SGM818Y
Micro-Power Voltage Detector

GENERAL DESCRIPTION

The SGM818Y is a low power consumption voltage detector with high accuracy detection. It operates with a supply voltage (V_{DD}) range from 0.9V to 6V. It can provide circuit initialization for DSP-based and processor-based systems. The SGM818Y offers two fixed threshold voltages of 1.6V and 2.9V.

Whenever V_{DD} falls below a factory preset threshold level (V_{TH}), the device will send out a reset signal. This signal will last the whole period until V_{DD} recovers. Once V_{DD} exceeds the release voltage (V_{TH} + V_{HYS}), the reset signal will maintain a certain delay time and be released.

The SGM818Y is available in Green SOT-23-3 and UTDFN-1×1-4L packages. It is specified over the -40℃ to +125℃ operating temperature range.

TYPICAL APPLICATION

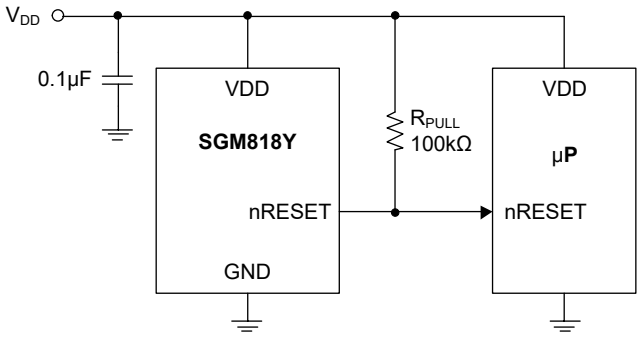


Figure 1. Typical Application Circuit

FEATURES

- **High Accuracy: ±1% at T_J = +25℃**
- **Low Supply Current: 1μA (TYP)**
- **Fixed Detection Voltages: 1.6V and 2.9V**
- **No External Components Required**
- **Quick Reset within 35μs (TYP)**
- **Reset Active Timeout Period: 6.6ms (nRESET)**
- **Low Functional Supply Voltage: 0.9V**
- **N-Channel Open-Drain Output**
- **Available in Green SOT-23-3 and UTDFN-1×1-4L Packages**

APPLICATIONS

Computers
Controllers
Intelligent Instruments
Portable Equipment
μP Power Monitoring
Battery-Powered Equipment

PACKAGE/ORDERING INFORMATION

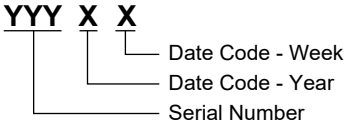
MODEL	THRESHOLD VOLTAGE (V)	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM818Y-1.6	1.6	SOT-23-3	-40℃ to +125℃	SGM818Y-1.6XN3G/TR	0UFXX	Tape and Reel, 3000
		SOT-23-3 (L-Type)	-40℃ to +125℃	SGM818Y-1.6LXN3G/TR	0NTXX	Tape and Reel, 3000
		UTDFN-1×1-4L	-40℃ to +125℃	SGM818Y-1.6XUDH4G/TR	06X	Tape and Reel, 10000
SGM818Y-2.9	2.9	SOT-23-3	-40℃ to +125℃	SGM818Y-2.9XN3G/TR	0UGXX	Tape and Reel, 3000
		SOT-23-3 (L-Type)	-40℃ to +125℃	SGM818Y-2.9LXN3G/TR	0UEXX	Tape and Reel, 3000
		UTDFN-1×1-4L	-40℃ to +125℃	SGM818Y-2.9XUDH4G/TR	07X	Tape and Reel, 10000

NOTE: For more models not listed above, please contact your local SGMICRO sales representatives.

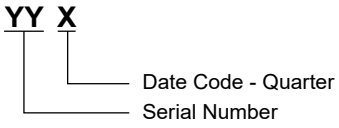
MARKING INFORMATION

NOTE: X = Date Code.

SOT-23-3



UTDFN-1×1-4L



Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

Terminal Voltage (with Respect to GND), V_{DD} ..... -0.3V to 6V
All Other Inputs ..... -0.3V to 6V
Input Current, I_{nRESET} 20mA
Package Thermal Resistance
SOT-23-3, θ_{JA} ..... 255.2℃/W
SOT-23-3, θ_{JB} ..... 111.9℃/W
SOT-23-3, θ_{JC} ..... 147.7℃/W
UTDFN-1×1-4L, θ_{JA} ..... 218.2℃/W
UTDFN-1×1-4L, θ_{JB} ..... 157.9℃/W
UTDFN-1×1-4L, θ_{JC_TOP} ..... 183.5℃/W
UTDFN-1×1-4L, θ_{JC_BOT} ..... 154.1℃/W
Junction Temperature ..... +150℃
Storage Temperature Range ..... -65℃ to +150℃
Lead Temperature (Soldering, 10s) ..... +260℃
ESD Susceptibility
HBM 4000V
CDM 1000V

RECOMMENDED OPERATING CONDITIONS

Operating Junction Temperature Range ..... -40℃ to +125℃

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

ESD SENSITIVITY CAUTION

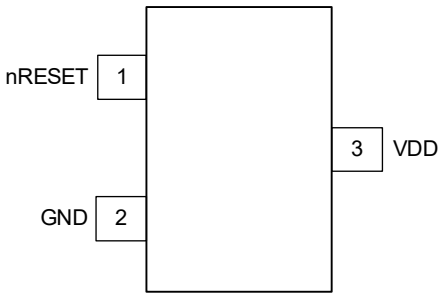
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

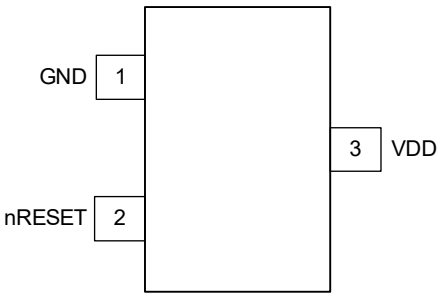
PIN CONFIGURATIONS

(TOP VIEW)



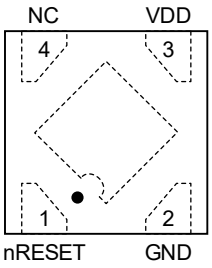
SOT-23-3

(TOP VIEW)



SOT-23-3 (L-Type)

(TOP VIEW)



UTDFN-1×1-4L

PIN DESCRIPTION

PIN			NAME	FUNCTION
SOT-23-3	SOT-23-3 (L-Type)	UTDFN-1×1-4L		
1	2	1	nRESET	Active-Low Reset Output Pin.
2	1	2	GND	Ground.
3	3	3	VDD	Power Pin.
—	—	4	NC	No Connection.

ELECTRICAL CHARACTERISTICS

(V_{DD} = 3V, T_J = +25℃, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Operating V_{DD} Range	V_{DD}		0.9		6	V
Supply Current	I_{DD}	V_{TH} = 3V, V_{DD} = 4.5V, T_J = +25℃		1	2	μA
Reset Threshold	V_{TH}			1.6		V
				2.9		
Threshold Voltage Accuracy	ΔV_{TH}	T_J = +25℃	-1		1	%
V_{DD} Drop to Reset Delay	t_{RD}	Drop = V_{TH} - 125mV		37		μs
Reset Active Timeout Period	t_{RP}	$V_{DD} \geq 1.02 \times V_{TH}$	3.2	6.6	10.2	ms
Reset Output Voltage Low (1)	V_{OL}	1.5V = V_{DD} < V_{TH}, I_{SINK} = 3.5mA			0.4	V
Hysteresis Width	V_{HYS}			0.64% × V_{TH}	1.6% × V_{TH}	V

NOTE:

1. V_{OL} can be calculated by $V_{OL} = V_{DD} - I_R \times R_{PU}$, where R_{PU} is the pull-up resistor and I_R is the current flowing through the pull-up resistor. For typical application, R_{PU} is 100kΩ and V_{OL} is less than 0.2V.

TIMING DIAGRAM

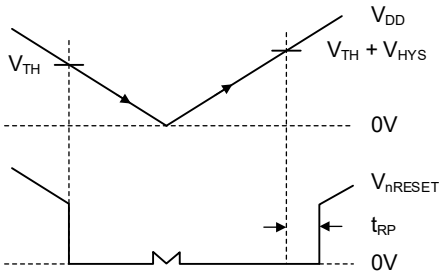
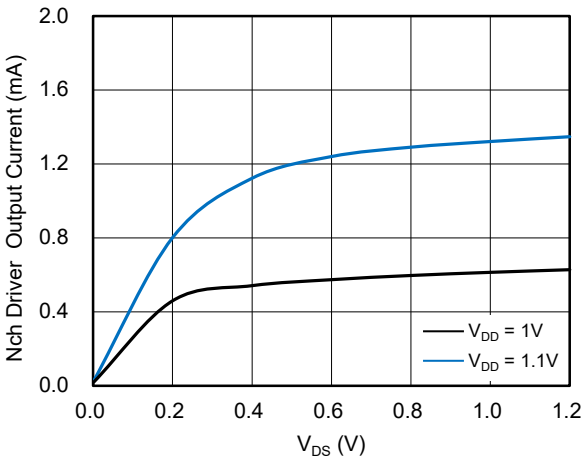


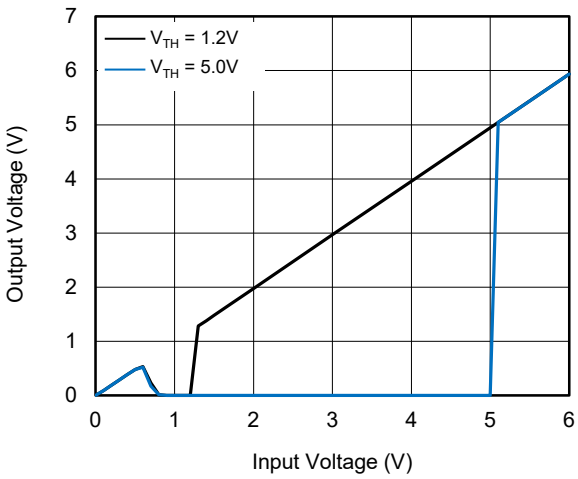
Figure 2. Timing Diagram

TYPICAL PERFORMANCE CHARACTERISTICS

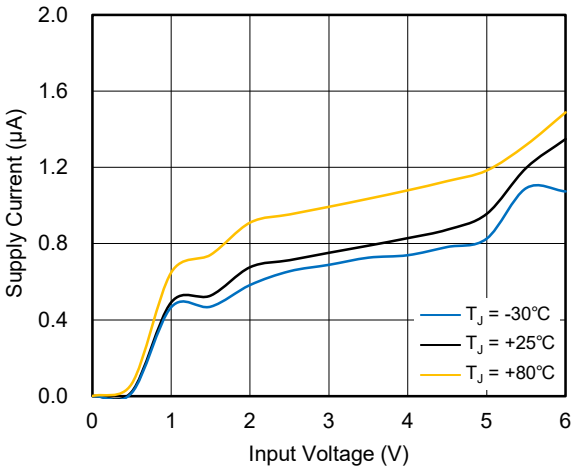
Nch Driver Output Current vs. V_{DS}



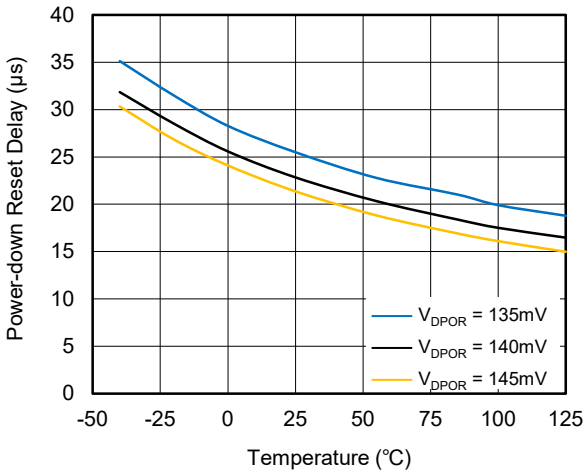
Output Voltage vs. Input Voltage



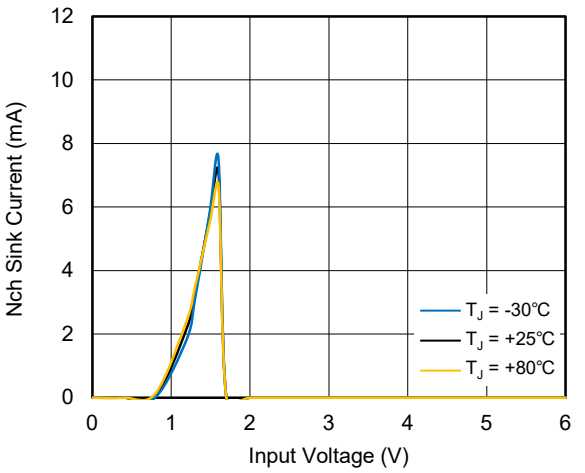
Supply Current vs. Input Voltage



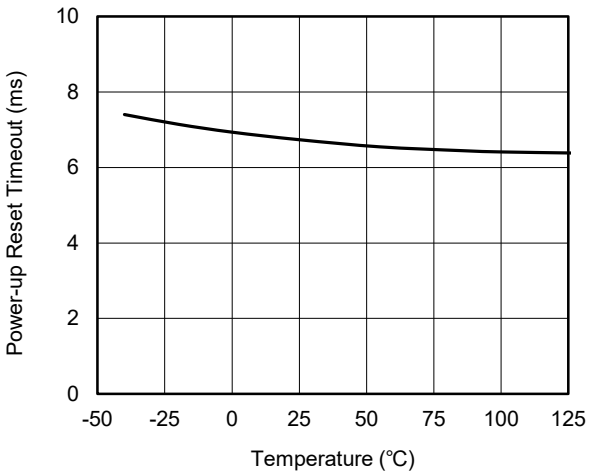
Power-down Reset Delay vs. Temperature



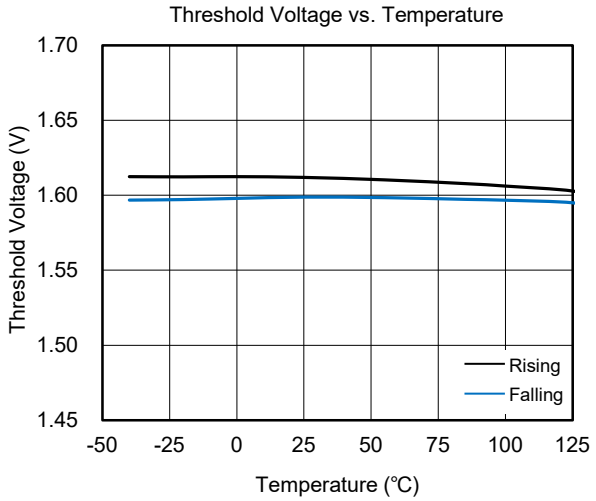
Nch Sink Current vs. Input Voltage



Power-up Reset Timeout vs. Temperature



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



FUNCTIONAL BLOCK DIAGRAM

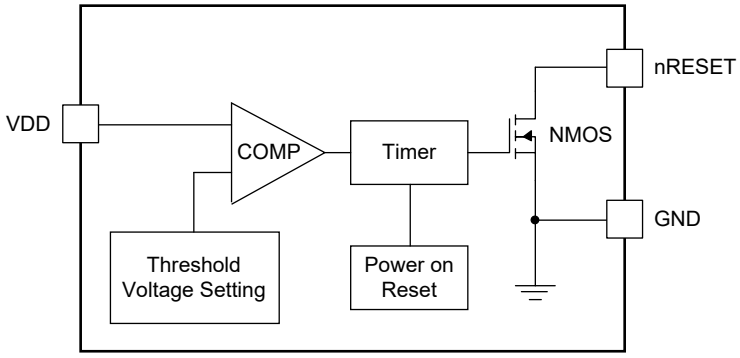


Figure 3. Block Diagram

APPLICATION INFORMATION

Multiple Supplies

The pull-up resistor connected to the SGM818Y will be connected to the supply voltage monitored on the VDD pin of the IC. However, the systems using open-drain output can level-shift the monitored supply voltages into the reset circuit powered by some other supply.

High Accuracy of the Reset Threshold

The reset threshold voltages of most μP supervisor ICs are 1% to 1.5% lower than the nominal supply voltages. If the voltage is within 1% of the nominal supply, the reset will not assert, and if the voltage is within 1.5% of the nominal supply, the reset will assert.

REVISION HISTORY

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

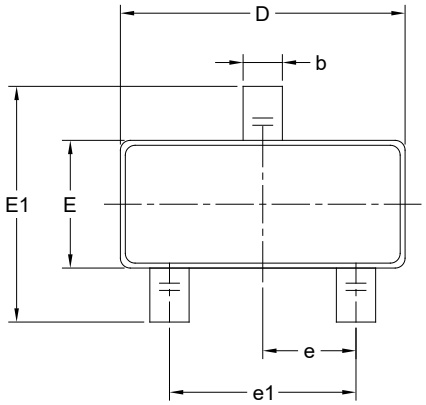
NOVEMBER 2024 – REV.A.1 to REV.A.2	Page
Updated Package/Ordering Information section	2
Updated Typical Performance Characteristics section	9

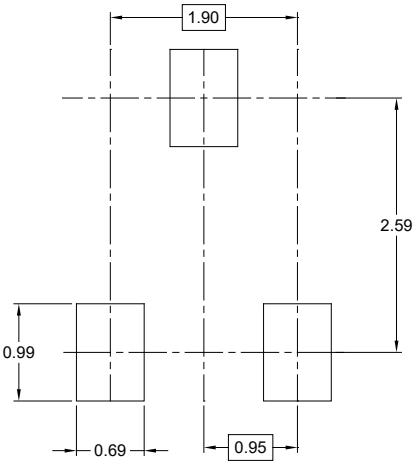
MAY 2024 – REV.A to REV.A.1	Page
Added UTDFN-1×1-4L Package	All
Changed Electrical Characteristics section	8

Changes from Original (MARCH 2024) to REV.A	Page
Changed from product preview to production data	All

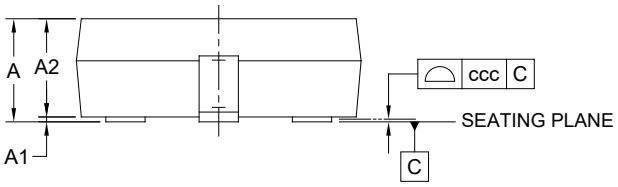
PACKAGE OUTLINE DIMENSIONS

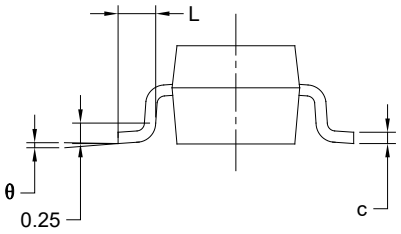
SOT-23-3





RECOMMENDED LAND PATTERN (Unit: mm)



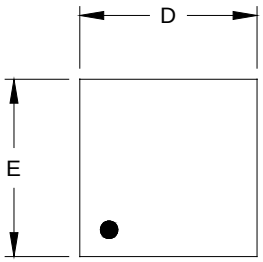


Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	-	-	1.450
A1	0.000	-	0.150
A2	0.900	-	1.300
b	0.300	-	0.500
c	0.080	-	0.220
D	2.750	-	3.050
E	1.450	-	1.750
E1	2.600	-	3.000
e	0.950 BSC		
e1	1.900 BSC		
L	0.300	-	0.600
θ	0°	-	8°
ccc	0.100		

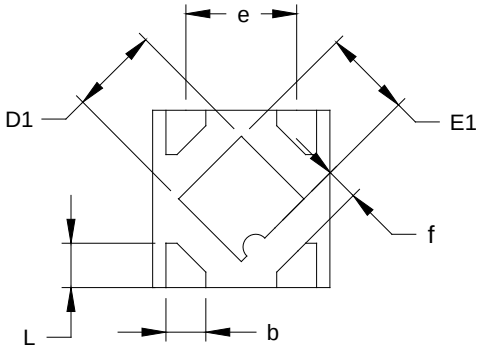
NOTES:
1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-178.

PACKAGE OUTLINE DIMENSIONS

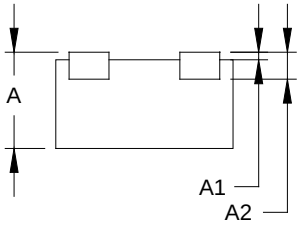
UTDFN-1×1-4L



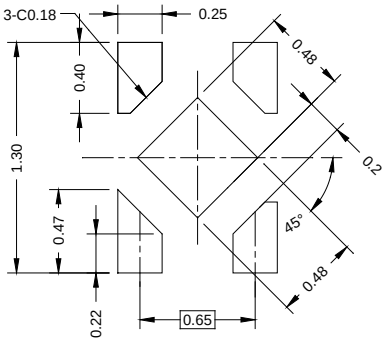
TOP VIEW



BOTTOM VIEW



SIDE VIEW



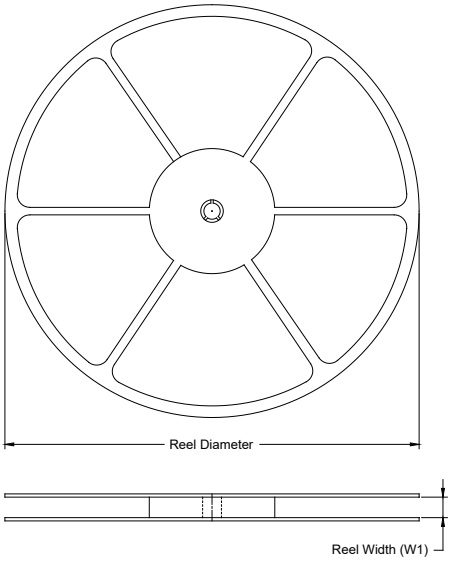
RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	0.500	0.550	0.600
A1	0.000		0.050
A2	0.152 REF		
D	0.950	1.000	1.050
D1	0.450	0.500	0.550
E	0.950	1.000	1.050
E1	0.450	0.500	0.550
b	0.175	0.225	0.275
e	0.625 BSC		
f	0.195 REF		
L	0.200	0.250	0.300

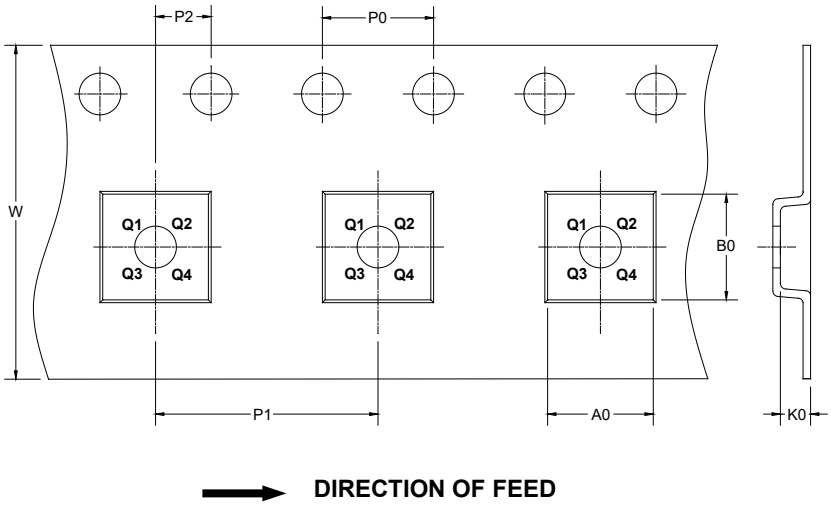
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



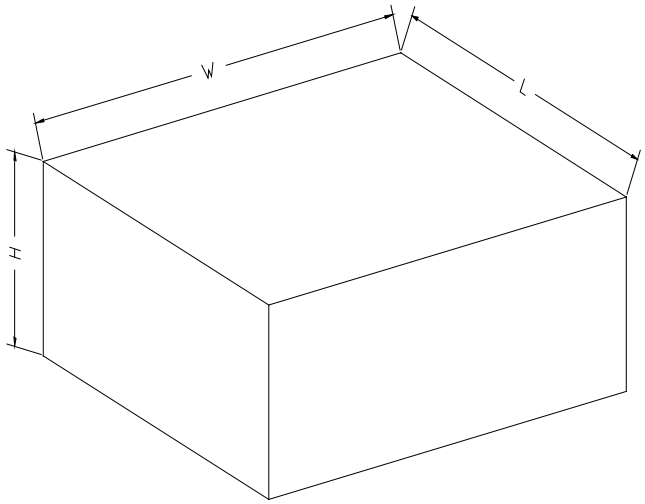
NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOT-23-3	7"	9.5	3.18	3.28	1.32	4.0	4.0	2.0	8.0	Q3
UTDFN-1×1-4L	7"	9.0	1.18	1.18	0.68	4.0	2.0	2.0	8.0	Q1

DD0001

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
7″ (Option)	368	227	224	8
7″	442	410	224	18

DD0002