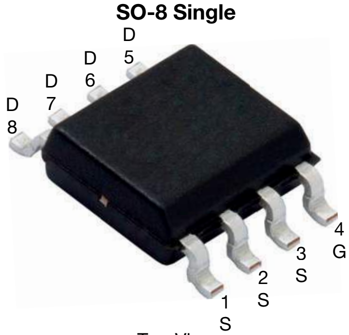
Automotive P-Channel 30 V (D-S) 175 °C MOSFET

SO-8 Single



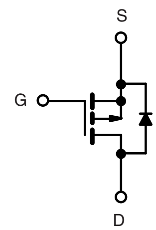
Top View

FEATURES

- TrenchFET® power MOSFET
- AEC-Q101 qualified [c]
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE
Pb-free
RoHS COMPLIANT
HALOGEN FREE

PRODUCT SUMMARY	
V_{DS} (V)	-30
$R_{DS(on)}$ (Ω) at V_{GS} = -10 V	0.0085
$R_{DS(on)}$ (Ω) at V_{GS} = -4.5 V	0.0200
I_D (A)	-22
Configuration	Single



P-Channel MOSFET

ORDERING INFORMATION	
Package	SO-8
Lead (Pb)-free and halogen-free	SQ4483EY (for detailed order number please see www.vishay.com/doc?79771)

ABSOLUTE MAXIMUM RATINGS (T_C = 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	I_D	-30	A
		-30	
Continuous source current (diode conduction)	I_S	-30	
Pulsed drain current [a]	I_{DM}	-84	
Single pulse avalanche current	I_{AS}	-32	
Single pulse avalanche energy	E_{AS}	51	mJ
Maximum power dissipation [a]	P_D	7	W
		2	
Operating junction and storage temperature range	T_J, T_{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS

PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-ambient	PCB mount [b]	R_{thJA}	85	°C/W
Junction-to-case (drain)		R_{thJF}	21	

Notes

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
b. When mounted on 1" square PCB (FR4 material)
c. Parametric verification ongoing

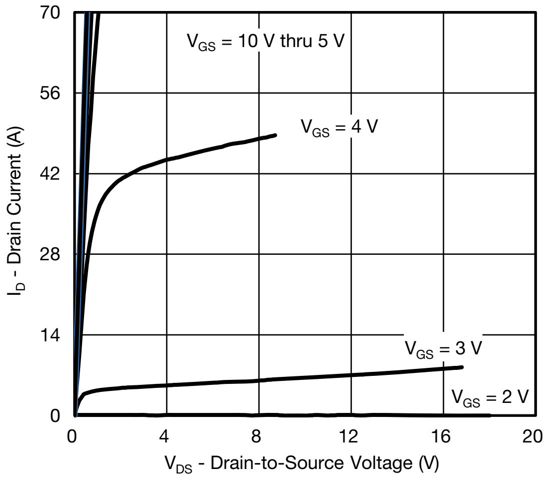
SPECIFICATIONS (T_C = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-source breakdown voltage	V_{DS}	V_{GS} = 0 V, I_D = -250 μA	-30	-	-	V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 μA	-1.5	-2.0	-2.5	V
Gate-source leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero gate voltage drain current	I_{DSS}	V_{GS} = 0 V, V_{DS} = -30 V	-	-	-1	μA
		V_{GS} = 0 V, V_{DS} = -30 V, T_J = 125 °C	-	-	-50	
		V_{GS} = 0 V, V_{DS} = -30 V, T_J = 175 °C	-	-	-150	
On-state drain current [a]	$I_{D(on)}$	V_{GS} = -10 V, $V_{DS} \leq$ -5 V	-30	-	-	A
Drain-source on-state resistance [a]	$R_{DS(on)}$	V_{GS} = -10 V, I_D = -10 A	-	0.0070	0.0085	Ω
		V_{GS} = -10 V, I_D = -10 A, T_J = 125 °C	-	-	0.0130	
		V_{GS} = -10 V, I_D = -10 A, T_J = 175 °C	-	-	0.0150	
		V_{GS} = -4.5 V, I_D = -7 A	-	0.0160	0.0200	
Forward transconductance [b]	g_{fs}	V_{DS} = -10 V, I_D = -10 A	-	32	-	S
Dynamic [b]						
Input capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = -15 V, f = 1 MHz	-	3400	4500	pF
Output capacitance	C_{oss}		-	712	890	
Reverse transfer capacitance	C_{rss}		-	580	770	
Total gate charge [c]	Q_g	V_{GS} = -10 V, V_{DS} = -15 V, I_D = -10 A	-	75	113	nC
Gate-source charge [c]	Q_{gs}		-	9.5	-	
Gate-drain charge [c]	Q_{gd}		-	19	-	
Gate resistance	R_g	f = 1 MHz	1	2	3	Ω
Turn-on delay time [c]	$t_{d(on)}$	V_{DD} = -15 V, R_L = 1.5 Ω $I_D \cong$ -10 A, V_{GEN} = -10 V, R_g = 1 Ω	-	20	25	ns
Rise time [c]	t_r		-	146	189	
Turn-off delay time [c]	$t_{d(off)}$		-	57	75	
Fall time [c]	t_f		-	20	25	
Source-Drain Diode Ratings and Characteristics [b]						
Pulsed current [a]	I_{SM}		-	-	-84	A
Forward voltage	V_{SD}	I_F = -3 A, V_{GS} = 0 V	-	-0.75	-1.2	V

Notes

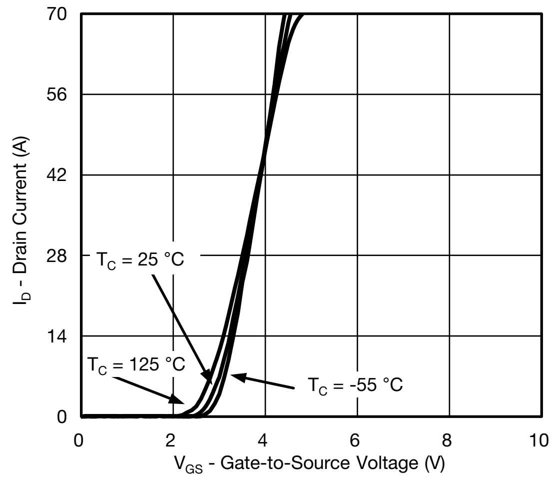
d. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
e. Guaranteed by design, not subject to production testing
f. Independent of operating temperature

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.

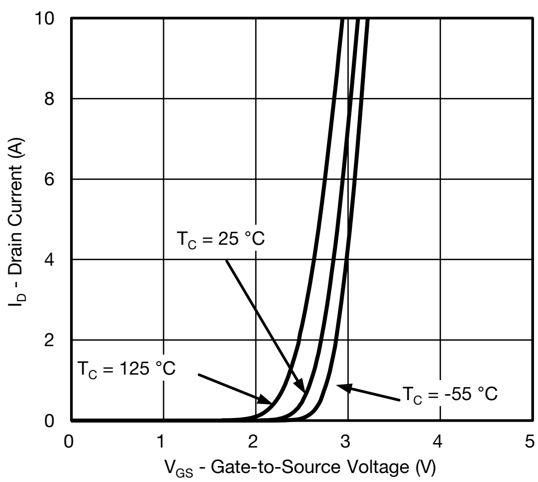
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



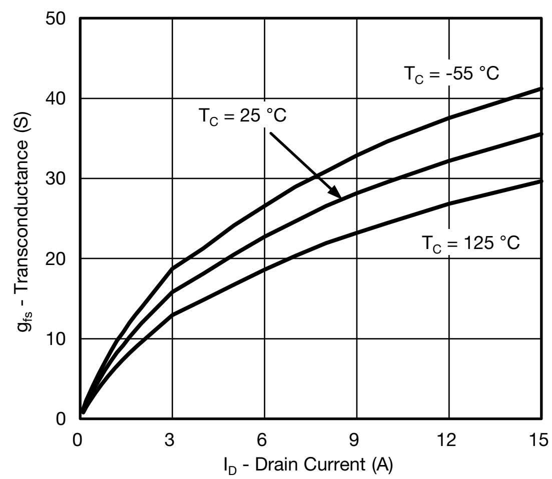
Output Characteristics



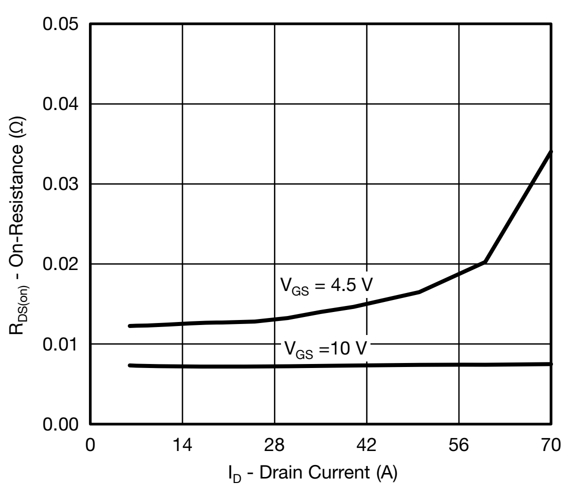
Transfer Characteristics



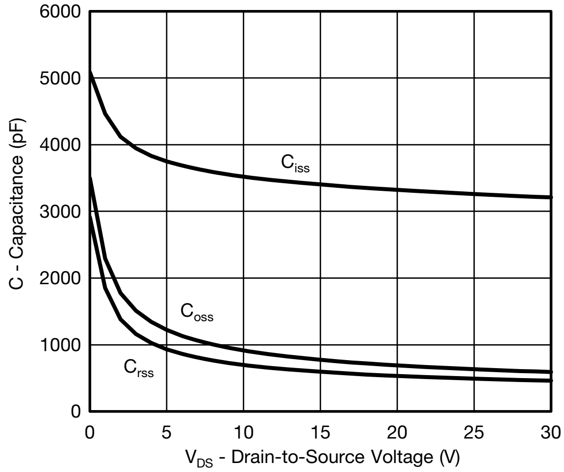
Transfer Characteristics



Transconductance



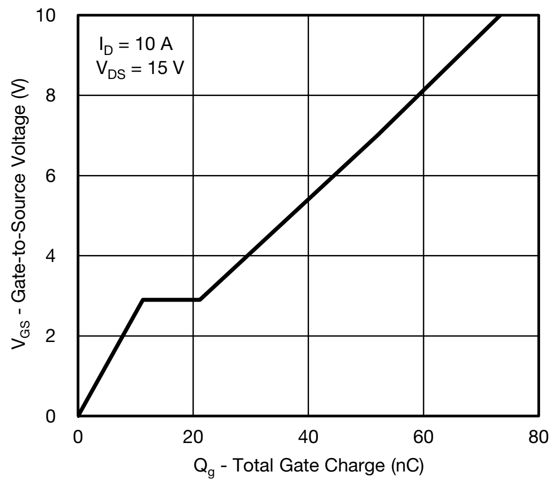
On-Resistance vs. Drain Current



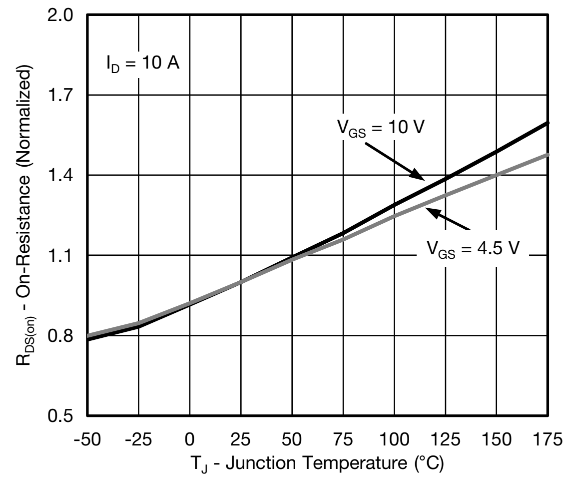
Capacitance

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

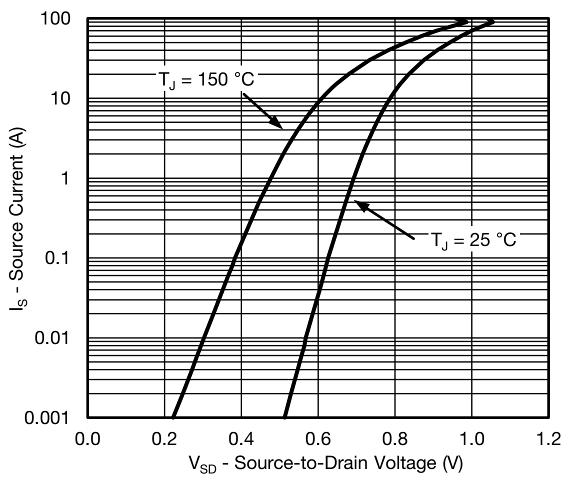
Threshold Voltage



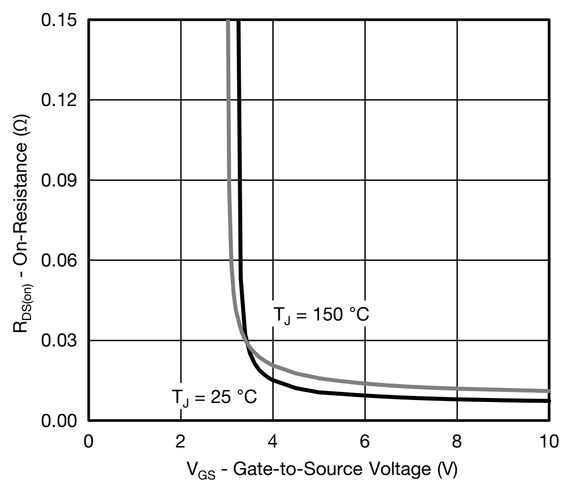
Gate Charge



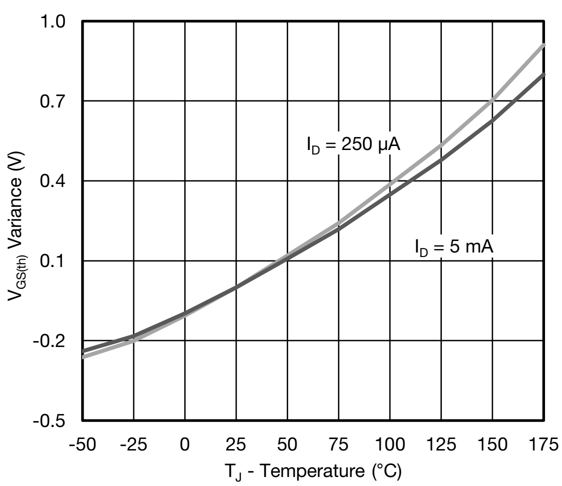
On-Resistance vs. Junction Temperature

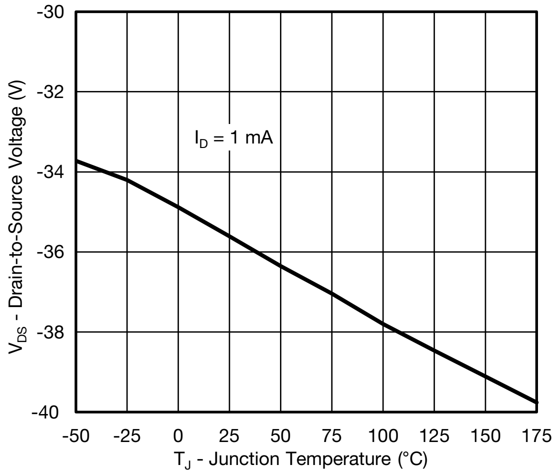


Source Drain Diode Forward Voltage



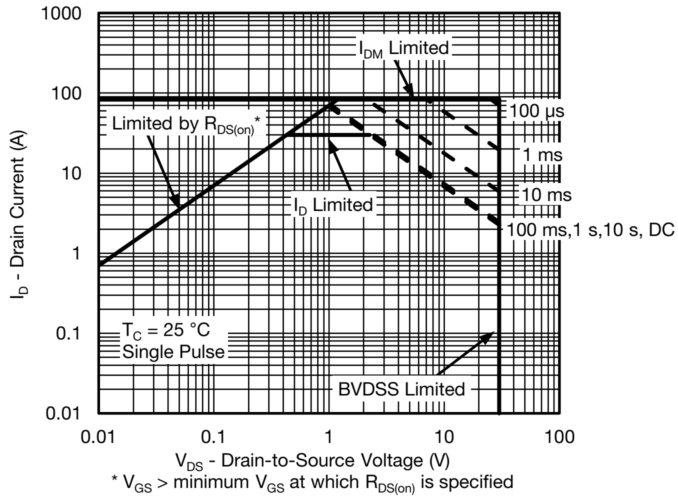
On-Resistance vs. Gate-to-Source Voltage



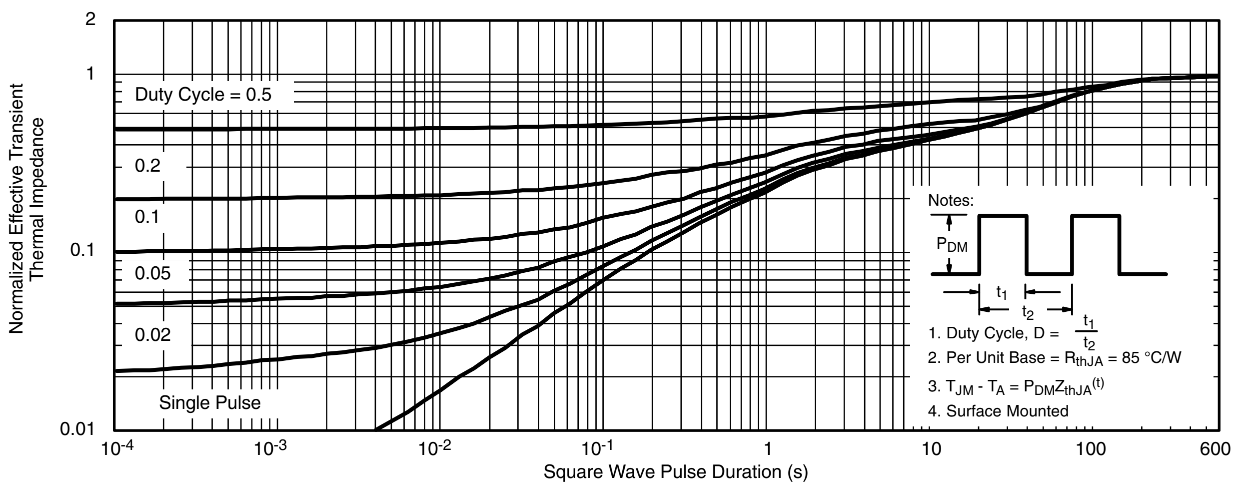


Drain Source Breakdown vs. Junction Temperature

THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)

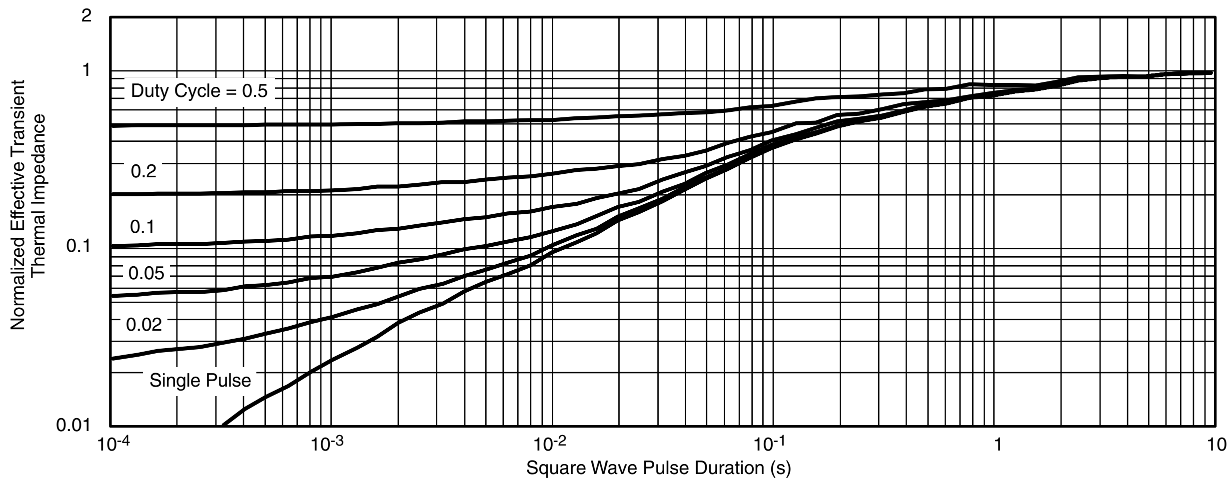


Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Foot

Note

- The characteristics shown in the two graphs
  - Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
  - Normalized Transient Thermal Impedance Junction-to-Foot (25 °C)

  are given for general guidelines only to enable the user to get a “ball park” indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions

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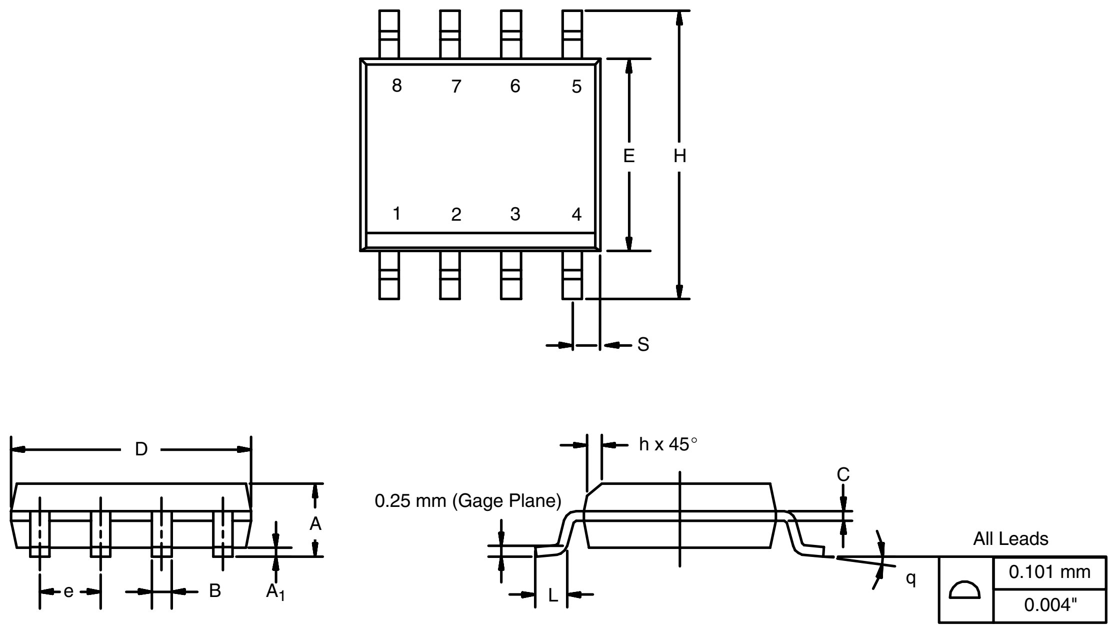
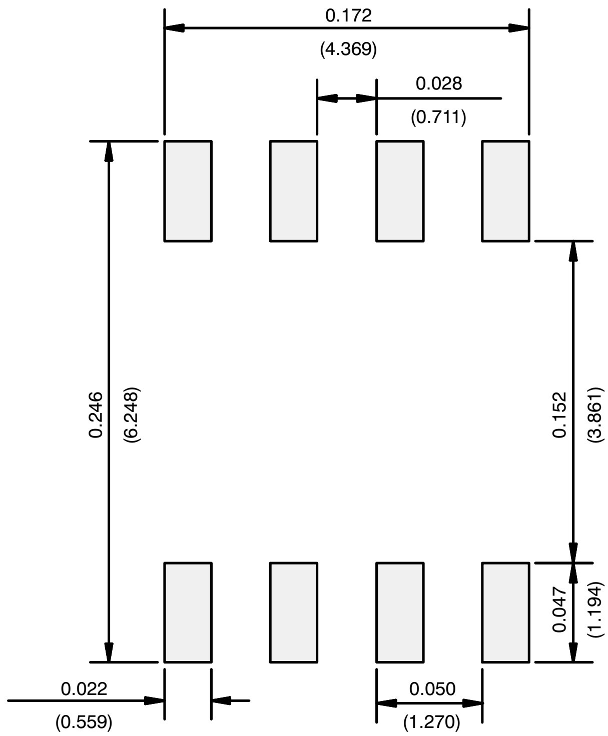
SOIC (NARROW): 8-LEAD
JEDEC Part Number: MS-012



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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