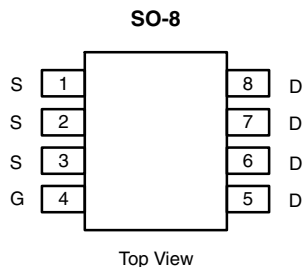




P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω) Max.	I _D ^a	Q _g (Typ.)
- 30	0.0065 at V _{GS} = - 10 V	- 29	66 nC
	0.0082 at V _{GS} = - 6 V	- 23	
	0.0112 at V _{GS} = - 4.5 V	- 20	



Ordering Information:
 Si4491EDY-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

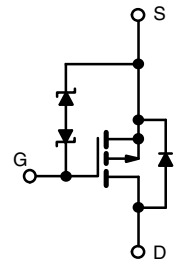
- Extended V_{GS} range (± 25 V) for adaptor switch applications
- Extremely low R_{DS(on)}
- TrenchFET[®] Power MOSFET
- 100 % R_g and UIS Tested
- Typical ESD Performance: 4000 V (HBM)
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
 COMPLIANT
 HALOGEN
 FREE

APPLICATIONS

- Adaptor Switch, Load Switch
- Power Management
- Notebook Computers and Portable Battery Packs



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted)				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	- 30	V	
Gate-Source Voltage	V _{GS}	± 25		
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	- 25.8	A
		T _C = 70 °C	- 20.7	
		T _A = 25 °C	- 17.3	
		T _A = 70 °C	- 13.9 ^{b, c}	
Pulsed Drain Current (t = 300 μs)	I _{DM}	- 60		
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	- 5.8 ^{b, c}	
		T _A = 25 °C	- 2.6 ^{b, c}	
Single Pulse Avalanche Current	I _{AS}	- 40		
Single Pulse Avalanche Energy	E _{AS}	80	mJ	
Maximum Power Dissipation	P _D	T _C = 25 °C	6.9	W
		T _C = 70 °C	4.4	
		T _A = 25 °C	3.1 ^{b, c}	
		T _A = 70 °C	2 ^{b, c}	
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 ^{b, d}	R _{thJA}	33	40	°C/W
Maximum Junction-to-Foot (Drain)	R _{thJF}	15	17	

Notes:

- Based on T_C = 25 °C.
- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under steady state conditions is 90 °C/W.

SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250\text{ }\mu\text{A}$		-24		mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			6		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-1.2		-2.8	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 25\text{ V}$			± 150	μA
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 15	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$			-1	
		$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -10\text{ V}$	-20			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -13\text{ A}$		0.0054	0.0065	Ω
		$V_{GS} = -6\text{ V}, I_D = -10\text{ A}$		0.0068	0.0082	
		$V_{GS} = -4.5\text{ V}, I_D = -8\text{ A}$		0.0093	0.0112	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -13\text{ A}$		44		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		4620		μF
Output Capacitance	C_{oss}			880		
Reverse Transfer Capacitance	C_{rss}			820		
Total Gate Charge	Q_g	$V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}, I_D = -17.3\text{ A}$		102	153	nC
				66	80	
Gate-Source Charge	Q_{gs}	$V_{DS} = -15\text{ V}, V_{GS} = -5\text{ V}, I_D = -17.3\text{ A}$		16		
Gate-Drain Charge	Q_{gd}			28		
Gate Resistance	R_g		$f = 1\text{ MHz}$	0.3	1.3	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 0\text{ V}, R_L = 1.5\text{ }\Omega$ $I_D \cong -10\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 1\text{ }\Omega$		70	105	ns
Rise Time	t_r			70	105	
Turn-Off Delay Time	$t_{d(off)}$			45	68	
Fall Time	t_f			27	41	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 1.5\text{ }\Omega$ $I_D \cong -10\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		18	30	
Rise Time	t_r			15	25	
Turn-Off Delay Time	$t_{d(off)}$			52	80	
Fall Time	t_f			14	25	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			-5.8	A
Pulse Diode Forward Current	I_{SM}				-60	
Body Diode Voltage	V_{SD}	$I_S = -10\text{ A}, V_{GS} = 0\text{ V}$		-0.78	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		35	53	ns
Body Diode Reverse Recovery Charge	Q_{rr}			25	38	nC
Reverse Recovery Fall Time	t_a			19		ns
Reverse Recovery Rise Time	t_b			16		

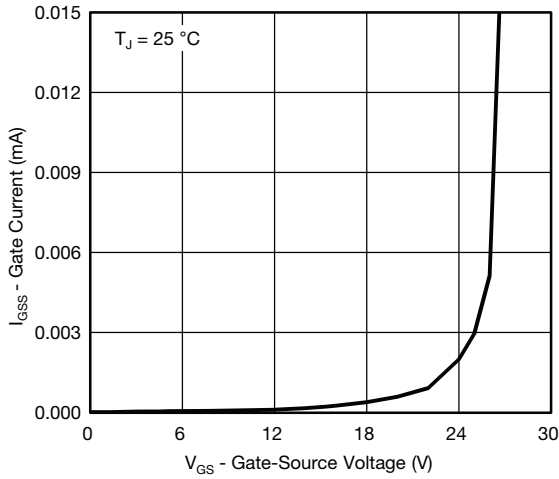
Notes:

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing.

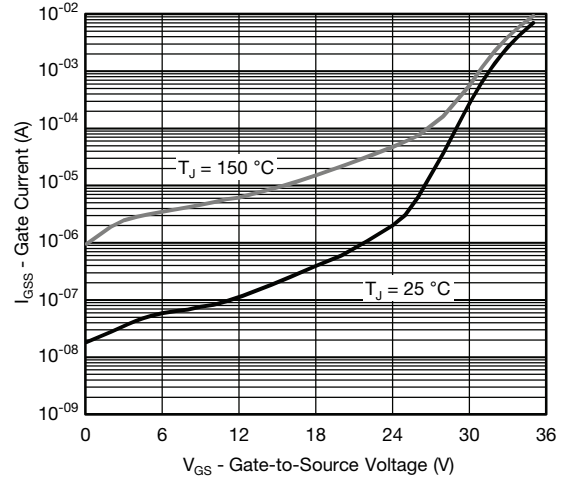
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



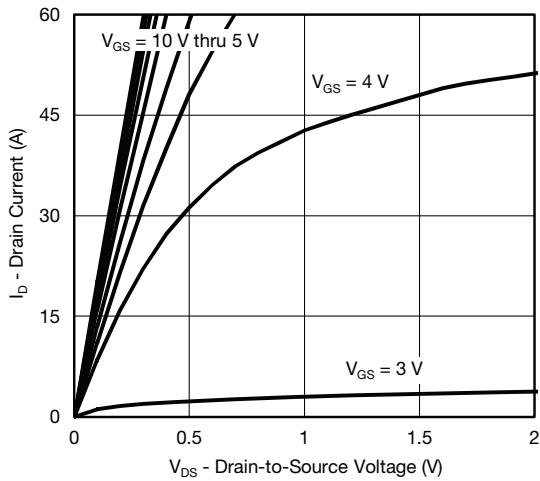
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



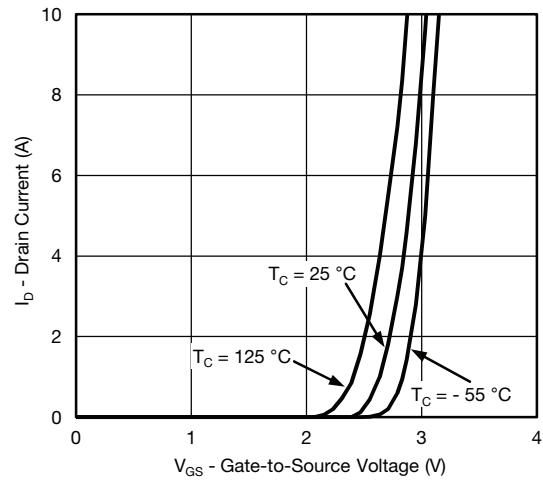
Gate Current vs. Gate-Source Voltage



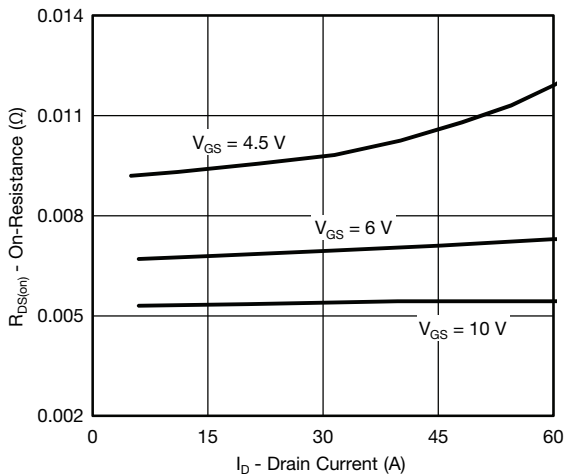
Gate Current vs. Gate-Source Voltage



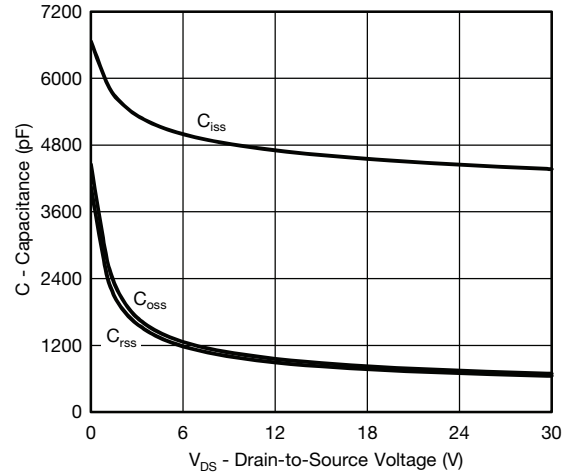
Output Characteristics



Transfer Characteristics



On-Resistance vs. Drain Current



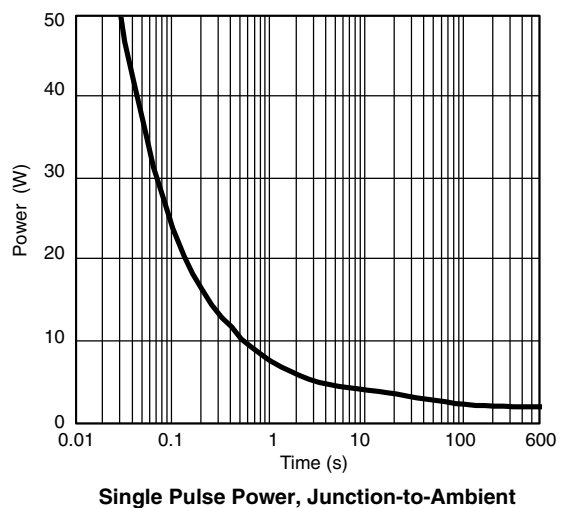
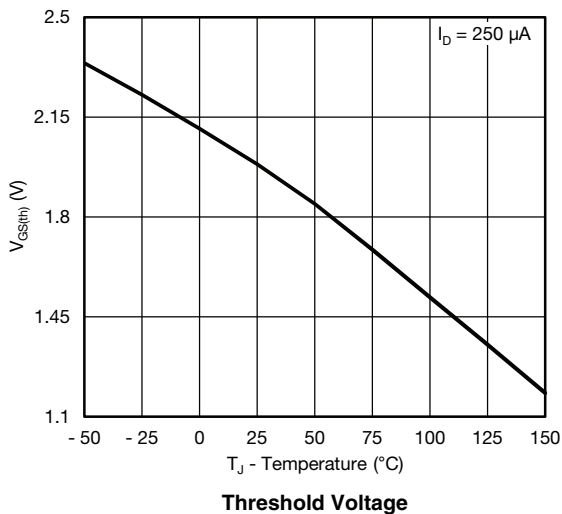
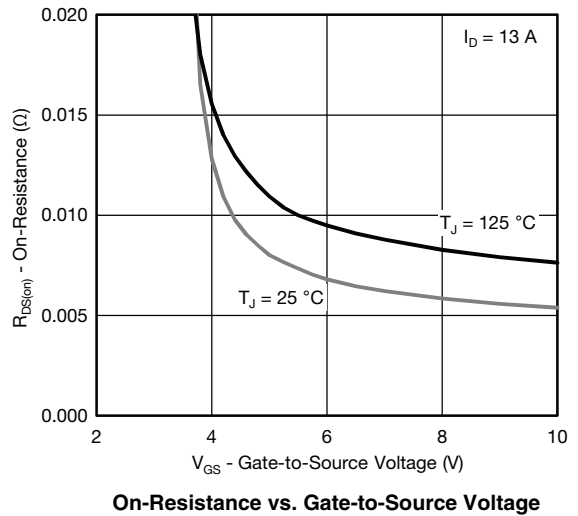
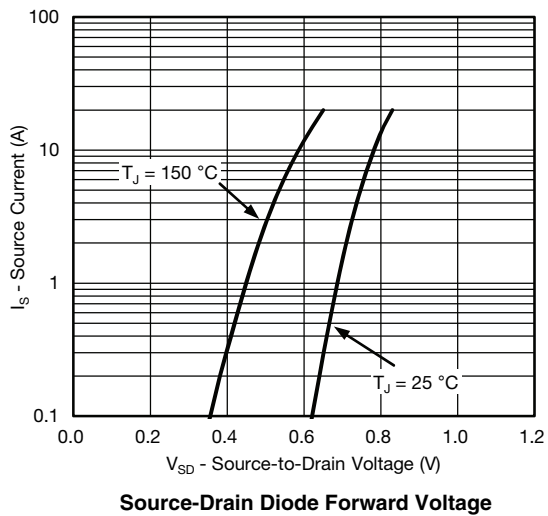
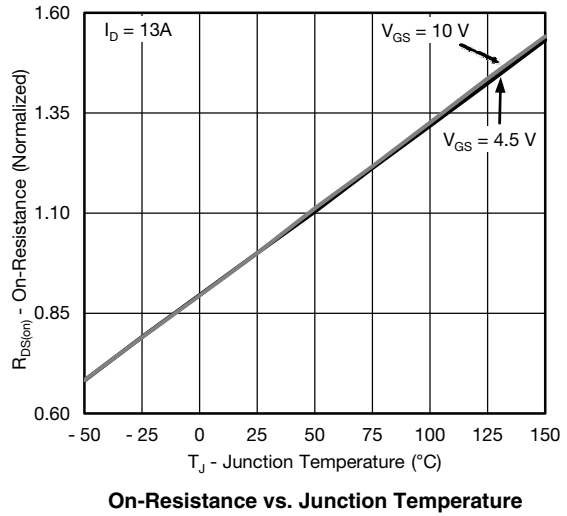
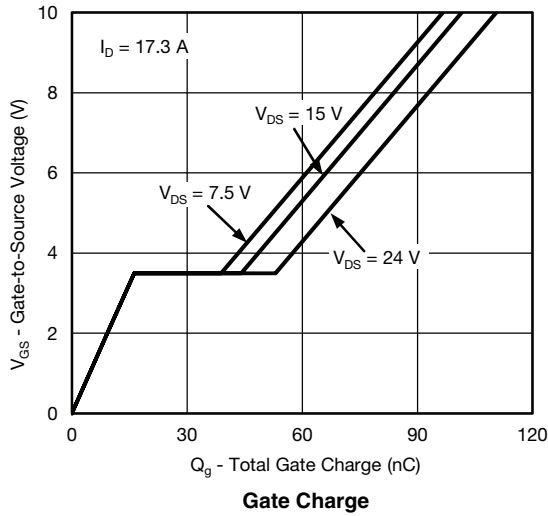
Capacitance

Si4491EDY

Vishay Siliconix

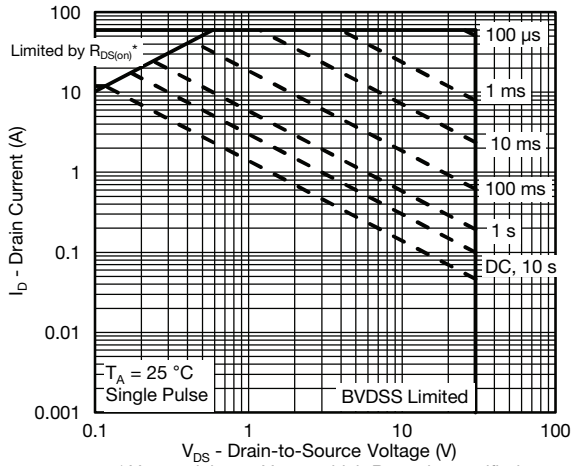


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

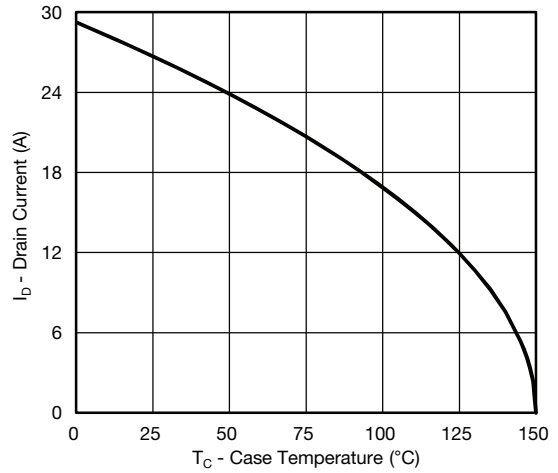




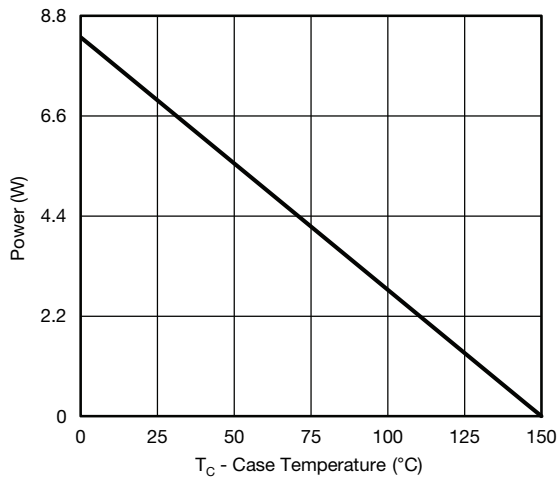
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



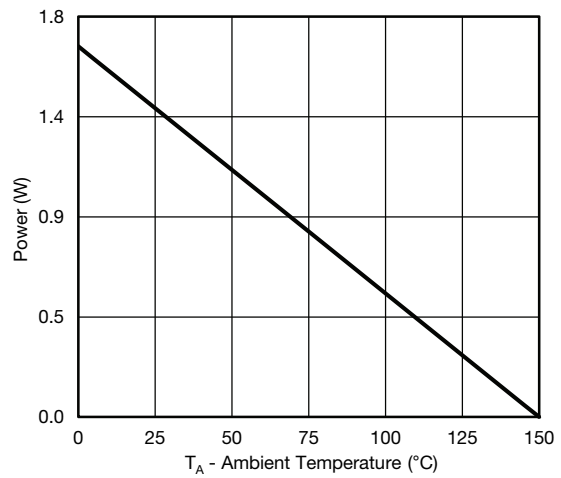
Safe Operating Area, Junction-to-Ambient



Current Derating*



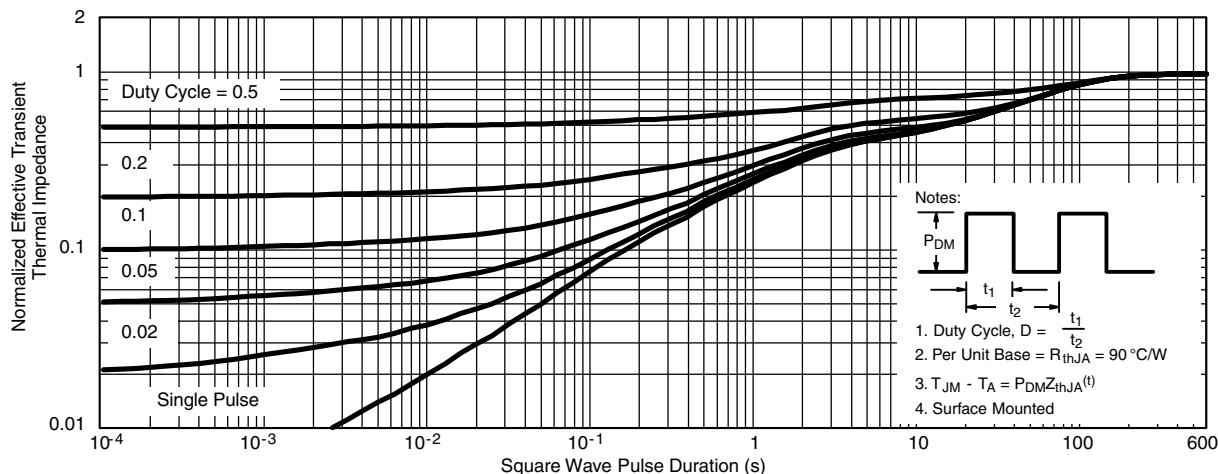
Power Junction-to-Foot



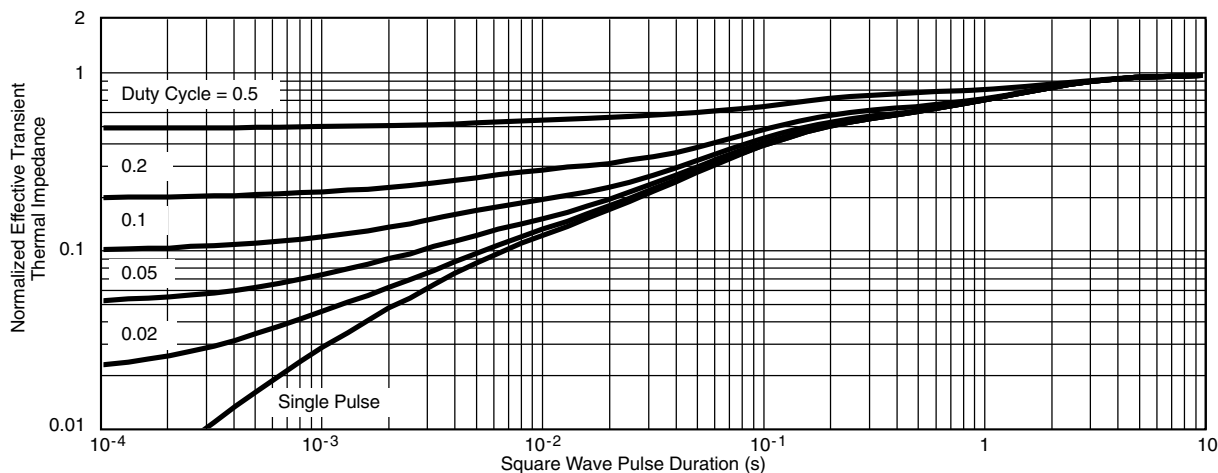
Power Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max.)} = 150\text{ }^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in settling the upper power dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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SOIC (NARROW): 8-LEAD

JEDEC Part Number: MS-012



DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A ₁	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026
ECN: C-06527-Rev. I, 11-Sep-06				
DWG: 5498				

RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads
Dimensions in Inches/(mm)

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