

# SCI7720Y Series

- High precision voltage detector
- Low operating current

## ■ OUTLINE

SCI7720Y series is an adjustment-free voltage detector developed using CMOS silicon gate process.

It is configured with a reference voltage circuit, voltage comparator, hysteresis circuit and output circuit of low operating current.

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

SCI7720Y series is N channel open drain output type and SCI7721Y series is CMOS output type.

Both series are best suited for detecting battery life and monitoring supply voltage fed to micro computers and LSIs.

## ■ FEATURES

- Low operating current  
Typically, 2.0  $\mu$  A
- Wide operating voltage range  
15V to 12.0V
- High voltage detection accuracy  
 $\pm 2.5\%$
- Smaller detecting voltage temperature coefficient  
Typically, -100 ppm/  $^{\circ}$ C
- Package  
SOT89-3pin

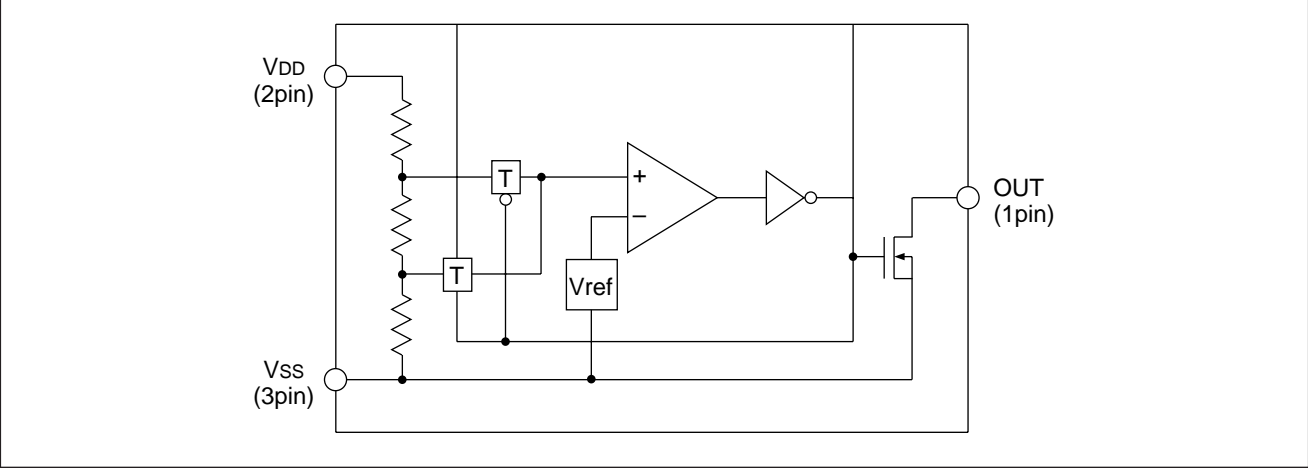
## ■ MODEL CLASSIFICATIONS

Model names	Output mode	Detecting voltage (V)			Operating voltage (V)	Operating current ( $\mu$ A-Typ.)
		Min.	Typ.	Max.		
SCI7720YFA	N-ch open drain	2.60	2.65	2.70	1.5 to 15.0	2.0 (V <sub>DD</sub> = 3.0V)
SCI7720YTA		3.90	4.00	4.10		2.0 (V <sub>DD</sub> = 5.0V)
SCI7721YCA	CMOS	2.10	2.15	2.20		2.0 (V <sub>DD</sub> = 3.0V)
SCI7721YCB*		2.10	2.15	2.20		2.0 (V <sub>DD</sub> = 3.0V)
SCI7721YPA		2.20	2.25	2.30		2.0 (V <sub>DD</sub> = 3.0V)
SCI7721YSA		2.30	2.35	2.40		2.0 (V <sub>DD</sub> = 3.0V)
SCI7721YEA		2.50	2.55	2.60		2.0 (V <sub>DD</sub> = 3.0V)
SCI7721YFA		2.60	2.65	2.70		2.0 (V <sub>DD</sub> = 3.0V)
SCI7721YFB*		2.60	2.65	2.70		2.0 (V <sub>DD</sub> = 3.0V)
SCI7721YRA		2.73	2.80	2.87		2.0 (V <sub>DD</sub> = 3.0V)
SCI7721YGA		2.93	3.00	3.07		2.0 (V <sub>DD</sub> = 4.0V)
SCI7721YHA		3.13	3.20	3.27		2.0 (V <sub>DD</sub> = 4.0V)
SCI7721Y3A		3.43	3.50	3.57		2.0 (V <sub>DD</sub> = 4.0V)
SCI7721YTA		3.90	4.00	4.10		2.0 (V <sub>DD</sub> = 5.0V)
SCI7721YMA		4.10	4.20	4.30		2.0 (V <sub>DD</sub> = 5.0V)
SCI7721YJA		4.30	4.40	4.50		2.0 (V <sub>DD</sub> = 5.0V)
SCI7721Y2A		4.50	4.60	4.70		2.0 (V <sub>DD</sub> = 5.0V)
SCI7721YKA		4.70	4.80	4.90		2.0 (V <sub>DD</sub> = 5.0V)
SCI7721YLA	4.90	5.00	5.10	2.0 (V <sub>DD</sub> = 6.0V)		

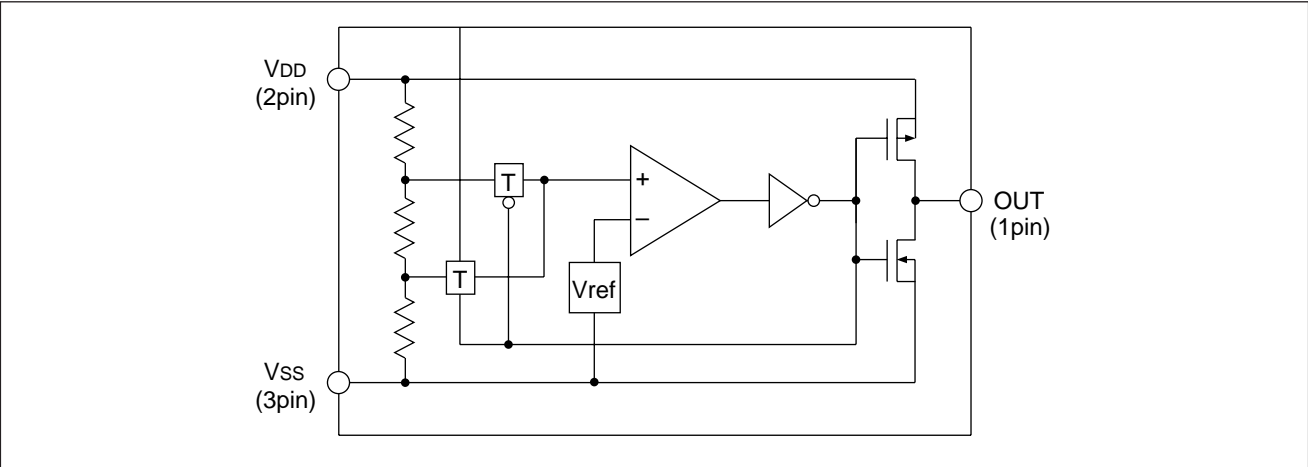
\* : Output reversal type

## ■ BLOCK DIAGRAM

● SCI7720Y series



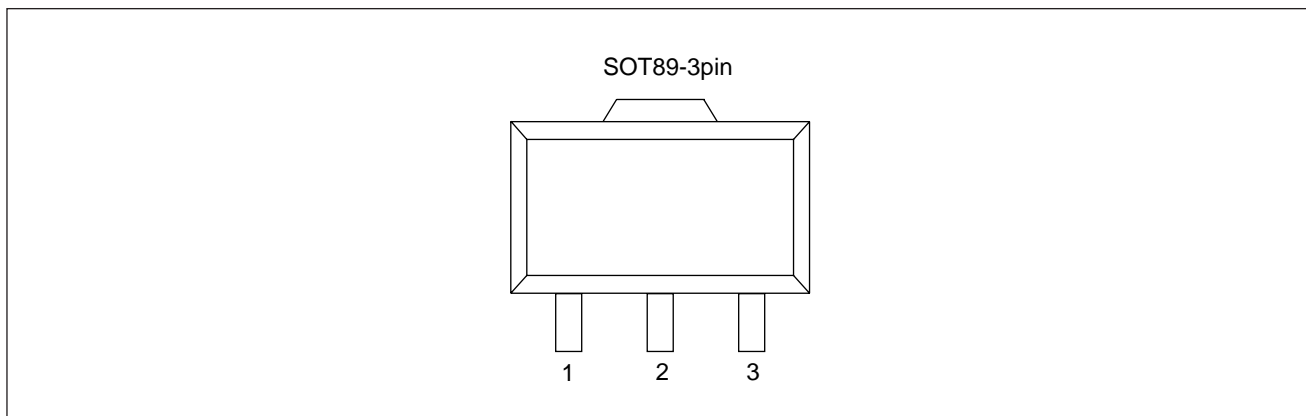
● SCI7721Y series



# SCI7720Y Series

## ■ PIN DIAGRAM

### ● Pin diagram



### ● Pin description

Pin No.	Pin names	Pin functions
1	OUT	Voltage detect output pin
2	VDD	Input voltage pin (positive side)
3	VSS	Input voltage pin (negative side)

## ■ ABSOLUTE MAXIMUM RATING

Item	Symbols	Rating	Unit
Supply voltage range	VDD to VSS	15	V
Output voltage	V <sub>O</sub>	VDD + 0.3 to VSS -  0.3	
Output current	I <sub>O</sub>	50	mA
Allowable loss	PD	200	mW
Operating temperature	T <sub>opr</sub>	- 30 to +85	°C
Storage ambient temperature	T <sub>stg</sub>	- 65 to +150	
Soldering time Soldering temperature	T <sub>sol</sub>	260°C 10 sec. (At lead)	-

## ■ ELECTRIC CHARACTERISTICS

### ● SCI7720Y<sub>FA</sub>

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

Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	V <sub>DD</sub>	—————	1.50	-	12.0	V
Detecting voltage	V <sub>DET</sub>	Ta = 25°C	2.60	2.65	2.70	V
Hysteresis width	V <sub>HYS</sub>	V <sub>HYS</sub> = V <sub>REL</sub> - V <sub>DET</sub>	0.05	0.10	0.15	V
Operating current	I <sub>DD</sub>	V <sub>DD</sub> = 3.0V	-	2.00	5.00	μA
Detecting voltage temperature characteristics	$\frac{\Delta V_{DET}}{V_{DET}}$	—————	-300	-100	+100	ppm/ °C
Low level output current	I <sub>OL</sub>	V <sub>DD</sub> = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	t <sub>PHL</sub>	V <sub>DD</sub> = 3V → 2V Ta = 25°C	-	8	40	μS
		V <sub>DD</sub> = 3V → 2V Ta = -30°C to 85°C	-	-	200	μS

### ● SCI7720Y<sub>TA</sub>

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

Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	V <sub>DD</sub>	—————	1.50	-	12.0	V
Detecting voltage	V <sub>DET</sub>	Ta = 25°C	3.90	4.00	4.10	V
Hysteresis width	V <sub>HYS</sub>	V <sub>HYS</sub> = V <sub>REL</sub> - V <sub>DET</sub>	0.13	0.20	0.27	V
Operating current	I <sub>DD</sub>	V <sub>DD</sub> = 5.0V	-	2.00	5.00	μA
Detecting voltage temperature characteristics	$\frac{\Delta V_{DET}}{V_{DET}}$	—————	-300	-100	+100	ppm/ °C
Low level output current	I <sub>OL</sub>	V <sub>DD</sub> = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	t <sub>PHL</sub>	V <sub>DD</sub> = 5V → 4V Ta = 25°C	-	8	40	μS
		V <sub>DD</sub> = 5V → 4V Ta = -30°C to 85°C	-	-	200	μS

# SCI7720Y Series

## ● SCI7721Y<sub>EA</sub>

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

Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	V <sub>DD</sub>	—————	1.50	-	12.0	V
Detecting voltage	V <sub>DET</sub>	Ta = 25 °C	2.50	2.55	2.60	V
Hysteresis width	V <sub>HYS</sub>	V <sub>HYS</sub> = V <sub>REL</sub> - V <sub>DET</sub>	0.05	0.10	0.15	V
Operating current	I <sub>DD</sub>	V <sub>DD</sub> = 3.0V	-	2.00	5.00	μA
Detecting voltage temperature characteristics	$\frac{\Delta V_{DET}}{V_{DET}}$	—————	-300	-100	+100	ppm/ °C
High level output current	I <sub>OH</sub>	V <sub>DD</sub> = 3.0V OUT = 2.7V	-	-1.00	-0.25	mA
Low level output current	I <sub>OL</sub>	V <sub>DD</sub> = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	t <sub>PHL</sub>	V <sub>DD</sub> = 3V→2V Ta = 25°C	-	8	40	μS
		V <sub>DD</sub> = 3V→2V Ta = -30°C to 85°C	-	-	200	μS

## ● SCI7721Y<sub>FA</sub>

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

Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	V <sub>DD</sub>	—————	1.50	-	12.0	V
Detecting voltage	V <sub>DET</sub>	Ta = 25°C	2.60	2.65	2.70	V
Hysteresis width	V <sub>HYS</sub>	V <sub>HYS</sub> = V <sub>REL</sub> -V <sub>DET</sub>	0.05	0.10	0.15	V
Operating current	I <sub>DD</sub>	V <sub>DD</sub> = 3.0V	-	2.00	5.00	μA
Detecting voltage temperature characteristics	$\frac{\Delta V_{DET}}{V_{DET}}$	—————	-300	-100	+100	ppm/ °C
High level output current	I <sub>OH</sub>	V <sub>DD</sub> = 3.0V OUT = 2.7V	-	-1.00	-0.25	mA
Low level output current	I <sub>OL</sub>	V <sub>DD</sub> = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	t <sub>PHL</sub>	V <sub>DD</sub> = 3V→2V Ta = 25°C	-	8	40	μS
		V <sub>DD</sub> = 3V→2V Ta = -30°C to 85°C	-	-	200	μS

● SCI7721YTA

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

Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	VDD	—————	1.50	-	12.0	V
Detecting voltage	VDET	Ta = 25°C	3.90	4.00	4.10	V
Hysteresis range	VHYS	VHYS = VREL - VDET	0.13	0.20	0.27	V
Operating current	IDD	VDD = 5.0V	-	2.00	5.00	μA
Detecting voltage temperature characteristics	$\frac{\Delta V_{DET}}{V_{DET}}$	—————	-300	-100	+100	ppm/ °C
High level output current	IOH	VDD = 5.0V OUT = 4.5V	-	-2.00	-0.50	mA
Low level output current	IOL	VDD = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	tPHL	VDD = 5V→4V Ta = 25°C	-	8	40	μS
		VDD = 5V→4V Ta = -30°C to 85°C	-	-	200	μS

● SCI7721YJA

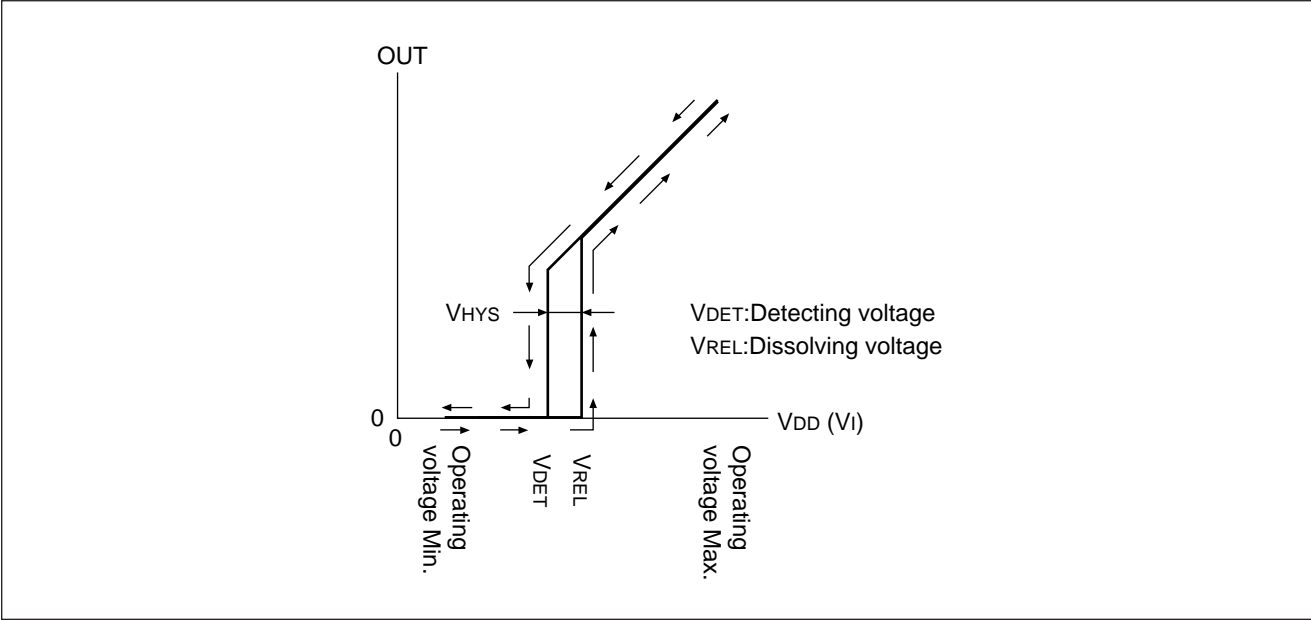
(Except where otherwise specified, Ta=-30°C to +85°C)

Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	VDD	—————	1.50	-	12.0	V
Detecting voltage	VDET	Ta = 25°C	4.30	4.40	4.50	V
Hysteresis range	VHYS	VHYS = VREL - VDET	0.13	0.20	0.27	V
Operating current	IDD	VDD = 5.0V	-	2.00	5.00	μA
Detecting voltage temperature characteristics	$\frac{\Delta V_{DET}}{V_{DET}}$	—————	-300	-100	+100	ppm/ °C
High level output current	IOH	VDD = 5.0V OUT = 4.5V	-	-2.00	-0.50	mA
Low level output current	IOL	VDD = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	tPHL	VDD = 5V→4V Ta = 25°C	-	8	40	μS
		VDD = 5V→4V Ta = -30°C to 85°C	-	-	200	μS

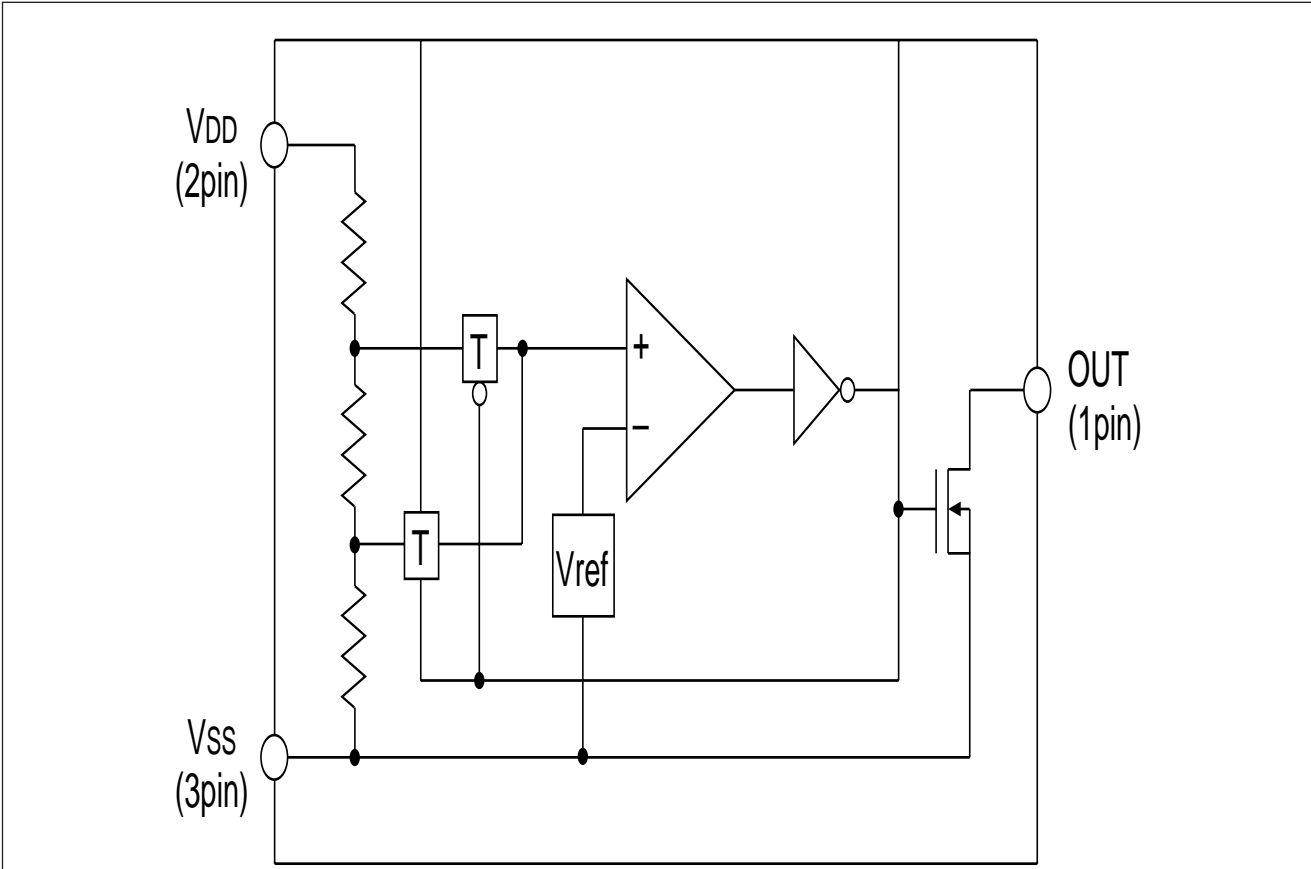
# SCI7720Y Series

## INPUT AND OUTPUT CHARACTERISTICS

I/O characteristics diagram of SCI7720Y series (N-channel open drain output type) when pull-up resistance is connected between OUT pin and VDD pin.



## OVERALL DIMENSION DIAGRAM



Note: Avoid using dip soldering for mounting devices, otherwise they can be damaged.

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