



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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## Dual N-Channel 30-V (D-S) MOSFET with Schottky Diode

PRODUCT SUMMARY				
	V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A) <sup>a</sup>	Q <sub>g</sub> (Typ.)
Channel-1	30	0.0160 at V <sub>GS</sub> = 10 V	8.0 <sup>e</sup>	19
		0.0186 at V <sub>GS</sub> = 4.5 V	8.0 <sup>e</sup>	
Channel-2	30	0.0264 at V <sub>GS</sub> = 10 V	8.0 <sup>e</sup>	6
		0.0290 at V <sub>GS</sub> = 4.5 V	8.0 <sup>e</sup>	

### FEATURES

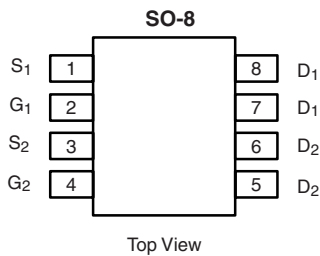
- Halogen-free According to IEC 61249-2-21 Definition
- SkyFET® Monolithic TrenchFET® Power MOSFET and Schottky Diode
- 100 % R<sub>g</sub> and UIS Tested
- Compliant to RoHS Directive 2002/95/EC



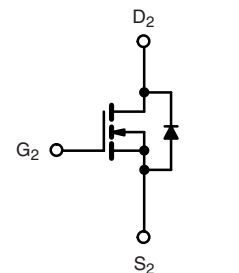
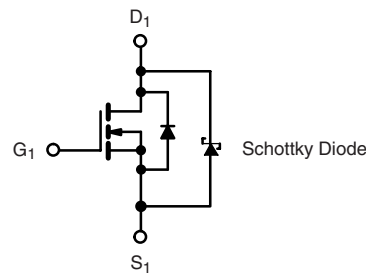
**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available

### APPLICATIONS

- Notebook Logic DC-DC
- Low Current DC-DC



Ordering Information: Si4622DY-T1-E3 (Lead (Pb)-free)  
Si4622DY-T1-GE3 (Lead (Pb)-free and Halogen-free)



ABSOLUTE MAXIMUM RATINGS T <sub>A</sub> = 25 °C, unless otherwise noted				
Parameter	Symbol	Channel-1	Channel-2	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	30	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	± 16	
Continuous Drain Current (T <sub>J</sub> = 150 °C)	I <sub>D</sub>	T <sub>C</sub> = 25 °C	8 <sup>e</sup>	A
		T <sub>C</sub> = 70 °C	8 <sup>e</sup>	
		T <sub>A</sub> = 25 °C	8 <sup>b, c, e</sup>	
		T <sub>A</sub> = 70 °C	7.2 <sup>b, c</sup>	
Pulsed Drain Current (10 μs Pulse Width)	I <sub>DM</sub>	60	30	
Source-Drain Current Diode Current	I <sub>S</sub>	T <sub>C</sub> = 25 °C	2.8	
		T <sub>A</sub> = 25 °C	1.8 <sup>b, c</sup>	
Single Pulse Avalanche Current	I <sub>AS</sub>	25	15	
Single Pulse Avalanche Energy	E <sub>AS</sub>	31.2	11.2	mJ
Maximum Power Dissipation	P <sub>D</sub>	T <sub>C</sub> = 25 °C	3.3	W
		T <sub>C</sub> = 70 °C	2.1	
		T <sub>A</sub> = 25 °C	2.2 <sup>b, c</sup>	
		T <sub>A</sub> = 70 °C	1.4 <sup>b, c</sup>	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	- 55 to 150		°C

THERMAL RESISTANCE RATINGS						
Parameter	Symbol	Channel-1		Channel-2		Unit
		Typ.	Max.	Typ.	Max.	
Maximum Junction-to-Ambient <sup>b, d</sup>	R <sub>thJA</sub>	45	56	55	62.5	°C/W
Maximum Junction-to-Foot (Drain)	R <sub>thJF</sub>	29	38	33	40	

Notes:

- Based on T<sub>C</sub> = 25 °C.
- Surface Mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under Steady State conditions is 110 °C/W (Channel-1) and 110 °C/W (Channel-2).
- Package limited.

SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted							
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
<b>Static</b>							
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	Ch-1	30		V	
		$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	Ch-2	30			
$V_{DS}$ Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\text{ }\mu\text{A}$	Ch-2		33	mV/ $^\circ\text{C}$	
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	$I_D = 250\text{ }\mu\text{A}$	Ch-2		- 4.7		
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1\text{ mA}$	Ch-1	1.5		2.5	
		$V_{DS} = V_{GS}, I_D = 1\text{ mA}$	Ch-2	1		2.2	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	Ch-1			100	
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 16\text{ V}$	Ch-2			100	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	Ch-1		0.04	0.2	
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	Ch-2			1	
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 100\text{ }^\circ\text{C}$	Ch-1		4.4	44	
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 100\text{ }^\circ\text{C}$	Ch-2			5	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	Ch-1	25		A	
		$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	Ch-2	20			
Drain-Source On-State Resistance <sup>b</sup>	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 9.6\text{ A}$	Ch-1		0.0132	0.0160	
		$V_{GS} = 10\text{ V}, I_D = 6.7\text{ A}$	Ch-2		0.022	0.0264	
		$V_{GS} = 4.5\text{ V}, I_D = 8.9\text{ A}$	Ch-1		0.0155	0.0186	
		$V_{GS} = 4.5\text{ V}, I_D = 6.4\text{ A}$	Ch-2		0.0240	0.0290	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 9.6\text{ A}$	Ch-1		94	S	
		$V_{DS} = 15\text{ V}, I_D = 6.7\text{ A}$	Ch-2		10		
<b>Dynamic<sup>a</sup></b>							
Input Capacitance	$C_{iss}$	Channel-1 $V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	Ch-1		2458	pF	
			Ch-2		760		
Output Capacitance	$C_{oss}$		Ch-1		385		
			Ch-2		110		
Reverse Transfer Capacitance	$C_{rss}$	Channel-2 $V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	Ch-1		150		
			Ch-2		50		
Total Gate Charge	$Q_g$		$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 9.6\text{ A}$	Ch-1		40	60
			$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 6.7\text{ A}$	Ch-2		13.2	20
		Channel-1 $V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 9.6\text{ A}$	Ch-1		19	29	
			Ch-2		6	12	
Gate-Source Charge	$Q_{gs}$	Channel-2 $V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 6.7\text{ A}$	Ch-1		8	nC	
			Ch-2		2.1		
Gate-Drain Charge	$Q_{gd}$		Ch-1		6		
			Ch-2		1.4		
Gate Resistance	$R_g$	$f = 1\text{ MHz}$	Ch-1	0.26	1.3	2.6	
			Ch-2	0.62	3.1	6.2	



SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted							
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
<b>Dynamic<sup>a</sup></b>							
Turn-On Delay Time	$t_{d(on)}$	Channel-1 $V_{DD} = 15\text{ V}$ , $R_L = 2\ \Omega$ $I_D \cong 7.7\text{ A}$ , $V_{GEN} = 10\text{ V}$ , $R_g = 1\ \Omega$	Ch-1		14	21	ns
			Ch-2		8	16	
Rise Time	$t_r$		Ch-1		8	16	
			Ch-2		10	20	
Turn-Off Delay Time	$t_{d(off)}$	Channel-2 $V_{DD} = 15\text{ V}$ , $R_L = 2.8\ \Omega$ $I_D \cong 5.3\text{ A}$ , $V_{GEN} = 10\text{ V}$ , $R_g = 1\ \Omega$	Ch-1		25	38	
			Ch-2		17	26	
Fall Time	$t_f$		Ch-1		9	18	
			Ch-2		8	15	
Turn-On Delay Time	$t_{d(on)}$	Channel-1 $V_{DD} = 15\text{ V}$ , $R_L = 2\ \Omega$ $I_D \cong 7.7\text{ A}$ , $V_{GEN} = 4.5\text{ V}$ , $R_g = 1\ \Omega$	Ch-1		27	35	
			Ch-2		14	21	
Rise Time	$t_r$		Ch-1		15	23	
			Ch-2		12	18	
Turn-Off Delay Time	$t_{d(off)}$	Channel-2 $V_{DD} = 15\text{ V}$ , $R_L = 2.8\ \Omega$ $I_D \cong 5.3\text{ A}$ , $V_{GEN} = 4.5\text{ V}$ , $R_g = 1\ \Omega$	Ch-1		29	44	
			Ch-2		21	32	
Fall Time	$t_f$		Ch-1		11	17	
			Ch-2		11	17	
<b>Drain-Source Body Diode Characteristics</b>							
Continuous Source-Drain Diode Current	$I_S$	$T_C = 25\text{ }^\circ\text{C}$	Ch-1			2.8	A
			Ch-2				
Pulse Diode Forward Current <sup>a</sup>	$I_{SM}$		Ch-1			60	
			Ch-2				
Body Diode Voltage	$V_{SD}$	$I_S = 2\text{ A}$	Ch-1		0.57	0.68	V
		$I_S = 5.3\text{ A}$	Ch-2		0.8	1.2	
Body Diode Reverse Recovery Time	$t_{rr}$	Channel-1 $I_F = 7.7\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , $T_J = 25\text{ }^\circ\text{C}$	Ch-1		26	39	ns
			Ch-2		17	26	
Body Diode Reverse Recovery Charge	$Q_{rr}$	Channel-2 $I_F = 5.3\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , $T_J = 25\text{ }^\circ\text{C}$	Ch-1		15	23	nC
			Ch-2		8	16	
Reverse Recovery Fall Time	$t_a$		Ch-1		13		ns
			Ch-2		10		
Reverse Recovery Rise Time	$t_b$		Ch-1		13		
			Ch-2		7		

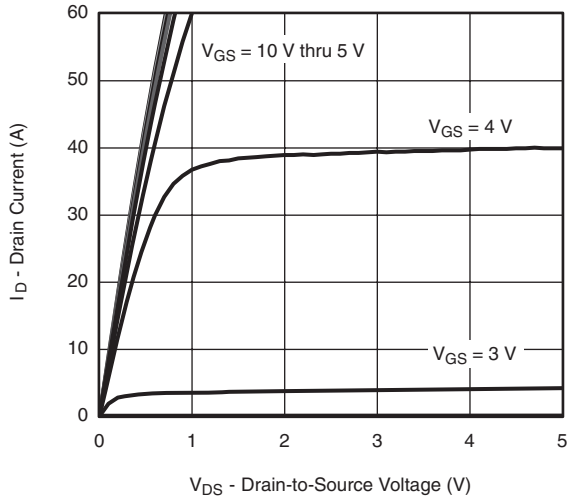
Notes:

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

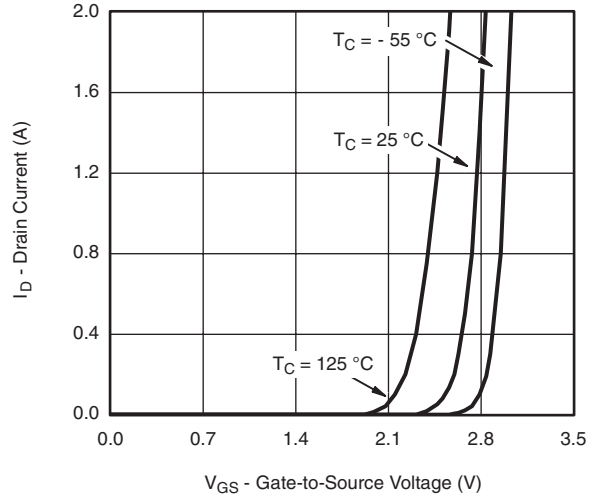
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



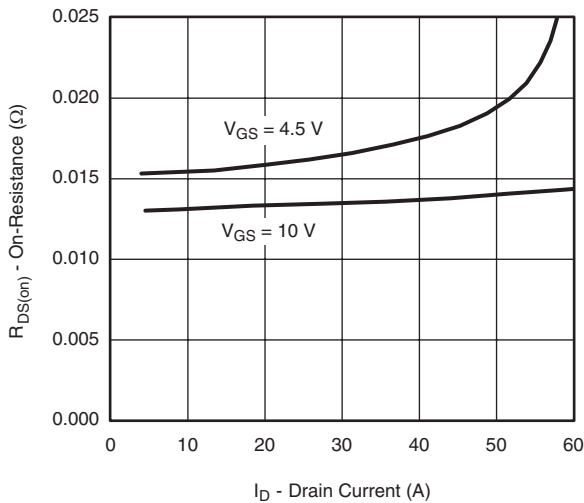
**CHANNEL-1 TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



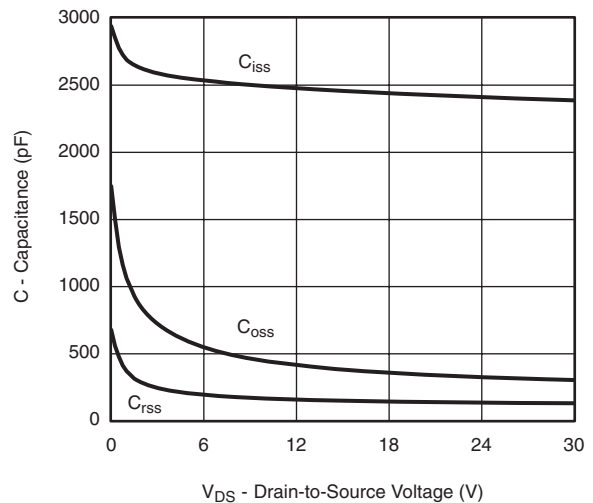
**Output Characteristics**



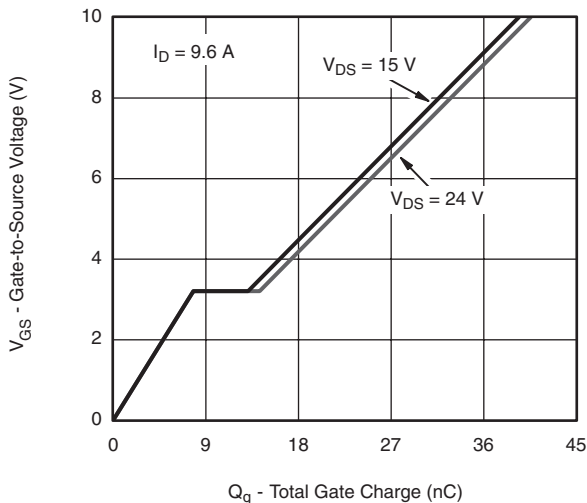
**Transfer Characteristics**



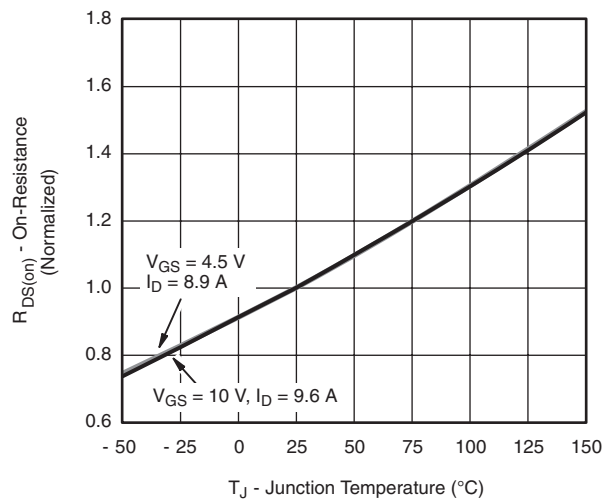
**On-Resistance vs. Drain Current**



**Capacitance**



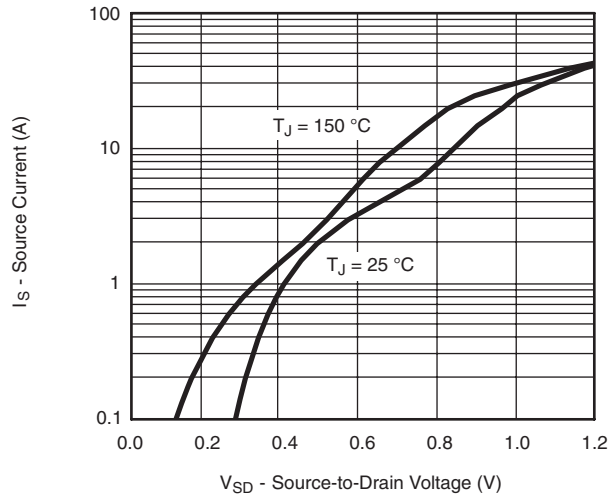
**Gate Charge**



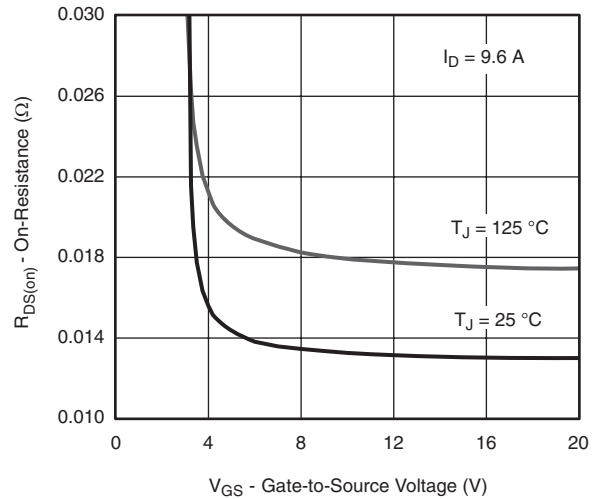
**On-Resistance vs. Junction Temperature**



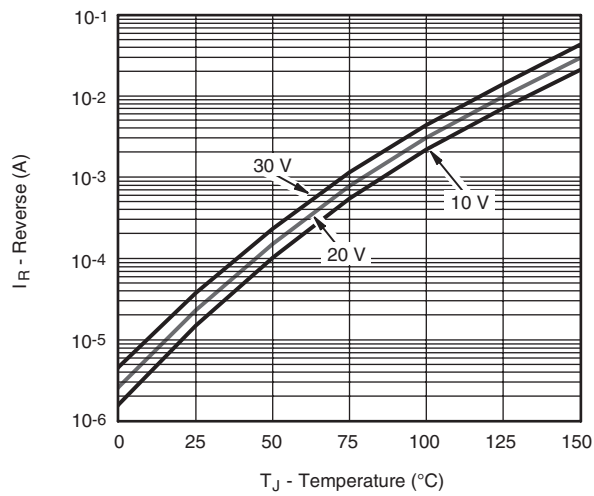
**CHANNEL-1 TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



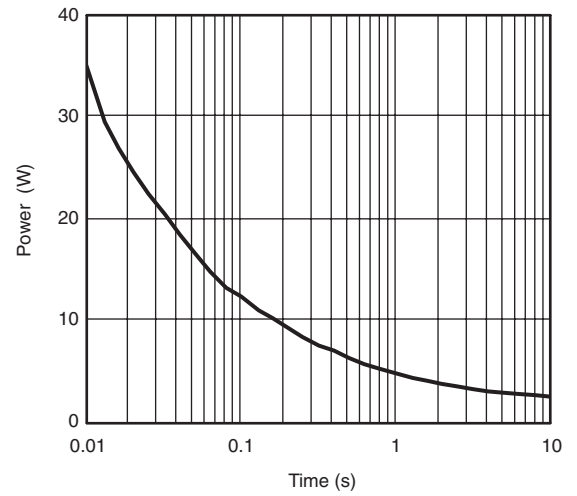
Source-Drain Diode Forward Voltage



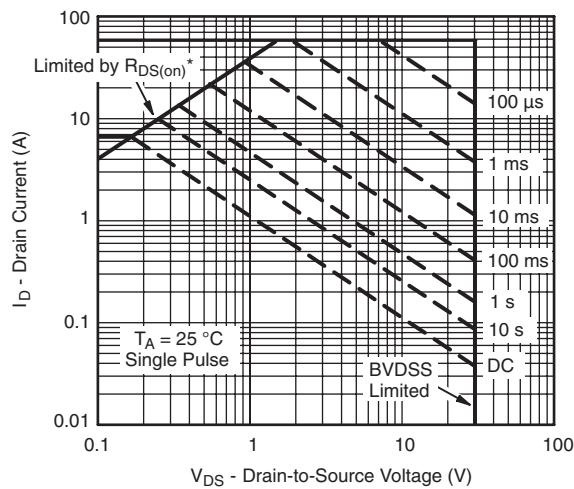
On-Resistance vs. Gate-to-Source Voltage



Reverse Current (Schottky)



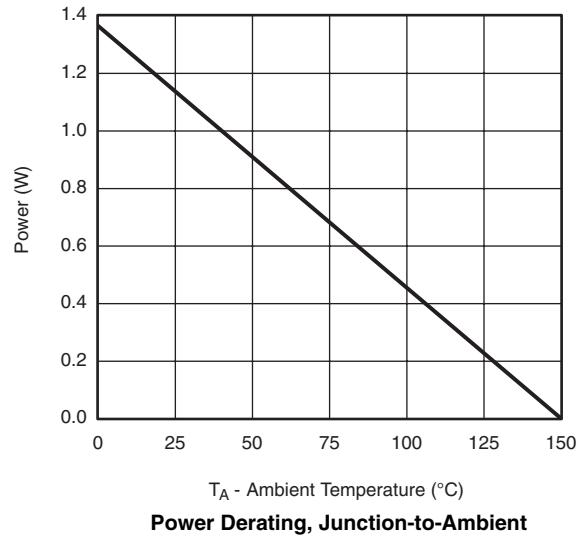
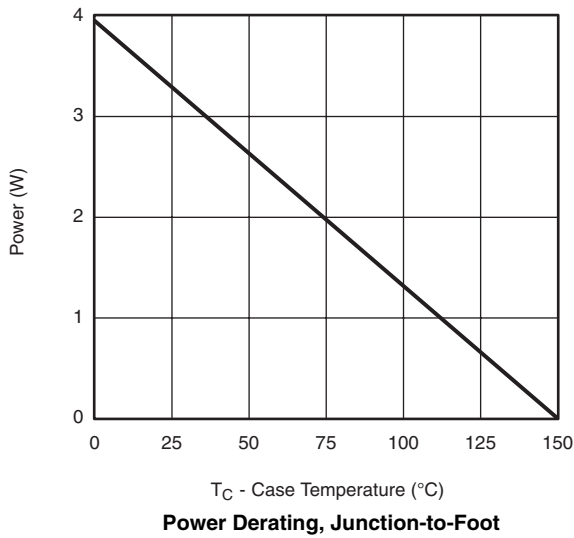
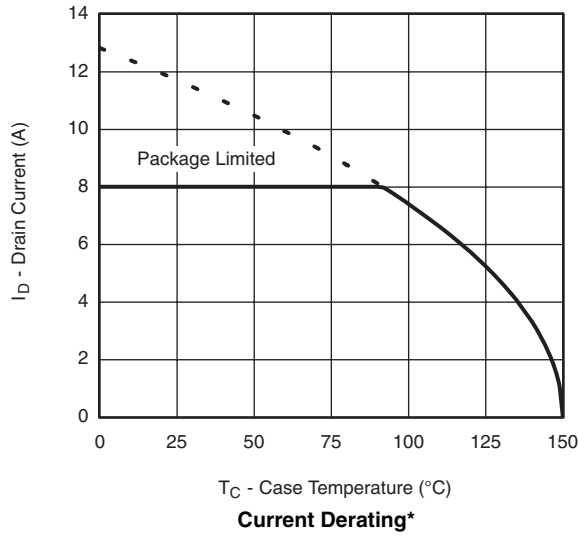
Single Pulse Power, Junction-to-Ambient



\*  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

Safe Operating Area, Junction-to-Ambient

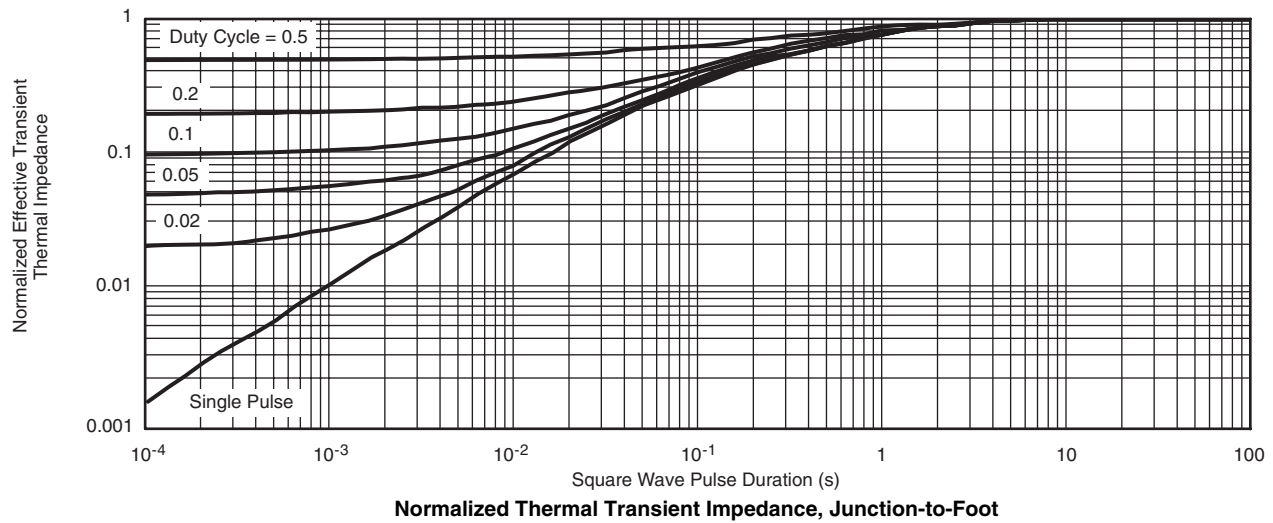
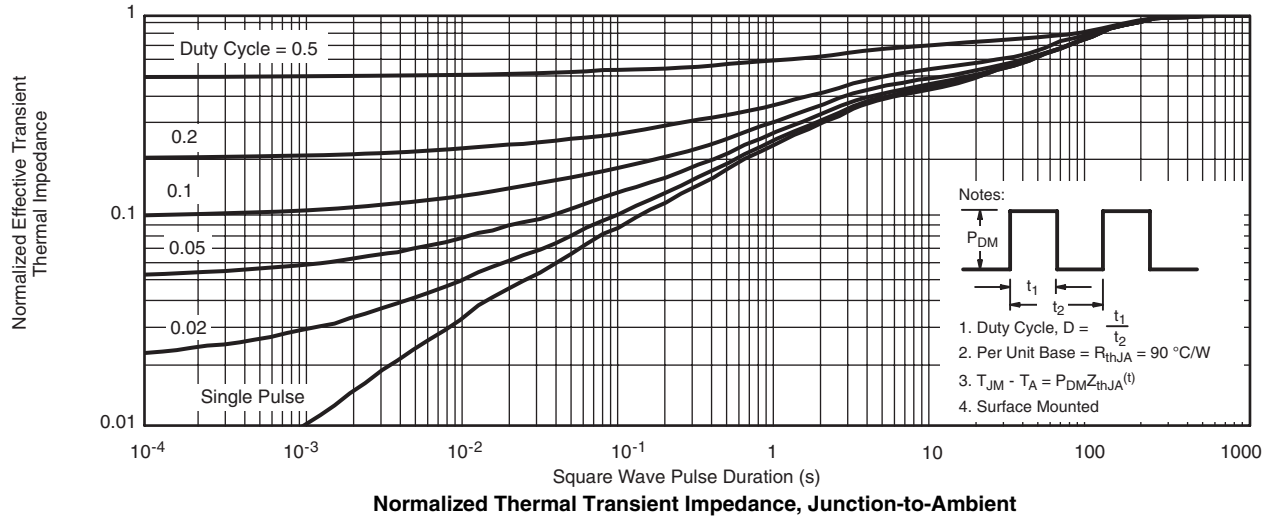
**CHANNEL-1 TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



\* 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.



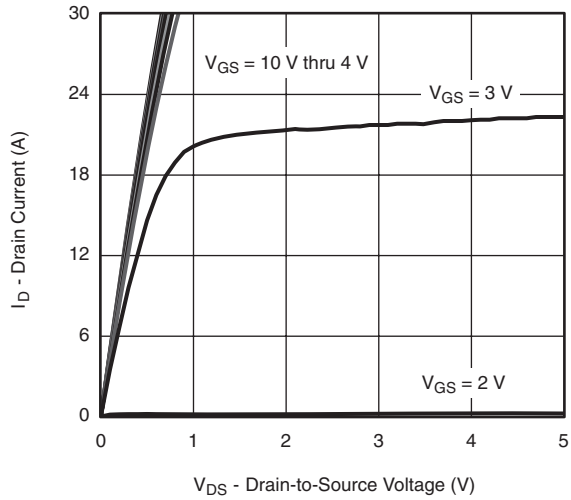
**CHANNEL-1 TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



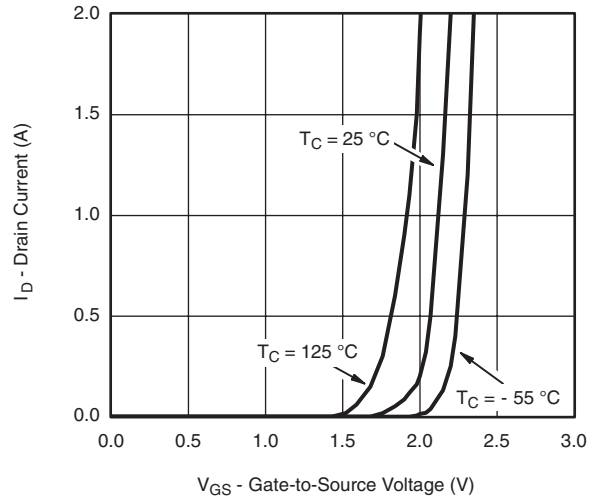




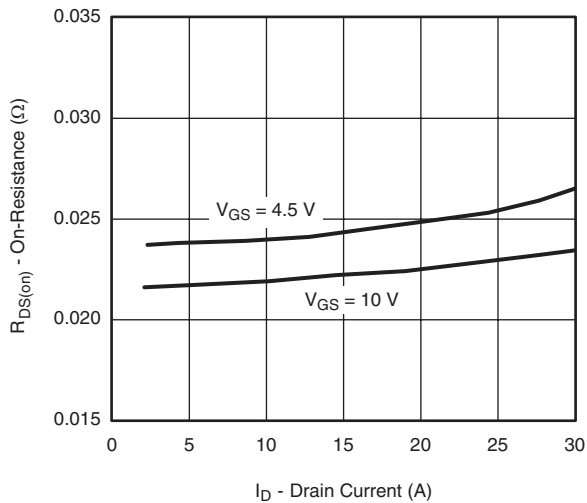
**CHANNEL-2 TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



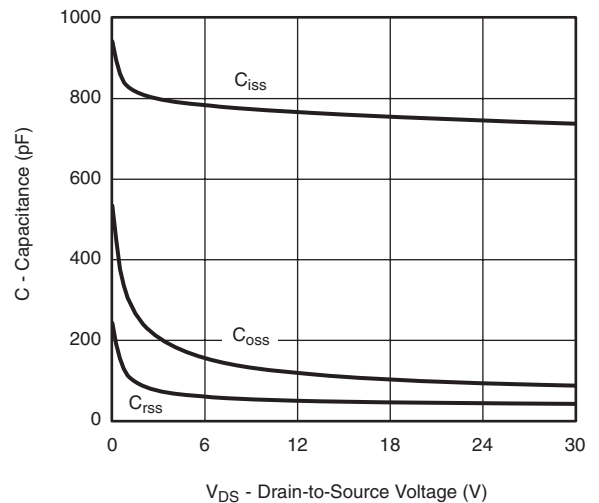
**Output Characteristics**



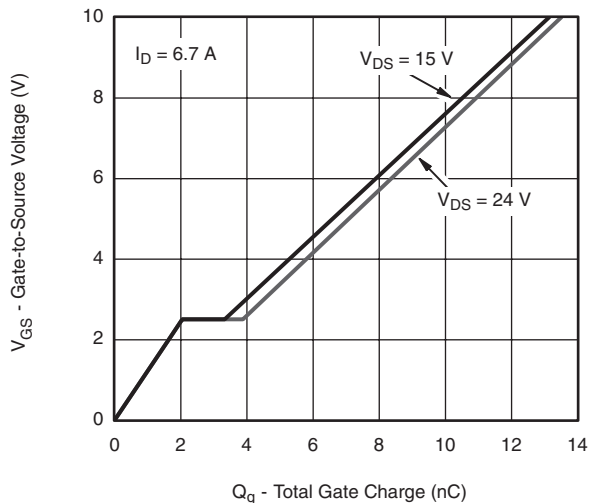
**Transfer Characteristics**



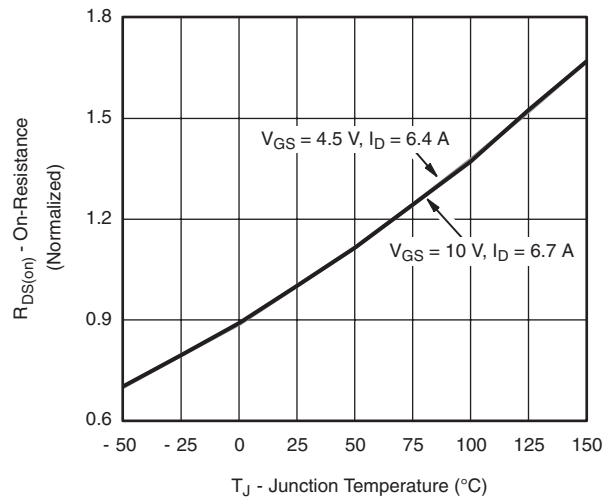
**On-Resistance vs. Drain Current**



**Capacitance**



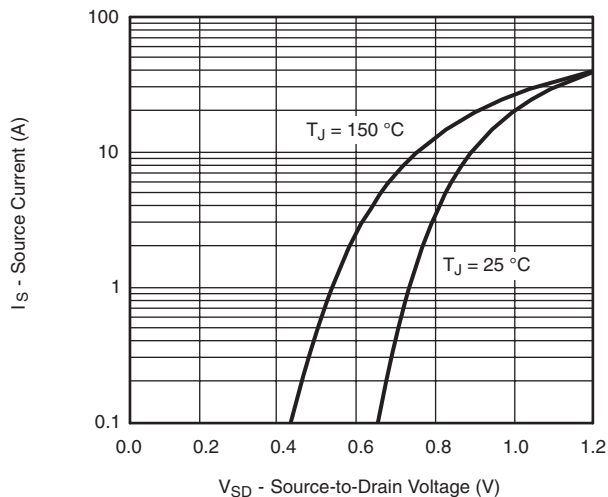
**Gate Charge**



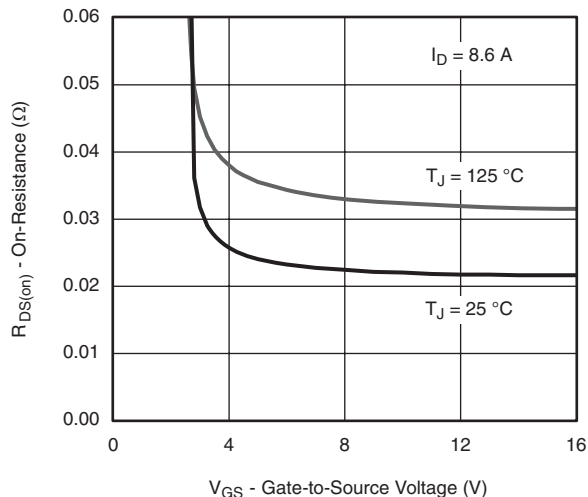
**On-Resistance vs. Junction Temperature**



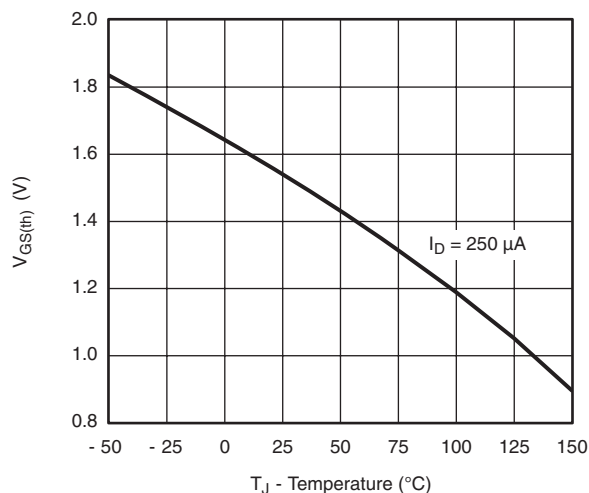
**CHANNEL-2 TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



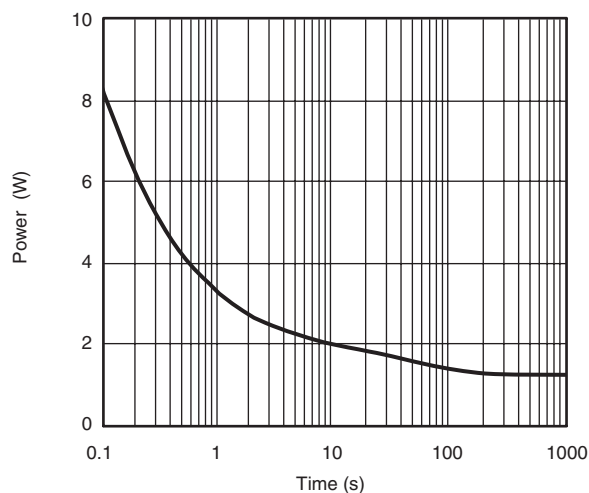
**Source-Drain Diode Forward Voltage**



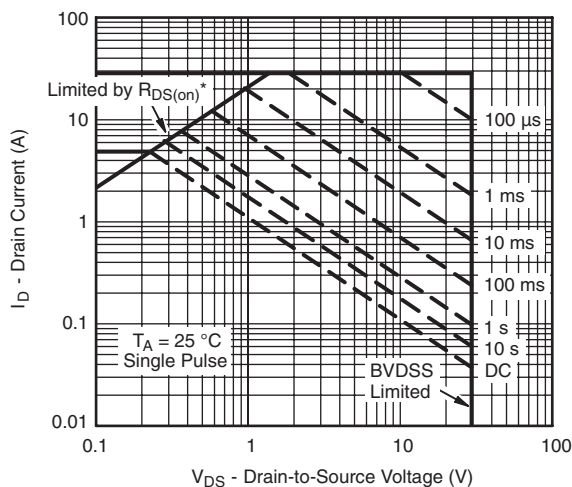
**On-Resistance vs. Gate-to-Source Voltage**



**Threshold Voltage**



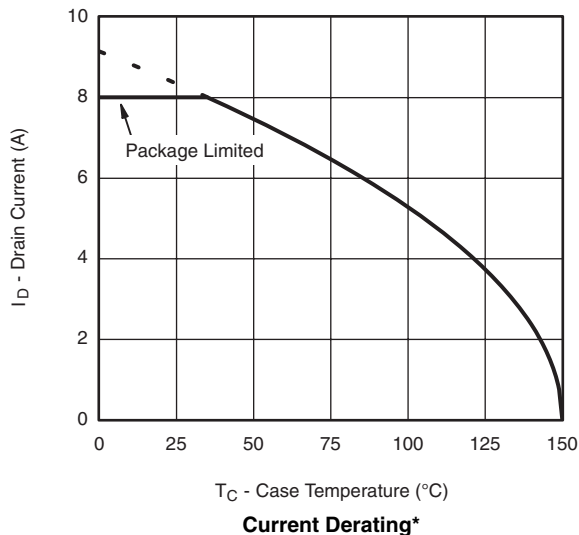
**Single Pulse Power, Junction-to-Ambient**



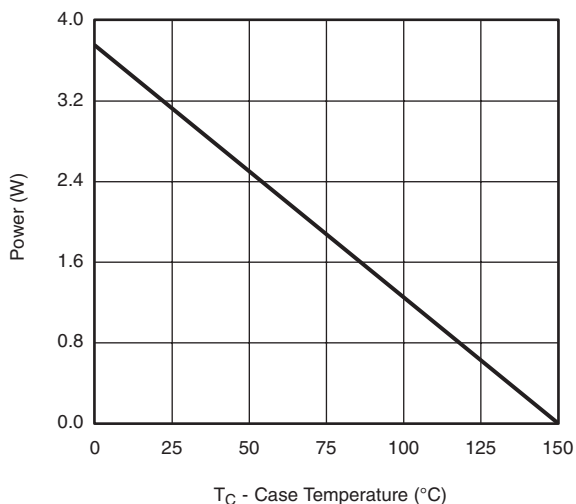
\*  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

**Safe Operating Area, Junction-to-Ambient**

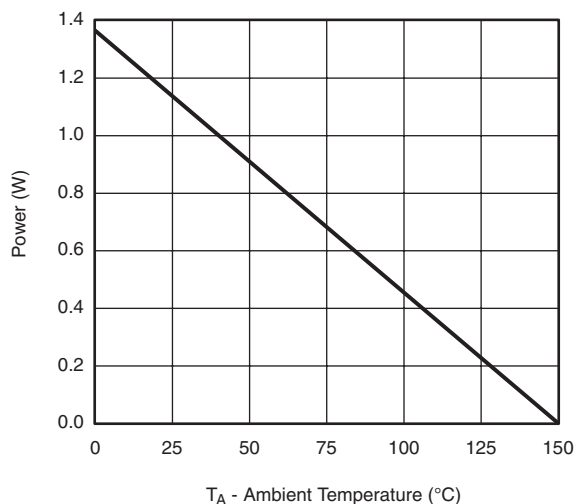
**CHANNEL-2 TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



**Current Derating\***



**Power Derating, Junction-to-Foot**

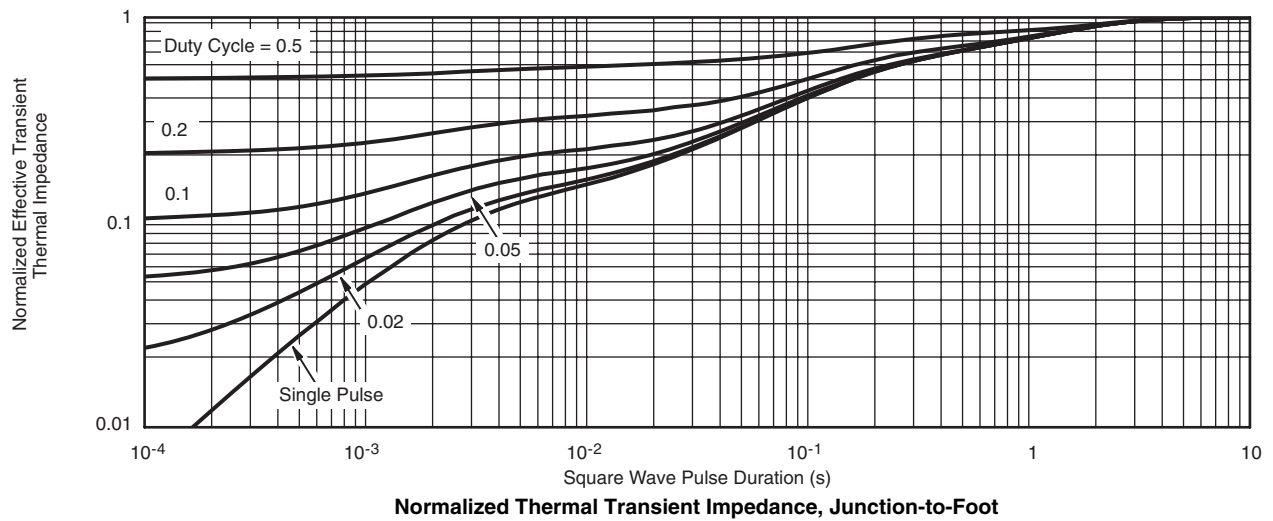
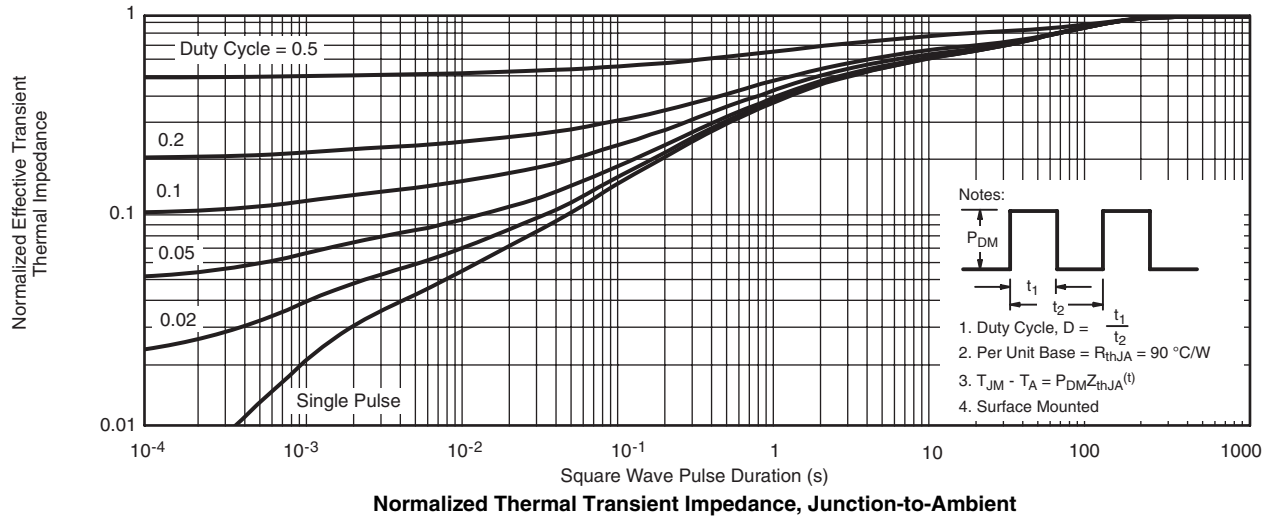


**Power Derating, Junction-to-Ambient**

\* The power dissipation  $P_D$  is based on  $T_{J(max)} = 150\text{ °C}$ , 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.



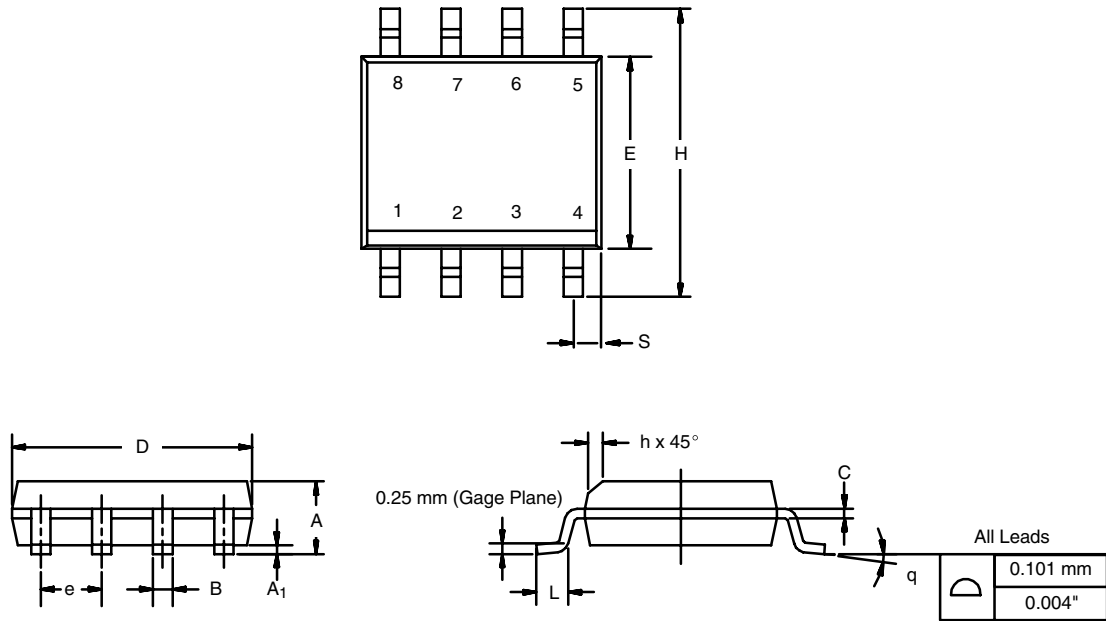
**CHANNEL-2 TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



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?68695](http://www.vishay.com/ppg?68695).

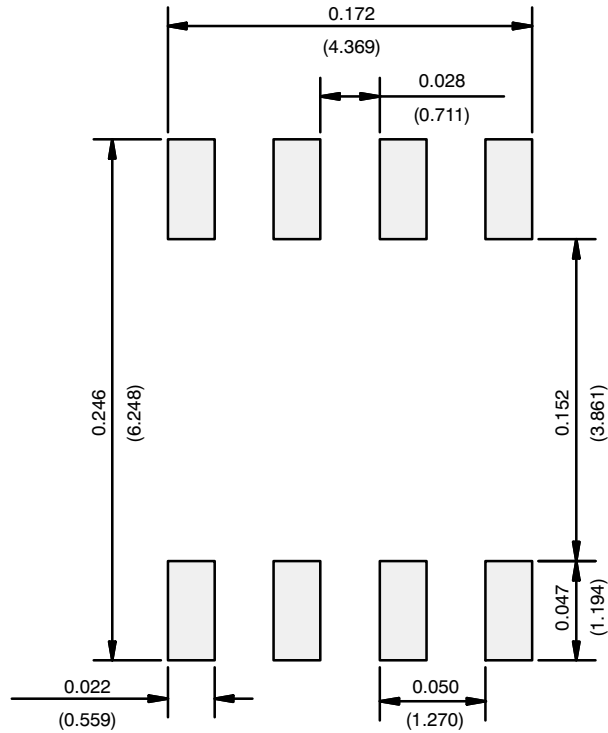
## SOIC (NARROW): 8-LEAD

JEDEC Part Number: MS-012



DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A <sub>1</sub>	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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