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Vishay/Siliconix
SI4622DY-T1-GE3

For any questions, you can email us directly:
sales@integrated-circuit.com

New Product

Si4622DY

Vishay Siliconix

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

PRODUCT SUMMARY				
	V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[a]	Q_g (Typ.)
Channel-1	30	0.0160 at V_{GS} = 10 V	8.0[e]	19
		0.0186 at V_{GS} = 4.5 V	8.0[e]	
Channel-2	30	0.0264 at V_{GS} = 10 V	8.0[e]	6
		0.0290 at V_{GS} = 4.5 V	8.0[e]	

FEATURES

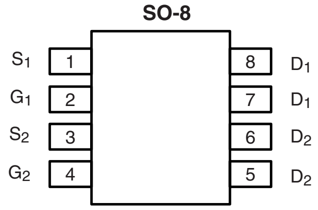
- **Halogen-free According to IEC 61249-2-21 Definition**
- SkyFET® Monolithic TrenchFET® Power MOSFET and Schottky Diode
- 100 % R_g and UIS Tested
- Compliant to RoHS Directive 2002/95/EC

Pb-free
RoHS COMPLIANT
HALOGEN FREE Available

APPLICATIONS

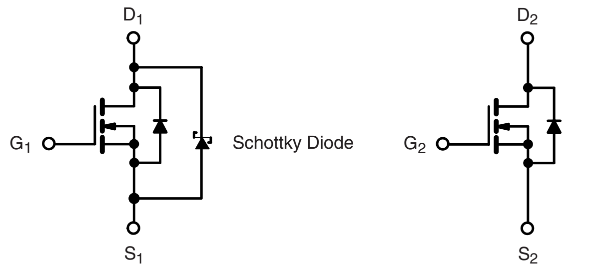
- Notebook Logic DC-DC
- Low Current DC-DC

SO-8



Top View

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



N-Channel MOSFET N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted

Parameter		Symbol	Channel-1	Channel-2	Unit
Drain-Source Voltage		V_{DS}	30	30	V
Gate-Source Voltage		V_{GS}	± 20	± 16	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	8[e]	8[e]	A
	T_C = 70 °C		8[e]	6.7	
	T_A = 25 °C		8[b, c, e]	6.7[b, c]	
	T_A = 70 °C		7.2[b, c]	5.3[b, c]	
Pulsed Drain Current (10 µs Pulse Width)		I_{DM}	60	30	
Source-Drain Current Diode Current	T_C = 25 °C	I_S	2.8	2.6	
	T_A = 25 °C		1.8[b, c]	1.7[b, c]	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	25	15	
Single Pulse Avalanche Energy		E_{AS}	31.2	11.2	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	3.3	3.1	W
	T_C = 70 °C		2.1	2.0	
	T_A = 25 °C		2.2[b, c]	2.0[b, c]	
	T_A = 70 °C		1.4[b, c]	1.3[b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150		°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Channel-1		Channel-2		Unit
			Typ.	Max.	Typ.	Max.	
Maximum Junction-to-Ambient[b, d]	t ≤ 10 s	R_{thJA}	45	56	55	62.5	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	29	38	33	40	

Notes:
a. Based on T_C = 25 °C.
b. Surface Mounted on 1" x 1" FR4 board.
c. t = 10 s.
d. Maximum under Steady State conditions is 110 °C/W (Channel-1) and 110 °C/W (Channel-2).
e. Package limited.

New Product

Si4622DY

Vishay Siliconix

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

New Product

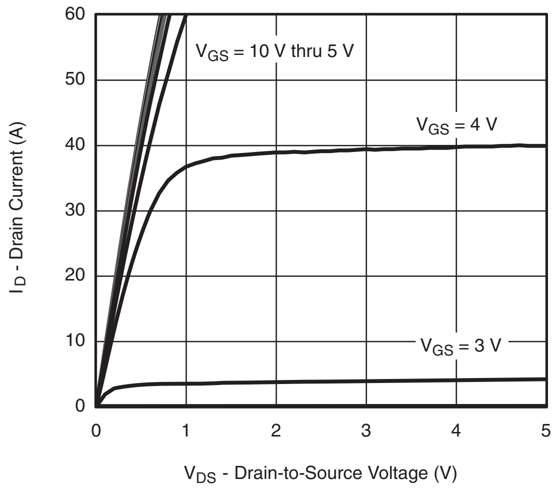
SPECIFICATIONS T_J = 25 °C, unless otherwise noted							
Parameter	**Symbol**	**Test Conditions**		**Min.**	**Typ.**	**Max.**	**Unit**
Dynamic[a]							
Turn-On Delay Time	$t_{d(on)}$	Channel-1 V_{DD} = 15 V, R_L = 2 Ω I_D ≅ 7.7 A, V_{GEN} = 10 V, R_g = 1 Ω; Channel-2 V_{DD} = 15 V, R_L = 2.8 Ω I_D ≅ 5.3 A, V_{GEN} = 10 V, R_g = 1 Ω	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	$t_{d(off)}$		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 V, R_L = 2 Ω I_D ≅ 7.7 A, V_{GEN} = 4.5 V, R_g = 1 Ω; Channel-2 V_{DD} = 15 V, R_L = 2.8 Ω I_D ≅ 5.3 A, V_{GEN} = 4.5 V, R_g = 1 Ω	Ch-1		27	35	
			Ch-2		14	21	
Rise Time	t_r		Ch-1		15	23	
			Ch-2		12	18	
Turn-Off Delay Time	$t_{d(off)}$		Ch-1		29	44	
			Ch-2		21	32	
Fall Time	t_f		Ch-1		11	17	
			Ch-2		11	17	
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C	Ch-1			2.8	A
			Ch-2			2.6	
Pulse Diode Forward Current[a]	I_{SM}		Ch-1			60	
			Ch-2			30	
Body Diode Voltage	V_{SD}	I_S = 2 A	Ch-1		0.57	0.68	V
		I_S = 5.3 A	Ch-2		0.8	1.2	
Body Diode Reverse Recovery Time	t_{rr}	Channel-1 I_F = 7.7 A, dI/dt = 100 A/µs, T_J = 25 °C; Channel-2 I_F = 5.3 A, dI/dt = 100 A/µs, T_J = 25 °C	Ch-1		26	39	ns
			Ch-2		17	26	
Body Diode Reverse Recovery Charge	Q_{rr}		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 ≤ 300 µs, duty cycle ≤ 2 %.

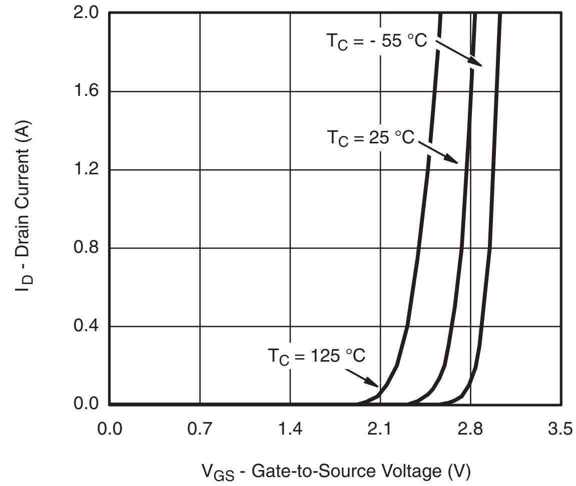
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

New Product

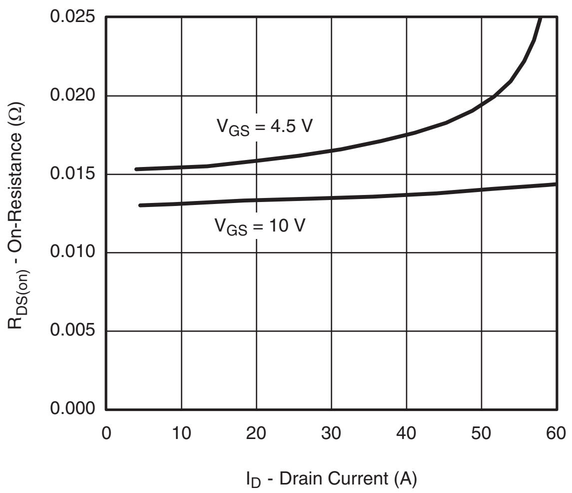
CHANNEL-1 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



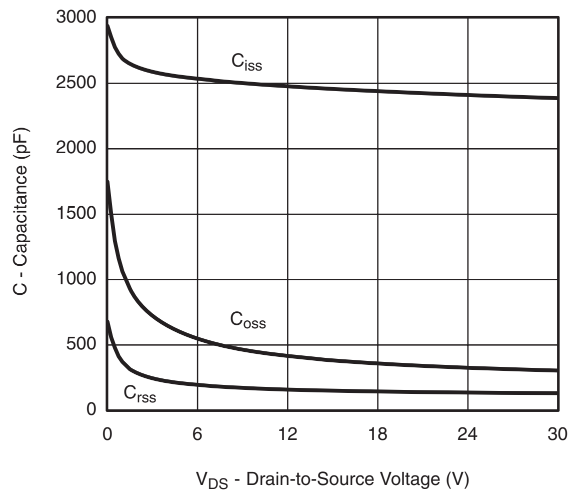
Output Characteristics



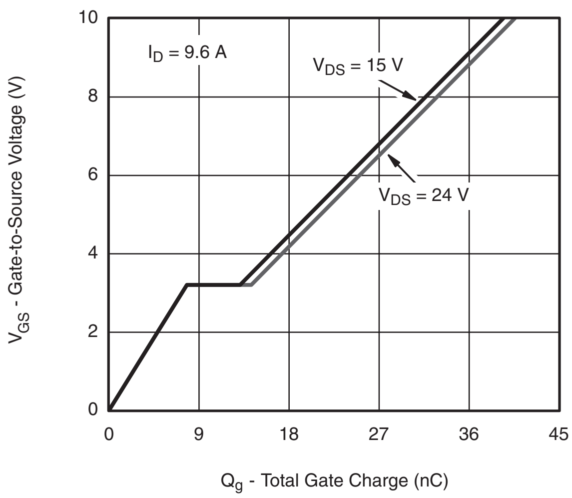
Transfer Characteristics



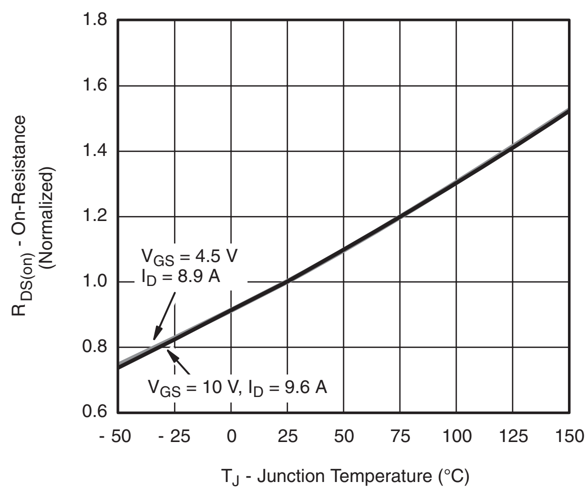
On-Resistance vs. Drain Current



Capacitance



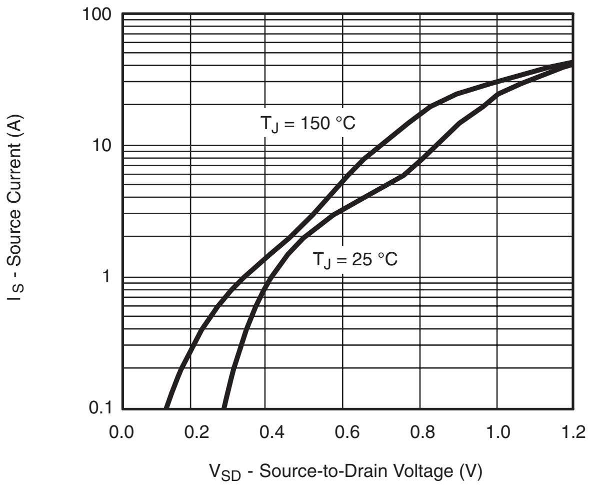
Gate Charge



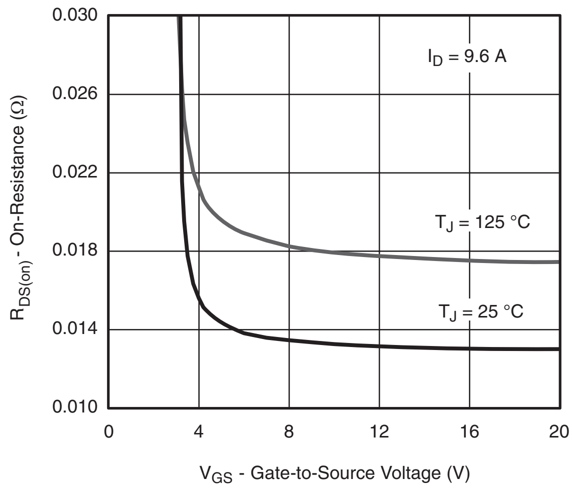
On-Resistance vs. Junction Temperature

New Product

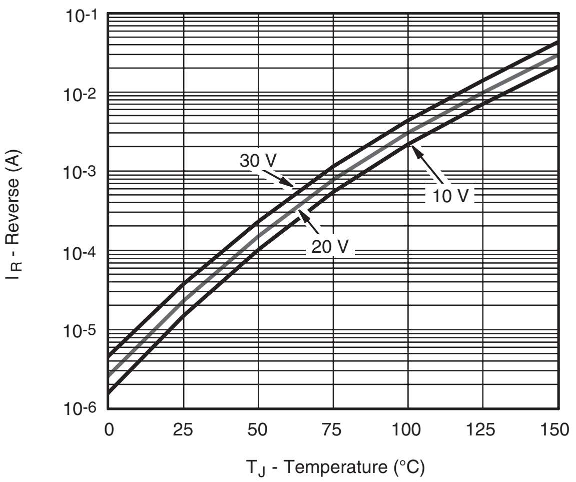
CHANNEL-1 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



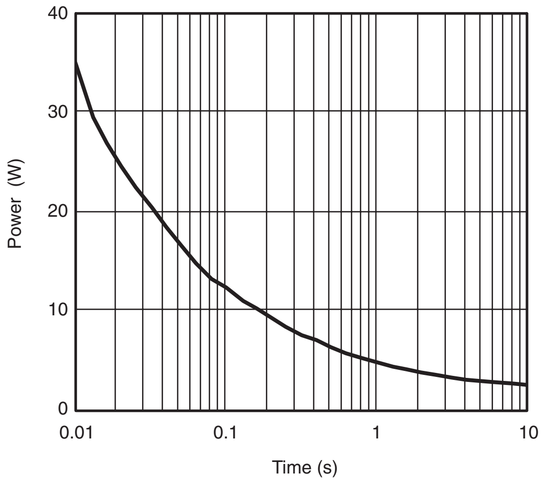
Source-Drain Diode Forward Voltage



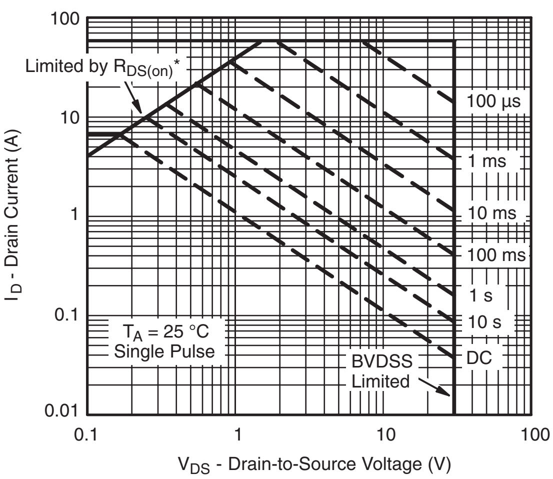
On-Resistance vs. Gate-to-Source Voltage



Reverse Current (Schottky)



Single Pulse Power, Junction-to-Ambient

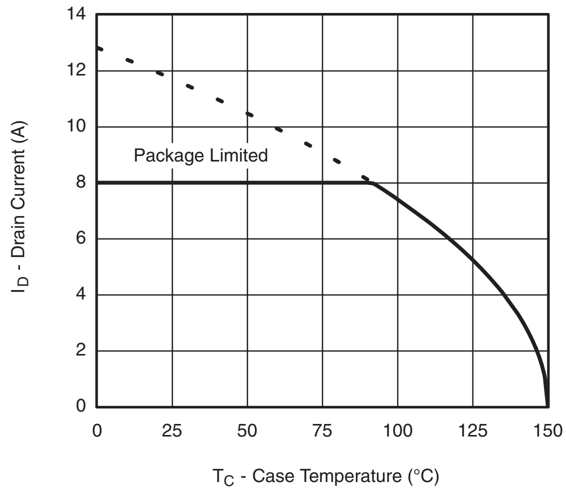


* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

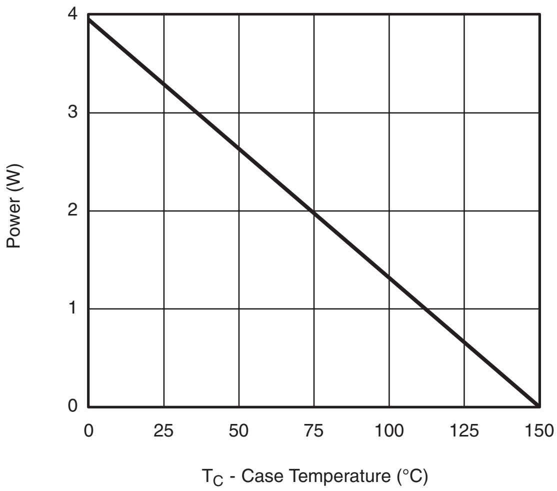
Safe Operating Area, Junction-to-Ambient

New Product

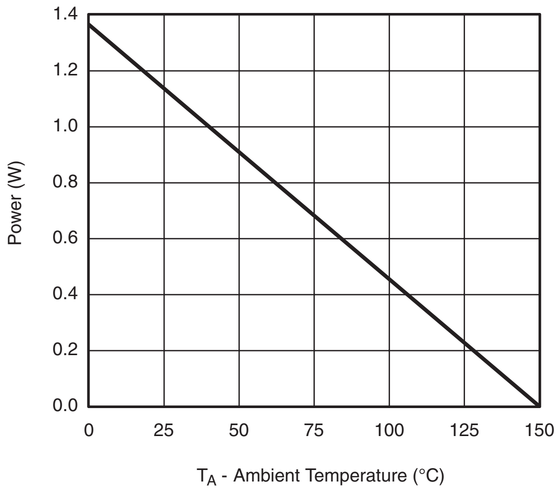
CHANNEL-1 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Current Derating*



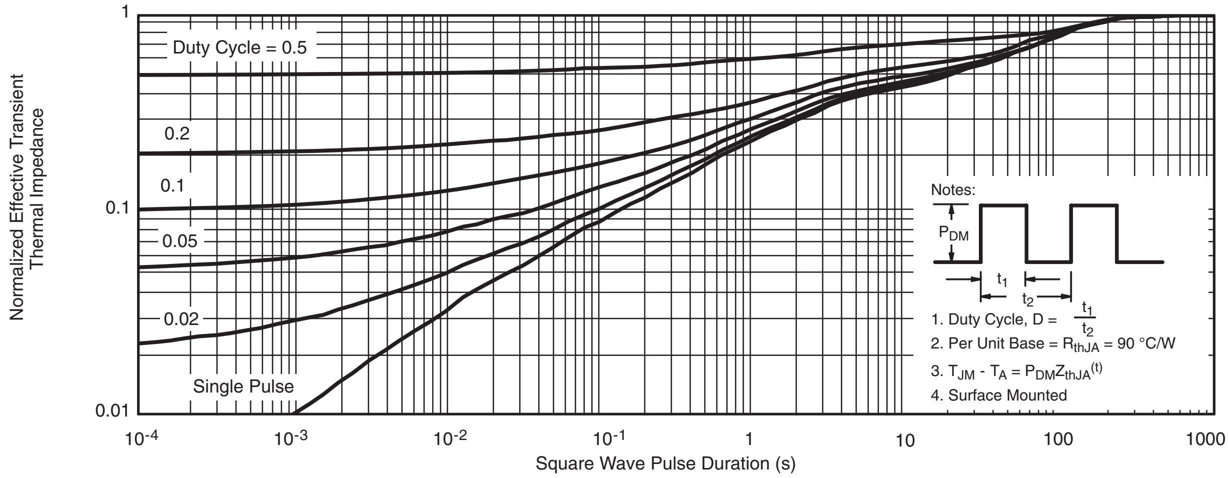
Power Derating, Junction-to-Foot



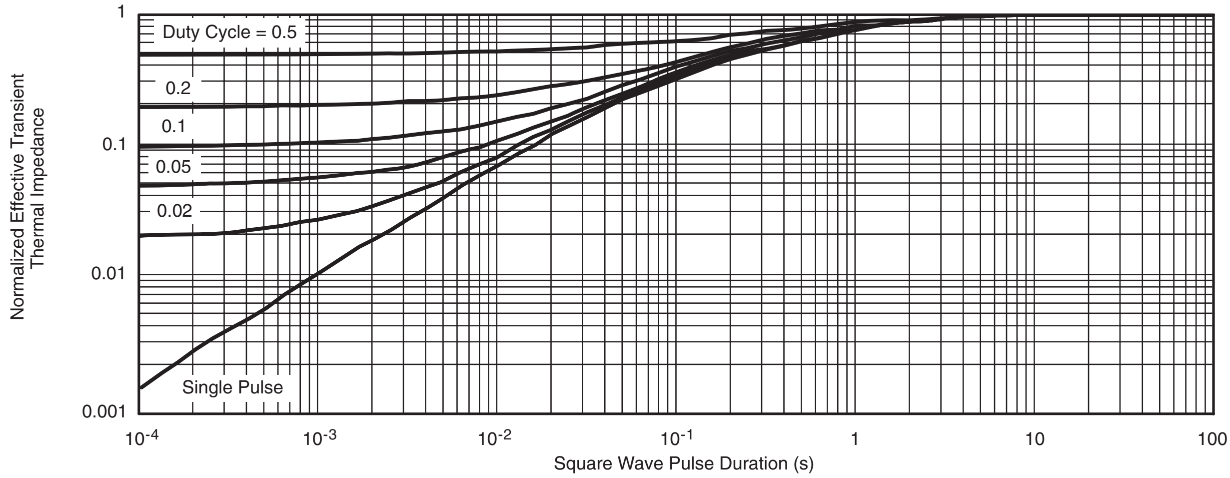
Power Derating, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max)}$ = 150 °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



Normalized Thermal Transient Impedance, Junction-to-Ambient



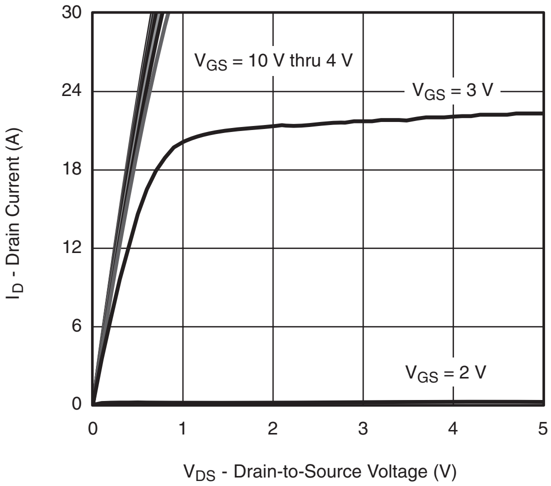
Normalized Thermal Transient Impedance, Junction-to-Foot

New Product

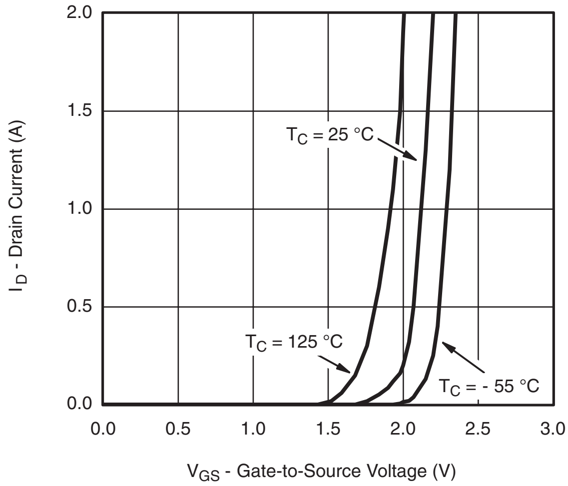
Si4622DY

Vishay Siliconix

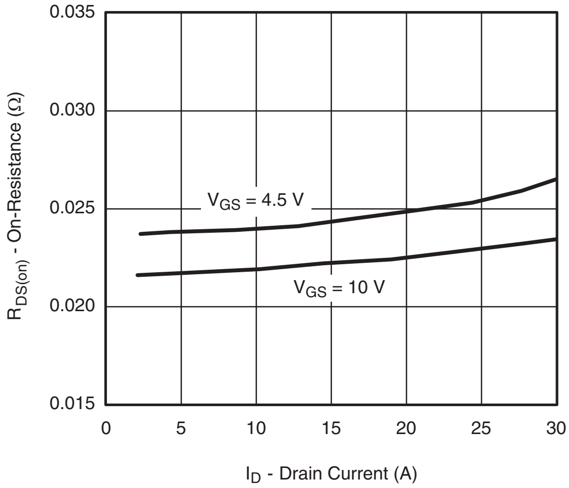
CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



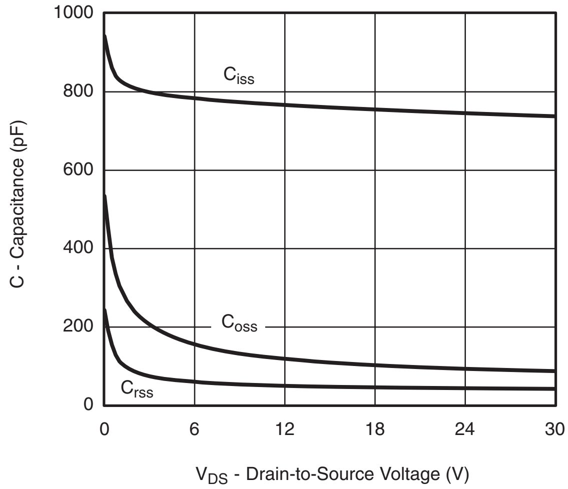
Output Characteristics



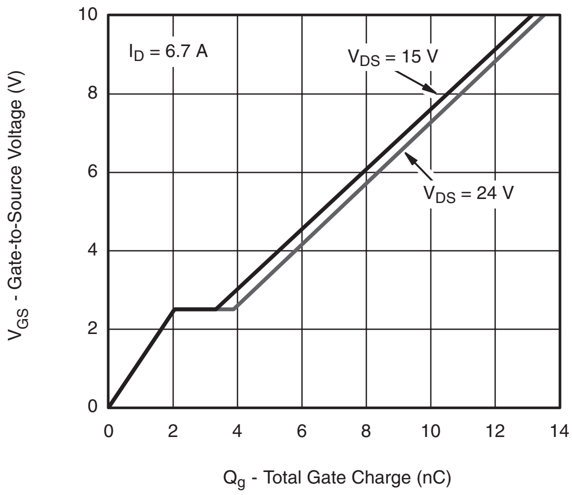
Transfer Characteristics



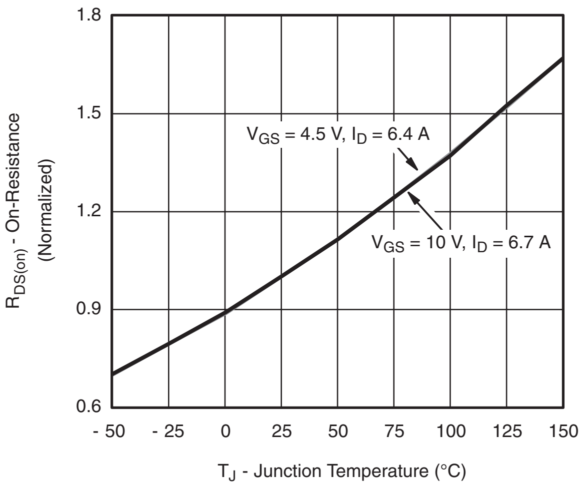
On-Resistance vs. Drain Current



Capacitance



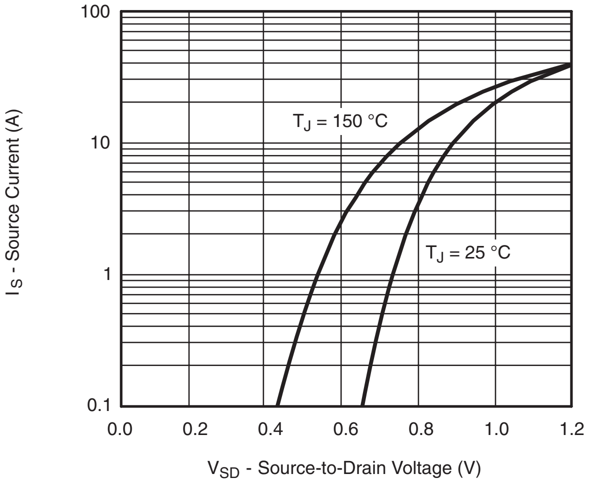
Gate Charge



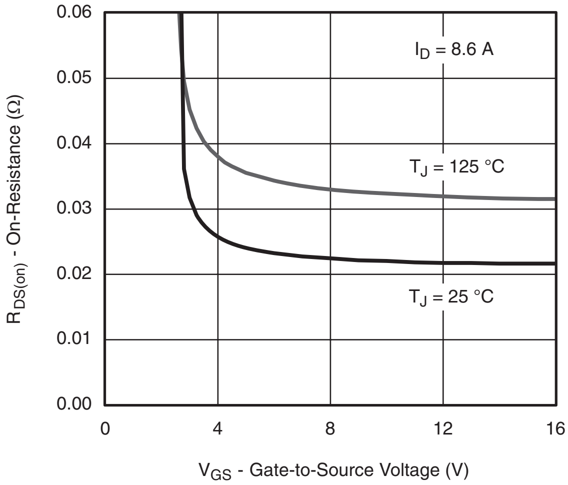
On-Resistance vs. Junction Temperature

New Product

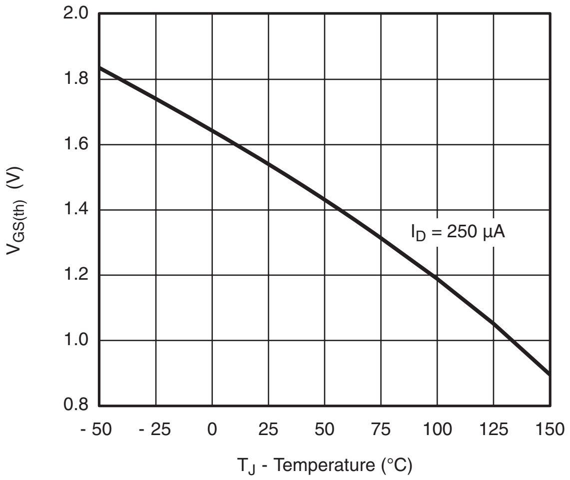
CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



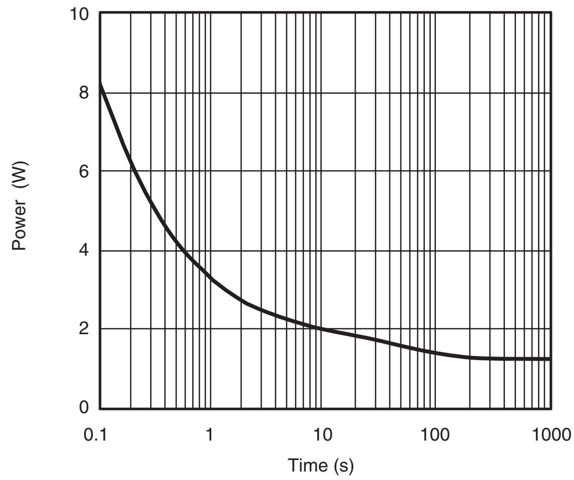
Source-Drain Diode Forward Voltage



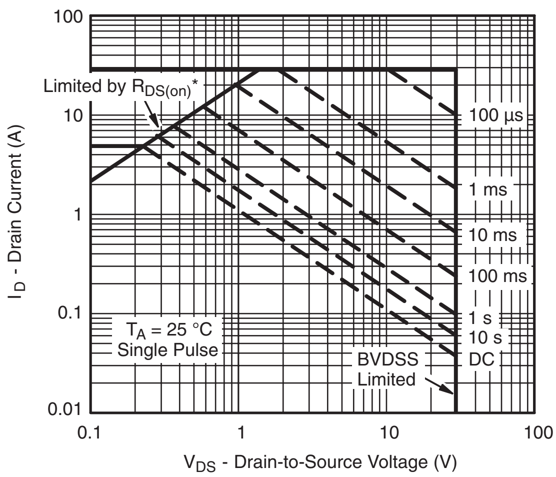
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



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

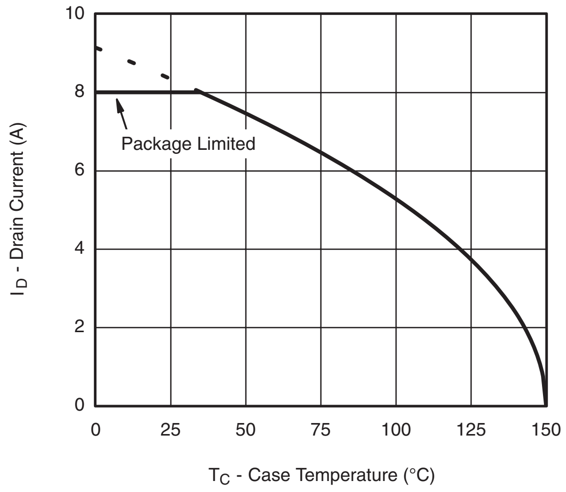
Safe Operating Area, Junction-to-Ambient

New Product

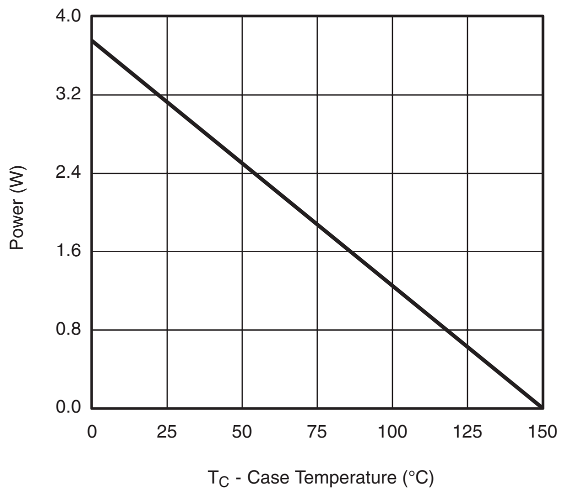
Si4622DY

Vishay Siliconix

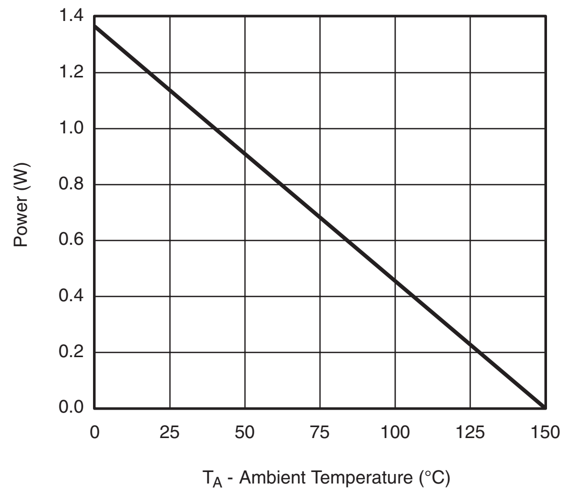
CHANNEL-2 TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Current Derating*



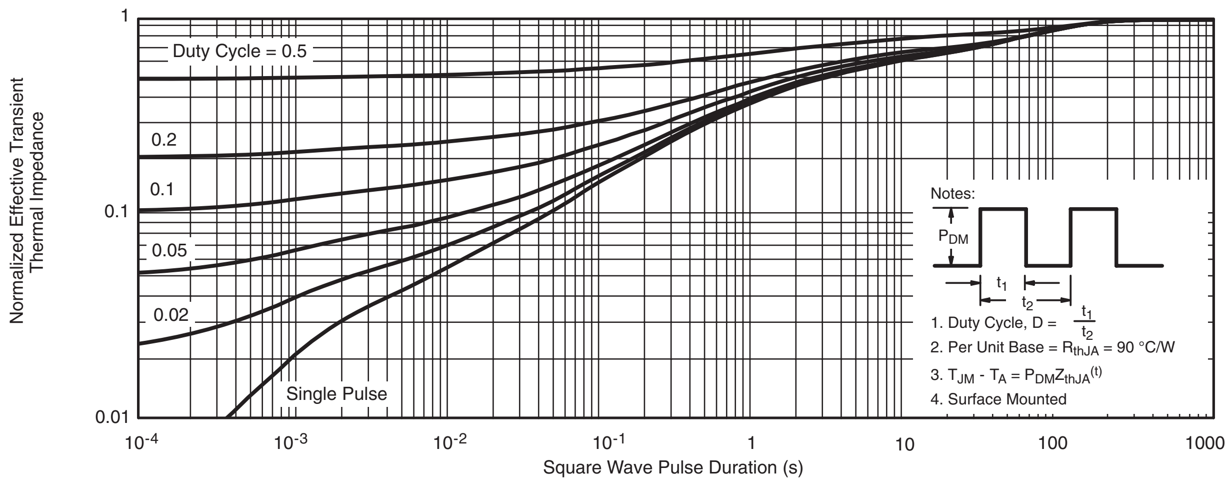
Power Derating, Junction-to-Foot



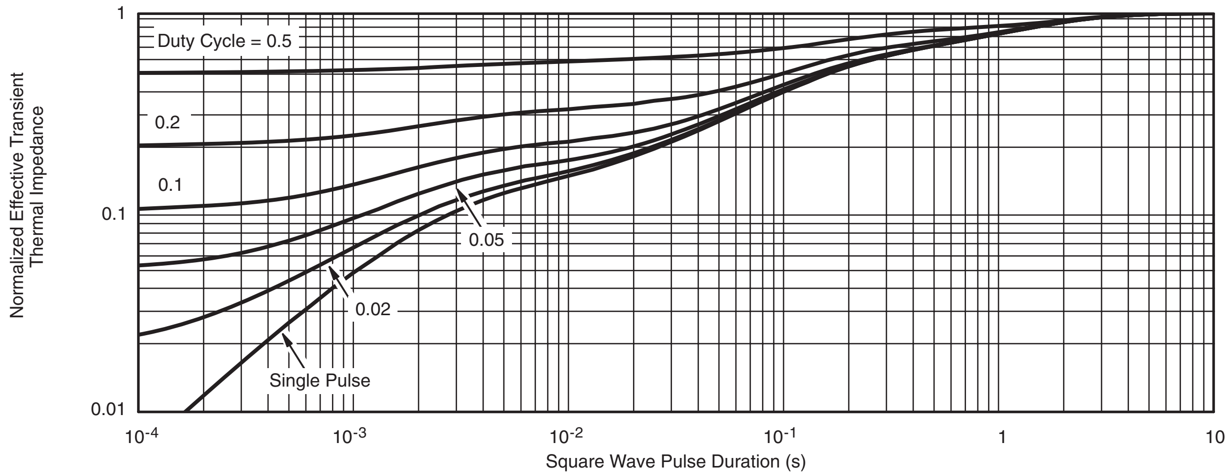
Power Derating, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max)}$ = 150 °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



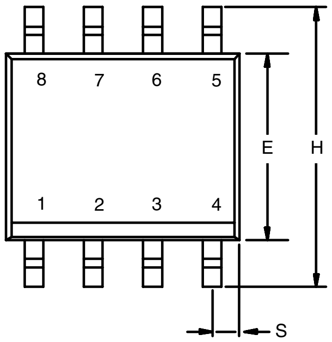
Normalized Thermal Transient Impedance, Junction-to-Ambient

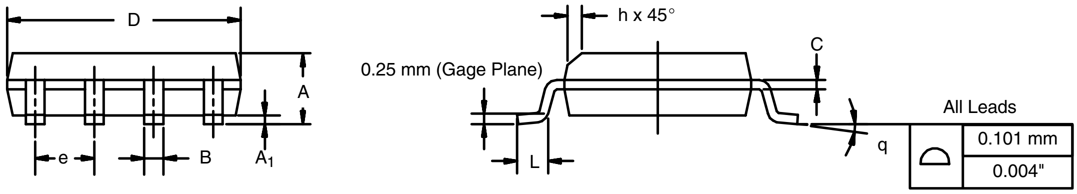


Normalized Thermal Transient Impedance, Junction-to-Foot

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.

SOIC (NARROW): 8-LEAD
JEDEC Part Number: MS-012



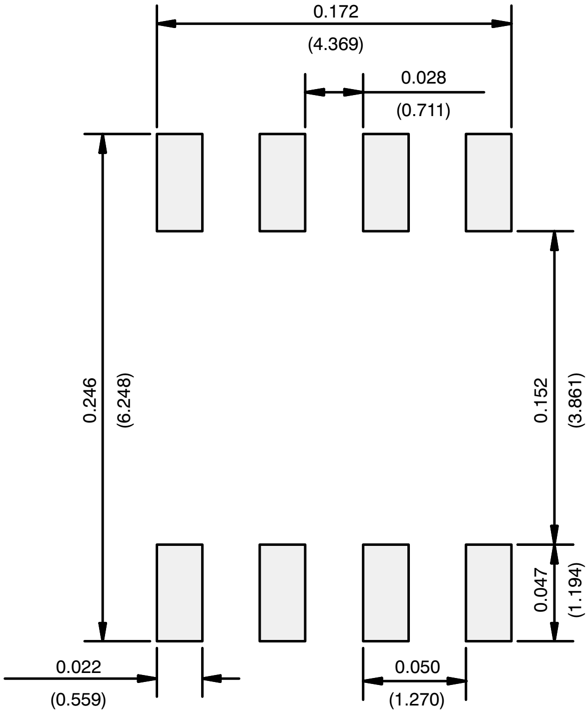


DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A_1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026
ECN: C-06527-Rev. I, 11-Sep-06 DWG: 5498				

Application Note 826

Vishay Siliconix

RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads
Dimensions in Inches/(mm)

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APPLICATION NOTE

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