IC for CMOS Detector Monolithic IC KIC71** Series

This IC functions in a variety of CPU systems and other logic systems, to detect supply voltage and reset the system accurately when the power is turned on or interrupted.
To 2% of detection voltage accuracy of the conventional models, a maximum of 1% of super-high precision is realized, and it is more suitable for battery detection ets.
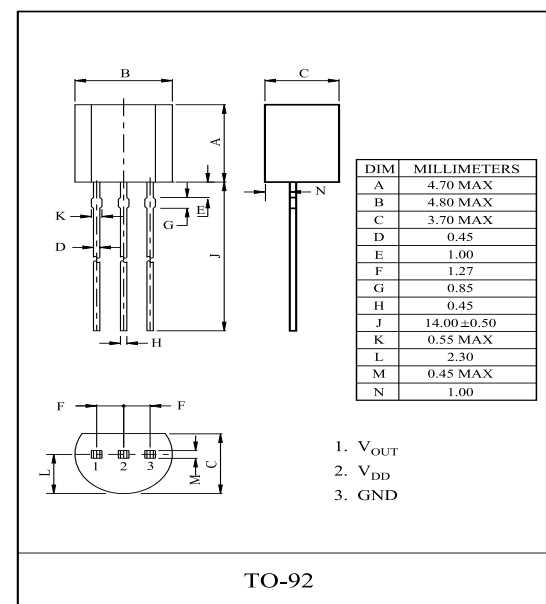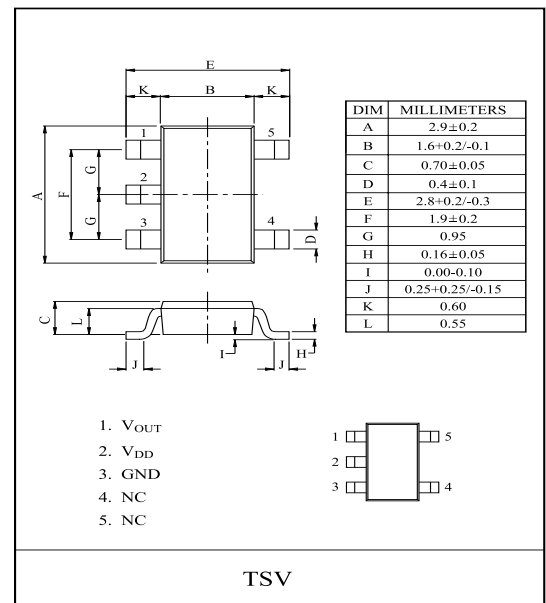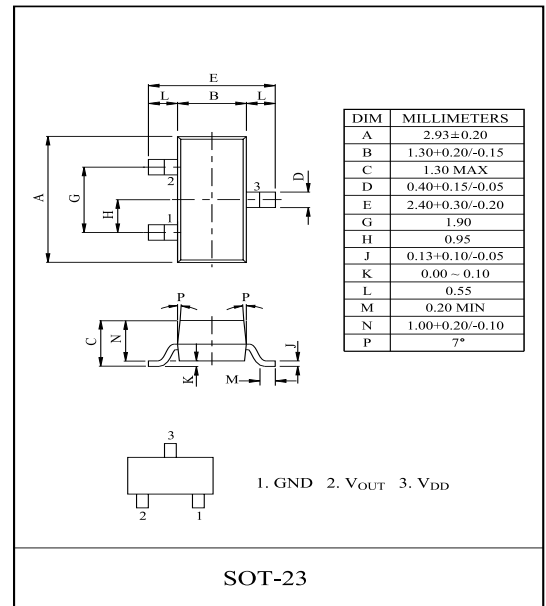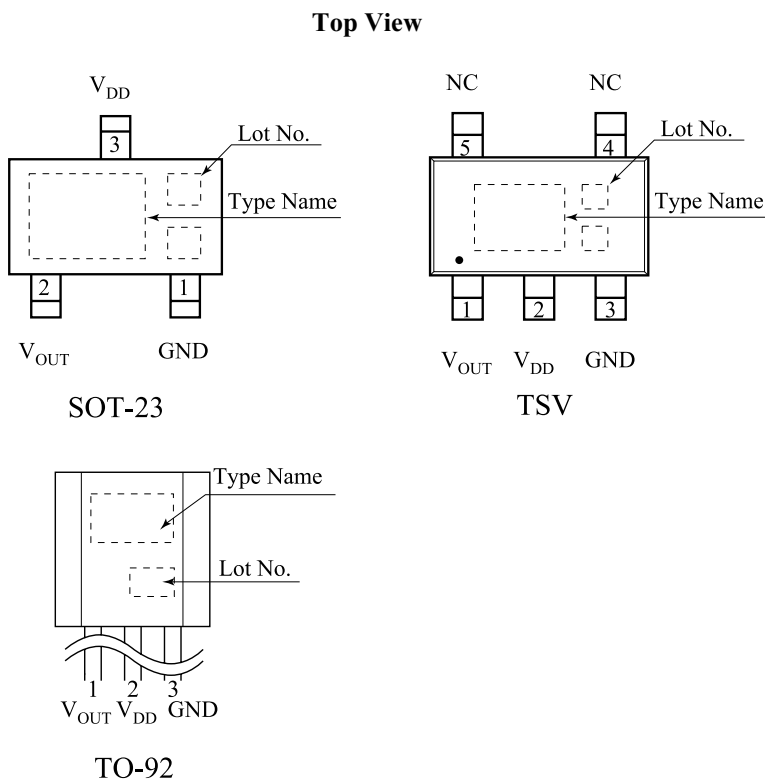
FEATURES

· High Accuracy : ± 1%

· Ultra-low current consumption: 0.25μA(Typ)

· Operating temperature range : -40~ + 105

· Detecting voltage rank : 0.8 ~ 6.0V(0.1V step)

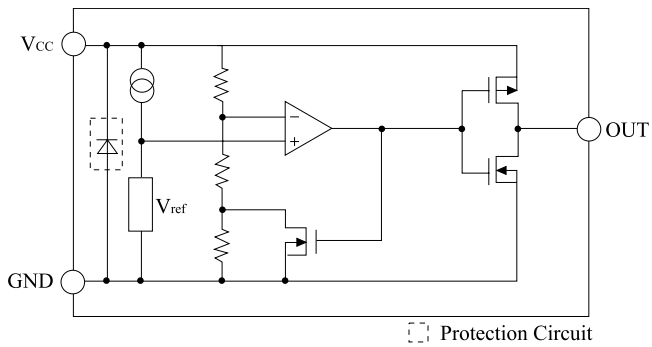· Output configuration : CMOS output

Applications

· Reset circuits for microcomputers, CPUs and MPUs

· Reset circuits for logic circuits

· Battery voltage check circuits

· Back-up power supply switching circuits

· Level detection circuits

Pin Configuration

Top View

SOT-23

TSV

TO-92

DIM	MILLIMETERS
A	2.93±0.20
B	1.30+0.20/-0.15
C	1.30 MAX
D	0.40+0.15/-0.05
E	2.40+0.30/-0.20
G	1.90
H	0.95
J	0.13+0.10/-0.05
K	0.00 ~ 0.10
L	0.55
M	0.20 MIN
N	1.00+0.20/-0.10
P	7°

1. GND 2. V_{OUT} 3. V_{DD}

SOT-23

DIM	MILLIMETERS
A	2.9±0.2
B	1.6+0.2/-0.1
C	0.70±0.05
D	0.4±0.1
E	2.8+0.2/-0.3
F	1.9±0.2
G	0.95
H	0.16±0.05
I	0.00-0.10
J	0.25+0.25/-0.15
K	0.60
L	0.55

1. V_{OUT}
2. V_{DD}
3. GND
4. NC
5. NC

TSV

DIM	MILLIMETERS
A	4.70 MAX
B	4.80 MAX
C	3.70 MAX
D	0.45
E	1.00
F	1.27
G	0.85
H	0.45
J	14.00 ±0.50
K	0.55 MAX
L	2.30
M	0.45 MAX
N	1.00

1. V_{OUT}
2. V_{DD}
3. GND

TO-92

Block Diagram

Pin No		Symbol	Function
SOT-23	TSV		
1	3	GND	GND
2	1	V_{OUT}	Detector Output
3	2	V_{DD}	Power Supply Voltage
-	4.5	NC	No Connection.

Figure. 1

Selection Guide

The output voltage, package type for the ICs can be selected at the user's request.
The selection can be made with designating the part number as shown below

KIC7 1 ___ ___

NO.	Specifications		Description
	Function & Output Type		-
	Detection Voltage		0.8 ~ 6.0V
	Package	M	SOT - 23
		T5	TSV
		P	TO-92

Line-up

Detection voltage	SOT-23 / TSV		TO-92		Detection voltage	SOT-23 / TSV		TO-92	
	Item	Marking	Item	Marking		Item	Marking	Item	Marking
0.8V	KIC7108M/T5	108	KIC7108P	KIC7108	3.5V	KIC7135M/T5	135	KIC7135P	KIC7135
0.9V	KIC7109M/T5	109	KIC7109P	KIC7109	3.6V	KIC7136M/T5	136	KIC7136P	KIC7136
1.0V	KIC7110M/T5	110	KIC7110P	KIC7110	3.7V	KIC7137M/T5	137	KIC7137P	KIC7137
1.1V	KIC7111M/T5	111	KIC7111P	KIC7111	3.8V	KIC7138M/T5	138	KIC7138P	KIC7138
1.2V	KIC7112M/T5	112	KIC7112P	KIC7112	3.9V	KIC7139M/T5	139	KIC7139P	KIC7139
1.3V	KIC7113M/T5	113	KIC7113P	KIC7113	4.0V	KIC7140M/T5	140	KIC7140P	KIC7140
1.4V	KIC7114M/T5	114	KIC7114P	KIC7114	4.1V	KIC7141M/T5	141	KIC7141P	KIC7141
1.5V	KIC7115M/T5	115	KIC7115P	KIC7115	4.2V	KIC7142M/T5	142	KIC7142P	KIC7142
1.6V	KIC7116M/T5	116	KIC7116P	KIC7116	4.3V	KIC7143M/T5	143	KIC7143P	KIC7143
1.7V	KIC7117M/T5	117	KIC7117P	KIC7117	4.4V	KIC7144M/T5	144	KIC7144P	KIC7144
1.8V	KIC7118M/T5	118	KIC7118P	KIC7118	4.5V	KIC7145M/T5	145	KIC7145P	KIC7145
1.9V	KIC7119M/T5	119	KIC7119P	KIC7119	4.6V	KIC7146M/T5	146	KIC7146P	KIC7146
2.0V	KIC7120M/T5	120	KIC7120P	KIC7120	4.7V	KIC7147M/T5	147	KIC7147P	KIC7147
2.1V	KIC7121M/T5	121	KIC7121P	KIC7121	4.8V	KIC7148M/T5	148	KIC7148P	KIC7148
2.2V	KIC7122M/T5	122	KIC7122P	KIC7122	4.9V	KIC7149M/T5	149	KIC7149P	KIC7149
2.3V	KIC7123M/T5	123	KIC7123P	KIC7123	5.0V	KIC7150M/T5	150	KIC7150P	KIC7150
2.4V	KIC7124M/T5	124	KIC7124P	KIC7124	5.1V	KIC7151M/T5	151	KIC7151P	KIC7151
2.5V	KIC7125M/T5	125	KIC7125P	KIC7125	5.2V	KIC7152M/T5	152	KIC7152P	KIC7152
2.6V	KIC7126M/T5	126	KIC7126P	KIC7126	5.3V	KIC7153M/T5	153	KIC7153P	KIC7153
2.7V	KIC7127M/T5	127	KIC7127P	KIC7127	5.4V	KIC7154M/T5	154	KIC7154P	KIC7154
2.8V	KIC7128M/T5	128	KIC7128P	KIC7128	5.5V	KIC7155M/T5	155	KIC7155P	KIC7155
2.9V	KIC7129M/T5	129	KIC7129P	KIC7129	5.6V	KIC7156M/T5	156	KIC7156P	KIC7156
3.0V	KIC7130M/T5	130	KIC7130P	KIC7130	5.7V	KIC7157M/T5	157	KIC7157P	KIC7157
3.1V	KIC7131M/T5	131	KIC7131P	KIC7131	5.8V	KIC7158M/T5	158	KIC7158P	KIC7158
3.2V	KIC7132M/T5	132	KIC7132P	KIC7132	5.9V	KIC7159M/T5	159	KIC7159P	KIC7159
3.3V	KIC7133M/T5	133	KIC7133P	KIC7133	6.0V	KIC7160M/T5	160	KIC7160P	KIC7160
3.4V	KIC7134M/T5	134	KIC7134P	KIC7134					

KIC7108~7160M/T5/P

ABSOLUTE MAXIMUM RATINGS (Ta=25)

ITEM	SYMBOL	RATING		UNITS
Supply voltage	$V_{DD\ MAX.}$	-0.3 +12.0		V
Output voltage	V_{OUT}	-0.3 (V_{DD}+0.3)		V
Input current (V_{DD})	I_{DD}	20		mA
Output current ($\overline{RESET}$)	I_{OUT}	20		mA
Power Dissipation	P_D	SOT-23	350 * Note 1)	mW
		TSV	900 * Note 2)	
		TO-92	400	
Operating temperature	T_{OPR}	-40~+105		
Storage temperature	T_{STG}	-65~+150		

* Note 1) Package Mounted on 99.5% Alumina (10× 8× 0.6mm)

* Note 2) Package Mounted on a Ceramic board (600mm²× 0.8mm)

Recommended Operating Conditions

ITEM	SYMBOL	RATINGS	UNITS
Operating Temperature	T_{opr}	-40 +105	
Supply voltage	V_{DD}	0.70 ~ 10.0	V

Electrical characteristics : UnlessOtherwise Specified Ta=25

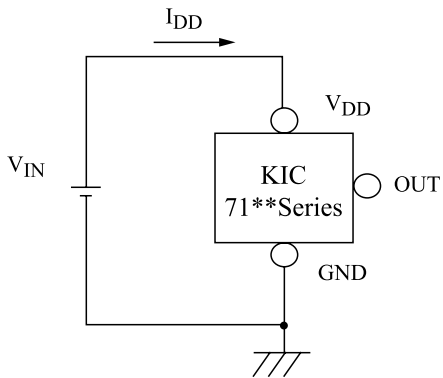| ITEM	SYMBOL	MEASUREMENT CONDITIONS	MIN.	TYP.	MAX.	UNITS	CIRCUIT
Supply current	I_{DD}	$V_{DD} = V_{TH} + 1V$	-	0.25	1.0	uA	(1)
Reset threshold	V_{TH}	Ta = +25	V_{TH}-1%	V_{TH} 0.8~6.0V (0.1Vstep)	V_{TH}+1%	V	(2)
		Ta = -40~+85 (note1)	V_{TH}-2.5%		V_{TH}+2.5%		
Reset threshold hysteresis	V_{TH}	V_{DD}=0V V_{TH} +1V 0V	V_{TH}× 0.03	-	V_{TH}× 0.08	V	(2)
Reset threshold temp. coefficient	$V_{TH}/$	Ta=-40~+85 (note 1)	-	± 100	-	ppm/	(2)
L transfer delay time	t_{PHL}	V_{DD}=V_{TH}+0.4V V_{TH}-0.4V(note 2)	-	-	100	us	(5)
H transfer delay time	t_{PLH}	V_{DD}=V_{TH}+0.4V V_{TH}-0.4V(note 2)	-	-	100	us	(5)
"L" output current	I_{OL1}	V_{DD}=0.7V, V_{DS}=0.05V	0.01	0.10		mA	(3)
	I_{OL2}	V_{DD}=1.2V, V_{DS}=0.5V V_{TH} 1.3V	0.23	2.00			
	I_{OL3}	V_{DD}=2.4V, V_{DS}=0.5V V_{TH} 2.5V	1.60	8.00			
	I_{OL4}	V_{DD}=3.6V, V_{DS}=0.5V V_{TH} 3.7V	3.20	12.0			
"H" output current	I_{OH1}	V_{DD}=4.8V, V_{DS}=0.5V, V_{TH} 4.7V	0.36	0.62		mA	(4)
	I_{OH2}	V_{DD}=6.1V, V_{DS}=0.5V, V_{TH} 5.9V	0.46	0.75			

note 1: This device is tested at Ta=25 , over temperature limits guaranteed by design only.
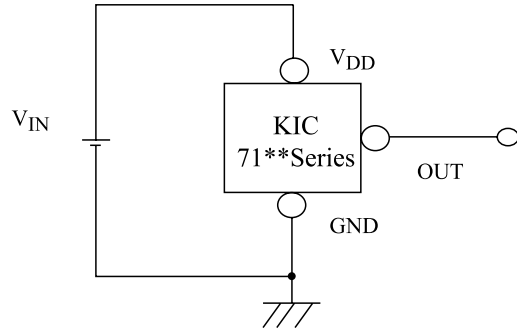
note 2: The parameter is guaranteed by design.

Test Circuits

(1) I_{DD}
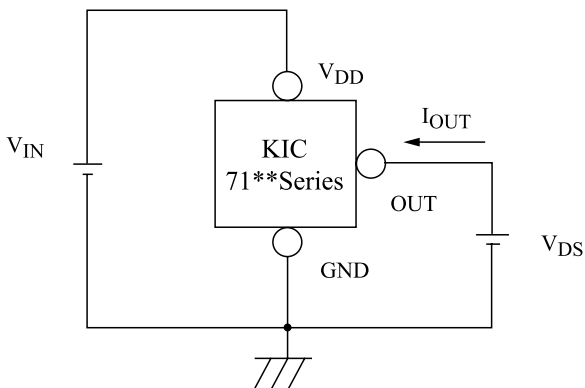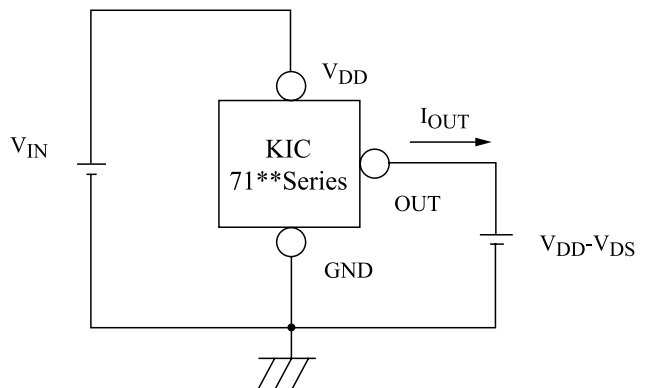

(2) V_{TH}, ΔV_{TH}, $\Delta V_{TH}/°C$

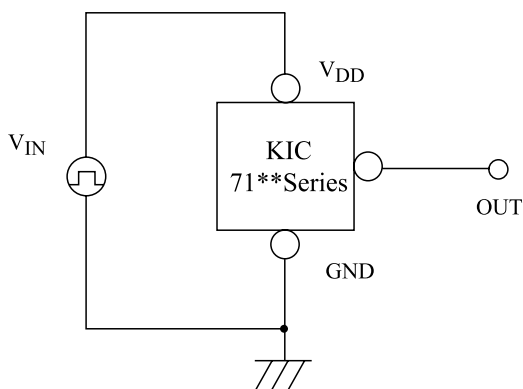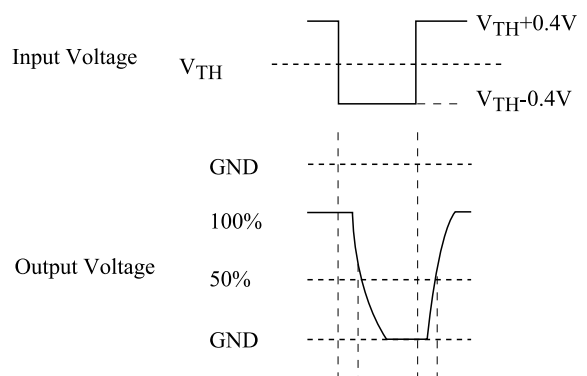
(3) I_{OL1}, I_{OL2}, I_{OL3}, I_{OL4}
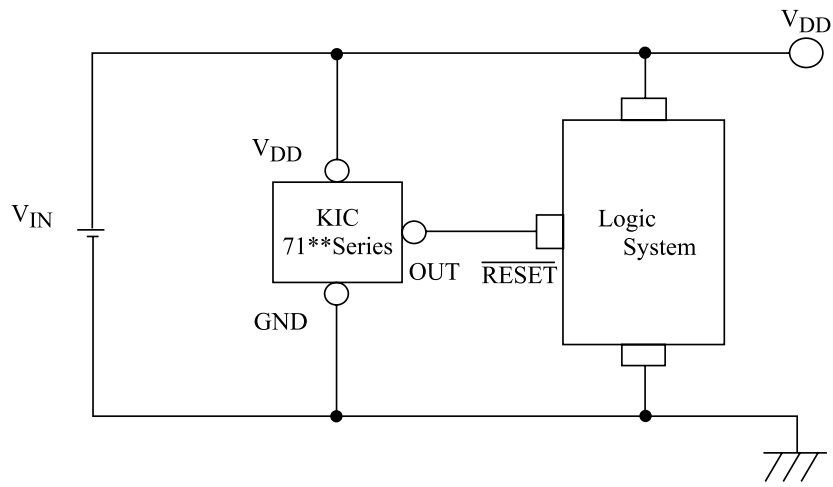

(4) I_{OH1}, I_{OH2}

(5) T_{PLH}, T_{PHL}

Test Wave

KIC7108~7160M/T5/P

Application Circuit

Typical Characteristics (Typical Performance Characteristics 2.8V)

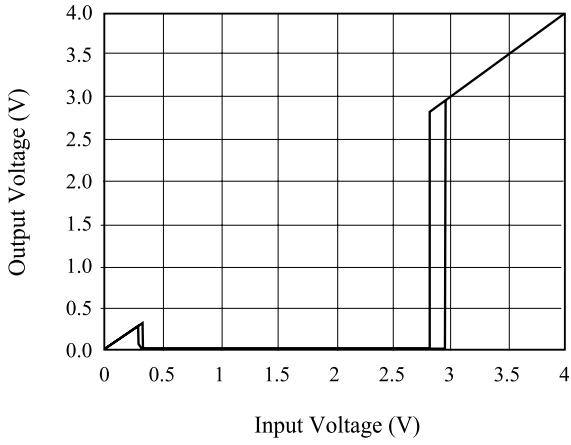note : These are typical characteristics
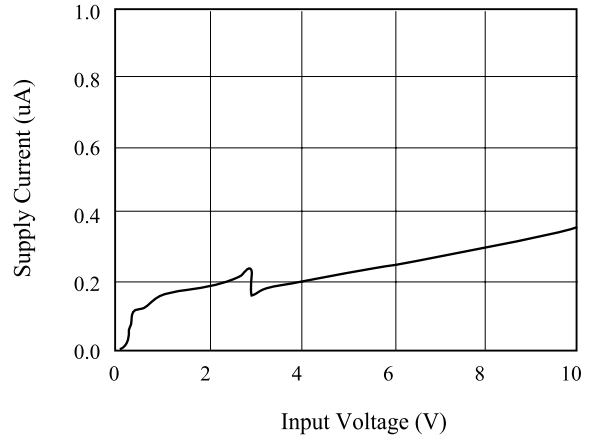
Fig1. Detecting Voltage

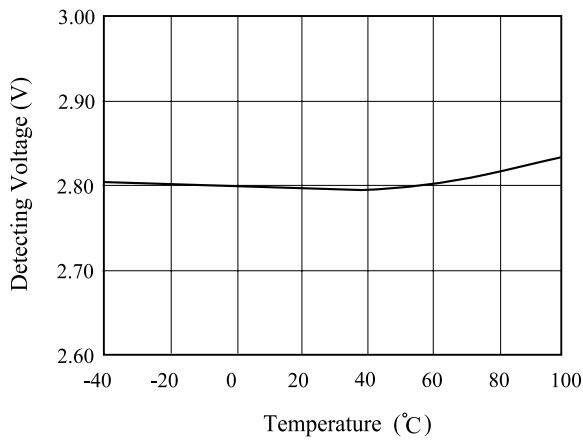Fig2. Supply Current

Fig3. Detecting Voltage vs Temperature

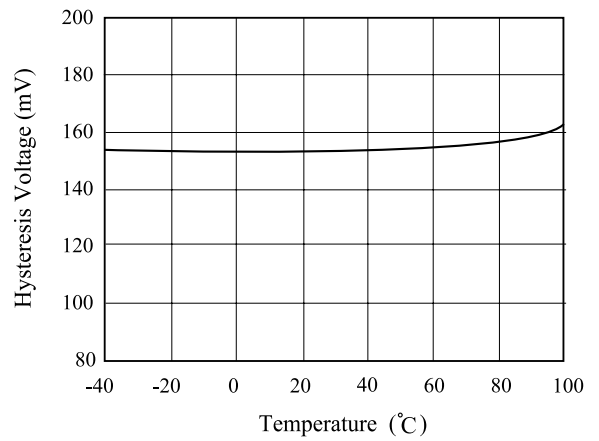Fig4. Hysteresis Voltage vs Temperature
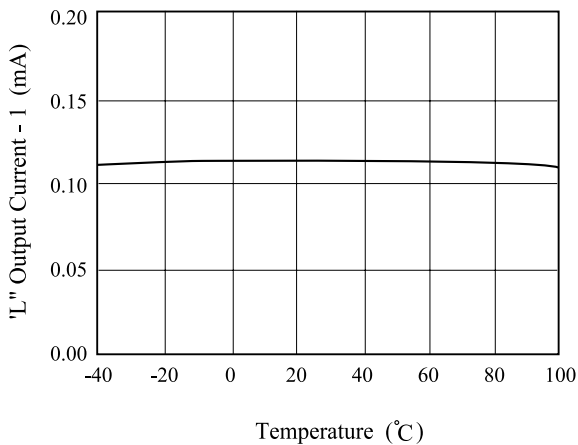

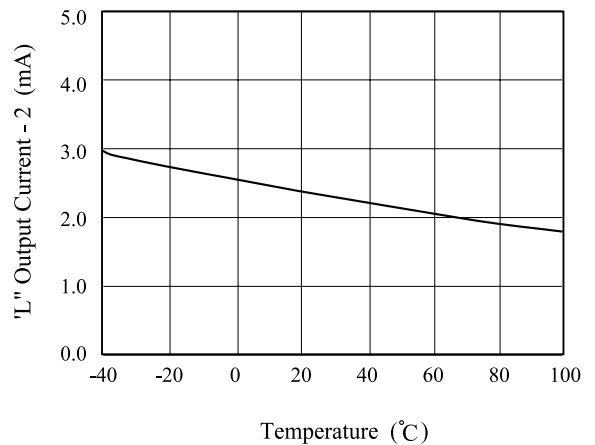Fig5. "L" Output Current 1 vs Temperature

Fig6. "L" Output Current 2 vs Temperature

Fig7. "L" Output Current 3 vs Temperature