

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

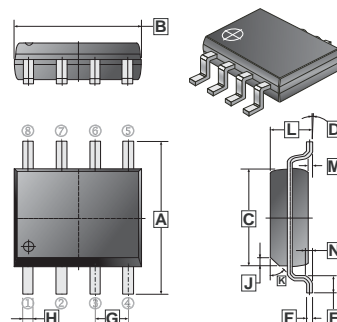
## DESCRIPTION

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.

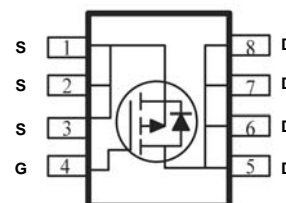
## SOP-8



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	$V_{GS}$	$\pm 25$	V
Continuous Drain Current <sup>1</sup>	$I_D @ T_A = 25^\circ\text{C}$	-11.5	A
	$I_D @ T_A = 70^\circ\text{C}$	-9.3	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	$\pm 50$	A
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	-2.1	A
Total Power Dissipation <sup>1</sup>	$P_D @ T_A = 25^\circ\text{C}$	3.1	W
	$P_D @ T_A = 70^\circ\text{C}$	2.3	W
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 ~ 150	$^\circ\text{C}$
<b>Thermal Resistance Ratings</b>			
Thermal Resistance Junction-Case (Max.) <sup>1</sup>	$t \leq 5 \text{ sec}$	$R_{\theta JC}$	25 $^\circ\text{C} / \text{W}$
Thermal Resistance Junction-Ambient (Max.) <sup>1</sup>	$t \leq 5 \text{ sec}$	$R_{\theta JA}$	50 $^\circ\text{C} / \text{W}$

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	Teat Conditions
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30	-	-	V	$V_{GS} = 0V, I_D = -250\mu A$
Gate Threshold Voltage	$V_{GS(th)}$	-1	-	-	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Gate-Body Leakage Current	$I_{GSS}$	-	-	$\pm 100$	$\mu A$	$V_{DS} = 0V, V_{GS} = \pm 25V$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	-1	$\mu A$	$V_{DS} = -24V, V_{GS} = 0V$
		-	-	-5	$\mu A$	$V_{DS} = -24V, V_{GS} = 0V, T_J = 55^\circ C$
On-State Drain Current <sup>1</sup>	$I_{D(on)}$	-50	-	-	A	$V_{DS} = -5V, V_{GS} = -10V$
Drain-Source On-Resistance <sup>1</sup>	$R_{DS(ON)}$	-	-	13	m $\Omega$	$V_{GS} = -10V, I_D = -11.5A$
		-	-	19		$V_{GS} = -4.5V, I_D = -9.3A$
Forward Transconductance <sup>1</sup>	$g_{fs}$	-	29	-	S	$V_{DS} = -15V, I_D = -11.5A$
Diode Forward Voltage	$V_{SD}$	-	-0.8	-	V	$I_S = 2.5A, V_{GS} = 0V$
<b>Dynamic <sup>2</sup></b>						
Total Gate Charge	$Q_g$	-	25	-	nC	$I_D = -11.5A$ $V_{DS} = -15V$ $V_{GS} = -5V$
Gate-Source Charge	$Q_{gs}$	-	11	-		
Gate-Drain Charge	$Q_{gd}$	-	17	-		
Input Capacitance	$C_{iss}$	-	2300	-	pF	$V_{DS} = -15V$ $V_{GS} = 0V$ $f = 1MHz$
Output Capacitance	$C_{oss}$	-	600	-		
Reverse Transfer Capacitance	$C_{rss}$	-	300	-		
Turn-On Delay Time	$T_{d(on)}$	-	15	-	nS	$V_{DD} = -15V$ $I_D = -1A$ $V_{GEN} = -10V$ $R_L = 6\Omega$
Rise Time	$T_r$	-	13	-		
Turn-Off Delay Time	$T_{d(off)}$	-	100	-		
Fall Time	$T_f$	-	54	-		

Notes:

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

**Typical Electrical Characteristics (P-Channel)**

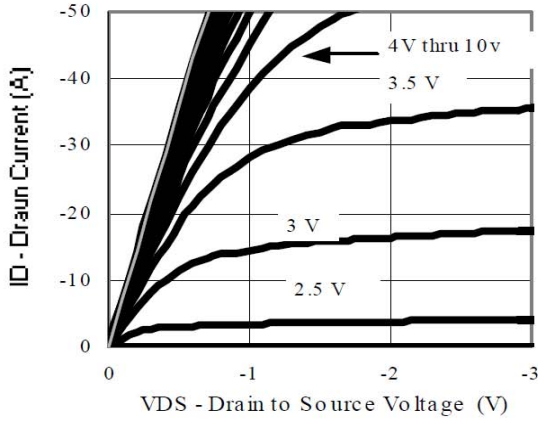


Figure 1. On-Region Characteristics

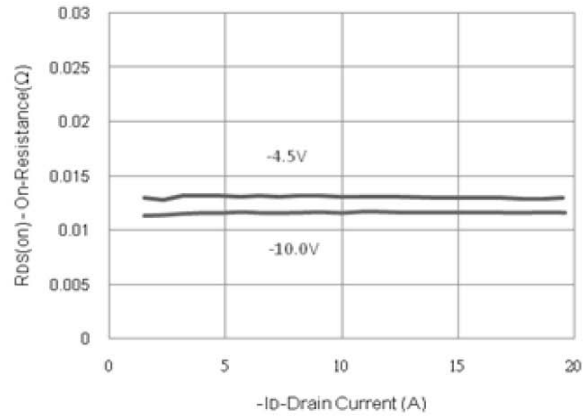


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

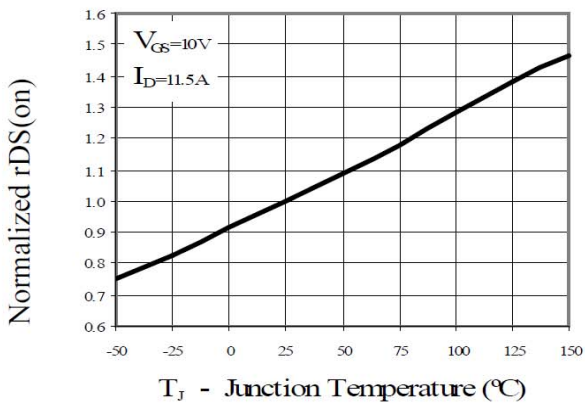


Figure 3. On-Resistance Variation with Temperature

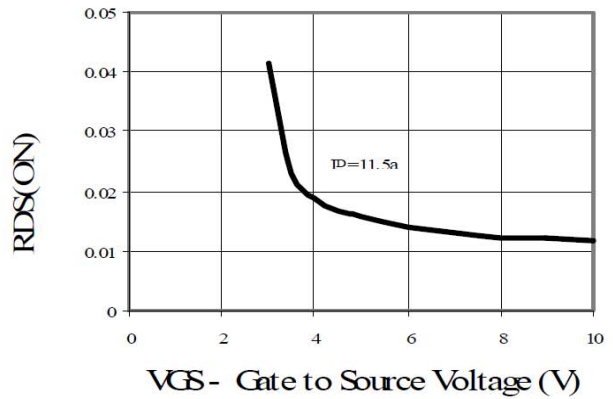


Figure 4. On-Resistance with Gate to Source Voltage

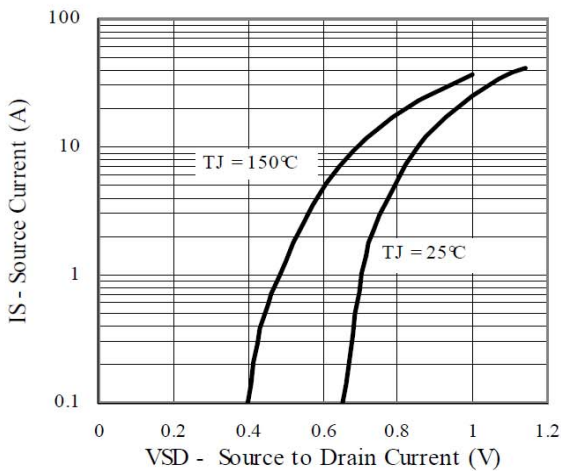


Figure 5. Transfer Characteristics

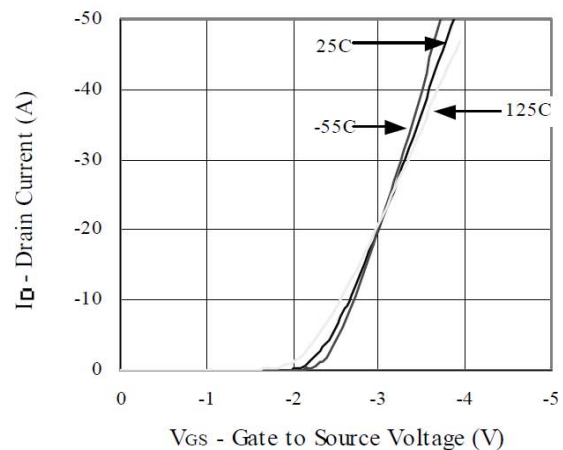


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

**Typical Electrical Characteristics (P-Channel)**

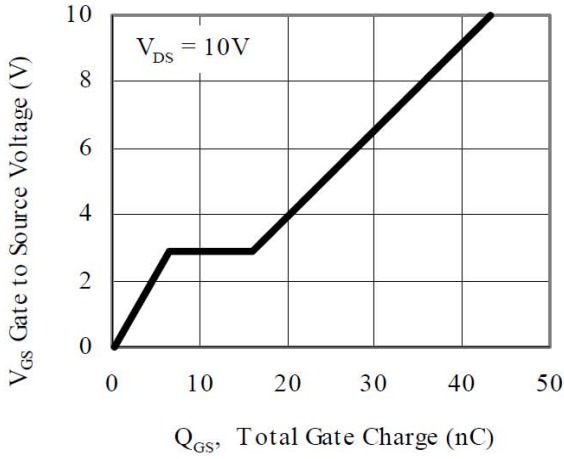


Figure 7. Gate Charge Characteristics

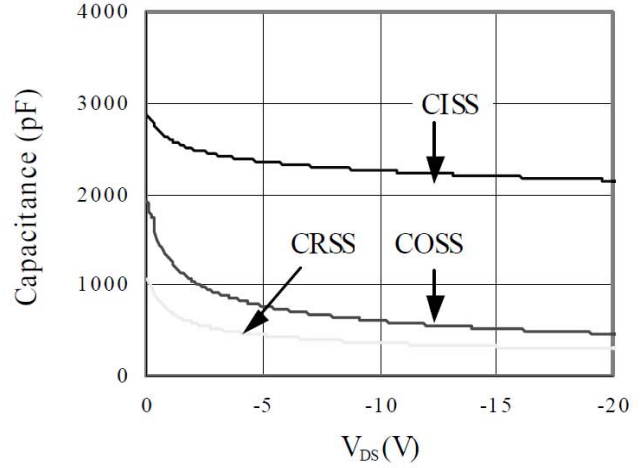


Figure 8. Capacitance Characteristics

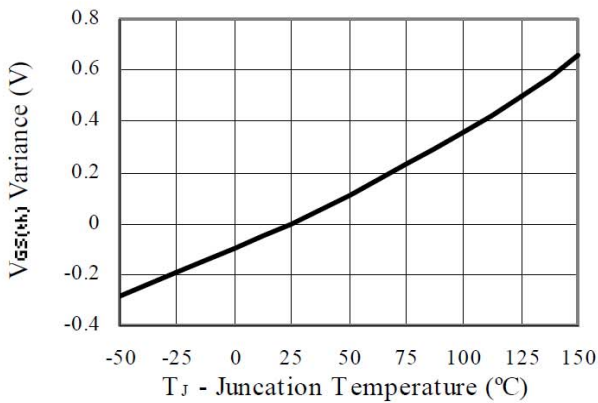


Figure 9. Maximum Safe Operating Area

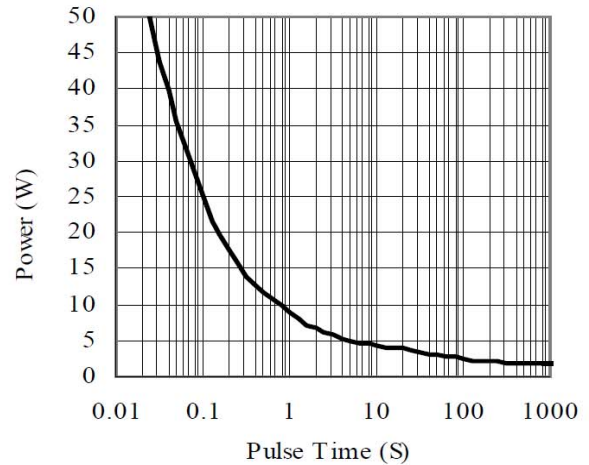


Figure 10. Single Pulse Maximum Power Dissipation

**Normalized Thermal Transient Junction to Ambient**

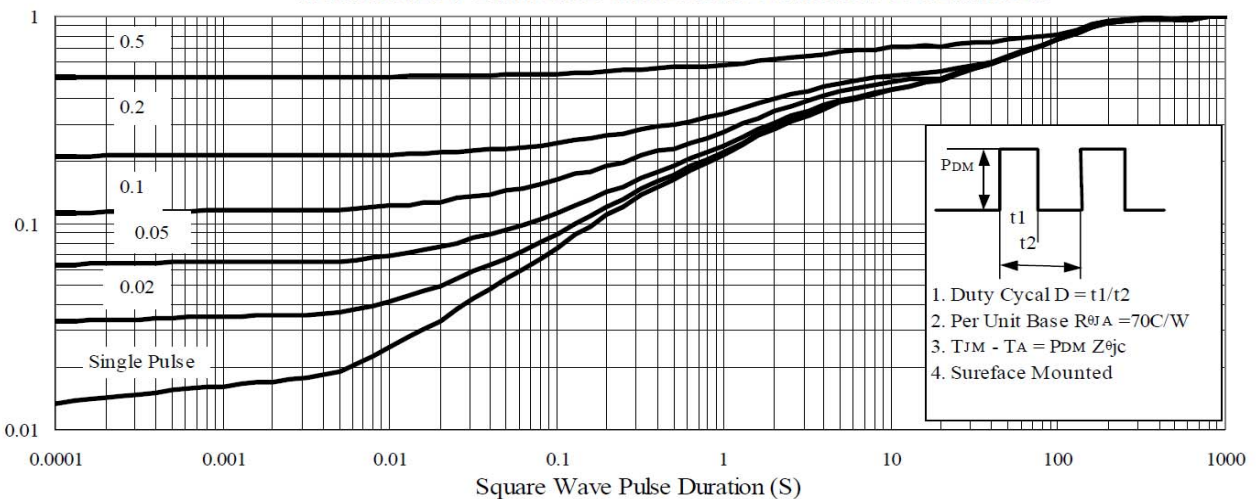


Figure 11. Transient Thermal Response Curve