

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

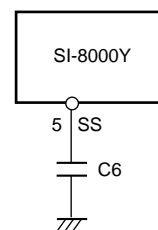
Parameter	Symbol	Ratings		Unit
		SI-8010Y	SI-8050Y	
Input Voltage Range	V_{IN}	8 or V_o+3^* to 43	8 to 43	V
Output Voltage Range	V_o	1 to 15	5	V
Output Current Range	I_o	0 to 8.0		A
Operating Junction Temperature Range	T_{jop}	-30 to +135		°C
Operating Temperature Range	T_{op}	-30 to +85		°C

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

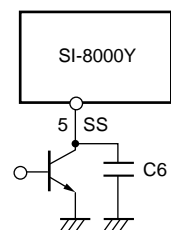
■Electrical Characteristics

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
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	$V_{IN}=30V, I_o=0.1A, T_a=0 \text{ to } 100^\circ C$			$V_{IN}=30V, I_o=0.1A, T_a=0 \text{ to } 100^\circ C$			
Efficiency	η	86			86			%
	Conditions	$V_{IN}=30V, I_o=3A$			$V_{IN}=30V, I_o=3A$			
Oscillation Frequency	f_o	130			130			kHz
	Conditions	$V_{IN}=30V, I_o=3A$			$V_{IN}=30V, I_o=3A$			
Line Regulation	ΔV_{OLINE}	30			30			mV
	Conditions	$V_{IN}=10 \text{ to } 43V, I_o=3A$			$V_{IN}=10 \text{ to } 43V, I_o=3A$			
Load Regulation	ΔV_{OLOAD}	30			30			mV
	Conditions	$V_{IN}=30V, I_o=0.1 \text{ to } 8A$			$V_{IN}=30V, I_o=0.1 \text{ to } 8A$			
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	$V_{IN}=30V, I_o=0A, EN/SS=open$			$V_{IN}=30V, I_o=0A, EN/SS=open$			
	$I_{q(OFF)}$	200			200			
EN/SS Pin*	Outflow Current at Low Voltage	I_{SSL}	10		10		30	μA
		Conditions	$V_{IN}=30V, EN/SS=0V$		$V_{IN}=30V, EN/SS=0V$			
	Low Level Voltage	V_{SSL}					0.5	V
Error Amplifier Voltage Gain	AEA	300			300			V/V
Error Amplifier Transformer Conductance	GEA	800			800			$\mu A/V$
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

*: $R1=8k\Omega, R2=2k\Omega$ when $T_a=25^\circ C$ and $V_o=5V$



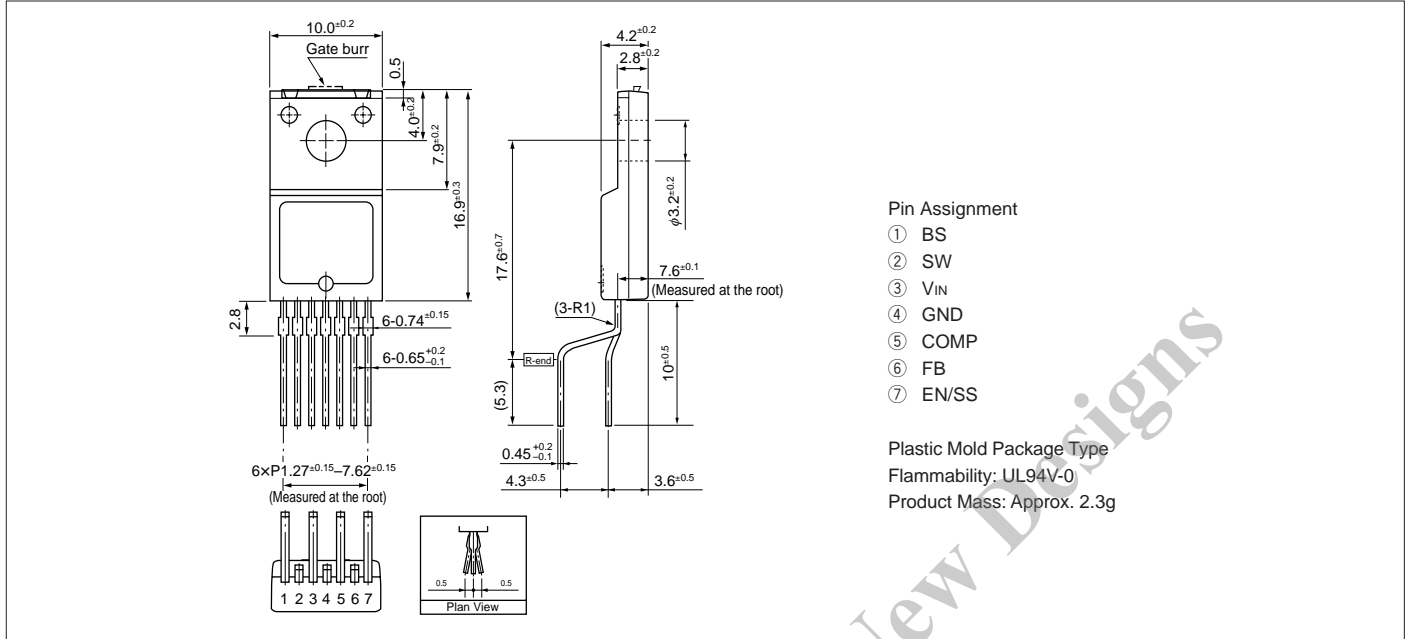
Soft start



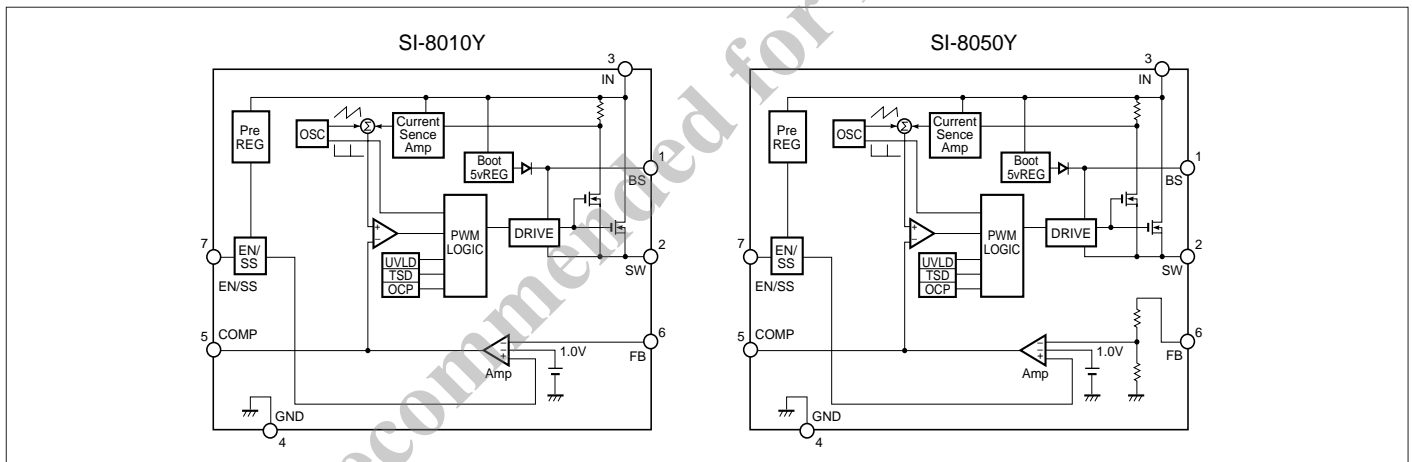
Soft start +Vout. ON/OFF

External Dimensions (TO220F-7)

(Unit : mm)



Block Diagram



Typical Connection Diagram

