

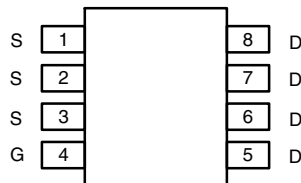


P-Channel 30 V (D-S) MOSFET

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	

SO-8



Top View

Ordering Information:

Si4491EDY-T1-GE3 (Lead (Pb)-free and Halogen-free)

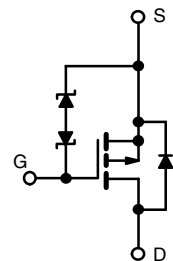
FEATURES

- 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 ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 30	V
Gate-Source Voltage	V_{GS}	± 25	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	A
		$T_C = 70^\circ\text{C}$	
		$T_A = 25^\circ\text{C}$	
		$T_A = 70^\circ\text{C}$	
Pulsed Drain Current ($t = 300 \mu\text{s}$)	I_{DM}	- 60	A
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$	
		$T_A = 25^\circ\text{C}$	
Single Pulse Avalanche Current	I_{AS}	- 40	mJ
Single Pulse Avalanche Energy	E_{AS}	80	
Maximum Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	W
		$T_C = 70^\circ\text{C}$	
		$T_A = 25^\circ\text{C}$	
		$T_A = 70^\circ\text{C}$	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, d}	R_{thJA}	33	40	$^\circ\text{C/W}$
Maximum Junction-to-Foot (Drain)	R_{thJF}	15	17	

Notes:

a. Based on $T_C = 25^\circ\text{C}$.

b. Surface mounted on 1" x 1" FR4 board.

c. $t = 10$ s.d. Maximum under steady state conditions is 90°C/W .

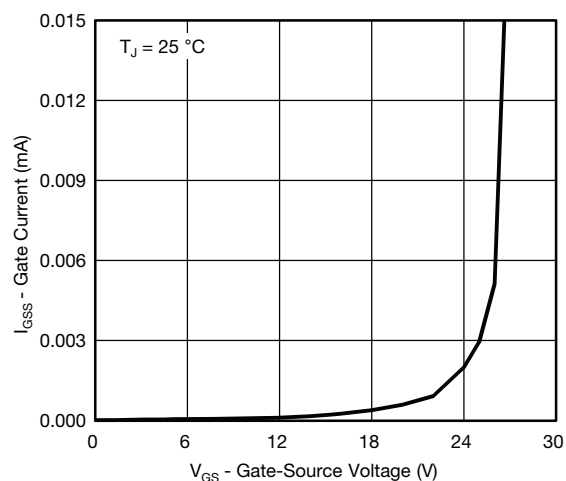
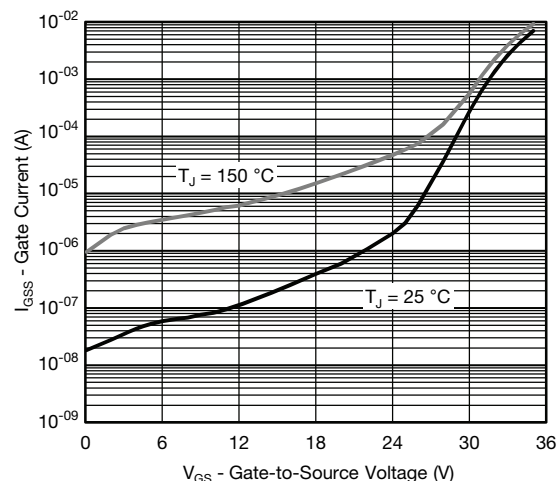
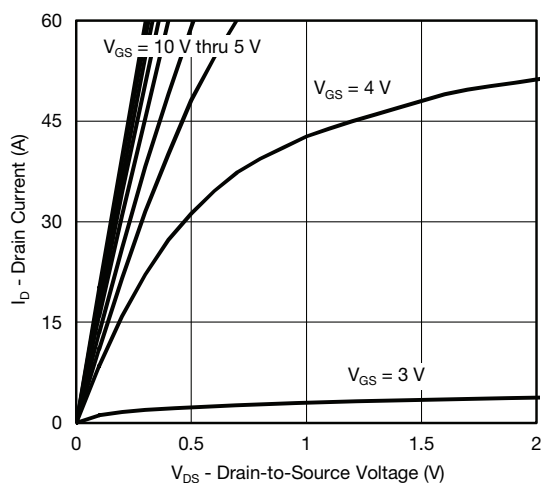
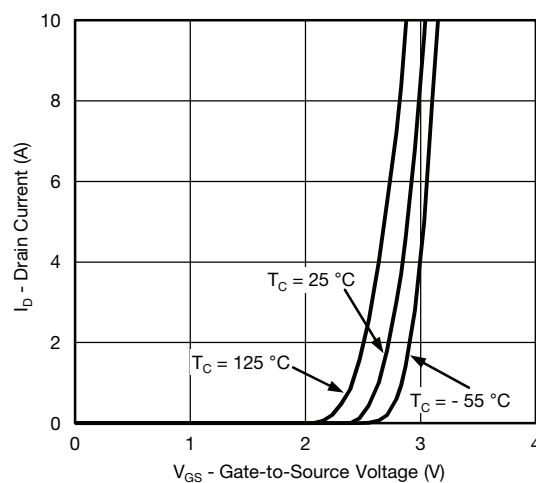
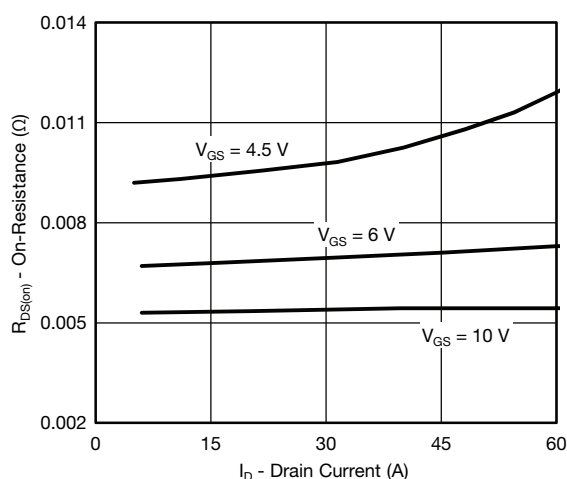
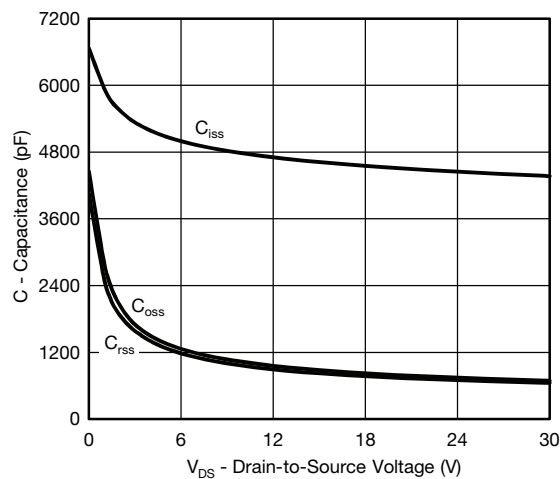
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)							
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 30			V	
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = - 250 μA		- 24		mV/°C	
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			6			
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1.2		- 2.8	V	
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 25 V			± 150	μA	
		V _{DS} = 0 V, V _{GS} = ± 20 V			± 15		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 30 V, V _{GS} = 0 V			- 1		
		V _{DS} = - 30 V, V _{GS} = 0 V, T _J = 55 °C			- 10		
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≤ - 5 V, V _{GS} = - 10 V	- 20			A	
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 13 A		0.0054	0.0065	Ω	
		V _{GS} = - 6 V, I _D = - 10 A		0.0068	0.0082		
		V _{GS} = - 4.5 V, I _D = - 8 A		0.0093	0.0112		
Forward Transconductance ^a	g _{fs}	V _{DS} = - 15 V, I _D = - 13 A		44		S	
Dynamic ^b							
Input Capacitance	C _{iss}	V _{DS} = - 15 V, V _{GS} = 0 V, f = 1 MHz		4620		pF	
Output Capacitance	C _{oss}			880			
Reverse Transfer Capacitance	C _{rss}			820			
Total Gate Charge	Q _g	V _{DS} = - 15 V, V _{GS} = - 10 V, I _D = - 17.3 A		102	153	nC	
Gate-Source Charge	Q _{gs}	V _{DS} = - 15 V, V _{GS} = - 5 V, I _D = - 17.3 A		66	80		
Gate-Drain Charge	Q _{gd}			16			
				28			
Gate Resistance	R _g	f = 1 MHz	0.3	1.3	2.6	Ω	
Turn-On Delay Time	t _{d(on)}	V _{DD} = 0 V, R _L = 1.5 Ω I _D ≅ - 10 A, V _{GEN} = - 4.5 V, R _g = 1 Ω		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 V, R _L = 1.5 Ω I _D ≅ - 10 A, V _{GEN} = - 10 V, R _g = 1 Ω		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 °C			- 5.8	A	
Pulse Diode Forward Current	I _{SM}				- 60		
Body Diode Voltage	V _{SD}	I _S = - 10 A, V _{GS} = 0 V		- 0.78	- 1.2	V	
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 10 A, dI/dt = 100 A/μs, T _J = 25 °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 $\leq 2\%$

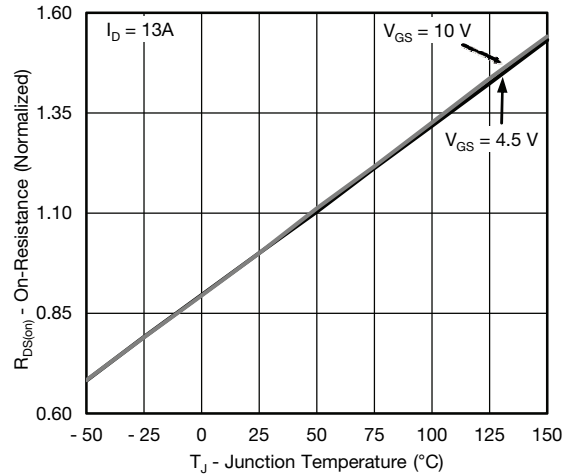
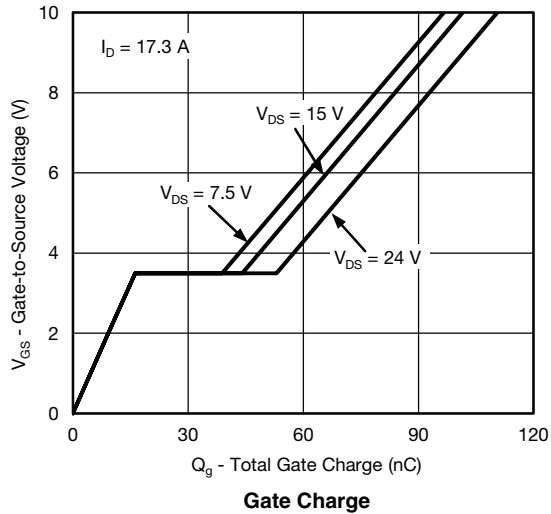
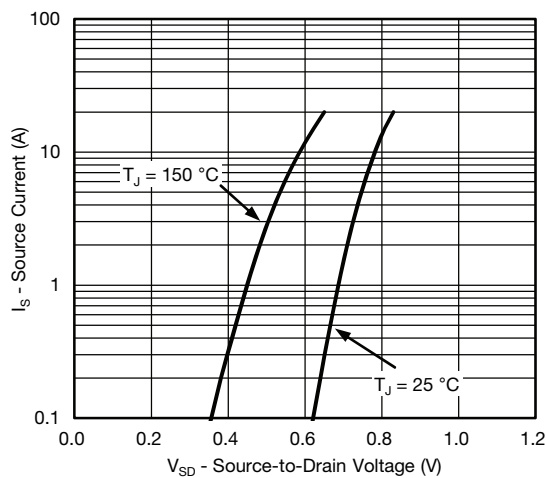
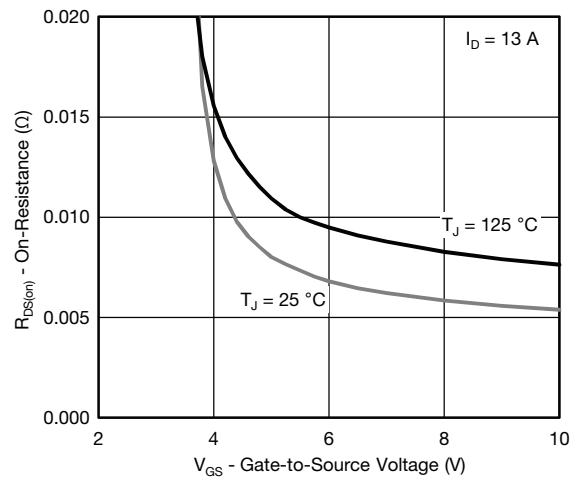
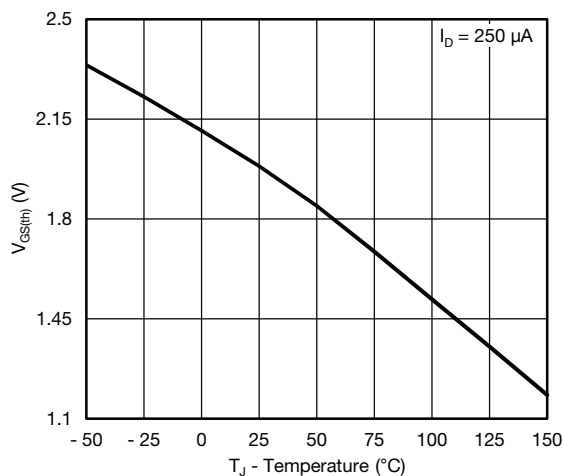
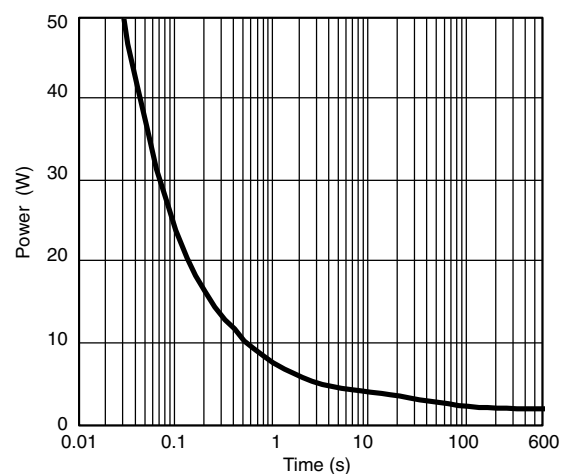
b. Guaranteed by design, not subject to production testing.

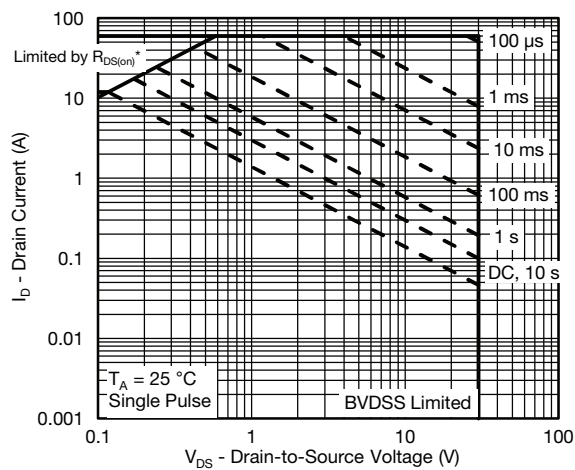
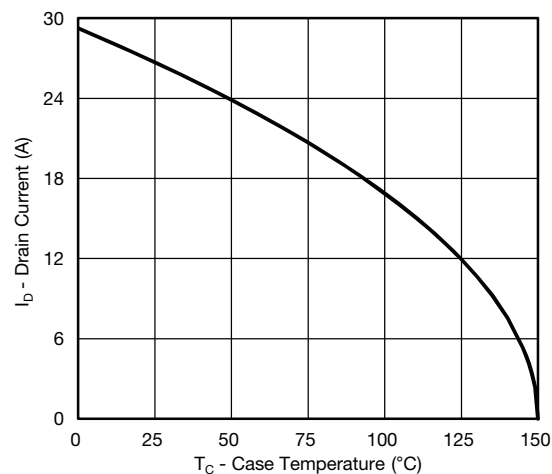
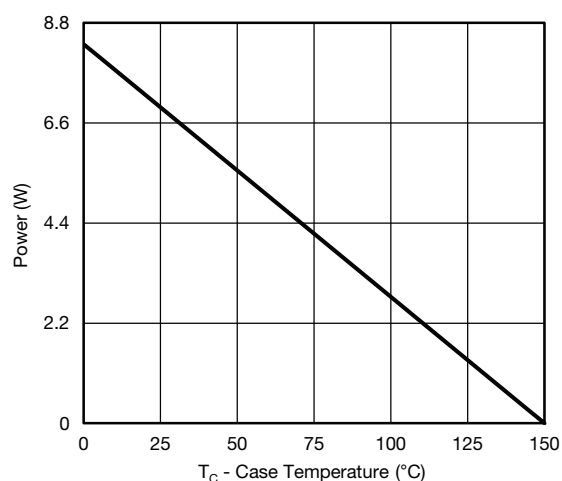
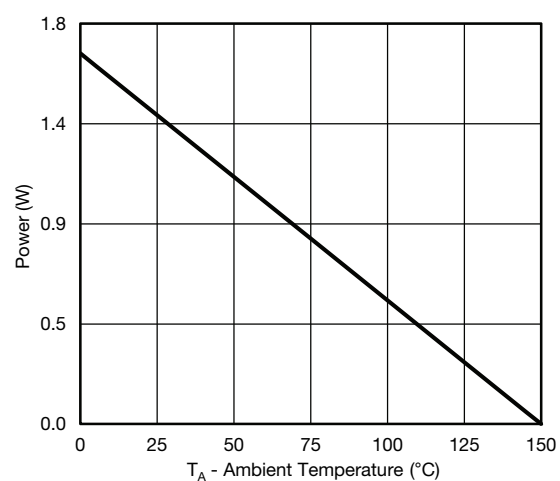
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

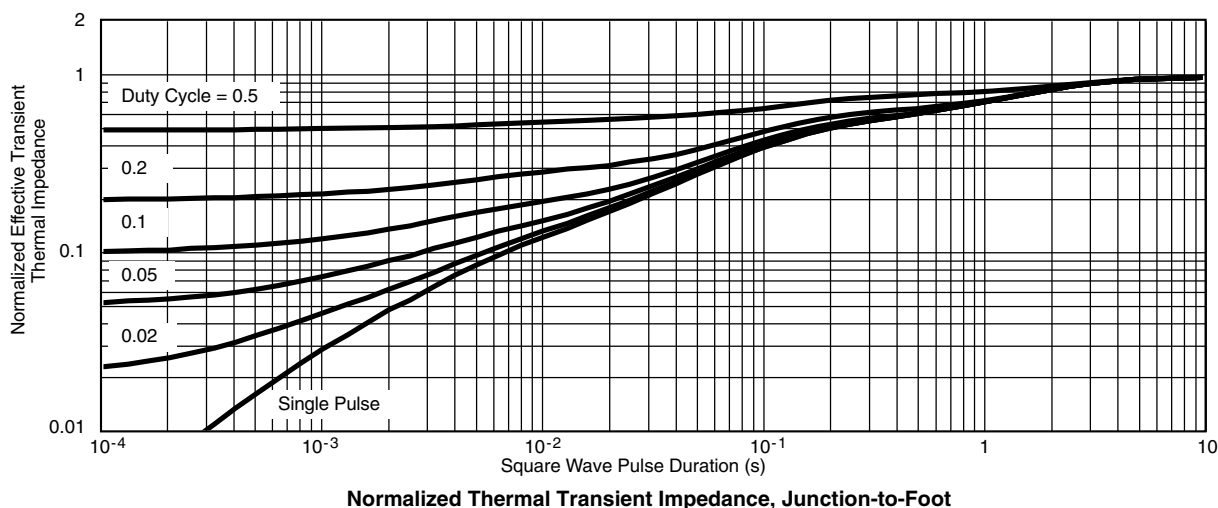
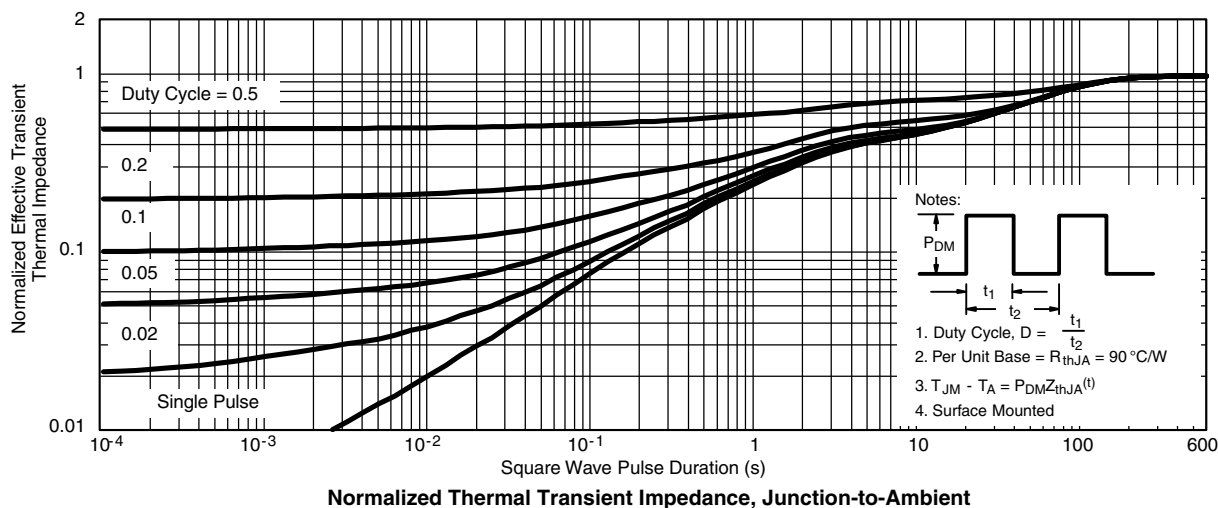
Si4491EDY

Vishay Siliconix

**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)**On-Resistance vs. Junction Temperature****Source-Drain Diode Forward Voltage****On-Resistance vs. Gate-to-Source Voltage****Threshold Voltage****Single Pulse Power, Junction-to-Ambient**


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 $T_{J(max.)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper 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)

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?63866.

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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