

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

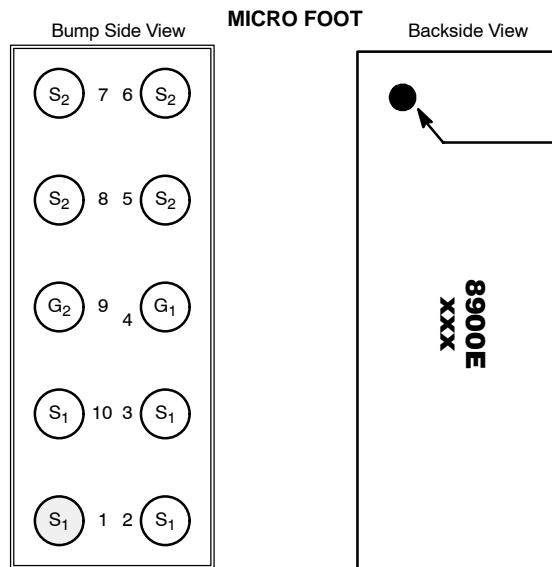
PRODUCT SUMMARY		
V _{S1S2} (V)	r _{S1S2(on)} (Ω)	I _{S1S2} (A)
20	0.024 @ V _{GS} = 4.5 V	7
	0.026 @ V _{GS} = 3.7 V	6.8
	0.034 @ V _{GS} = 2.5 V	5.0
	0.040 @ V _{GS} = 1.8 V	5.5

FEATURES

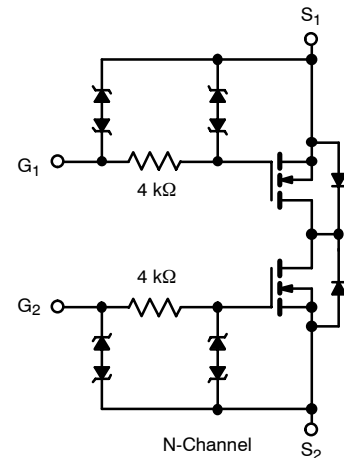
- TrenchFET® Power MOSFET
- Ultra-Low r_{SS(on)}
- ESD Protected: 4000 V
- New MICRO FOOT® Chipscale Packaging Reduces Footprint Area Profile (0.62 mm) and On-Resistance Per Footprint Area

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



Ordering Information: Si8900EDB-T2
Si8900EDB-T2—E1 (Lead (Pb)-Free)

ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED)					
Parameter	Symbol	5 secs	Steady State	Unit	
Source1—Source2 Voltage	V _{S1S2}	20		V	
Gate-Source Voltage	V _{GS}	±12			
Continuous Source1—Source2 Current (T _J = 150°C) ^a	I _{S1S2}	T _A = 25°C	7	5.4	A
		T _A = 85°C	5.1	3.9	
Pulsed Source1—Source2 Current	I _{SM}	50			
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	
Package Reflow Conditions ^c	VPR	215			
	IR/Convection	220			

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.
- Refer to IPC/JEDEC (J-STD-020A), no manual or hand soldering.



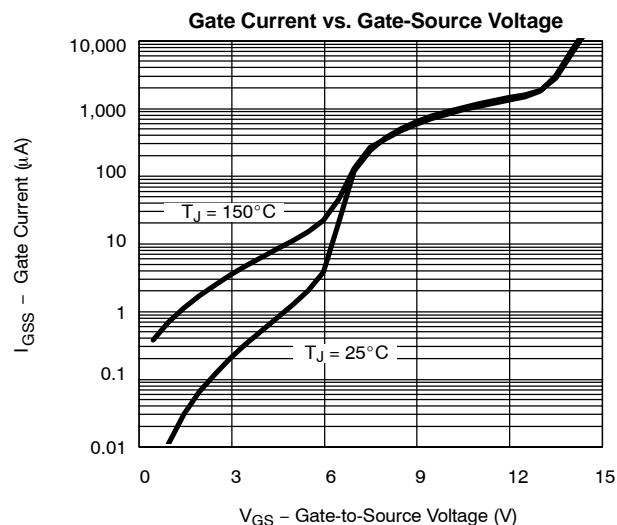
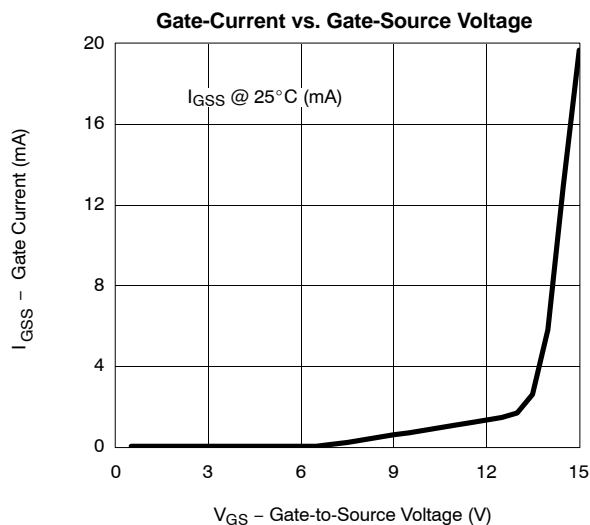
SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{SS} = V _{GS} , I _D = 1.1 mA	0.45		1.0	V
Gate-Body Leakage	I _{GSS}	V _{SS} = 0 V, V _{GS} = ±4.5 V			±4	μA
		V _{SS} = 0 V, V _{GS} = ±12 V			±10	mA
Zero Gate Voltage Source Current	I _{S1S2}	V _{SS} = 20 V, V _{GS} = 0 V			1	μA
		V _{SS} = 20 V, V _{GS} = 0 V, T _J = 85 °C			5	
On-State Source Current ^a	I _{S(on)}	V _{SS} = 5 V, V _{GS} = 4.5 V	5			A
Source1—Source2 On-State Resistance ^a	r _{S1S2(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	0.040	
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

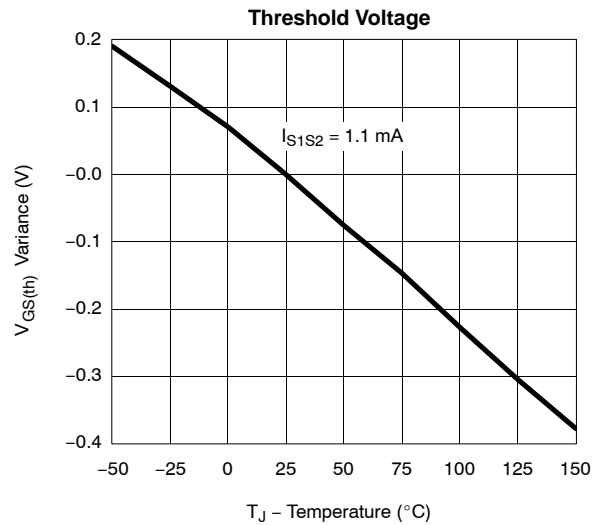
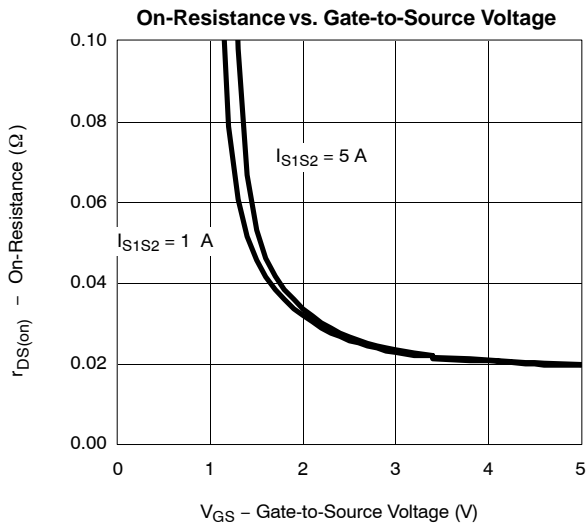
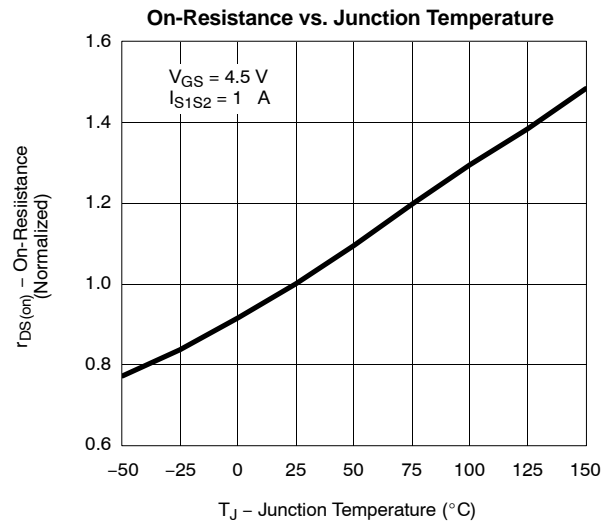
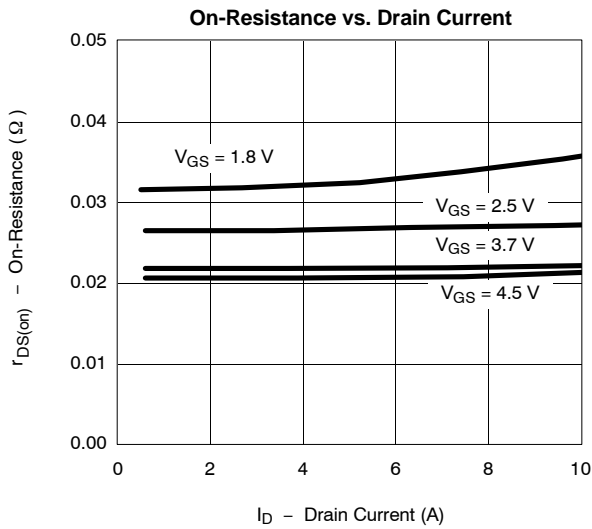
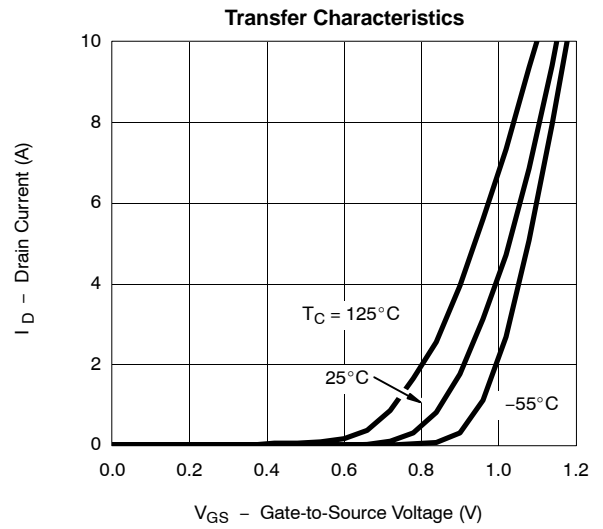
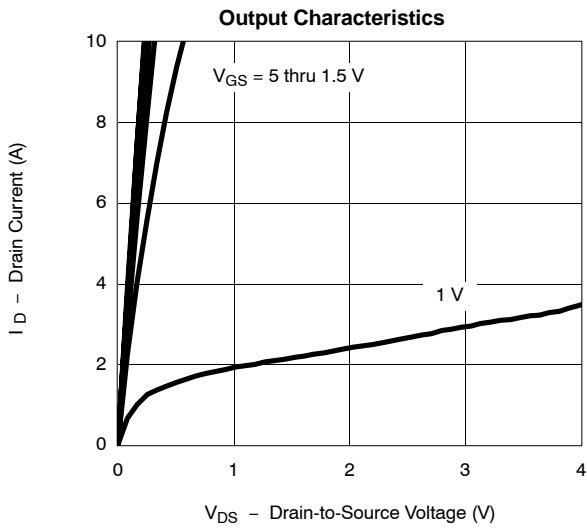
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

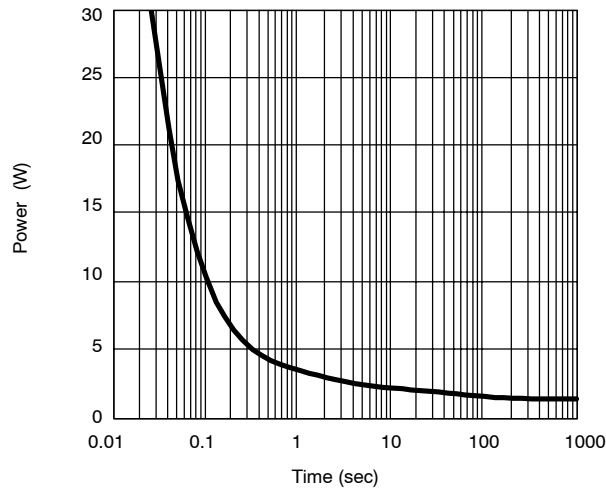


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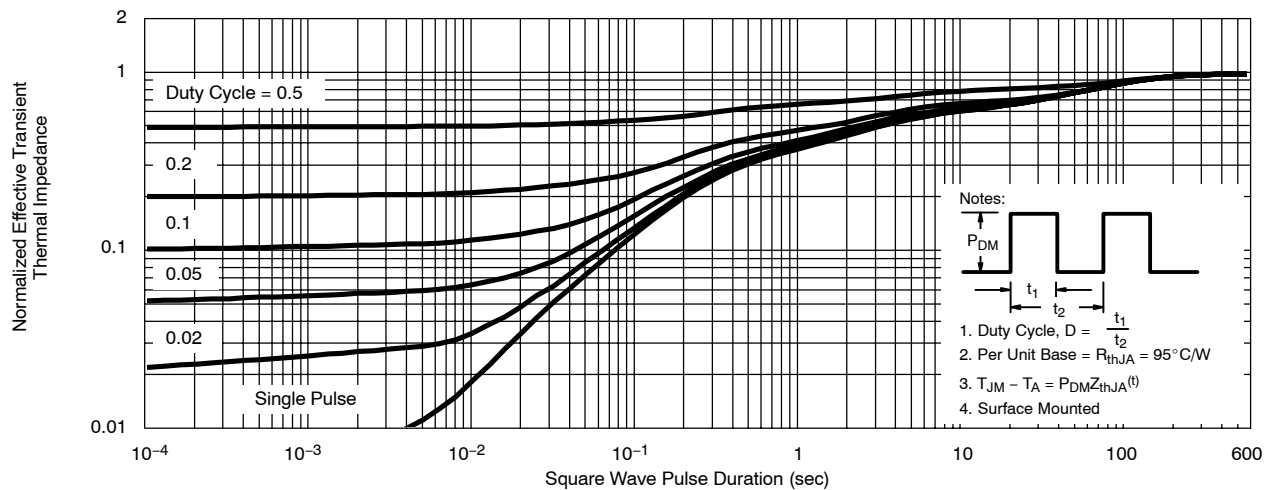


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

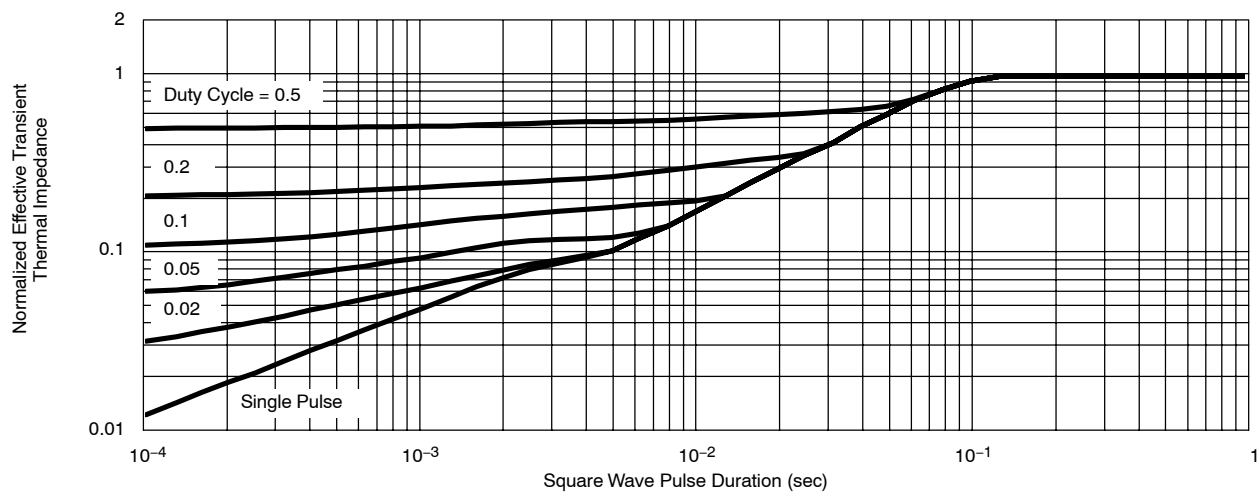
Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

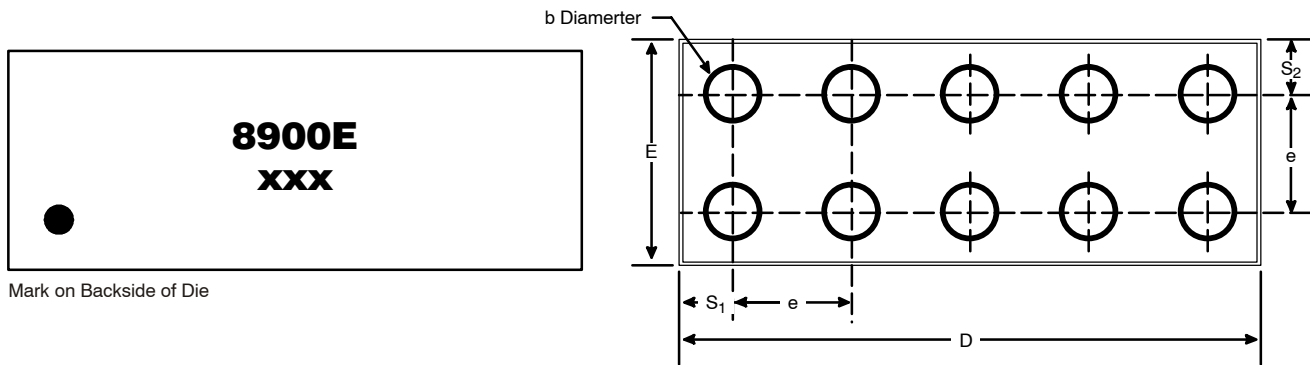
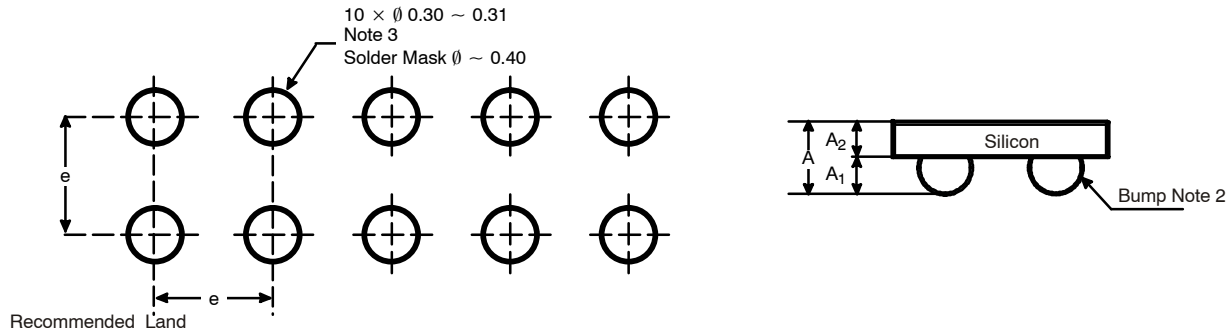


Normalized Thermal Transient Impedance, Junction-to-Foot



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.

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