Micro-Power Voltage Detectors

General Description

The ET9818 is a micro-power voltage detector supervising the power supply voltage level for microprocessors (μP) or digital systems. It provides internally fixed threshold levels with 0.1V per step ranging from 1.2V to 5V, which covers most digital applications.

It features low supply current of 3μA. The ET9818 performs supervisory function by sending out a reset signal whenever the V_{DD} voltage falls below a preset threshold level. This reset signal will last the whole period before V_{DD} recovering. Once V_{DD} recovered up crossing the threshold level, the reset signal will be released after a certain delay time.

Features

- Internally Fixed Threshold 1.2V to 5V in 0.1V Step
- High Accuracy ±1.5%
- Low Supply Current 3μA
- No External Components Required
- Quick Reset within 20μs
- Built-in Recovery Delay Include 0ms, 55ms, 220ms,450ms Options
- Low Functional Supply Voltage 0.9V
- Output Type : Open-Drain or CMOS
- Package information:

Part No.	Package	Packing Option	MSL
ET9818XXXXX	SOT23-3(2.92mm×2.8mm)	Tape and Reel, 3K	Level 3
ET9818XXXXSX	SSOT23-3(2.92mm×2.4mm)	Tape and Reel, 3K	Level 3
ET9818XXXXYX	DFN4(1mm×1mm)	Tape and Reel, 10K	Level 1

Application

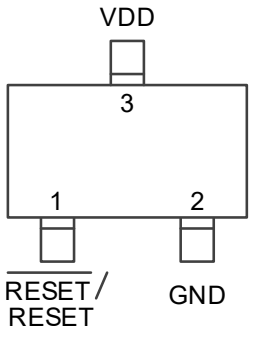
- Computers
- Controllers
- Intelligent Instruments
- Critical μP and μC Power Monitoring
- Portable/Battery-Powered Equipment

Device Information

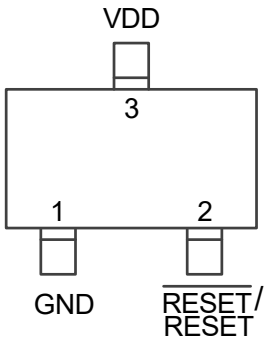
ET 9818 X① XX② X③ X④ X⑤

X①	Reset Active Timeout Period	A	0ms $\overline{\text{RESET}}$
		B	55ms $\overline{\text{RESET}}$
		C	220ms $\overline{\text{RESET}}$
		D	450ms $\overline{\text{RESET}}$
		E	0ms RESET
		F	55ms RESET
		G	220ms RESET
		H	450ms RESET
XX②	Threshold Voltage	12	1.2V
		13	1.3V
		…	…
		49	4.9V
		50	5.0V
X③	Output Type	Blank	Open-Drain
		C	CMOS
X④	Package	Blank	SOT23-3
		S	SSOT23-3
		Y	DFN4(1×1)
X⑤	Pin Configuration	Blank	Type 1 (Pin 2 GND)
		L	Type 2 (Pin 1 GND)

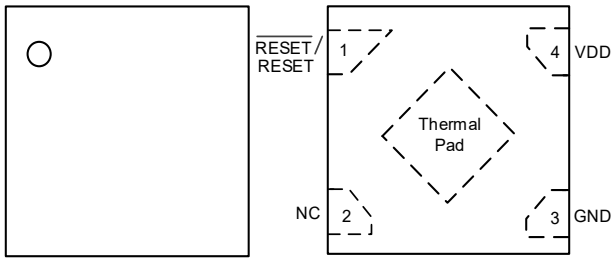
Pin Configuration



SOT23-3/SSOT23-3 Type 1



SOT23-3/SSOT23-3 Type 2 (L)

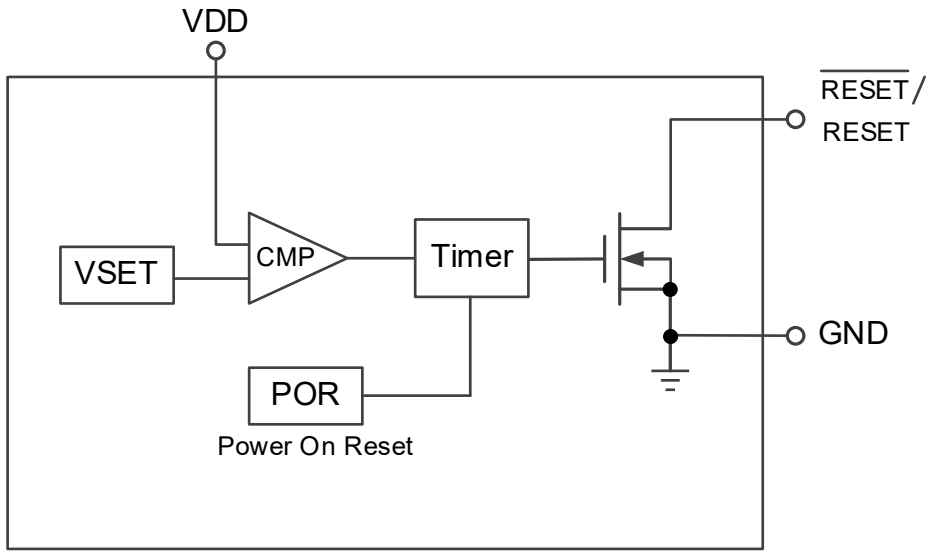


DFN4(1×1)
TOP VIEW

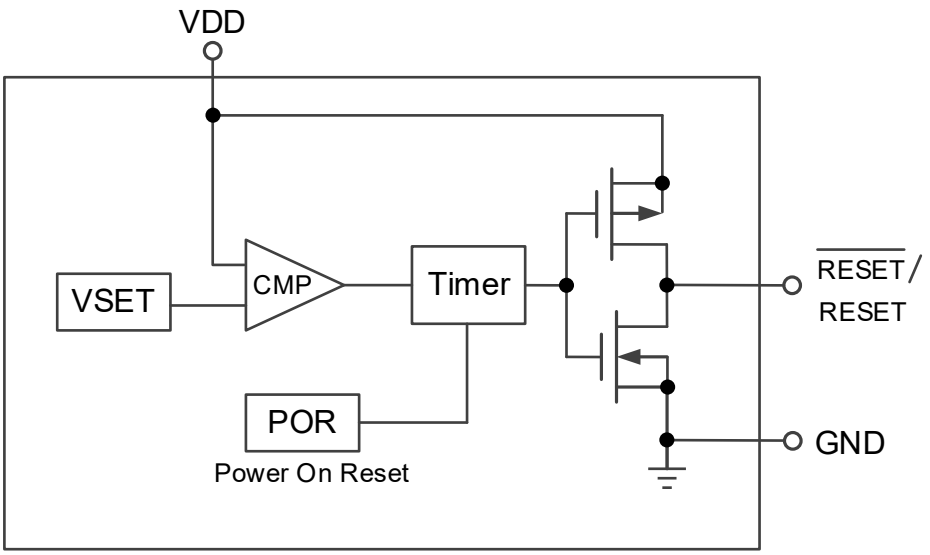
Pin Function

Pin Name	Description
$\overline{\text{RESET}}$/RESET	Active Low/High Reset Output
GND	Ground
VDD	Power Pin
Thermal Pad	Connect thermal pad to GND

Block Diagram



(Open-Drain Output Type)



(CMOS Output Type)

Absolute Maximum Ratings(1)

Characteristic	Symbol	Min	Max	Unit
Supply Voltage	V_{DD}	-0.3	6.5	V
Input Current	I_{VDD}		20	mA
Junction Temperature	T_J	-40	+150	°C
Package Thermal Resistance (3)	θ_{JA}		250	°C/W
Storage Temperature Range	T_{STG}	-65	+150	°C
Lead Temperature (Soldering, 10sec.)	T_{LEAD}		260	°C
Power Dissipation	P_D		400	mW
Human Body Model, JESD22-A114	ESD(2)	±4000		V
Charged Device Model,JESD22-C101		±500		V

Note1. Stresses listed as the above "Absolute Maximum Ratings" may cause permanent damage to the device.These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note2. Devices are ESD sensitive. Handling precaution recommended.

Note3. θ_{JA} is measured in the natural convection at T_A = 25°C on a low effective thermal conductivity test board of JEDEC 51-3 thermal measurement standard.

Recommended Operating Conditions (4)

Characteristic	Symbol	Min	Max	Unit
Supply Voltage	V_{DD}	0.9	6.0	V
Operating Ambient Temperature	T_A	-40	85	°C
Power Dissipation	P_D		400	mW

Note4.The device is not guaranteed to function outside its operating condition.

Electrical Characteristics

(V_{DD} = 3V, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Units
Operating VDD (VOUT) Range		V_{DD}		0.9		6	V
Supply Current		I_{DD}	V_{DD} = 4.5V, T_A = 25°C		3	8	μA
Reset Threshold		V_{TH}	T_A = 25°C		1.2 to 5.0		V
Threshold Voltage Accuracy		ΔV_{TH}	T_A = 25°C	-1.5		+1.5	%
V_{DD} Drop to Reset Delay		t_{RD}	Drop = V_{TH} -125mV		20		μs
Reset Active Time Out Period	ET9818A/E	t_{RP}	$V_{DD} \geq 1.03 \times V_{TH}$		0		ms
	ET9818B/F			35	55	75	
	ET9818C/G			143	220	297	
	ET9818D/H			292	450	608	
RESET Output Voltage Low[(5)](NCH)		V_{OL1}	0 < V_{DD} < V_{TH}, R-pull up=100k			0.2	V
		V_{OL2}	V_{DD} = V_{TH} -0.1, I_{SINK} >3.5mA			0.2	
RESET Output Voltage High (PCH)		V_{OH}	V_{DD} = V_{TH} + 0.1, I_{SOURCE} >3.5mA	V_{DD} -0.2			V
Hysteresis Width		V_{HYS}			0.015 V_{TH}	0.025 V_{TH}	V

Note5. The voltage V_{OL} can be calculated by V_{OL} = VDD − Ir * R. Where R is the pull-up resistor and Ir is the current flowing through the pull-up resistor. For typical application (R=100kΩ), V_{OL} is less than 0.2V.

Application Information

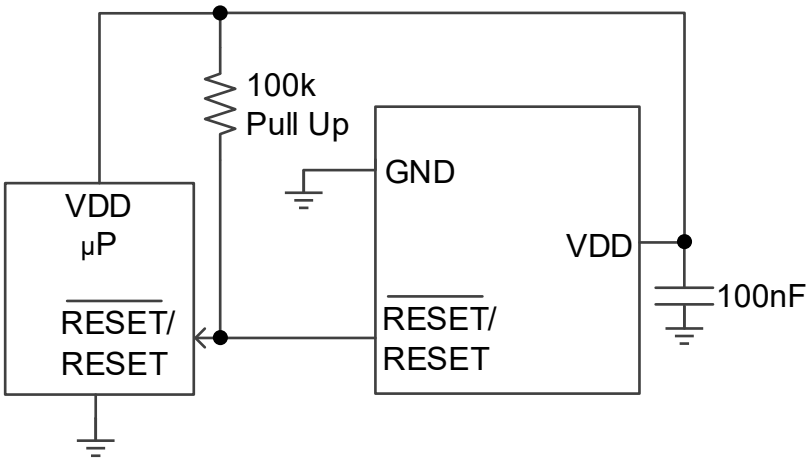
Multiple Supplies

Mainly, the pull-up connected to the ET9818 will connect to the supply voltage that is being monitored at the IC' s VDD pin. However, some systems may use the open-drain output to level-shift from the monitored supply to reset circuitry powered by some other supply.

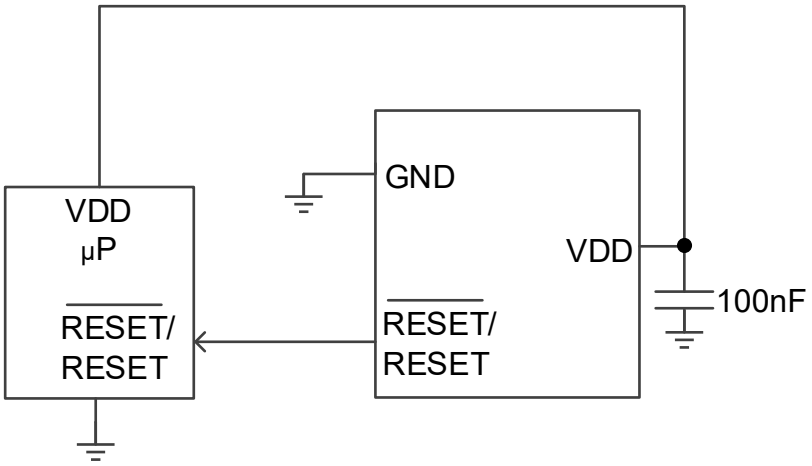
Benefits of Highly Accurate Reset Threshold

Most μP supervisor ICs have reset threshold voltages between 1% and 1.5% below the value of nominal supply voltages. This ensures a reset will not occur within 1% of the nominal supply, but will occur when the supply is 1.5% below nominal.

Test Circuit



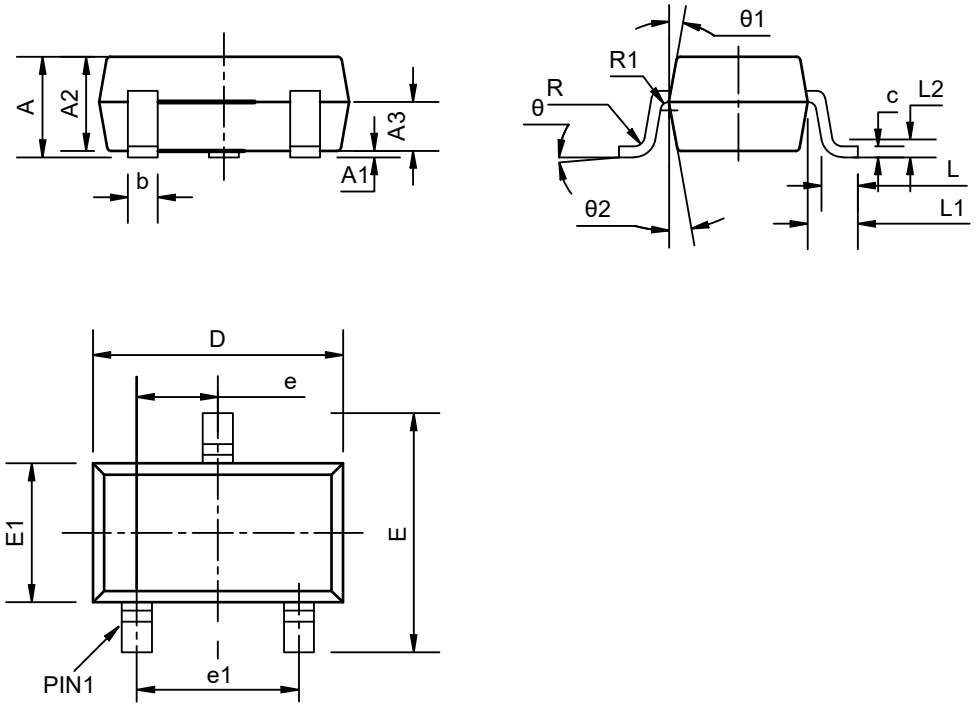
Open-Drain Output Type



CMOS Output Type

Package Dimension

SOT23-3

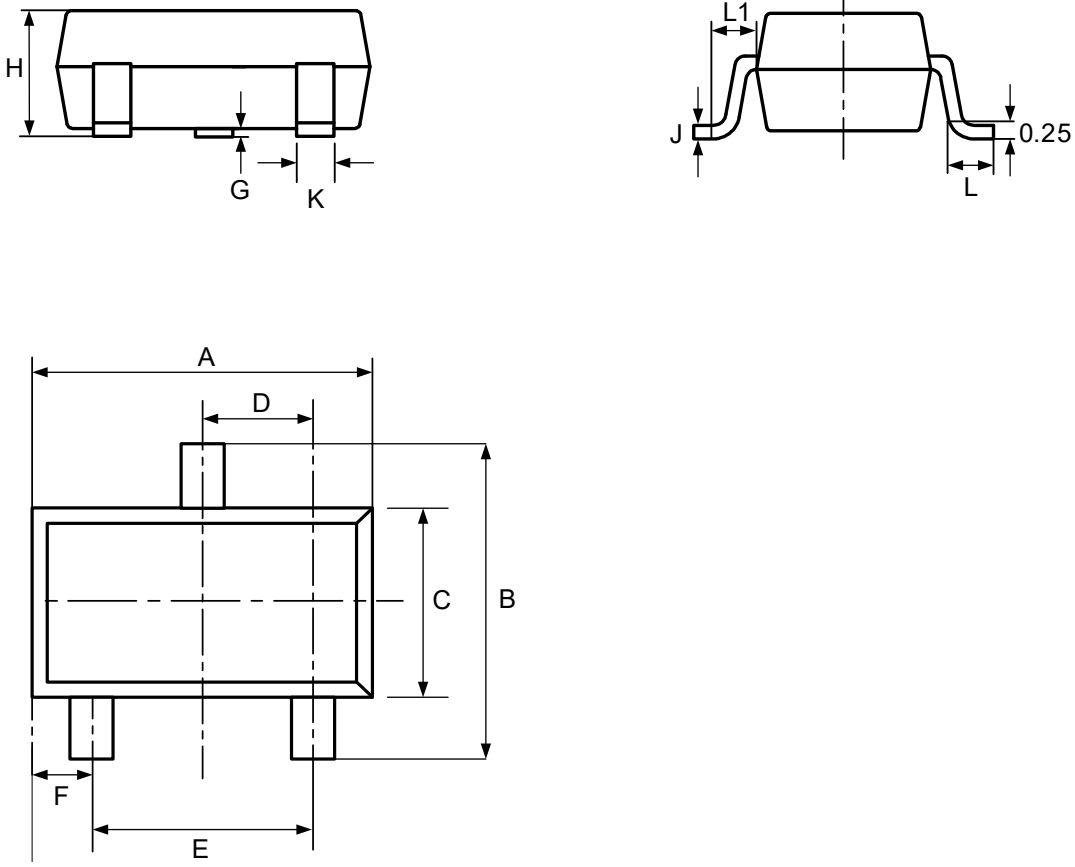


COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	--	--	1.25
A1	0	--	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.35	--	0.50
c	0.12	--	0.20
D	2.80	2.92	3.05
E	2.60	2.80	3.00
E1	1.52	1.62	1.72
e	0.95BSC		
e1	1.90BSC		
L	0.30	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
R	0.05	--	0.20
R1	0.05	--	0.20
θ	0°	--	8°
θ1	3°	--	12°
θ2	6°	--	14°

SSOT23-3

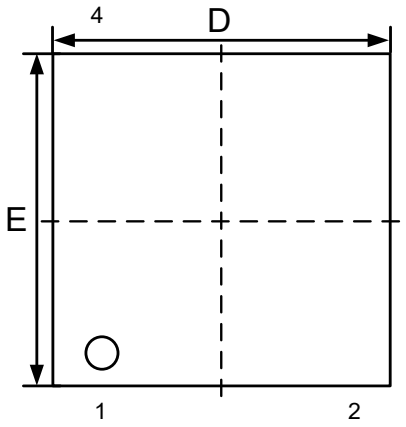


COMMON DIMENSIONS

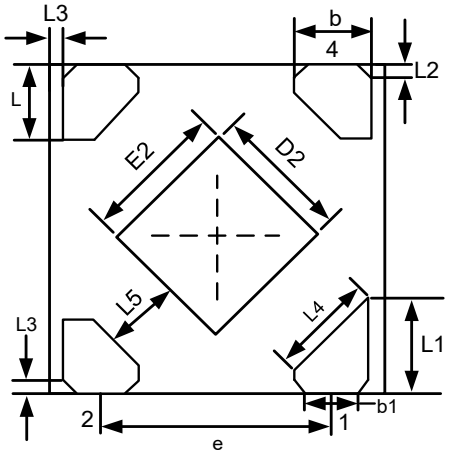
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	MAX
A	2.800	3.040
B	2.100	2.640
C	1.200	1.400
D	0.890	1.030
E	1.780	2.050
F	0.450	0.600
G	0.013	0.100
H	0.900	1.110
J	0.085	0.180
K	0.370	0.510
L	0.300	0.500
L1	0.500	0.600

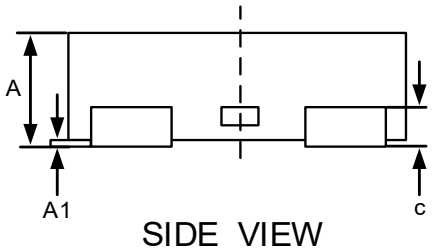
DFN4(1×1)



TOP VIEW



BOTTOM VIEW



SIDE VIEW

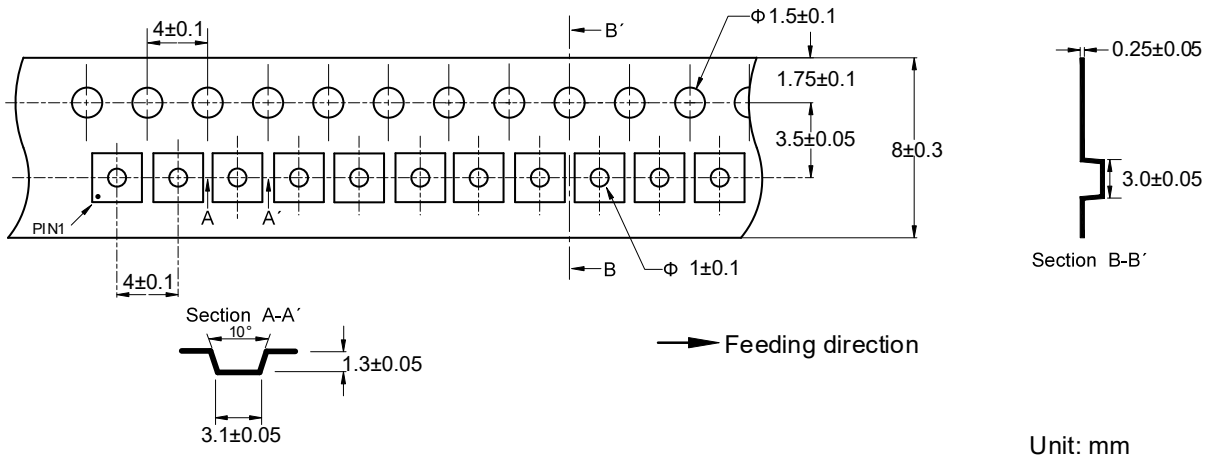
COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

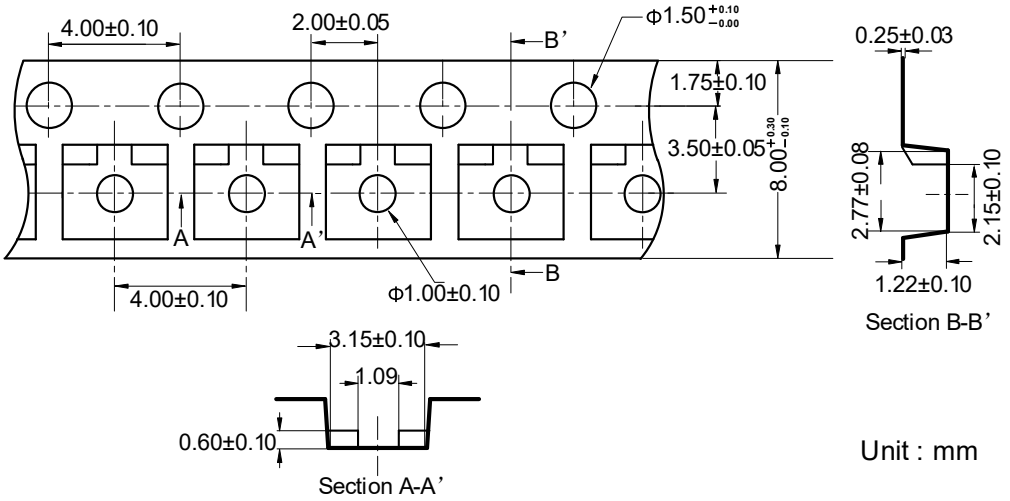
SYMBOL	MIN	NOM	MAX
A	0.35	--	0.40
A1	0.00	0.02	0.05
b	0.20	0.25	0.30
b1	0.13	0.18	0.23
c	0.07	0.12	0.17
D	0.95	1.00	1.05
D2	0.43	0.48	0.53
e	0.65BSC		
E	0.95	1.00	1.05
E2	0.43	0.48	0.53
L	0.20	0.25	0.30
L1	0.27	0.32	0.37
L2	0.77REF		
L3	0.05REF		
L4	0.34REF		
L5	0.20REF		

Tape Information

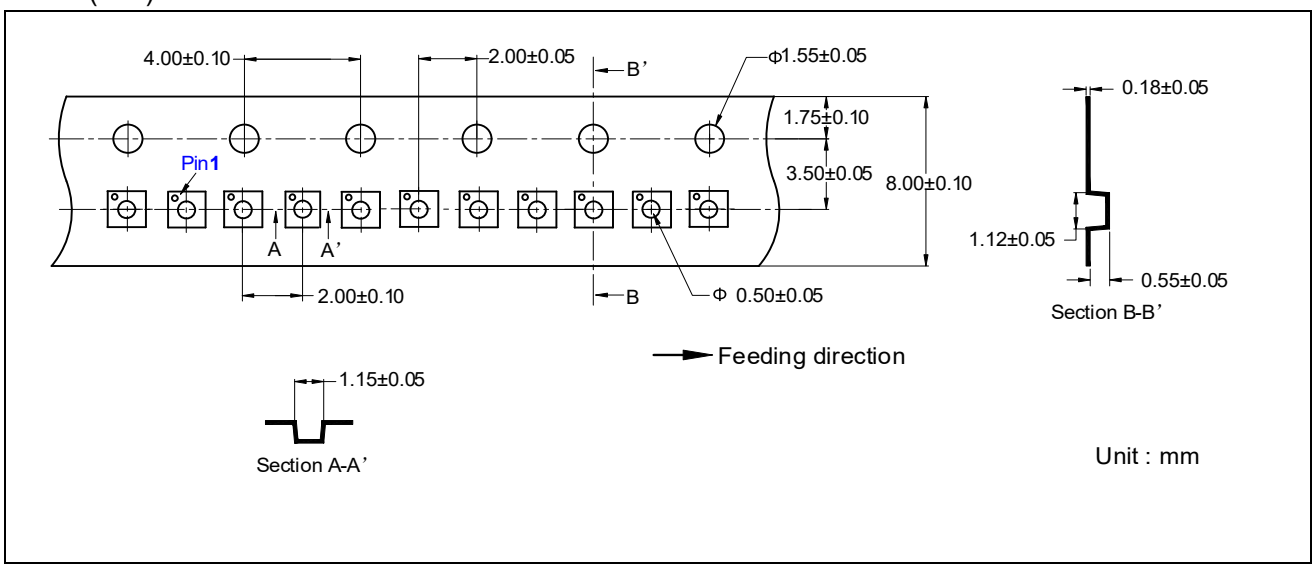
SOT23-3



SSOT23-3



DFN4(1×1)



Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2016-03-31	Original version	Wanggp	Wanggp	Zhujl
1.1	2019-05-06	Update AMR table	Wanggp	Wanggp	Liujy
1.2	2023-09-16	Update Typeset	Huyt	Liujy	Liujy
1.3	2025-12-04	Add L type	Huyt	Liujy	Liujy
1.4	2026-05-21	Add CMOS type	Huyt	Chenh	Liujy
1.5	2026-05-29	Add SSOT23-3, DFN4 (1×1) package	Huyt	Chenh	Liujy
1.6	2026-08-06	Add Tape Information	Huyt	Chenh	Liujy