

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.

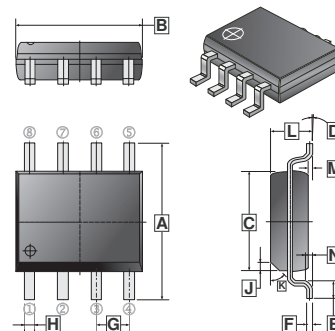
## FEATURES

- 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.

## APPLICATION

DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

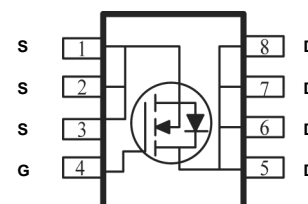
## SOP-8



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	Leader Size
SOP-8	2.5K	13' inch



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	200	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D$	$T_A = 25^\circ\text{C}$	5.1
		$T_A = 70^\circ\text{C}$	4.3
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	30	A
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	4.2	A
Total Power Dissipation <sup>1</sup>	$P_D$	$T_A = 25^\circ\text{C}$	3.1
		$T_A = 70^\circ\text{C}$	2.2
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 ~ 150	$^\circ\text{C}$
THERMAL RESISTANCE RATINGS			
Maximum Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	$t \leq 10$ sec	40
		Steady State	80

Notes:

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

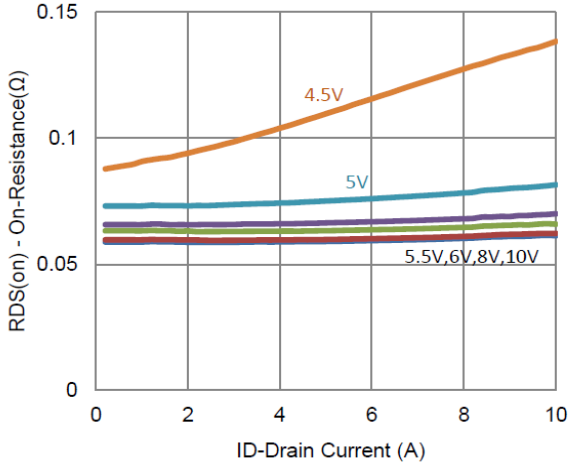
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

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	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{DS}=0$ , $V_{GS}=\pm 20\text{V}$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1	$\mu\text{A}$	$V_{DS}=160\text{V}$ , $V_{GS}=0$
		-	-	25		$V_{DS}=160\text{V}$ , $V_{GS}=0$ , $T_J=55^\circ\text{C}$
On-State Drain Current <sup>1</sup>	$I_{D(on)}$	10	-	-	A	$V_{DS}=5\text{V}$ , $V_{GS}=10\text{V}$
Drain-Source On-Resistance <sup>1</sup>	$R_{DS(ON)}$	-	-	78	m $\Omega$	$V_{GS}=10\text{V}$ , $I_D=4\text{A}$
		-	-	92		$V_{GS}=5.5\text{V}$ , $I_D=3.2\text{A}$
Forward Transconductance <sup>1</sup>	$g_{fs}$	-	27	-	S	$V_{DS}=15\text{V}$ , $I_D=4\text{A}$
Diode Forward Voltage	$V_{SD}$	-	0.71	-	V	$I_S=2.1\text{A}$ , $V_{GS}=0$
<b>Dynamic <sup>2</sup></b>						
Total Gate Charge	$Q_g$	-	54	-	nC	$I_D=4\text{A}$ $V_{DS}=100\text{V}$ $V_{GS}=5.5\text{V}$
Gate-Source Charge	$Q_{gs}$	-	21	-		
Gate-Drain Charge	$Q_{gd}$	-	34	-		
Turn-On Delay Time	$T_{d(on)}$	-	27	-	nS	$V_{DS}=100\text{V}$ $I_D=4\text{A}$ $V_{GEN}=10\text{V}$ $R_L=25\Omega$ $R_{GEN}=6\Omega$
Rise Time	$T_r$	-	35	-		
Turn-Off Delay Time	$T_{d(off)}$	-	97	-		
Fall Time	$T_f$	-	29	-	pF	$V_{DS}=15\text{V}$ $V_{GS}=0\text{V}$ $f=1\text{MHz}$
Input Capacitance	$C_{iss}$	-	4552	-		
Output Capacitance	$C_{oss}$	-	226	-		
Reverse Transfer Capacitance	$C_{rss}$	-	215	-		

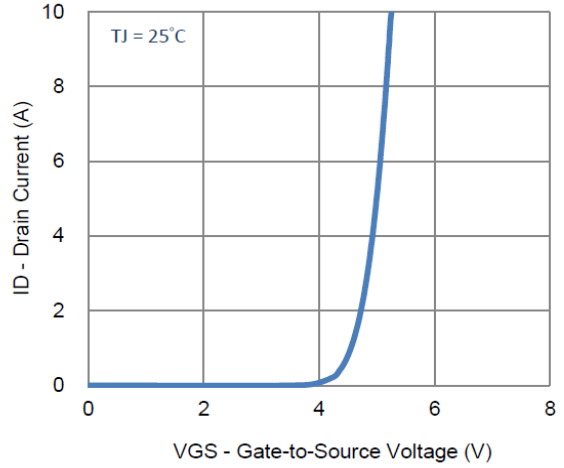
Notes:

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

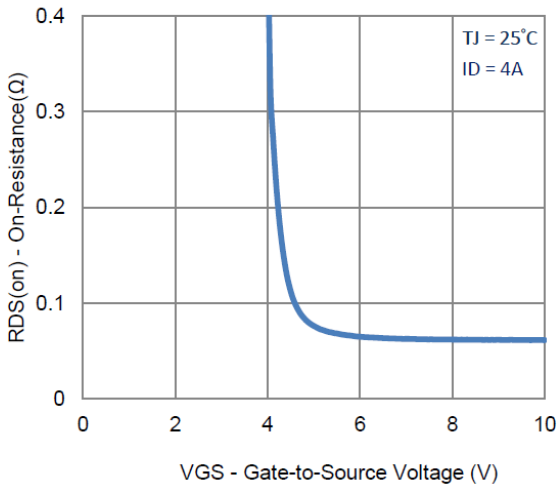
**CHARACTERISTIC CURVE**



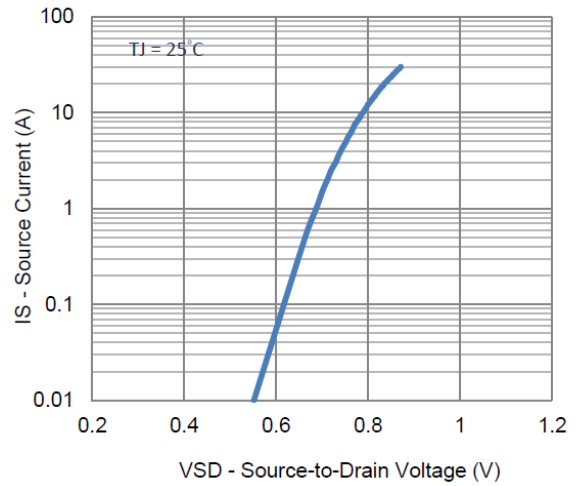
**1. On-Resistance vs. Drain Current**



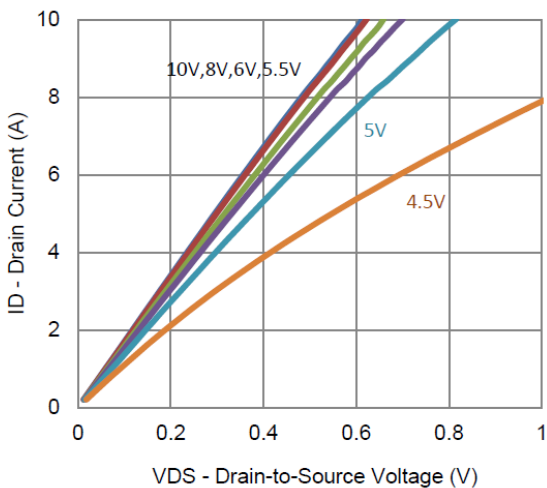
**2. Transfer Characteristics**



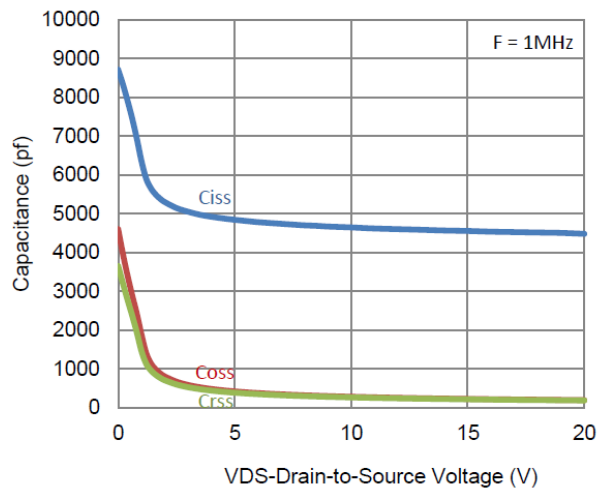
**3. On-Resistance vs. Gate-to-Source Voltage**



**4. Drain-to-Source Forward Voltage**

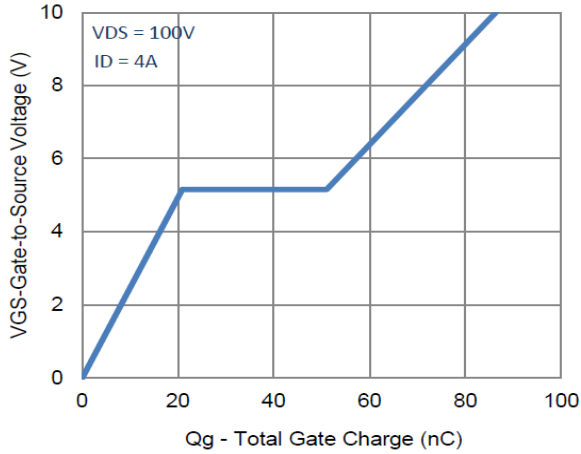


**5. Output Characteristics**

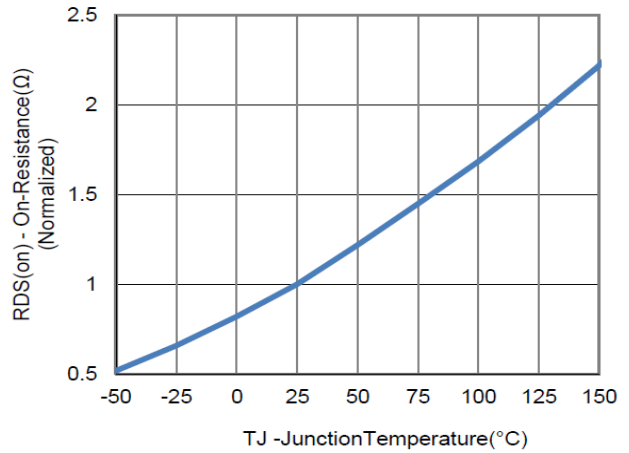


**6. Capacitance**

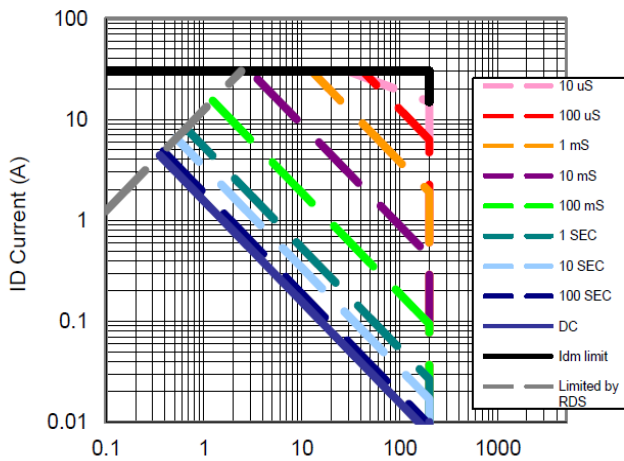
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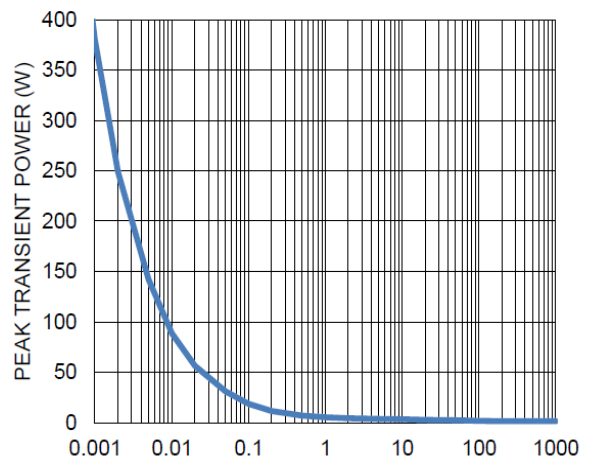
**7. Gate Charge**



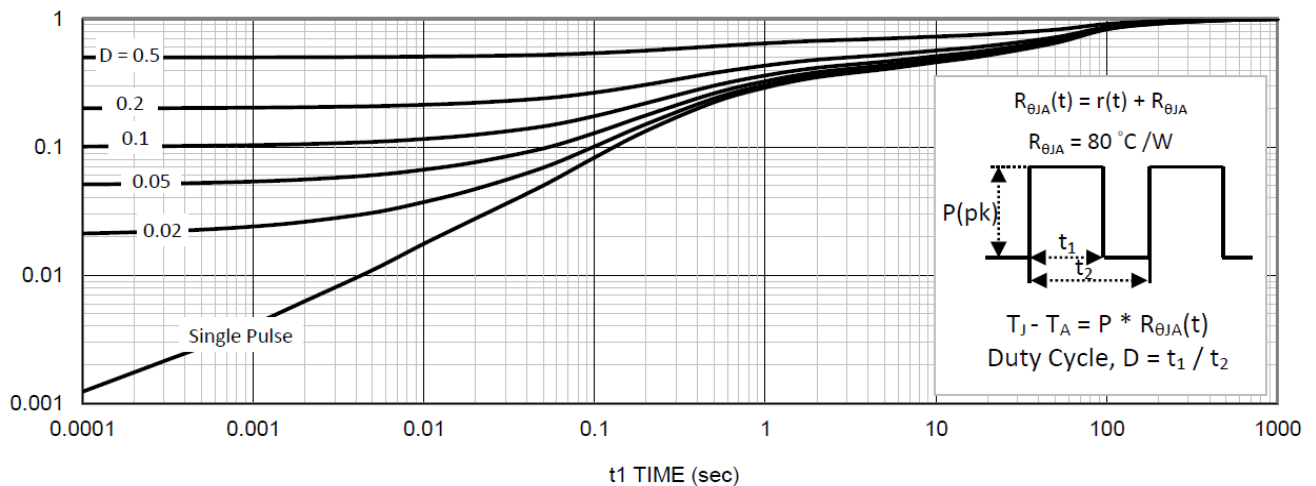
**8. Normalized On-Resistance Vs Junction Temperature**



**9. Safe Operating Area**



**10. Single Pulse Maximum Power Dissipation**



**11. Normalized Thermal Transient Junction to Ambient**