ULTRA-SMALL PACKAGE HIGH-PRECISION VOLTAGE DETECTOR

The G61CxxC series is a series of high-precision voltage detectors developed using CMOS process. The detection voltage is fixed internally with an accuracy of ±2.0%. Two output forms, Nch open-drain and CMOS output, are available. Ultra-low current consumption and miniature package lineup can meet demand from the portable device applications.

■ Features

● Ultra-low current consumption 0.8 μA typ. （Vin=1.5V）
● High-precision detection voltage ±2.0 %
● Operating voltage range 0.7 V to 8 V
● Detection voltage 1.5 V to 6.0 V (0.1 V step)
● Output form Nch open-drain output (Active Low) or CMOS output (Active Low)
●Small package: SOT23-3，SSOT-24，SOT-89，TO-92

■ Applications

● Battery checkers
● Power failure detectors
● Power monitor for portable equipments such as pagers, calculators, electronic notebooks and remote controllers.
● Constant voltage power monitor for cameras, video equipments and communication devices.
● Power monitor for microcomputers and reset for CPUs.

■ Block Diagrams

（1） **CMOS Output Products**　　　　　（2） **Nch Open-drain Output Products**
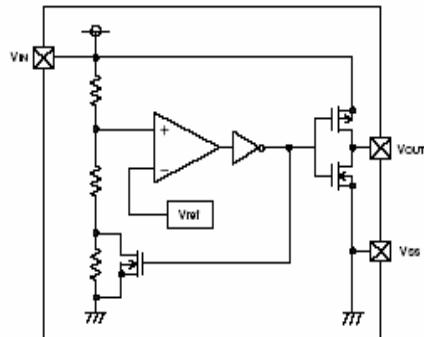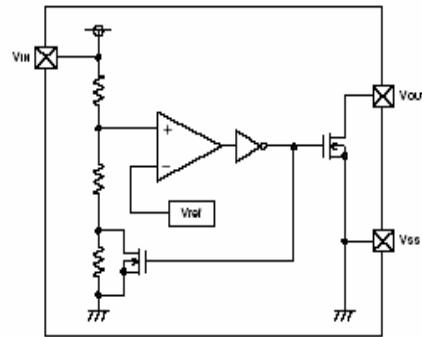
■ Pin Configurations
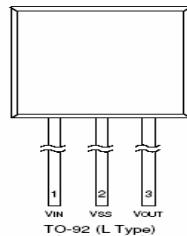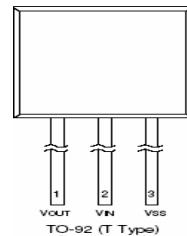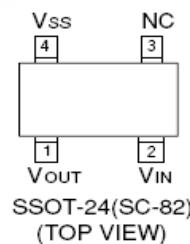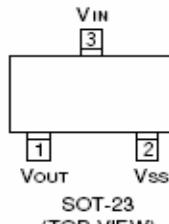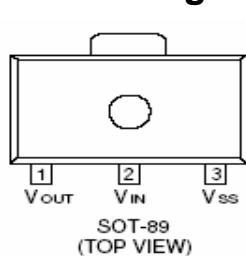
ULTRA-SMALL PACKAGE HIGH-PRECISION VOLTAGE DETECTOR

■ Pin Assignment

Pin No.					Pin name	Pin description
SOT23-3	SOT89-3	TO-92（T）	TO-92（L）	SSOT-24		
3	2	2	1	2	VIN	Voltage input pin
2	3	3	2	4	VSS	GND pin
1	1	1	3	1	VOUT	output pin
-	-	-	-	3	NC	No connection

■ Typical application
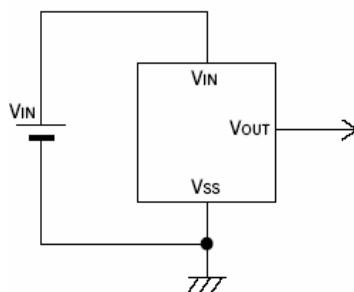
CMOS Output
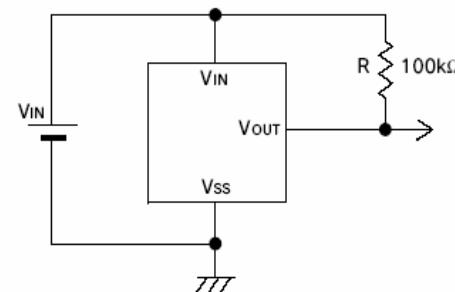
Nch Open-drain Output

■ Absolute Maximum Ratings

Ta=25℃

Item		Symbol	Absolute maximum ratings	unit
Power supply voltage		Vin	8	V
Output current		Iout	50	mA
Output voltage	CMOS	Vout	Vss-0.3～Vin+0.3	V
	N-ch		Vss-0.3～8	
Power dissipation	SOT23-3	Pd	150	mW
	SOT89-3		500	
	SSOT-24		150	
	TO-92		300	
Operating ambient temperature		Topr	-40～+85	℃

■ Electrical Characteristics

VDF (T) = 1.6 to 6.0V ±2%

Item	Symbol	Condition	Min.	Typ.	Max.	unit	Test circuit
Detection voltage	VDF		VDF x0.98	VDF	VDF x1.02	V	1
Release voltage	VHYS		VDF x0.02	VDF x0.05	VDF x0.08	V	1
Current	Iss	Vin=1.5V		0.8	2.4	uA	2
		=2.0V		0.9	2.8		
		=3.0V		1.0	3.1		

2

ULTRA-SMALL PACKAGE HIGH-PRECISION VOLTAGE DETECTOR

consumption		=4.0V			1.1	3.3		
		=5.0V			1.2	3.7		
Operating voltage	Vin	VDF=1.60~6.0V		0.7		8	V	1
Output current	Iout	Nch Vds= 0.5V	Vin=1.0V	1.0	2.2		mA	3
			Vin=2.0V	3.0	7.7			
			Vin=3.0V	5.0	10.1			
			Vin=4.0V	6.0	11.5			
			Vin=5.0V	7.0	13.0			
		Pch vds=2.1 vin=8.0			-10	-2		4
temperature coefficient		-40~+85℃			±100		ppm/℃	

■ **Test circuit**
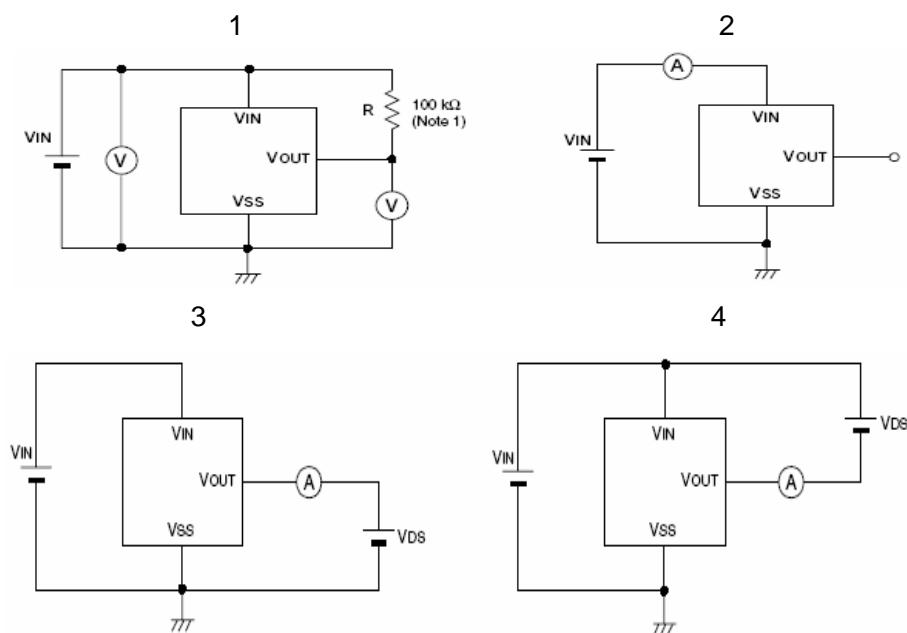
■ **Timing Chart**
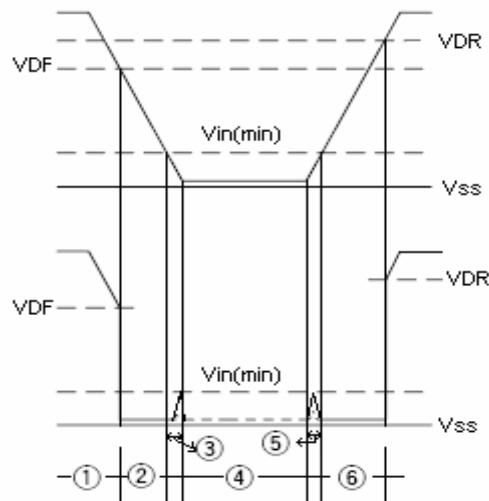
## ULTRA-SMALL PACKAGE HIGH-PRECISION VOLTAGE DETECTOR

■ Operation
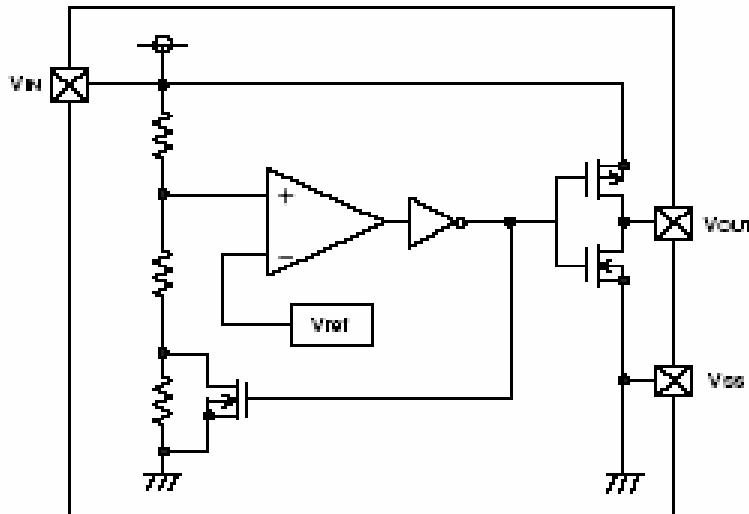
1-1. When the power supply voltage (VDD) is higher than the release voltage (VDF), the Nch transistor is OFF and the Pch transistor is ON to provide VDD (high) at   the output.

1-2. When the power supply voltage (VDD) is lower than the release voltage (VDF), the Nch transistor is ON and the Pch transistor is OFF to provide VSS (low) at the output.

1-3. When the VDD falls below the minimum operating voltage, the output becomes undefined, or goes to the VDD when the output is pulled up to the VDD.

1-4. The VSS level appears when the VDD is VSS level.

1-5. The VSS level appears when the VDD rises above the minimum operating voltage. The VSS level still appears even when the VDD surpasses − VDF, as long as it does not exceed the release voltage + VDF.

1-6. When the VDD rises above + VDF the Nch transistor becomes OFF and the Pch transistor becomes ON to provide VDD level at the output.

## ■ Product Classification

● **Ordering Information**

G 61C ①②③④⑤⑥⑦

DESIGNATOR	DESCRIPTION	DESIGNATOR	DESCRIPTION
①	Output Configuration: C=CMOS N=N-ch open drain	⑥	Package Type: M=SOT23-3 P=SOT89 N=SSOT-24 T=TO-92(Standard) L=TO-92(Custom pin configuration
②③	Detect Voltage 25=2.5V 38=3.8V		
④	Output Delay 0=No delay	⑦	Device Orientation: R=Embossed Taped(Right) L=Embossed Taped(Left) H=Paper Type(TO-92) B=Bag(TO-92)
⑤	Detect Accuracy: 2=with±2%		

ULTRA-SMALL PACKAGE HIGH-PRECISION VOLTAGE DETECTOR

■ Marking

● SOT-23，SOT-89

SSOT-24(SC-82) (TOP VIEW) SOT-23 (TOP VIEW) SOT-89 (TOP VIEW)
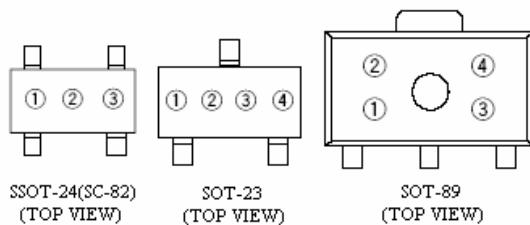
① Represents the product name

Symbol	Product Description
C	61C◆◆◆◆◆◆

② Represents the Output configuration and detect voltage range

DESIGNATOR	OUTPUT CONFIGURATION	VOLTAGE RANGE(V)
A	CMOS	0.1~3.0
B	CMOS	3.1~6.0
N	OPEN DRAIN	0.1~3.0
P	OPEN DRAIN	3.1~6.0

③Represents the detect voltage

DESIGNATOR	DETECT VOLTAGE (V)				DESIGNATIOR	DETECT VOLTAGE (V)			
0	–	3.1	–	3.15	F	1.6	4.6	1.65	4.65
1	–	3.2	–	3.25	H	1.7	4.7	1.75	4.75
2	–	3.3	–	3.35	K	1.8	4.8	1.85	4.85
3	–	3.4	–	3.45	L	1.9	4.9	1.95	4.95
4	–	3.5	–	3.55	M	2	5	2.05	5.05
5	–	3.6	–	3.65	N	2.1	5.1	2.15	5.15
6	–	3.7	–	3.75	P	2.2	5.2	2.25	5.25
7	–	3.8	–	3.85	R	2.3	5.3	2.35	5.35
8	–	3.9	–	3.95	S	2.4	5.4	2.45	5.45
9	–	4	–	4.05	T	2.5	5.5	2.55	5.55
A	–	4.1	–	4.15	U	2.6	5.6	2.65	5.65
B	–	4.2	–	4.25	V	2.7	5.7	2.75	5.75
C	–	4.3	–	4.35	X	2.8	5.8	2.85	5.85
D	–	4.4	–	4.45	Y	2.9	5.9	2.95	5.95
E	1.5	4.5	1.55	4.55	Z	3	6	3.05	6.05

④Based on internal standards

0~9，A~Z repeated G，I，J，O，Q，W are excepted）

ULTRA-SMALL PACKAGE HIGH-PRECISION VOLTAGE DETECTOR

- TO−92

TO-92 (L Type)
(TOP VIEW)

TO-92 (T Type)
(TOP VIEW)
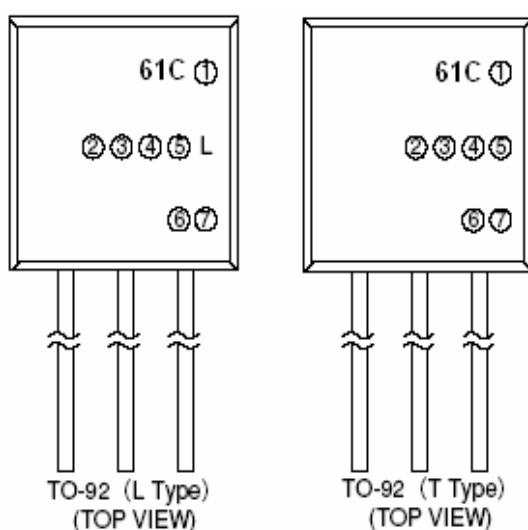
①Represents the output configuration

DESIGNATOR	OUTPUT CONFIGURATION
C	CMOS
T	N-ch open drain

②③Represents the detect voltage

DESIGNATOR		DETECT VOLTAGE (V)	PRODUCT NAME
②	③		
2	4	2.4	LN61C*24****
3	0	3.0	LN61C*30****

④Represents the output delay

DESIGNATOR	OUTPUT DELAY
0	NO DELAY

⑤represents the detect voltage accuracy

DESIGNATOR	OUTPUT ACCURACY
1	Within ±1%
2	Within ±2%

⑥Represents a least significant digit of the produced year

DESIGNATOR	PRODUCED YEAR	PRODUCT NAME
1	2001	LN61C*****1*
2	2002	LN61C*****2*

⑦Denotes the production lot number

0～9, A～Z repeated (G, I, J, O, Q, W excepted)

■ Application Circuit Examples

● Microcomputer Reset Circuits
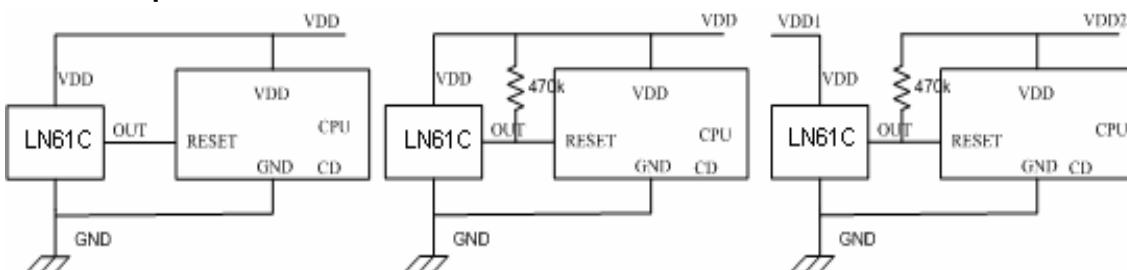
The Same supply voltage with CPU
(CMOS output)

The same supply voltage with CPU
(Nch Open drain output)

The different supply voltage with CPU
(Nch Open drain output)

ULTRA-SMALL PACKAGE HIGH-PRECISION
## VOLTAGE DETECTOR

● **Power-on Reset Circuit**

Nch Open drain output   Nch Open drain output
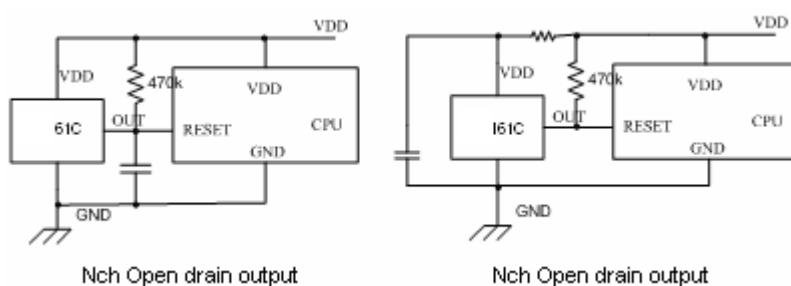
● **Mermory back-up circuit**
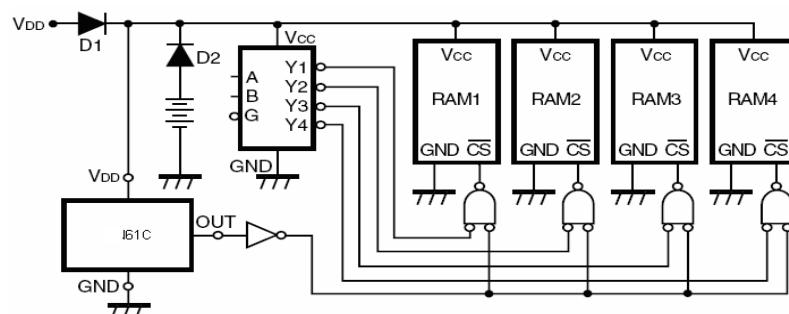
● **Power failure detectors**
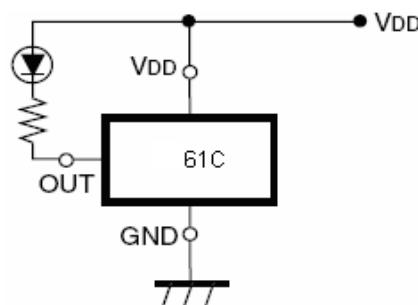

● **Overcharge protect circuit**
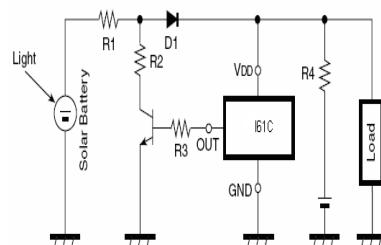
●**Window Comparator Circuit**
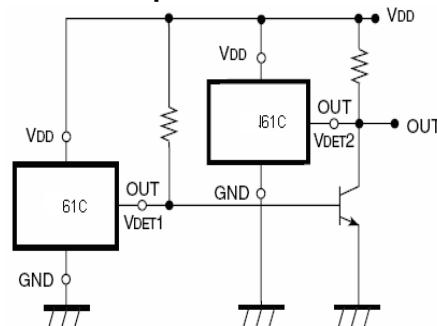
● **Detector Adjustable Circuit**
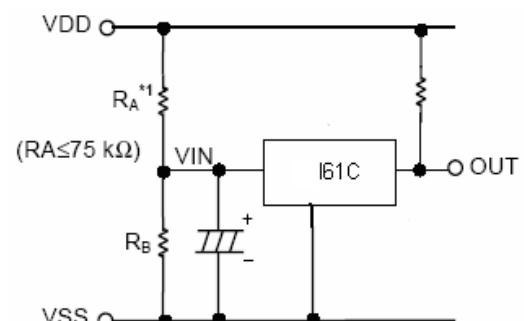
## ULTRA-SMALL PACKAGE HIGH-PRECISION VOLTAGE DETECTOR

■ **PACKAGE INFORMATION**

● SOT23-3
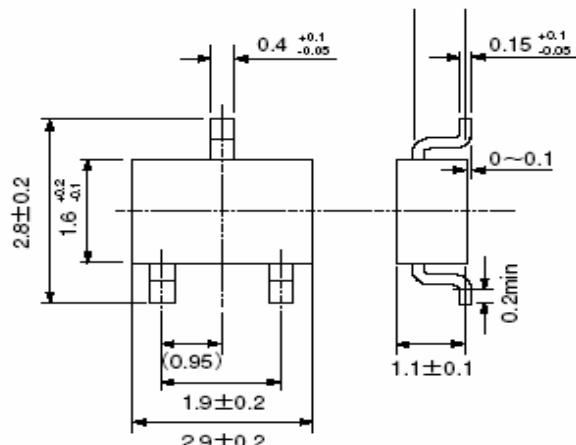
● SOT89-3
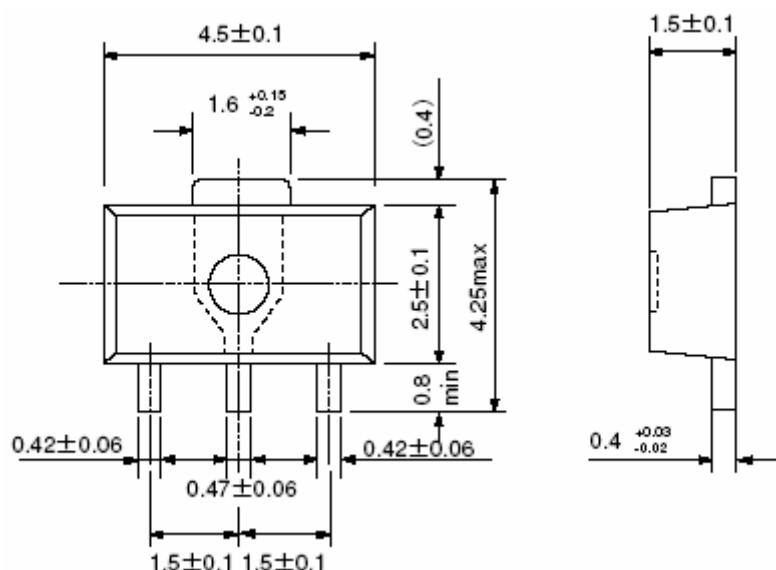
● TO-92
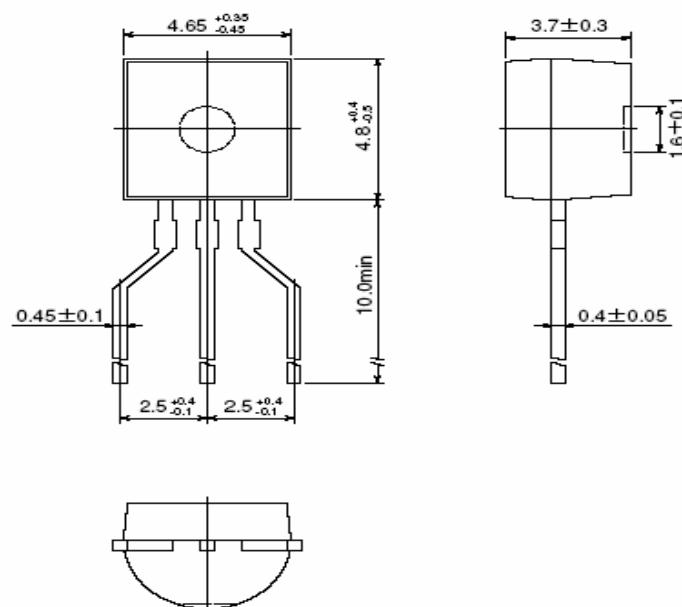
ULTRA-SMALL PACKAGE HIGH-PRECISION VOLTAGE DETECTOR

● SSOT-24
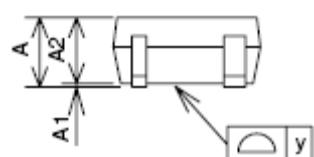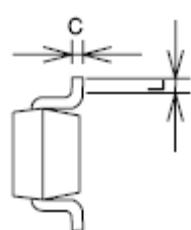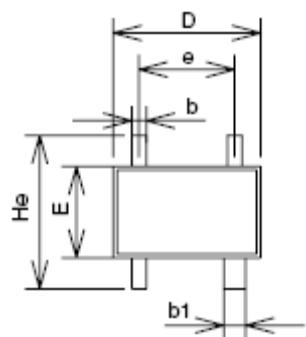
	SIZE mm		
	MIN	TYP	MAX
A	0.80	—	1.10
A1	0.00	—	0.10
A2	0.80	—	1.00
b	0.15	0.25	0.30
b1	0.25	0.35	0.40
C	0.075	0.125	0.225
D	1.80	2.00	2.20
E	1.15	1.25	1.45
He	1.80	2.10	2.40
e	1.10	1.30	1.50
L	0.10	0.30	—
y	—	—	0.10