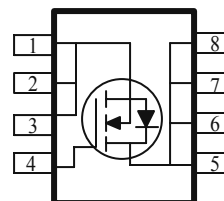
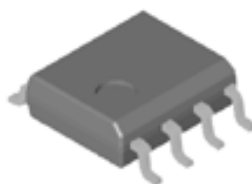


## N-Channel 30-V (D-S) MOSFET

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low  $r_{DS(on)}$  and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

- Low  $r_{DS(on)}$  provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe SOIC-8 saves board space
- Fast switching speed
- High performance trench technology



PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ m( $\Omega$ )	$I_D$ (A)
30	13.5 @ $V_{GS} = 10V$	13
	20 @ $V_{GS} = 4.5V$	11

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Units
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$T_A = 25^\circ\text{C}$	$\pm 13$	A
	$T_A = 70^\circ\text{C}$	$\pm 11$	
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	$\pm 50$	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	2.3	A
Power Dissipation <sup>a</sup>	$T_A = 25^\circ\text{C}$	3.1	W
	$T_A = 70^\circ\text{C}$	2.2	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Case <sup>a</sup>	$t \leq 5$ sec	$R_{\theta JC}$	25	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 5$ sec	$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$

### Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

SPECIFICATIONS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	1			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = 20 \text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}$			1	uA
		$V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$			25	
On-State Drain Current <sup>A</sup>	$I_{D(on)}$	$V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$	20			A
Drain-Source On-Resistance <sup>A</sup>	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 10 \text{ A}$			13.5	m $\Omega$
		$V_{GS} = 4.5 \text{ V}, I_D = 8 \text{ A}$			20	
Forward Transconductance <sup>A</sup>	$g_{fs}$	$V_{DS} = 15 \text{ V}, I_D = 10 \text{ A}$		40		S
Diode Forward Voltage	$V_{SD}$	$I_S = 2.3 \text{ A}, V_{GS} = 0 \text{ V}$		0.7		V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V},$ $I_D = 10 \text{ A}$		12.5		nC
Gate-Source Charge	$Q_{gs}$			2.6		
Gate-Drain Charge	$Q_{gd}$			4.6		
Input Capacitance	$C_{iss}$	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V},$ $f = 1 \text{ MHz}$		1191		pF
Output Capacitance	$C_{oss}$			412		
Reverse Transfer Capacitance	$C_{rss}$			160		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 25 \text{ V}, R_L = 25 \Omega, I_D = 1 \text{ A},$ $V_{GEN} = 10 \text{ V}$		20		nS
Rise Time	$t_r$			9		
Turn-Off Delay Time	$t_{d(off)}$			70		
Fall-Time	$t_f$			20		

## Notes

- Pulse test: PW  $\leq$  300us duty cycle  $\leq$  2%.
- Guaranteed by design, not subject to production testing.

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## Typical Electrical Characteristics (N-Channel)

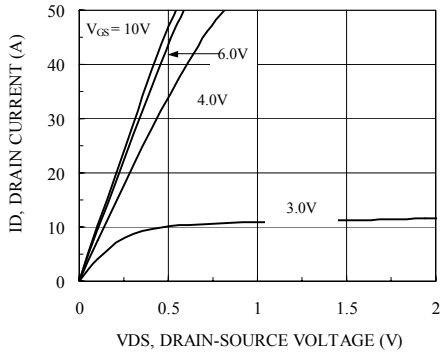


Figure 1. On-Region Characteristics

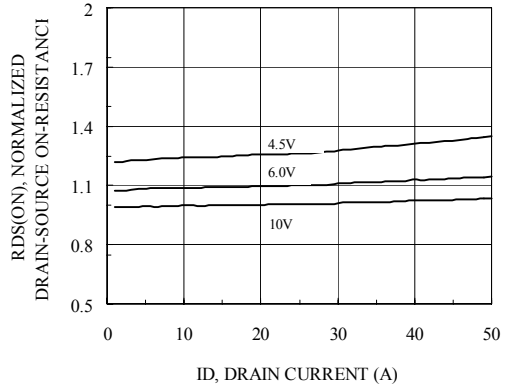


Figure 2. On-Resistance with Drain Current

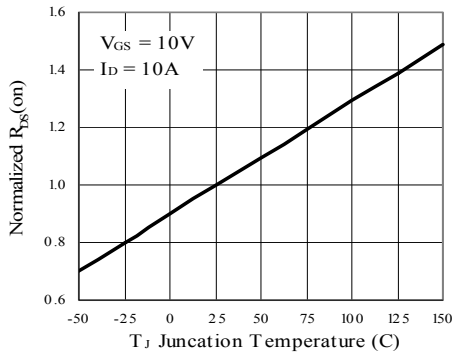


Figure 3. On-Resistance Variation with Temperature

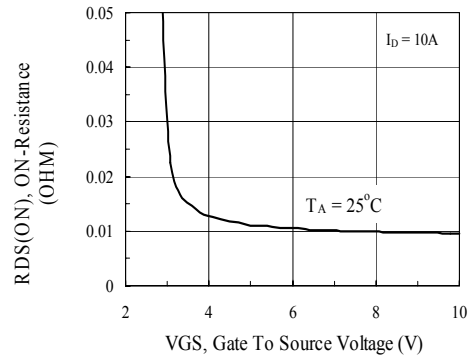


Figure 4. On-Resistance Variation with Gate to Source Voltage

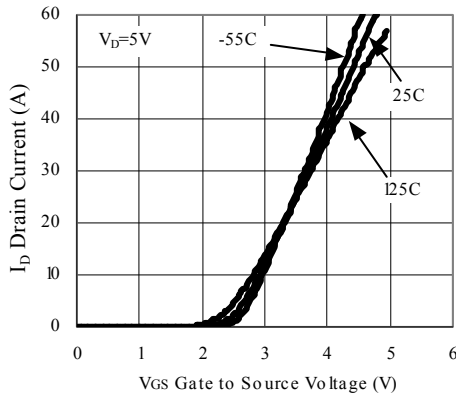


Figure 5. Transfer Characteristics

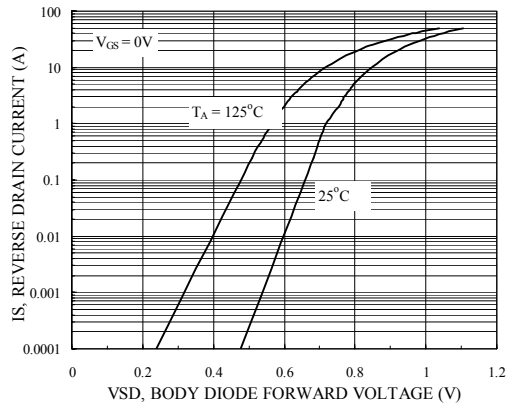


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

### Typical Electrical Characteristics (N-Channel)

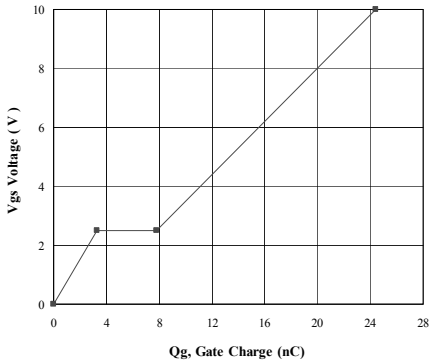


Figure 7. Gate Charge Characteristics

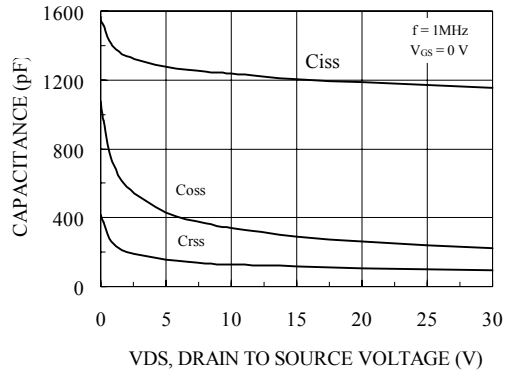


Figure 8. Capacitance Characteristics

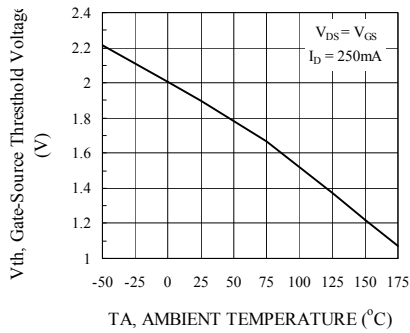


Figure 9. Threshold Vs Ambient Temperature

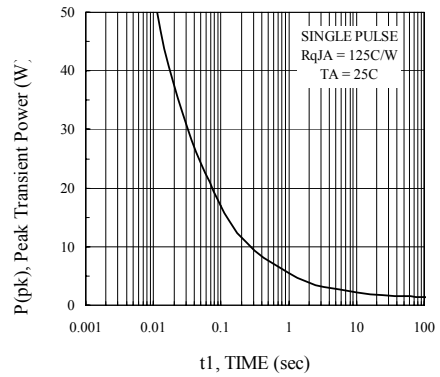


Figure 10. Single Pulse Maximum Power Dissipation

### Normalized Thermal Transient Junction to Ambient

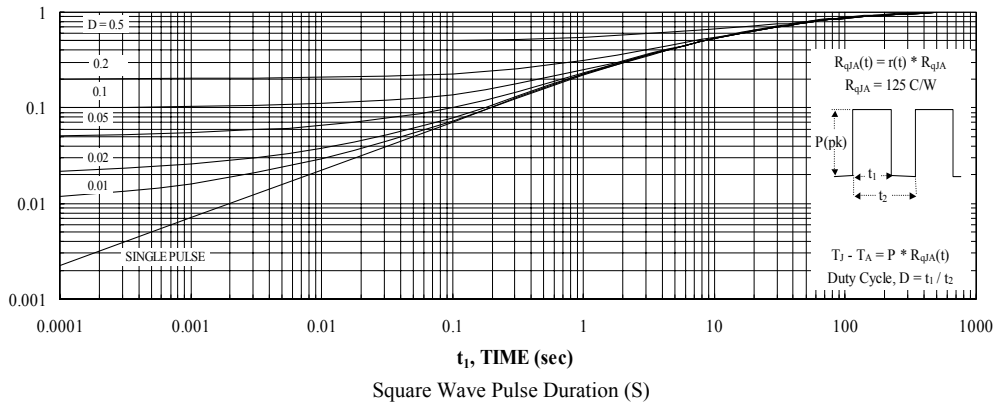
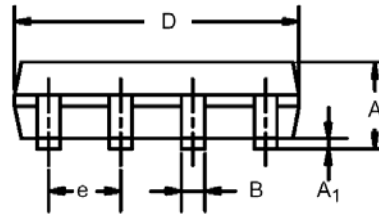
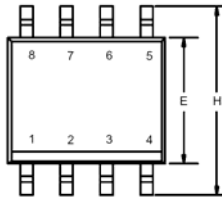


Figure 11. Transient Thermal Response Curve

Package Information

SO-8: 8LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A <sub>1</sub>	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°

