

# SPI-8000A Series Surface Mount, Separate Excitation Step-down Switching Mode

## Features

- Surface-mount 16 pin package
- Output current: 3.0A
- High efficiency: 91% (at  $V_{IN} = 10V$ ,  $I_o = 1A$ ,  $V_o = 5V$ )
- Capable of downsizing a choke-coil due to IC's high switching frequency (125kHz). (Compared with conventional Sanken devices)
- The output-voltage-variable type can vary its output voltage from 1V to 14V because of its low reference voltage ( $V_{REF}$ ) of 1V.
- Wide Input Voltage Range (8 to 50V)
- Output ON/OFF available
- Built-in overcurrent and thermal protection circuits

## Absolute Maximum Ratings

( $T_a=25^\circ C$ )

Parameter	Symbol	Rated	Unit
DC Input Voltage	$V_{IN}$	53	V
Power Dissipation	$P_D^{*1, *2}$	2.4	W
Junction Temperature	$T_j$	+125	$^\circ C$
Storage Temperature	$T_{stg}$	-40 to +125	$^\circ C$
Thermal Resistance (junction to case)	$\theta_{jc}^{*2}$	18	$^\circ C/W$
Thermal Resistance (junction to ambient air)	$\theta_{ja}^{*2}$	50	$^\circ C/W$

\*1: Limited due to thermal protection.

\*2: When mounted on glass-epoxy board 700cm<sup>2</sup> (copper laminate area 30.8cm<sup>2</sup>).

## Applications

- Onboard local power supplies
- OA equipment
- For stabilization of the secondary-side output voltage of switching power supplies

## Recommended Operating Conditions

Parameter	Symbol	Ratings		Unit
		SPI-8010A		
DC Input Voltage Range	$V_{IN}$	(8 or $V_o+3$ ) <sup>*1</sup> to 50		V
Output Voltage Range	$V_o$	1 to 14		V
Output Current Range <sup>*2</sup>	$I_o$	0.02 to 3.0 <sup>*2</sup>		A
Operating Junction Temperature Range	$T_{jop}$	-30 to +125		$^\circ C$
Operating Temperature Range	$T_{op}$	-30 to +125		$^\circ C$

\*1: The minimum value of an input voltage range is the higher of either 8V or  $V_o+3$ V.

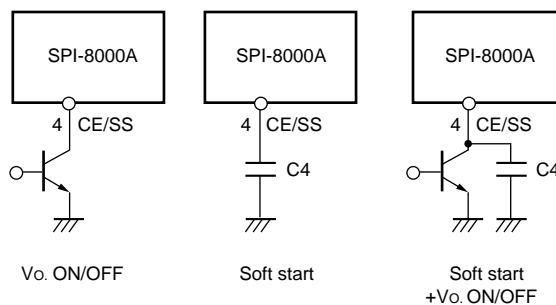
\*2: Please be sure to let the output current run more than 20 mA. When using by less than 20 mA, there is a possibility that the output voltage becomes unstable.

## Electrical Characteristics

( $T_a=25^\circ C$ )

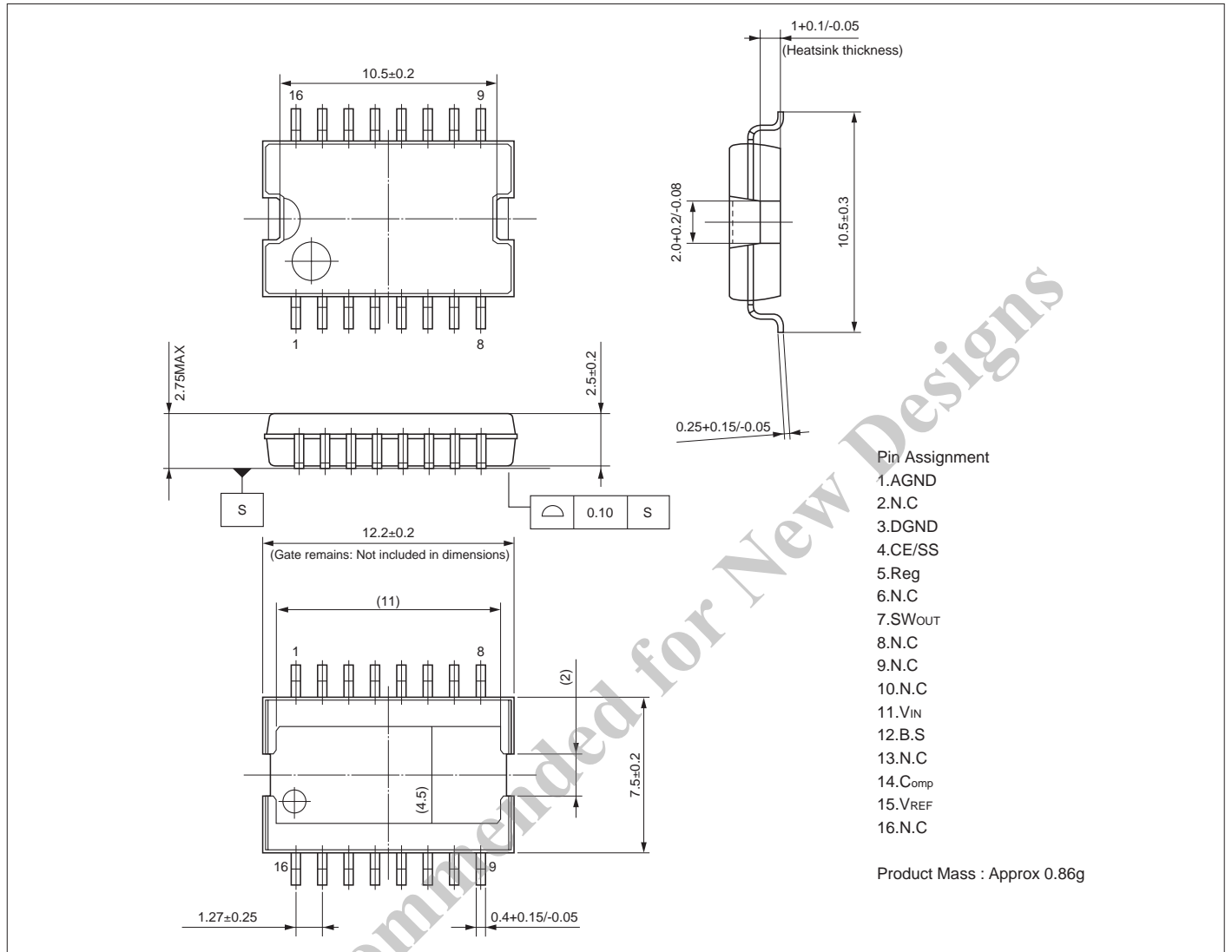
Parameter	Symbol	Rating			Unit
		SPI-8010A (Variable type)			
		min.	typ.	max.	
Reference Voltage	$V_{REF}$	0.97	1.00	1.03	V
	Conditions	$V_{IN}=12V, I_o=1A$			
Efficiency	Eff	86			%
	Conditions	$V_{IN}=20V, I_o=1A, V_o=5V$			
Oscillation Frequency	$F_{OSC}$	250			kHz
	Conditions	$V_{IN}=12V, I_o=1A$			
Line Regulation	$\Delta V_{OLINE}$	20			mV
	Conditions	$V_{IN}=10$ to $30V, I_o=1A$			
Load Regulation	$\Delta V_{OLOAD}$	10			mV
	Conditions	$V_{IN}=12V, I_o=0.1$ to $1.5A$			
Temperature Coefficient of Reference Voltage	$\Delta V_{REF}/\Delta T_a$	$\pm 0.5$			mV/ $^\circ C$
Overcurrent Protection Starting Current	$I_s$	3.1			A
	Conditions	$V_{IN}=12V$			
Quiescent Circuit Current	$I_q$	7			mA
	Conditions	$V_{IN}=12V, I_o=0A$			
Circuit Current at Output OFF	$I_q(off)$	400			$\mu A$
	Conditions	$V_{IN}=12V, V_{ON/OFF}=0.3V$			
CE/SS Terminal	Low Level Voltage	$V_{SSL}$	0.5		V
	Outflow Current at Low Voltage	$I_{SSL}$	50		$\mu A$
	Conditions	$V_{SSL}=0V$			

\* Pin 4 is the CE/SS pin. Soft start at power on can be performed with a capacitor connected to this pin. The output can also be turned ON/OFF with this pin. The output is stopped by setting the voltage of this pin to  $V_{SSL}$  or lower. CE/SS-pin voltage can be changed with an open-collector drive circuit of a transistor. When using both the soft-start and ON/OFF functions together, the discharge current from  $C_4$  flows into the ON/OFF control transistor. Therefore, limit the current securely to protect the transistor if  $C_3$  capacitance is large. The CE/SS pin is pulled up to the power supply in the IC, so applying the external voltage is prohibited.

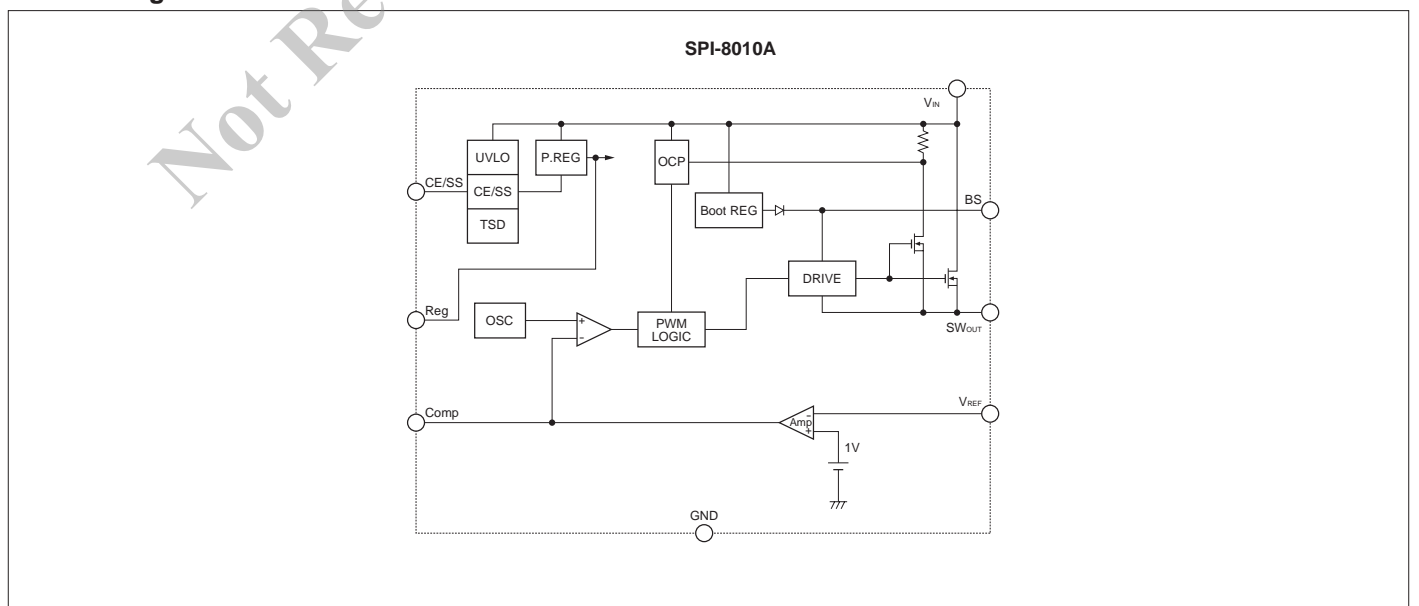


External Dimensions (HSOP16)

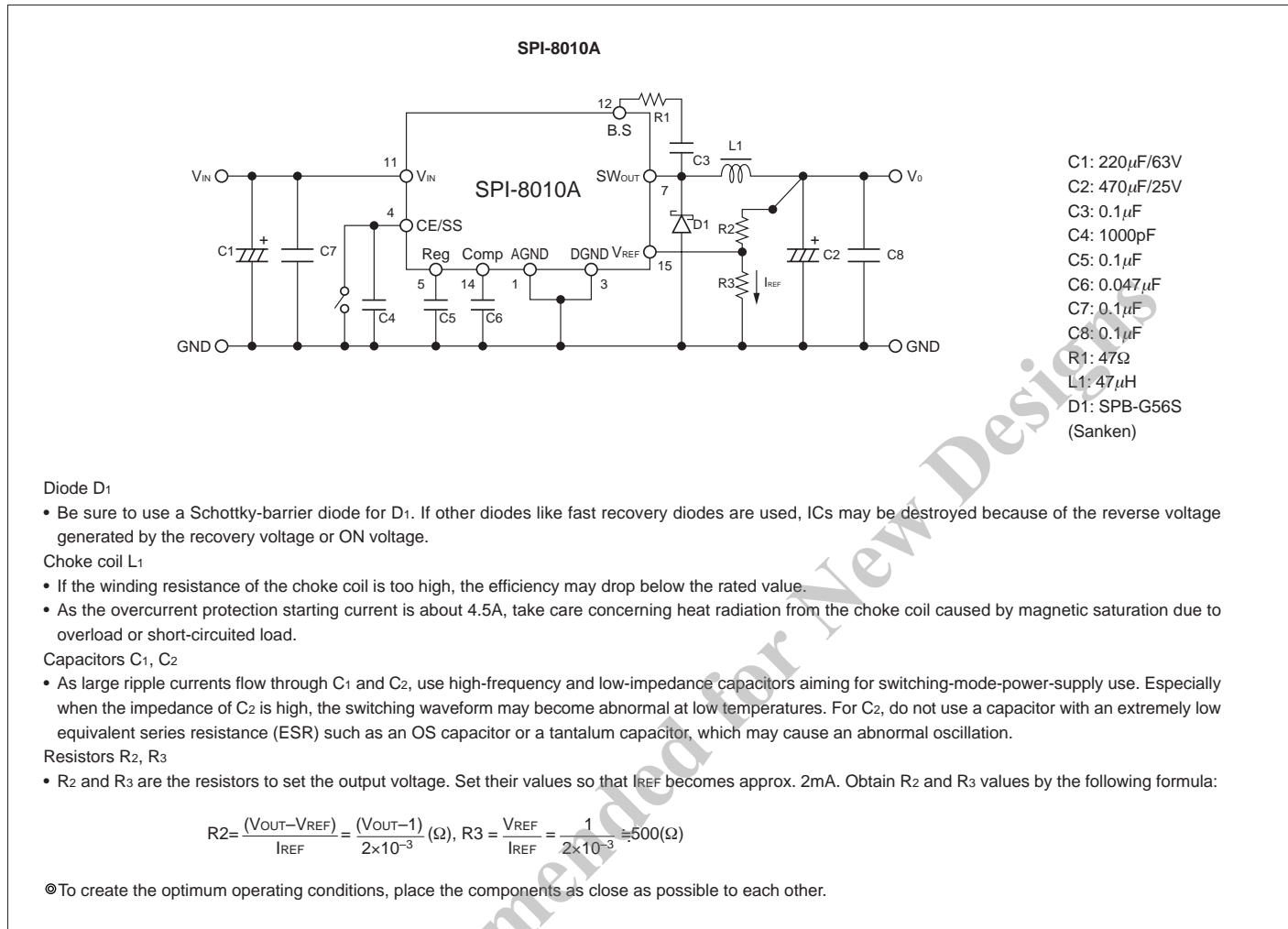
(Unit : mm)



Block Diagram



Typical Connection Diagram



Ta-Pd Characteristics

