

N-Channel 30-V (D-S) MOSFET

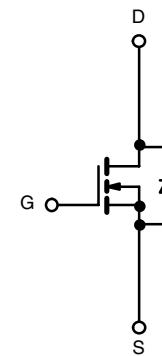
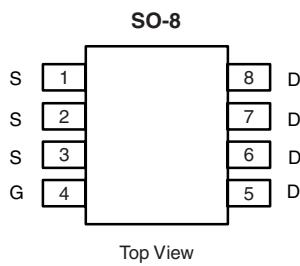
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
30	0.0045 at $V_{GS} = 10$ V	22
	0.005 at $V_{GS} = 4.5$ V	19
	0.0075 at $V_{GS} = 2.5$ V	17

FEATURES

- Halogen-free According to IEC 61249-2-21 Available
- TrenchFET® Power MOSFETs: 2.5 V Rated
- 100 % R_g Tested



RoHS
COMPLIANT
HALOGEN
FREE
Available



Ordering Information: Si4442DY-T1-E3 (Lead (Pb)-free)
Si4442DY-T1-GE3 (Lead (Pb)-free and Halogen-free)

N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted						
Parameter		Symbol	10 s	Steady State	Unit	
Drain-Source Voltage		V_{DS}	30		V	
Gate-Source Voltage		V_{GS}	± 12			
Continuous Drain Current ($T_J = 150$ °C) ^a	$T_A = 25$ °C	I_D	22	15	A	
	$T_A = 70$ °C		17	11		
Pulsed Drain Current (10 μ s Pulse Width)		I_{DM}	60			
Continuous Source Current (Diode Conduction) ^a		I_S	2.9	1.3		
Maximum Power Dissipation ^a	$T_A = 25$ °C	P_D	3.5	1.6	W	
	$T_A = 70$ °C		2.2	1		
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	$t \leq 10$ s	R_{thJA}	29	35	°C/W
	Steady State		67	80	
Maximum Junction-to-Foot (Drain)		Steady State	R_{thJF}	13	16

Notes:

a. Surface Mounted on 1" x 1" FR4 board.

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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$	0.6		1.5	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 12 \text{ V}$			± 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	$I_{D(\text{on})}$	$V_{DS} \geq 5 \text{ V}$, $V_{GS} = 10 \text{ V}$	30			A
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}$, $I_D = 22 \text{ A}$		0.0035	0.0045	Ω
		$V_{GS} = 4.5 \text{ V}$, $I_D = 19 \text{ A}$		0.0041	0.005	
		$V_{GS} = 2.5 \text{ V}$, $I_D = 17 \text{ A}$		0.0062	0.0075	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15 \text{ V}$, $I_D = 22 \text{ A}$		100		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.9 \text{ A}$, $V_{GS} = 0 \text{ V}$		0.75	1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 15 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 22 \text{ A}$		36	50	nC
Gate-Source Charge	Q_{gs}			8		
Gate-Drain Charge	Q_{gd}			10.5		
Gate Resistance	R_g		0.5	1.5	2.6	Ω
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = 15 \text{ V}$, $R_L = 15 \Omega$ $I_D \geq 1 \text{ A}$, $V_{GEN} = 10 \text{ V}$, $R_g = 6 \Omega$		17	30	ns
Rise Time	t_r			11	20	
Turn-Off Delay Time	$t_{d(\text{off})}$			125	180	
Fall Time	t_f			47	70	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.9 \text{ A}$, $dl/dt = 100 \text{ A}/\mu\text{s}$		50	80	

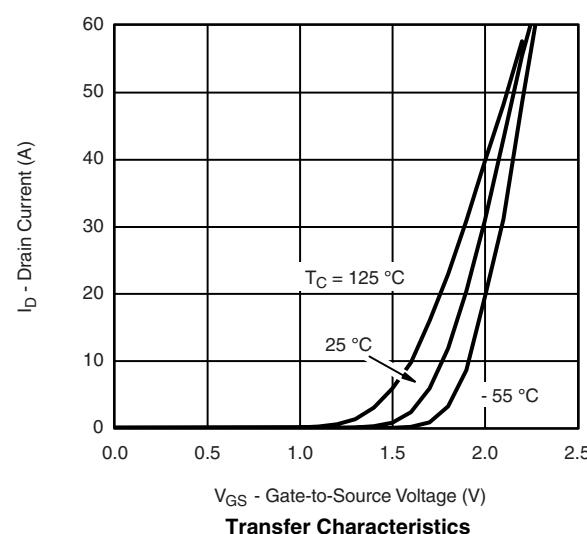
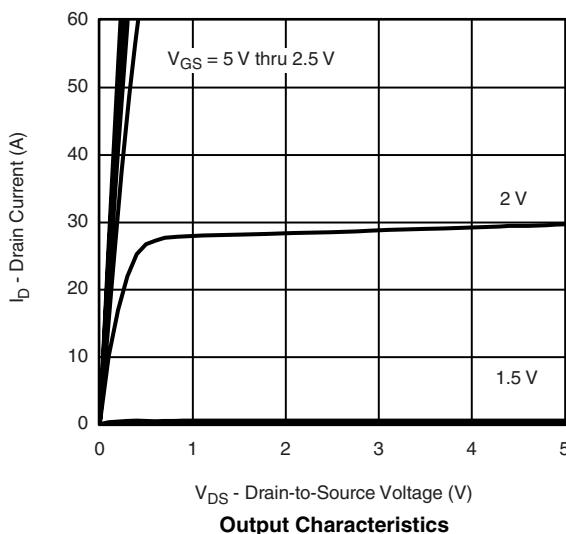
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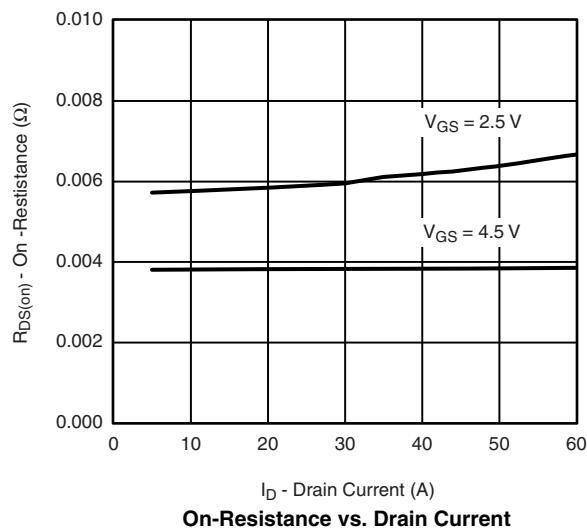
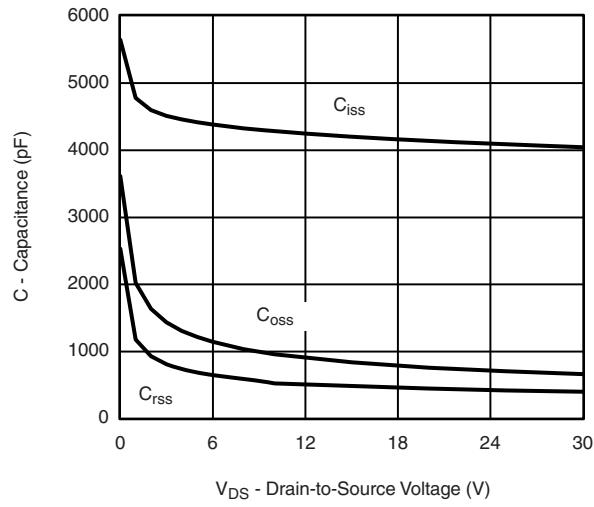
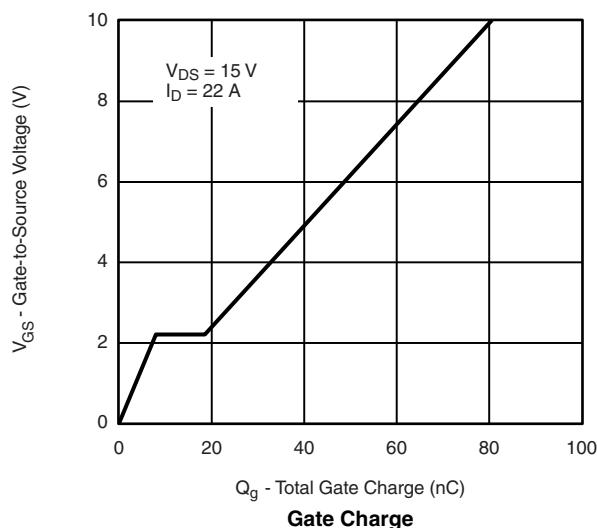
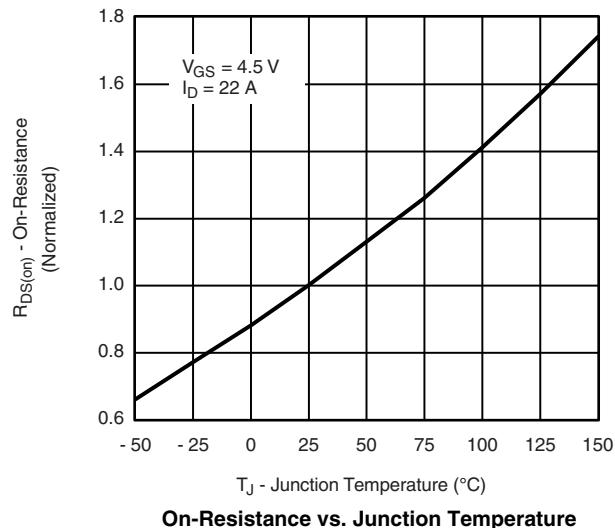
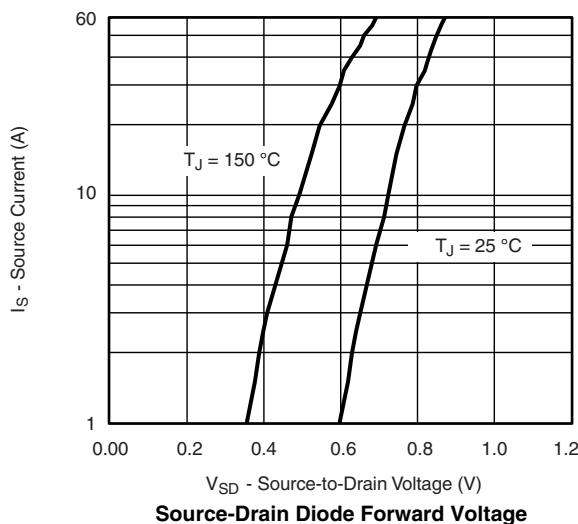
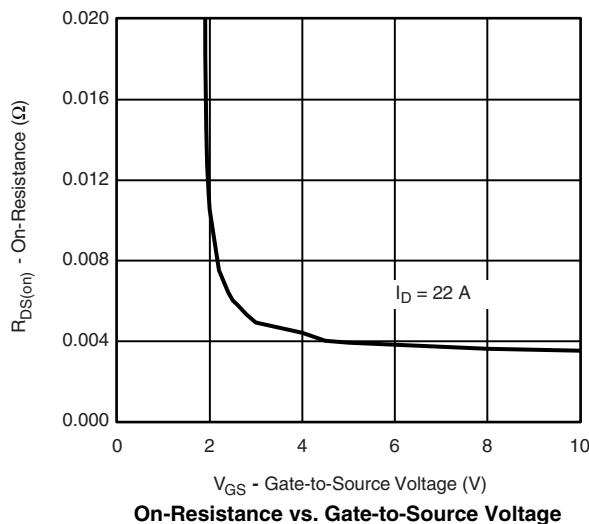
a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.

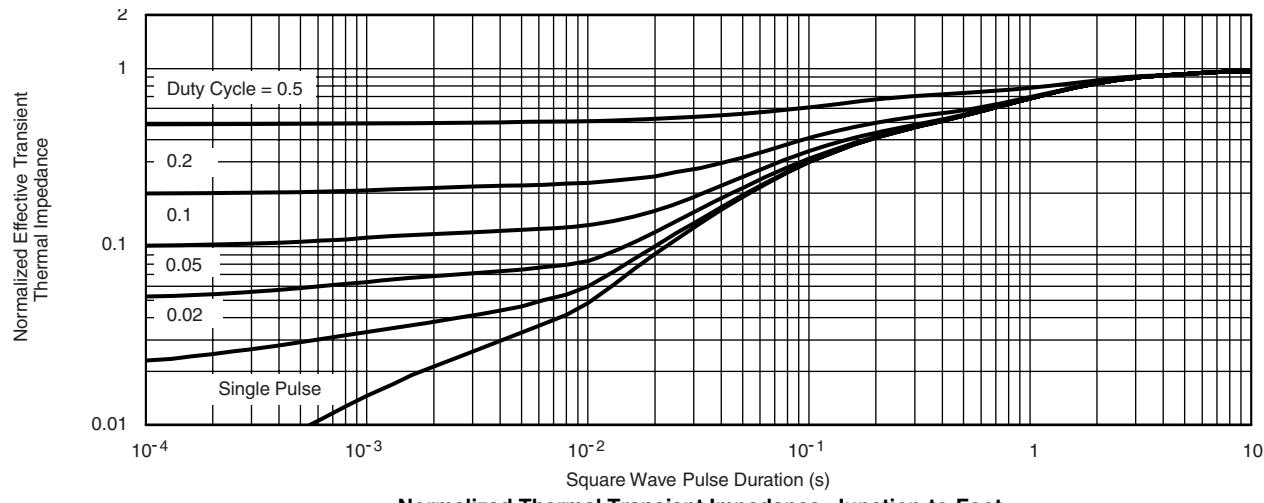
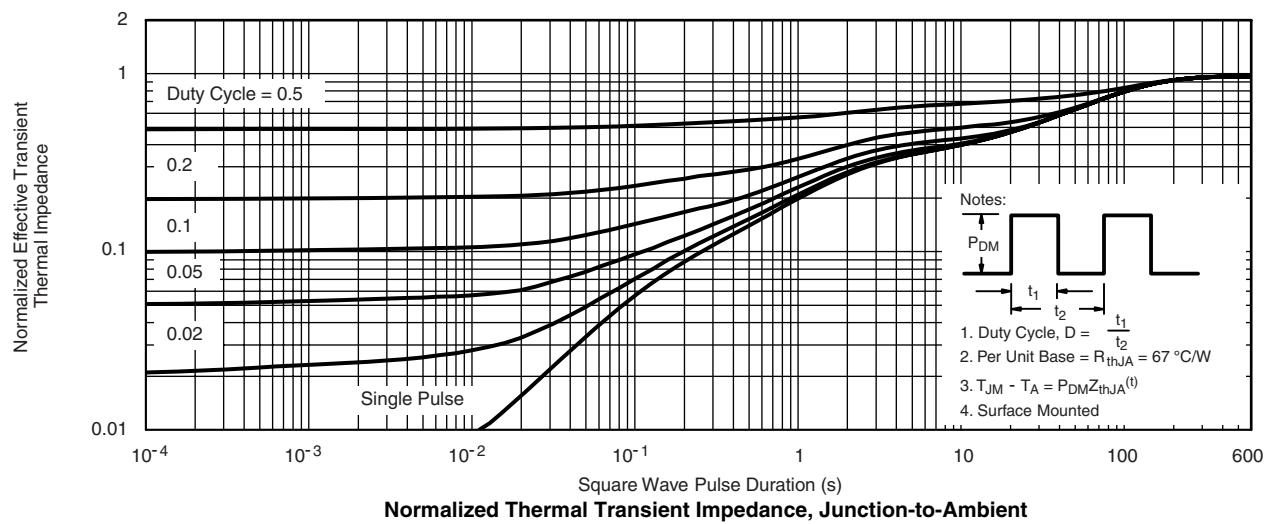
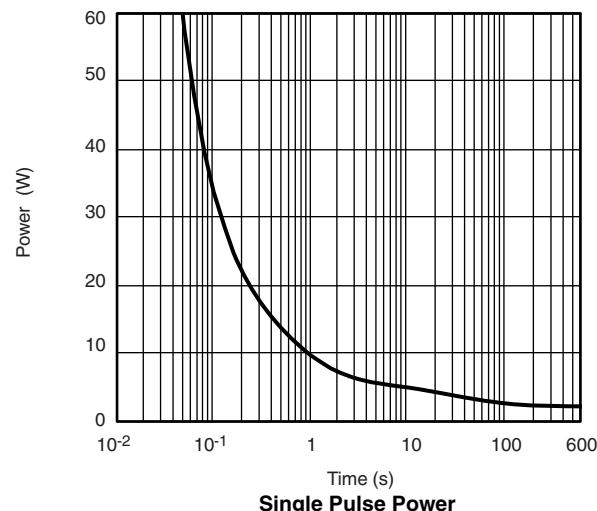
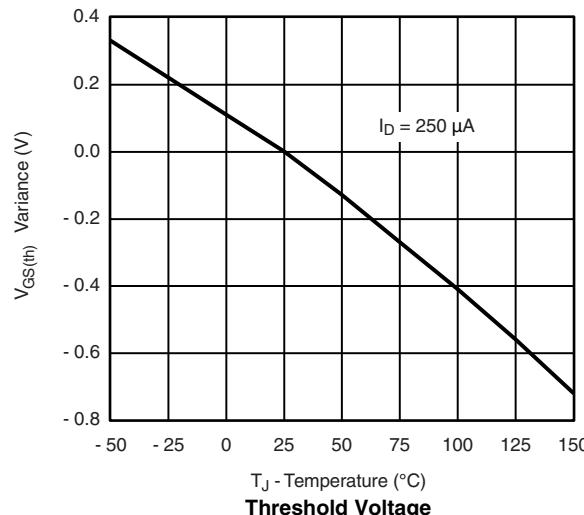
b. Guaranteed by design, not subject to production testing.

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



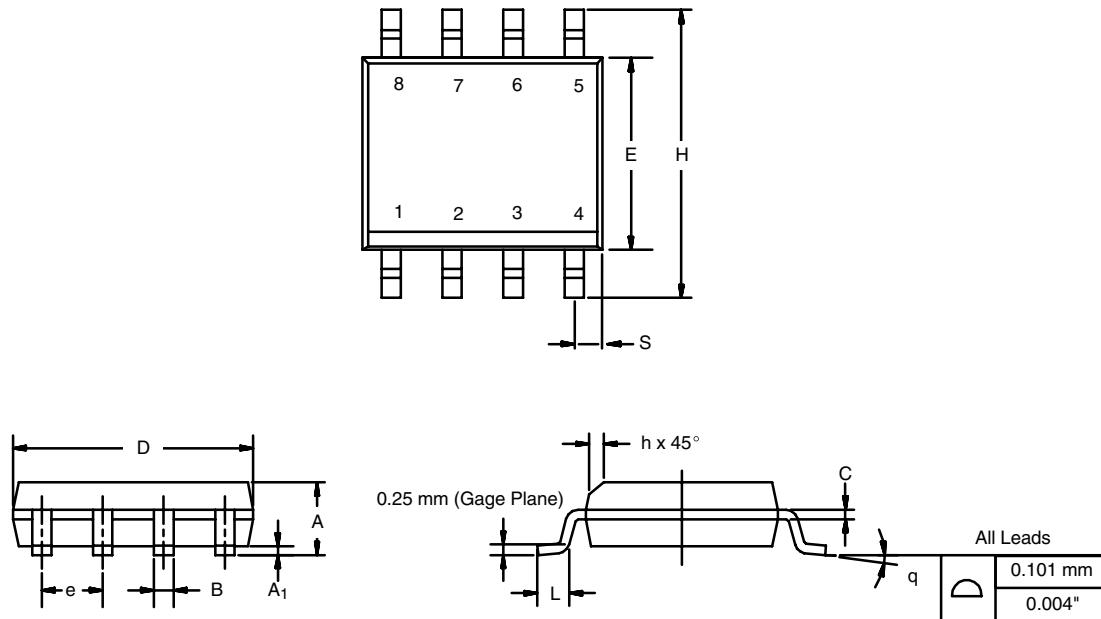
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

On-Resistance vs. Drain Current

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature

Source-Drain Diode Forward Voltage

On-Resistance vs. Gate-to-Source Voltage

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


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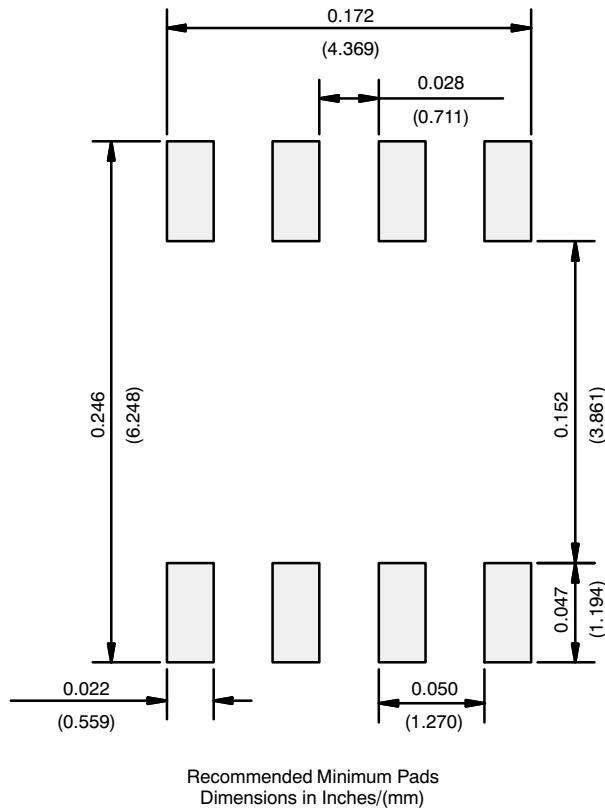
SOIC (NARROW): 8-LEAD

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



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