



SGMNE39220

20V, Power, Single N-Channel, UTDFN Package, MOSFET

FEATURES

- Low On-State Resistance
- Ultra-Low Q_G and Q_{GD}
- ESD Diode Protected Gate
- HBM: 2kV
- Ultra-Small Footprint "Tiny FET"

ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	VALUE	UNITS
Drain-to-Source Voltage		V _{DS}	20	V
Gate-to-Source Voltage		V _{GS}	±8	V
Drain Current ⁽¹⁾	T _A = +25°C	I _D	1.2	A
	T _A = +100°C		0.75	
Drain Current (Pulse) ⁽²⁾		I _{DM}	2.5	A
Total Dissipation	T _A = +25°C	P _D	700	mW
	T _A = +100°C		300	
Junction Temperature		T _J	+150	°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.

NOTES:

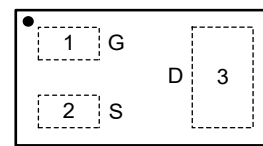
1. Current limited by bond wire.
2. $t_{PULSE} < 10\mu\text{s}$.

PRODUCT SUMMARY

$R_{DS(on)}$ (TYP) $V_{GS} = 4.5\text{V}$	$R_{DS(on)}$ (MAX) $V_{GS} = 4.5\text{V}$	I_D (MAX) $T_A = +25^\circ\text{C}$
300m Ω	390m Ω	1.2A

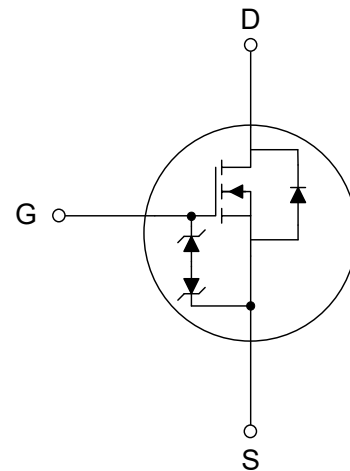
PIN CONFIGURATION

(TOP VIEW)



UTDFN-1x0.6-3L

EQUIVALENT CIRCUIT



APPLICATIONS

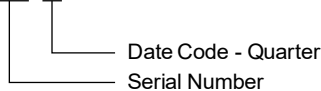
- Optimized for Load Switch Applications
- Optimized for General Purpose
- Switching Applications
- Battery Applications
- Handheld and Mobile Applications
- IO Expansion Switch

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMNE39220	UTDFN-1×0.6-3L	-55°C to +150°C	SGMNE39220TUEM3G/TR	03X	Tape and Reel, 10000

MARKING INFORMATION

NOTE: X = Date Code.

YY X

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.

ESD SENSITIVITY CAUTION

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

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-Ambient Thermal Resistance ⁽¹⁾	$R_{\theta JA}$	180	°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.

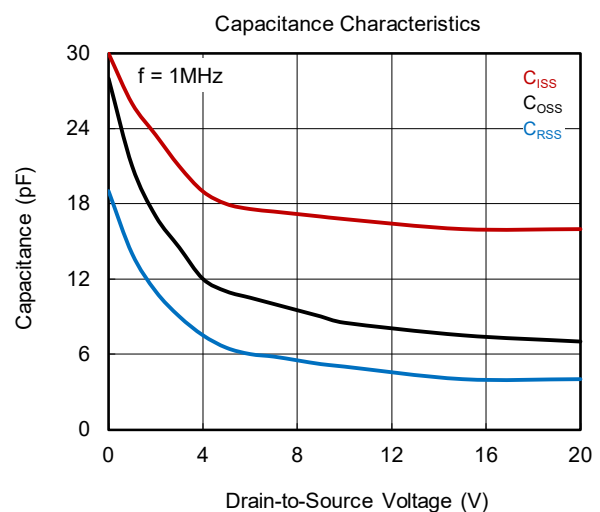
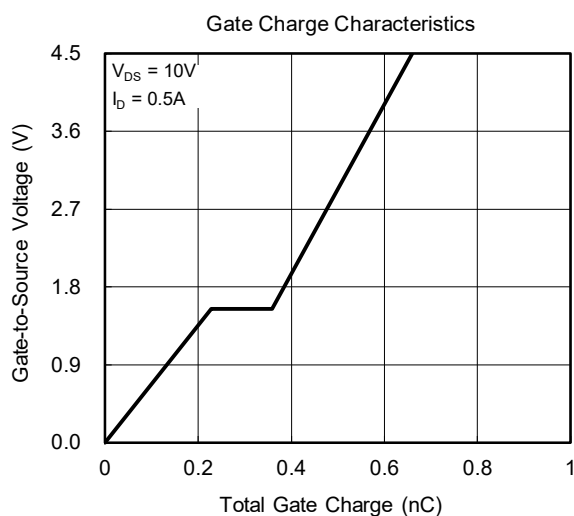
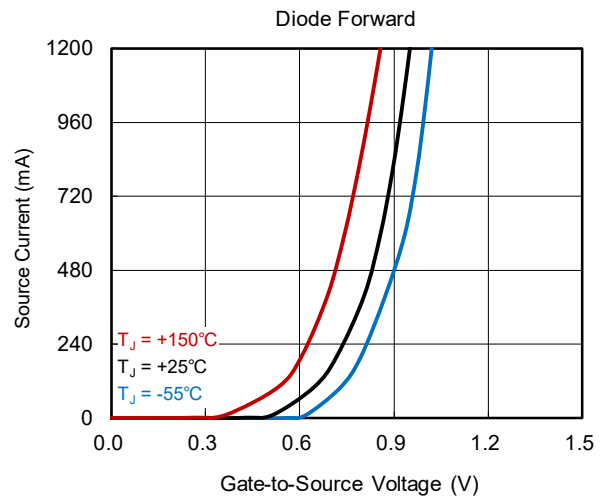
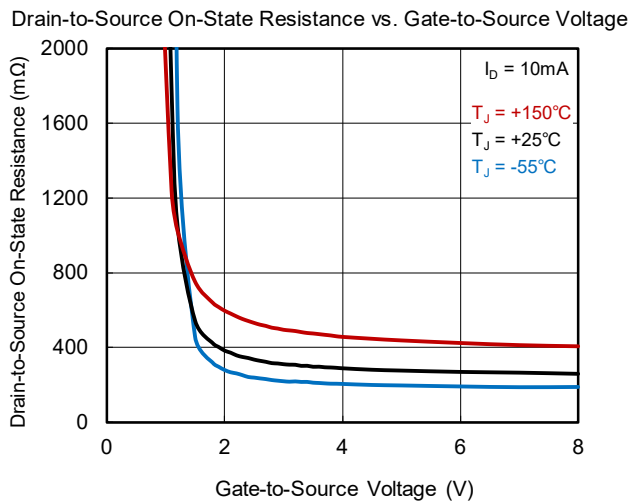
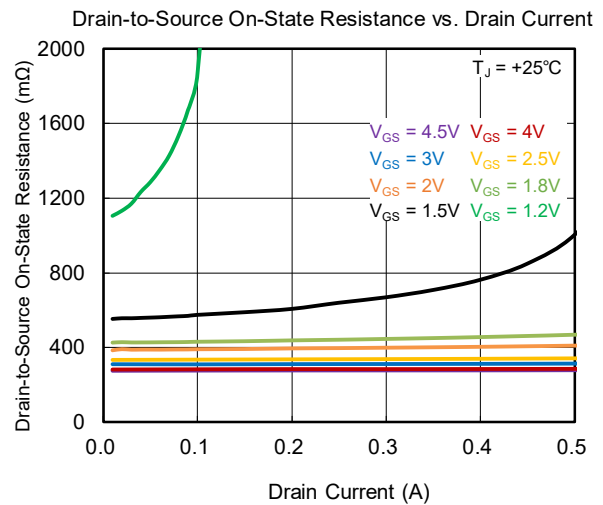
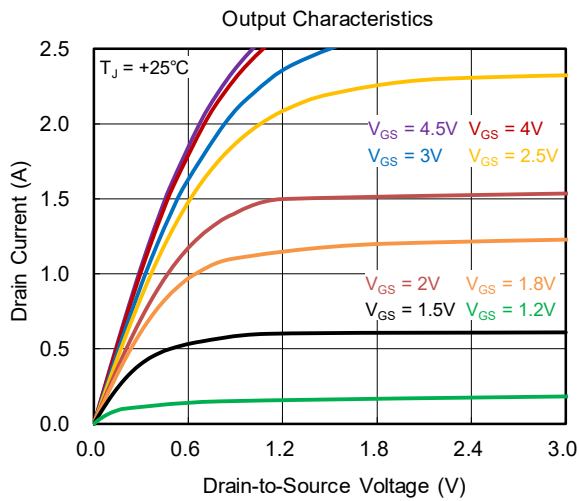
ELECTRICAL CHARACTERISTICS

(T_A = +25°C, unless otherwise noted.)

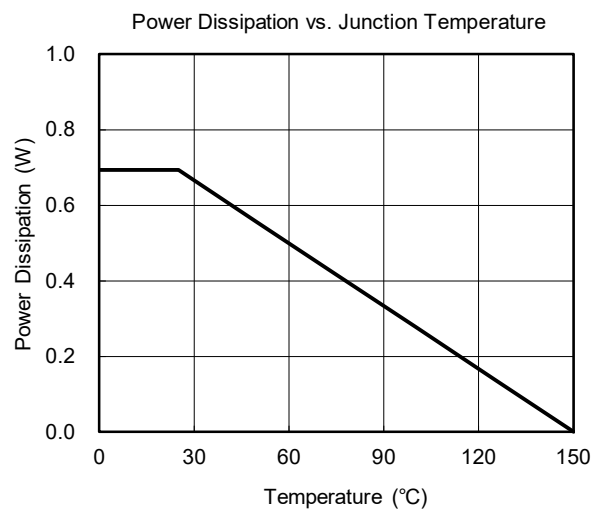
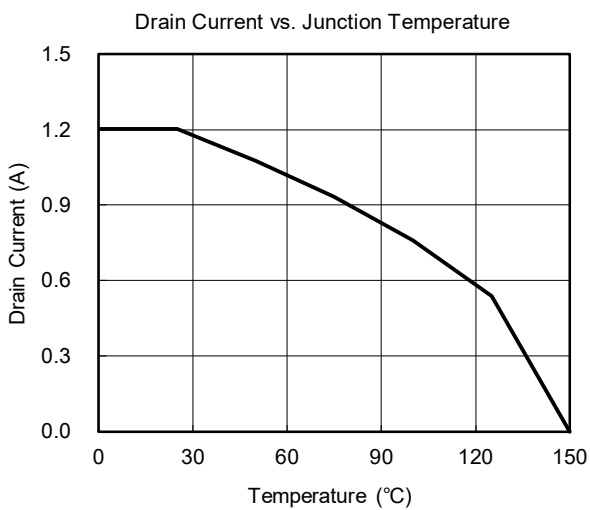
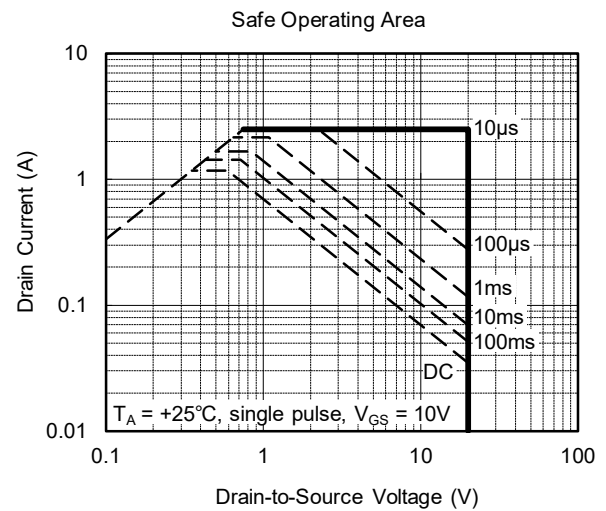
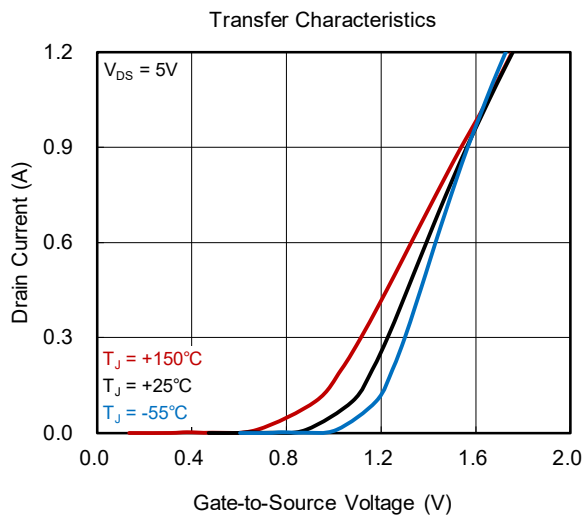
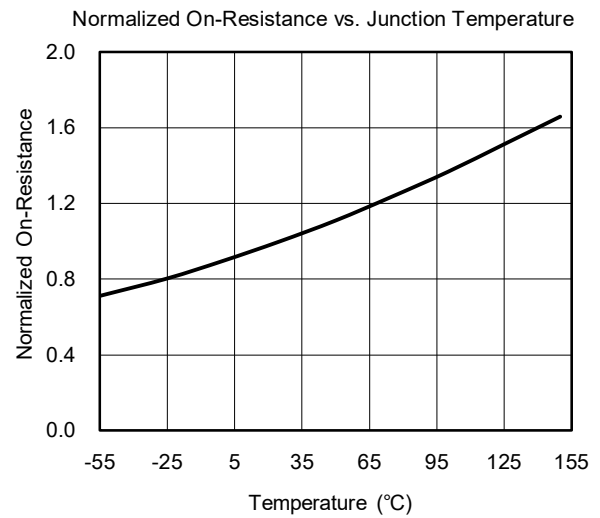
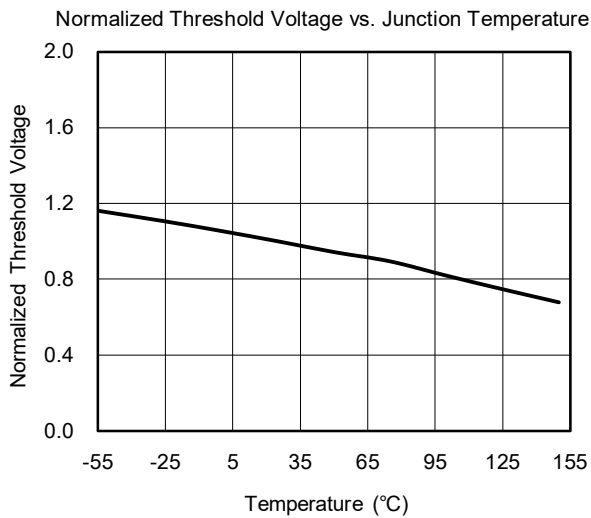
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Static OFF Characteristics						
Drain-to-Source Breakdown Voltage	V _{BR_DSS}	V _{GS} = 0V, I _D = 250μA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0V, V _{DS} = 20V			1	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} = ±8V, V _{DS} = 0V			±5	μA
Static ON Characteristics						
Gate Threshold Voltage	V _{GS_TH}	V _{GS} = V _{DS} , I _D = 250μA	0.4	0.65	1.0	V
Static Drain-to-Source On-State Resistance	R _{DS(on)}	V _{GS} = 4.5V, I _D = 1.2A		300	390	mΩ
		V _{GS} = 2.5V, I _D = 1A		370	485	
		V _{GS} = 1.8V, I _D = 0.12A		440	580	
		V _{GS} = 1.5V, I _D = 0.01A		560	840	
		V _{GS} = 1.2V, I _D = 0.01A		1000	3000	
Forward Transconductance	g _{fs}	V _{DS} = 5V, I _D = 1.2A		1.5		S
Diode Characteristics						
Forward Diode Voltage	V _{F_SD}	V _{GS} = 0V, I _S = 1A		0.9	1.2	V
Dynamic Characteristics						
Input Capacitance	C _{iSS}	V _{GS} = 0V, V _{DS} = 10V, f = 1MHz		19		pF
Output Capacitance	C _{oSS}			9		
Reverse Transfer Capacitance	C _{rSS}			5		
Total Gate Charge	Q _G	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 0.5A		0.7		nC
Gate-to-Source Charge	Q _{GS}			0.2		
Gate-to-Drain Charge	Q _{GD}			0.1		
Switch Characteristics						
Turn-On Delay Time	t _{D_ON}	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 1A, R _G = 3Ω		5.8		ns
Rise Time	t _R			11.7		
Turn-Off Delay Time	t _{D_OFF}			8.1		
Fall Time	t _F			3.8		

NOTE: 1. Please contact sales for SPICE Model support.

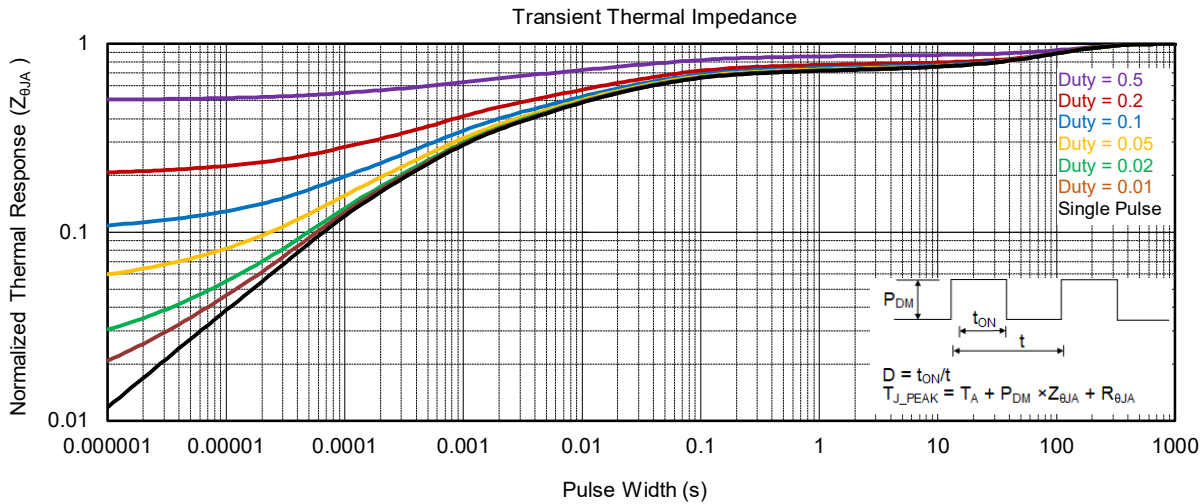
TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

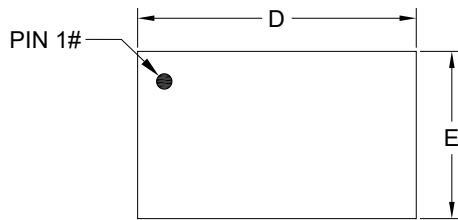
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

MARCH 2025 – REV.A to REV.A.1		Page
Updated pin 1 quadrant		8
Changes from Original (DECEMBER 2024) to REV.A		Page
Changed from product preview to production data.....		All

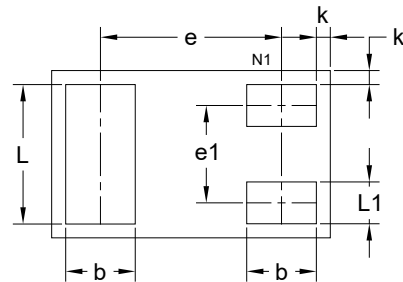
PACKAGE INFORMATION

PACKAGE OUTLINE DIMENSIONS

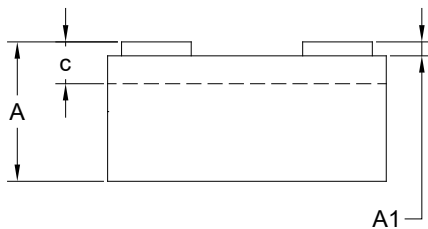
UTDFN-1×0.6-3L



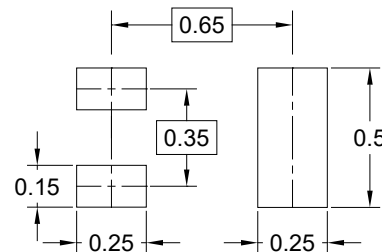
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)

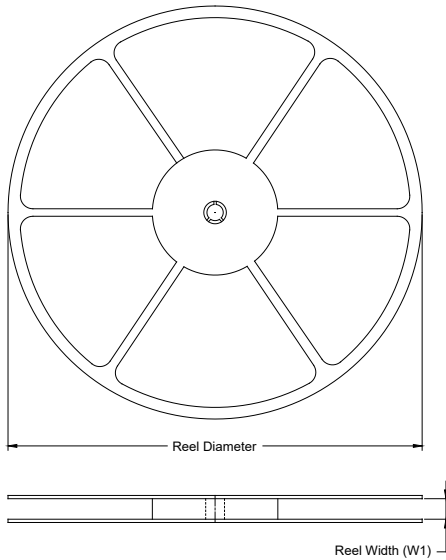
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.450	0.500	0.550
A1	0.000	-	0.050
b	0.200	0.250	0.300
c	0.120	0.150	0.180
D	0.950	1.000	1.050
E	0.550	0.600	0.650
e	0.650 BSC		
e1	0.350 BSC		
k	0.050 REF		
L	0.450	0.500	0.550
L1	0.100	0.150	0.200

NOTE: This drawing is subject to change without notice.

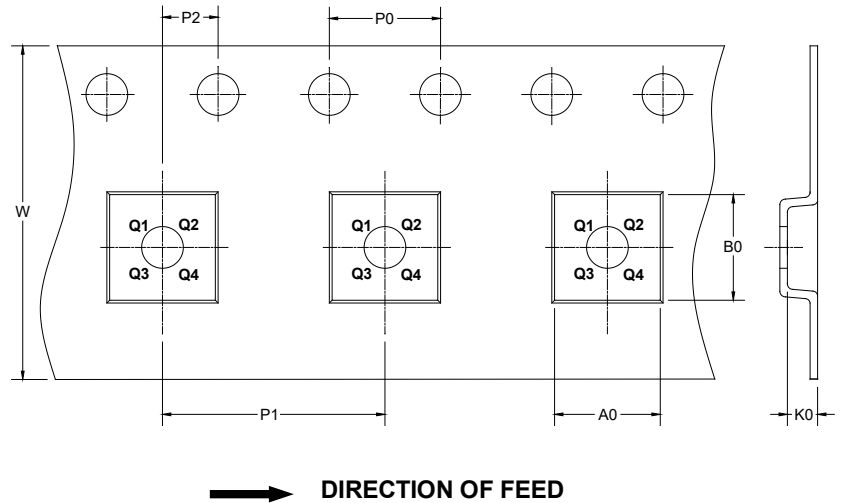
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

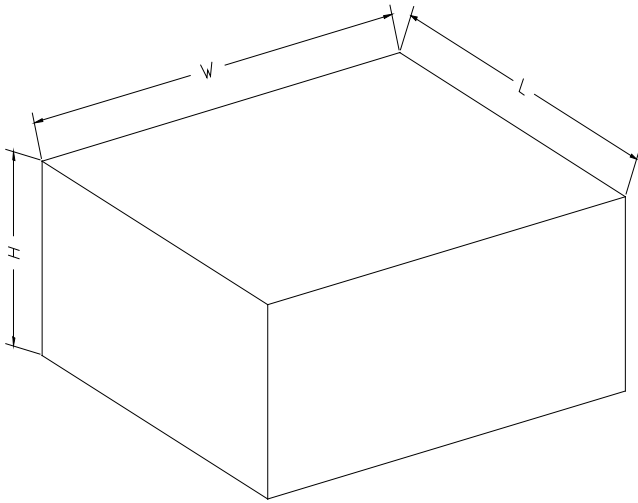
KEY PARAMETER LIST OF TAPE AND REEL

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-1×0.6-3L	7"	8.6	0.70	1.15	0.57	4.0	2.0	2.0	8.0	Q3

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