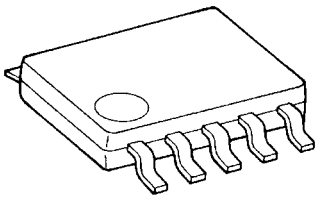
Preliminary TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA6042FNG

Shock sensor IC for signal processing

TA6042FNG performs the signal processing in response to the amplification signal of a shock sensor.

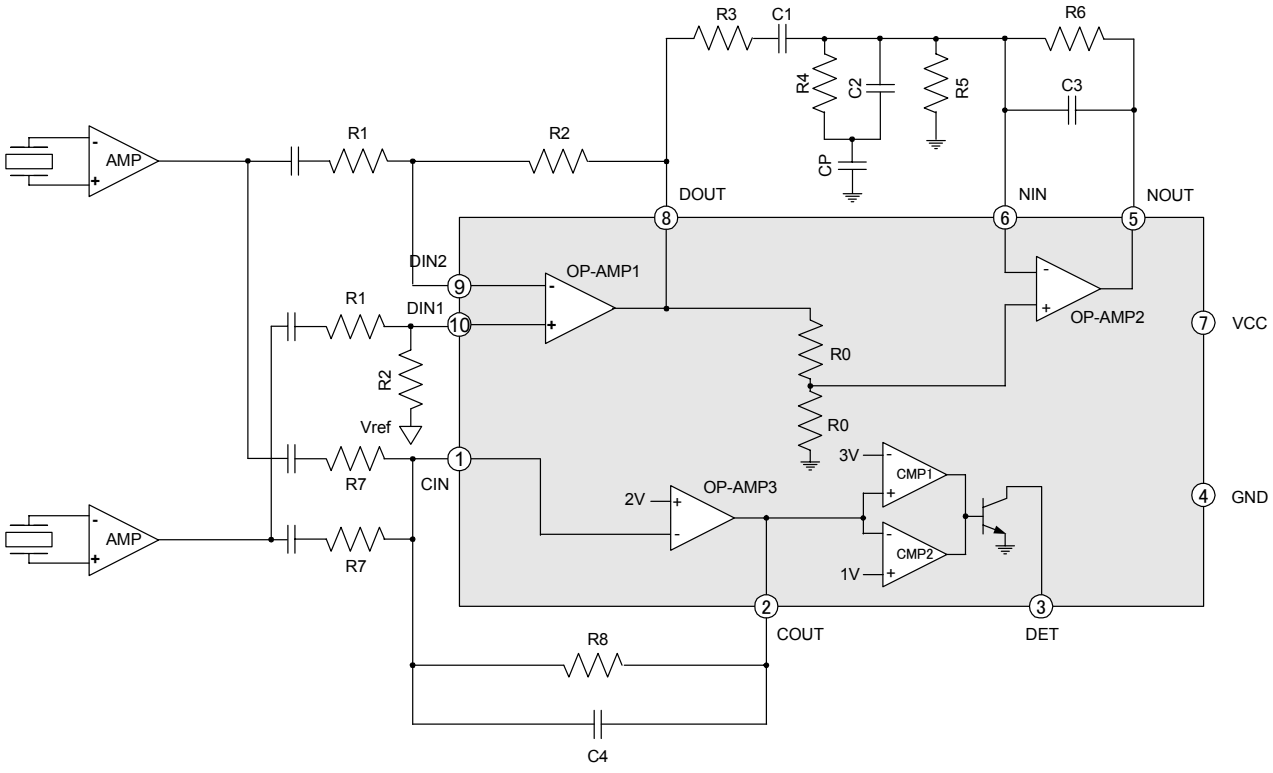


Weight: 0.04 g (Type.)

Features

- TA6042FNG is operated under 4.5 ~ 5.5 V DC single power supply voltage.
- User can make notch-filter circuit with OP-AMP2 and external element, and adjust gain by changing R1/R2 Ratio.
- To change the g-force sensing level, user can adjust gain by changing R7/R8 ratio.
- The Window comparator has a hysteresis which width is about 150mV.
- Small package: SSOP10-P-0.65A (0.65 mm pitch)

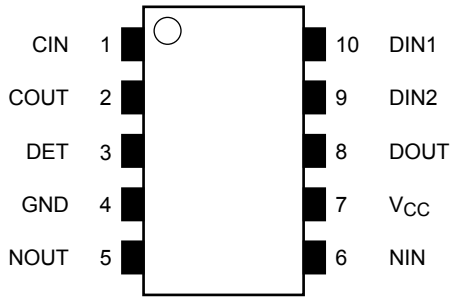
Block Diagram



Pin Function

Pin No.	Pin Name	Function
1	CIN	OP-AMP3 input terminal (Shock sensor amplification signal input)
2	COUT	OP-AMP3 output terminal
3	DET	Window Comparator output terminal ("L" is outputted at the time of shock detection.)
4	GND	Ground terminal
5	NOUT	OP-AMP2 output terminal
6	NIN	OP-AMP2 input terminal
7	V_{CC}	Power supply voltage
8	DOUT	OP-AMP1 output terminal
9	DIN2	OP-AMP1 - side input terminal (Shock sensor amplification signal input)
10	DIN1	OP-AMP1 + side input terminal (Shock sensor amplification signal input)

Pin Connection (top view)



Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Power supply voltage	V_{CC}	7	V
Power dissipation	P_D	300	mW
Storage temperature	T_{stg}	−55~150	°C

Recommend Operating Condition

Characteristics	Symbol	Rating	Unit
Power supply voltage	V_{CC}	4.5~5.5	V
Operating temperature	T_{opr}	−25~85	°C

Note: The IC may be destroyed due to short circuit between adjacent pins, incorrect orientation of device's mounting, connecting positive and negative power supply pins wrong way round, air contamination fault, or fault by improper grounding.

Please consider the voltage-drop caused by OP-AMP3 input current and feedback resistance (R8), and examine the value of the feedback resistance.

We will recommend 500kΩ or less as a value of the feedback resistance.

TA6042FNG is Pd free product..
The following conditions apply to solderability:
*Solderability
1. Use of Sn-63Pb solder bath
   *solder bath temperature=230 degrees
   *dipping time=5seconds
   *number of times=once
   *use of R-type flux
2. Use of Sn-3.0Ag-0.5Cu solder bath
   *solder bath temperature=245 degrees
   *dipping time=5seconds
   *the number of times=once
   *use of R-type flux

Electrical Characteristics (unless otherwise specified, V_{CC} = 5.0 V, Ta = 25°C)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Supply voltage	V_{CC}	—	—	4.5	5.0	5.5	V
Supply current	I_{CC}	(1)	Max:Vcc=5.5V	—	—	2.5	mA

(OP-AMP1)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input current	Iin1	(2)	—	—	35	80	nA
Output dynamic range	Vod1	(3)	—	0.3	—	Vcc-0.3	V
Output source current	Iso1	(4)	Voh = V_{CC} − 0.3 V	100	250	—	μA
Output sink current	Isi1	(5)	Vol = 0.3 V	2	11	—	mA

(OP-AMP2)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input current	Iin2	(6)	—	—	35	80	nA
Output dynamic range	Vod2	(7)	—	0.3	—	Vcc-0.3	V
Output source current	Iso2	(8)	Voh = V_{CC} − 0.3 V	100	190	—	μA
Output sink current	Isi2	(9)	Vol = 0.3 V	2	11	—	mA
Output DC voltage	Vo2		5pin - 6pin: Short Circuit, 8pin - 9pin: Short Circuit, 8pin output voltage:2.0V setup. (The voltage input from 10pin)	0.98	1.00	1.02	V

(OP-AMP3)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input current	Iin3	(10)	—	—	35	80	nA
Output dynamic range	Vod3	(11)	—	0.3	—	Vcc-0.3	V
Output source current	Iso3	(12)	Voh = V_{CC} − 0.3 V	100	180	—	μA
Output sink current	Isi3	(13)	Vol = 0.3 V	2	11	—	mA
Output DC voltage	Vo3	(14)	—	1.86	2.00	2.14	V

(Window Comparator)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Hysteresis width	Vwhys	(15)	—	100	150	200	mV
Detection voltage level (High side)	Vwsh	(16)	—	2.79	3.00	3.21	V
Detection voltage level (Low side)	Vwsl	(16)	—	0.93	1.00	1.07	V
Output sink current	Iwsi	(17)	Vol = 0.3 V	0.30	1.39	—	mA

Electrical Characteristics (2) --- Reference data for application (Note)

(OP-AMP1)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
GBW (Cutoff frequency)	fT1	—	—	2.0	3.0	—	MHz
Openloop gain	Gvo1	—	—	80	90	—	dB
Offset voltage	Voff1	—	—	−5	0	5	mV

(OP-AMP2)

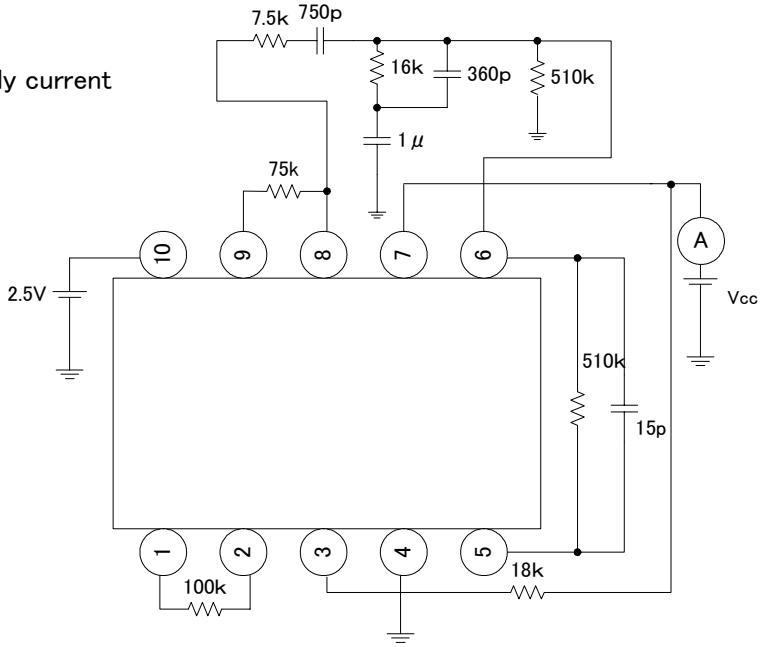
Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
GBW (Cutoff frequency)	fT2	—	—	2.0	3.0	—	MHz
Openloop gain	Gvo2	—	—	85	95	—	dB

(OP-AMP3)

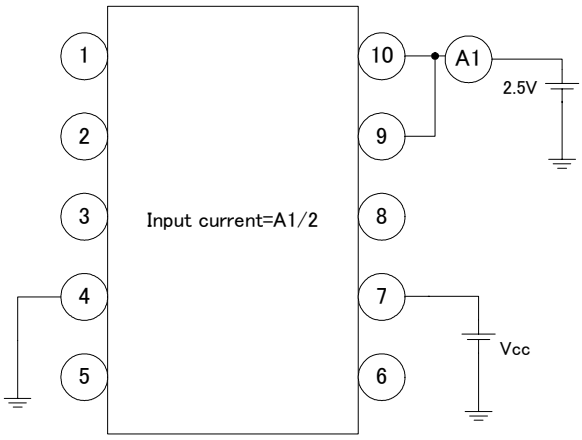
Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
GBW (Cutoff frequency)	fT3	—	—	1.5	2.0	—	MHz
Openloop gain	Gvo3	—	—	85	95	—	dB

■ TEST Circuit

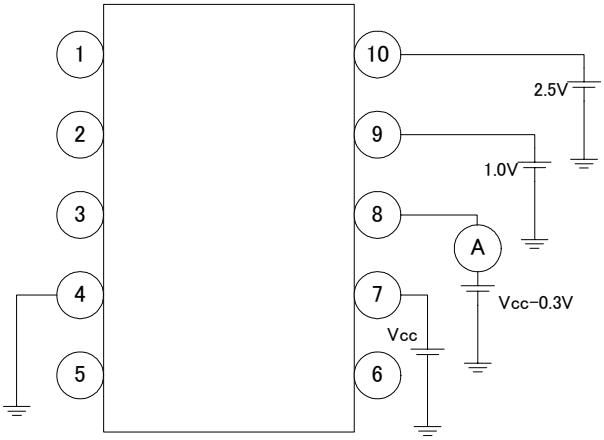
(1) Supply current



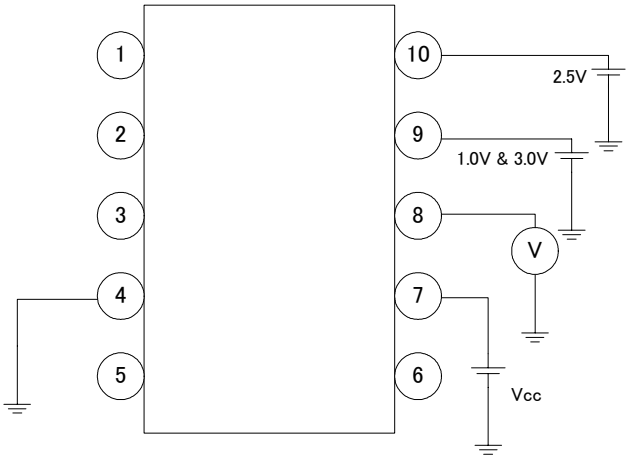
(2) OP-AMP1 Input current



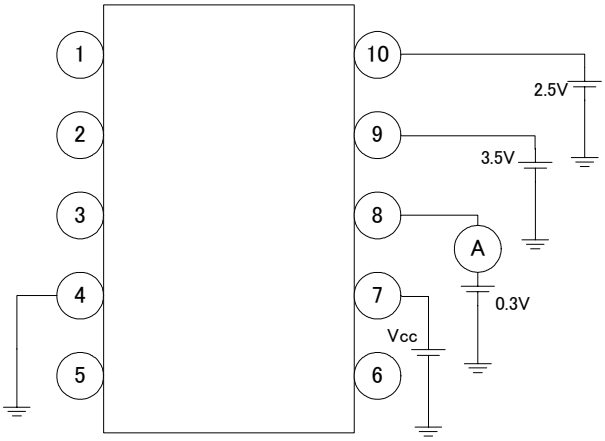
(4) OP-AMP1 Output source current



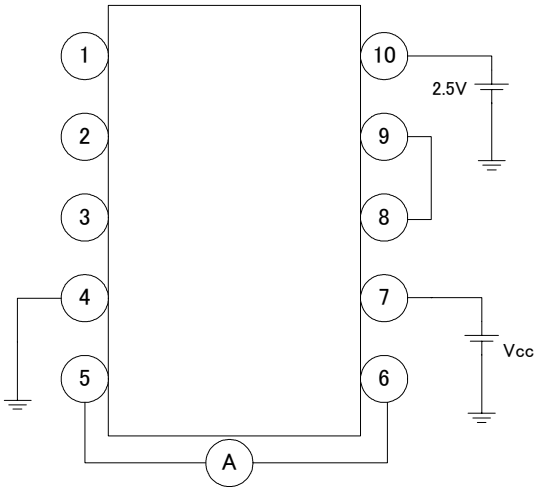
(3) Output dynamic range
(Low side)(High side)



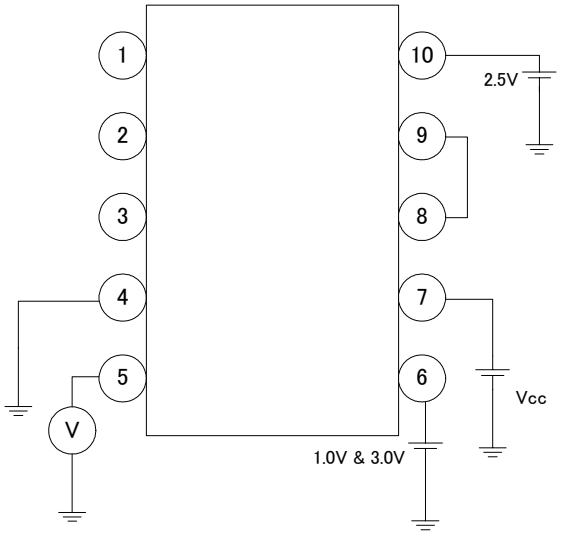
(5) OP-AMP1 Output sink current



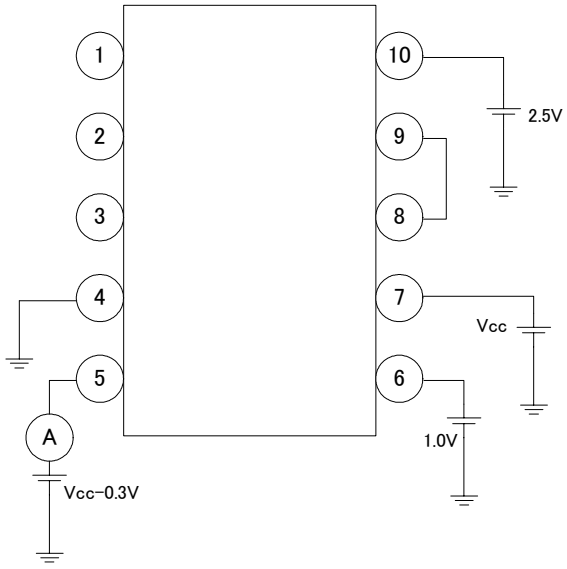
(6) OP-AMP2 Input current



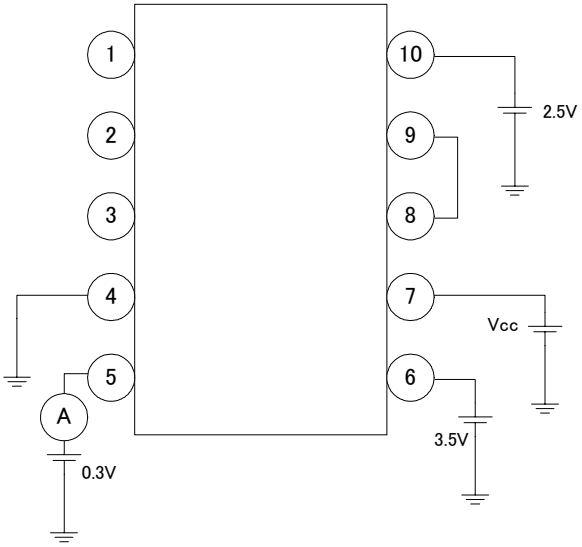
(7) OP-AMP2 Output dynamic range
(Low side)(High side)



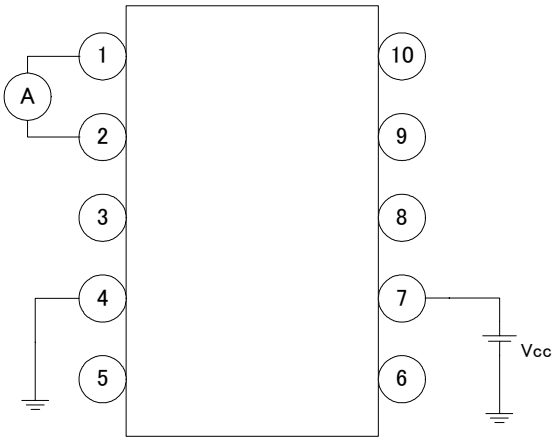
(8) OP-AMP2 Output source current



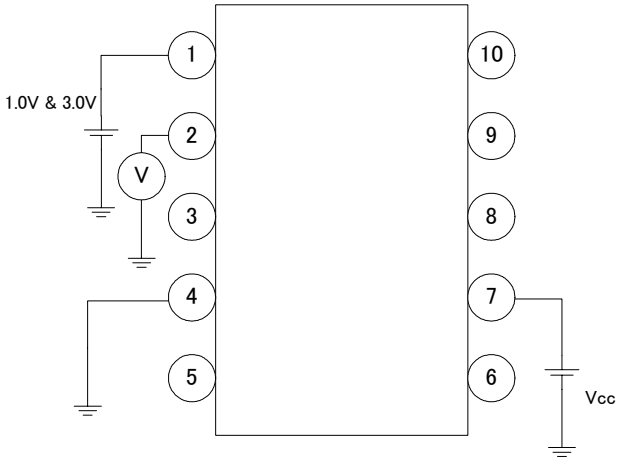
(9) OP-AMP2 Output sink current



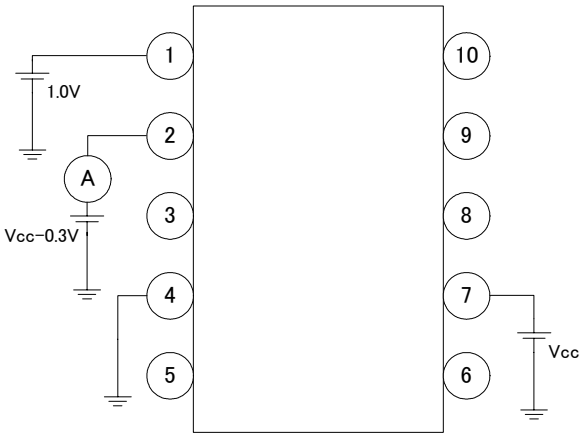
(10) OP-AMP3 Input current



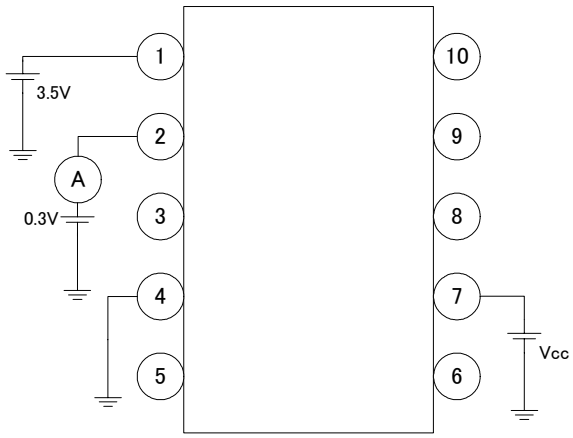
(11) OP-AMP3 Output dynamic range
(Low side)(High side)



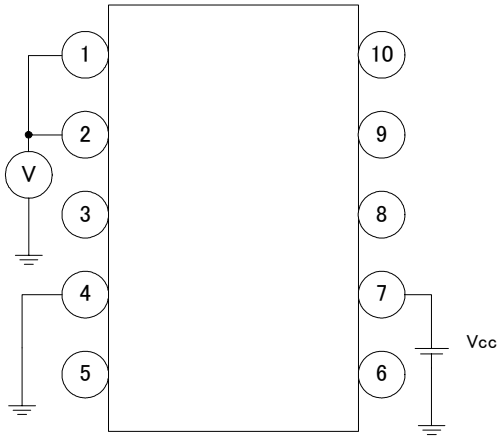
(12)OP-AMP3 Output source current



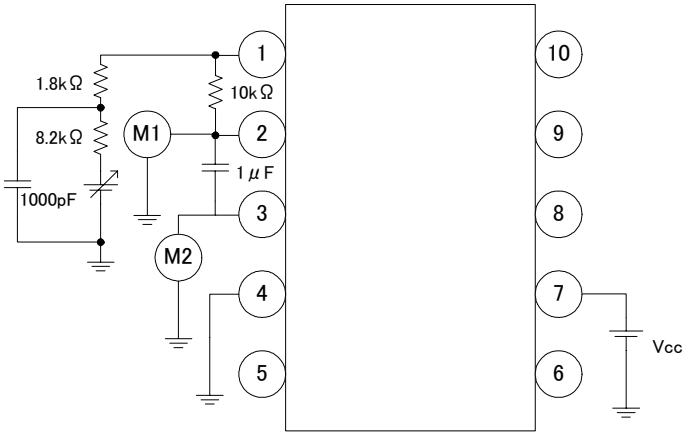
(13)OP-AMP3 Output sink current



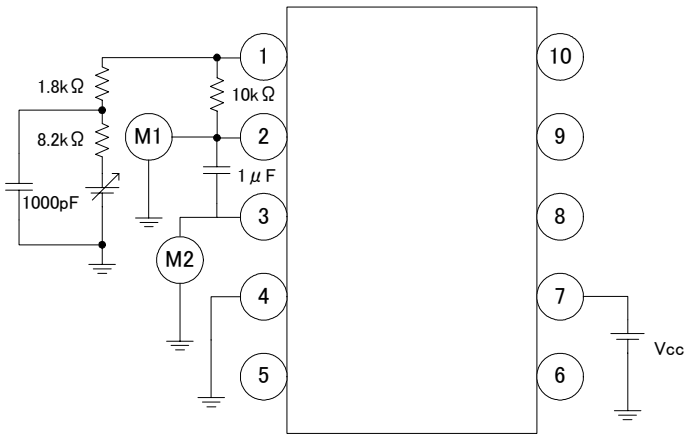
(14)OP-AMP3 Output DC voltage



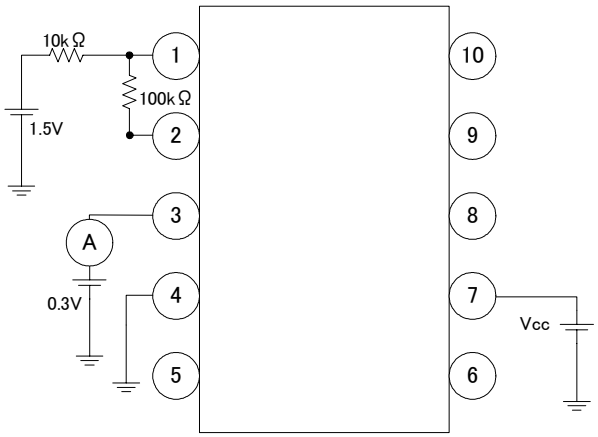
(15)Window-Comparator Hysteresis width



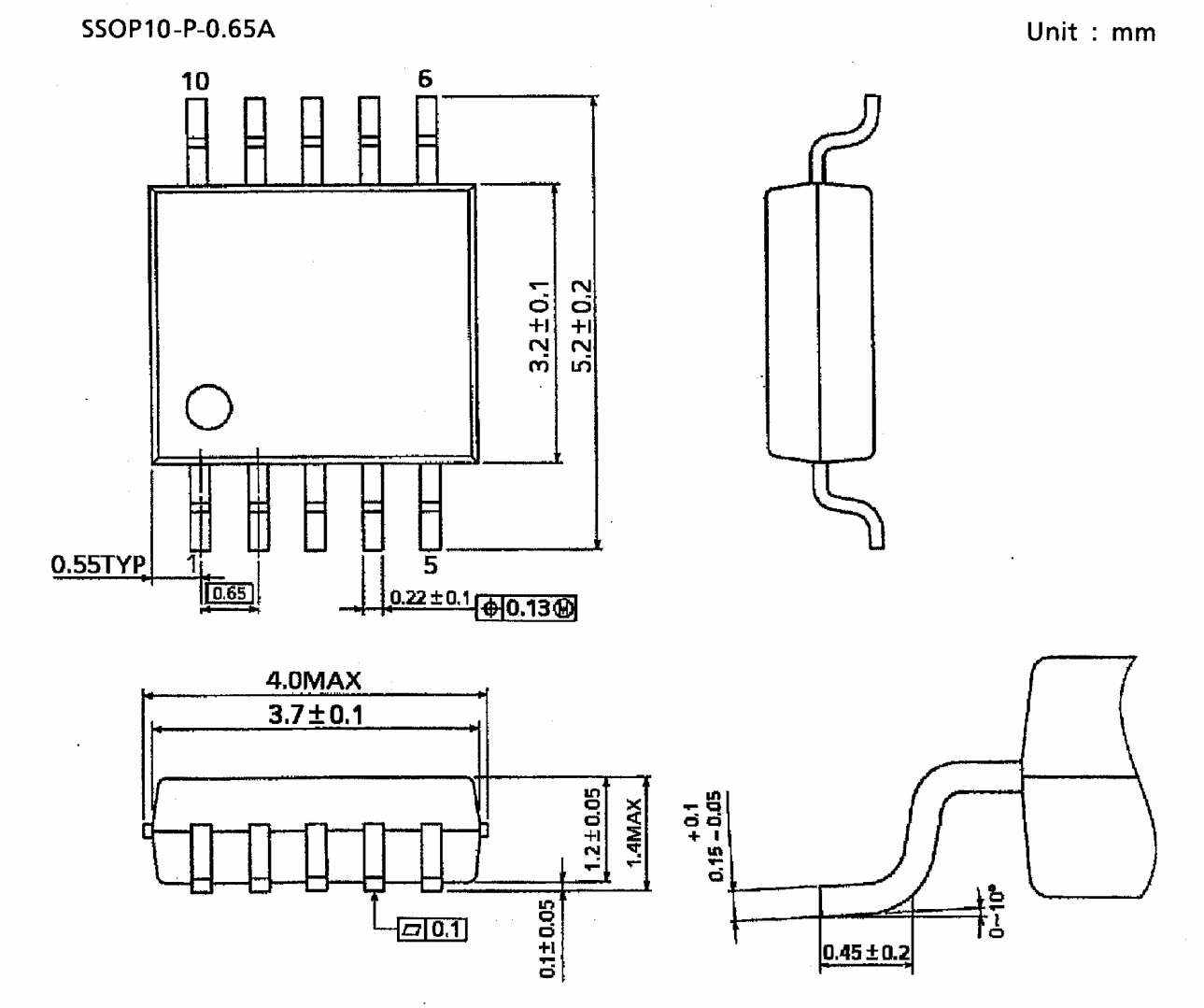
(16)Window-Comparator Detection voltage level (High side)(Low side)



(17)Window-Comparator Output sink current



Package Dimensions



Weight: 0.04 g (typ.)

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