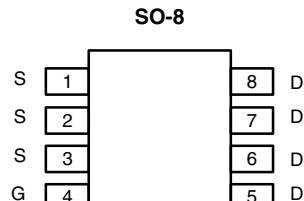


P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω) Max.	I_D (A) ^d	Q_g (Typ.)
- 30	0.0060 at $V_{GS} = - 10$ V	- 25.7	65 nC
	0.0080 at $V_{GS} = - 4.5$ V	- 22.3	

FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g and UIS Tested
- Material categorization:
For definitions of compliance please see www.vishay.com/doc?99912

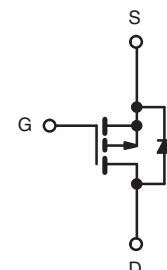


Top View

Ordering Information:
Si4101DY-T1-GE3 (Lead (Pb)-free and 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}	± 20	
Continuous Drain Current ($T_J = 150$ °C)	I_D	- 25.7	A
		- 20.6	
		- 18 ^{a, b}	
		- 14.4 ^{a, b}	
Pulsed Drain Current ($t = 300$ μ s)	I_{DM}	- 70	
Continuous Source-Drain Diode Current	I_S	- 5	A
		- 2.4 ^{a, b}	
Avalanche Current	I_{AS}	- 30	
Single-Pulse Avalanche Energy	E_{AS}	45	mJ
Maximum Power Dissipation	P_D	6	W
		3.8	
		2.9 ^{a, b}	
		1.9 ^{a, b}	
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 ^{a, c}	R_{thJA}	36	43	°C/W
Maximum Junction-to-Foot	R_{thJF}	16	21	

Notes:

- Surface mounted on 1" x 1" FR4 board.
- $t = 10$ s.
- Maximum under steady state conditions is 84 °C/W.
- Based on $T_C = 25$ °C.

Si4101DY

Vishay Siliconix

**SPECIFICATIONS** ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V}$, $I_D = -250 \mu\text{A}$	-30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250 \mu\text{A}$		-20		mV/°C
$V_{GS(\text{th})}$ Temperature Coefficient	$\Delta V_{GS(\text{th})}/T_J$			5.3		
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = -250 \mu\text{A}$	-1		-2.5	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30 \text{ V}$, $V_{GS} = 0 \text{ V}$			-1	μA
		$V_{DS} = -30 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 55^\circ\text{C}$			-5	
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} \geq -10 \text{ V}$, $V_{GS} = -10 \text{ V}$	-30			A
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = -10 \text{ V}$, $I_D = -15 \text{ A}$		0.0050	0.0060	Ω
		$V_{GS} = -4.5 \text{ V}$, $I_D = -10 \text{ A}$		0.0066	0.0080	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10 \text{ V}$, $I_D = -15 \text{ A}$		72		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -15 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$		8190		pF
Output Capacitance	C_{oss}			772		
Reverse Transfer Capacitance	C_{rss}			715		
Total Gate Charge	Q_g	$V_{DS} = -15 \text{ V}$, $V_{GS} = -10 \text{ V}$, $I_D = -18 \text{ A}$		135	203	nC
				65	85	
Gate-Source Charge	Q_{gs}	$V_{DS} = -15 \text{ V}$, $V_{GS} = -4.5 \text{ V}$, $I_D = -18 \text{ A}$		22.5		
Gate-Drain Charge	Q_{gd}			17.6		
Gate Resistance	R_g	$f = 1 \text{ MHz}$	0.4	2	4	Ω
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = -15 \text{ V}$, $R_L = 1.5 \Omega$ $I_D \geq -10 \text{ A}$, $V_{GEN} = -10 \text{ V}$, $R_g = 1 \Omega$		20	30	ns
Rise Time	t_r			9	18	
Turn-Off DelayTime	$t_{d(\text{off})}$			80	120	
Fall Time	t_f			11	20	
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = -15 \text{ V}$, $R_L = 1.5 \Omega$ $I_D \geq -10 \text{ A}$, $V_{GEN} = -4.5 \text{ V}$, $R_g = 1 \Omega$		72	108	
Rise Time	t_r			60	90	
Turn-Off DelayTime	$t_{d(\text{off})}$			60	90	
Fall Time	t_f			23	35	
Drain-Source Body Diode Characteristics						
Continous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$			-5	A
Pulse Diode Forward Current	I_{SM}				-70	
Body Diode Voltage	V_{SD}	$I_S = -3 \text{ A}$, $V_{GS} = 0 \text{ V}$		-0.78	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -10 \text{ A}$, $dl/dt = 100 \text{ A}/\mu\text{s}$, $T_J = 25^\circ\text{C}$		29	45	ns
Body Diode Reverse Recovery Charge	Q_{rr}			19	29	nC
Reverse Recovery Fall Time	t_a			13		ns
Reverse Recovery Rise Time	t_b			16		

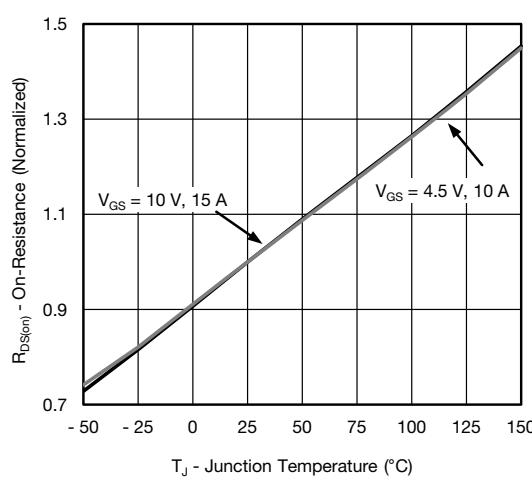
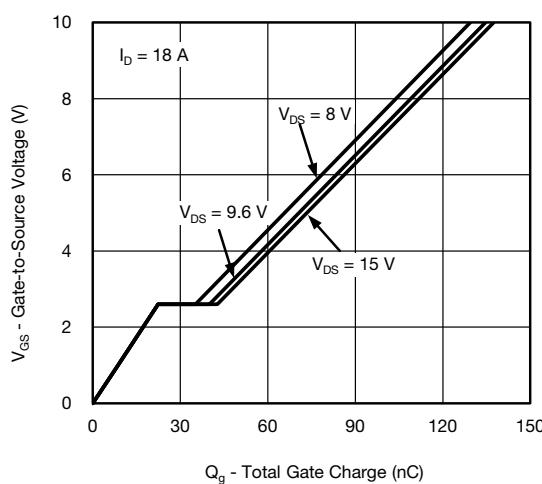
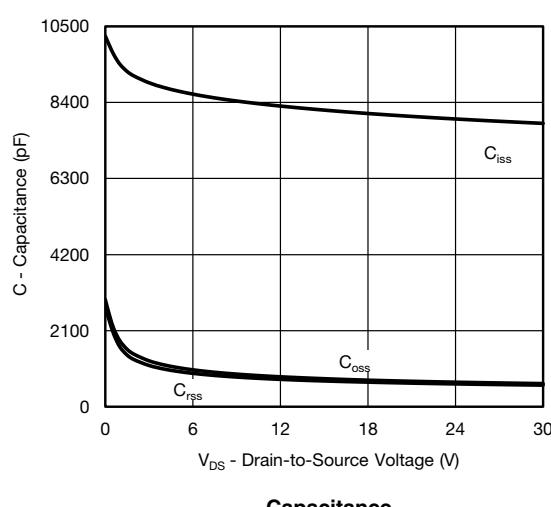
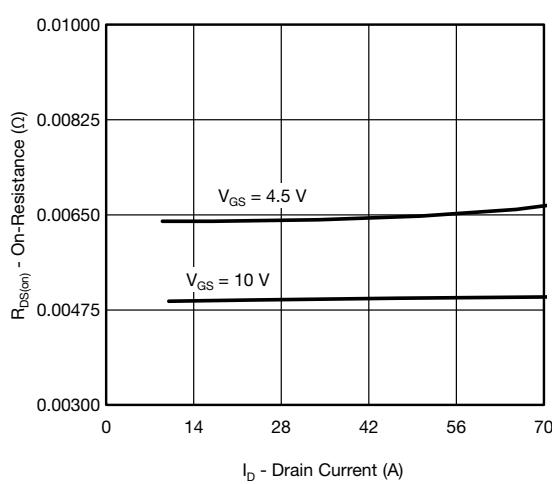
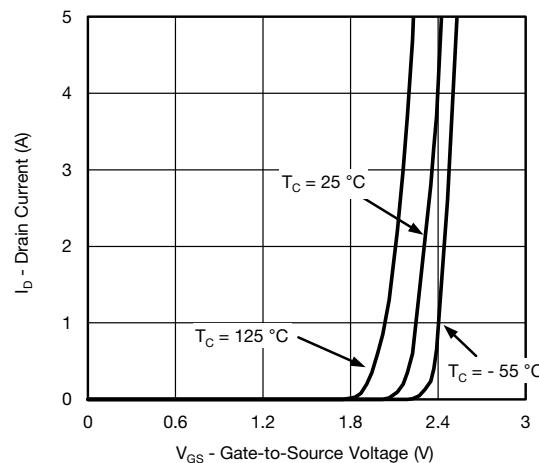
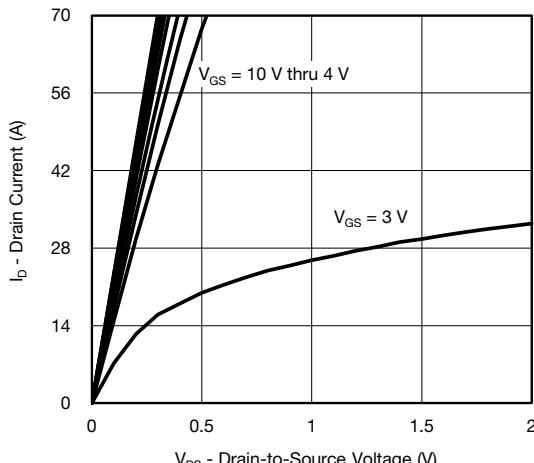
Notes:

a. Pulse test; pulse width $\leq 300 \mu\text{s}$, 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)

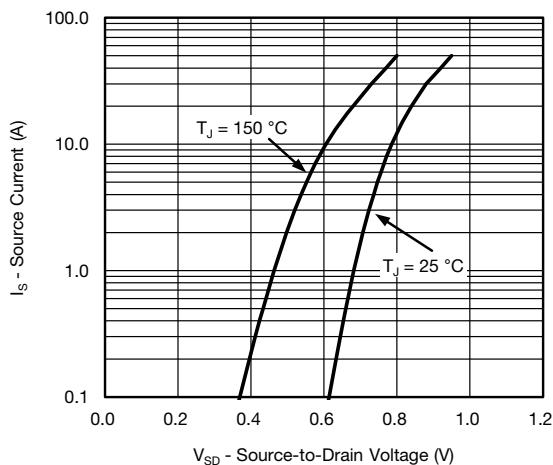


Si4101DY

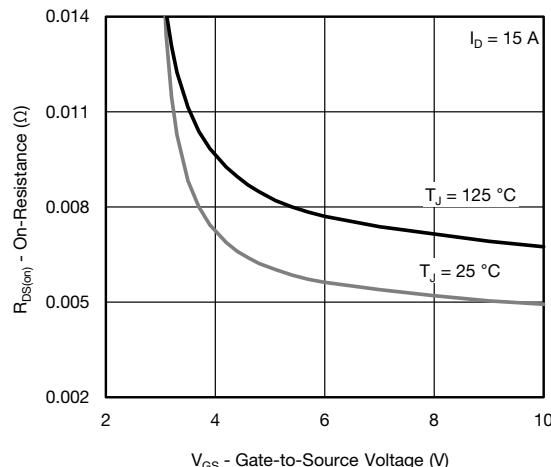
Vishay Siliconix



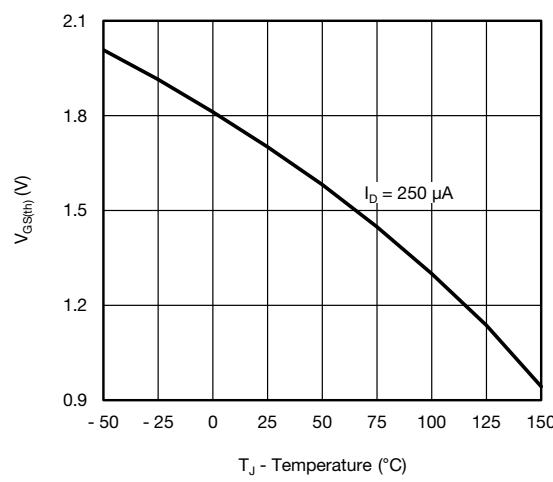
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



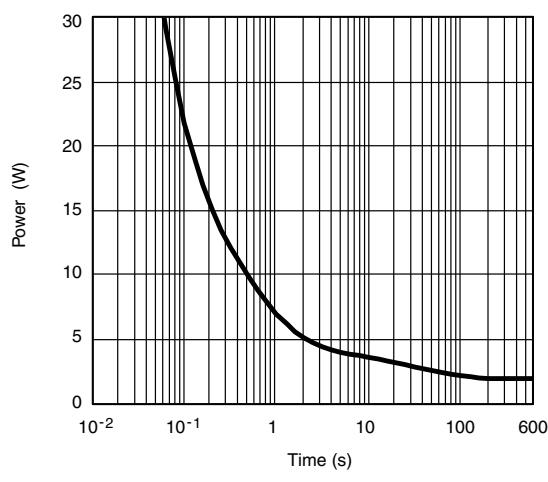
Source-Drain Diode Forward Voltage



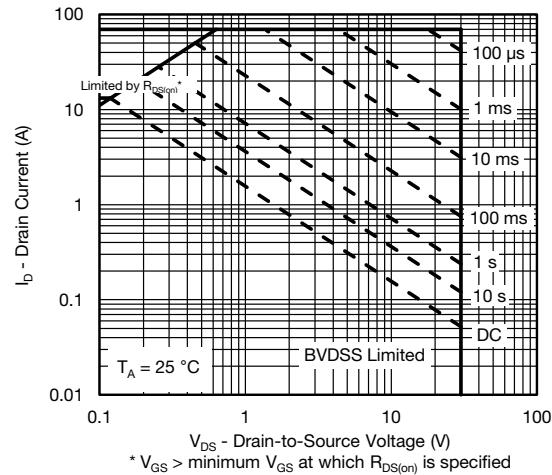
On-Resistance vs. Gate-to-Source Voltage



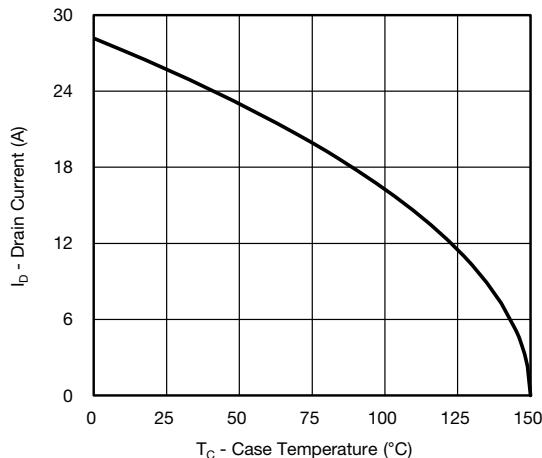
Threshold Voltage



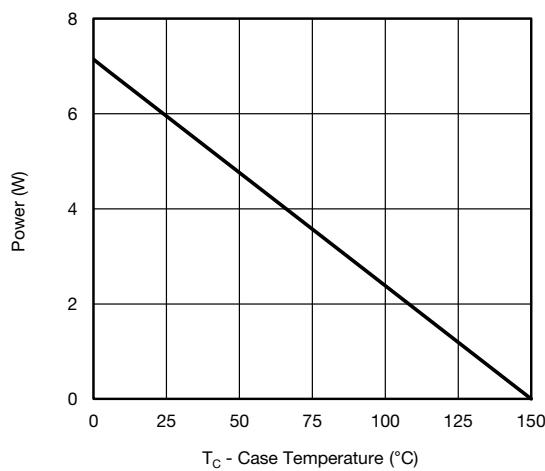
Single Pulse Power, Junction-to-Ambient



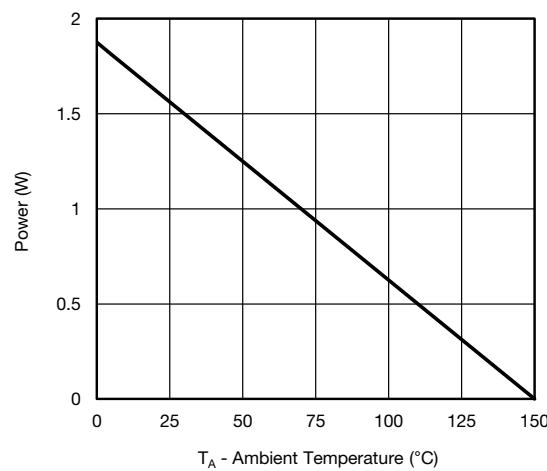
Safe Operating Area

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


Current Derating*



Power Derating, Junction-to-Foot

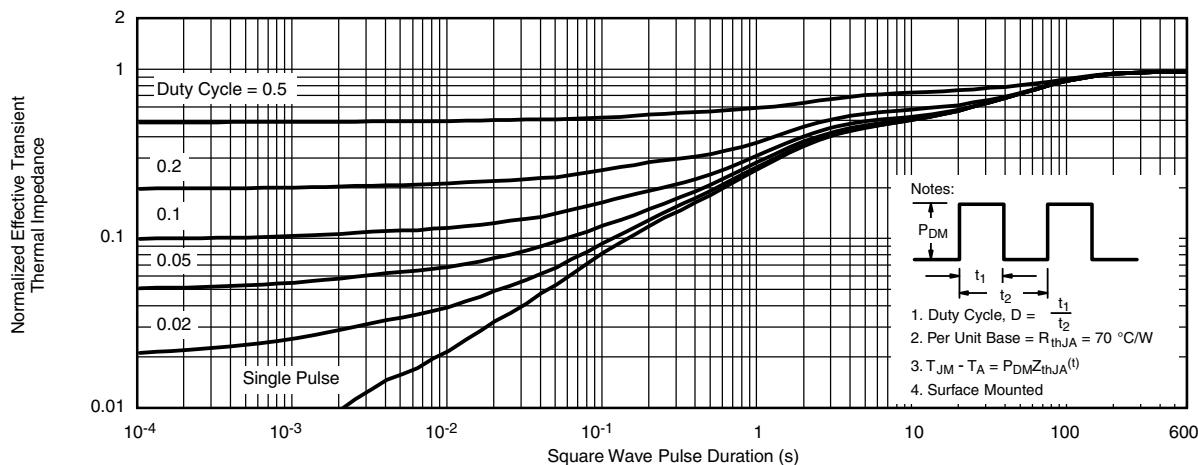


Power Derating, Junction-to-Ambient

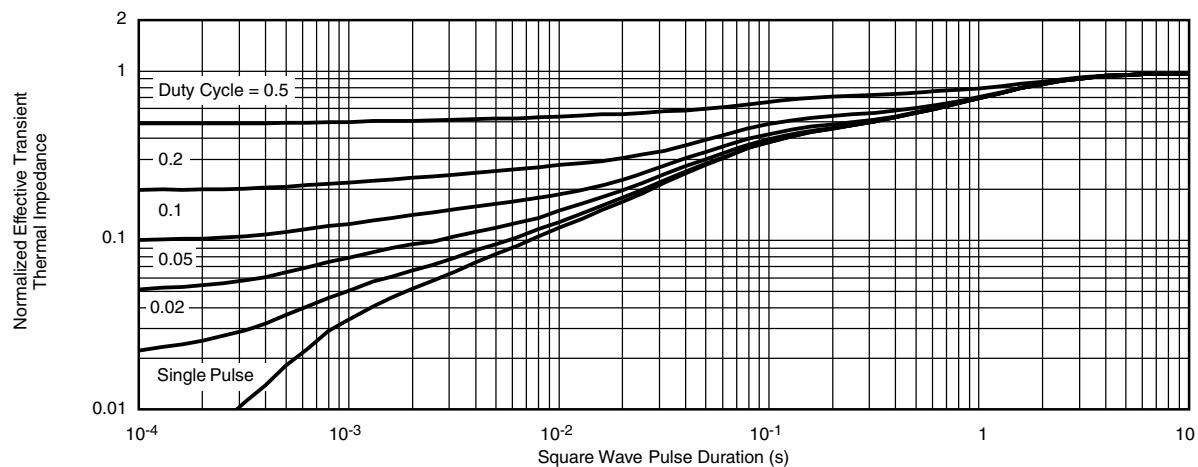
* The power dissipation P_D is based on $T_{J(max.)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

Si4101DY

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**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)

Normalized Thermal Transient Impedance, Junction-to-Ambient

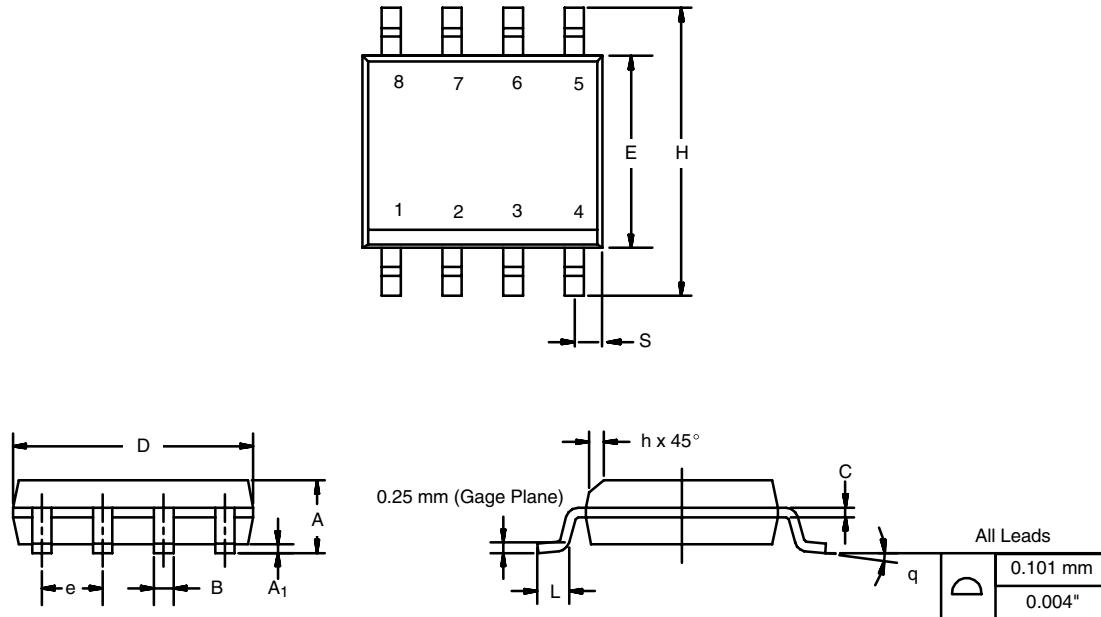


Normalized Thermal Transient Impedance, Junction-to-Foot

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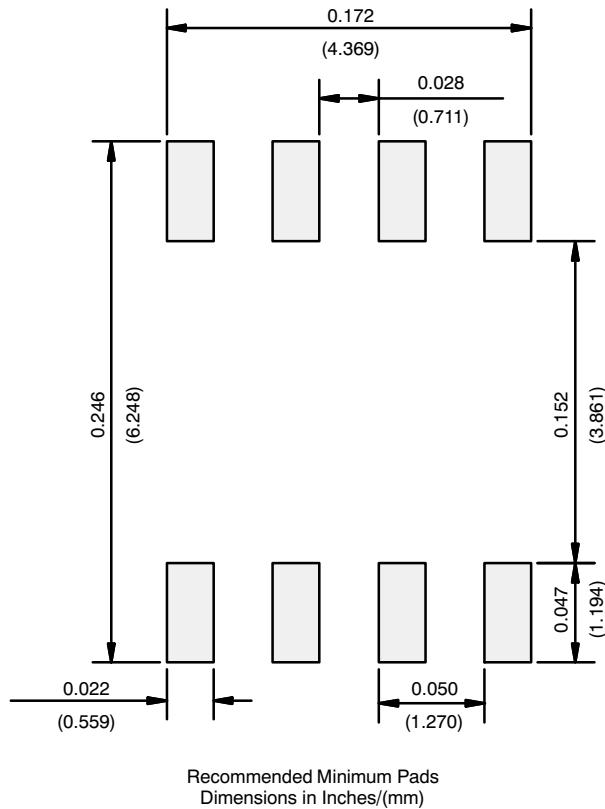
SOIC (NARROW): 8-LEAD

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



[Return to Index](#)

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