

DESCRIPTION

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.

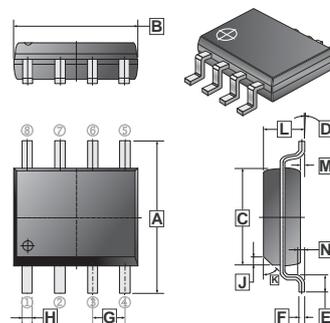
FEATURES

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

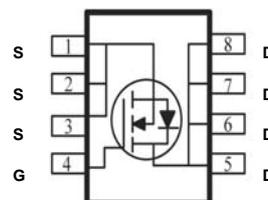
PACKAGE INFORMATION

Package	MPQ	LeaderSize
SOP-8	2.5K	13' inch

SOP-8



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	H	0.35	0.49
B	4.80	5.00	J	0.375 REF.	
C	3.80	4.00	K	45°	
D	0°	8°	L	1.35	1.75
E	0.40	0.90	M	0.10	0.25
F	0.19	0.25	N	0.25 REF.	
G	1.27 TYP.				



MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit	
Drain-Source Voltage	V_{DS}	30	V	
Gate-Source Voltage	V_{GS}	± 20	V	
Continuous Drain Current ¹	$I_D @ T_A = 25^\circ\text{C}$	18.6	A	
	$I_D @ T_A = 70^\circ\text{C}$	15.7	A	
Pulsed Drain Current ²	I_{DM}	60	A	
Continuous Source Current (Diode Conduction) ¹	I_S	2.9	A	
Total Power Dissipation ¹	$P_D @ T_A = 25^\circ\text{C}$	3.1	W	
	$P_D @ T_A = 70^\circ\text{C}$	2.2	W	
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55 ~ 150	$^\circ\text{C}$	
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient (Max.) ¹	$t \leq 10$ sec	$R_{\theta JA}$	40	$^\circ\text{C} / \text{W}$
	Steady State		80	$^\circ\text{C} / \text{W}$

Notes

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

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	3	V	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$
Gate-Body Leakage	I_{GSS}	-	-	100	nA	$V_{DS} = 0\text{V}$, $V_{GS} = 20\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS} = 24\text{V}$, $V_{GS} = 0\text{V}$
		-	-	5	μA	$V_{DS} = 24\text{V}$, $V_{GS} = 0\text{V}$, $T_J = 55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(on)}$	30	-	-	A	$V_{DS} = 5\text{V}$, $V_{GS} = 10\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	6	m Ω	$V_{GS} = 10\text{V}$, $I_D = 18.6\text{A}$
		-	-	8		$V_{GS} = 4.5\text{V}$, $I_D = 16.1\text{A}$
Forward Transconductance ¹	g_{fs}	-	90	-	S	$V_{DS} = 15\text{V}$, $I_D = 18.6\text{A}$
Diode Forward Voltage	V_{SD}	-	0.7	-	V	$I_S = 2.3\text{A}$, $V_{GS} = 0\text{V}$
Dynamic ²						
Total Gate Charge	Q_g	-	25	-	nC	$I_D = 18.6\text{A}$ $V_{DS} = 15\text{V}$ $V_{GS} = 4.5\text{V}$
Gate-Source Charge	Q_{gs}	-	6	-		
Gate-Drain Charge	Q_{gd}	-	9	-		
Turn-On Delay Time	$T_{d(on)}$	-	20	-	nS	$V_{DD} = 15\text{V}$ $I_D = 1\text{A}$ $V_{GEN} = 10\text{V}$ $R_L = 6\Omega$
Rise Time	T_r	-	13	-		
Turn-Off Delay Time	$T_{d(off)}$	-	82	-		
Fall Time	T_f	-	43	-		

Notes

- Pulse test : $PW \leq 300\mu\text{s}$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

CHARACTERISTICS CURVE

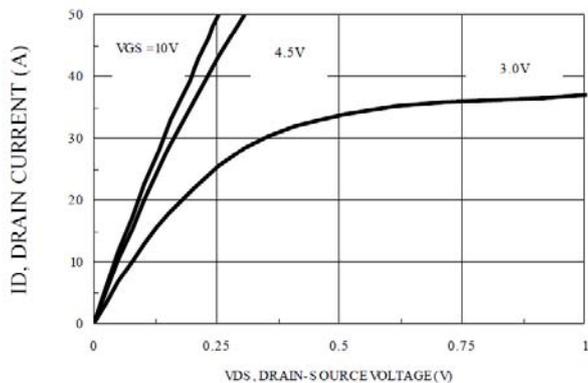


Figure 1. Output Characteristics

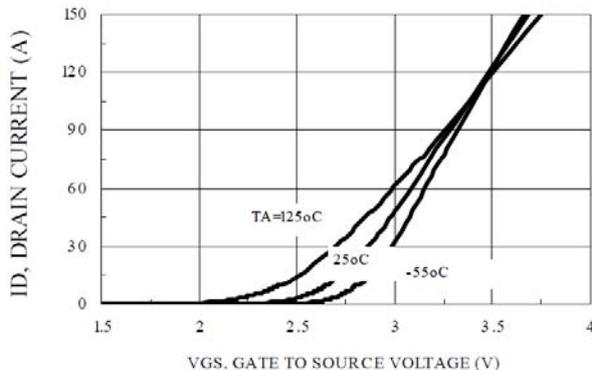


Figure 2. Transfer Characteristics

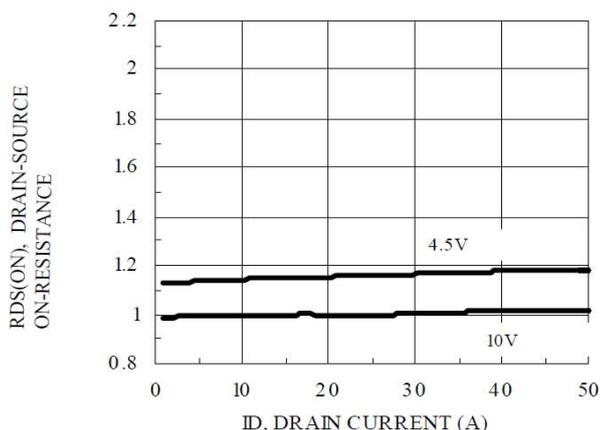


Figure 3. On-Resistance vs. Drain Current

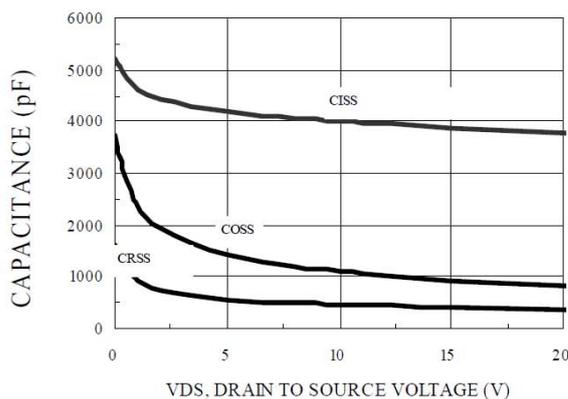


Figure 4. Capacitance

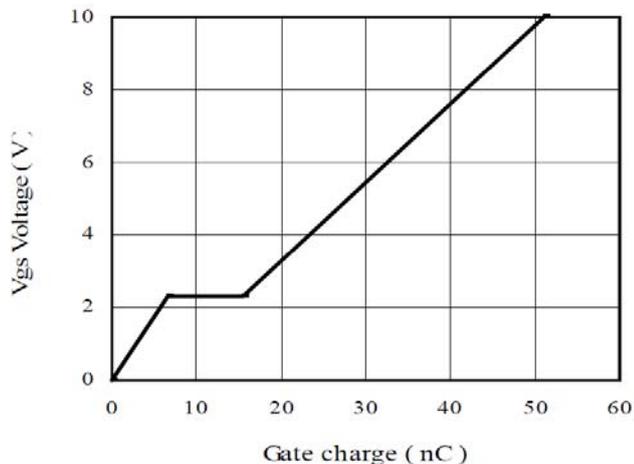


Figure 5. Gate Charge

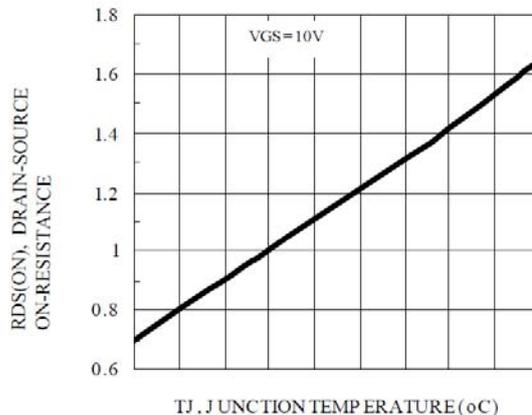


Figure 6. On-Resistance vs. Junction Temperature

CHARACTERISTICS CURVE

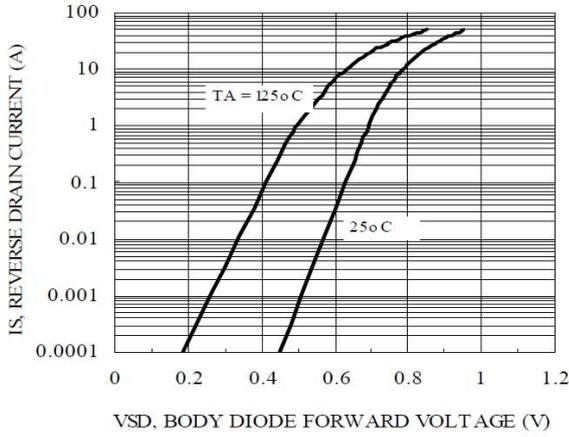


Figure 7. Source-Drain Diode Forward Voltage

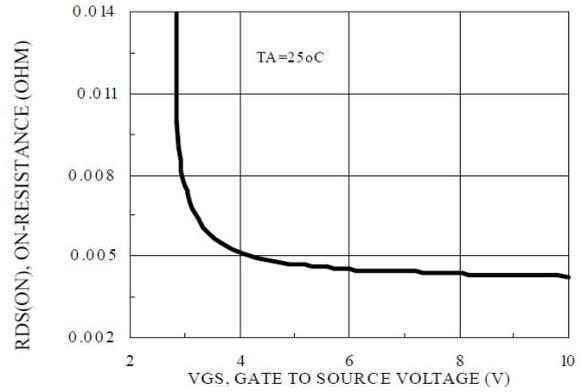


Figure 8. On-Resistance vs. Gate-to-Source Voltage

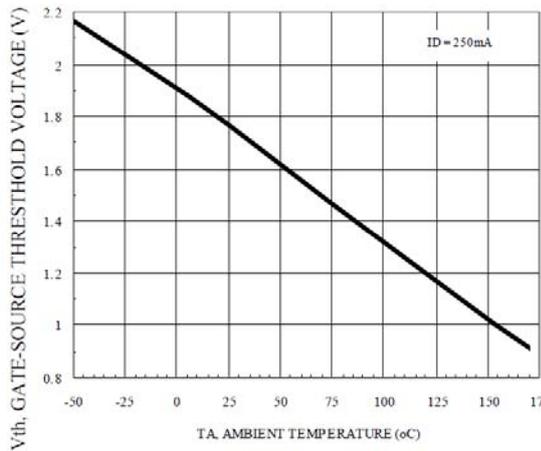


Figure 9. Threshold Voltage

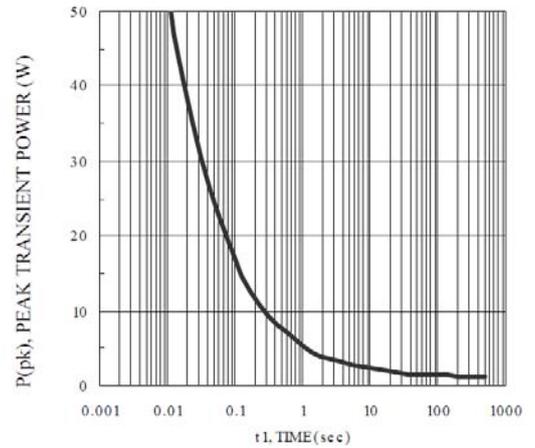


Figure 10. Single Pulse Power

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

