

Bi-Directional N-Channel 20-V (D-S) MOSFET

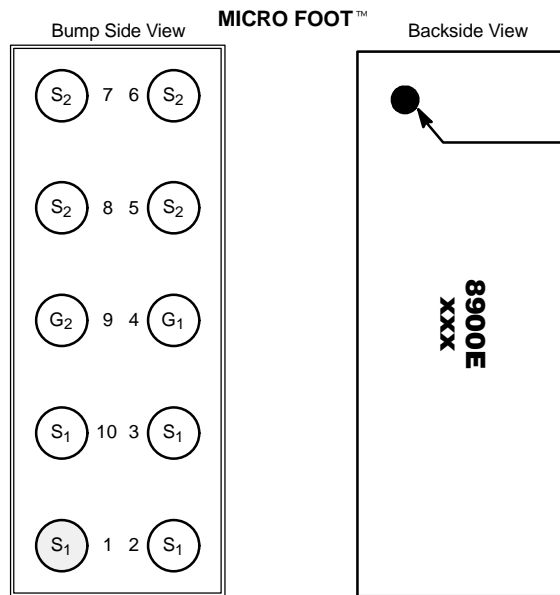
PRODUCT SUMMARY		
V _{SS} (V)	r _{SS(on)} (Ω)	I _{SS} (A)
20	0.024 @ V _{GS} = 4.5 V	7
	0.026 @ V _{GS} = 3.7 V	6.8
	0.034 @ V _{GS} = 2.5 V	5.0
	0.40 @ V _{GS} = 1.8 V	5.5

FEATURES

- TrenchFET® Power MOSFET
- Ultra-Low r_{SS(on)}
- ESD Protected: 4000 V
- New MICRO FOOT™ Chipscale Packaging Reduces Footprint Area Profile (0.62 mm) and On-Resistance Per Footprint Area

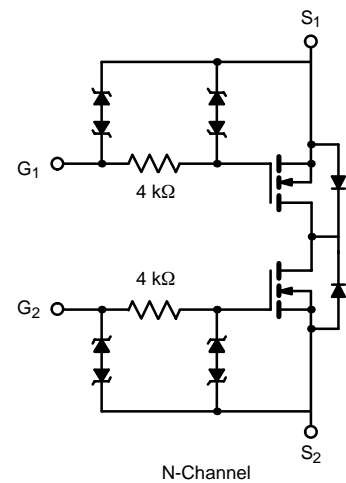
APPLICATIONS

- Battery Protection Circuit
 - 1-2 Cell Li+/LiP Battery Pack for Portable Devices



Device Marking:

8900E = P/N Code
xxx = Date/Lot Traceability Code



ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 secs	Steady State	Unit	
Drain-Source Voltage	V _{SS}	20		V	
Gate-Source Voltage	V _{GS}	± 12			
Continuous Drain Current (T _J = 150 °C) ^a	I _{SS}	T _A = 25 °C	7	5.4	A
		T _A = 85 °C	5.1	3.9	
Pulsed Drain Current	I _{SM}	10			
Maximum Power Dissipation ^a	P _D	T _A = 25 °C	1.8	1	W
		T _A = 85 °C	0.9	0.5	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150		°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^a	R _{thJA}	t ≤ 5 sec	55	70	°C/W
		Steady State	95	120	
Maximum Junction-to-Foot ^b	R _{thJF}	12	15		

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- The Foot is defined as the top surface of the package.

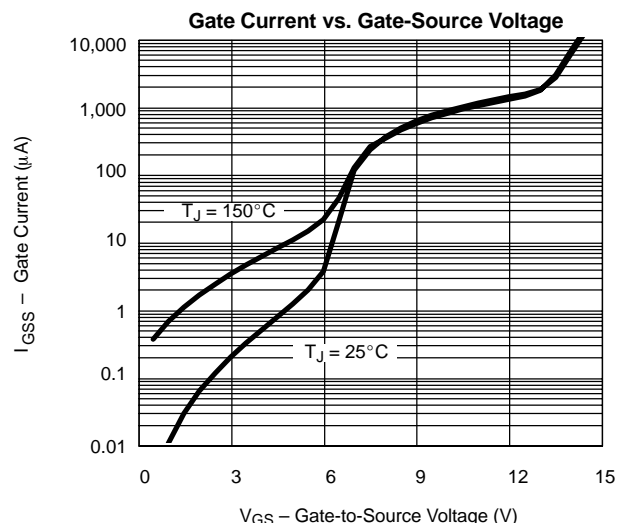
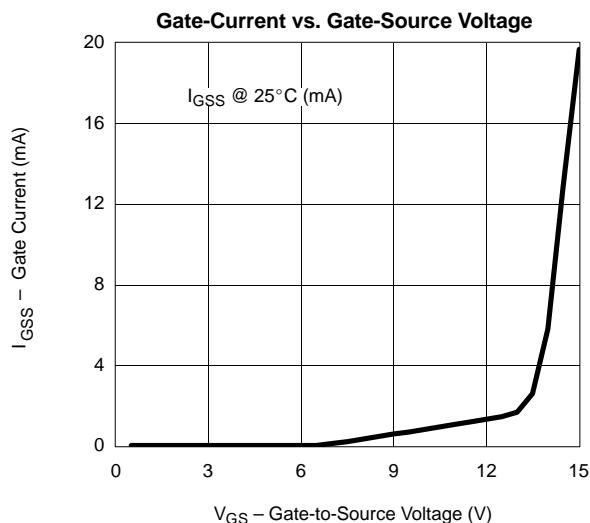
SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{SS} = V _{GS} , I _D = 250 μA	0.45		1.0	V
Gate-Body Leakage	I _{GSS}	V _{SS} = 0 V, V _{GS} = ±4.5 V			±4	μA
		V _{SS} = 0 V, V _{GS} = ±12 V			±10	mA
Zero Gate Voltage Drain Current	I _{SS}	V _{SS} = 16 V, V _{GS} = 0 V			1	μA
		V _{SS} = 16 V, V _{GS} = 0 V, T _J = 85 °C			5	
On-State Drain Current ^a	I _{SS(on)}	V _{SS} = 5 V, V _{GS} = 4.5 V	5			A
Drain-Source On-State Resistance ^a	r _{SS(on)}	V _{GS} = 4.5 V, I _{SS} = 1 A		0.020	0.024	Ω
		V _{GS} = 3.7 V, I _{SS} = 1 A		0.022	0.026	
		V _{GS} = 2.5 V, I _{SS} = 1 A		0.026	0.034	
		V _{GS} = 1.8 V, I _{SS} = 1 A		0.032	0.40	
Forward Transconductance ^a	g _{fs}	V _{SS} = 10 V, I _{SS} = 1 A		31		S
Dynamic^b						
Turn-On Delay Time	t _{d(on)}	V _{SS} = 10 V, R _L = 10 Ω I _{SS} ≅ 1 A, V _{GEN} = 4.5 V, R _G = 6 Ω		3	5	μS
Rise Time	t _r			4.5	7	
Turn-Off Delay Time	t _{d(off)}			55	85	
Fall Time	t _f			15	25	

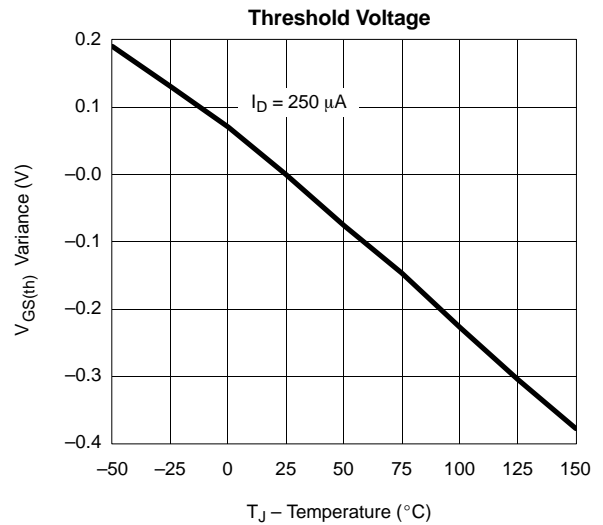
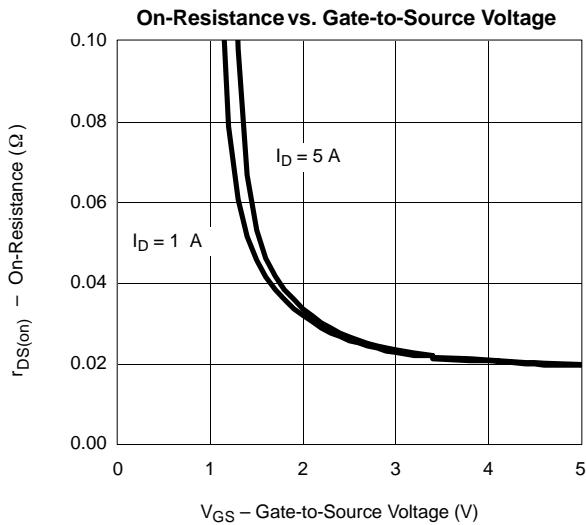
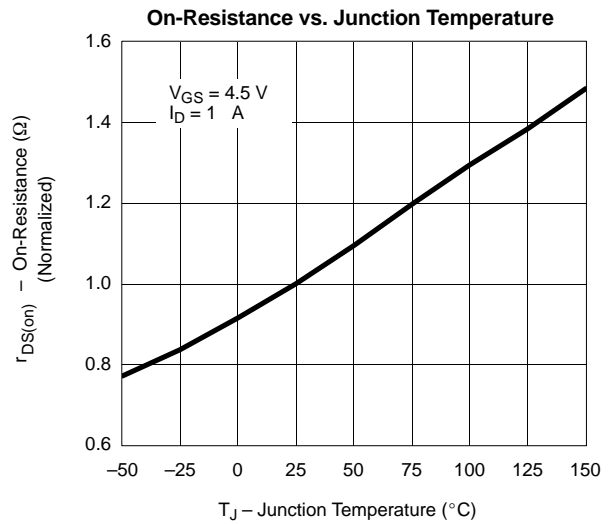
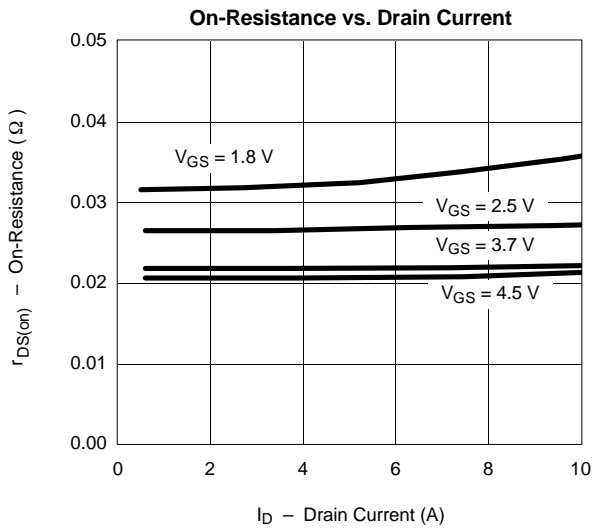
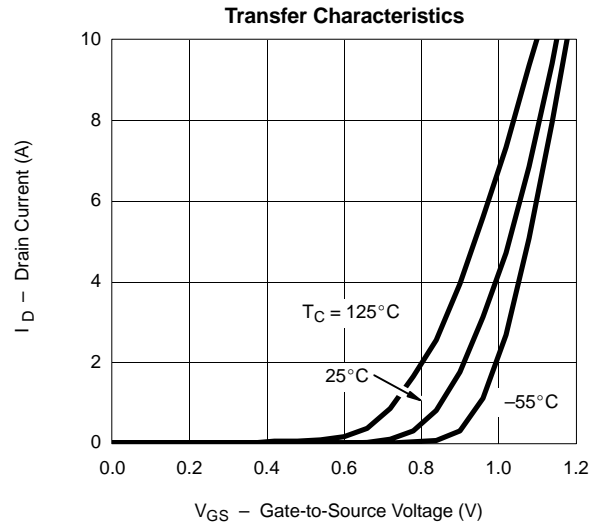
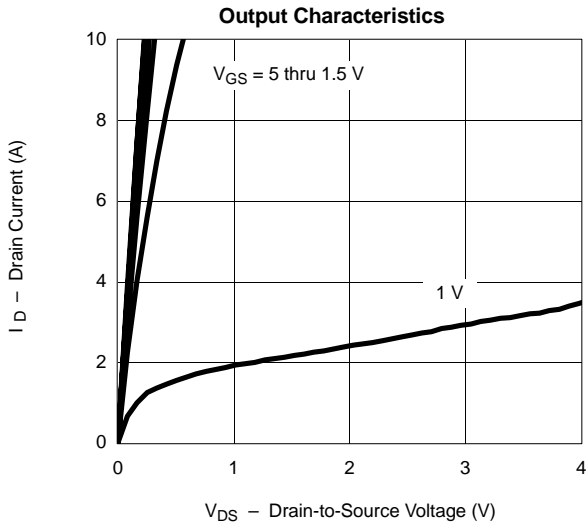
Notes

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

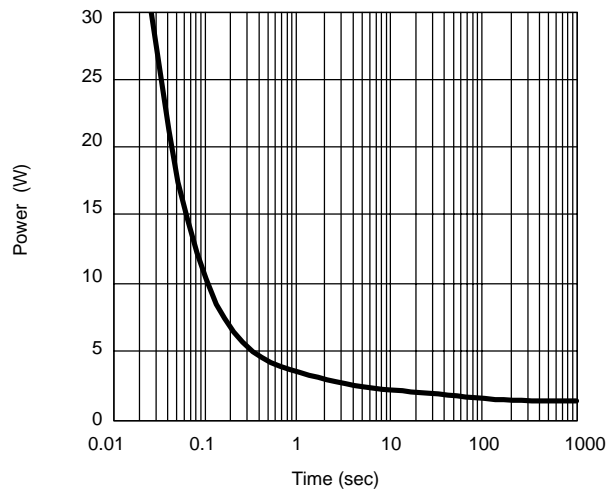


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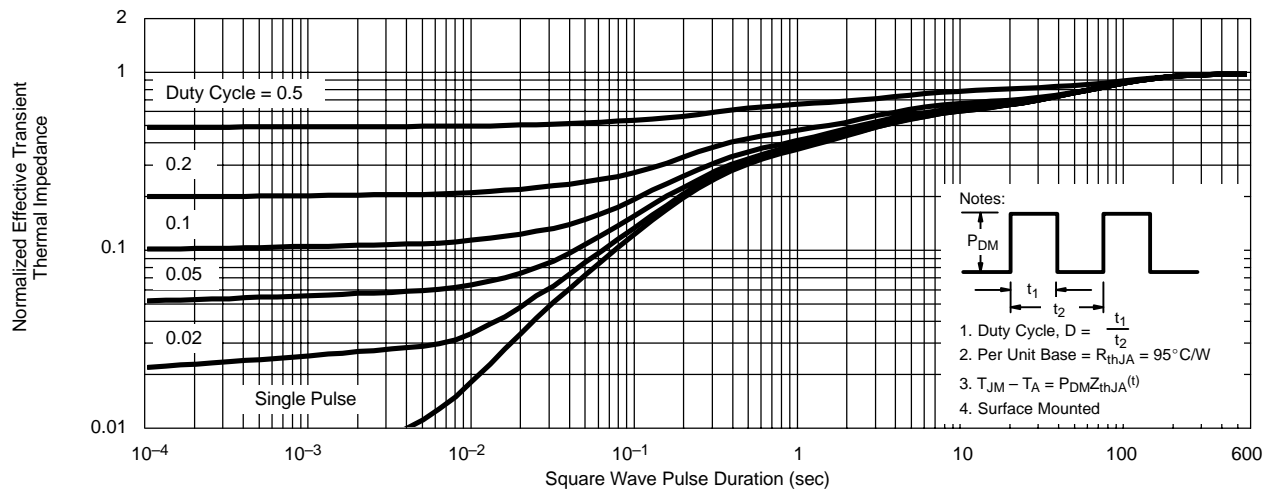


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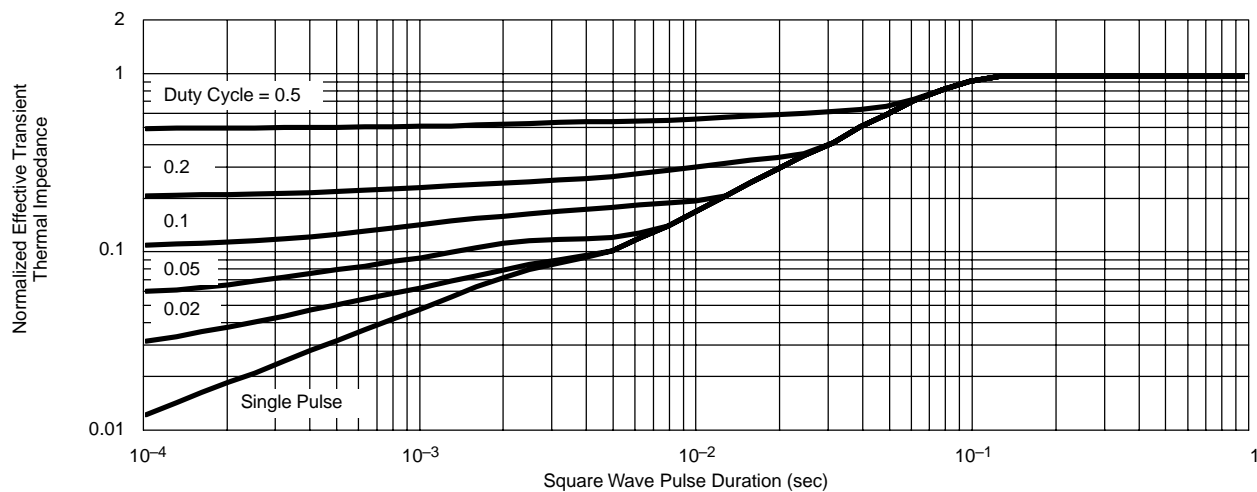
Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

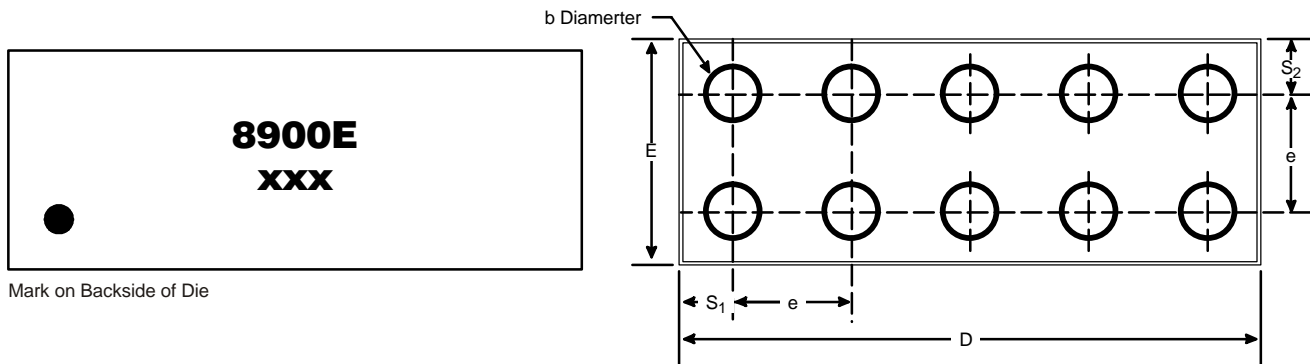
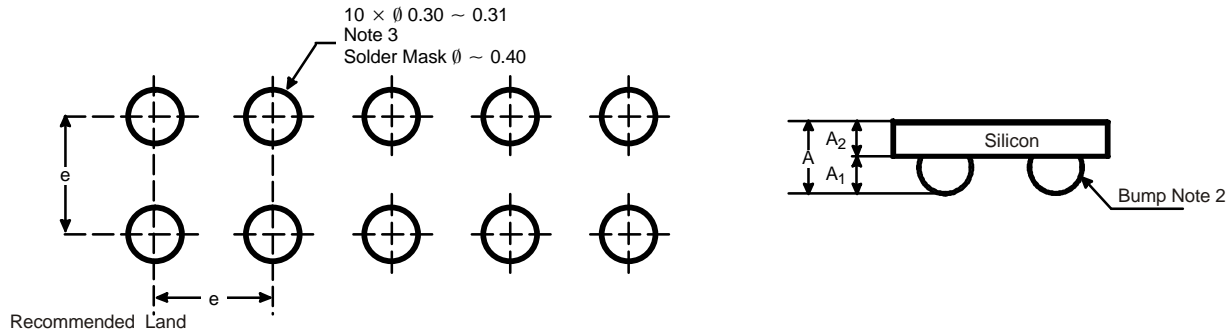


Normalized Thermal Transient Impedance, Junction-to-Foot



PACKAGE OUTLINE

MICRO FOOT: 10-BUMP (2 X 5, 0.8-mm PITCH)



NOTES (Unless Otherwise Specified):

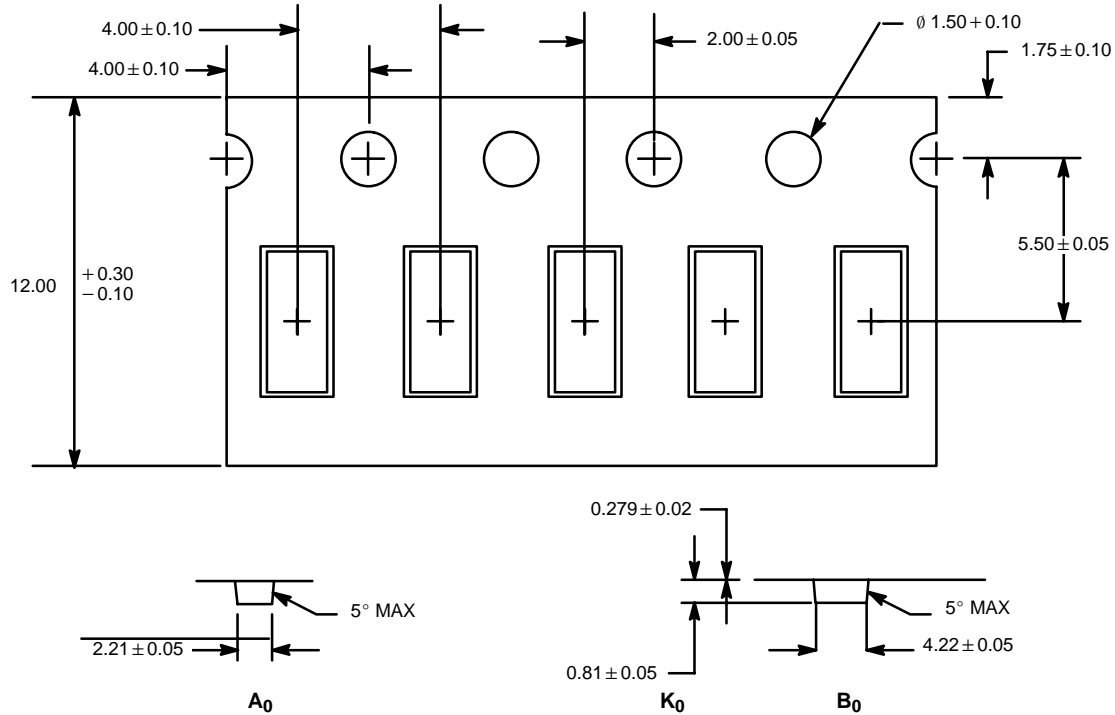
1. Laser mark on the silicon die back, coated with a thin metal.
2. Bumps are Eutectic solder 63/57 Sn/Pb.
3. Non-solder mask defined copper landing pad.

Dim	MILLIMETERS*		INCHES	
	Min	Max	Min	Max
A	0.600	0.650	0.0236	0.0256
A ₁	0.260	0.290	0.102	0.0114
A ₂	0.340	0.360	0.0134	0.0142
b	0.370	0.410	0.0146	0.0161
D	4.050	4.060	0.1594	0.1598
E	1.980	2.000	0.0780	0.0787
e	0.750	0.850	0.0295	0.0335
S ₁	0.430	0.450	0.0169	0.0177
S ₂	0.580	0.600	0.0228	0.0236

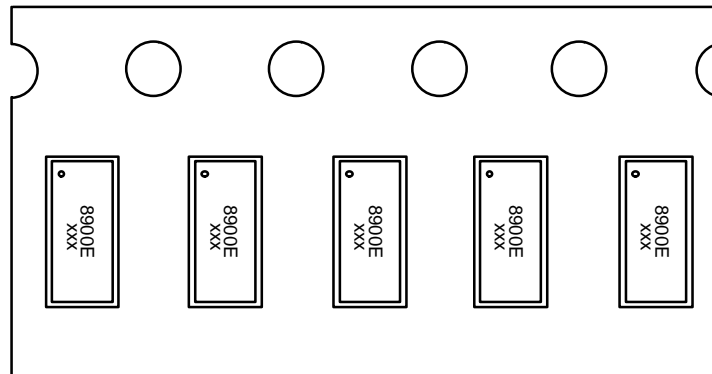
* Use millimeters as the primary measurement.

CARRIER TAPE

MICRO FOOT: 10-BUMP (2 X 2, 0.8-mm PITCH)



DEVICE ON TAPE ORIENTATION



NOTES:

1. Material: Black Conductive Polycarbonate.
2. Cover tape is conductive pressure sensitive adhesive tape. Resistivity ~ 1.00E+5 Ω/sq.; minimum removal force ~ 31 oz. min.
3. All Dimensions are in millimeters unless otherwise specified.

VER	A ₀	B ₀	K ₀	REEL DIA.	LENGTH
-1	2.21	4.22	0.81	178	14 m approx.

QUANTITY PER REEL	
T1	3000