EPSON

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 μ A
● Wide operating voltage range	15V to 12.0V
● High voltage detection accuracy	± 2.5%
● Smaller detecting voltage temperature coefficient	Typically, -100 ppm/ °C
● Package	SOT89-3pin

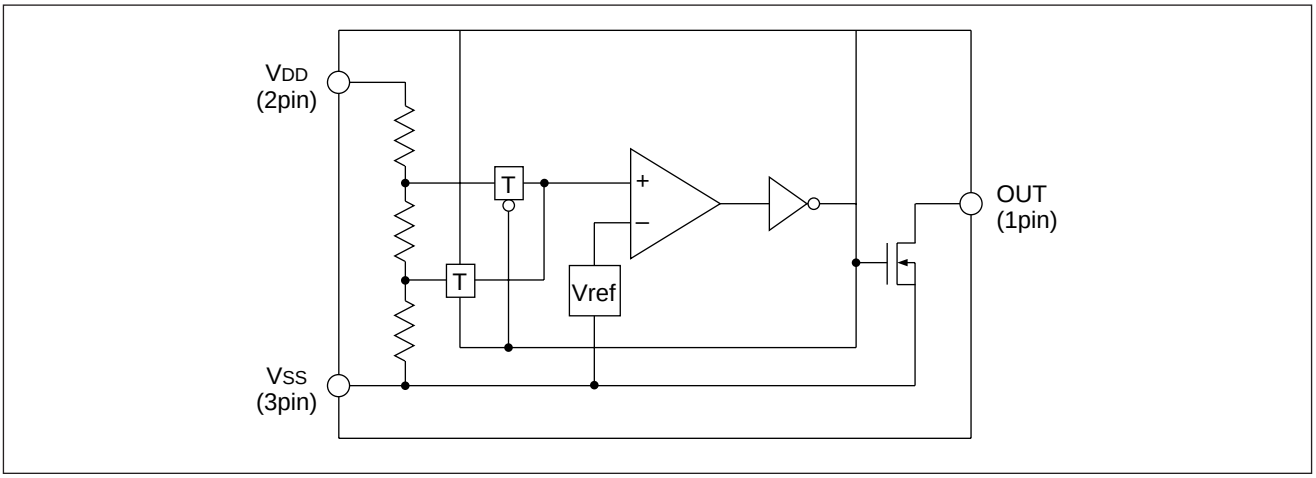
■ MODEL CLASSIFICATIONS

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

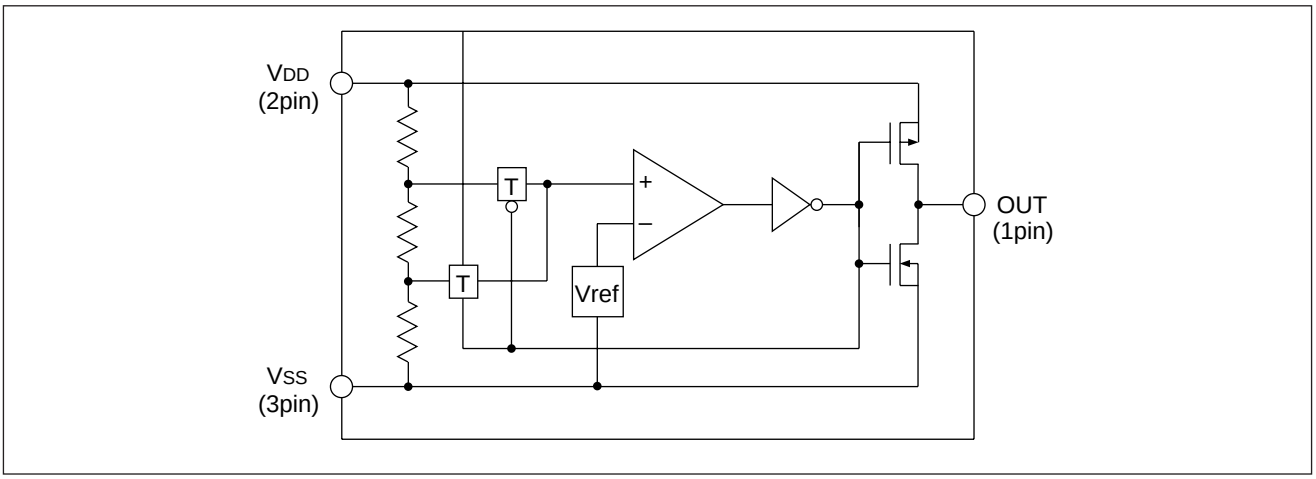
* : Output reversal type

■ BLOCK DIAGRAM

● SCI7720Y series

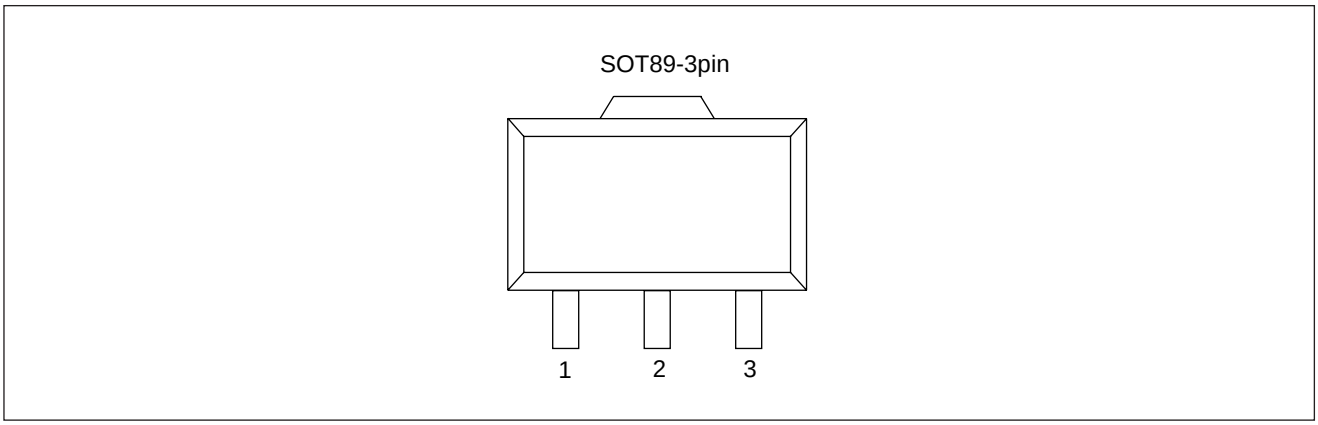


● SCI7721Y series



■ PIN DIAGRAM

● Pin diagram



● Pin description

Pin No.	Pin names	Pin functions
1	OUT	Voltage detect output pin
2	V_{DD}	Input voltage pin (positive side)
3	V_{SS}	Input voltage pin (negative side)

■ ABSOLUTE MAXIMUM RATING

Item	Symbols	Rating	Unit
Supply voltage range	V_{DD} to V_{SS}	15	V
Output voltage	V_O	V_{DD} + 0.3 to V_{SS}-|0.3	
Output current	I_O	50	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 Soldering temperature	T_{sol}	260°C 10 sec. (At lead)	-

■ ELECTRIC CHARACTERISTICS

● SCI7720Y$_{FA}$

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

Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	V_{DD}	———	1.50	-	12.0	V
Detecting voltage	V_{DET}	Ta = 25°C	2.60	2.65	2.70	V
Hysteresis width	V_{HYS}	$V_{HYS} = V_{REL} - V_{DET}$	0.05	0.10	0.15	V
Operating current	I_{DD}	V_{DD} = 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_{OL}	V_{DD} = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	t_{PHL}	V_{DD} = 3V → 2V Ta = 25°C	-	8	40	µS
		V_{DD} = 3V → 2V Ta = -30°C to 85°C	-	-	200	µS

● SCI7720Y$_{TA}$

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

Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	V_{DD}	———	1.50	-	12.0	V
Detecting voltage	V_{DET}	Ta = 25°C	3.90	4.00	4.10	V
Hysteresis width	V_{HYS}	$V_{HYS} = V_{REL} - V_{DET}$	0.13	0.20	0.27	V
Operating current	I_{DD}	V_{DD} = 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_{OL}	V_{DD} = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	t_{PHL}	V_{DD} = 5V→ 4V Ta = 25°C	-	8	40	µS
		V_{DD} = 5V→ 4V Ta = -30°C to 85°C	-	-	200	µS

● SCI7721Y$_{EA}$

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

Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	V_{DD}	———	1.50	-	12.0	V
Detecting voltage	V_{DET}	Ta = 25 °C	2.50	2.55	2.60	V
Hysteresis width	V_{HYS}	$V_{HYS} = V_{REL} - V_{DET}$	0.05	0.10	0.15	V
Operating current	I_{DD}	V_{DD} = 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_{OH}	V_{DD} = 3.0V OUT = 2.7V	-	-1.00	-0.25	mA
Low level output current	I_{OL}	V_{DD} = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	t_{PHL}	V_{DD} = 3V→ 2V Ta = 25°C	-	8	40	µS
		V_{DD} = 3V→ 2V Ta =-30°C to 85°C	-	-	200	µS

● SCI7721Y$_{FA}$

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

Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	V_{DD}	———	1.50	-	12.0	V
Detecting voltage	V_{DET}	Ta = 25°C	2.60	2.65	2.70	V
Hysteresis width	V_{HYS}	$V_{HYS} = V_{REL}-V_{DET}$	0.05	0.10	0.15	V
Operating current	I_{DD}	V_{DD} = 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_{OH}	V_{DD} = 3.0V OUT = 2.7V	-	-1.00	-0.25	mA
Low level output current	I_{OL}	V_{DD} = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	t_{PHL}	V_{DD} = 3V→2V Ta = 25°C	-	8	40	µS
		V_{DD} = 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	V_{DD}	———	1.50	-	12.0	V
Detecting voltage	V_{DET}	Ta = 25°C	3.90	4.00	4.10	V
Hysteresis range	V_{HYS}	$V_{HYS} = V_{REL} - V_{DET}$	0.13	0.20	0.27	V
Operating current	I_{DD}	V_{DD} = 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	I_{OH}	V_{DD} = 5.0V OUT = 4.5V	-	-2.00	-0.50	mA
Low level output current	I_{OL}	V_{DD} = 2.0V OUT = 0.2V	0.20	1.00	-	mA
Detecting voltage response time	t_{PHL}	V_{DD} = 5V→4V Ta = 25°C	-	8	40	µS
		V_{DD} = 5V→4V Ta = -30°C to 85°C	-	-	200	µS

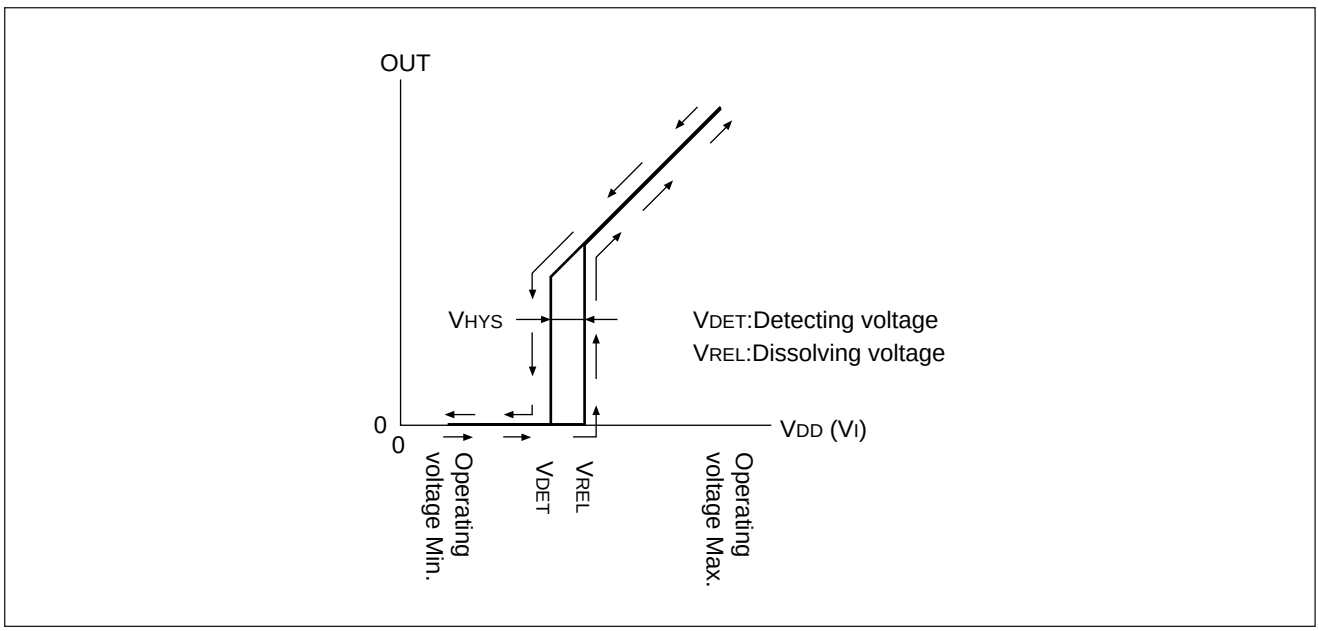
● SCI7721YJA

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

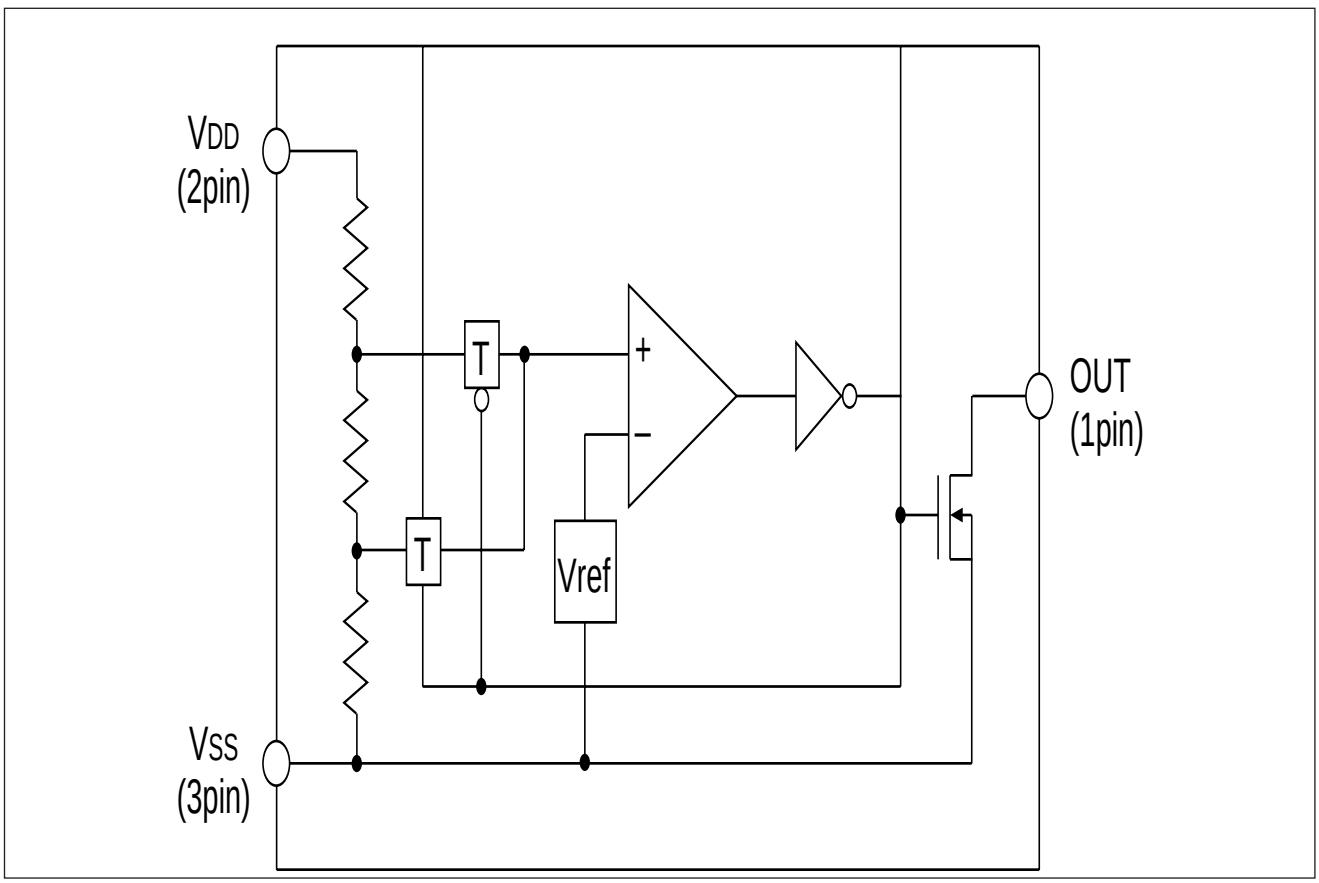
Items	Symbols	Condition	Min.	Typ.	Max.	Unit
Operating voltage	V_{DD}	———	1.50	-	12.0	V
Detecting voltage	V_{DET}	Ta = 25°C	4.30	4.40	4.50	V
Hysteresis range	V_{HYS}	$V_{HYS} = V_{REL} - V_{DET}$	0.13	0.20	0.27	V
Operating current	I_{DD}	V_{DD} = 5.0V	-	2.00	5.00	µA
Detecting voltage temperature characteristics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

■ 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 V_{DD} pin.



■ OVERALL DIMENSION DIAGRAM



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

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