

# SCI7810Y Series

- Positive output voltage regulator
- Lower operating current
- Higher output voltage regulation capability

## OUTLINE

SCI7810Y series a fixed type voltage regulator developed utilizing CMOS silicon gate process. It is configured with a reference circuit, differential amplifier, output control transistor and voltage setting resistor of high accuracy and low operating current.

Output voltage is fixed in IC. This series supports a variety of output voltages.

## FEATURES

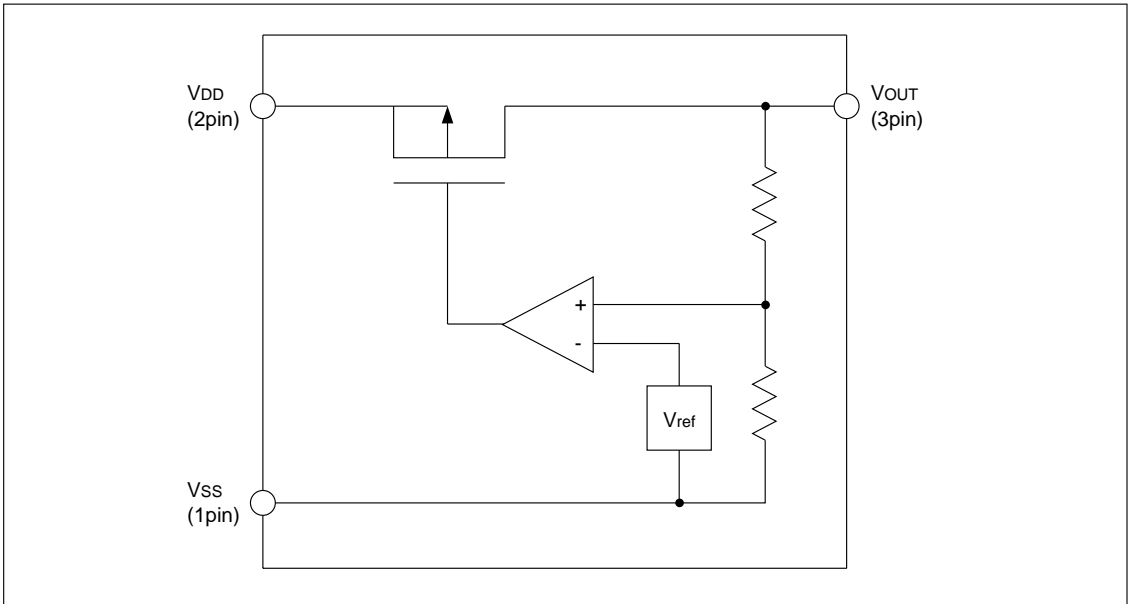
- Low operating current  
Typically, 1.5  $\mu$ A ( $V_{DD} = 5.0V$ )
- Smaller temperature difference between output and input voltages  
Typically 0.17V ( $I_O = 10mA, V_{OUT} = 5.0V$ )
- Smaller output voltage temperature coefficient  
Typically, -100ppm/ $^{\circ}C$
- Larger operating voltage range  
15V maximum
- Higher output voltage regulation capability  
 $\pm 2.0\%$  ( $V_{DD}=7.0V, I_P=10mA, V_{OUT} = 5.0V, T_a=25^{\circ}C$ )
- Package  
SOT89-3pin

## MODEL TYPES

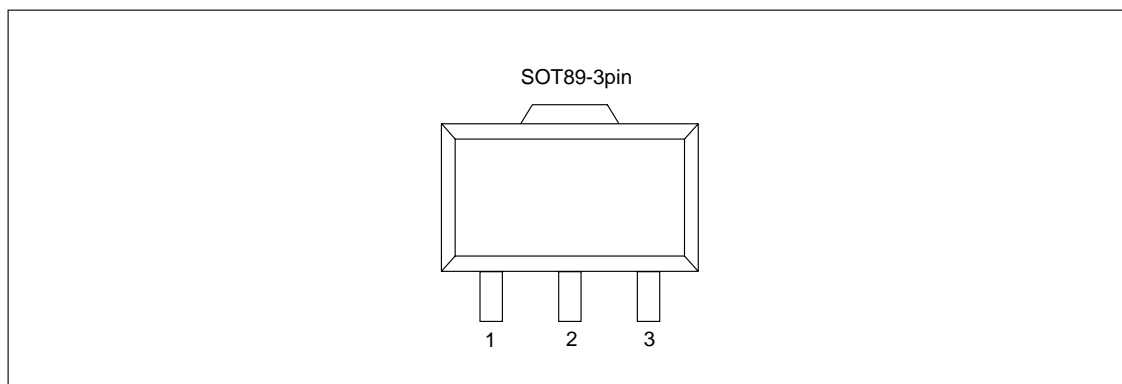
Model names	Input voltage (V)	Output voltage (V)			Output current (Max.) (mA)	Operating current ( $\mu$ A)
		Min.	Typ.	Max.		
SCI7810YHA	15	1.45	1.50	1.55	10 at $V_I = 3V$	1.5
SCI7810YGA		1.75	1.80	1.85	10 at $V_I = 3V$	
SCI7810YFA		2.15	2.20	2.25	10 at $V_I = 3V$	
SCI7810YLA		2.53	2.60	2.67	30 at $V_I = 5V$	
SCI7810YRA		2.73	2.80	2.87	30 at $V_I = 5V$	
SCI7810YDA		2.93	3.00	3.07	30 at $V_I = 5V$	
SCI7810YCA		3.13	3.20	3.27	30 at $V_I = 5V$	
SCI7810YTA		3.23	3.30	3.37	30 at $V_I = 5V$	
SCI7810YNA		3.43	3.50	3.57	30 at $V_I = 5V$	
SCI7810YKA		3.80	3.90	4.00	40 at $V = 6V$	
SCI7810YPA		3.90	4.00	4.10	40 at $V_I = 6V$	
SCI7810YMA		4.40	4.50	4.60	40 at $V_I = 6V$	
SCI7810YBA		4.90	5.00	5.10	50 at $V_I = 7V$	
SCI7810YAA		5.75	6.00	6.25	50 at $V_I = 8V$	

# SCI7810Y Series

## ■ BLOCK DIAGRAM



## PIN DIAGRAM



## PIN DESCRIPTION

Pin No.	Pin names	Function
1	$V_{SS}$	Input voltage pin (negative side)
2	$V_{DD}$	Input voltage pin (positive side)
3	$V_{OUT}$	Output voltage pin

## ABSOLUTE MAXIMUM RATINGS

Items	Symbols	Rating	Unit
Input voltage	$V_{DD}-V_{SS}$	18	V
Output voltage	$V_O$	$V_{DD} + 0.3$ to $V_{SS}-0.3$	
Output current	$I_O$	100	mA
Allowable loss	$P_D$	200	mW
Operating temperature	$T_{opr}$	-30 to +85	°C
Storage ambient temperature	$T_{stg}$	-65 to +150	
Soldering time	$T_{sol}$	260°C	-
Soldering temperature		10 sec. (at lead)	

# SCI7810Y Series

## ■ ELECTRIC CHARACTERISTICS

### ● SCI7810Y<sub>AA</sub>

(Except where otherwise specified, Ta=-30°C to +85°C)

Items	Symbols	Condition (V <sub>SS</sub> = 0.0V)	Min.	Typ.	Max.	Unit
Input voltage	V <sub>I</sub>	—————	—	—	15	V
Output voltage	V <sub>O</sub>	V <sub>DD</sub> = 8.0V, I <sub>O</sub> = -10mA Ta = 25°C	5.75	6.00	6.25	V
Operating current	I <sub>OP</sub>	V <sub>DD</sub> = 6.0V to 15.0V No load	—	1.5	5.0	μA
Voltage difference between input and output voltages	V <sub>I</sub> -V <sub>O</sub>	V <sub>OUT</sub> = 6.0V, I <sub>O</sub> = -10mA	—	0.16	0.32	V
Output voltage temperature characteristics	$\frac{\Delta V_{OUT}}{V_{OUT}}$	—————	-300	-100	+100	ppm/°C
Input stability	$\frac{dV_O}{dV_I \cdot V_O}$	Ta = -30°C to +85°C (Same temperature condition) V <sub>DD</sub> = 7.0V to 15.0V I <sub>O</sub> = -10mA	—	0.1	—	%/V
Load stability	ΔV <sub>O</sub>	Ta = -30°C to +85°C (Same temperature condition) V <sub>DD</sub> = 8.0V I <sub>O</sub> = -1mA to -50mA	—	50	—	mV
Supply voltage fluctuation elimination ratio	PSRR	V <sub>DD</sub> = 8.0V, f <sub>in</sub> = 50kHz C <sub>L</sub> = 10μF, I <sub>OUT</sub> = -10mA	—	-40	—	dB

# SCI7810Y Series

## ● SCI7810YBA

(Except where otherwise specified, Ta=-30°C to +85°C)

Items	Symbols	Condition (VSS = 0.0V)	Min.	Typ.	Max.	Unit
Input voltage	V <sub>I</sub>	—————	—	—	15	V
Output voltage	V <sub>O</sub>	V <sub>DD</sub> = 7.0V, I <sub>O</sub> = -10mA Ta = 25°C	4.90	5.00	5.10	V
Operating current	I <sub>OP</sub>	V <sub>DD</sub> = 5.0V to 15.0V No load	—	1.5	5.0	μA
Voltage difference between input and output voltages	V <sub>I</sub> -V <sub>O</sub>	V <sub>OUT</sub> = 5.0V, I <sub>O</sub> = -10mA	—	0.17	0.34	V
Output voltage temperature characteristics	$\frac{\Delta V_{OUT}}{V_{OUT}}$	—————	-300	-100	+100	ppm/°C
Input stability	$\frac{dV_O}{dV_I \cdot V_O}$	Ta = -30°C to +85°C (Same temperature condition) V <sub>DD</sub> = 6.0V to 15.0V I <sub>O</sub> = -10mA	—	0.1	—	%/ V
Load stability	ΔV <sub>O</sub>	Ta = -30°C to +85°C (Same temperature condition) V <sub>DD</sub> = 7.0V I <sub>O</sub> = -1mA to -50mA	—	50	—	mV
Supply voltage fluctuation elimination ratio	PSRR	V <sub>DD</sub> = 7.0V, f <sub>in</sub> = 50kHz C <sub>L</sub> = 10μF, I <sub>OUT</sub> = -10mA	—	-40	—	dB

## ● SCI7810YKA

(Except where otherwise specified, Ta=-30°C to +85°C)

Items	Symbols	Condition (VSS = 0.0V)	Min.	Typ.	Max.	Unit
Input voltage	V <sub>I</sub>	—————	—	—	15	V
Output voltage	V <sub>O</sub>	V <sub>DD</sub> = 6.0V, I <sub>O</sub> = -10mA Ta = 25°C	3.80	3.90	4.00	V
Operating current	I <sub>OP</sub>	V <sub>DD</sub> = 3.9V to 15.0V No load	—	1.5	5.0	μA
Voltage difference between input and output voltages	V <sub>I</sub> -V <sub>O</sub>	V <sub>OUT</sub> = 3.9V, I <sub>O</sub> = -10mA	—	0.19	0.38	V
Output voltage temperature characteristics	$\frac{\Delta V_{OUT}}{V_{OUT}}$	—————	-300	-100	+100	ppm/°C
Input stability	$\frac{dV_O}{dV_I \cdot V_O}$	Ta = -30°C to +85°C (Same temperature condition) V <sub>DD</sub> = 5.0V to 15.0V I <sub>O</sub> = -10mA	—	0.1	—	%/ V
Load stability	ΔV <sub>O</sub>	Ta = -30°C to +85°C (Same temperature condition) V <sub>DD</sub> = 6.0V I <sub>O</sub> = -1mA to -40mA	—	40	—	mV
Supply voltage fluctuation elimination ratio	PSRR	V <sub>DD</sub> = 6.0V, f <sub>in</sub> = 50kHz C <sub>L</sub> = 10μF, I <sub>OUT</sub> = -10mA	—	-40	—	dB

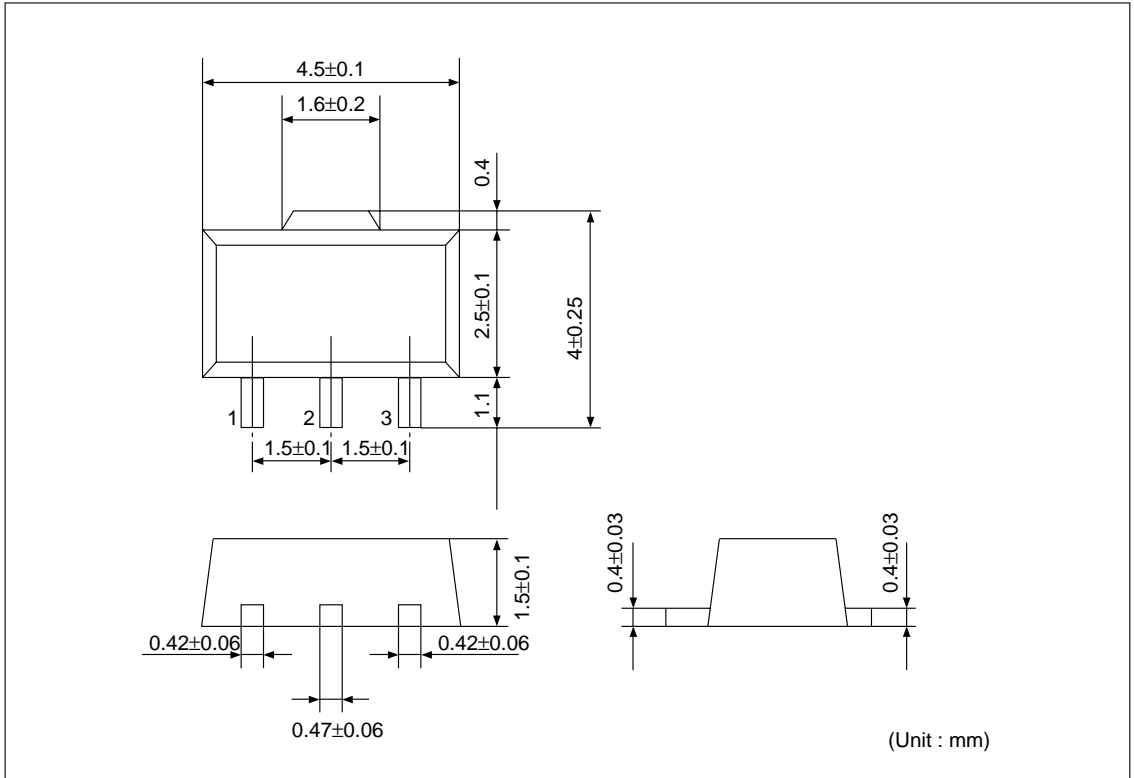
# SCI7810Y Series

## ● SCI7810Y<sub>DA</sub>

(Except where otherwise specified, Ta=-30°C to +85°C)

Items	Symbols	Condition (V <sub>SS</sub> = 0.0V)	Min.	Typ.	Max.	Unit
Input voltage	V <sub>I</sub>	—————	—	—	15	V
Output voltage	V <sub>O</sub>	V <sub>DD</sub> = 5.0V, I <sub>O</sub> = -10mA T <sub>a</sub> = 25°C	2.93	3.00	3.07	V
Operating current	I <sub>OP</sub>	V <sub>DD</sub> = 3.0V to 15.0V No load	—	1.5	5.0	μA
Voltage difference between input and output voltages	V <sub>I</sub> -V <sub>O</sub>	V <sub>OUT</sub> = 3.0V, I <sub>O</sub> = -10mA	—	0.23	0.46	V
Output voltage temperature characteristics	$\frac{\Delta V_{OUT}}{V_{OUT}}$	—————	-300	-100	+100	ppm/°C
Input stability	$\frac{dV_O}{dV_I \cdot V_O}$	T <sub>a</sub> = -30°C to +85°C (Same temperature condition) V <sub>DD</sub> = 4.0V to 15.0V I <sub>O</sub> = -10mA	—	0.1	—	%/V
Load stability	ΔV <sub>O</sub>	T <sub>a</sub> = -30°C to +85°C (Same temperature condition) V <sub>DD</sub> = 5.0V I <sub>O</sub> = -1mA to -30mA	—	30	—	mV
Supply voltage fluctuation elimination ratio	PSRR	V <sub>DD</sub> = 5.0V, f <sub>in</sub> = 50kHz C <sub>L</sub> = 10μF, I <sub>OUT</sub> = -10mA	—	-40	—	dB

## OVERALL DIMENSION DIAGRAM



Note: Dimensions are subject to change for the product innovation.

**NOTICE:**

No part of this material may be reproduced or duplicated in any form or by any means without the written permission of Seiko Epson. Seiko Epson reserves the right to make changes to this material without notice. Seiko Epson does not assume any liability of any kind arising out of any inaccuracies contained in this material or due to its application or use in any product or circuit and, further, there is no representation that this material is applicable to products requiring high level reliability, such as, medical products. Moreover, no license to any intellectual property rights is granted by implication or otherwise, and there is no representation or warranty that anything made in accordance with this material will be free from any patent or copyright infringement of a third party. This material or portions thereof may contain technology or the subject relating to strategic products under the control of the Foreign Exchange and Foreign Trade Law of Japan and may require an export license from the Ministry of International Trade and Industry or other approval from another government agency.

© Seiko Epson Corporation 2000 All right reserved.

All other product names mentioned herein are trademarks and/or registered trademarks of their respective companies.

---

**SEIKO EPSON CORPORATION**

**ELECTRONIC DEVICES MARKETING DIVISION**

**IC Marketing & Engineering Group**

**ED International Marketing Department I (Europe & U.S.A.)**

421-8, Hino, Hino-shi, Tokyo 191-8501, JAPAN  
Phone : +81-(0)42-587-5812 FAX : +81-(0)42-587-5564

**ED International Marketing Department II (Asia)**

421-8, Hino, Hino-shi, Tokyo 191-8501, JAPAN  
Phone : +81-(0)42-587-5814 FAX : +81-(0)42-587-5110

■ EPSON Electronic Devices Website

<http://www.epson.co.jp/device/>



First issue November, 1996  
Printed February, 2000 in Japan 