

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

■ Features

- Low $r_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Miniature SO-8 Surface Mount Package Saves Board Space
- High power and current handling capability

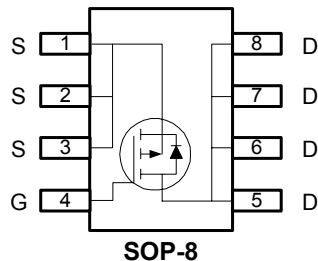
■ General Description

These miniature surface mount MOSFETs utilize High Cell Density process. Low $r_{DS(on)}$ assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are PWM DC-DC converters, power management in portable and battery-powered products such as computers, printers, battery charger, telecommunication power system, and telephones power system.

■ Product Summary

V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
-20	20@ $V_{GS}=-4.5V$	10.2
	29@ $V_{GS}=-2.5V$	8.5
	54@ $V_{GS}=-1.8V$	6.2

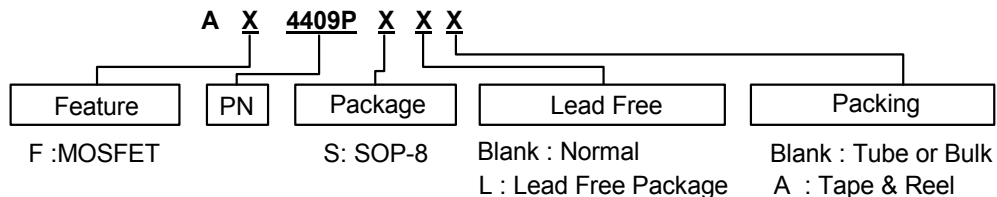
■ Pin Assignments



■ Pin Descriptions

Pin Name	Description
S	Source
G	Gate
D	Drain

■ Ordering information





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

■ Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current (Note 1)	$T_A=25^\circ\text{C}$	10.2
		$T_A=70^\circ\text{C}$	8.2
I_{DM}	Pulsed Drain Current (Note 2)	± 30	A
I_S	Continuous Source Current (Diode Conduction) (Note 1)	-2.3	A
P_D	Power Dissipation (Note 1)	$T_A=25^\circ\text{C}$	3.1
		$T_A=70^\circ\text{C}$	2
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ\text{C}$

■ Thermal Resistance Ratings

Symbol	Parameter	Maximum	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient (Note 1)	$t \leq 10$ sec	50
		Steady State	92

Note 1: surface Mounted on 1"x 1" FR4 Board.

Note 2: Pulse width limited by maximum junction temperature

■ Specifications ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Static						
$V_{GS(th)}$	Gate-Threshold Voltage	$V_{DS}=V_{GS}, I_D=-350\mu\text{A}$	-0.6	-	-	V
I_{GSS}	Gate-Body Leakage	$V_{DS}=0\text{V}, V_{GS}=\pm 12\text{V}$	-	-	± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-16\text{V}, V_{GS}=0\text{V}$	-	-	-1	uA
		$V_{DS}=-16\text{V}, V_{GS}=0\text{V}, T_J=55^\circ\text{C}$	-	-	-10	
$I_{D(on)}$	On-State Drain Current (Note 3)	$V_{DS}=-5\text{V}, V_{GS}=-4.5\text{V}$	-20	-	-	A
$r_{DS(on)}$	Drain-Source On-Resistance (Note 3)	$V_{GS}=-4.5\text{V}, I_D=-10.2\text{A}$	-	-	20	m Ω
		$V_{GS}=-2.5\text{V}, I_D=-8.5\text{A}$	-	-	29	
		$V_{GS}=-1.8\text{V}, I_D=-6.2\text{A}, T_J=55^\circ\text{C}$	-	-	54	
g_{fs}	Forward Transconductance (Note 3)	$V_{DS}=-10\text{V}, I_D=-10.2\text{A}$	-	36	-	S
V_{SD}	Diode Forward Voltage	$I_S=-2.3\text{A}, V_{GS}=0\text{V}$	-	-0.8	-1.2	V
Dynamic (Note 4)						
Q_g	Total Gate Charge	$V_{DS}=-10\text{V}, V_{GS}=-5\text{V}, I_D=-10.2\text{A}$	-	30	-	nC
Q_{gs}	Gate-Source Charge		-	4	-	
Q_{gd}	Gate-Drain Charge		-	8.3	-	
Switching						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-10\text{V}, R_L=15\Omega, I_D=-1\text{A}, V_{GEN}=-5\text{V}, R_G=6\Omega,$	-	25	-	nS
t_r	Rise Time		-	45	-	
$t_{d(off)}$	Turn-Off Delay Time		-	150	-	
t_f	Fall-Time		-	70	-	

Note 3: Pulse test: $PW \leq 300\mu\text{s}$ duty cycle $\leq 2\%$.

Note 4: Guaranteed by design, not subject to production testing.

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Typical Performance Characteristics

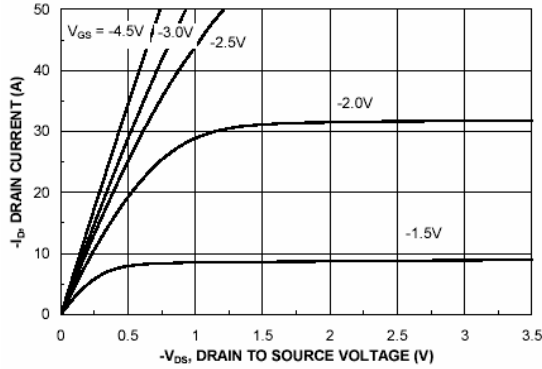


Figure 1. Output Characteristics

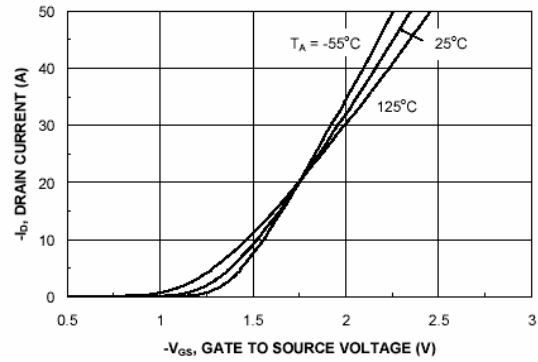


Figure 2. Transfer Characteristics

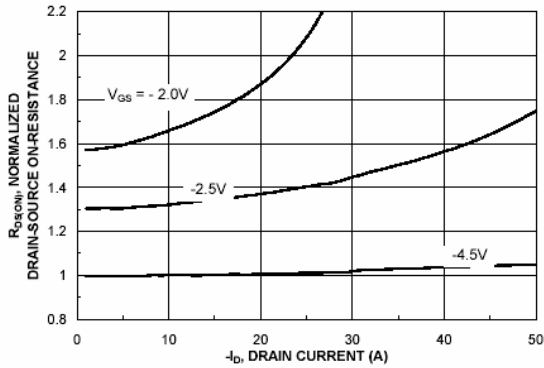


Figure 3. On Resistance vs. Drain Current

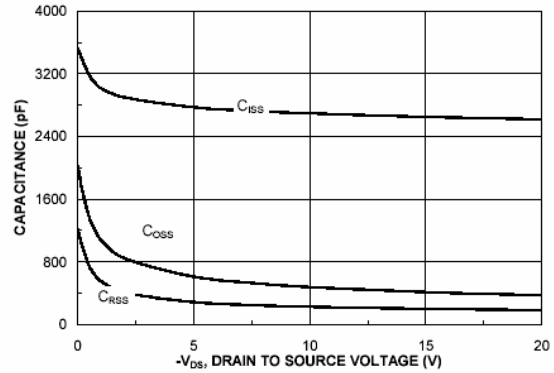


Figure 4. Capacitance

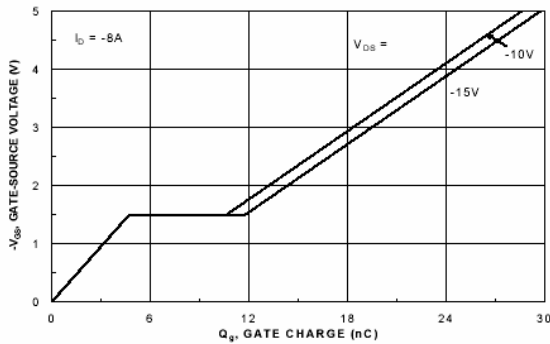


Figure 5. Gate Charge

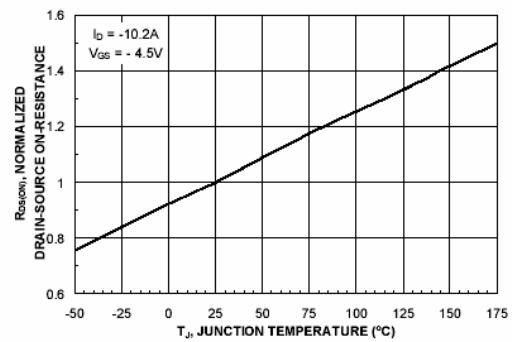


Figure 6. On-Resistance vs. Junction Temperature

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■ Typical Performance Characteristics (Continued)

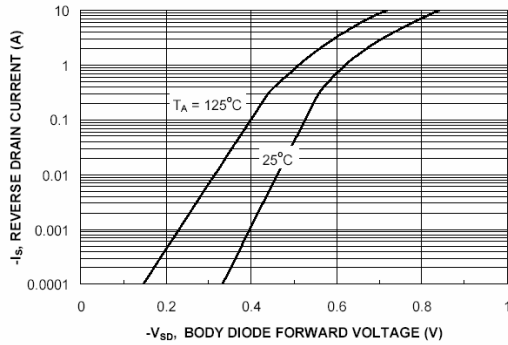


Figure 7. Source-Drain Diode Forward Voltage

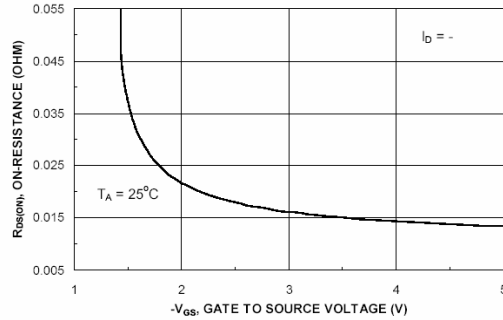


Figure 8. On-Resistance vs. Gate-to-Source Voltage

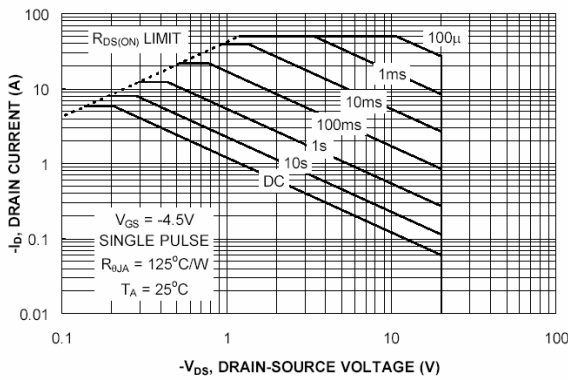


Figure 9. Safe Operating Area

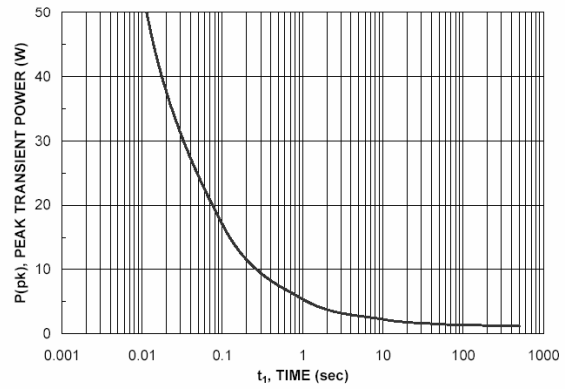


Figure 10. Single Pulse Power, Junction-to-Ambient

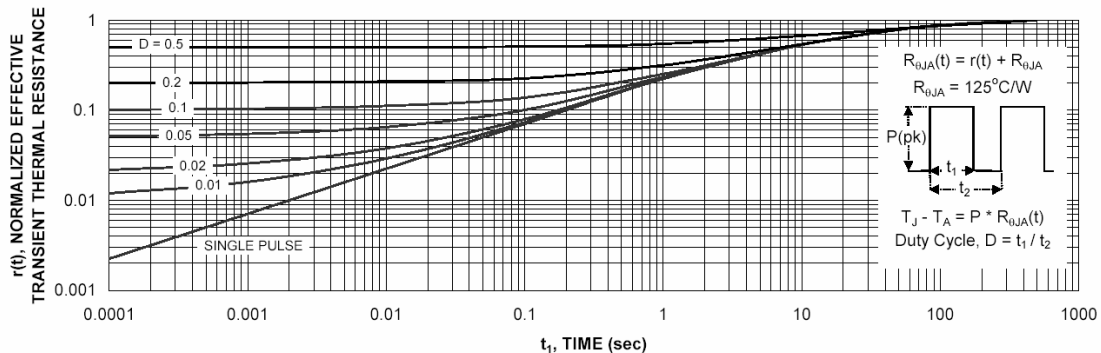
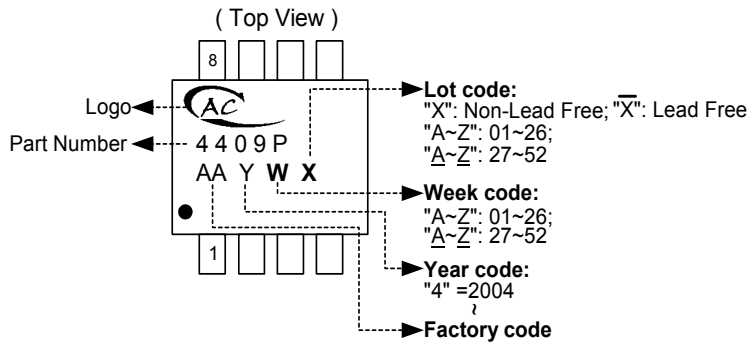


Figure 11. Normalized Thermal Transient Impedance, Junction-to-Ambient

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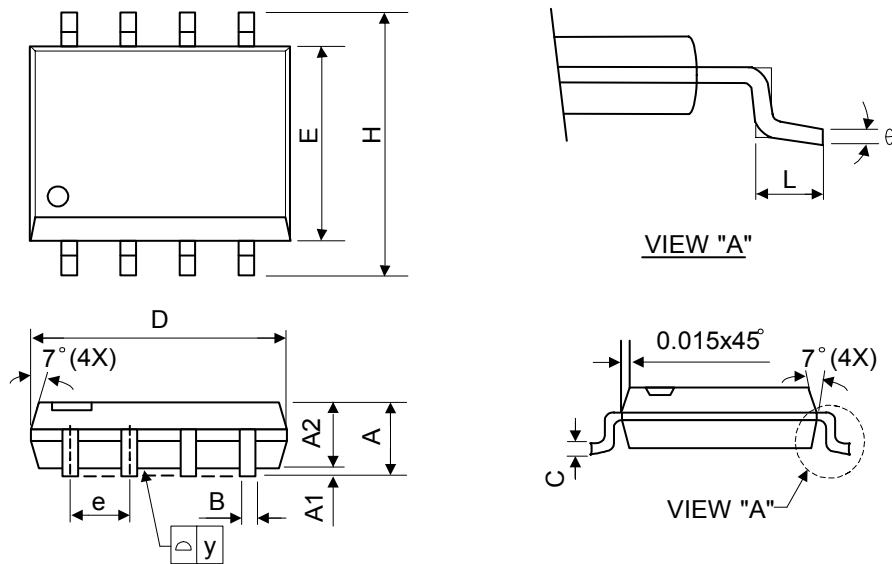
■ Marking Information

SOP-8L



■ Package Information

Package Type: SOP-8L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.40	1.60	1.75	0.055	0.063	0.069
A1	0.10	-	0.25	0.040	-	0.100
A2	1.30	1.45	1.50	0.051	0.057	0.059
B	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.010
D	4.80	5.05	5.30	0.189	0.199	0.209
E	3.70	3.90	4.10	0.146	0.154	0.161
e	-	1.27	-	-	0.050	-
H	5.79	5.99	6.20	0.228	0.236	0.244
L	0.38	0.71	1.27	0.015	0.028	0.050
y	-	-	0.10	-	-	0.004
θ	0°	-	8°	0°	-	8°



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