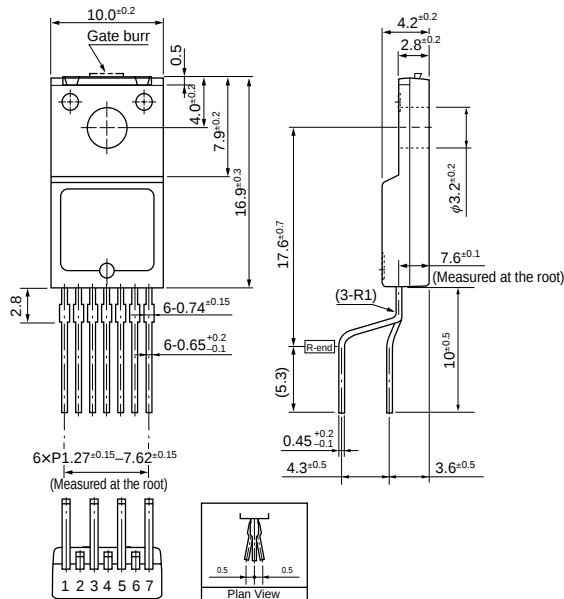
Parameter		Symbol	Ratings						Unit
			SI-8010Y*			SI-8050Y			
			min.	typ.	max.	min.	typ.	max.	
Output Voltage (Reference voltage for SI-8010Y)		Vo(VREF)	0.98	1.00	1.02	4.90	5.00	5.10	V
		Conditions	VIN=30V, Io=0.1A			VIN=30V, Io=0.1A			
Temperature Coefficient of Output Voltage (Reference voltage temperature coefficient for SI-8010Y)		ΔVo/ΔT(ΔVREF/ΔT)		±0.1			±0.5		mV/°C
		Conditions	VIN=30V, Io=0.1A, Ta=0 to 100°C			VIN=30V, Io=0.1A, Ta=0 to 100°C			
Efficiency		η		86			86		%
		Conditions	VIN=30V, Io=3A			VIN=30V, Io=3A			
Oscillation Frequency		fo		130			130		kHz
		Conditions	VIN=30V, Io=3A			VIN=30V, Io=3A			
Line Regulation		ΔVLINE		30	90		30	90	mV
		Conditions	VIN=10 to 43V, Io=3A			VIN=10 to 43V, Io=3A			
Load Regulation		ΔVLOAD		30	90		30	90	mV
		Conditions	VIN=30V, Io=0.1 to 8A			VIN=30V, Io=0.1 to 8A			
Overcurrent Protection Starting Current		Is	8.1			8.1			A
		Conditions	VIN=20V			VIN=20V			
Quiescent Circuit Current		Iq		8			8		mA
		Conditions	VIN=30V, Io=0A, EN/SS=open			VIN=30V, Io=0A, EN/SS=open			
		Iq(OFF)		200	500		200	500	μA
		Conditions	VIN=30V, EN/SS=0V			VIN=30V, EN/SS=0V			
EN/SS Pin*	Outflow Current at Low Voltage	ISSL		10	30		10	30	μA
		Conditions	VIN=30V, EN/SS=0V			VIN=30V, EN/SS=0V			
	Low Level Voltage	VSSL			0.5			0.5	V
		Conditions	VIN=30V			VIN=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



External Dimensions (TO220F-7)

(Unit : mm)

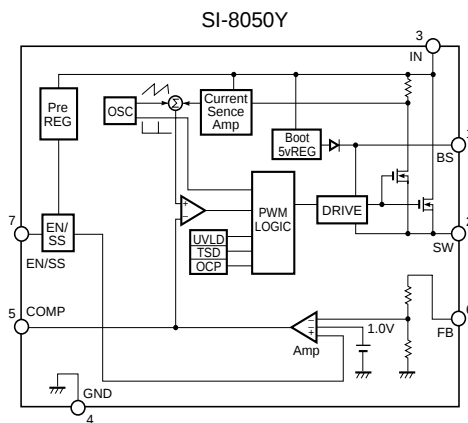
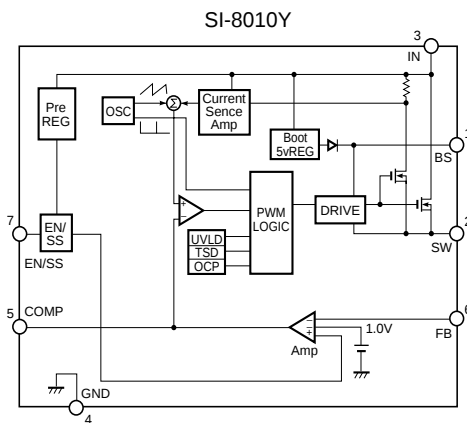


Pin Assignment

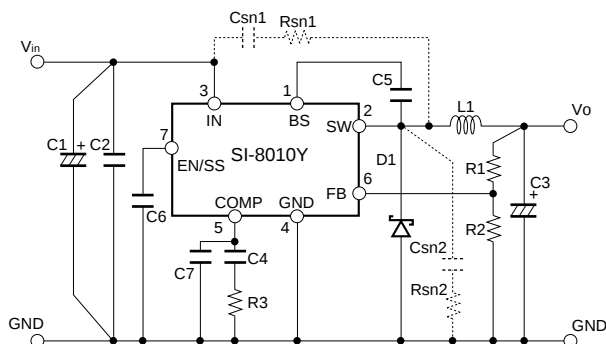
- ① BS
- ② SW
- ③ V_{IN}
- ④ GND
- ⑤ COMP
- ⑥ FB
- ⑦ EN/SS

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

Block Diagram



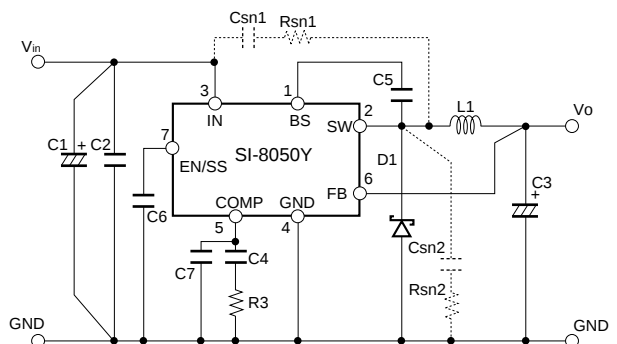
Typical Connection Diagram



SI-8010Y
 C1:2200 μ F/50V
 C2:4.7 μ F/50V
 C3:470 μ F/25V
 C4:1200pF⁻¹
 C5:0.22 μ F/50V
 C7:680pF⁻¹
 L1:47 μ H
 D1:FMW-2156 (Sanken)
 R1:8k Ω ⁻¹
 R2:2k Ω
 R3:39k Ω ⁻¹

Csn1,2=2200pF (When V_{IN}>40V)
 Rsn1,2=10 Ω (When V_{IN}>40V)

*1: When V_O=5V



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

Csn1,2=2200pF (When V_{IN}>40V)
 Rsn1,2=10 Ω (When V_{IN}>40V)