

### FEATURES

- Low On-State Resistance
- Low Qg and Capacitance Losses
- Small Footprint (5×6mm<sup>2</sup>) for Compact Design
- RoHS Compliant and Halogen-Free

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Drain-to-Source Voltage	V <sub>DS</sub>	30	V
Gate-to-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current <sup>(1)</sup>	I <sub>D</sub>	T <sub>C</sub> = +25°C	50
		T <sub>C</sub> = +100°C	36
		T <sub>A</sub> = +25°C	18
		T <sub>A</sub> = +70°C	15
Drain Current (Pulse) <sup>(2)</sup>	I <sub>DM</sub>	132	A
Total Dissipation	P <sub>D</sub>	T <sub>C</sub> = +25°C	35
		T <sub>C</sub> = +100°C	14
		T <sub>A</sub> = +25°C	2.5
		T <sub>A</sub> = +70°C	1.6
Avalanche Current <sup>(3)</sup>	I <sub>AS</sub>	36.5	A
Avalanche Energy <sup>(3)</sup>	E <sub>AS</sub>	66.6	mJ
Junction Temperature	T <sub>J</sub>	+150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C
Lead Temperature (Soldering, 10s)		+260	°C

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.

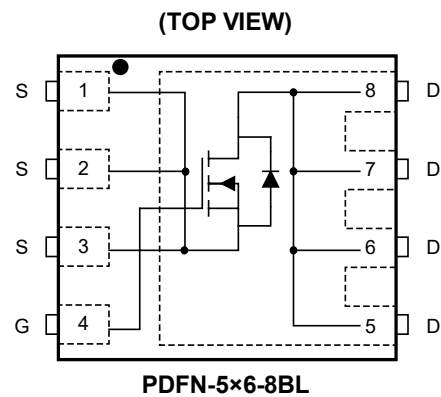
**NOTES:**

1. The current will be limited by package, PCB, thermal design and operating temperature.
2. t<sub>PULSE</sub> < 10µs.
3. Parts are 100% tested at V<sub>GS</sub> = 10V, I<sub>L</sub> = 26A, and E<sub>AS</sub> = 33.3mJ.

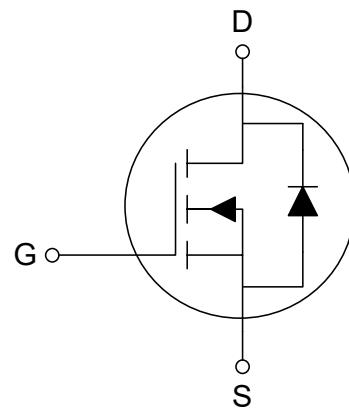
### PRODUCT SUMMARY

R <sub>DS(on)</sub> (TYP) V <sub>GS</sub> = 10V	R <sub>DS(on)</sub> (MAX) V <sub>GS</sub> = 10V	I <sub>D</sub> (MAX) T <sub>C</sub> = +25°C
4.4mΩ	5.8mΩ	50A

### PIN CONFIGURATION



### EQUIVALENT CIRCUIT



### APPLICATIONS

- CPU Power Delivery
- DC/DC Converter
- Power Load Switch
- Notebook Battery Management

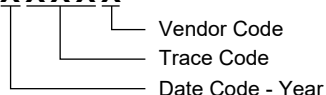
**PACKAGE/ORDERING INFORMATION**

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMNQ59430	PDFN-5x6-8BL	-55°C to +150°C	SGMNQ59430TPDA8G/TR	SGM59430 TPDA8 XXXXX	Tape and Reel, 4000

**MARKING INFORMATION**

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

**XXXXX**



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.

**DISCLAIMER**

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

**THERMAL RESISTANCE MAXIMUM RATINGS**

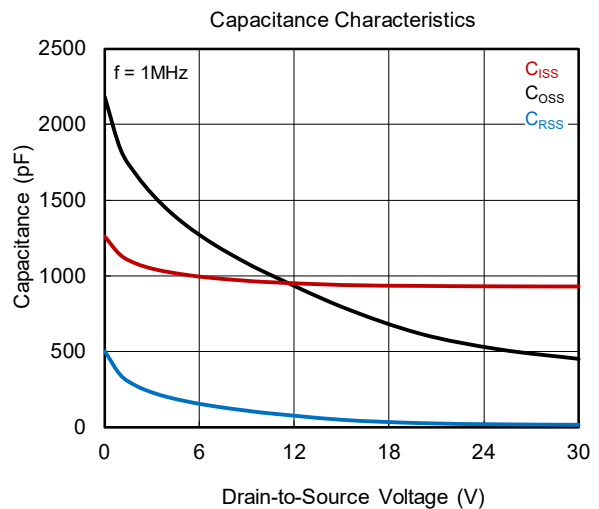
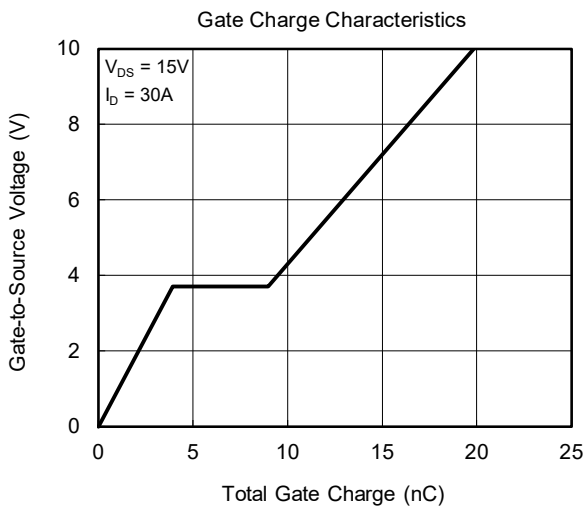
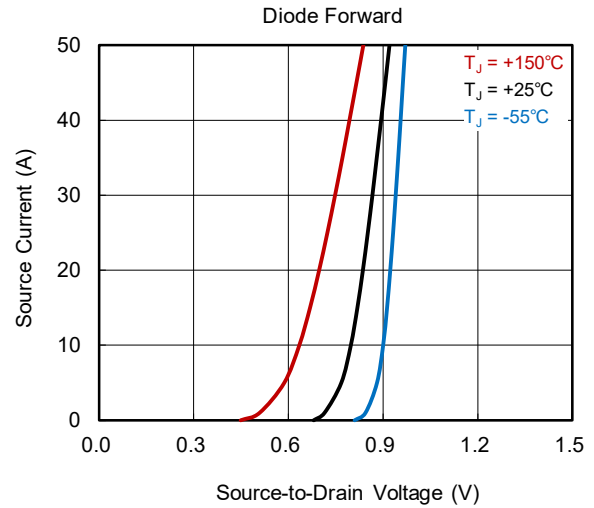
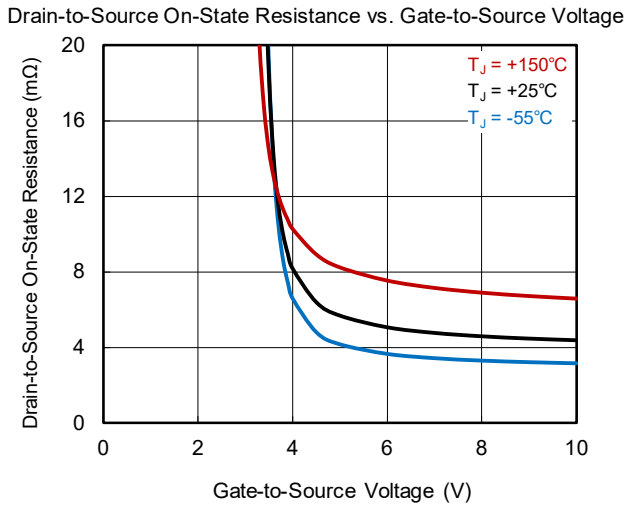
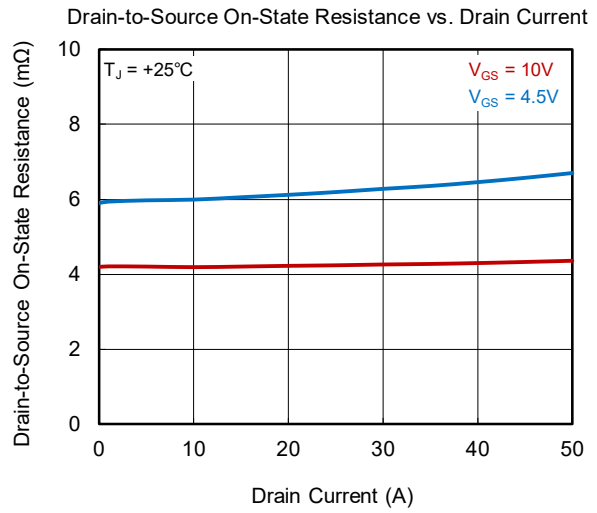
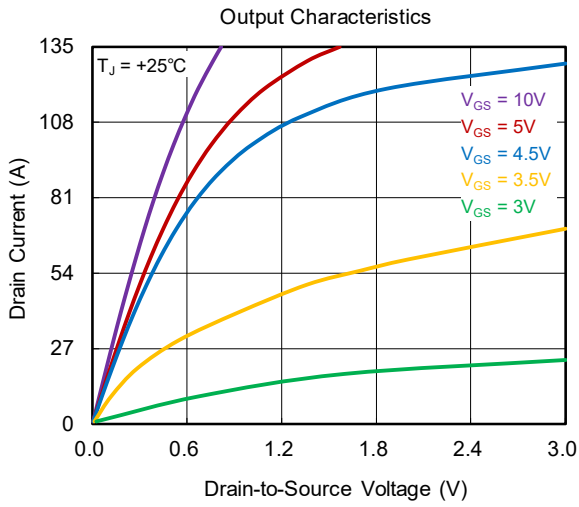
PARAMETER	SYMBOL	VALUE	UNITS
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	3.5	°C/W
Junction-to-Ambient Thermal Resistance <sup>(1)</sup>	$R_{\theta JA}$	50	°C/W

NOTE: 1.  $R_{\theta JA}$  is determined with the device mounted on one square inch of copper pad, 2oz copper on FR4 board.

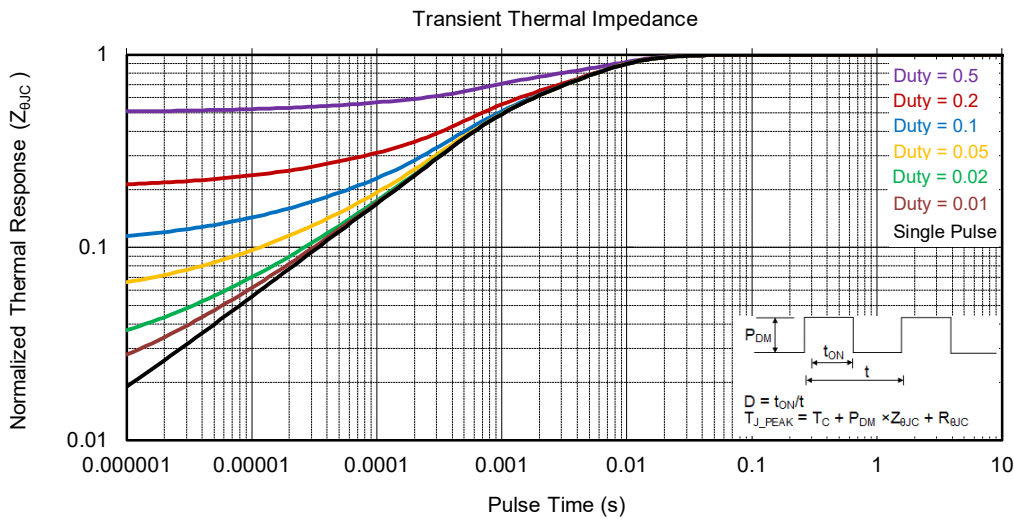
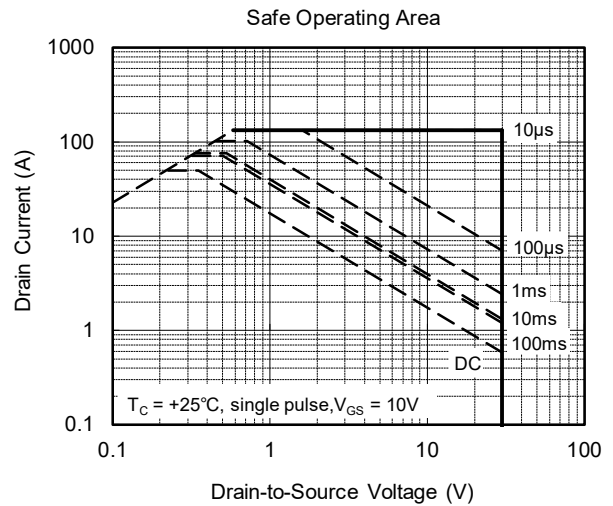
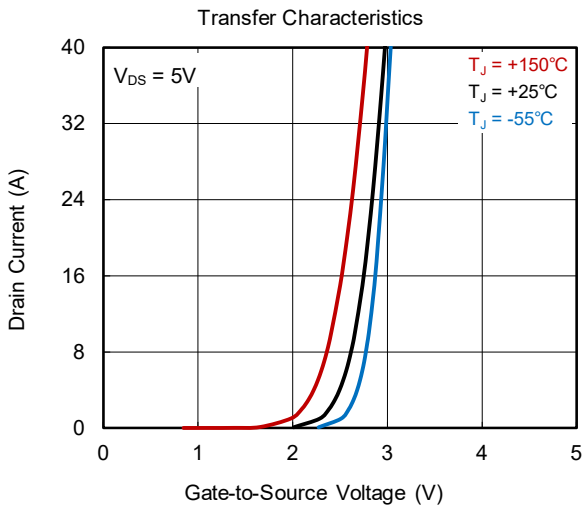
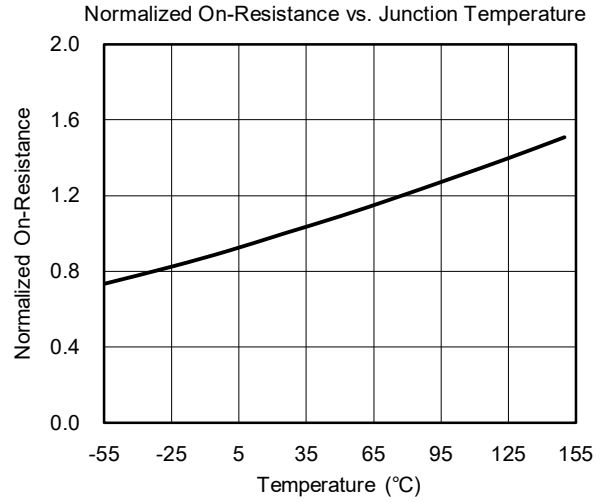
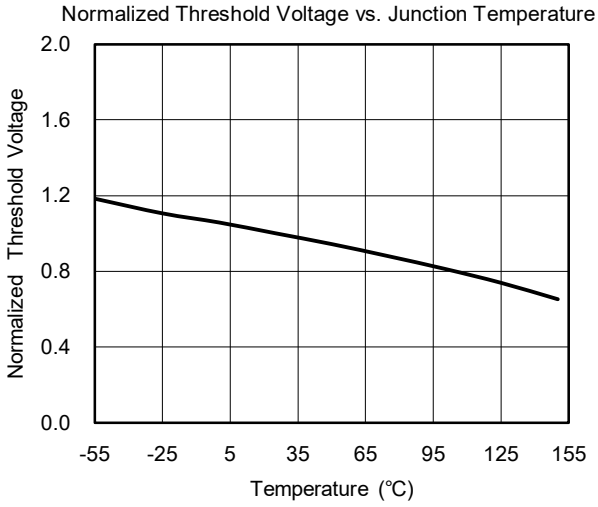
**ELECTRICAL CHARACTERISTICS**(T<sub>A</sub> = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
<b>Static OFF Characteristics</b>						
Drain-to-Source Breakdown Voltage	V <sub>BR_DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 24V			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
<b>Static ON Characteristics</b>						
Gate-to-Source Threshold Voltage	V <sub>GS_TH</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250μA	1.2	1.6	2.2	V
Drain-to-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A		4.4	5.8	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 15A		6.4	8.5	
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 1.5V, I <sub>D</sub> = 15A		30		S
Gate Resistance	R <sub>G</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz		1		Ω
<b>Diode Characteristics</b>						
Diode Forward Voltage	V <sub>F_SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 10A		0.8	1.1	V
Reverse Recovery Time	t <sub>RR</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 30A, di/dt = 100A/μs		33.3		ns
Reverse Recovery Charge	Q <sub>RR</sub>			22.2		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz		880		pF
Output Capacitance	C <sub>oss</sub>			780		
Reverse Transfer Capacitance	C <sub>rss</sub>			57		
Total Gate Charge	Q <sub>G</sub>	V <sub>DS</sub> = 15V, I <sub>D</sub> = 30A	V <sub>GS</sub> = 10V	19.8		nC
			V <sub>GS</sub> = 4.5V	9.9		
Gate-to-Source Charge	Q <sub>GS</sub>	V <sub>GS</sub> = 4.5V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 30A		3.9		
Gate-to-Drain Charge	Q <sub>GD</sub>			5.0		
<b>Switch Characteristics</b>						
Turn-On Delay Time	t <sub>d_ON</sub>	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 15V, I <sub>D</sub> = 15A, R <sub>G</sub> = 3Ω		5.1		ns
Rise Time	t <sub>r</sub>			45.4		
Turn-Off Delay Time	t <sub>d_OFF</sub>			14		
Fall Time	t <sub>f</sub>			6		

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



**REVISION HISTORY**

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

**Changes from Original (SEPTEMBER 2024) to REV.A**

**Page**

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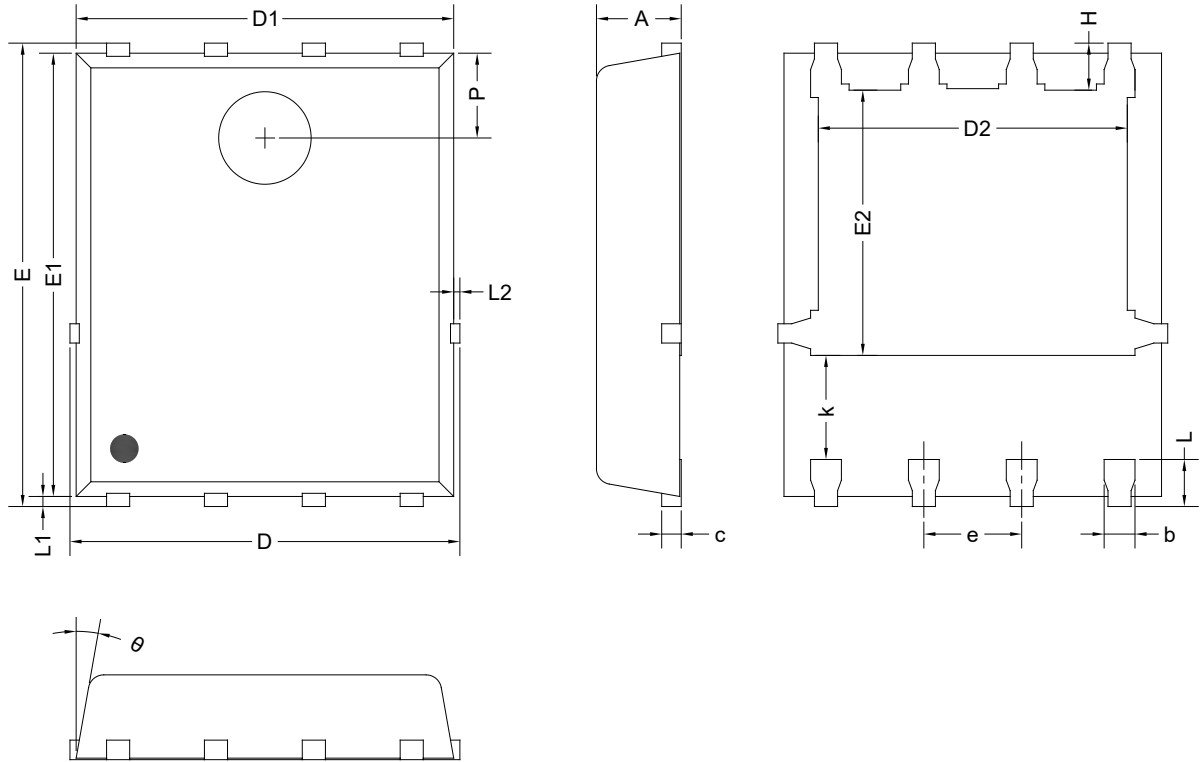
Changed from product preview to production data..... All

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# PACKAGE INFORMATION

## PACKAGE OUTLINE DIMENSIONS

### PDFN-5×6-8BL



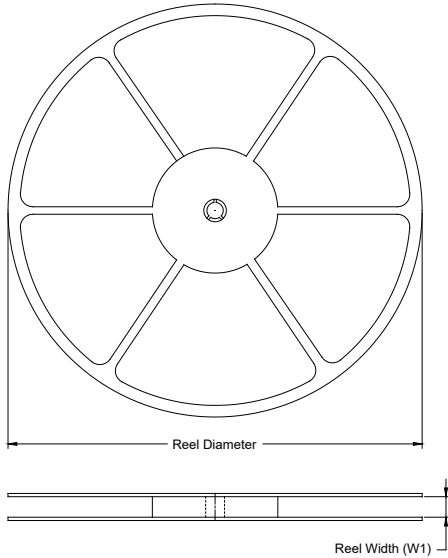
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	1.000	1.100	1.200
b	0.350	0.400	0.450
c	0.210	0.250	0.340
D	4.800	-	5.100
D1	4.800	4.900	5.000
D2	3.910	4.010	4.110
E	5.900	6.000	6.100
E1	5.700	5.750	5.800
E2	3.340	3.440	3.540
e	1.270 BSC		
H	0.510	0.610	0.710
k	1.100	-	-
L	0.510	0.610	0.710
L1	0.060	0.130	0.200
L2	-	-	0.100
P	1.000	1.100	1.200
θ	8°	10°	12°

NOTE: This drawing is subject to change without notice.

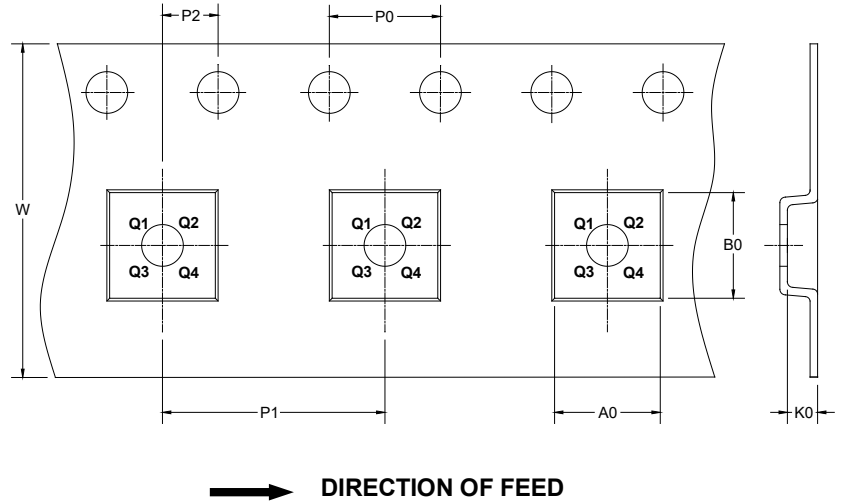
# PACKAGE INFORMATION

## 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

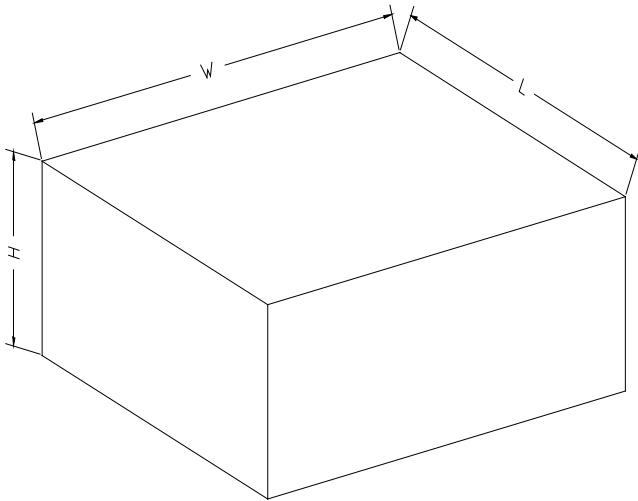
Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
PDFN-5×6-8BL	13"	12.4	6.45	5.30	1.40	4.0	8.0	2.0	12.0	Q1

DD0001



# 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
13"	386	280	370	5

DD0002