S-5844A Series

TEMPERATURE SWITCH IC (THERMOSTAT IC)

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Rev.2.7_00

The S-5844A Series is a temperature switch IC (thermostat IC) which detects the temperature with a temperature accuracy of ±2.5°C. The output inverts when temperature reaches the detection temperature. The S-5844A Series restores the output voltage when the temperature drops to the level of release temperature.
The S-5844A Series operates at the lower power supply voltage of 1.65 V and its current consumption is 0.18 μA typ. due to CMOS configuration.
A temperature sensor with the negative temperature coefficient, a reference voltage generation circuit and a comparator are integrated on one chip, and enclosed into the packages SOT-23-5 and SNT-4A, and the super-small package HSNT-4 (1010).

■ Features

- Detection temperature: T_{DET} = +50°C to +100°C, +5°C step, detection accuracy: ±2.5°C
- Low voltage operation: V_{DD} = 1.65 V min.
- Low current consumption: I_{DD} = 0.18 μA typ. (Ta = +25°C)
- Hysteresis temperature: selectable in 5°C, 10°C, 15°C or 20°C
- Selectable output logic in active "H" or active "L"
- Selectable output form in CMOS or Nch open-drain
- Operation temperature range: Ta = –40°C to +125°C
- Lead-free (Sn 100%), halogen-free

■ Applications

- Fan control
- Air conditioning system
- Mobile phone
- Game console
- Various electronic devices

■ Packages

- SOT-23-5
- SNT-4A
- HSNT-4 (1010)

■ Block Diagrams

1. CMOS output product

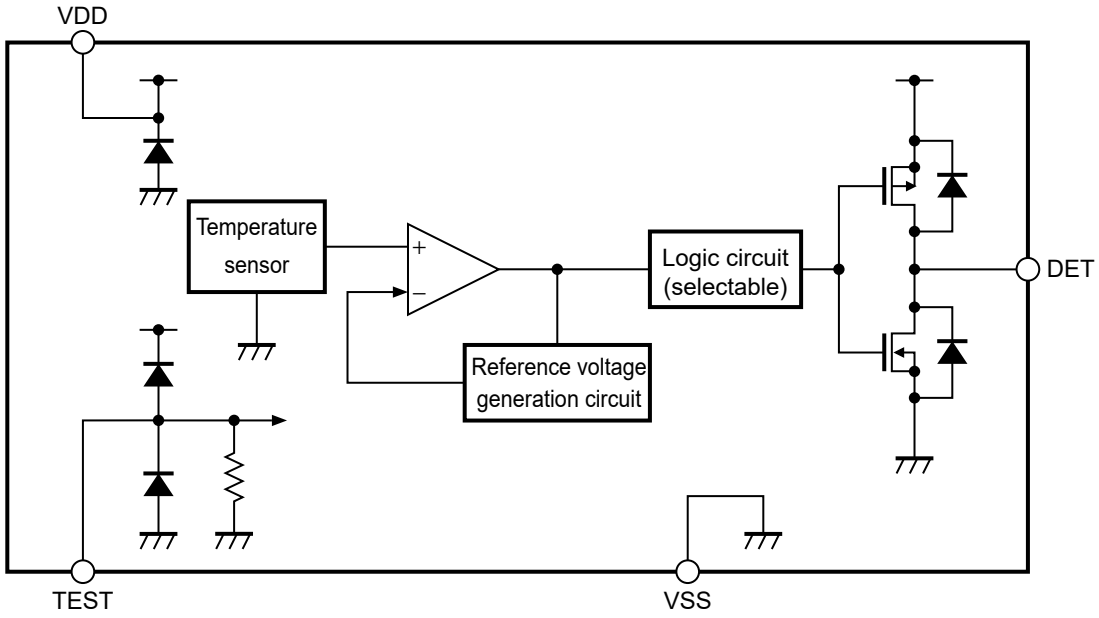


Figure 1

2. Nch open-drain output product

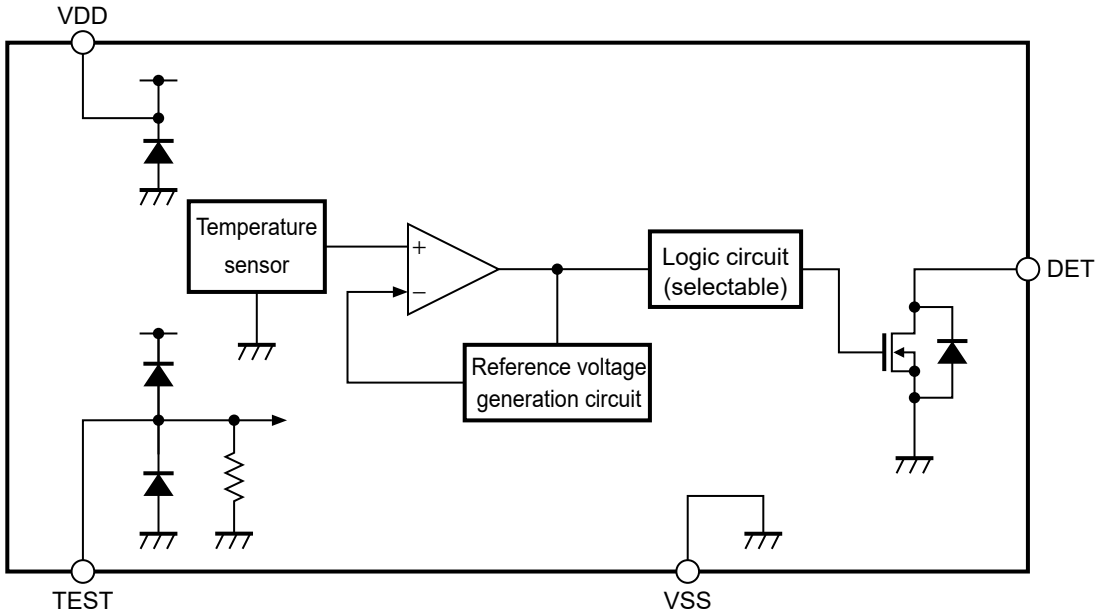


Figure 2

■ Product Name Structure

Users are able to select the detection temperature, output form and logic, hysteresis temperature, and package for the S-5844A Series.

1. Product name

S-5844A xx x x - xxxx U 3

Environmental code
- U: Lead-free (Sn 100%), halogen-free

Package abbreviation and IC packing specifications*1
- M5T1: SOT-23-5, Tape
- I4T1: SNT-4A, Tape
- A4T2: HSNT-4 (1010), Tape

Hysteresis temperature*2
- A: 5°C
- B: 10°C
- C: 15°C
- D: 20°C

Output form and output logic*3
- A: CMOS output, active "H"
- B: CMOS output, active "L"
- C: Nch open-drain output, active "H"
- D: Nch open-drain output, active "L"

Detection temperature*4
- 50 to 95, A0
- (When detection temperature is +80°C, it is expressed as 80.
  When detection temperature is +100°C, it is expressed as A0.)

***1.** Refer to the tape drawing.
***2.** The hysteresis temperature is selectable in 5°C, 10°C, 15°C, or 20°C.
However, if the detection temperature is +50°C, select the hysteresis temperature in 5°C or 10°C.
***3.** For the DET pin output, selectable the output logic active "H" or active "L".
For the DET pin output, selectable the output form CMOS or Nch open-drain.
***4.** Detection temperature (T_{DET}) is settable in +50°C to +100°C, in +5°C step.

2. Packages

Table 1 Package Drawing Codes

Package Name	Dimension	Tape	Reel	Land
SOT-23-5	MP005-A-P-SD	MP005-A-C-SD	MP005-A-R-SD	–
SNT-4A	PF004-A-P-SD	PF004-A-C-SD	PF004-A-R-SD	PF004-A-L-SD
HSNT-4 (1010)	PL004-A-P-SD	PL004-A-C-SD	PL004-A-R-SD	PL004-A-L-SD

3. Product name list

3. 1 SOT-23-5

Table 2 (1 / 2)

Product Name	Detection Temperature (T_{DET})	DET Pin Output Form	DET Pin Output Logic	Hysteresis Temperature (T_{HYS})
S-5844A50CB-M5T1U3	+50°C	Nch open-drain	Active "H"	10°C
S-5844A50DB-M5T1U3	+50°C	Nch open-drain	Active "L"	10°C
S-5844A55CB-M5T1U3	+55°C	Nch open-drain	Active "H"	10°C
S-5844A55CC-M5T1U3	+55°C	Nch open-drain	Active "H"	15°C
S-5844A55CD-M5T1U3	+55°C	Nch open-drain	Active "H"	20°C
S-5844A55DB-M5T1U3	+55°C	Nch open-drain	Active "L"	10°C
S-5844A60AB-M5T1U3	+60°C	CMOS	Active "H"	10°C
S-5844A60CB-M5T1U3	+60°C	Nch open-drain	Active "H"	10°C
S-5844A60CC-M5T1U3	+60°C	Nch open-drain	Active "H"	15°C
S-5844A60CD-M5T1U3	+60°C	Nch open-drain	Active "H"	20°C
S-5844A60DA-M5T1U3	+60°C	Nch open-drain	Active "L"	5°C
S-5844A60DB-M5T1U3	+60°C	Nch open-drain	Active "L"	10°C
S-5844A65AA-M5T1U3	+65°C	CMOS	Active "H"	5°C
S-5844A65CB-M5T1U3	+65°C	Nch open-drain	Active "H"	10°C
S-5844A65CC-M5T1U3	+65°C	Nch open-drain	Active "H"	15°C
S-5844A65CD-M5T1U3	+65°C	Nch open-drain	Active "H"	20°C
S-5844A65DA-M5T1U3	+65°C	Nch open-drain	Active "L"	5°C
S-5844A65DB-M5T1U3	+65°C	Nch open-drain	Active "L"	10°C
S-5844A70AB-M5T1U3	+70°C	CMOS	Active "H"	10°C
S-5844A70AD-M5T1U3	+70°C	CMOS	Active "H"	20°C
S-5844A70BD-M5T1U3	+70°C	CMOS	Active "L"	20°C
S-5844A70CB-M5T1U3	+70°C	Nch open-drain	Active "H"	10°C
S-5844A70CC-M5T1U3	+70°C	Nch open-drain	Active "H"	15°C
S-5844A70CD-M5T1U3	+70°C	Nch open-drain	Active "H"	20°C
S-5844A70DB-M5T1U3	+70°C	Nch open-drain	Active "L"	10°C
S-5844A75AB-M5T1U3	+75°C	CMOS	Active "H"	10°C
S-5844A75AD-M5T1U3	+75°C	CMOS	Active "H"	20°C
S-5844A75CB-M5T1U3	+75°C	Nch open-drain	Active "H"	10°C
S-5844A75CC-M5T1U3	+75°C	Nch open-drain	Active "H"	15°C
S-5844A75CD-M5T1U3	+75°C	Nch open-drain	Active "H"	20°C
S-5844A75DB-M5T1U3	+75°C	Nch open-drain	Active "L"	10°C
S-5844A80AB-M5T1U3	+80°C	CMOS	Active "H"	10°C
S-5844A80CB-M5T1U3	+80°C	Nch open-drain	Active "H"	10°C
S-5844A80CC-M5T1U3	+80°C	Nch open-drain	Active "H"	15°C
S-5844A80CD-M5T1U3	+80°C	Nch open-drain	Active "H"	20°C
S-5844A80DB-M5T1U3	+80°C	Nch open-drain	Active "L"	10°C
S-5844A85AB-M5T1U3	+85°C	CMOS	Active "H"	10°C
S-5844A85CB-M5T1U3	+85°C	Nch open-drain	Active "H"	10°C
S-5844A85CC-M5T1U3	+85°C	Nch open-drain	Active "H"	15°C
S-5844A85CD-M5T1U3	+85°C	Nch open-drain	Active "H"	20°C
S-5844A85DB-M5T1U3	+85°C	Nch open-drain	Active "L"	10°C

Remark Please contact our sales representatives for products other than the above.

Table 2 (2 / 2)

Product Name	Detection Temperature (T_{DET})	DET Pin Output Form	DET Pin Output Logic	Hysteresis Temperature (T_{HYS})
S-5844A90AA-M5T1U3	+90°C	CMOS	Active "H"	5°C
S-5844A90CB-M5T1U3	+90°C	Nch open-drain	Active "H"	10°C
S-5844A90CC-M5T1U3	+90°C	Nch open-drain	Active "H"	15°C
S-5844A90CD-M5T1U3	+90°C	Nch open-drain	Active "H"	20°C
S-5844A90DB-M5T1U3	+90°C	Nch open-drain	Active "L"	10°C
S-5844A95CB-M5T1U3	+95°C	Nch open-drain	Active "H"	10°C
S-5844A95CC-M5T1U3	+95°C	Nch open-drain	Active "H"	15°C
S-5844A95CD-M5T1U3	+95°C	Nch open-drain	Active "H"	20°C
S-5844A95DA-M5T1U3	+95°C	Nch open-drain	Active "L"	5°C
S-5844A95DB-M5T1U3	+95°C	Nch open-drain	Active "L"	10°C

Remark Please contact our sales representatives for products other than the above.

3. 2 SNT-4A

Table 3 (1 / 2)

Product Name	Detection Temperature (T_{DET})	DET Pin Output Form	DET Pin Output Logic	Hysteresis Temperature (T_{HYS})
S-5844A50CB-I4T1U3	+50°C	Nch open-drain	Active "H"	10°C
S-5844A50DB-I4T1U3	+50°C	Nch open-drain	Active "L"	10°C
S-5844A55CB-I4T1U3	+55°C	Nch open-drain	Active "H"	10°C
S-5844A55CC-I4T1U3	+55°C	Nch open-drain	Active "H"	15°C
S-5844A55CD-I4T1U3	+55°C	Nch open-drain	Active "H"	20°C
S-5844A55DB-I4T1U3	+55°C	Nch open-drain	Active "L"	10°C
S-5844A60AB-I4T1U3	+60°C	CMOS	Active "H"	10°C
S-5844A60CB-I4T1U3	+60°C	Nch open-drain	Active "H"	10°C
S-5844A60CC-I4T1U3	+60°C	Nch open-drain	Active "H"	15°C
S-5844A60CD-I4T1U3	+60°C	Nch open-drain	Active "H"	20°C
S-5844A60DA-I4T1U3	+60°C	Nch open-drain	Active "L"	5°C
S-5844A60DB-I4T1U3	+60°C	Nch open-drain	Active "L"	10°C
S-5844A65AA-I4T1U3	+65°C	CMOS	Active "H"	5°C
S-5844A65CB-I4T1U3	+65°C	Nch open-drain	Active "H"	10°C
S-5844A65CC-I4T1U3	+65°C	Nch open-drain	Active "H"	15°C
S-5844A65CD-I4T1U3	+65°C	Nch open-drain	Active "H"	20°C
S-5844A65DA-I4T1U3	+65°C	Nch open-drain	Active "L"	5°C
S-5844A65DB-I4T1U3	+65°C	Nch open-drain	Active "L"	10°C
S-5844A70AB-I4T1U3	+70°C	CMOS	Active "H"	10°C
S-5844A70AD-I4T1U3	+70°C	CMOS	Active "H"	20°C
S-5844A70BD-I4T1U3	+70°C	CMOS	Active "L"	20°C
S-5844A70CB-I4T1U3	+70°C	Nch open-drain	Active "H"	10°C
S-5844A70CC-I4T1U3	+70°C	Nch open-drain	Active "H"	15°C
S-5844A70CD-I4T1U3	+70°C	Nch open-drain	Active "H"	20°C
S-5844A70DB-I4T1U3	+70°C	Nch open-drain	Active "L"	10°C
S-5844A75AB-I4T1U3	+75°C	CMOS	Active "H"	10°C
S-5844A75AD-I4T1U3	+75°C	CMOS	Active "H"	20°C
S-5844A75CB-I4T1U3	+75°C	Nch open-drain	Active "H"	10°C
S-5844A75CC-I4T1U3	+75°C	Nch open-drain	Active "H"	15°C
S-5844A75CD-I4T1U3	+75°C	Nch open-drain	Active "H"	20°C
S-5844A75DB-I4T1U3	+75°C	Nch open-drain	Active "L"	10°C
S-5844A80AB-I4T1U3	+80°C	CMOS	Active "H"	10°C
S-5844A80CB-I4T1U3	+80°C	Nch open-drain	Active "H"	10°C
S-5844A80CC-I4T1U3	+80°C	Nch open-drain	Active "H"	15°C
S-5844A80CD-I4T1U3	+80°C	Nch open-drain	Active "H"	20°C
S-5844A80DB-I4T1U3	+80°C	Nch open-drain	Active "L"	10°C
S-5844A85AB-I4T1U3	+85°C	CMOS	Active "H"	10°C
S-5844A85CB-I4T1U3	+85°C	Nch open-drain	Active "H"	10°C
S-5844A85CC-I4T1U3	+85°C	Nch open-drain	Active "H"	15°C
S-5844A85CD-I4T1U3	+85°C	Nch open-drain	Active "H"	20°C
S-5844A85DB-I4T1U3	+85°C	Nch open-drain	Active "L"	10°C

Remark Please contact our sales representatives for products other than the above.

Table 3 (2 / 2)

Product Name	Detection Temperature (T_{DET})	DET Pin Output Form	DET Pin Output Logic	Hysteresis Temperature (T_{HYS})
S-5844A90AA-I4T1U3	+90°C	CMOS	Active "H"	5°C
S-5844A90CB-I4T1U3	+90°C	Nch open-drain	Active "H"	10°C
S-5844A90CC-I4T1U3	+90°C	Nch open-drain	Active "H"	15°C
S-5844A90CD-I4T1U3	+90°C	Nch open-drain	Active "H"	20°C
S-5844A90DB-I4T1U3	+90°C	Nch open-drain	Active "L"	10°C
S-5844A95CB-I4T1U3	+95°C	Nch open-drain	Active "H"	10°C
S-5844A95CC-I4T1U3	+95°C	Nch open-drain	Active "H"	15°C
S-5844A95CD-I4T1U3	+95°C	Nch open-drain	Active "H"	20°C
S-5844A95DA-I4T1U3	+95°C	Nch open-drain	Active "L"	5°C
S-5844A95DB-I4T1U3	+95°C	Nch open-drain	Active "L"	10°C

Remark Please contact our sales representatives for products other than the above.

3. 3 HSNT-4 (1010)

Table 4 (1 / 2)

Product Name	Detection Temperature (T_{DET})	DET Pin Output Form	DET Pin Output Logic	Hysteresis Temperature (T_{HYS})
S-5844A50CB-A4T2U3	+50°C	Nch open-drain	Active "H"	10°C
S-5844A50DB-A4T2U3	+50°C	Nch open-drain	Active "L"	10°C
S-5844A55CB-A4T2U3	+55°C	Nch open-drain	Active "H"	10°C
S-5844A55CC-A4T2U3	+55°C	Nch open-drain	Active "H"	15°C
S-5844A55CD-A4T2U3	+55°C	Nch open-drain	Active "H"	20°C
S-5844A55DB-A4T2U3	+55°C	Nch open-drain	Active "L"	10°C
S-5844A60AB-A4T2U3	+60°C	CMOS	Active "H"	10°C
S-5844A60CB-A4T2U3	+60°C	Nch open-drain	Active "H"	10°C
S-5844A60CC-A4T2U3	+60°C	Nch open-drain	Active "H"	15°C
S-5844A60CD-A4T2U3	+60°C	Nch open-drain	Active "H"	20°C
S-5844A60DA-A4T2U3	+60°C	Nch open-drain	Active "L"	5°C
S-5844A60DB-A4T2U3	+60°C	Nch open-drain	Active "L"	10°C
S-5844A65AA-A4T2U3	+65°C	CMOS	Active "H"	5°C
S-5844A65CB-A4T2U3	+65°C	Nch open-drain	Active "H"	10°C
S-5844A65CC-A4T2U3	+65°C	Nch open-drain	Active "H"	15°C
S-5844A65CD-A4T2U3	+65°C	Nch open-drain	Active "H"	20°C
S-5844A65DA-A4T2U3	+65°C	Nch open-drain	Active "L"	5°C
S-5844A65DB-A4T2U3	+65°C	Nch open-drain	Active "L"	10°C
S-5844A70AB-A4T2U3	+70°C	CMOS	Active "H"	10°C
S-5844A70AD-A4T2U3	+70°C	CMOS	Active "H"	20°C
S-5844A70BD-A4T2U3	+70°C	CMOS	Active "L"	20°C
S-5844A70CB-A4T2U3	+70°C	Nch open-drain	Active "H"	10°C
S-5844A70CC-A4T2U3	+70°C	Nch open-drain	Active "H"	15°C
S-5844A70CD-A4T2U3	+70°C	Nch open-drain	Active "H"	20°C
S-5844A70DB-A4T2U3	+70°C	Nch open-drain	Active "L"	10°C
S-5844A75AB-A4T2U3	+75°C	CMOS	Active "H"	10°C
S-5844A75AD-A4T2U3	+75°C	CMOS	Active "H"	20°C
S-5844A75CB-A4T2U3	+75°C	Nch open-drain	Active "H"	10°C
S-5844A75CC-A4T2U3	+75°C	Nch open-drain	Active "H"	15°C
S-5844A75CD-A4T2U3	+75°C	Nch open-drain	Active "H"	20°C
S-5844A75DB-A4T2U3	+75°C	Nch open-drain	Active "L"	10°C
S-5844A80AB-A4T2U3	+80°C	CMOS	Active "H"	10°C
S-5844A80CB-A4T2U3	+80°C	Nch open-drain	Active "H"	10°C
S-5844A80CC-A4T2U3	+80°C	Nch open-drain	Active "H"	15°C
S-5844A80CD-A4T2U3	+80°C	Nch open-drain	Active "H"	20°C
S-5844A80DB-A4T2U3	+80°C	Nch open-drain	Active "L"	10°C
S-5844A85AB-A4T2U3	+85°C	CMOS	Active "H"	10°C
S-5844A85CB-A4T2U3	+85°C	Nch open-drain	Active "H"	10°C
S-5844A85CC-A4T2U3	+85°C	Nch open-drain	Active "H"	15°C
S-5844A85CD-A4T2U3	+85°C	Nch open-drain	Active "H"	20°C
S-5844A85DB-A4T2U3	+85°C	Nch open-drain	Active "L"	10°C

Remark Please contact our sales representatives for products other than the above.

Table 4 (2 / 2)

Product Name	Detection Temperature (T_{DET})	DET Pin Output Form	DET Pin Output Logic	Hysteresis Temperature (T_{HYS})
S-5844A90AA-A4T2U3	+90°C	CMOS	Active "H"	5°C
S-5844A90CB-A4T2U3	+90°C	Nch open-drain	Active "H"	10°C
S-5844A90CC-A4T2U3	+90°C	Nch open-drain	Active "H"	15°C
S-5844A90CD-A4T2U3	+90°C	Nch open-drain	Active "H"	20°C
S-5844A90DB-A4T2U3	+90°C	Nch open-drain	Active "L"	10°C
S-5844A95CB-A4T2U3	+95°C	Nch open-drain	Active "H"	10°C
S-5844A95CC-A4T2U3	+95°C	Nch open-drain	Active "H"	15°C
S-5844A95CD-A4T2U3	+95°C	Nch open-drain	Active "H"	20°C
S-5844A95DA-A4T2U3	+95°C	Nch open-drain	Active "L"	5°C
S-5844A95DB-A4T2U3	+95°C	Nch open-drain	Active "L"	10°C

Remark Please contact our sales representatives for products other than the above.

■ Pin Configurations

1. SOT-23-5

Top view

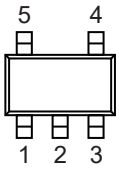


Figure 3

Table 5

Pin No.	Symbol	Description
1	TEST*1	Test pin
2	VSS	GND pin
3	DET	Output pin
4	NC*2	No connection
5	VDD	Power supply pin

***1.** Connect the TEST pin to the VSS pin, or leave it open.
***2.** The NC pin is electrically open.
The NC pin can be connected to the VDD pin or the VSS pin.

2. SNT-4A

Top view

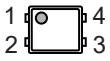


Figure 4

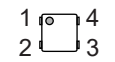
Table 6

Pin No.	Symbol	Description
1	DET	Output pin
2	VSS	GND pin
3	TEST*1	Test pin
4	VDD	Power supply pin

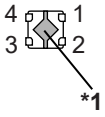
***1.** Connect the TEST pin to the VSS pin, or leave it open.

3. HSNT-4 (1010)

Top view



Bottom view



***1.** Connect the heat sink of backside at shadowed area to the board, and set electric potential open or GND. However, do not use it as the function of electrode.

Figure 5

Table 7

Pin No.	Symbol	Description
1	DET	Output pin
2	VSS	GND pin
3	TEST*1	Test pin
4	VDD	Power supply pin

***1.** Connect the TEST pin to the VSS pin, or leave it open.

■ Absolute Maximum Ratings

Table 8

(Ta = +25°C unless otherwise specified)

Item		Symbol	Absolute Maximum Rating	Unit
Power supply voltage (V_{SS} = 0 V)		V_{DD}	V_{SS} + 6.0	V
Pin voltage		V_{TEST}	V_{SS} – 0.3 to V_{DD} + 0.3	V
Output voltage	CMOS output product	V_{DET}	V_{SS} – 0.3 to V_{DD} + 0.3	V
	Nch open-drain output product		V_{SS} – 0.3 to V_{SS} + 6.0	V
Output pin current	Pch driving current	I_{DETH}	10	mA
	Nch driving current	I_{DETL}	10	mA
Power dissipation	SOT-23-5	P_D	600*1	mW
	SNT-4A		300*1	mW
	HSNT-4 (1010)		340*1	mW
Operation ambient temperature		T_{opr}	–40 to +125	°C
Storage temperature		T_{stg}	–55 to +150	°C

***1.** When mounted on board

[Mounted board]

(1) Board size: 114.3 mm × 76.2 mm × t1.6 mm

(2) Board name: JEDEC STANDARD51-7

Caution The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

■ DC Electrical Characteristics

1. CMOS output product

Table 9

(V_{DD} = 3.0 V, Ta = +25°C unless otherwise specified)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Test Circuit
Power supply voltage	V_{DD}	–	1.65	–	5.5	V	1
Detection temperature*1	$+T_D$	–	T_{DET} – 2.5	T_{DET}	T_{DET} + 2.5	°C	1
Hysteresis temperature*2	T_{HYS}	–	–	5, 10, 15, 20	–	°C	1
Output voltage	V_{DETH}	I_{DETH} = 0.5 mA	V_{DD} – 0.5	–	–	V	2
	V_{DETL}	I_{DETL} = 0.5 mA	–	–	0.5	V	3
Current consumption during operation	I_{DD}	–	–	0.18	0.5	µA	1

***1.** T_{DET}: Set value of detection temperature

***2.** The hysteresis temperature is selectable in 5°C, 10°C, 15°C, or 20°C.
However, if the detection temperature is +50°C, select the hysteresis temperature in 5°C or 10°C.

2. Nch open-drain output product

Table 10

(V_{DD} = 3.0 V, Ta = +25°C unless otherwise specified)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Test Circuit
Power supply voltage	V_{DD}	–	1.65	–	5.5	V	1
Detection temperature*1	$+T_D$	–	T_{DET} – 2.5	T_{DET}	T_{DET} + 2.5	°C	1
Hysteresis temperature*2	T_{HYS}	–	–	5, 10, 15, 20	–	°C	1
Output voltage	V_{DETL}	I_{DETL} = 0.5 mA	–	–	0.5	V	3
Leakage current	I_{LEAK}	V_{DET} = 5.5 V	–	–	0.1	µA	4
Current consumption during operation	I_{DD}	–	–	0.18	0.5	µA	1

***1.** T_{DET}: Set value of detection temperature

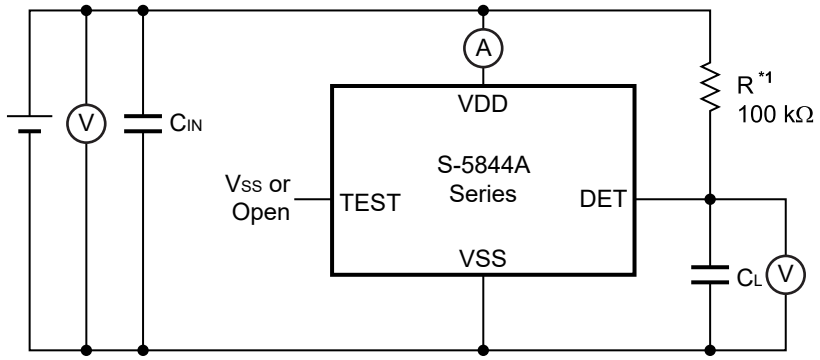
***2.** The hysteresis temperature is selectable in 5°C, 10°C, 15°C, or 20°C.
However, if the detection temperature is +50°C, select the hysteresis temperature in 5°C or 10°C.

[Fahrenheit ⇔ Celsius conversion equation]

°C = (°F – 32) × 5 / 9

°F = 32 + °C × 9 / 5

■ Test Circuits



***1.** Resistor (R) is unnecessary for the CMOS output product.

Figure 6 Test Circuit 1

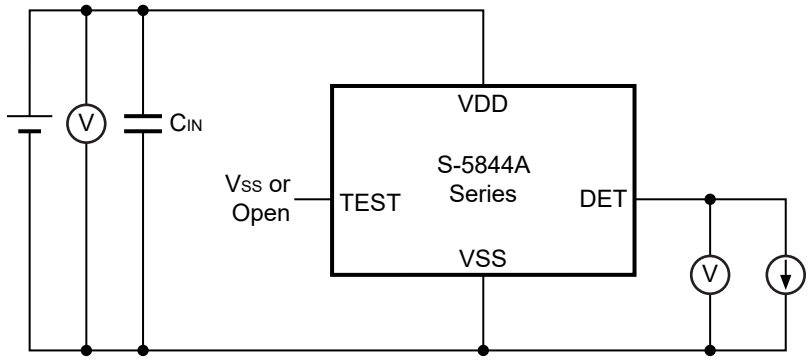


Figure 7 Test Circuit 2

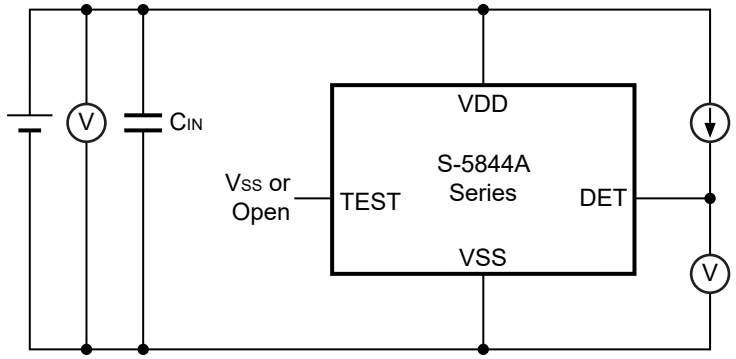


Figure 8 Test Circuit 3

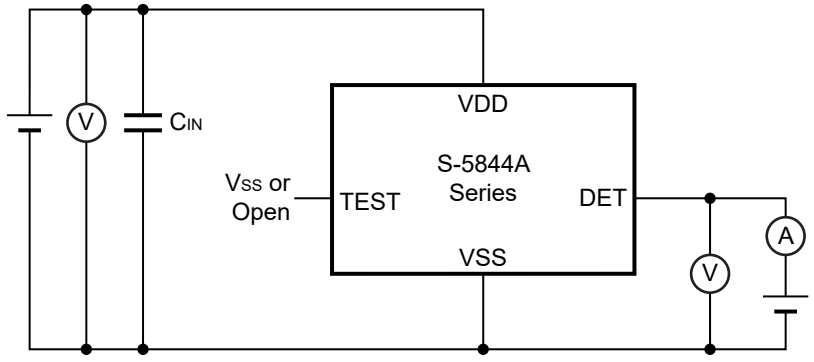


Figure 9 Test Circuit 4

■ Operation

The S-5844A Series is a temperature switch IC (thermostat IC) which detects temperature and sends a signal to an external device.
The users can select various combinations of the parameters such as the detection temperature, the output form and logic, and hysteresis temperature.

Following is about the operation when the DET pin output logic is active "H".
After applying the power supply, the S-5844A Series starts to detect the temperature. If the temperature is lower than the detection temperature ($+T_D$), the DET pin output keeps "L". After that, the temperature rises and exceeds the detection temperature, and the DET pin goes in "H".
After the detection, the temperature drops and reaches the release temperature ($+T_D - T_{HYS}$), the DET pin output returns to "L".
Figure 10 is the timing chart.

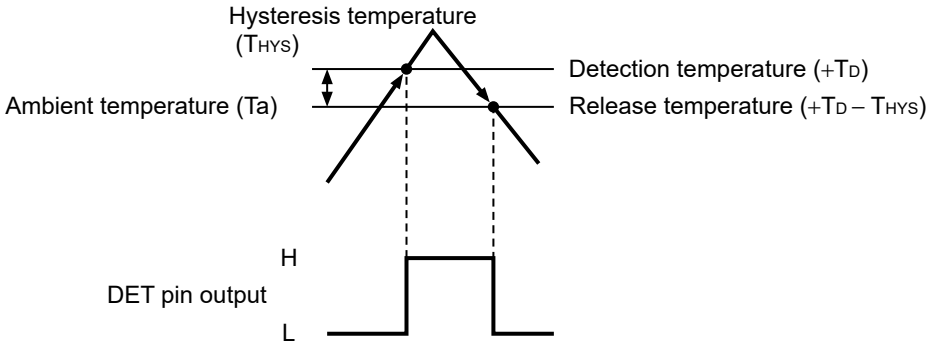
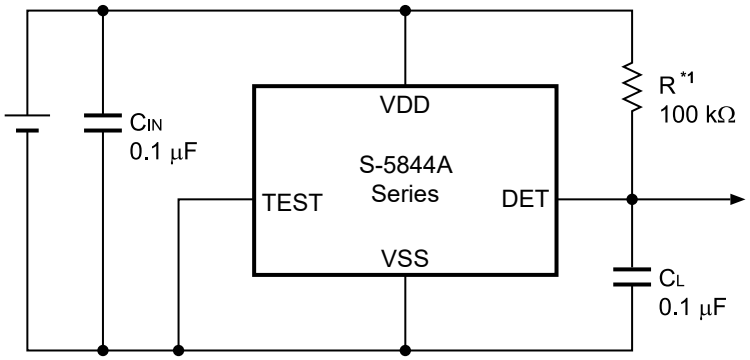


Figure 10 Operation when the DET Pin Output Logic is Active "H"

■ Standard Circuit



***1.** Resistor (R) is unnecessary for the CMOS output product.

Figure 11

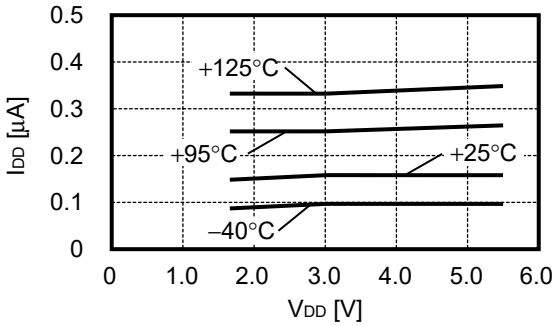
Caution The above connection diagram will not guarantee successful operation. Perform thorough evaluation using actual application to set the constants.

■ Precautions

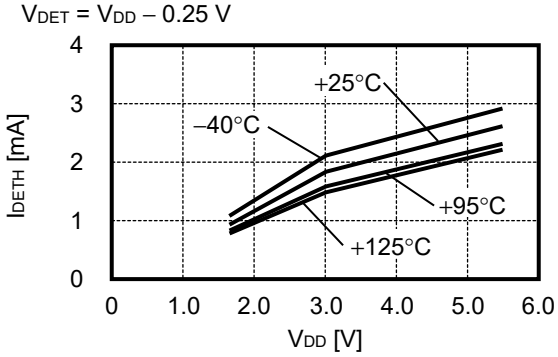
- If power impedance is high, the S-5844A Series may malfunction due to voltage drop caused by feed-through current. Set wire patterns carefully for lower power impedance.
- It is recommended to set a capacitor (C_{IN}) of 0.1 μF or more between the VDD pin and VSS pin for stabilization.
- The S-5844A Series may malfunction if the power supply voltage changes suddenly.
- The S-5844A Series is more easily affected by disturbance or noise if the TEST pin is left open.
- It is recommended to set a capacitor (C_L) of about 0.1 μF for the DET pin to prevent malfunction caused by the noise when the power supply is applied.
- The S-5844A Series may malfunction if the power supply voltage is lower than the minimum operation voltage.
- Do not apply an electrostatic discharge to this IC that exceeds the performance ratings of the built-in electrostatic protection circuit.
- ABLIC Inc. claims no responsibility for any disputes arising out of or in connection with any infringement by products, including this IC, of patents owned by a third party.

■ Characteristics (Typical Data)

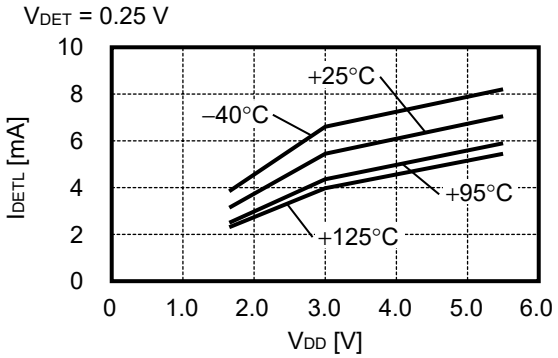
1. Current consumption vs. Power supply voltage characteristics



2. DET pin current "H" vs. Power supply voltage characteristics (CMOS output product only)



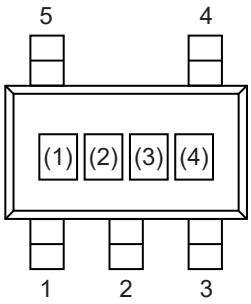
3. DET pin current "L" vs. Power supply voltage characteristics



■ Marking Specifications

1. SOT-23-5

Top view



(1) to (3): Product code (refer to **Product name vs. Product code)**
(4): Lot number

Product name vs. Product code

Product Name	Product Code		
	(1)	(2)	(3)
S-5844A50CB-M5T1U3	2	M	J
S-5844A50DB-M5T1U3	2	M	4
S-5844A55CB-M5T1U3	2	M	F
S-5844A55CC-M5T1U3	2	O	F
S-5844A55CD-M5T1U3	2	Q	F
S-5844A55DB-M5T1U3	2	M	X
S-5844A60AB-M5T1U3	2	L	F
S-5844A60CB-M5T1U3	2	M	G
S-5844A60CC-M5T1U3	2	O	G
S-5844A60CD-M5T1U3	2	Q	G
S-5844A60DA-M5T1U3	2	K	V
S-5844A60DB-M5T1U3	2	M	Y
S-5844A65AA-M5T1U3	2	J	D
S-5844A65CB-M5T1U3	2	M	H
S-5844A65CC-M5T1U3	2	O	H
S-5844A65CD-M5T1U3	2	Q	H
S-5844A65DA-M5T1U3	2	K	U
S-5844A65DB-M5T1U3	2	M	Z
S-5844A70AB-M5T1U3	2	L	D
S-5844A70AD-M5T1U3	2	P	A
S-5844A70BD-M5T1U3	2	P	R
S-5844A70CB-M5T1U3	2	M	I
S-5844A70CC-M5T1U3	2	O	I
S-5844A70CD-M5T1U3	2	Q	I
S-5844A70DB-M5T1U3	2	M	3
S-5844A75AB-M5T1U3	2	L	C

Product Name	Product Code		
	(1)	(2)	(3)
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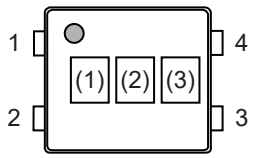
S-5844A75CB-M5T1U3	2	M	A
S-5844A75CC-M5T1U3	2	O	A
S-5844A75CD-M5T1U3	2	Q	A
S-5844A75DB-M5T1U3	2	M	R
S-5844A80AB-M5T1U3	2	L	B
S-5844A80CB-M5T1U3	2	M	B
S-5844A80CC-M5T1U3	2	O	B
S-5844A80CD-M5T1U3	2	Q	B
S-5844A80DB-M5T1U3	2	M	S
S-5844A85AB-M5T1U3	2	L	A
S-5844A85CB-M5T1U3	2	M	C
S-5844A85CC-M5T1U3	2	O	C
S-5844A85CD-M5T1U3	2	Q	C
S-5844A85DB-M5T1U3	2	M	T
S-5844A90AA-M5T1U3	2	J	A
S-5844A90CB-M5T1U3	2	M	D
S-5844A90CC-M5T1U3	2	O	D
S-5844A90CD-M5T1U3	2	Q	D
S-5844A90DB-M5T1U3	2	M	U
S-5844A95CB-M5T1U3	2	M	E
S-5844A95CC-M5T1U3	2	O	E
S-5844A95CD-M5T1U3	2	Q	E
S-5844A95DA-M5T1U3	2	K	T
S-5844A95DB-M5T1U3	2	M	V

2. SNT-4A

Top view



(1) to (3): Product code (refer to **Product name vs. Product code**)

Product name vs. Product code

Product Name	Product Code		
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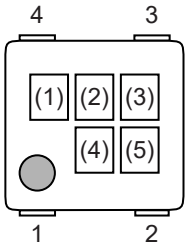
S-5844A50CB-I4T1U3	2	M	J
S-5844A50DB-I4T1U3	2	M	4
S-5844A55CB-I4T1U3	2	M	F
S-5844A55CC-I4T1U3	2	O	F
S-5844A55CD-I4T1U3	2	Q	F
S-5844A55DB-I4T1U3	2	M	X
S-5844A60AB-I4T1U3	2	L	F
S-5844A60CB-I4T1U3	2	M	G
S-5844A60CC-I4T1U3	2	O	G
S-5844A60CD-I4T1U3	2	Q	G
S-5844A60DA-I4T1U3	2	K	V
S-5844A60DB-I4T1U3	2	M	Y
S-5844A65AA-I4T1U3	2	J	D
S-5844A65CB-I4T1U3	2	M	H
S-5844A65CC-I4T1U3	2	O	H
S-5844A65CD-I4T1U3	2	Q	H
S-5844A65DA-I4T1U3	2	K	U
S-5844A65DB-I4T1U3	2	M	Z
S-5844A70AB-I4T1U3	2	L	D
S-5844A70AD-I4T1U3	2	P	A
S-5844A70BD-I4T1U3	2	P	R
S-5844A70CB-I4T1U3	2	M	I
S-5844A70CC-I4T1U3	2	O	I
S-5844A70CD-I4T1U3	2	Q	I
S-5844A70DB-I4T1U3	2	M	3
S-5844A75AB-I4T1U3	2	L	C

Product Name	Product Code		
	(1)	(2)	(3)
S-5844A75AD-I4T1U3	2	P	B
S-5844A75CB-I4T1U3	2	M	A
S-5844A75CC-I4T1U3	2	O	A
S-5844A75CD-I4T1U3	2	Q	A
S-5844A75DB-I4T1U3	2	M	R
S-5844A80AB-I4T1U3	2	L	B
S-5844A80CB-I4T1U3	2	M	B
S-5844A80CC-I4T1U3	2	O	B
S-5844A80CD-I4T1U3	2	Q	B
S-5844A80DB-I4T1U3	2	M	S
S-5844A85AB-I4T1U3	2	L	A
S-5844A85CB-I4T1U3	2	M	C
S-5844A85CC-I4T1U3	2	O	C
S-5844A85CD-I4T1U3	2	Q	C
S-5844A85DB-I4T1U3	2	M	T
S-5844A90AA-I4T1U3	2	J	A
S-5844A90CB-I4T1U3	2	M	D
S-5844A90CC-I4T1U3	2	O	D
S-5844A90CD-I4T1U3	2	Q	D
S-5844A90DB-I4T1U3	2	M	U
S-5844A95CB-I4T1U3	2	M	E
S-5844A95CC-I4T1U3	2	O	E
S-5844A95CD-I4T1U3	2	Q	E
S-5844A95DA-I4T1U3	2	K	T
S-5844A95DB-I4T1U3	2	M	V

3. HSNT-4 (1010)

Top view



(1) to (3): Product code (refer to **Product name vs. Product code**)
(4), (5): Lot number

Product name vs. Product code

Product Name	Product Code		
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S-5844A50CB-A4T2U3	2	M	J
S-5844A50DB-A4T2U3	2	M	4
S-5844A55CB-A4T2U3	2	M	F
S-5844A55CC-A4T2U3	2	O	F
S-5844A55CD-A4T2U3	2	Q	F
S-5844A55DB-A4T2U3	2	M	X
S-5844A60AB-A4T2U3	2	L	F
S-5844A60CB-A4T2U3	2	M	G
S-5844A60CC-A4T2U3	2	O	G
S-5844A60CD-A4T2U3	2	Q	G
S-5844A60DA-A4T2U3	2	K	V
S-5844A60DB-A4T2U3	2	M	Y
S-5844A65AA-A4T2U3	2	J	D
S-5844A65CB-A4T2U3	2	M	H
S-5844A65CC-A4T2U3	2	O	H
S-5844A65CD-A4T2U3	2	Q	H
S-5844A65DA-A4T2U3	2	K	U
S-5844A65DB-A4T2U3	2	M	Z
S-5844A70AB-A4T2U3	2	L	D
S-5844A70AD-A4T2U3	2	P	A
S-5844A70BD-A4T2U3	2	P	R
S-5844A70CB-A4T2U3	2	M	I
S-5844A70CC-A4T2U3	2	O	I
S-5844A70CD-A4T2U3	2	Q	I
S-5844A70DB-A4T2U3	2	M	3
S-5844A75AB-A4T2U3	2	L	C

Product Name	Product Code		
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S-5844A75CB-A4T2U3	2	M	A
S-5844A75CC-A4T2U3	2	O	A
S-5844A75CD-A4T2U3	2	Q	A
S-5844A75DB-A4T2U3	2	M	R
S-5844A80AB-A4T2U3	2	L	B
S-5844A80CB-A4T2U3	2	M	B
S-5844A80CC-A4T2U3	2	O	B
S-5844A80CD-A4T2U3	2	Q	B
S-5844A80DB-A4T2U3	2	M	S
S-5844A85AB-A4T2U3	2	L	A
S-5844A85CB-A4T2U3	2	M	C
S-5844A85CC-A4T2U3	2	O	C
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S-5844A95CB-A4T2U3	2	M	E
S-5844A95CC-A4T2U3	2	O	E
S-5844A95CD-A4T2U3	2	Q	E
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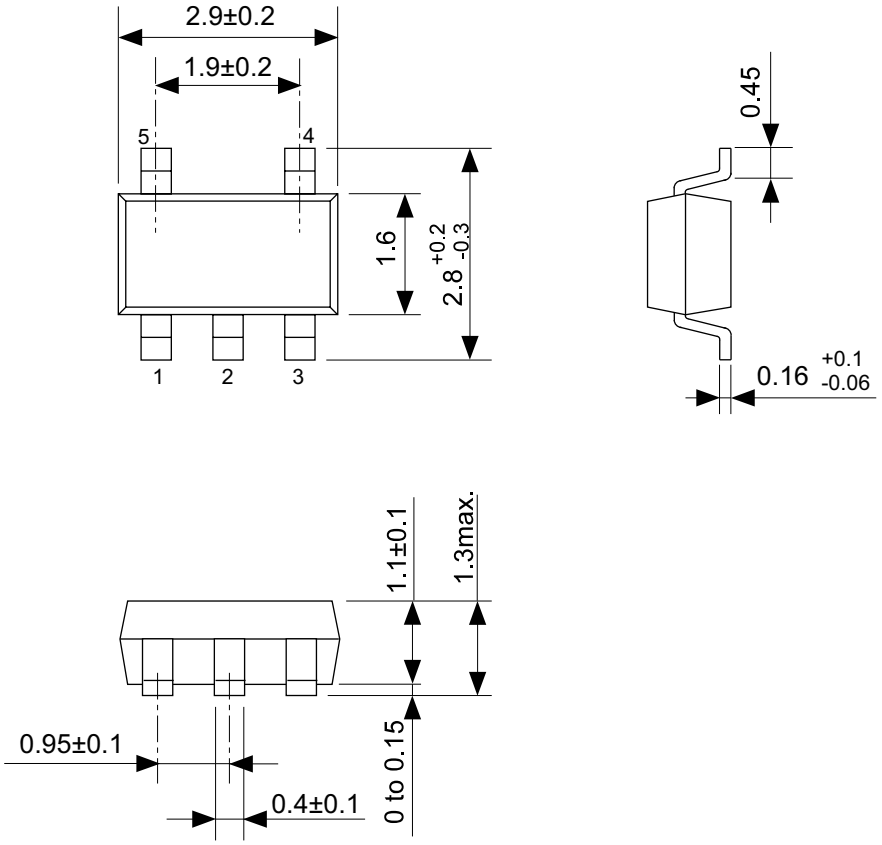
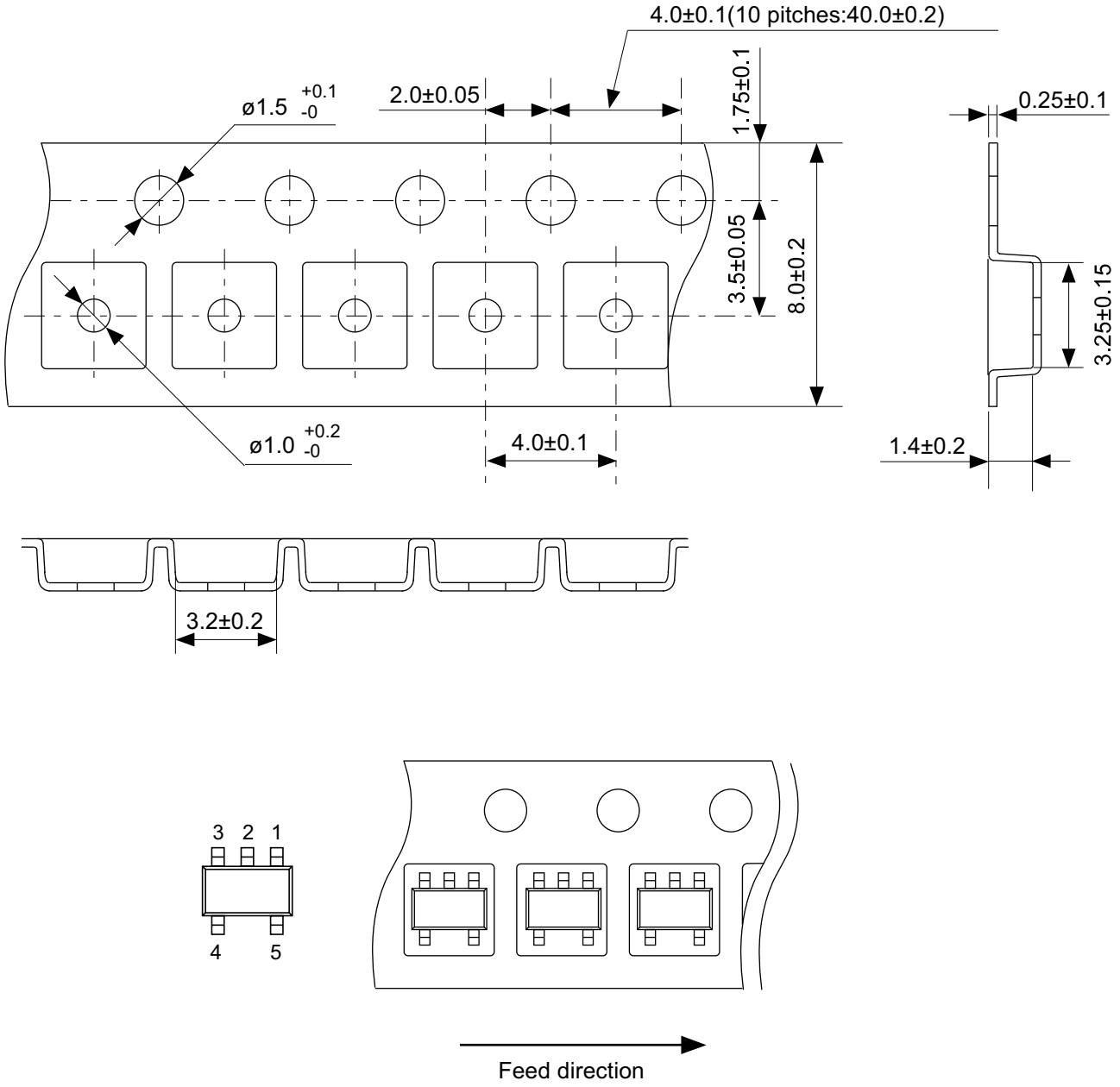
S-5844A95DB-A4T2U3	2	M	V



No. MP005-A-P-SD-1.3

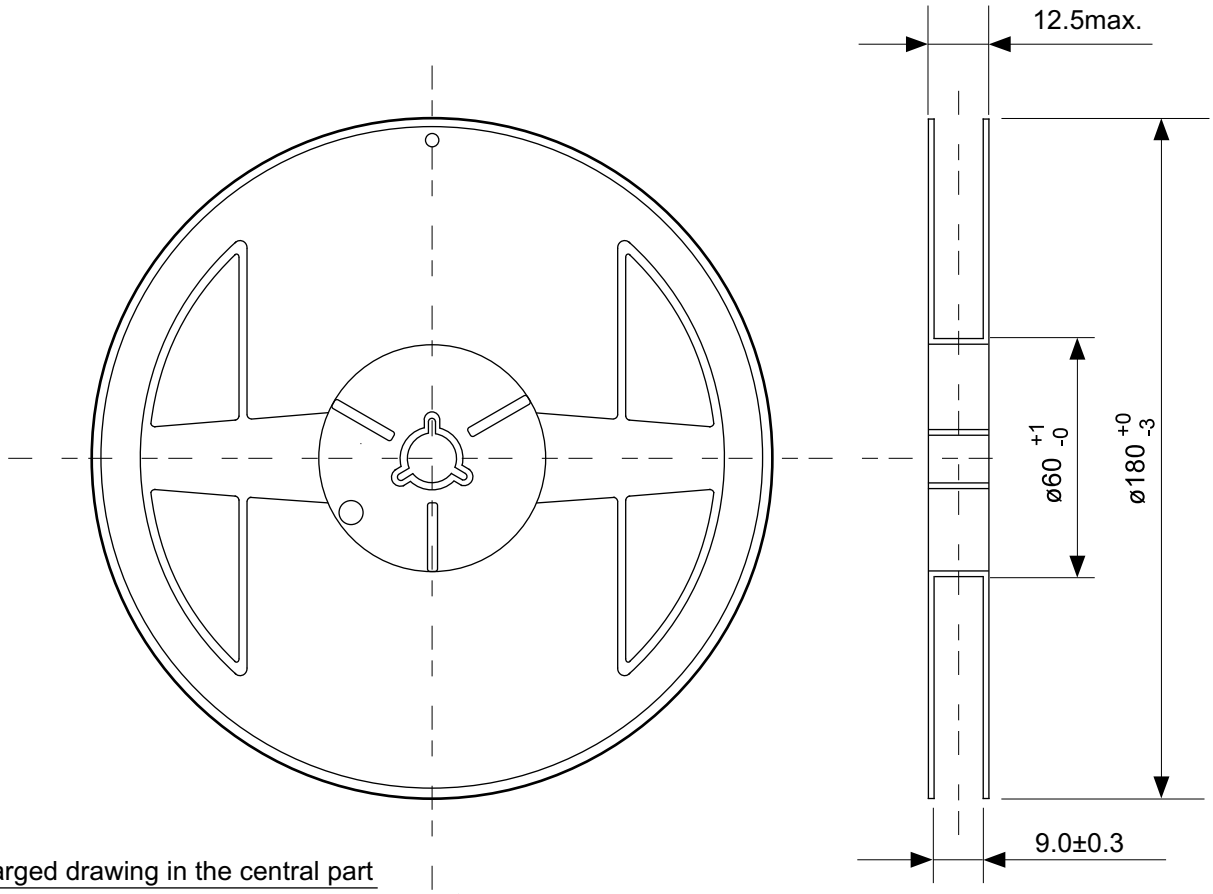
TITLE	SOT235-A-PKG Dimensions
No.	MP005-A-P-SD-1.3
ANGLE	
UNIT	mm

ABLIC Inc.

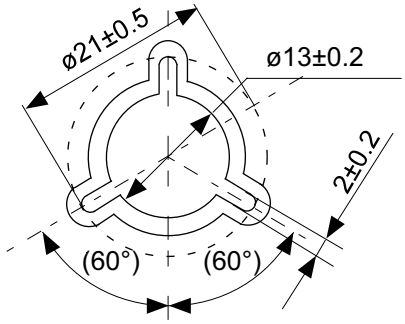


No. MP005-A-C-SD-2.1

TITLE	SOT235-A-Carrier Tape
No.	MP005-A-C-SD-2.1
ANGLE	
UNIT	mm
ABLIC Inc.	

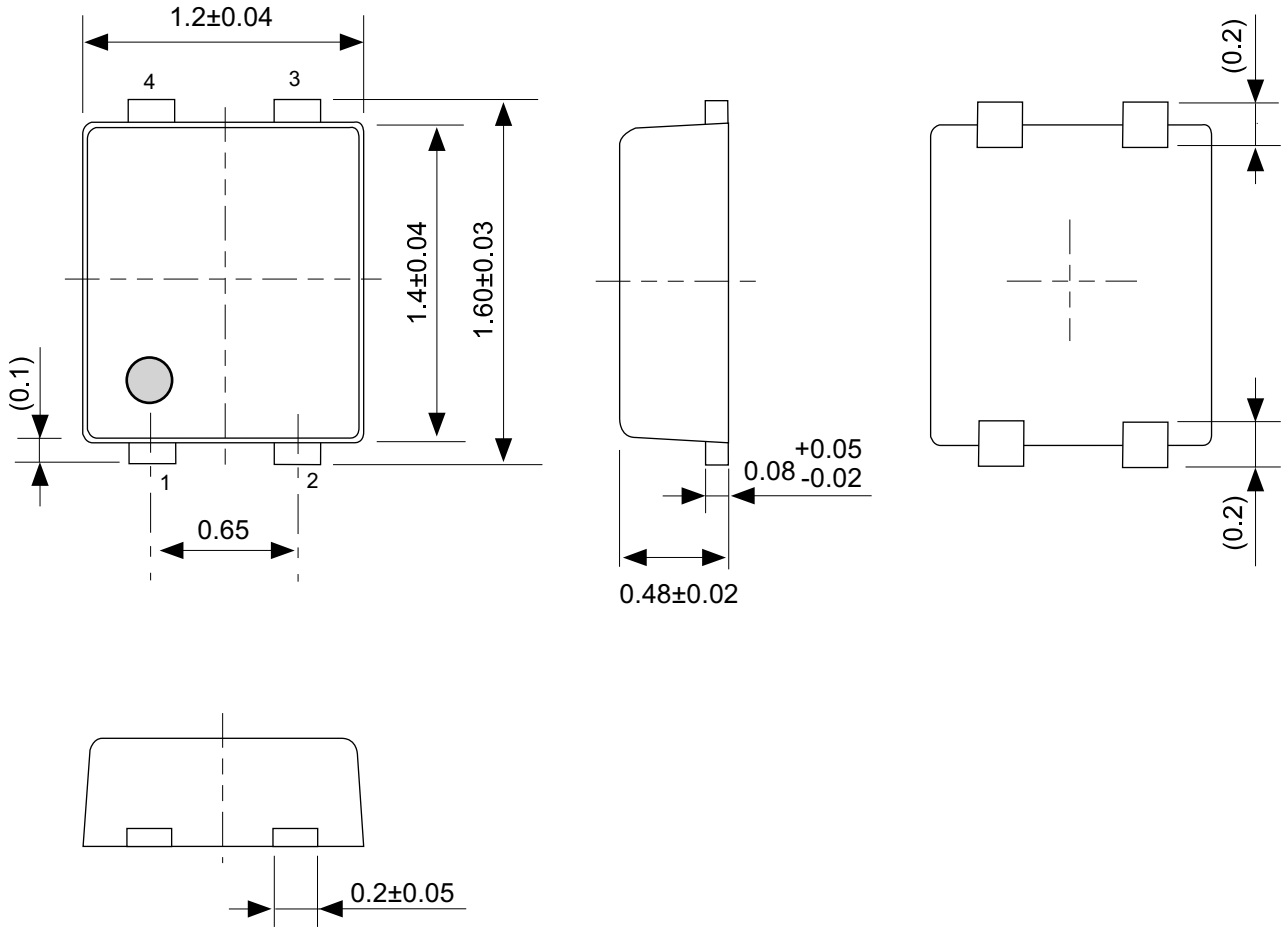


Enlarged drawing in the central part



No. MP005-A-R-SD-1.1

TITLE	SOT235-A-Reel		
No.	MP005-A-R-SD-1.1		
ANGLE		QTY.	3,000
UNIT	mm		
ABLIC Inc.			



No. PF004-A-P-SD-6.0

TITLE	SNT-4A-A-PKG Dimensions
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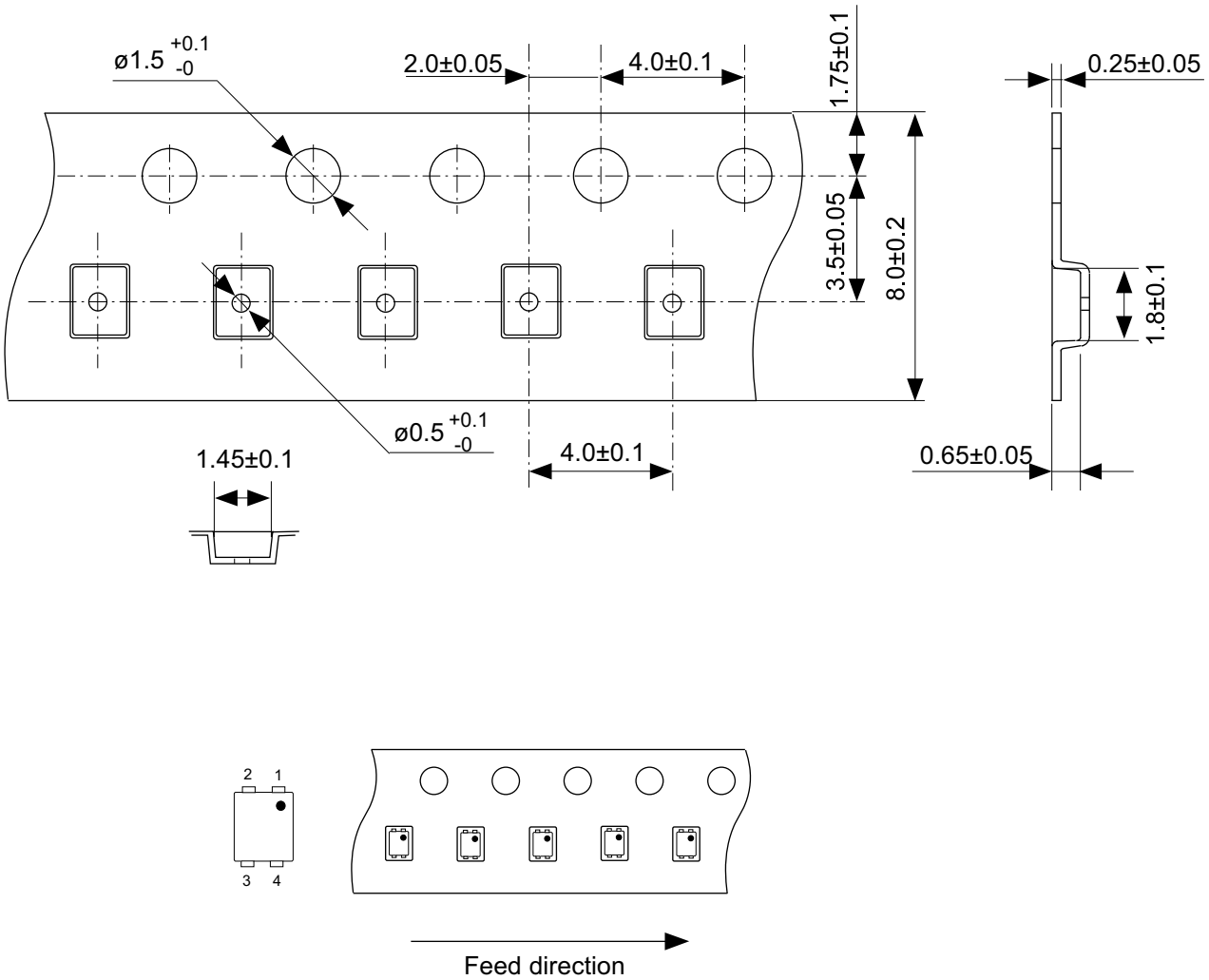
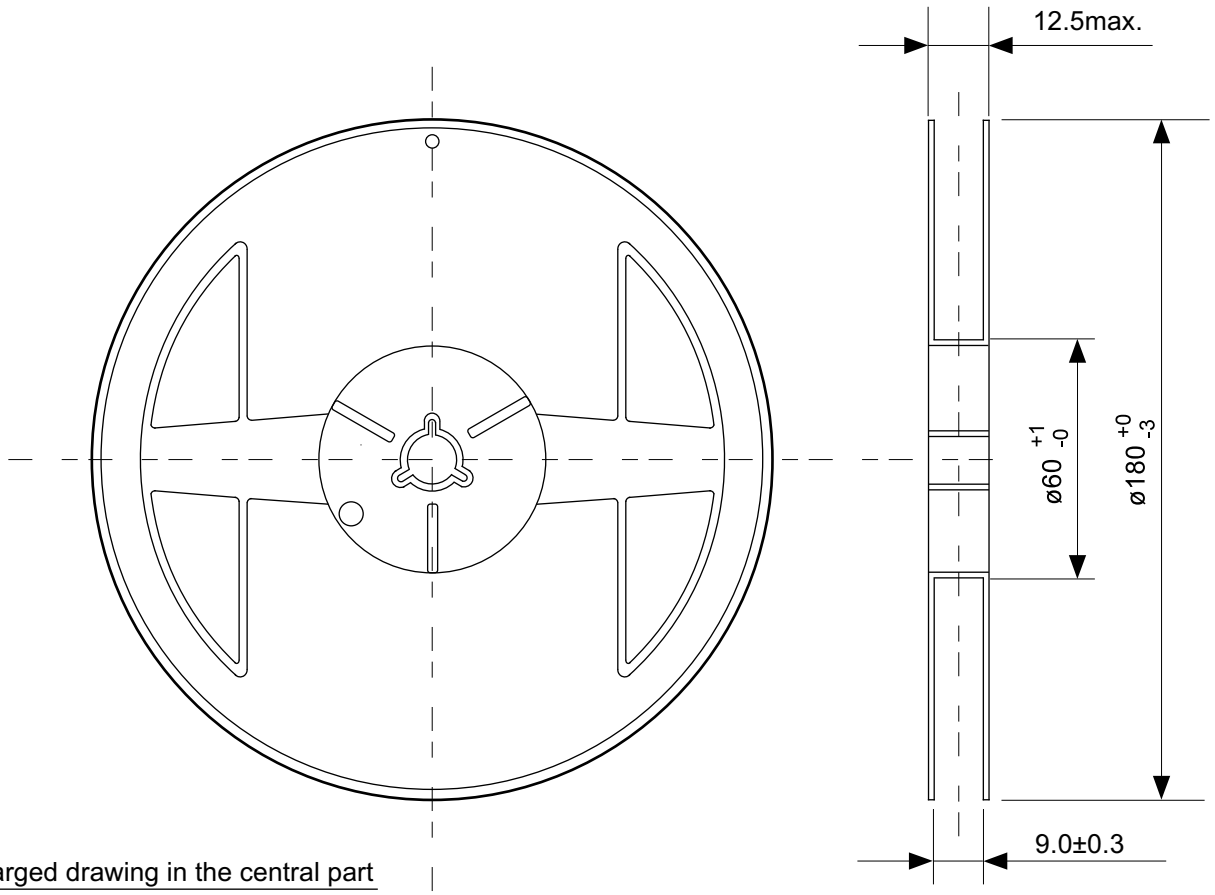
ANGLE	
UNIT	mm
ABLIC Inc.	



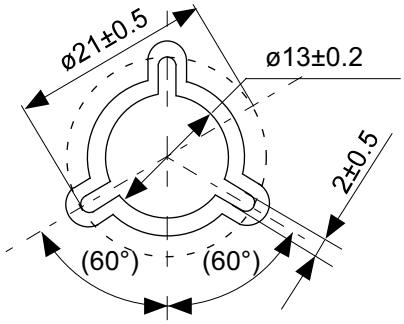
No. PF004-A-C-SD-2.0

TITLE	SNT-4A-A-Carrier Tape
No.	PF004-A-C-SD-2.0
ANGLE	
UNIT	mm

ABLIC Inc.



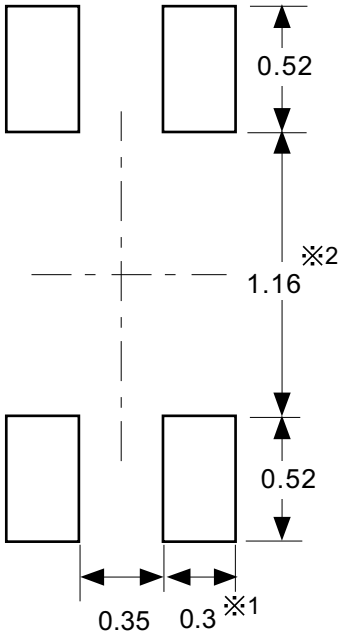
Enlarged drawing in the central part



No. PF004-A-R-SD-1.0

TITLE	SNT-4A-A-Reel		
No.	PF004-A-R-SD-1.0		
ANGLE		QTY.	5,000
UNIT	mm		

ABLIC Inc.



※1. ランドパターンの幅に注意してください (0.25 mm min. / 0.30 mm typ.)。
※2. パッケージ中央にランドパターンを広げないでください (1.10 mm ~ 1.20 mm)。

注意 1. パッケージのモールド樹脂下にシルク印刷やハンダ印刷などしないでください。
2. パッケージ下の配線上のソルダーレジストなどの厚みをランドパターン表面から**0.03 mm** 以下にしてください。
3. マスク開口サイズと開口位置はランドパターンと合わせてください。
4. 詳細は ″SNTパッケージ活用の手引き″ を参照してください。

※1. Pay attention to the land pattern width (0.25 mm min. / 0.30 mm typ.).
※2. Do not widen the land pattern to the center of the package (1.10 mm to 1.20 mm).

Caution 1. Do not do silkscreen printing and solder printing under the mold resin of the package.
2. The thickness of the solder resist on the wire pattern under the package should be 0.03 mm or less from the land pattern surface.
3. Match the mask aperture size and aperture position with the land pattern.
4. Refer to "SNT Package User's Guide" for details.

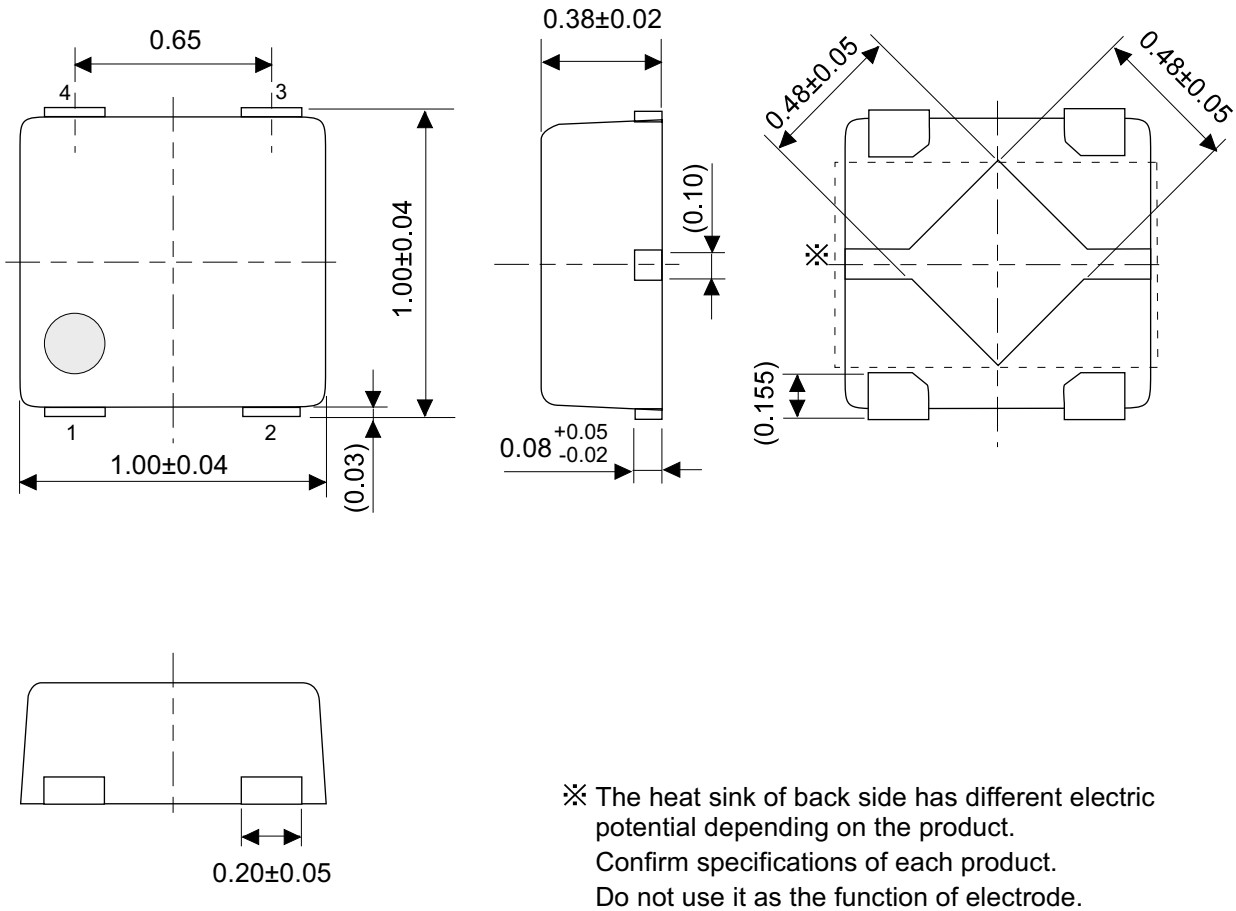
※1. 请注意焊盘模式的宽度 (0.25 mm min. / 0.30 mm typ.)。
※2. 请勿向封装中间扩展焊盘模式 (1.10 mm ~ 1.20 mm)。

注意 1. 请勿在树脂型封装的下面印刷丝网、焊锡。
2. 在封装下、布线上的阻焊膜厚度 (从焊盘模式表面起) 请控制在 0.03 mm 以下。
3. 钢网的开口尺寸和开口位置请与焊盘模式对齐。
4. 详细内容请参阅 "SNT 封装的应用指南"。

No. PF004-A-L-SD-4.1

TITLE	SNT-4A-A -Land Recommendation
No.	PF004-A-L-SD-4.1
ANGLE	
UNIT	mm

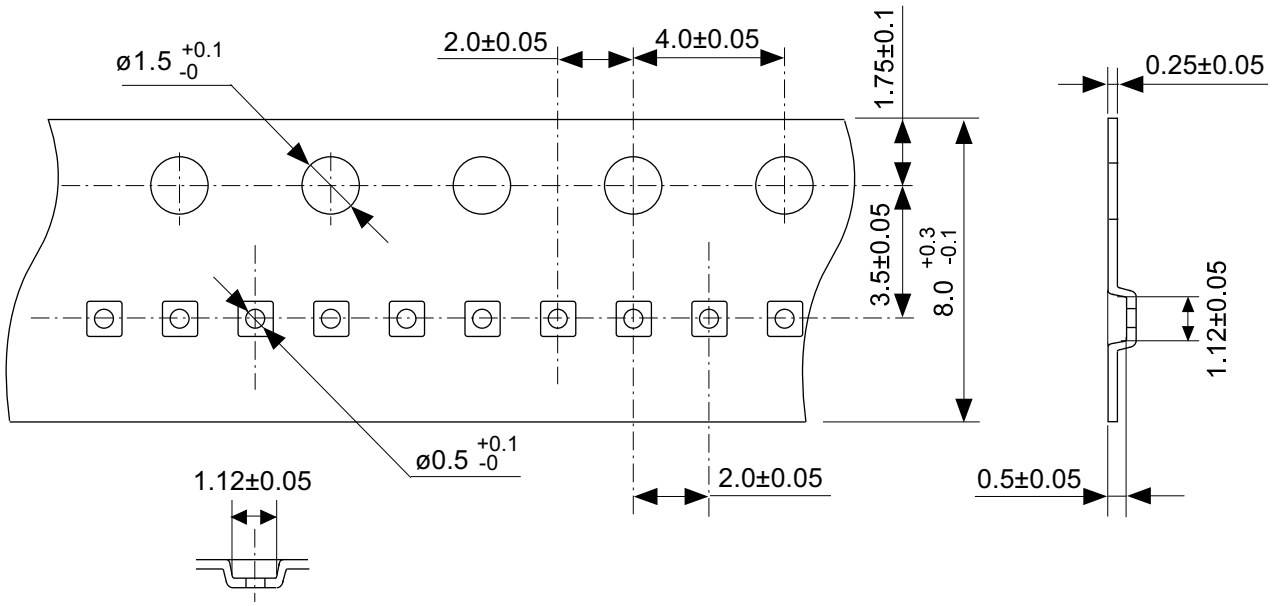
ABLIC Inc.

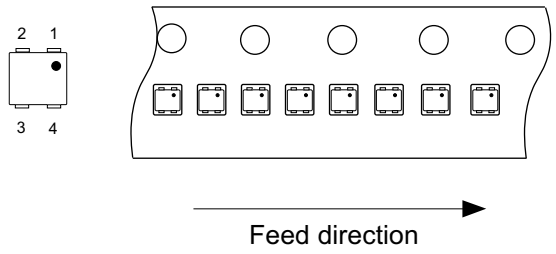


※ The heat sink of back side has different electric potential depending on the product.
Confirm specifications of each product.
Do not use it as the function of electrode.

No. PL004-A-P-SD-1.1

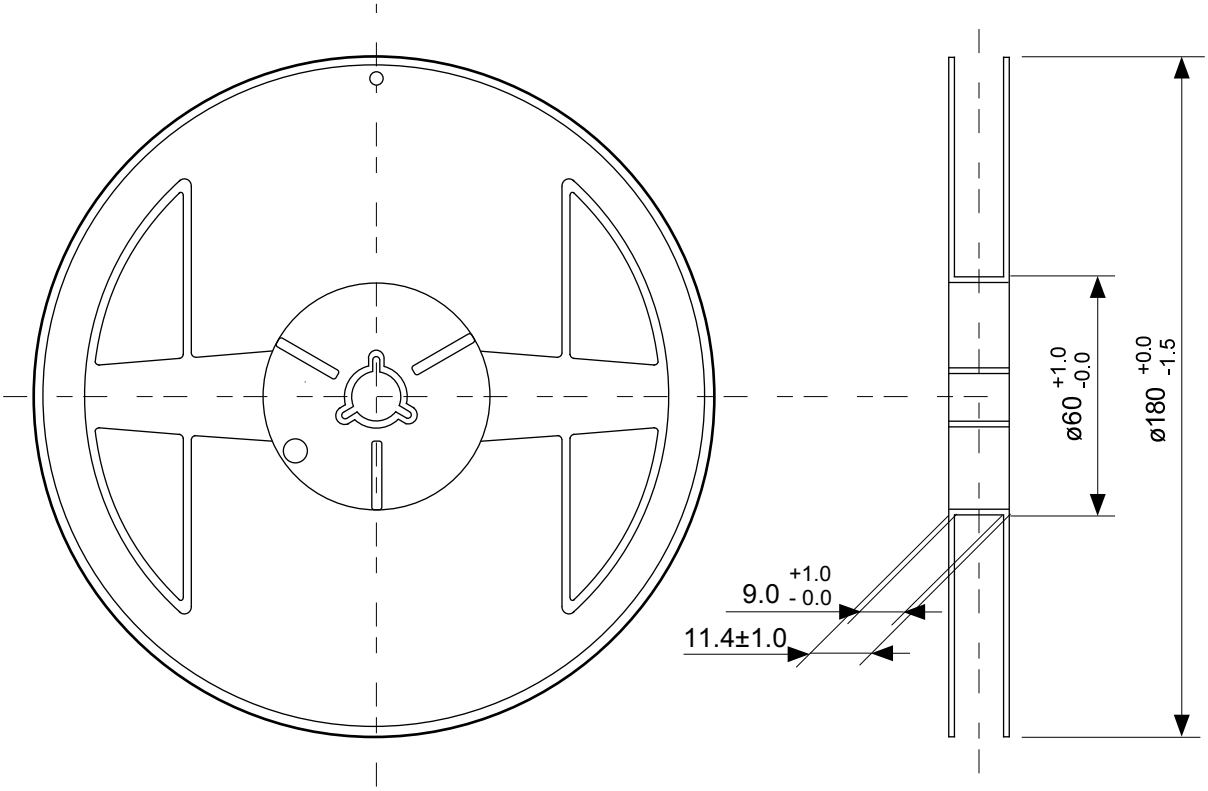
TITLE	HSNT-4-B-PKG Dimensions
No.	PL004-A-P-SD-1.1
ANGLE	
UNIT	mm
ABLIC Inc.	



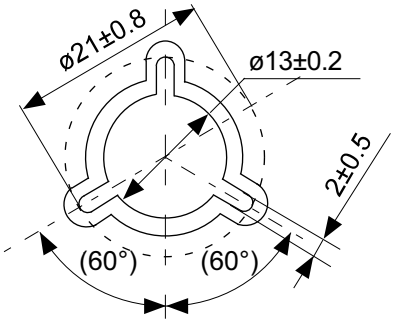


No. PL004-A-C-SD-2.0

TITLE	HSNT-4-B-Carrier Tape
No.	PL004-A-C-SD-2.0
ANGLE	
UNIT	mm
ABLIC Inc.	



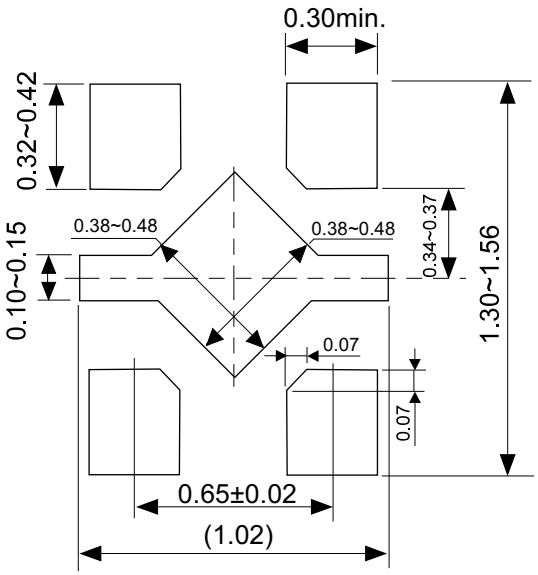
Enlarged drawing in the central part



No. PL004-A-R-SD-1.0

TITLE	HSNT-4-B-Reel		
No.	PL004-A-R-SD-1.0		
ANGLE		QTY.	10,000
UNIT	mm		
	ABLIC Inc.		

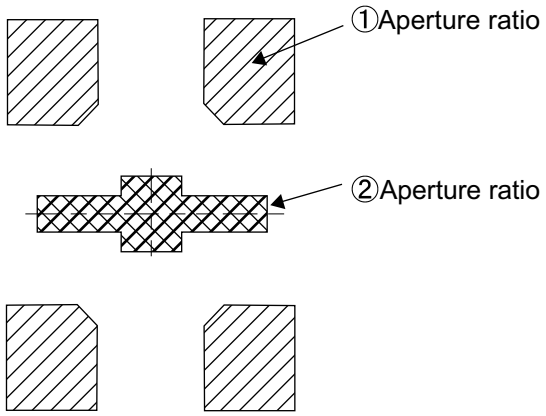
Land Pattern



Caution It is recommended to solder the heat sink to a board in order to ensure the heat radiation.

注意 放熱性を確保する為に、PKGの裏面放熱板（ヒートシンク）を基板に半田付けする事を推奨いたします。

Metal Mask Pattern



Caution ① Mask aperture ratio of the lead mounting part is 100%.
② Mask aperture ratio of the heat sink mounting part is 40%.
③ Mask thickness: t0.10mm to 0.12 mm

注意 ①リード実装部のマスク開口率は100%です。
②放熱板実装のマスク開口率は40%です。
③マスク厚み：t0.10mm ~ 0.12 mm

No. PL004-A-L-SD-2.0

TITLE	HSNT-4-B -Land Recommendation
No.	PL004-A-L-SD-2.0
ANGLE	
UNIT	mm
	ABLIC Inc.

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2.4-2019.07