

GENERAL DESCRIPTION

The SGM2239 is a high voltage, low quiescent current and low dropout voltage linear regulator. It is capable of supplying 300mA output current with typical dropout voltage of 900mV. The operating input voltage range is from 2.5V to 40V and output voltage range is from 1.215V to 39V.

Other features include current limit and thermal shutdown protection. The SGM2239 is suitable for various applications.

The SGM2239 is available in Green TDFN-2×2-6AL and TDFN-3×3-8JL packages. It operates over an operating temperature range of -40°C to +125°C.

APPLICATIONS

Industrial Equipment
Battery-Powered Equipment
Medical Equipment

FEATURES

- Operating Input Voltage Range: 2.5V to 40V
- Enable Pin Accept Voltages Higher than the Supply Voltage and up to 40V
- Fixed Output from 1.8V to 12V
- Adjustable Output from 1.215V to 39V
- 300mA Output Current
- Output Voltage Accuracy: $\pm 1\%$ at +25°C
- Low Quiescent Current: 3.2 μ A (TYP)
- Low Dropout Voltage:
900mV (TYP) at 300mA, $V_{OUT} = 5.0V$
- Current Limiting and Thermal Protection
- With Output Automatic Discharge
- Stable with Small Case Size Ceramic Capacitors
- -40°C to +125°C Operating Temperature Range
- Available in Green TDFN-2×2-6AL and TDFN-3×3-8JL Packages

TYPICAL APPLICATION

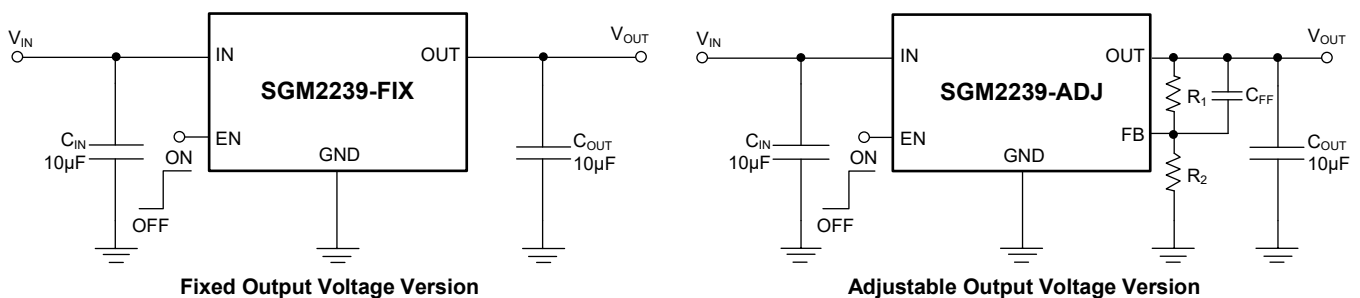


Figure 1. Typical Application Circuits

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM2239-1.8	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-1.8XTDI6G/TR	22V XXXX	Tape and Reel, 3000
SGM2239-2.5	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-2.5XTDI6G/TR	22W XXXX	Tape and Reel, 3000
SGM2239-3.0	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-3.0XTDI6G/TR	22X XXXX	Tape and Reel, 3000
SGM2239-3.3	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-3.3XTDI6G/TR	22Y XXXX	Tape and Reel, 3000
SGM2239-3.6	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-3.6XTDI6G/TR	22Z XXXX	Tape and Reel, 3000
SGM2239-4.2	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-4.2XTDI6G/TR	230 XXXX	Tape and Reel, 3000
SGM2239-5.0	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-5.0XTDI6G/TR	231 XXXX	Tape and Reel, 3000
SGM2239-8.0	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-8.0XTDI6G/TR	232 XXXX	Tape and Reel, 3000
SGM2239-9.0	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-9.0XTDI6G/TR	233 XXXX	Tape and Reel, 3000
SGM2239-12	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-12XTDI6G/TR	234 XXXX	Tape and Reel, 3000
SGM2239-ADJ	TDFN-2×2-6AL	-40°C to +125°C	SGM2239-ADJXTDI6G/TR	235 XXXX	Tape and Reel, 3000
SGM2239-1.8	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-1.8XTHI8G/TR	SGM 236THI XXXXX	Tape and Reel, 4000
SGM2239-2.5	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-2.5XTHI8G/TR	SGM 237THI XXXXX	Tape and Reel, 4000
SGM2239-3.0	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-3.0XTHI8G/TR	SGM 238THI XXXXX	Tape and Reel, 4000
SGM2239-3.3	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-3.3XTHI8G/TR	SGM 1S2THI XXXXX	Tape and Reel, 4000
SGM2239-3.6	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-3.6XTHI8G/TR	SGM 239THI XXXXX	Tape and Reel, 4000
SGM2239-4.2	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-4.2XTHI8G/TR	SGM 23ATHI XXXXX	Tape and Reel, 4000
SGM2239-5.0	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-5.0XTHI8G/TR	SGM 1S3THI XXXXX	Tape and Reel, 4000
SGM2239-8.0	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-8.0XTHI8G/TR	SGM 23BTHI XXXXX	Tape and Reel, 4000
SGM2239-9.0	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-9.0XTHI8G/TR	SGM 23CTHI XXXXX	Tape and Reel, 4000

PACKAGE/ORDERING INFORMATION (continued)

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM2239-12	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-12XTHI8G/TR	SGM 23DTHI XXXXXX	Tape and Reel, 4000
SGM2239-ADJ	TDFN-3×3-8JL	-40°C to +125°C	SGM2239-ADJXTHI8G/TR	SGM 1S4THI XXXXXX	Tape and Reel, 4000

MARKING INFORMATION

NOTE: XXXX = Date Code, Trace Code and Vendor Code. XXXXX = Date Code, Trace Code and Vendor Code.

TDFN-2×2-6AL

YYY — Serial Number
XXXX
Vendor Code
Trace Code
Date Code - Year

TDFN-3×3-8JL

XXXXX
Vendor Code
Trace Code
Date Code - Year

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

IN, EN to GND -0.3V to 45V
OUT to GND -0.3V to 45V
FB to GND -0.3V to 45V

Package Thermal Resistance

TDFN-2×2-6AL, θ_{JA} 62.9°C/W
TDFN-2×2-6AL, θ_{JB} 28.9°C/W
TDFN-2×2-6AL, $\theta_{JC(TOP)}$ 77.8°C/W
TDFN-2×2-6AL, $\theta_{JC(BOT)}$ 11.6°C/W
TDFN-3×3-8JL, θ_{JA} 50.2°C/W
TDFN-3×3-8JL, θ_{JB} 22.5°C/W
TDFN-3×3-8JL, $\theta_{JC(TOP)}$ 52.2°C/W
TDFN-3×3-8JL, $\theta_{JC(BOT)}$ 11°C/W

Junction Temperature +150°C

Storage Temperature Range -65°C to +150°C

Lead Temperature (Soldering, 10s) +260°C

ESD Susceptibility ^{(1) (2)}

HBM ±6000V

CDM ±1000V

NOTES:

1. For human body model (HBM), all pins comply with ANSI/ESDA/JEDEC JS-001 specifications.
2. For charged device model (CDM), all pins comply with ANSI/ESDA/JEDEC JS-002 specifications.

RECOMMENDED OPERATING CONDITIONS

Supply Voltage Range, V_{IN} 2.5V to 40V

Enable Input Voltage Range 0V to 40V

Input Effective Capacitance, C_{IN} 0.5μF (MIN)

Output Effective Capacitance, C_{OUT} 1μF to 100μF

Operating Junction Temperature Range -40°C to +125°C

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

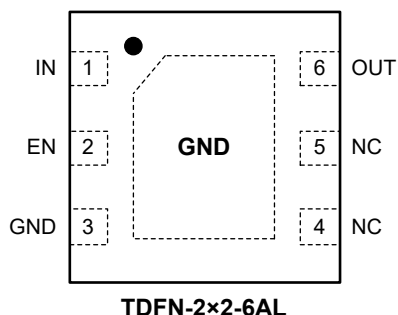
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance 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.

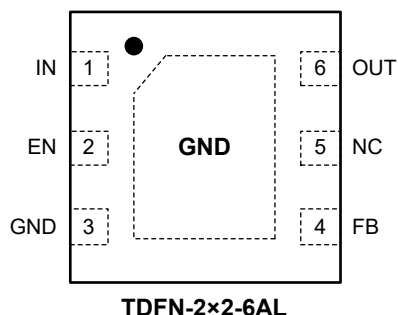
PIN CONFIGURATIONS

SGM2239-FIX (TOP VIEW)



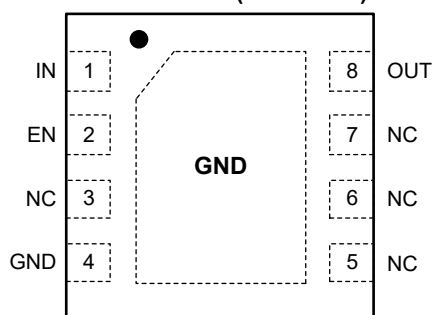
TDFN-2x2-6AL

SGM2239-ADJ (TOP VIEW)



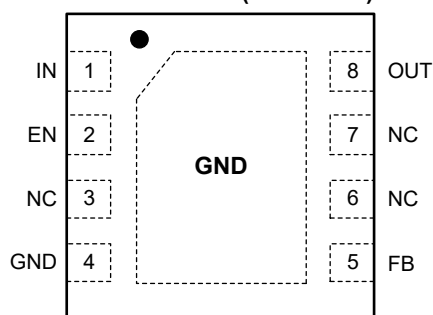
TDFN-2x2-6AL

SGM2239-FIX (TOP VIEW)



TDFN-3x3-8JL

SGM2239-ADJ (TOP VIEW)



TDFN-3x3-8JL

PIN DESCRIPTION

PIN		NAME	FUNCTION
TDFN-2x2-6AL	TDFN-3x3-8JL		
1	1	IN	Input Supply Voltage Pin. It is recommended to use a 1 μ F or larger ceramic capacitor from IN pin to ground to get good power supply decoupling. This ceramic capacitor should be placed as close as possible to IN pin.
2	2	EN	Enable Pin. Drive EN high to turn on the regulator. Drive EN low to turn off the regulator.
3	4	GND	Ground.
4	5	FB	Feedback Voltage Input Pin (adjustable voltage version only). Connect this pin to the midpoint of an external resistor divider to adjust the output voltage. Place the resistors as close as possible to this pin.
		NC	No Connection (Fixed Version Only).
6	8	OUT	Regulator Output Pin. It is recommended to use a ceramic capacitor with effective capacitance in the range of 1 μ F to 100 μ F to ensure stability. This ceramic capacitor should be placed as close as possible to OUT pin.
5	3, 6, 7	NC	No Connection.
Exposed Pad	Exposed Pad	GND	Exposed Pad. Connect it to GND internally. Connect it to a large ground plane to maximize thermal performance. This pad is not an electrical connection point.

SGM2239 40V, 300mA, Low Quiescent Current and Low Dropout Voltage Linear Regulator

FUNCTIONAL BLOCK DIAGRAMS

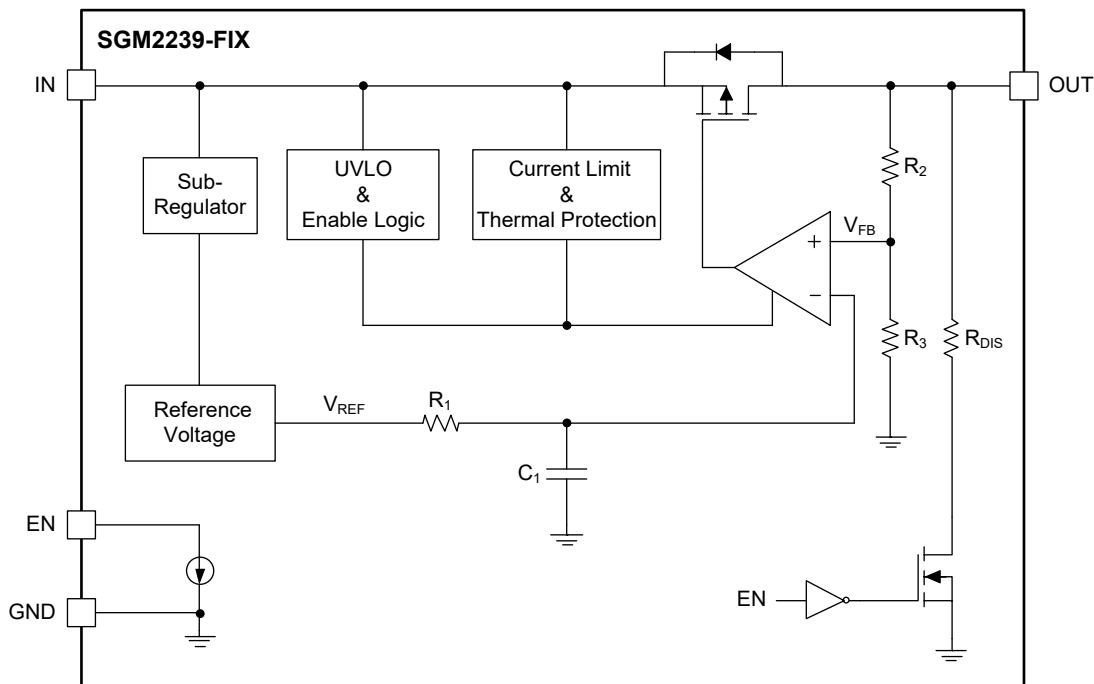


Figure 2. Block Diagram of Fixed Output Version

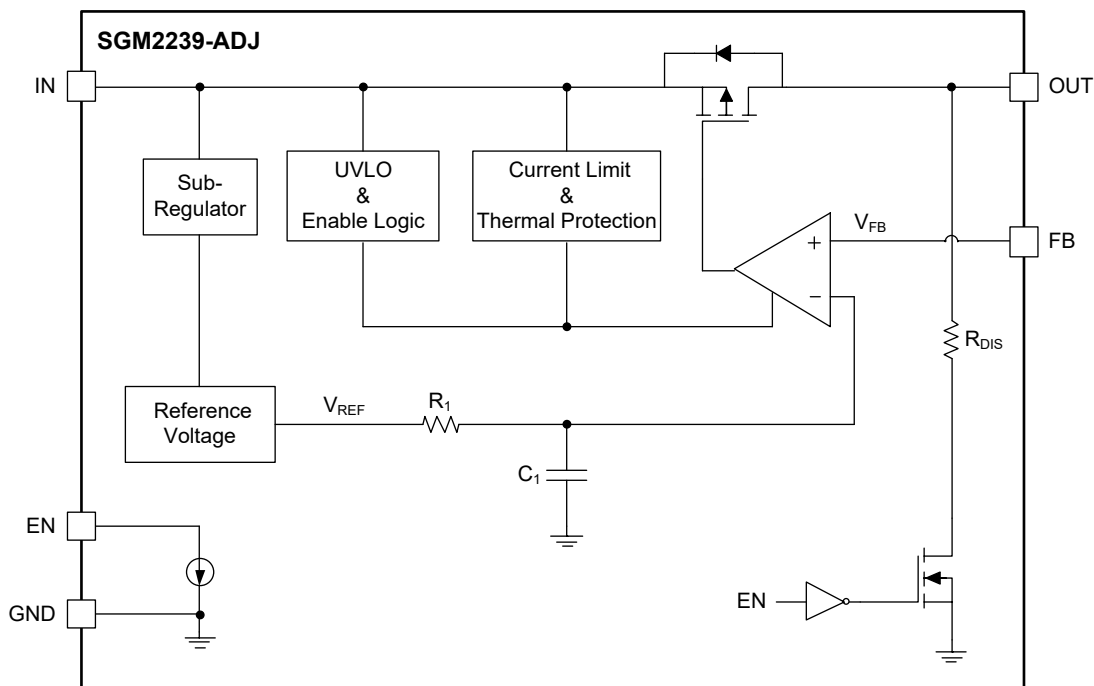
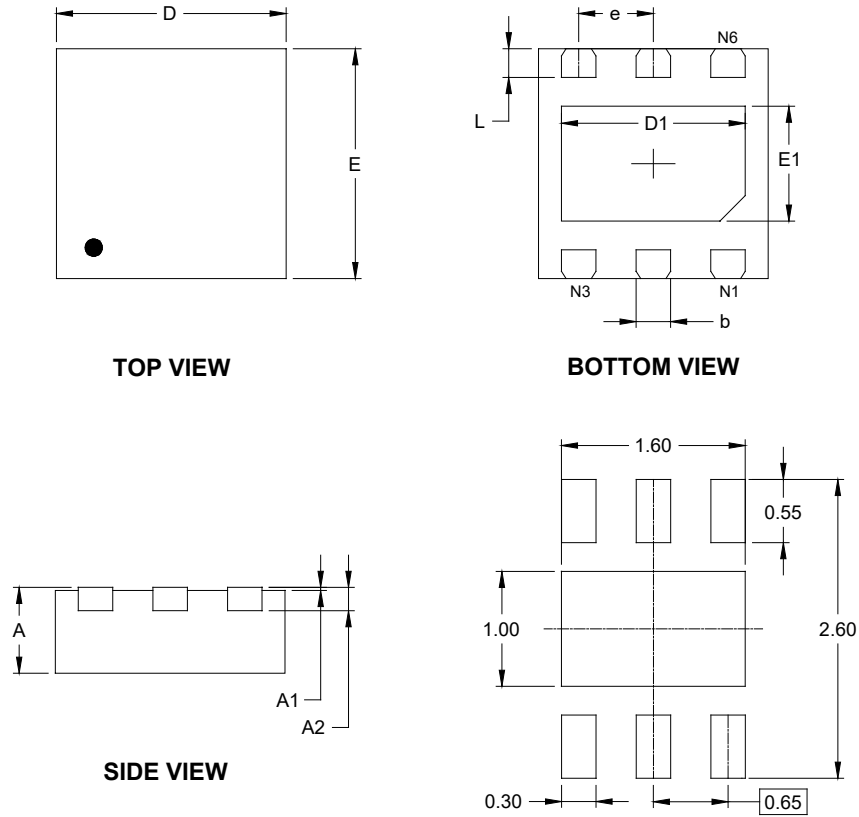


Figure 3. Block Diagram of Adjustable Output Version

PACKAGE OUTLINE DIMENSIONS

TDFN-2×2-6AL



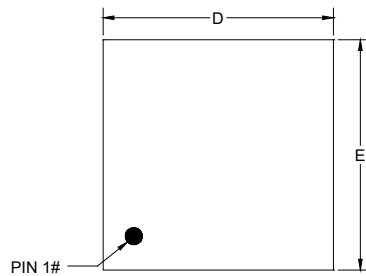
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	1.900	2.100	0.075	0.083
D1	1.500	1.700	0.059	0.067
E	1.900	2.100	0.075	0.083
E1	0.900	1.100	0.035	0.043
b	0.250	0.350	0.010	0.014
e	0.650 BSC		0.026 BSC	
L	0.174	0.326	0.007	0.013

NOTE: This drawing is subject to change without notice.

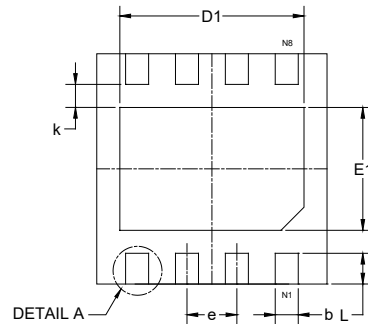
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

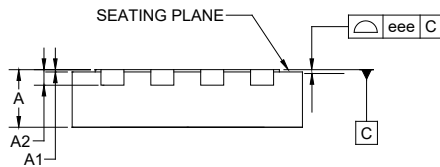
TDFN-3×3-8JL



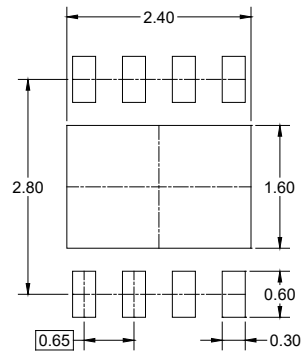
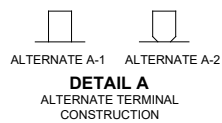
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)

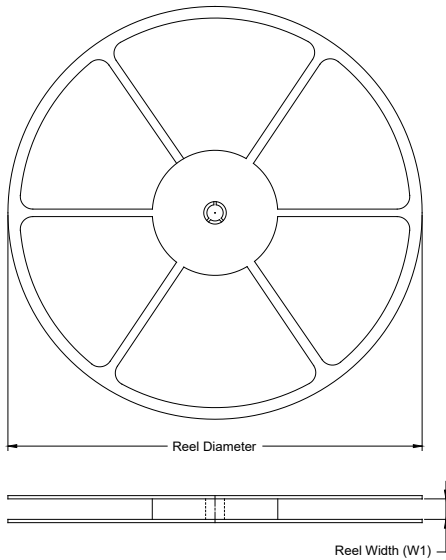
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.700	-	0.800
A1	0.000	-	0.050
A2	0.203 REF		
b	0.250	-	0.350
D	2.900	-	3.100
D1	2.300	-	2.500
E	2.900	-	3.100
E1	1.500	-	1.700
e	0.650 BSC		
k	0.300 REF		
L	0.300	-	0.500
eee	0.080		

NOTE: This drawing is subject to change without notice.

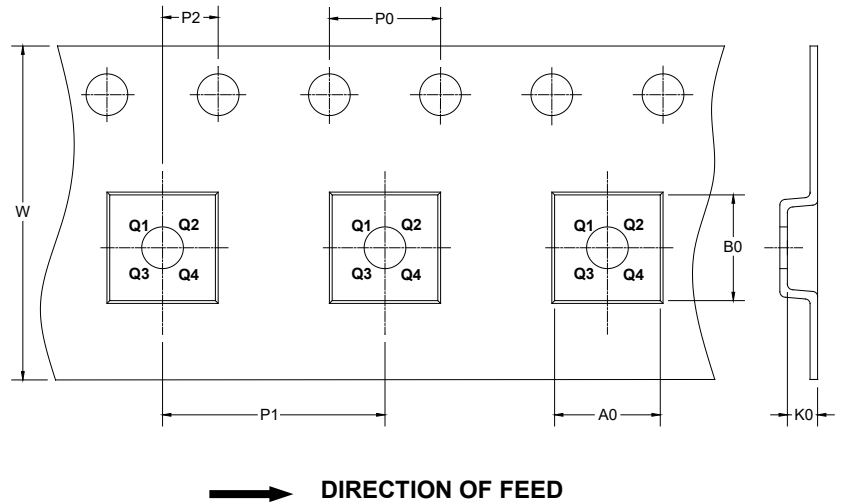
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

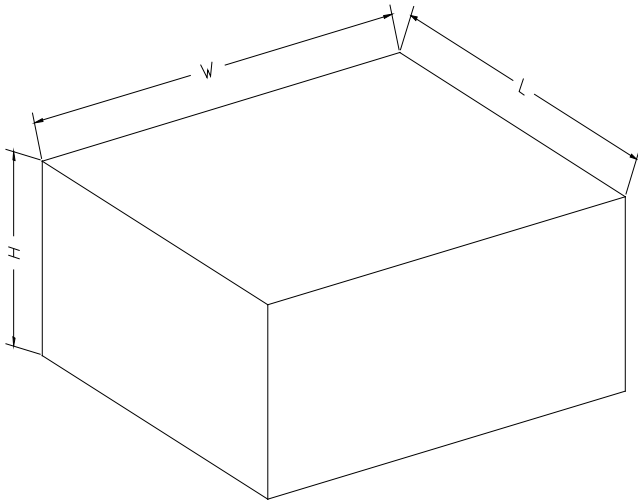
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TDFN-2×2-6AL	7"	9.5	2.30	2.30	1.10	4.0	4.0	2.0	8.0	Q1
TDFN-3×3-8JL	13"	12.4	3.35	3.35	1.13	4.0	8.0	2.0	12.0	Q1

DD00001

PACKAGE INFORMATION

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
13"	386	280	370	5

DD0002