

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

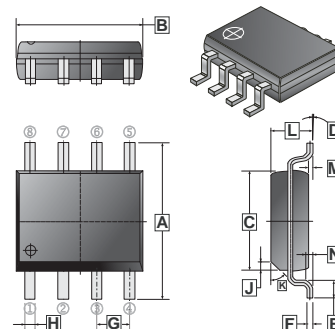
## DESCRIPTION

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

## FEATURES

- Low  $R_{DS(on)}$  provides higher efficiency and extends battery life.
- Miniature SOP-8 surface mount package saves board space.
- High power and current handling capability.
- Extended  $V_{GS}$  range ( $\pm 25$ ) for battery pack applications.

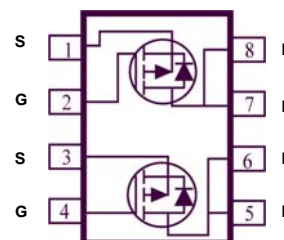
## SOP-8



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>	$I_D @$	$T_A = 25^\circ\text{C}$	-5.2
		$T_A = 70^\circ\text{C}$	-4.2
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-30	A
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	-1.6	A
Power Dissipation <sup>1</sup>	$P_D @$	$T_A = 25^\circ\text{C}$	2.1
		$T_A = 70^\circ\text{C}$	1.3
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 ~ 150	$^\circ\text{C}$
<b>Thermal Resistance Ratings</b>			
Junction to Case (Max.) <sup>1</sup>	$t \leq 5$ sec	$R_{\theta JC}$	40 $^\circ\text{C} / \text{W}$
Junction to Ambient (Max.) <sup>1</sup>	$t \leq 10$ sec	$R_{\theta JA}$	60 $^\circ\text{C} / \text{W}$

Notes:

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

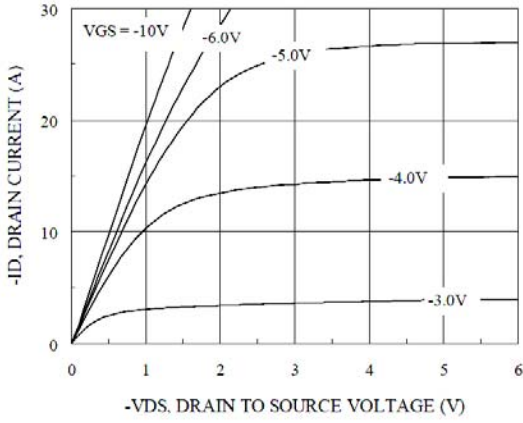
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

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	$V_{DS} = 0\text{V}, V_{GS} = \pm 25\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	-1	$\mu\text{A}$	$V_{DS} = -24\text{V}, V_{GS} = 0\text{V}$
		-	-	-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>	$I_{D(on)}$	-30	-	-	A	$V_{DS} = -5\text{V}, V_{GS} = -10\text{V}$
Drain-Source On-Resistance <sup>1</sup>	$R_{DS(ON)}$	-	-	52	m $\Omega$	$V_{GS} = -10\text{V}, I_D = -5.2\text{A}$
		-	-	89		$V_{GS} = -4.5\text{V}, I_D = -4.0\text{A}$
Forward Transconductance <sup>1</sup>	$g_{fs}$	-	19	-	S	$V_{DS} = -15\text{V}, I_D = -5.2\text{A}$
Diode Forward Voltage	$V_{SD}$	-	-0.7	-	V	$I_S = -2.1\text{A}, V_{GS} = 0\text{V}$
<b>Dynamic <sup>2</sup></b>						
Total Gate Charge	$Q_g$	-	15	-	nC	$I_D = -5.2\text{A}$ $V_{DS} = -15\text{V}$ $V_{GS} = -10\text{V}$
Gate-Source Charge	$Q_{gs}$	-	2.2	-		
Gate-Drain Charge	$Q_{gd}$	-	1.7	-		
Turn-On Delay Time	$T_{d(on)}$	-	10	-	nS	$V_{DD} = -15\text{V}$ $I_D = -1\text{A}$ $V_{GEN} = -10\text{V}$ $R_L = 15\Omega, R_G = 6\Omega$
Rise Time	$T_r$	-	2.8	-		
Turn-Off Delay Time	$T_{d(off)}$	-	53.6	-		
Fall Time	$T_f$	-	46	-		

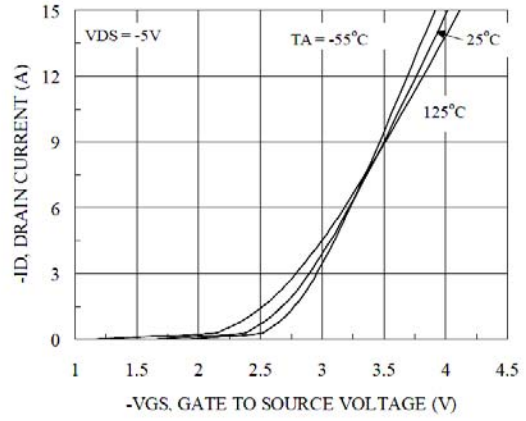
Notes:

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

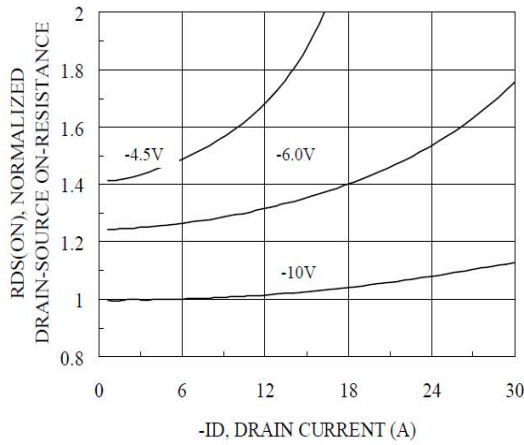
**CHARACTERISTIC CURVES**



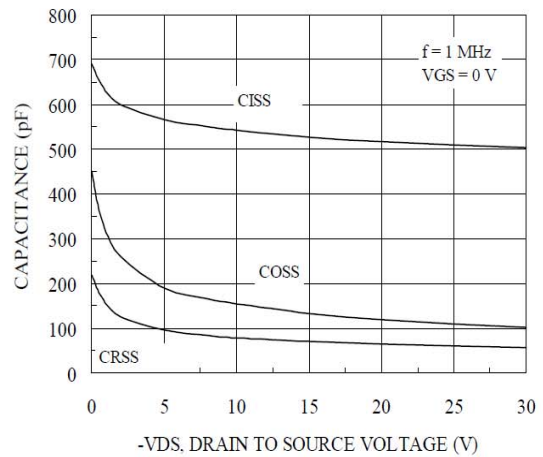
**Figure 1. On-Region Characteristics**



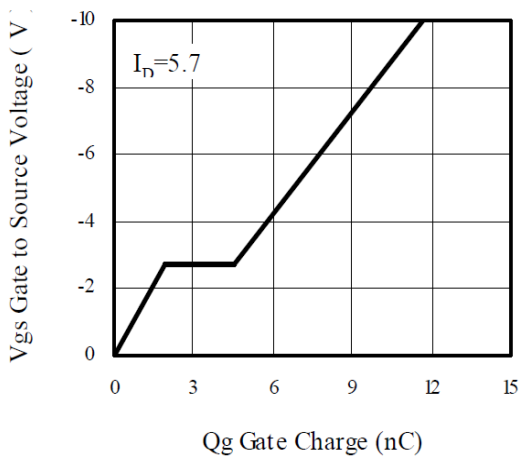
**Figure 2. Body Diode Forward Voltage Variation with Source Current and Temperature**



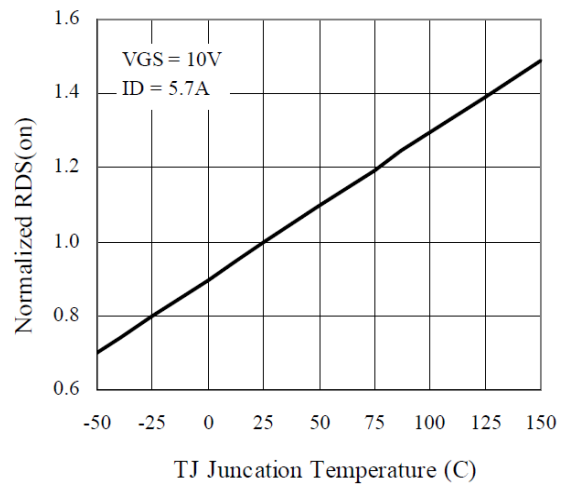
**Figure 3. On Resistance Vs Vgs Voltage**



**Figure 4. Capacitance Characteristics**



**Figure 5. Gate Charge Characteristics**



**Figure 6. On-Resistance Variation with Temperature**

**CHARACTERISTIC CURVES**

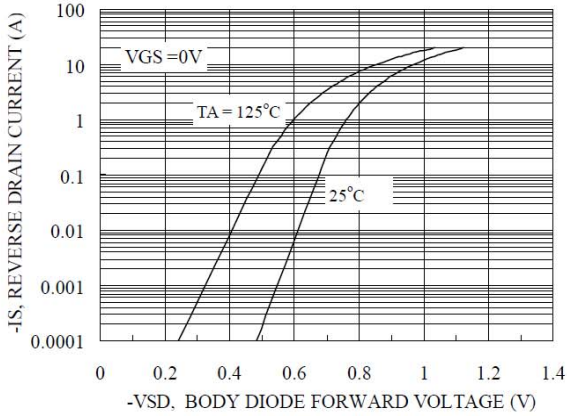


Figure 7. Transfer Characteristics

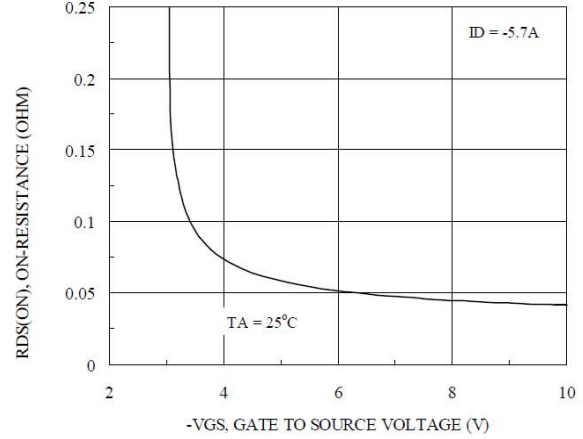


Figure 8. On-Resistance with Gate to Source Voltage

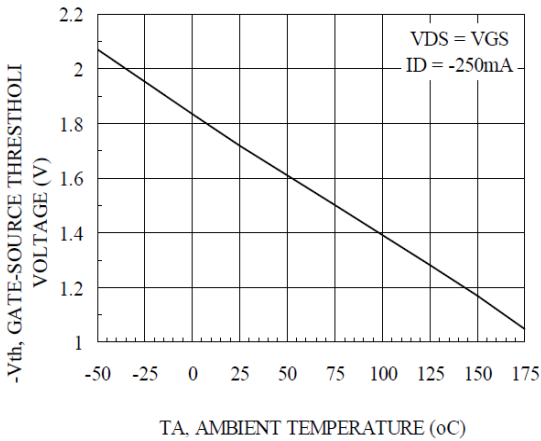


Figure 9.  $V_{th}$  Gate to Source Voltage Vs Temperature

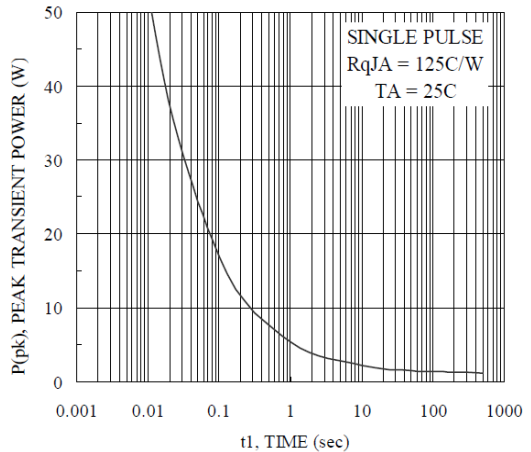


Figure 10. Single Pulse Maximum Power Dissipation

**Normalized Thermal Transient Junction to Ambient**

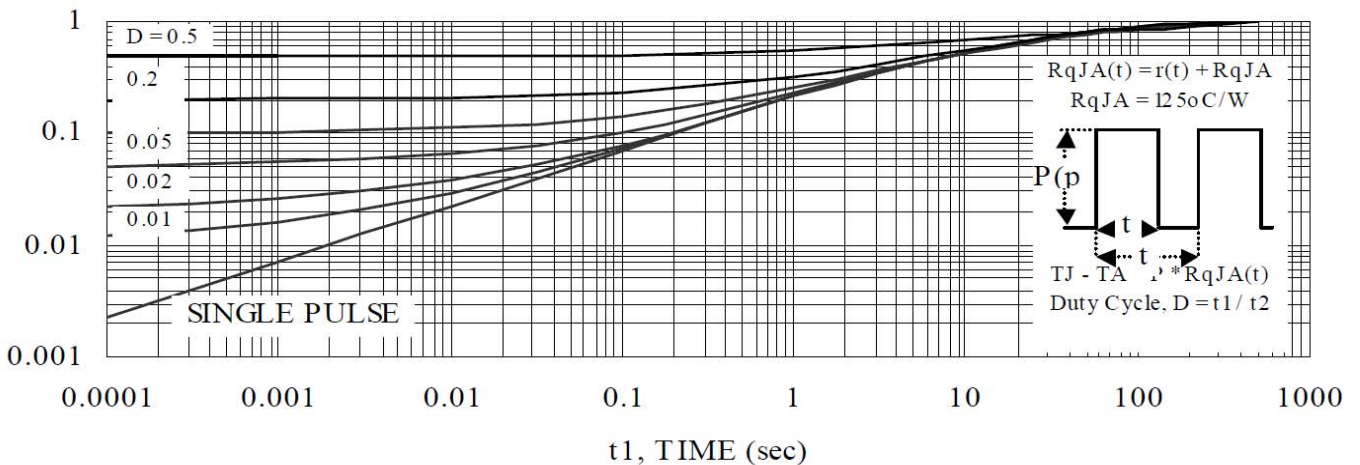


Figure 11. Transient Thermal Response Curve