

### GENERAL DESCRIPTION

The SGM05HU1AW is designed to protect voltage sensitive components from ESD. Excellent clamping capability, low leakage, high peak pulse current handling capability and fast response time provide best in class protection on designs that are exposed to ESD.

The SGM05HU1AW is available in a UTDFN-1.6×1-2L package with working voltage of 5V and specifically designed to power lines protection.

### FEATURES

- Low Clamping Voltage & Low Leakage
- Small Package: UTDFN-1.6×1-2L
- Protection for the Following IEC Standards:
  - IEC 61000-4-2 Level 4: ±30kV Contact Discharge
  - IEC 61000-4-5 (Lightning) 200A (8/20μs)
- RoHS Compliant and Halogen-Free

### APPLICATIONS

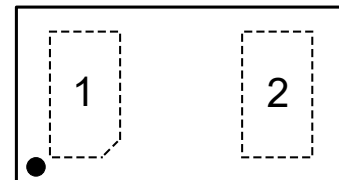
Power Management  
Power Supply Protection  
Battery Line Protection  
Audio Line Protection  
GPIO Protection

### PRODUCT SUMMARY

$V_{RWM}$ (TYP)	$I_{PPM}$ (MAX)	$C_{IN}$ (TYP)
4.85V	200A	550pF

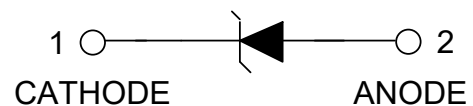
### PIN CONFIGURATION

(TOP VIEW)



UTDFN-1.6×1-2L

### EQUIVALENT CIRCUIT



### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Current ( $t_p$ : 8/20μs)	$I_{PPM}$	200	A
ESD IEC 61000-4-2 (Air)	$V_{ESD}$	±30	kV
ESD IEC 61000-4-2 (Contact)		±30	
Operating Temperature Range	$T_{OP}$	-40 to +125	°C
Storage Temperature Range	$T_{STG}$	-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.

## PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM05HU1AW	UTDFN-1.6×1-2L	-40°C to +125°C	SGM05HU1AWXUGI2G/TR	00 XX	Tape and Reel, 3000

## MARKING INFORMATION

NOTE: XX = Date Code.

**YY** — Serial Number  
**XX**  
 — Date Code - Week  
 — Date Code - Year

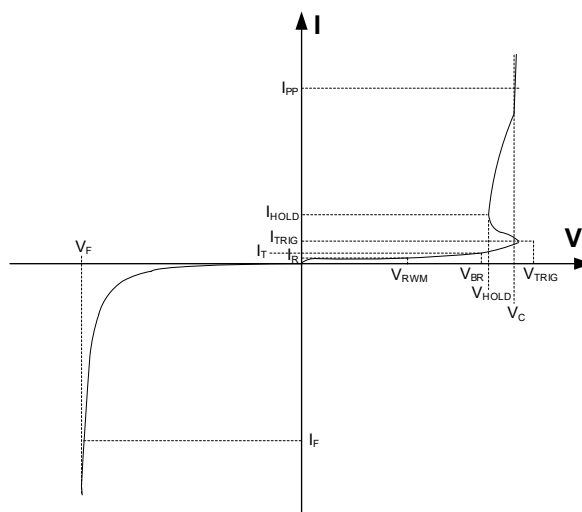
Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

## DISCLAIMER

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

## ELECTRICAL PARAMETERS

SYMBOL	PARAMETER
$I_{PP}$	Maximum Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{RWM}$	Working Peak Reverse Voltage
$I_R$	Maximum Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$I_T$	Test Current
$V_{TRIG}$	Reverse Trigger Voltage
$V_{HOLD}$	Reverse Holding Voltage



## ELECTRICAL CHARACTERISTICS

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

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Reverse Working Voltage	V <sub>RWM</sub>	I/O to GND		4.85	5	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> = 1mA, I/O to GND	5.5	6	7.7	V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> = 5V, I/O to GND			1	μA
Channel Input Capacitance	C <sub>IN</sub>	V <sub>R</sub> = 0V, f = 1MHz, I/O to GND		550	650	pF
Surge Clamping Voltage <sup>(1)</sup>	V <sub>C_SURGE</sub>	I <sub>PPM</sub> = 100A		7.85		V
	V <sub>C_SURGE</sub>	I <sub>PPM</sub> = 200A		10.3		V
ESD Clamping Voltage <sup>(2)</sup>	V <sub>C</sub>	I <sub>PP</sub> = 8A, IEC 61000-4-2 level 2 equivalent (±4kV contact, ±8kV air)		8.2		V
		I <sub>PP</sub> = 16A, IEC 61000-4-2 level 4 equivalent (±8kV contact, ±15kV air)		6.6		V
Dynamic Resistance	R <sub>DYN</sub>	t <sub>p</sub> = 100ns		0.19		Ω

## NOTES:

1. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC 61000-4-5, 2Ω source impedance.
2. Non-repetitive current pulse, Transmission Line Pulse (TLP) t<sub>p</sub> = 100ns; square pulse.

Positive 8kV:

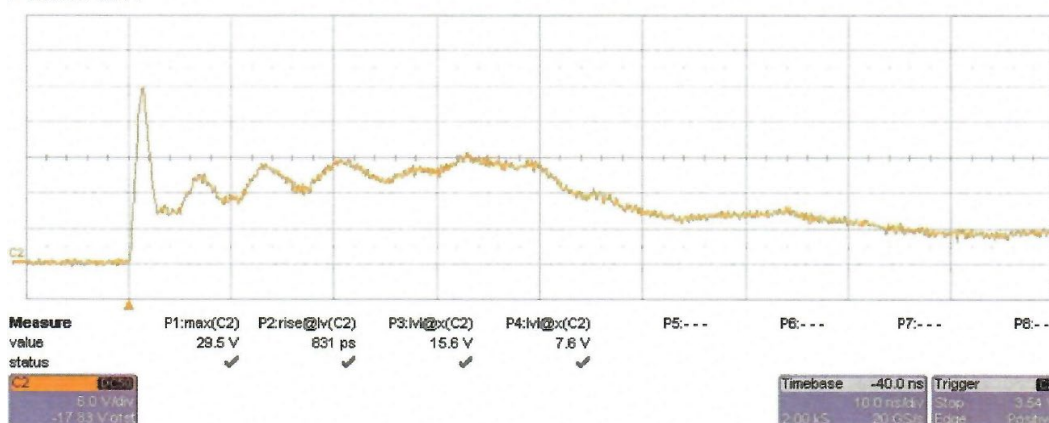


Figure 1. Typical Pulses ESD 8kV Contact per IEC 61000-4-2

Negative 8kV:

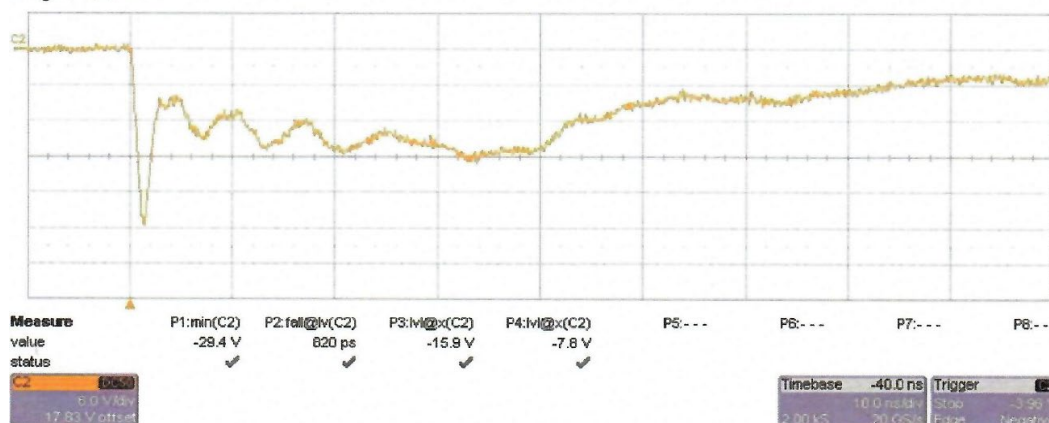
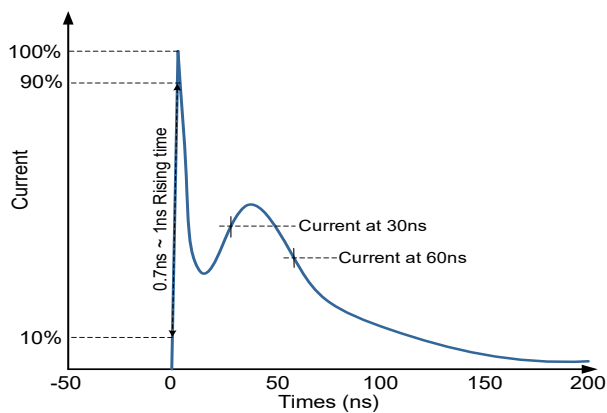


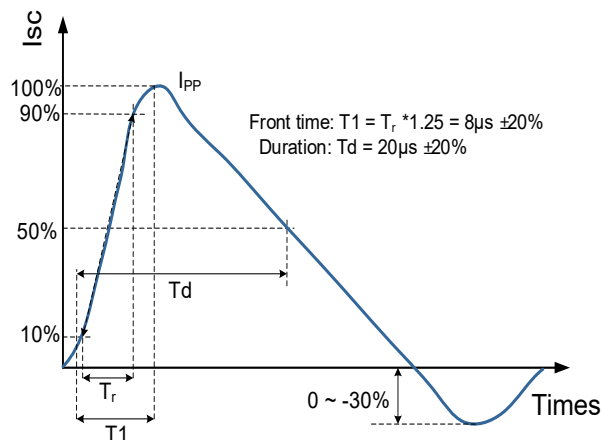
Figure 2. Typical Pulses ESD -8kV Contact per IEC 61000-4-2

## TYPICAL PERFORMANCE CHARACTERISTICS

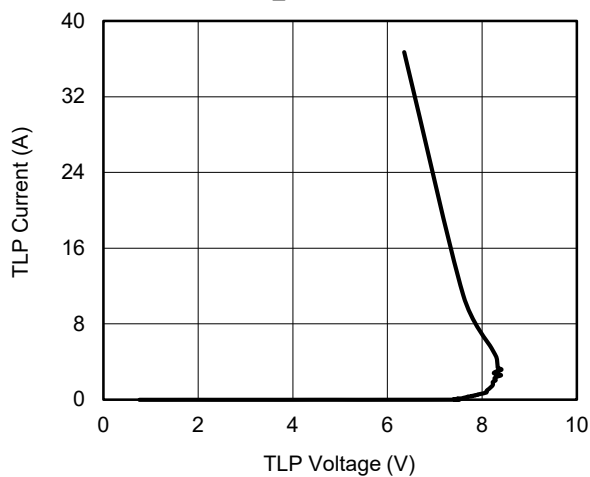
ESD pulse waveform per IEC61000-4-2



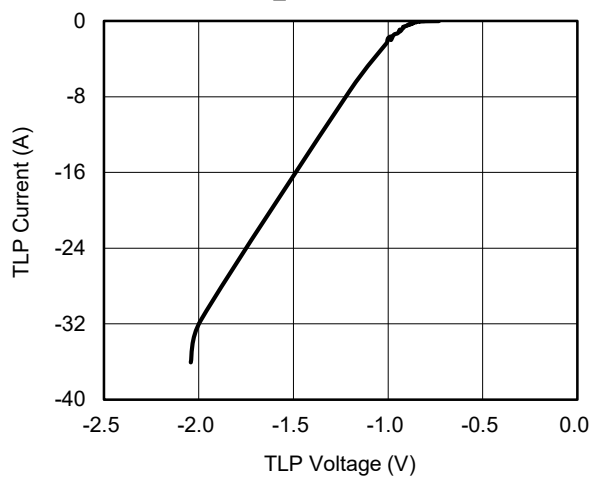
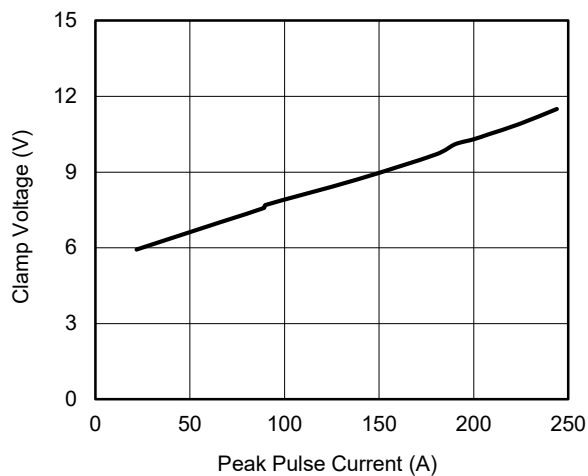
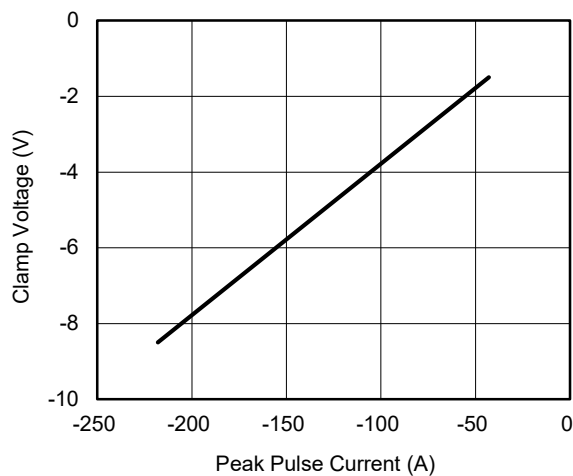
8/20μs waveform per IEC61000-4-5



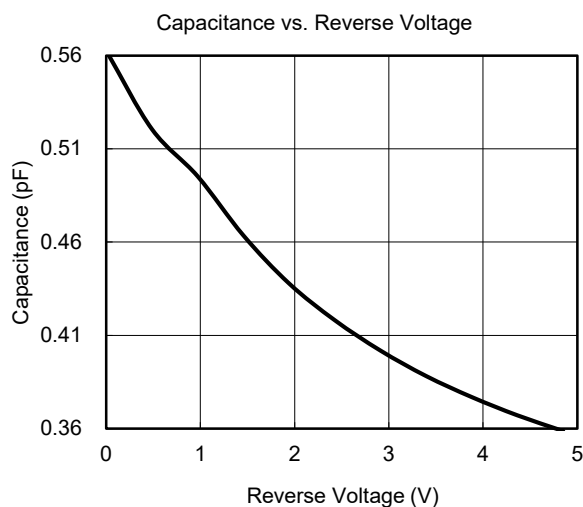
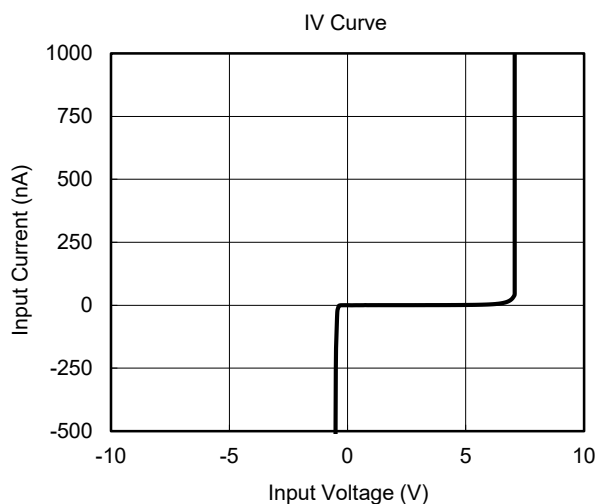
TLP\_Channel to GND



TLP\_GND to Channel

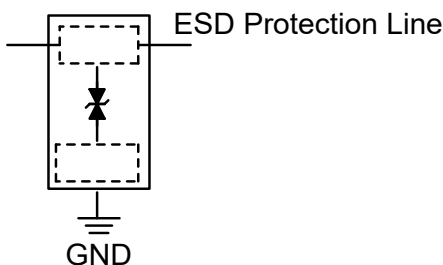
Positive Clamp Voltage vs. Peak Pulse Current ( $t_P = 8/20\mu s$ )Negative Clamp Voltage vs. Peak Pulse Current ( $t_P = 8/20\mu s$ )

## TYPICAL PERFORMANCE CHARACTERISTICS (continued)



## APPLICATION INFORMATION

The TVS is designed to provide a bidirectional line for dissipating ESD events on high-speed signal. The TVS is suitable for lines with positive and negative signal polarity relative to the ground.



The recommended guidelines are as follows:

## 1. TVS Placement

Place the TVS as close as possible to the input connector.

## 2. TVS's Trace Layout

Avoid running protected traces in parallel with unprotected traces.

Minimize the path length between the TVS and the protected line.

Minimize parallel signal path length.

Route the protected traces as straight as possible.

## 3. GND Layout

Avoid using a common ground point shared with the TVS transient return path.

Minimize the length of the TVS transient return path to ground.

Use ground vias as close as possible to the TVS transient return to ground.

**REVISION HISTORY**

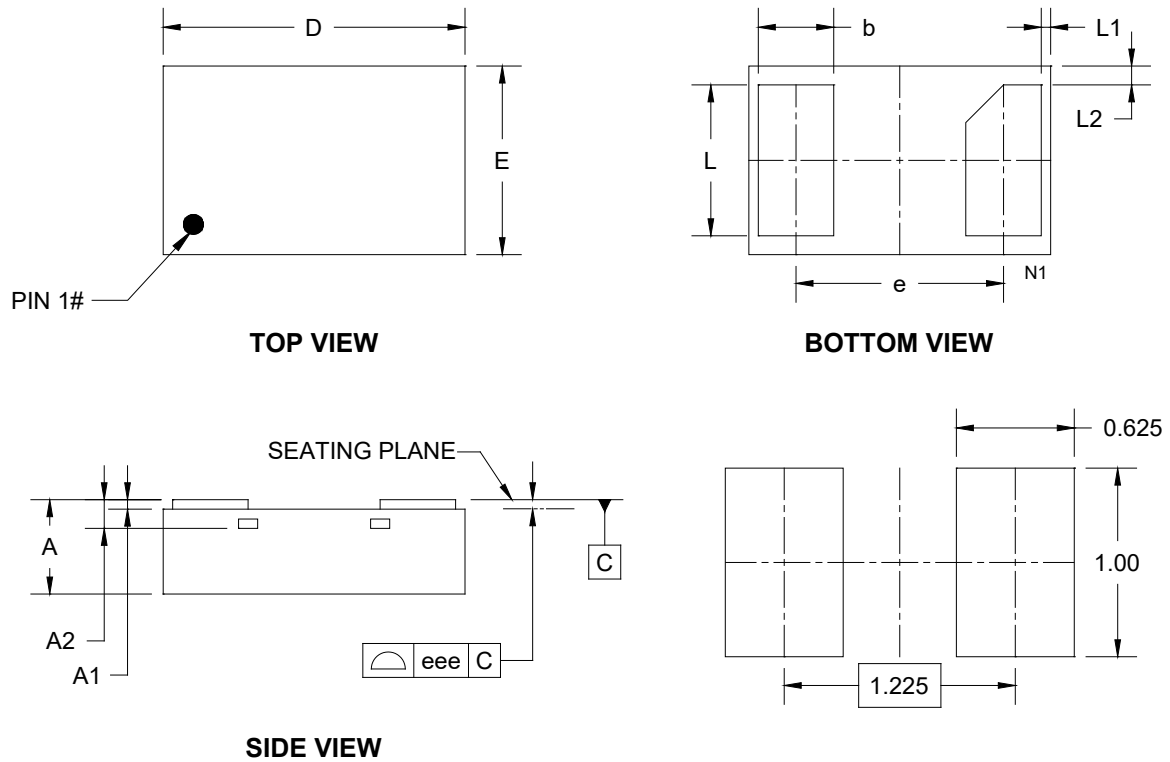
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Original (MAY 2025) to REV.A	Page
Changed from product preview to production data.....	All

## PACKAGE INFORMATION

### PACKAGE OUTLINE DIMENSIONS

#### UTDFN-1.6×1-2L



#### RECOMMENDED LAND PATTERN (Unit: mm)

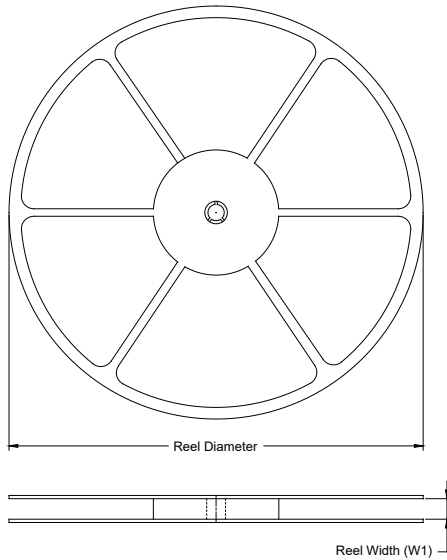
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.450	-	0.550
A1	0.000	-	0.050
A2	0.152 REF		
b	0.300	-	0.500
D	1.500	-	1.700
E	0.900	-	1.100
e	1.100 BSC		
L	0.750	-	0.850
L1	0.050 REF		
L2	0.100 REF		
eee	0.080		

NOTE: This drawing is subject to change without notice.

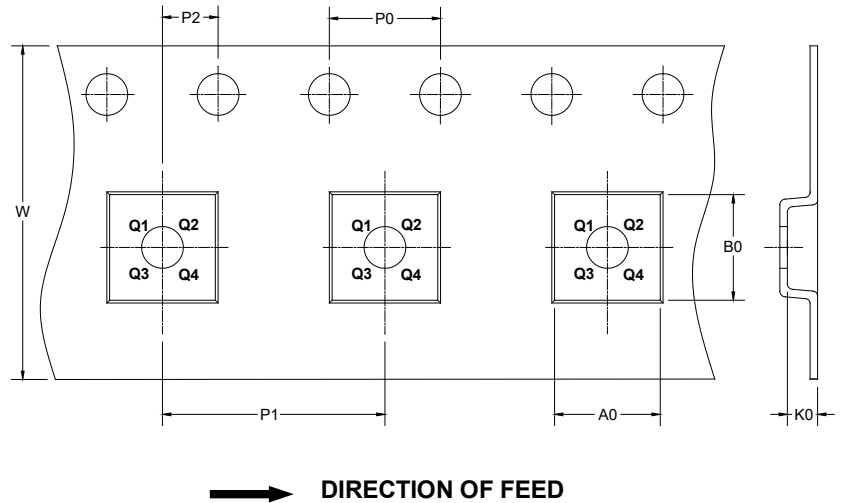
# PACKAGE INFORMATION

## 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

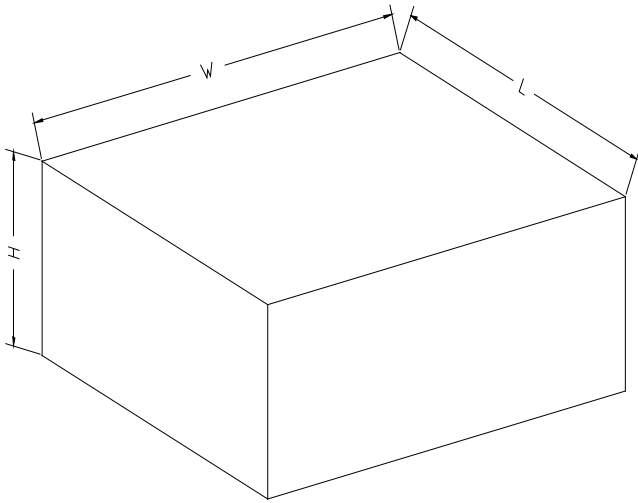
Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
UTDFN-1.6×1-2L	7"	9.5	1.12	1.72	0.70	4.0	4.0	2.0	8.0	Q1

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
7" (Option)	368	227	224	8
7"	442	410	224	18

DD0002