

# SI-8000Y Series Current Mode Control Step-down Switching Mode Regulator ICs

## Features

- Compact (equivalent to TO220) full-mold package
- Output current: 8.0 A
- High efficiency: 86 to 94%
- 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 <sub>IN</sub>	45	V
Power Dissipation	P <sub>D1</sub>	20.8(With infinite heatsink)	W
	P <sub>D2</sub>	1.8(Without heatsink, stand-alone operation)	W
Junction Temperature	T <sub>J</sub>	-30 to +150	°C
Storage Temperature	T <sub>stg</sub>	-40 to +150	°C
Thermal Resistance (Junction to Case)	θ <sub>J-C</sub>	6	°C/W
Thermal Resistance (Junction to Ambient Air)	θ <sub>J-a</sub>	66.7	°C/W

## Applications

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

## Recommended Operating Conditions

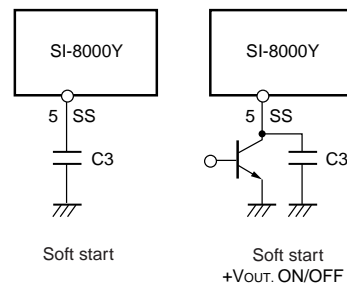
Parameter	Symbol	Raings		Unit
		SI-8010Y	SI-8050Y	
Input Voltage Range	V <sub>IN</sub>	8 or V <sub>o</sub> +3* to 43	8 to 43	V
Output Voltage Range	V <sub>o</sub>	1 to 15	5	V
Output Current Range	I <sub>o</sub>		0 to 8.0	A
Operating Junction Temperature Range	T <sub>JOP</sub>		-30 to +135	°C
Operating Temperature Range	T <sub>OP</sub>		-30 to +85	°C

\*: The minimum value of the input voltage range is 8 V or V<sub>o</sub> + 3V, whichever is higher.

## Electrical Characteristics

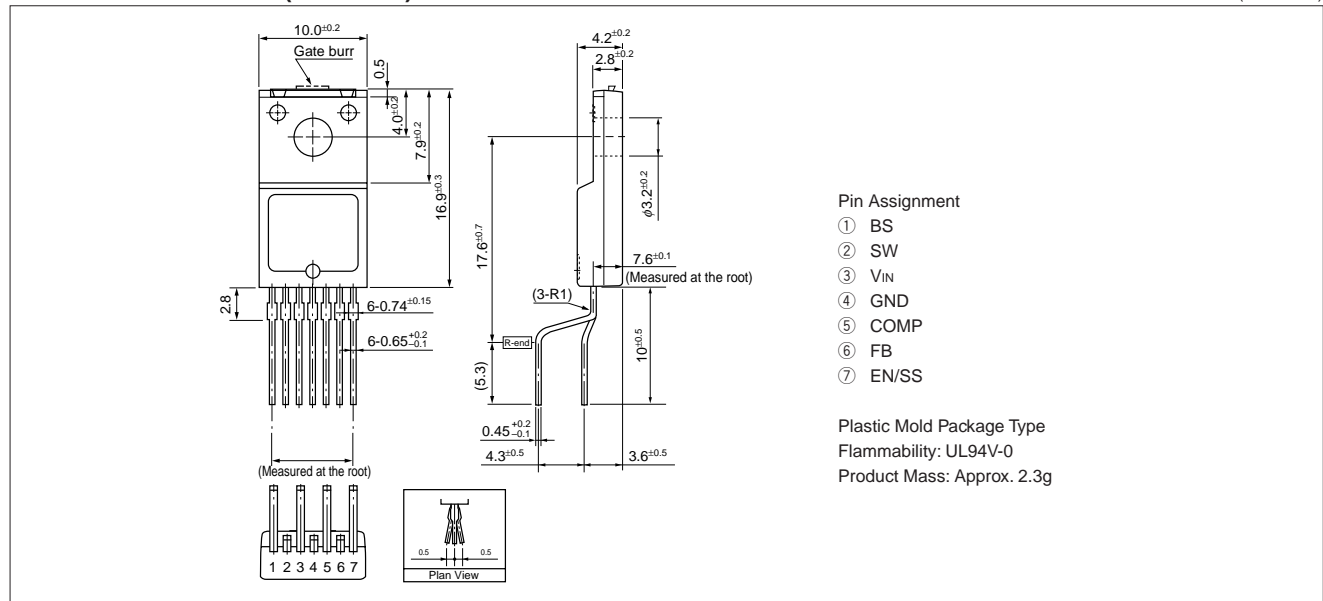
(R1=8kΩ, R2=2kΩ when Ta=25°C and Vo=5V)

Parameter	Symbol	Ratings						Unit	
		SI-8010Y*			SI-8050Y				
		min.	typ.	max.	min.	typ.	max.		
Output Voltage (Reference voltage for SI-8010Y)	V <sub>O</sub> (V <sub>REF</sub> )	0.98	1.00	1.02	4.90	5.00	5.10	V	
	Conditions	V <sub>IN</sub> =30V, I <sub>o</sub> =0.1A			V <sub>IN</sub> =30V, I <sub>o</sub> =0.1A				
Temperature Coefficient of Output Voltage (Reference voltage temperature coefficient for SI-8010Y)	ΔV <sub>O</sub> /ΔT(ΔV <sub>REF</sub> /ΔT)		±0.1			±0.5		mV/°C	
	Conditions	V <sub>IN</sub> =30V, I <sub>o</sub> =0.1A, T <sub>a</sub> =0 to 100°C			V <sub>IN</sub> =30V, I <sub>o</sub> =0.1A, T <sub>a</sub> =0 to 100°C				
Efficiency	η		86			86		%	
	Conditions	V <sub>IN</sub> =30V, I <sub>o</sub> =3A			V <sub>IN</sub> =30V, I <sub>o</sub> =3A				
Oscillation Frequency	f <sub>o</sub>		130			130		kHz	
	Conditions	V <sub>IN</sub> =30V, I <sub>o</sub> =3A			V <sub>IN</sub> =30V, I <sub>o</sub> =3A				
Line Regulation	ΔV <sub>OLINE</sub>		30	90		30	90	mV	
	Conditions	V <sub>IN</sub> =10 to 43V, I <sub>o</sub> =3A			V <sub>IN</sub> =10 to 43V, I <sub>o</sub> =3A				
Load Regulation	ΔV <sub>oload</sub>		30	90		30	90	mV	
	Conditions	V <sub>IN</sub> =30V, I <sub>o</sub> =0.1 to 8A			V <sub>IN</sub> =30V, I <sub>o</sub> =0.1 to 8A				
Overcurrent Protection Starting Current	I <sub>s</sub>		8.1			8.1		A	
	Conditions	V <sub>IN</sub> =20V			V <sub>IN</sub> =20V				
Quiescent Circuit Current	I <sub>q</sub>		8			8		mA	
	Conditions	V <sub>IN</sub> =30V, I <sub>o</sub> =0A, EN/SS=open			V <sub>IN</sub> =30V, I <sub>o</sub> =0A, EN/SS=open				
	I <sub>q</sub> (OFF)		200	500		200	500	μA	
	Conditions	V <sub>IN</sub> =30V, EN/SS=0V			V <sub>IN</sub> =30V, EN/SS=0V				
EN/SS Pin*	Outflow Current at Low Voltage	I <sub>SSL</sub>		10	30		10	30	μA
		Conditions	V <sub>IN</sub> =30V, EN/SS=0V			V <sub>IN</sub> =30V, EN/SS=0V			
	Low Level Voltage	V <sub>SSL</sub>			0.5			0.5	V
		Conditions	V <sub>IN</sub> =30V			V <sub>IN</sub> =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	D <sub>MAX</sub>		92			92		%	
Minimum ON Time	D <sub>MIN</sub>		200			200		nsec	

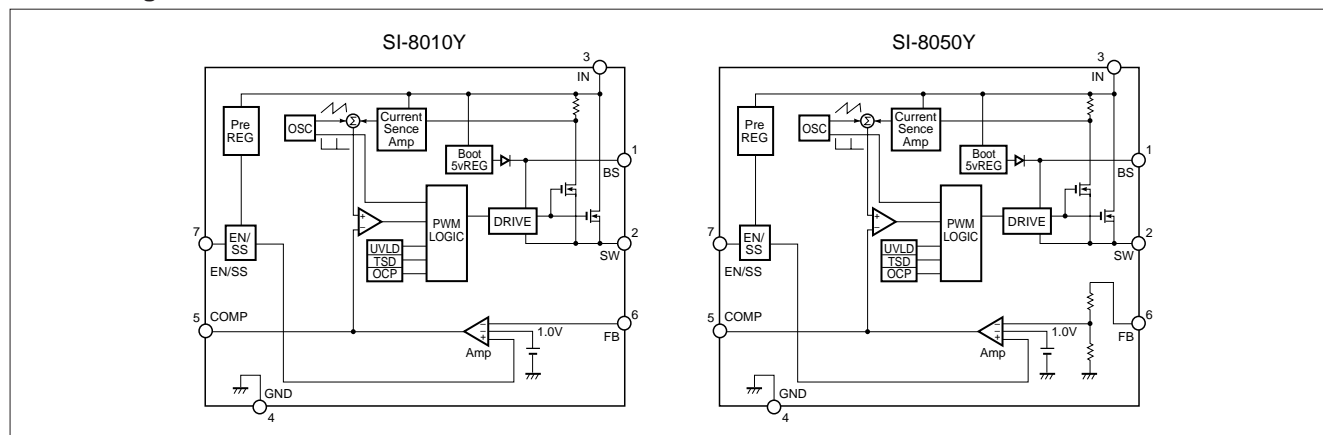


External Dimensions (TO220F-7)

(Unit : mm)



Block Diagram



Typical Connection Diagram

