

RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

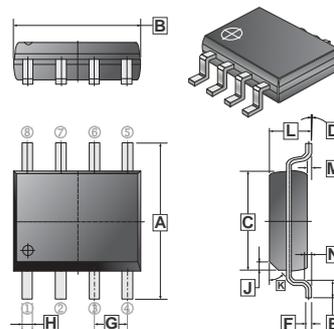
## DESCRIPTION

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.

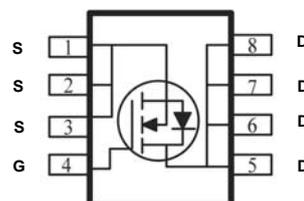
### SOP-8



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.				

## PACKAGE INFORMATION

Package	MPQ	LeaderSize
SOP-8	2.5K	13' inch



## 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 <sup>1</sup>	$I_D @ T_A = 25^\circ\text{C}$	16.8	A	
	$I_D @ T_A = 70^\circ\text{C}$	14.2	A	
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	50	A	
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	2.3	A	
Total Power Dissipation <sup>1</sup>	$P_D @ T_A = 25^\circ\text{C}$	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	$^\circ\text{C}$	
<b>Thermal Resistance Ratings</b>				
Thermal Resistance Junction-Ambient (Max.) <sup>1</sup>	$t \leq 10 \text{ sec}$	$R_{\theta JA}$	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.

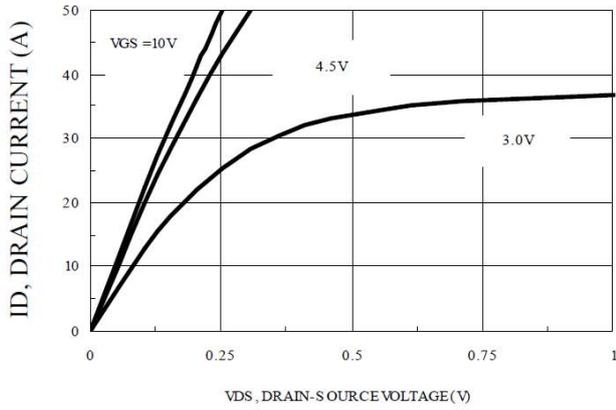
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	1	1.5	3	V	$V_{DS} = V_{GS}$ , $I_D = 250\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	-	1.2	100	nA	$V_{DS} = 0\text{V}$ , $V_{GS} = 20\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	10	1	$\mu\text{A}$	$V_{DS} = 24\text{V}$ , $V_{GS} = 0\text{V}$
		-	-	5	$\mu\text{A}$	$V_{DS} = 24\text{V}$ , $V_{GS} = 0\text{V}$ , $T_J = 55^\circ\text{C}$
On-State Drain Current <sup>1</sup>	$I_{D(on)}$	40	-	-	A	$V_{DS} = 5\text{V}$ , $V_{GS} = 10\text{V}$
Drain-Source On-Resistance <sup>1</sup>	$R_{DS(ON)}$	-	7	9	m $\Omega$	$V_{GS} = 10\text{V}$ , $I_D = 16.8\text{A}$
		-	9	12		$V_{GS} = 4.5\text{V}$ , $I_D = 16.1\text{A}$
Forward Transconductance <sup>1</sup>	$g_{fs}$	-	40	-	S	$V_{DS} = 15\text{V}$ , $I_D = 16.8\text{A}$
Diode Forward Voltage	$V_{SD}$	-	0.7	-	V	$I_S = 2.3\text{A}$ , $V_{GS} = 0\text{V}$
<b>Dynamic <sup>2</sup></b>						
Total Gate Charge	$Q_g$	-	15	40	nC	$I_D = 16.8\text{A}$ $V_{DS} = 15\text{V}$ $V_{GS} = 4.5\text{V}$
Gate-Source Charge	$Q_{gs}$	-	3	10		
Gate-Drain Charge	$Q_{gd}$	-	5	20		
Input Capacitance	$C_{iss}$	-	1642	4000	pF	$V_{DS} = 15\text{V}$ $V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$	-	579	2000		
Reverse Transfer Capacitance	$C_{rss}$	-	279	600		
Turn-On Delay Time	$T_{d(on)}$	-	15	40	nS	$V_{DD} = 15\text{V}$ $I_D = 1\text{A}$ $V_{GEN} = 10\text{V}$ $R_L = 6\Omega$
Rise Time	$T_r$	-	10	30		
Turn-Off Delay Time	$T_{d(off)}$	-	54	110		
Fall Time	$T_f$	-	26	60		

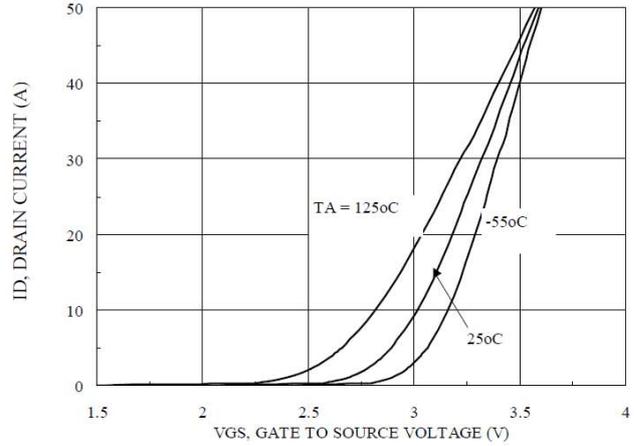
Notes:

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

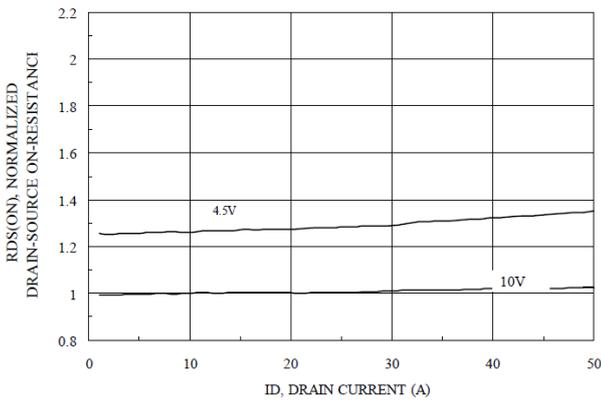
**TYPICAL ELECTRICAL CHARACTERISTICS**



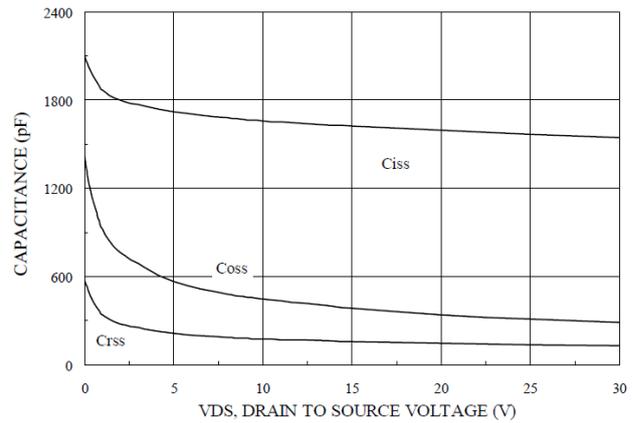
**Figure 1. Output Characteristics**



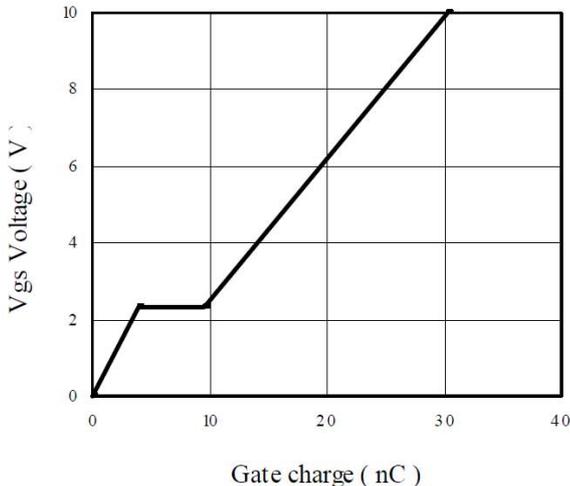
**Figure 2. Transfer Characteristics**



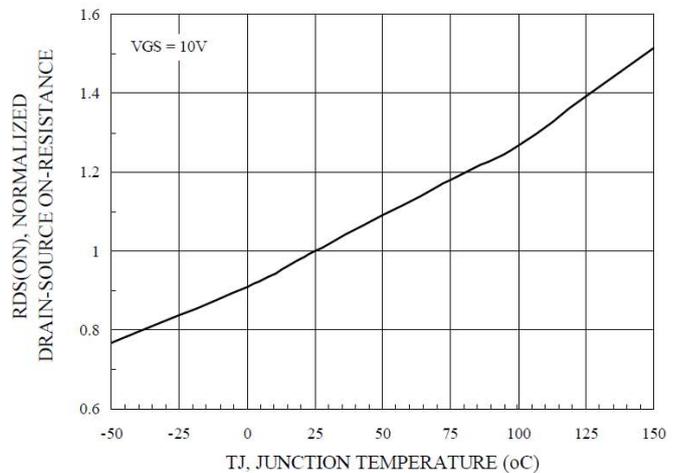
**Figure 3. On-Resistance vs. Drain Current**



**Figure 4. Capacitance**



**Figure 5. Gate Charge**



**Figure 6. On-Resistance vs. Junction Temperature**

**TYPICAL ELECTRICAL CHARACTERISTICS**

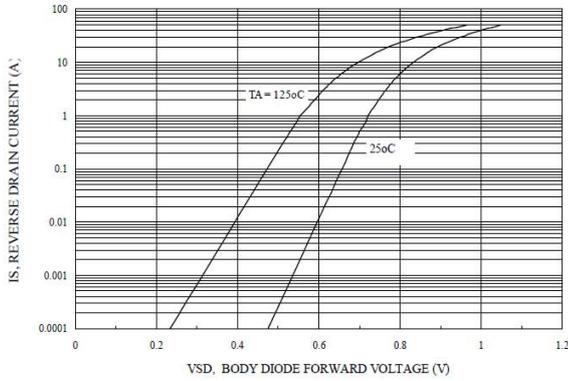


Figure 7. Source-Drain Diode Forward Voltage

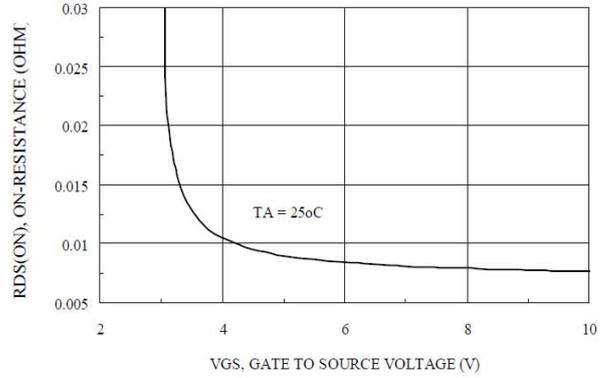


Figure 8. On-Resistance vs. Gate-to-Source Voltage

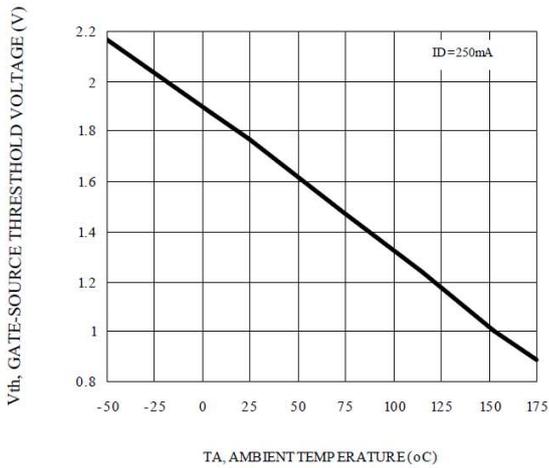


Figure 9. Threshold Voltage

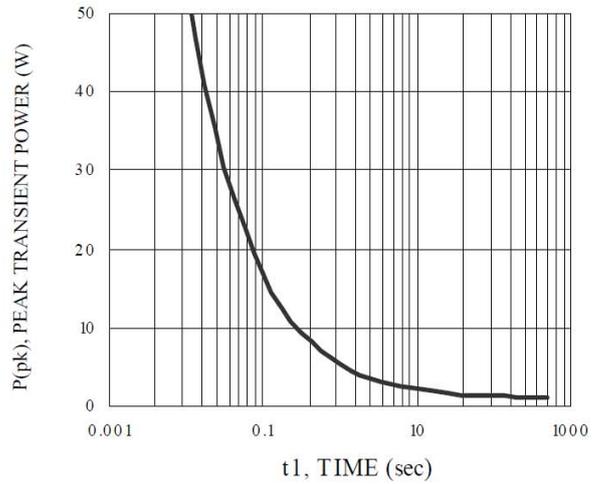


Figure 10. Single Pulse Power

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

