

## LOW POWER AND LOW OFFSET VOLTAGE SUPER SMALL-SIZED SINGLE C-MOS COMPARATOR

### ■GENERAL DESCRIPTION

The **NJU7108** is a super small-sized package single C-MOS comparator with push pull output.

The operating voltage is from 1V to 5.5V, and the interface can be connected with most of TTL and C-MOS type standard logic ICs.

Furthermore, The input offset voltage is lower than 4mV and Low operating current 10 $\mu$ A, therefore they can be suitable for battery use items and other portable items.

The available package is not only SC88A, but also ultra small package TSON6.

### ■PACKAGE INFORMATION



**NJU7108F3  
(SC88A)**

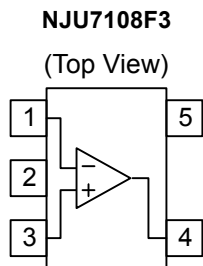


**NJU7108KL1  
(TSON6)**

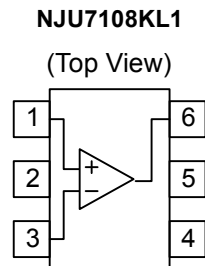
### ■FEATURES

- Single Low Power Supply  $V_{DD}=1.0\sim 5.5V$
- Low Offset Voltage  $V_{IO}=4mV$  max
- Low Operating Current  $I_{DD}=10\mu A$  typ
- Push Pull Output
- Package Outline SC88A, TSON6
- C-MOS Technology

### ■PIN CONFIGURATION



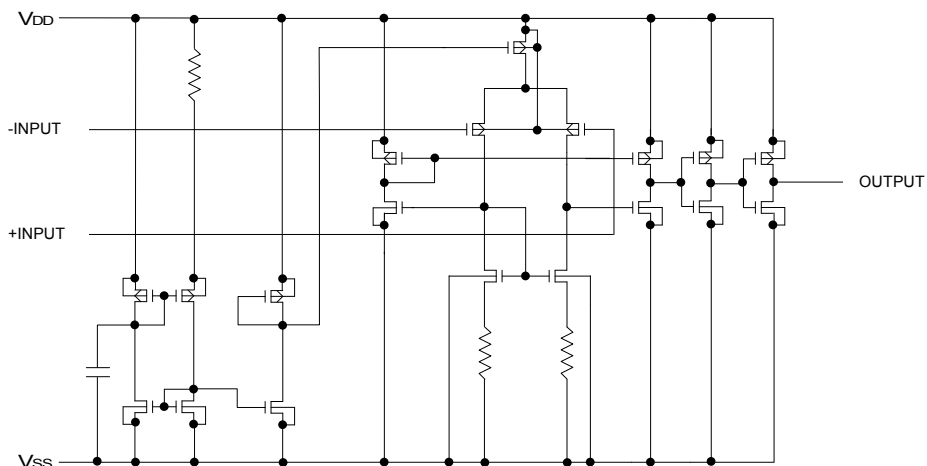
**NJU7108F3  
PIN CONFIGURATION**  
1. -INPUT  
2.  $V_{SS}$   
3. +INPUT  
4. OUTPUT  
5.  $V_{DD}$



**NJU7108KL1  
PIN CONFIGURATION**  
1. +INPUT  
2.  $V_{SS}$   
3. -INPUT  
4.  $V_{DD}$   
5.  $V_{SS}$   
6. OUTPUT

(CAUTION) There is not pin-compatible with NJU7108F3 and NJU7108KL1.

### ■EQUIVALENT CIRCUIT



## ■ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>DD</sub>	7.0	V
Differential Input Voltage	V <sub>ID</sub>	±7.0	V
Common Mode Input Voltage	V <sub>IC</sub>	-0.3~7.0 (Note1)	V
Power Dissipation	P <sub>D</sub>	SC88A : 250 (Note2) TSON6 : 515 (Note3)	mW
Operating Temperature	T <sub>opr</sub>	-40~+85	°C
Storage Temperature	T <sub>stg</sub>	-55~+125	°C

(Note1) For supply voltage less than +7.0V, the absolute maximum input voltage is equal to supply voltage.

(Note2) Mounted on a glass epoxy board (FR-4) in size of 50x50x1.6mm.

(Note3) Mounted on Two layer board(40x40x1.6mm, single layer, both-side 50% share of the wiring substrate).

(Note4) Decoupling capacitor should be connected between V<sub>DD</sub> and V<sub>SS</sub> due to the stabilized operation for the circuit. □

## ■ELECTRICAL CHARACTERISTICS

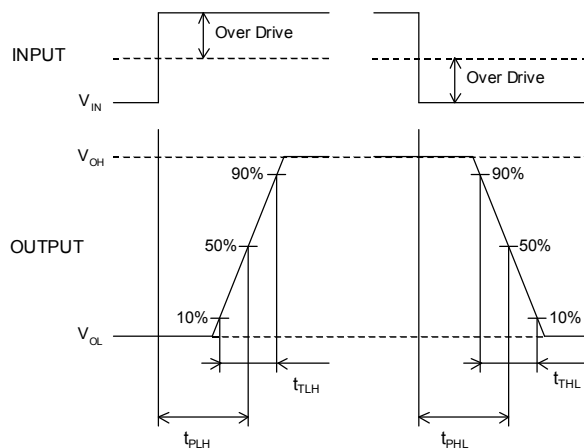
(V<sub>DD</sub>=3.0V, R<sub>L</sub>=∞, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V <sub>DD</sub>		1.0	-	5.5	V
Input Offset Voltage	V <sub>IO</sub>	V <sub>IN</sub> =V <sub>DD</sub> /2	-	-	4	mV
Input Offset Current	I <sub>IO</sub>		-	1	-	pA
Input Bias Current	I <sub>IB</sub>		-	1	-	pA
Input Common Mode Voltage Range	V <sub>ICM</sub>		0~2.5	-	-	V
High Level Output Voltage	V <sub>OH</sub>	I <sub>OH</sub> =-5mA	2.7	-	-	V
Low Level Output Voltage	V <sub>OL</sub>	I <sub>OL</sub> =+5mA	-	-	0.3	V
Supply Current	I <sub>DD</sub>		-	10	20	uA

(V<sub>DD</sub>=3.0V, f=19kHz, C<sub>L</sub>=15pF, Ta=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Low to High	t <sub>PLH</sub>	Over Drive=100mV	-	500	-	ns
Propagation Delay High to Low	t <sub>PHL</sub>	Over Drive=100mV	-	190	-	ns
Output Signal Rising Time	t <sub>TLH</sub>	Over Drive=100mV	-	10	-	ns
Output Signal Falling Time	t <sub>THL</sub>	Over Drive=100mV	-	5	-	ns

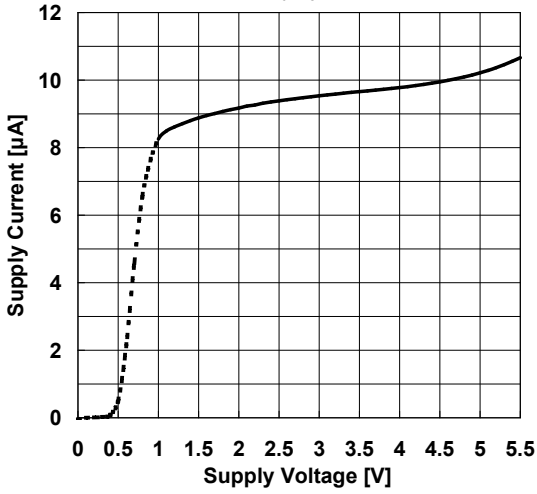
## ■TIMING WAVEFORM



■ TYPICAL CHARACTERISTICS

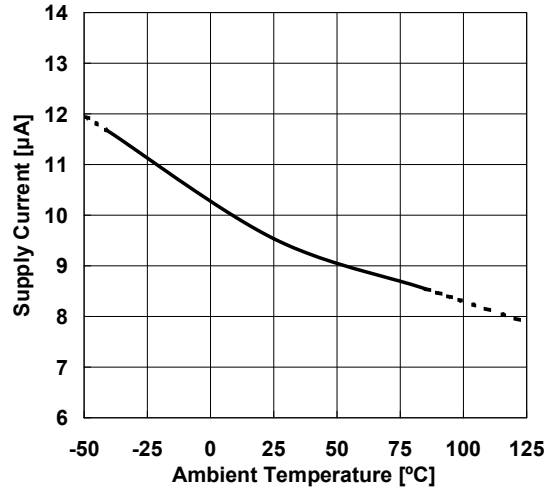
Supply Current vs. Supply Voltage

Ta=25°C



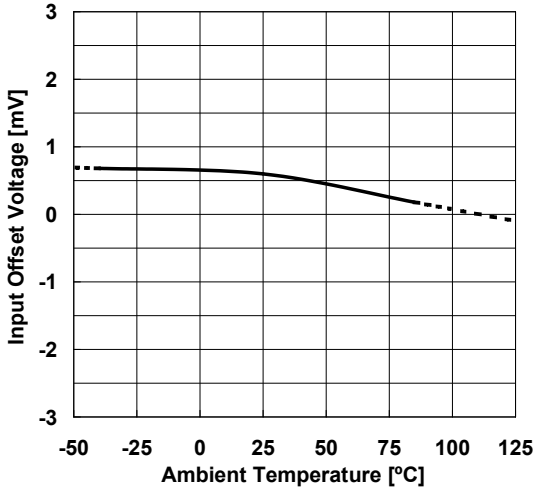
Supply Current vs. Temperature

VDD=3.0V



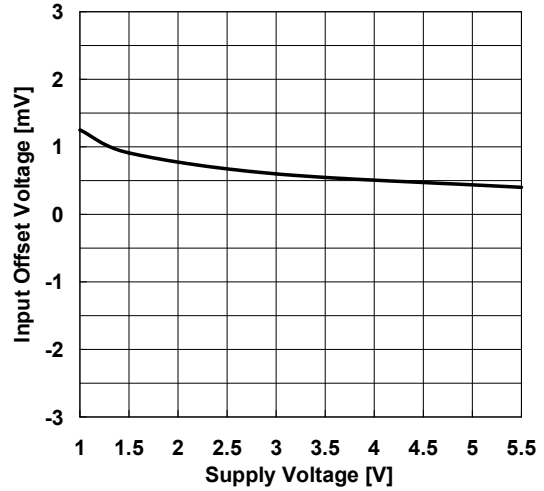
Input Offset Voltage vs. Temperature

VDD=3.0V



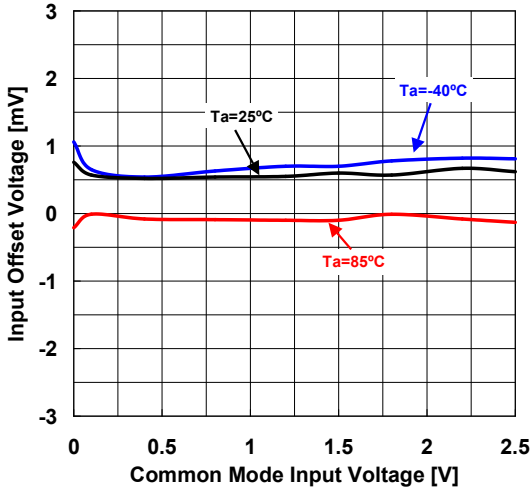
Input Offset Voltage vs. Supply Voltage

Ta=25°C



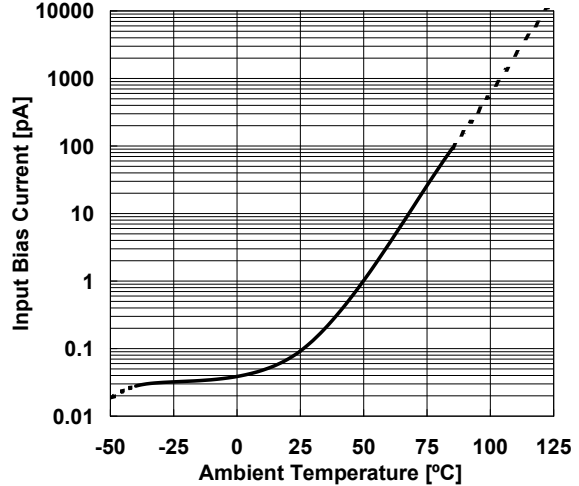
Input Offset Voltage vs. Common Mode Input Voltage (Temperature)

VDD=3.0V



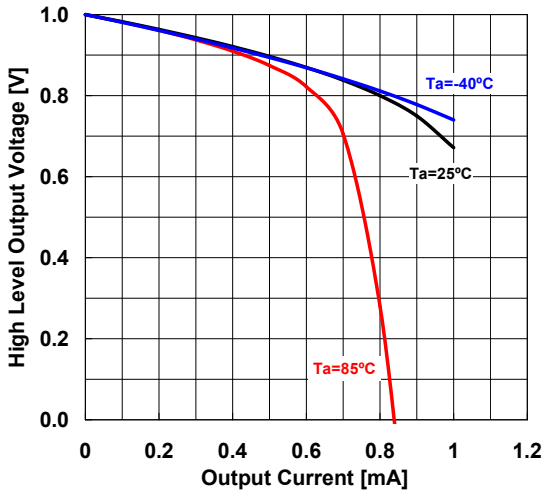
Input Bias Current vs. Temperature

VDD=3.0V

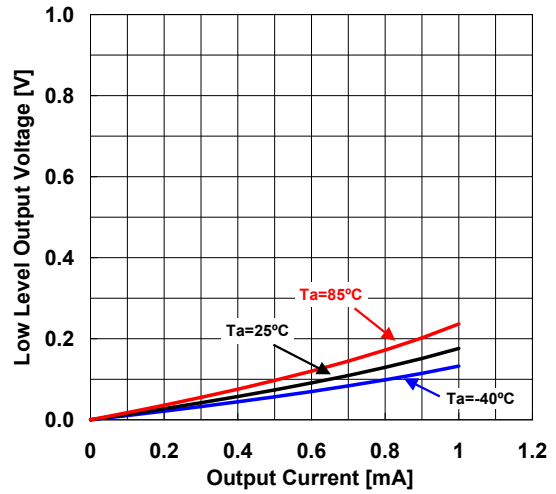


## TYPICAL CHARACTERISTICS

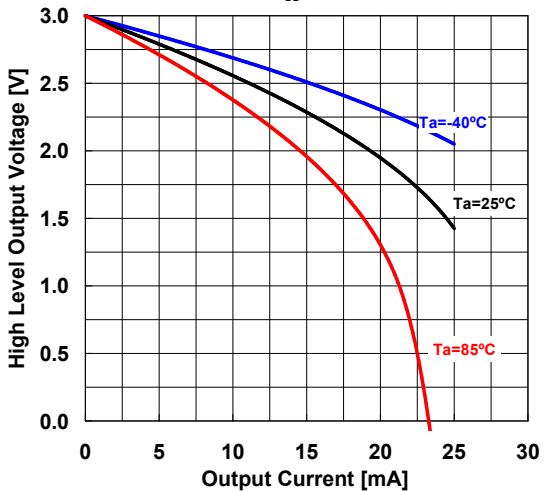
High Level Output Voltage vs. Output Current  
(Temperature)  
 $V_{DD}=1.0V$



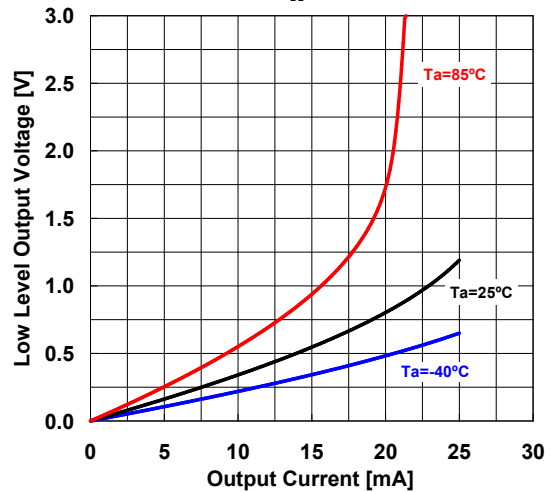
Low Level Output Voltage vs. Output Current  
(Temperature)  
 $V_{DD}=1.0V$



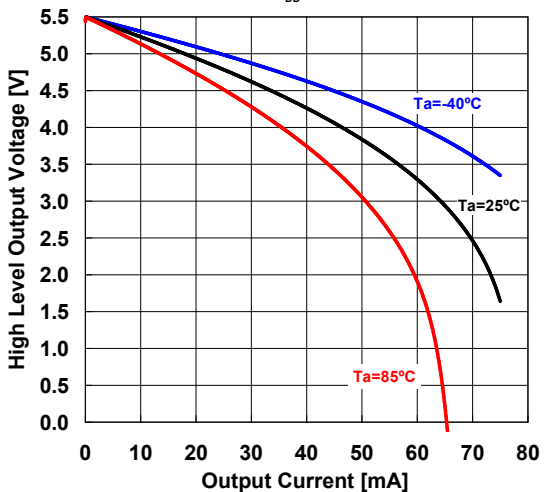
High Level Output Voltage vs. Output Current  
(Temperature)  
 $V_{DD}=3.0V$



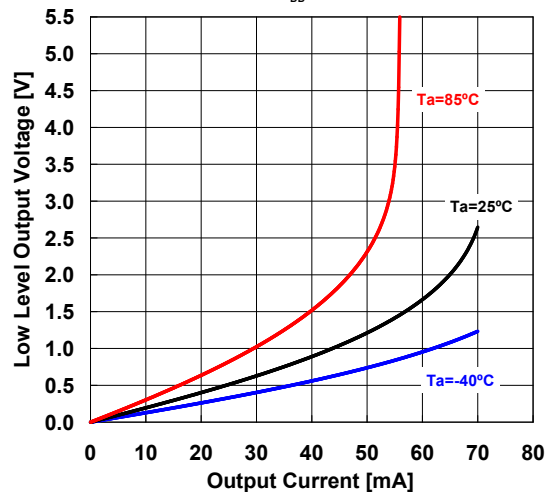
Low Level Output Voltage vs. Output Current  
(Temperature)  
 $V_{DD}=3.0V$



High Level Output Voltage vs. Output Current  
(Temperature)  
 $V_{DD}=5.5V$



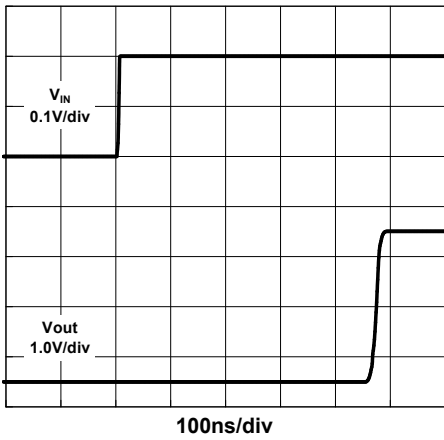
Low Level Output Voltage vs. Output Current  
(Temperature)  
 $V_{DD}=5.5V$



■ TYPICAL CHARACTERISTICS

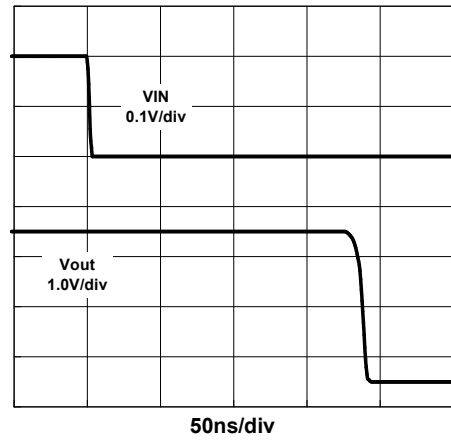
Propagation Delay  $t_{PLH}$

$V_{DD}/V_{SS}=\pm 1.5V$ , Over Drive=100mV,  $C_L=15pF$ ,  $T_a=25^\circ C$



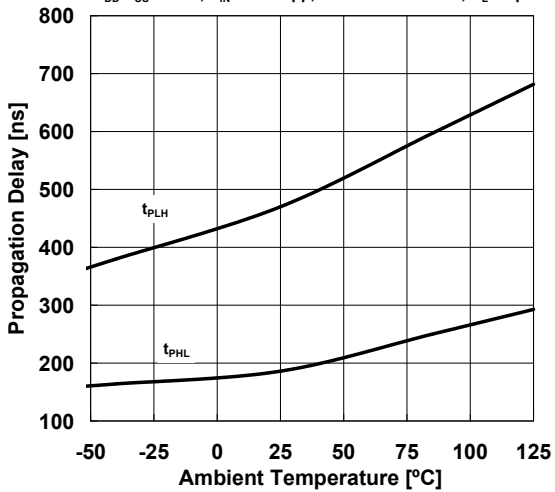
Propagation Delay  $t_{PHL}$

$V_{DD}/V_{SS}=\pm 1.5V$ , Over Drive=100mV,  $C_L=15pF$ ,  $T_a=25^\circ C$



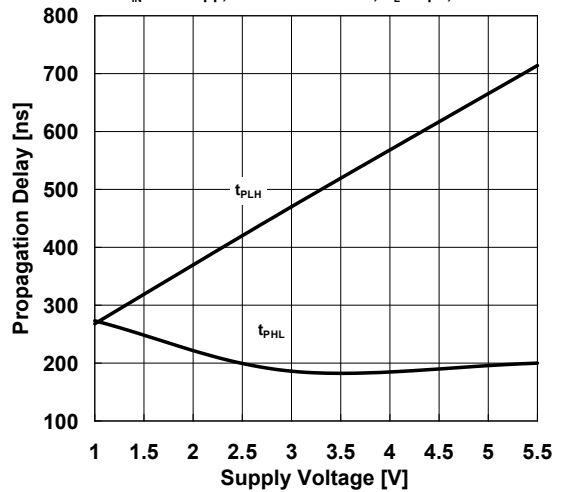
Propagation Delay vs. Temperature

$V_{DD}/V_{SS}=\pm 1.5V$ ,  $V_{IN}=200mV_{pp}$ , Over Drive=100mV,  $C_L=15pF$



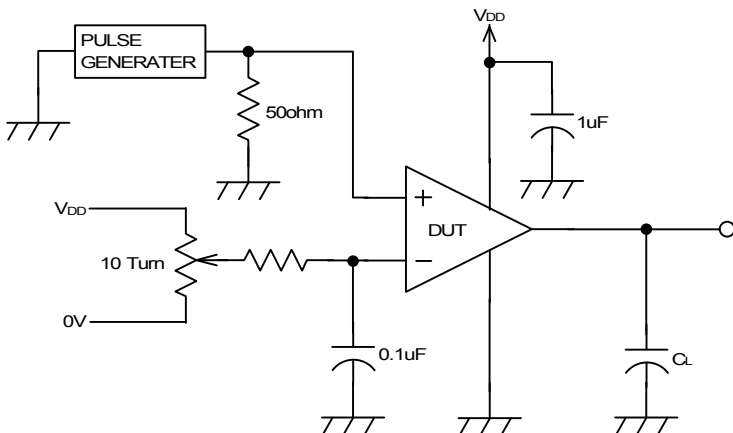
Propagation Delay vs. Supply Voltage

$V_{IN}=200mV_{pp}$ , Over Drive=100mV,  $C_L=15pF$ ,  $T_a=25^\circ C$



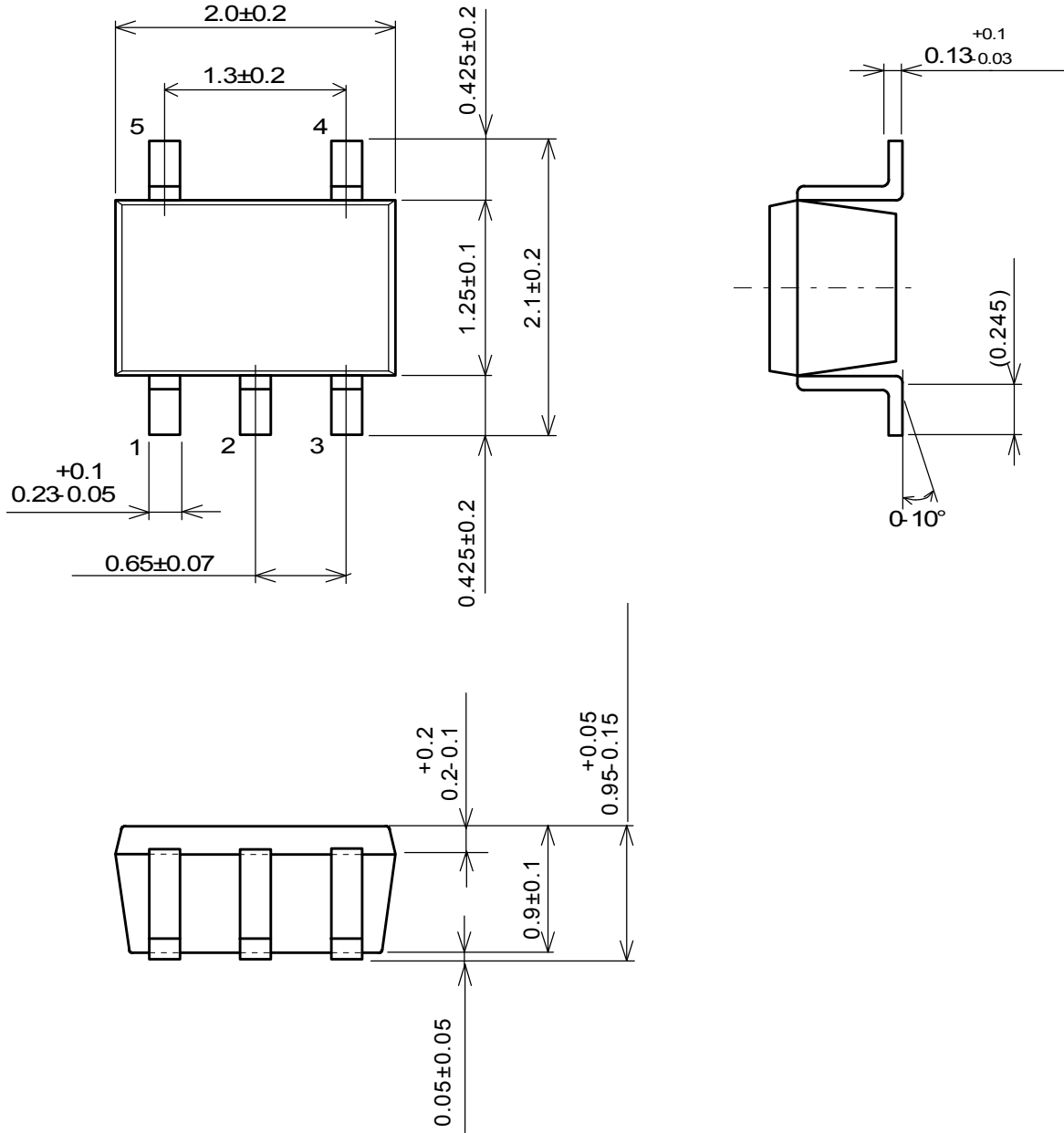
■ TEST CIRCUIT

Switching Characteristics Measurement Circuit



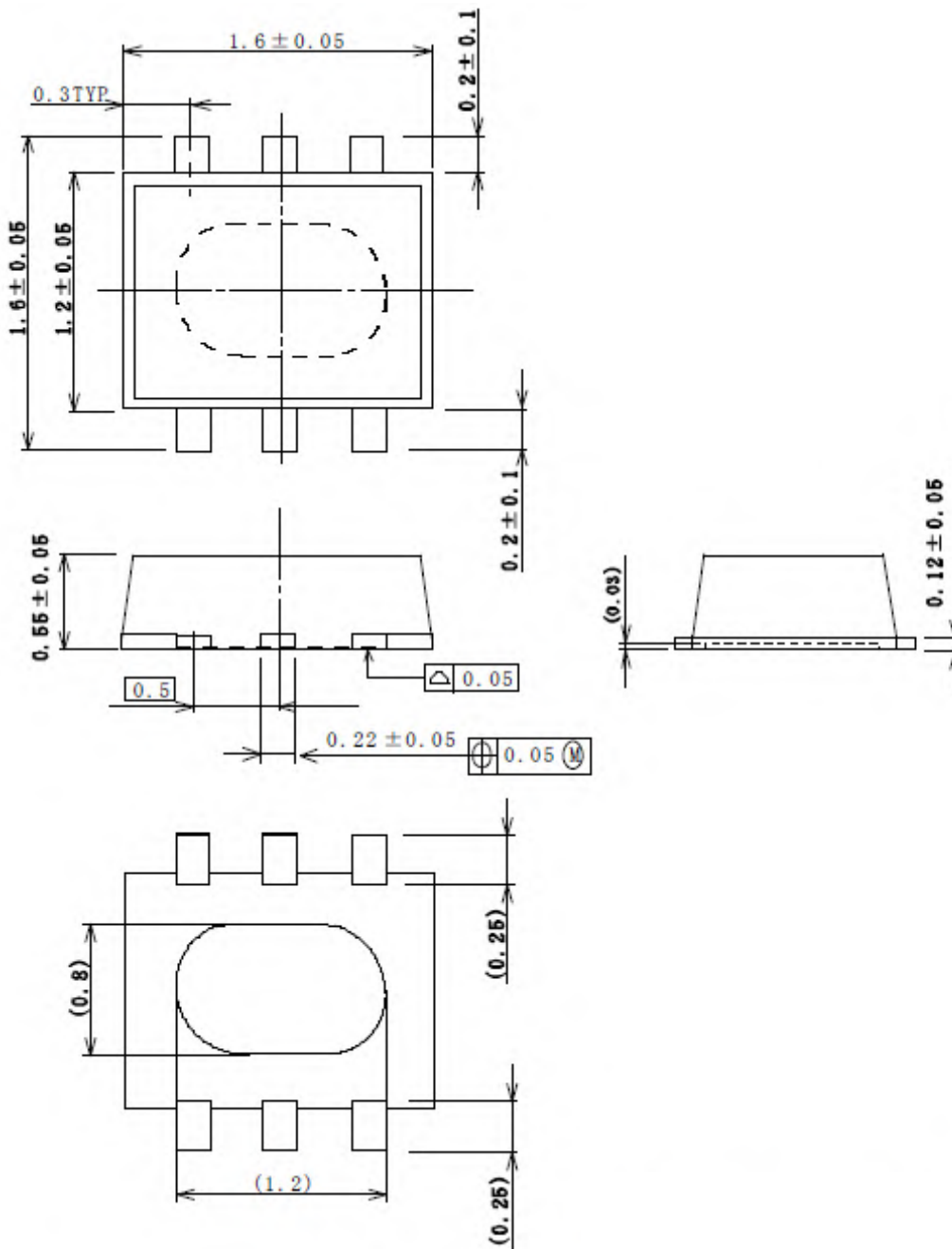
■ PACKAGE DIMENSIONS

SC88A



■PACKAGE DIMENSIONS

TS0N6



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