

FEATURES

- E-mode Transistor-Normally off Power Switch
- Footprint (5×6mm², 8×8mm²) for Compact Design
- Zero Reverse Recovery Loss
- Ultra High Switching Frequency
- RoHS Compliant and Halogen Free

APPLICATIONS

Fast Battery Charging
DC/DC Converters
Flyback Converter
High Efficiency Power Conversion

ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	VALUE	UNITS
Drain-to-Source Voltage		V _{DS}	650	V
Drain-to-Source Voltage Transient ⁽¹⁾		V _{DS-TRANSIENT}	800	V
Gate-to-Source Voltage ⁽²⁾		V _{GS}	-10 to 7	V
Drain Current	T _C = +25°C	I _D	11	A
	T _C = +100°C		7	
	T _A = +25°C		2.3	
	T _A = +70°C		1.8	
Drain Current (Pulse) ⁽³⁾		I _{DM}	22	A
Total Dissipation	T _C = +25°C	P _D	75	W
	T _C = +100°C		30	
	T _A = +25°C		2.5	
	T _A = +70°C		1.6	
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.

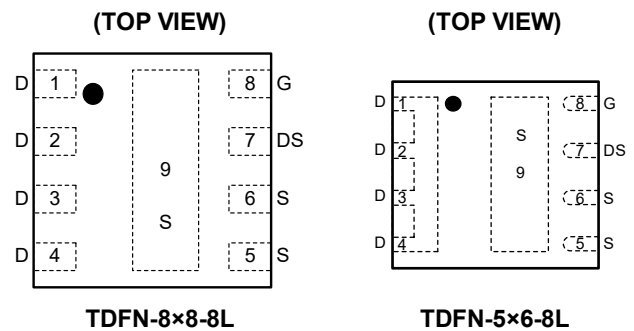
NOTES:

1. $t_{PULSE} < 1\mu\text{s}$.
2. To achieve the best $R_{DS(on)}$ performance, the recommended gate driving voltage range (V_{GS}) is 0V to 6V. E-HEMT does not need negative gate bias to turn off. Negative gate bias (typically $V_{GS} = -3\text{V}$) can ensure safe operation and is not affected by the gate voltage spike, but it may increase the reverse conduction loss if it is improperly driven.
3. $t_{PULSE} < 10\mu\text{s}$.

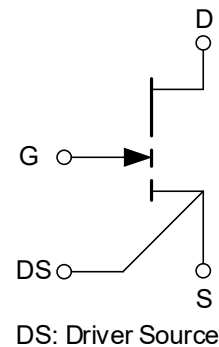
PRODUCT SUMMARY

$R_{DS(on)}$ (TYP) $V_{GS} = 6\text{V}$	$R_{DS(on)}$ (MAX) $V_{GS} = 6\text{V}$	I_D (MAX) $T_C = +25^{\circ}\text{C}$
170mΩ	240mΩ	11A

PIN CONFIGURATIONS



EQUIVALENT CIRCUIT



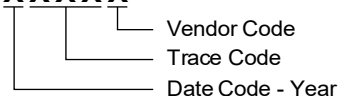
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMGH22265	TDFN-8×8-8L	-55°C to +150°C	SGMGH22265TTGR8G/TR	SGMGH22265 TTGR8 XXXXXX	Tape and Reel, 2500
	TDFN-5×6-8L	-55°C to +150°C	SGMGH22265TTGQ8G/TR	SGM0GV TTGQ8 XXXXXX	Tape and Reel, 3000

MARKING INFORMATION

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

XXXXXX



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	TDFN-8×8-8L	$R_{\theta JC}$	2	°C/W
	TDFN-5×6-8L		2	
Junction-to-Ambient Thermal Resistance	TDFN-8×8-8L	$R_{\theta JA}$	50	°C/W
	TDFN-5×6-8L		50.6	

ELECTRICAL CHARACTERISTICS

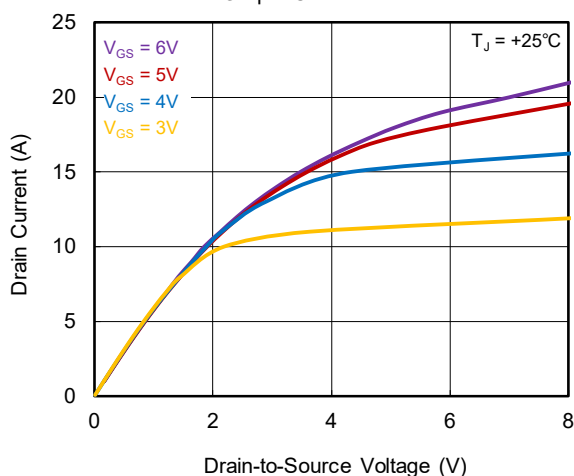
(T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Static OFF Characteristics							
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0V, V _{DS} = 650V	T _J = +25°C			20	μA
			T _J = +150°C		5		
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} = 6V, V _{DS} = 0V			20		μA
Static ON Characteristics							
Gate-to-Source Threshold Voltage	V _{GS_TH}	V _{GS} = V _{DS} , I _D = 1.7mA		1.1	1.6	2.6	V
Drain-to-Source On-State Resistance	R _{DSON}	V _{GS} = 6V, I _D = 3A	T _J = +25°C		170	240	mΩ
			T _J = +150°C		445		
Gate Resistance	R _G	f = 5MHz			2		Ω
Dynamic Characteristics							
Input Capacitance	C _{ISS}	V _{GS} = 0V, V _{DS} = 400V, f = 100kHz			53		pF
Output Capacitance	C _{OSS}				17		
Reverse Transfer Capacitance	C _{RSS}				0.2		
Output Capacitance Stored Energy	E _{OSS}				3.0		
Effective Output Capacitance, Energy Related	C _{O_ER}	V _{GS} = 0V, V _{DS} = 0V to 400V			37		pF
Effective Output Capacitance, Time Related	C _{O_TR}				39		
Output Charge	Q _{OSS}				16		nC
Total Gate Charge	Q _G			V _{GS} = 0V to 6V, V _{DS} = 400V, I _D = 3A			
Gate-to-Source Charge	Q _{GS}		0.4				
Gate-to-Drain Charge	Q _{GD}		0.6				
Gate Plateau Voltage	V _{PLAT}		3.2				V
Switch Characteristics							
Turn-On Delay Time	t _{D_ON}	V _{GS} = -3V to 6V, V _{DS} = 400V, I _D = 5A, R _{G_ON} = 10Ω, R _{G_OFF} = 2Ω, L = 250uH			3		ns
Rise Time	t _R				4		
Turn-Off Delay Time	t _{D_OFF}				6		
Fall Time	t _F				8		
Switching Energy during Turn-On	E _{ON}				11.2		μJ
Switching Energy during Turn-Off	E _{OFF}				4.1		

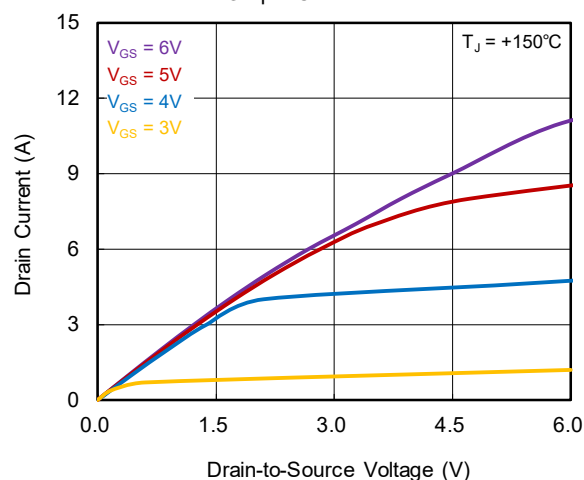
NOTE: Enhanced HEMTs has no intrinsic body diode (V_{FSD}) and the reverse recovery charge is zero. These devices can naturally turn on in reverse and show different characteristics according to the gate voltage. Please refer to Channel Reverse Characteristics figure.

TYPICAL PERFORMANCE CHARACTERISTICS

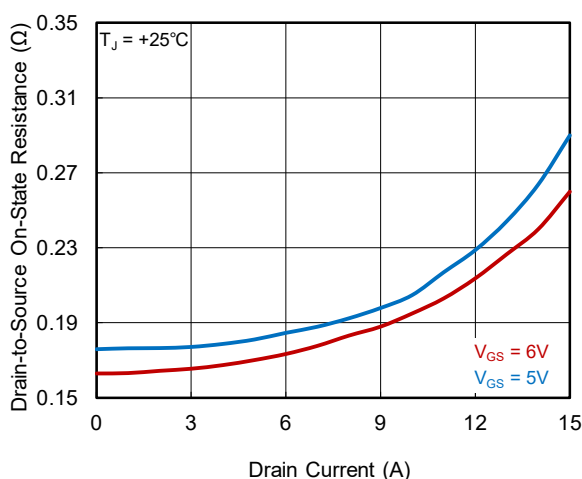
Output Characteristics



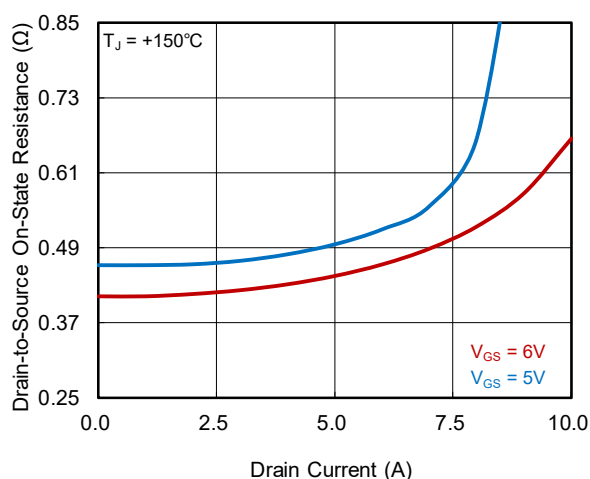
Output Characteristics



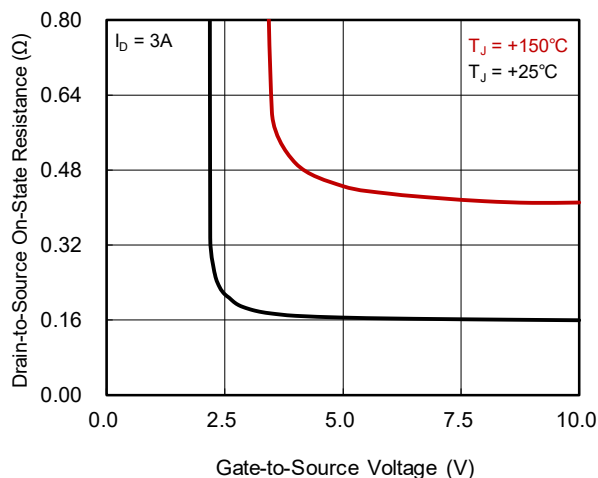
Drain-to-Source On-State Resistance vs. Drain Current



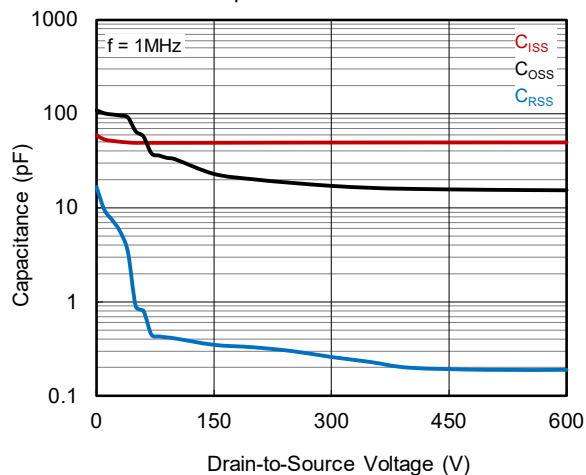
Drain-to-Source On-State Resistance vs. Drain Current



Drain-to-Source On-State Resistance vs. Gate-to-Source Voltage

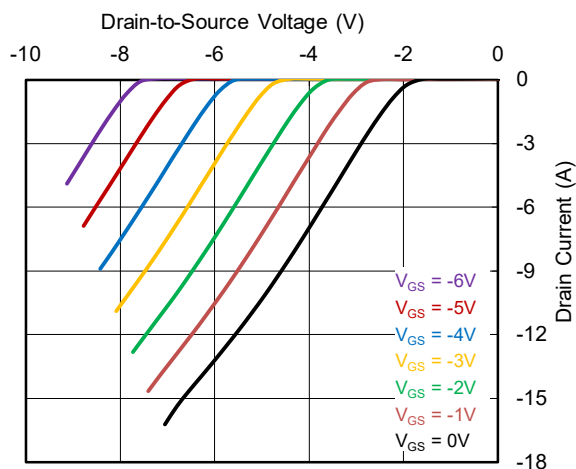


Capacitance Characteristics

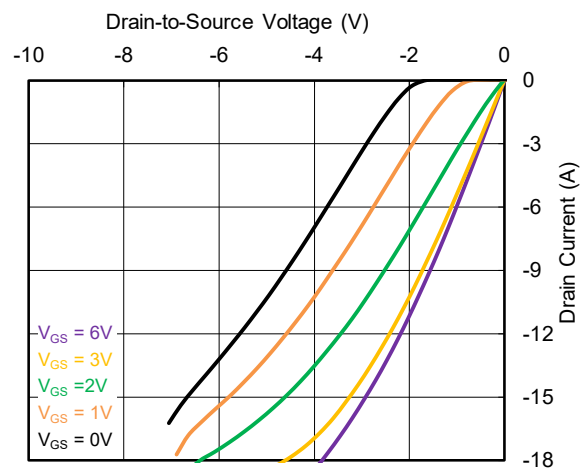


TYPICAL PERFORMANCE CHARACTERISTICS (continued)

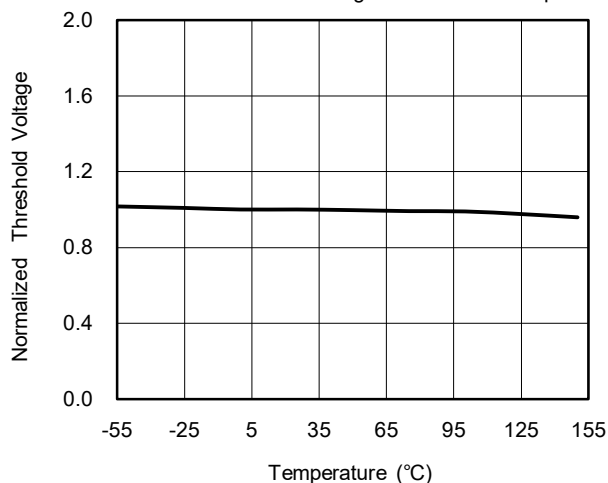
Channel Reverse Characteristics



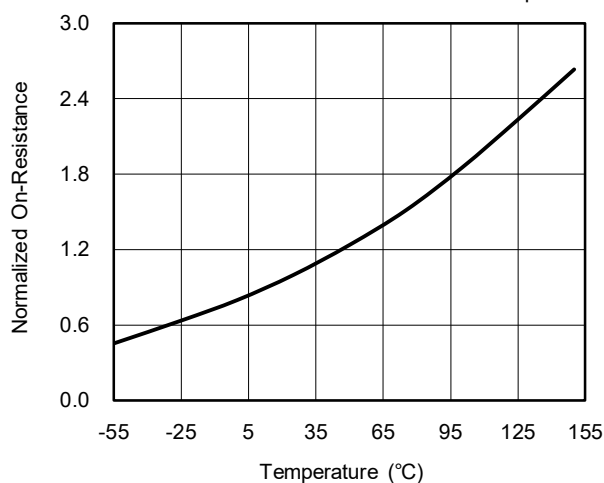
Channel Reverse Characteristics



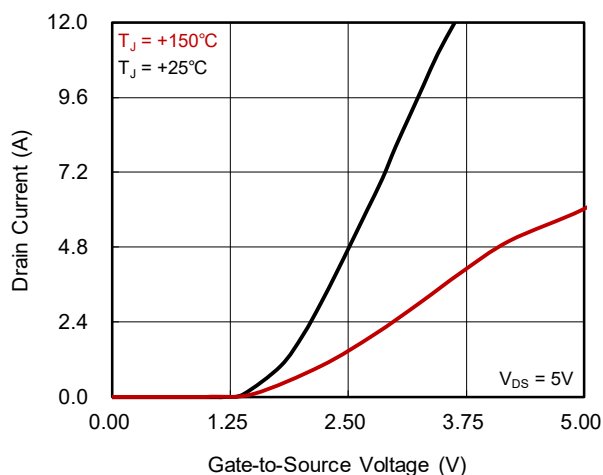
Normalized Threshold Voltage vs. Junction Temperature



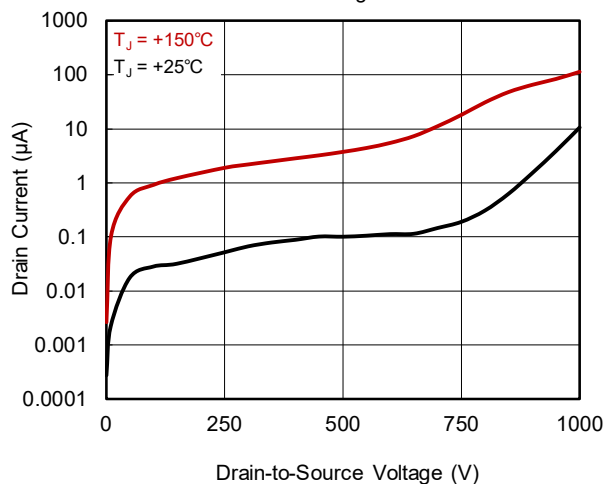
Normalized On-Resistance vs. Junction Temperature



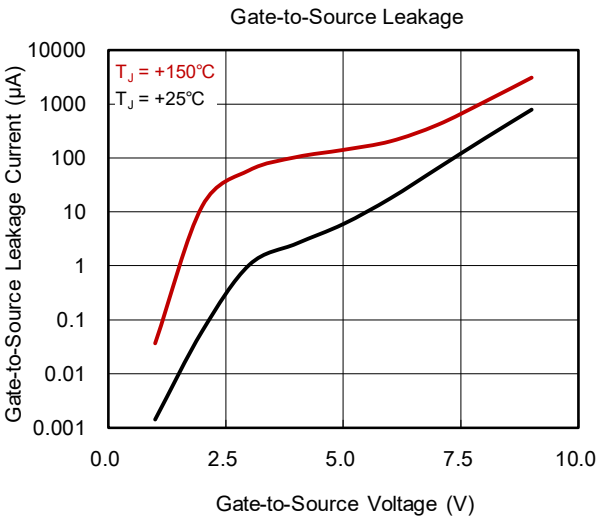
Transfer Characteristics



Drain-Source Leakage Characteristics



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



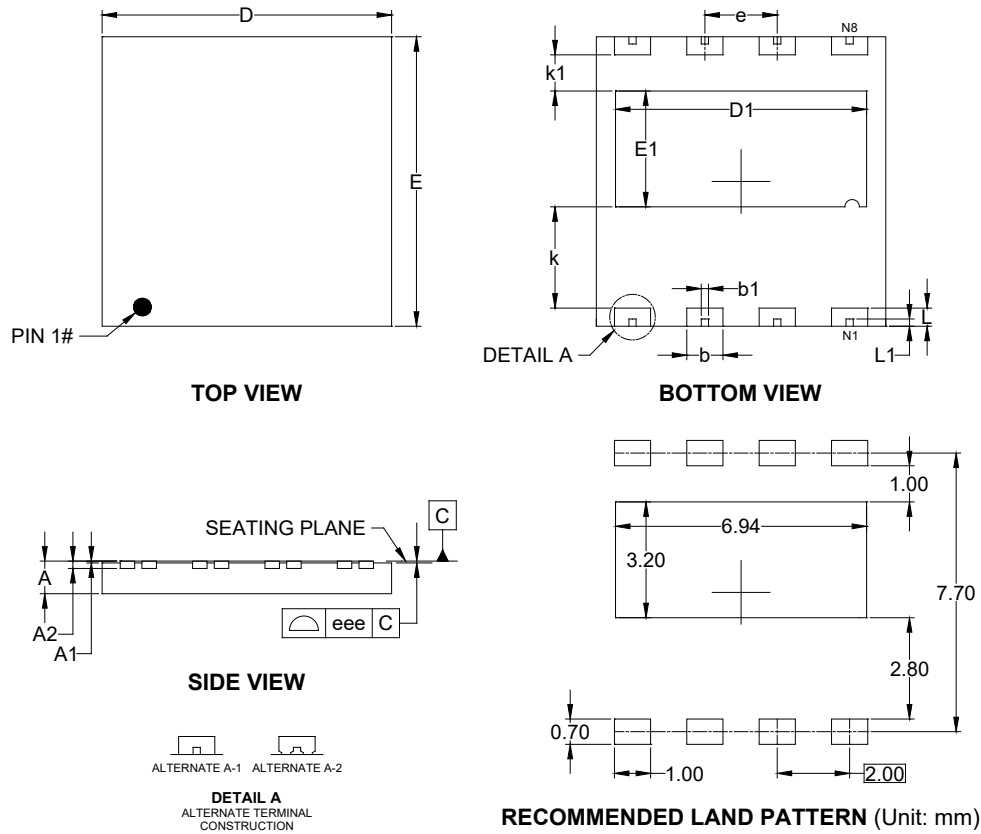
REVISION HISTORY

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

MARCH 2025 – REV.A.2 to REV.A.3		Page
Updated thermal resistance maximum ratings		2
JANUARY 2025 – REV.A.1 to REV.A.2		Page
Updated absolute maximum ratings.....		1
Updated electrical characteristics section.....		3
Updated typical performance characteristics		4, 5
OCTOBER 2024 – REV.A to REV.A.1		Page
Updated electrical characteristics section.....		3
Changes from Original (SEPTEMBER 2024) to REV.A		Page
Changed from product preview to production data.....		All

PACKAGE OUTLINE DIMENSIONS

TDFN-8×8-8L

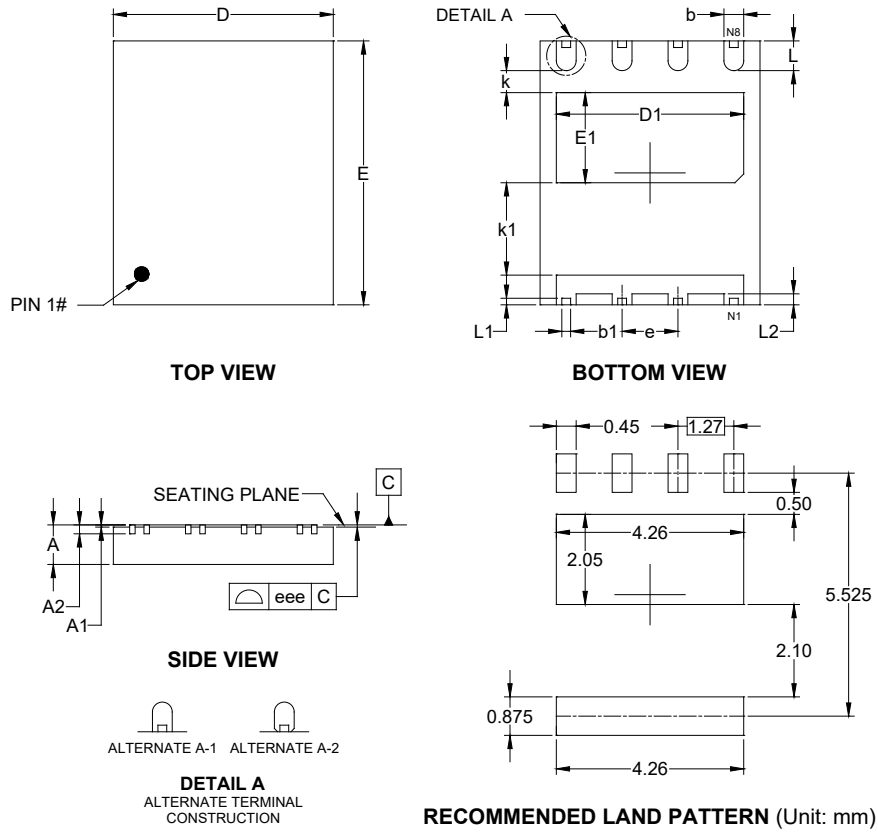


Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.800	-	1.000
A1	0.000	-	0.050
A2	0.203 REF		
b	0.950	-	1.050
b1	0.200 REF		
D	7.900	-	8.100
E	7.900	-	8.100
D1	6.840	-	7.040
E1	3.100	-	3.300
e	2.000 BSC		
k	2.800 REF		
k1	1.000 REF		
L	0.400	-	0.600
L1	0.200 REF		
eee	0.080		

NOTE: This drawing is subject to change without notice.

PACKAGE OUTLINE DIMENSIONS

TDFN-5×6-8L



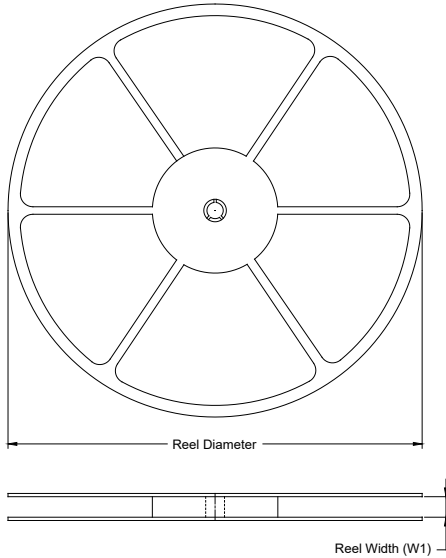
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	0.800	-	1.000
A1	0.000	-	0.050
A2	0.203 REF		
b	0.400	-	0.500
b1	0.200 REF		
D	4.900	-	5.100
E	5.900	-	6.100
D1	4.160	-	4.360
E1	1.950	-	2.150
e	1.270 BSC		
k	0.500 REF		
k1	2.100 REF		
L	0.575	-	0.775
L1	0.150 REF		
L2	0.250 REF		
eee	0.080		

NOTE: This drawing is subject to change without notice.

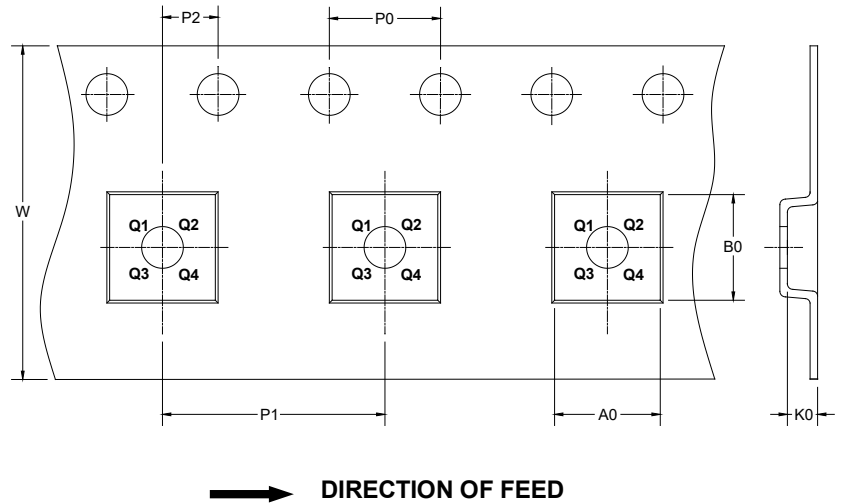
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

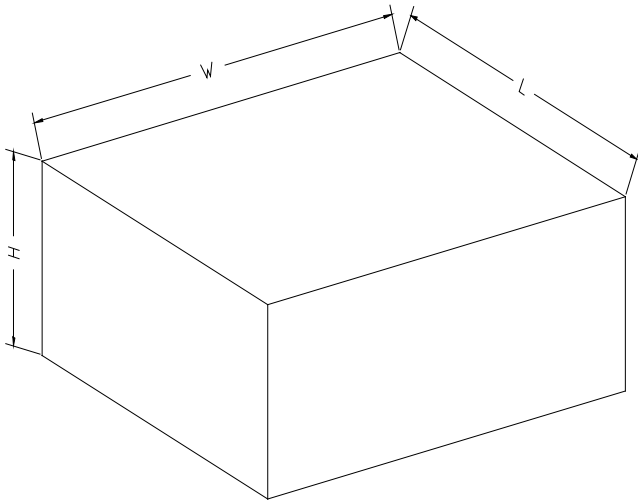
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
TDFN-8×8-8L	13"	16.4	8.30	8.30	1.10	4.0	12.0	2.0	16.0	Q2
TDFN-5×6-8L	13"	12.4	5.30	6.30	1.30	4.0	8.0	2.0	12.0	Q2

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

DP0002