

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

## 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.

## 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
- Extended VGS range ( $\pm 25$ ) for battery pack applications

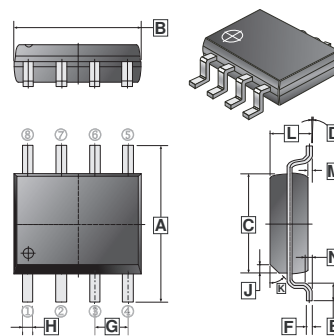
## APPLICATION

PWMDC-DC converters, power management in portable and battery-powered products such as computers, printers, battery charger, telecommunication power system, and telephones power system.

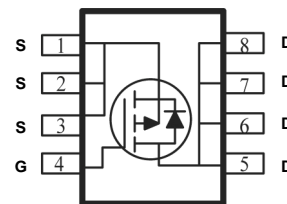
## PACKAGE INFORMATION

Package	MPQ	Leader Size
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	$V_{GS}$	$\pm 25$	V	
Continuous Drain Current <sup>1</sup>	$I_D$	$T_A=25^\circ\text{C}$	-15	A
		$T_A=70^\circ\text{C}$	-11	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
		$T_A=70^\circ\text{C}$	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>	$t \leq 5$ sec	$R_{\theta JC}$	25	$^\circ\text{C} / \text{W}$
Thermal Resistance Junction-Ambient (Max.) <sup>1</sup>	$t \leq 5$ 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	Test Conditions
<b>Static</b>						
Gate-Threshold Voltage	$V_{GS(th)}$	-1	-	-	V	$V_{DS}=V_{GS}, I_D = -250\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{DS}=0, V_{GS} = \pm 25\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	-1	$\mu\text{A}$	$V_{DS} = -24\text{V}, V_{GS} = 0$
		-	-	-5		$V_{DS} = -24\text{V}, V_{GS} = 0, T_J = 55^\circ\text{C}$
On-State Drain Current <sup>1</sup>	$I_{D(on)}$	-50	-	-	A	$V_{DS} = -5\text{V}, V_{GS} = -10\text{V}$
Drain-Source On-Resistance <sup>1</sup>	$R_{DS(ON)}$	-	-	9	m $\Omega$	$V_{GS} = -10\text{V}, I_D = -13\text{A}$
		-	-	13		$V_{GS} = -4.5\text{V}, I_D = -11\text{A}$
		-	-	11		$V_{GS} = -10\text{V}, I_D = -13\text{A}, T_J = 55^\circ\text{C}$
Forward Transconductance <sup>1</sup>	$g_{fs}$	-	44	-	S	$V_{DS} = -5\text{V}, I_D = -13\text{A}$
Diode Forward Voltage	$V_{SD}$	-	-0.7	-	V	$I_S = 2.1\text{A}, V_{GS} = 0$
<b>Dynamic <sup>2</sup></b>						
Total Gate Charge	$Q_g$	-	37	-	nC	$I_D = -13\text{A}$ $V_{DS} = -15\text{V}$ $V_{GS} = -10\text{V}$
Gate-Source Charge	$Q_{gs}$	-	10	-		
Gate-Drain Charge	$Q_{gd}$	-	14.5	-		
<b>Switching</b>						
Turn-On Delay Time	$T_{d(on)}$	-	19	-	nS	$V_{DD} = -15\text{V}$ $I_D = -1\text{A}$ $V_{GEN} = -10\text{V}$ $R_L = 6\Omega$
Rise Time	$T_r$	-	11	-		
Turn-Off Delay Time	$T_{d(off)}$	-	121	-		
Fall Time	$T_f$	-	68	-		

Notes:

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

**CHARACTERISTIC CURVE**

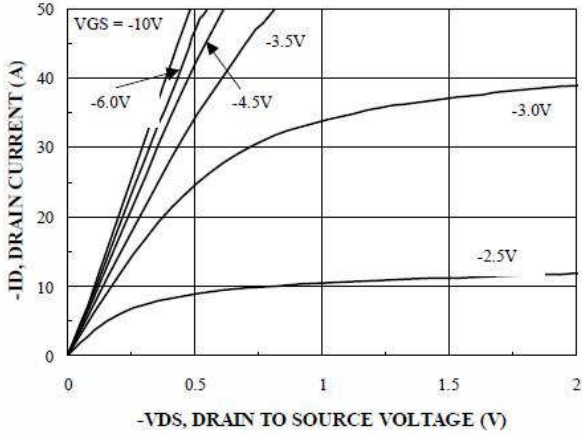


Figure 1. On-Region Characteristics

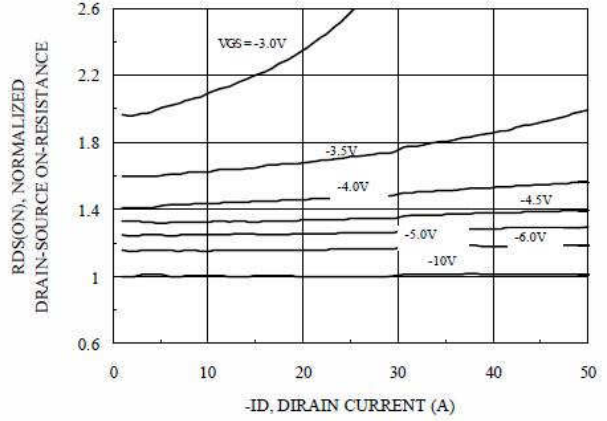


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

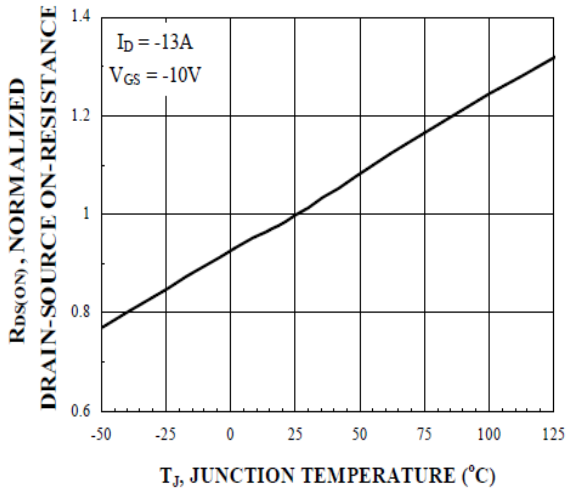


Figure 3. On-Resistance Variation with Temperature

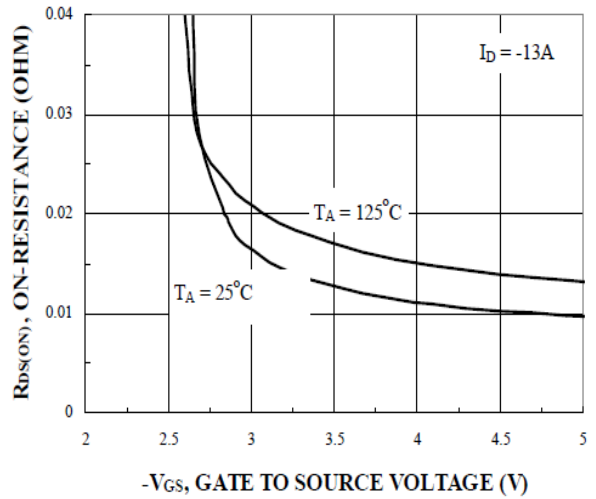


Figure 4. On-Resistance Variation with Gate to Source Voltage

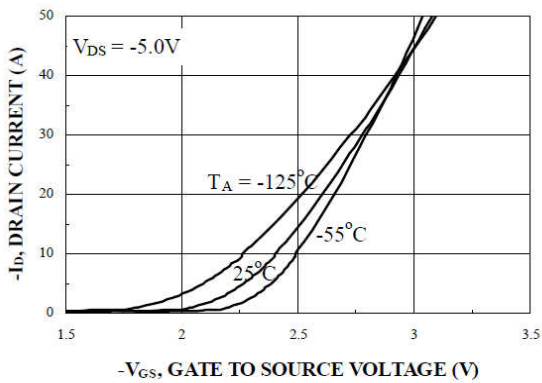


Figure 5. Transfer Characteristics

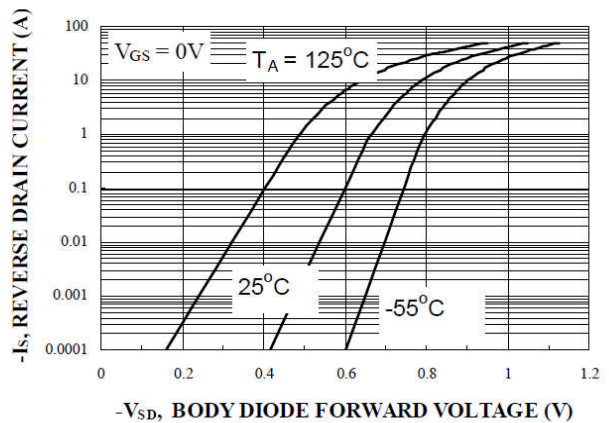


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

**CHARACTERISTIC CURVE**

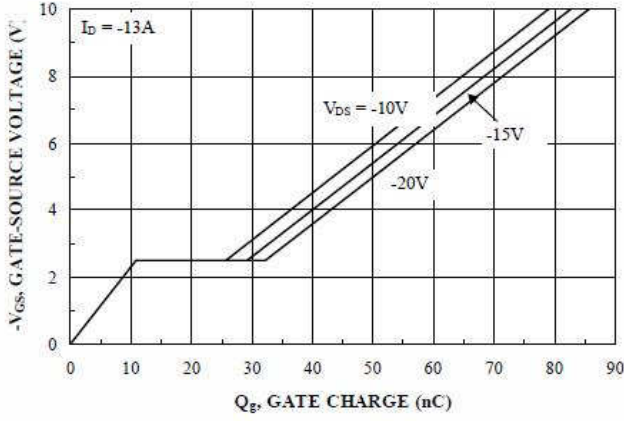


Figure 7. Gate Charge Characteristics

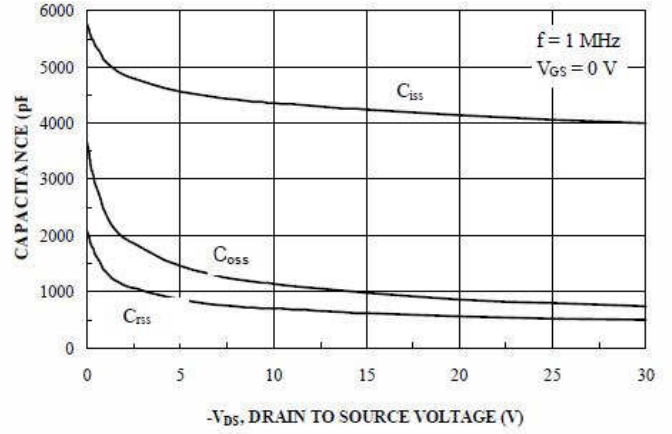


Figure 8. Capacitance Characteristics

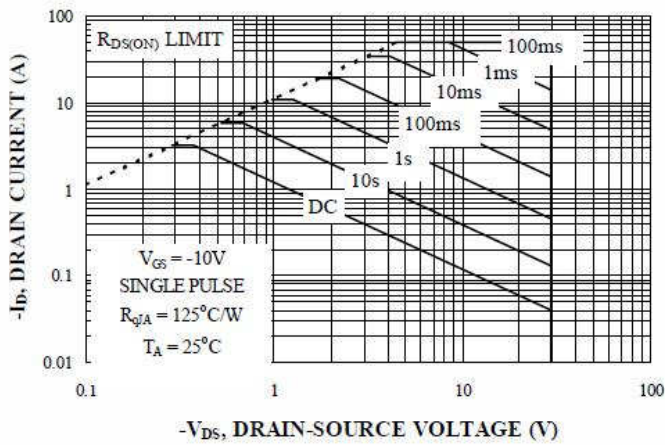


Figure 9. Maximum Safe Operating Area

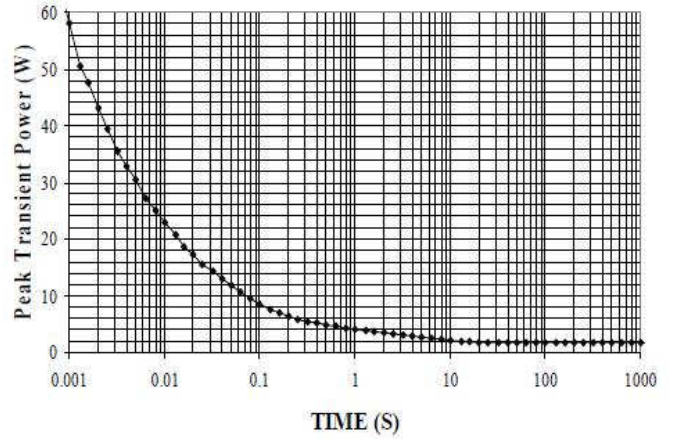


Figure 10. Single Pulse Maximum Power Dissipation

**NORMALIZED THERMAL TRANSIENT JUNCTION TO AMBIENT**

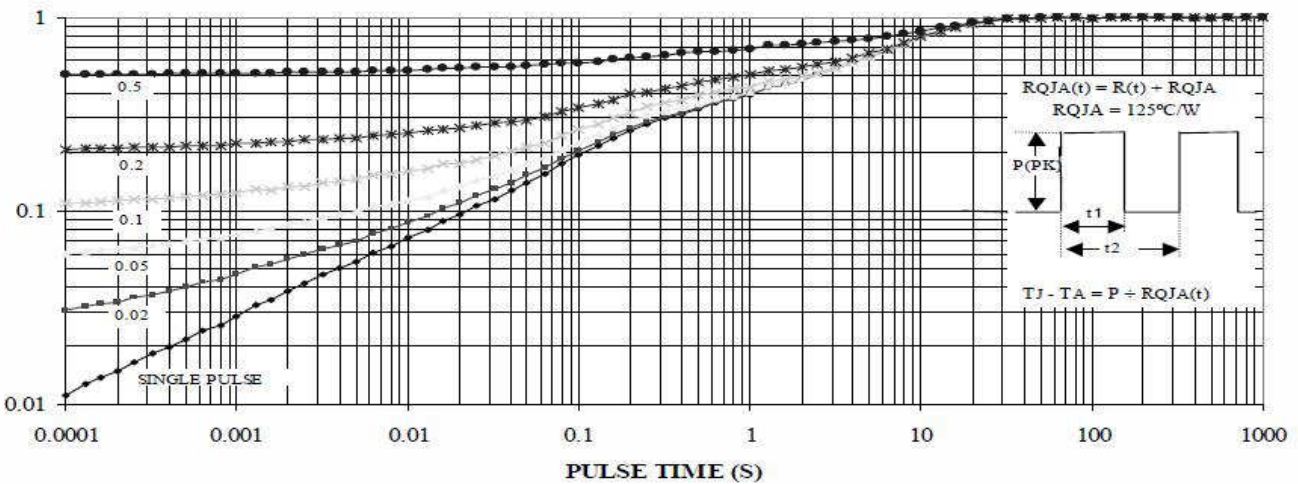


Figure 11. Transient Thermal Response Curve