

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

## DESCRIPTION

These miniature surface mount MOSFET 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 TO-252 saves board space
- Fast switching speed
- High performance trench technology

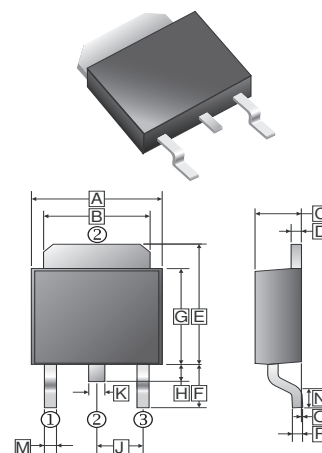
## APPLICATION

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

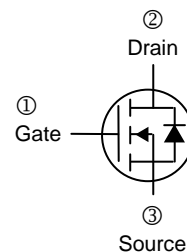
## PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-252	2.5K	13 inch

### TO-252(D-Pack)



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.35	6.80	J	2.30	REF.
B	5.20	5.50	K	0.64	0.90
C	2.15	2.40	M	0.50	1.1
D	0.45	0.58	N	0.9	1.65
E	6.8	7.5	O	0	0.15
F	2.40	3.0	P	0.43	0.58
G	5.40	6.25			
H	0.64	1.20			



## 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>	$I_D$	12	A
$T_C=25^\circ\text{C}$			
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	50	A
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	47	A
Total Power Dissipation <sup>1</sup>	$P_D$	50	W
$T_C=25^\circ\text{C}$			
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~175	$^\circ\text{C}$
Thermal Resistance Rating			
Maximum Thermal Resistance Junction-Ambient <sup>1</sup>	$T \leq 10$ Sec	$R_{\theta JA}$	40
	Steady State		3
			$^\circ\text{C} / \text{W}$

Note:

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

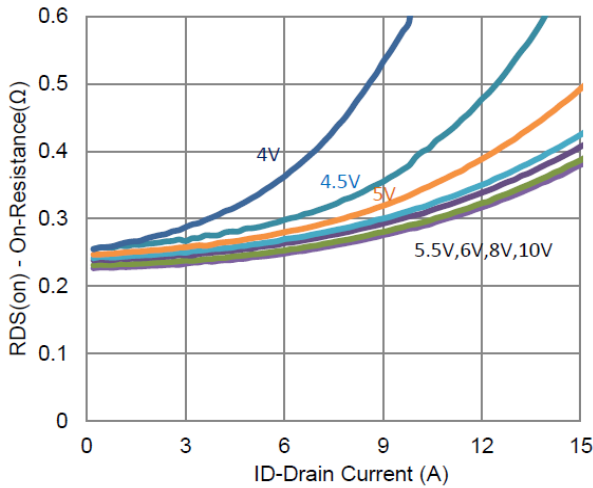
**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
<b>Static</b>						
Gate-Threshold Voltage	$V_{GS(th)}$	1.0	-	-	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>	$I_{D(on)}$	24	-	-	A	$V_{DS}=5\text{V}$ , $V_{GS}=10\text{V}$
Drain-Source On-Resistance <sup>1</sup>	$R_{DS(ON)}$	-	-	260	m $\Omega$	$V_{GS}=10\text{V}$ , $I_D=9.6\text{A}$
		-	-	300		$V_{GS}=5.5\text{V}$ , $I_D=8.3\text{A}$
Forward Transconductance <sup>1</sup>	$g_{fs}$	-	4.4	-	S	$V_{DS}=15\text{V}$ , $I_D=9.6\text{A}$
Diode Forward Voltage	$V_{SD}$	-	0.95	-	V	$I_S=23\text{A}$ , $V_{GS}=0$
<b>Dynamic <sup>2</sup></b>						
Input Capacitance	$C_{iss}$	-	807	-	pF	$V_{GS}=0$ $V_{DS}=15\text{V}$ $f=1.0\text{MHz}$
Output Capacitance	$C_{oss}$	-	81	-		
Reverse Transfer Capacitance	$C_{rss}$	-	38	-		
Total Gate Charge	$Q_g$	-	4	-	nC	$V_{DS}=100\text{V}$ $V_{GS}=4.5\text{V}$ $I_D=9.6\text{A}$
Gate-Source Charge	$Q_{gs}$	-	1.7	-		
Gate-Drain Charge	$Q_{gd}$	-	1.8	-		
Turn-on Delay Time	$T_{d(on)}$	-	10	-	nS	$V_{DS}=100\text{V}$ $I_D=9.6\text{A}$ $V_{GEN}=10\text{V}$ $R_L=10.5\Omega$ $R_{GEN}=6\Omega$
Rise Time	$T_r$	-	8	-		
Turn-off Delay Time	$T_{d(off)}$	-	27	-		
Fall Time	$T_f$	-	13	-		

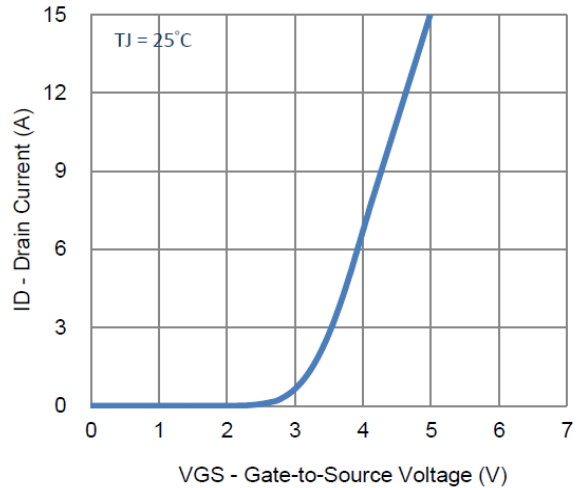
Notes:

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

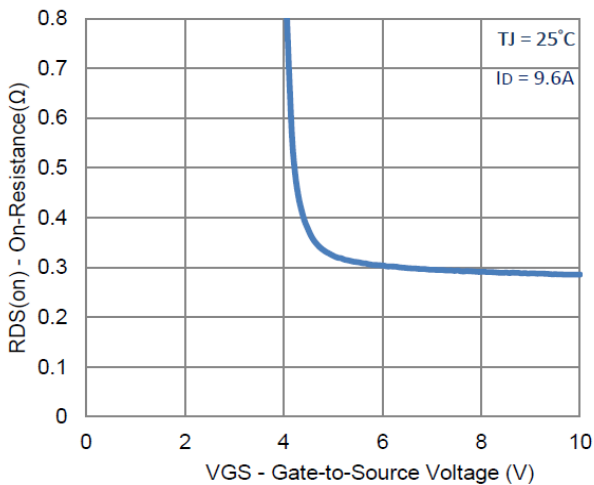
**CHARACTERISTIC CURVES**



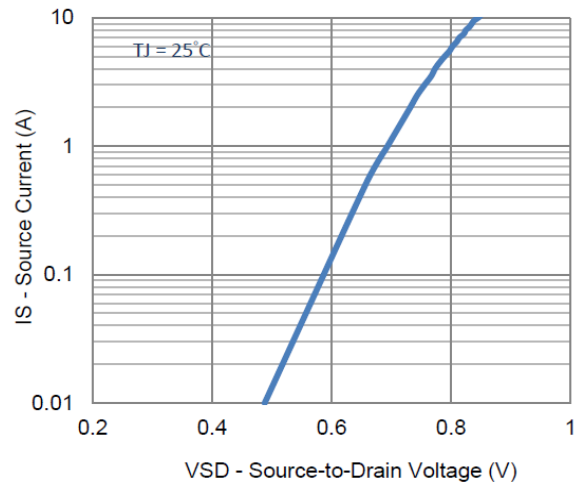
**1. On-Resistance vs. Drain Current**



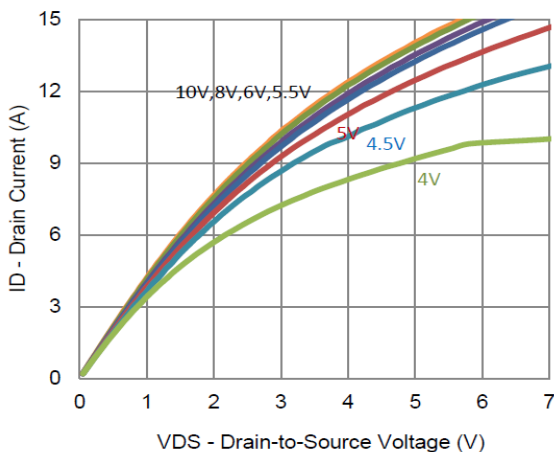
**2. Transfer Characteristics**



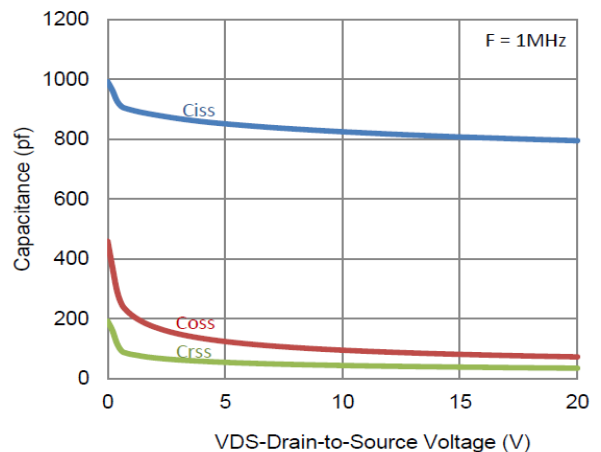
**3. On-Resistance vs. Gate-to-Source Voltage**



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

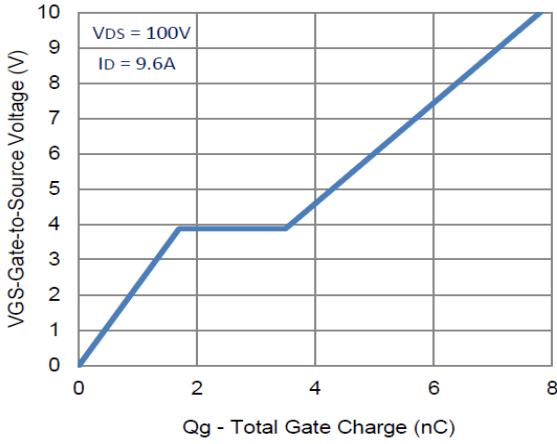


**5. Output Characteristics**

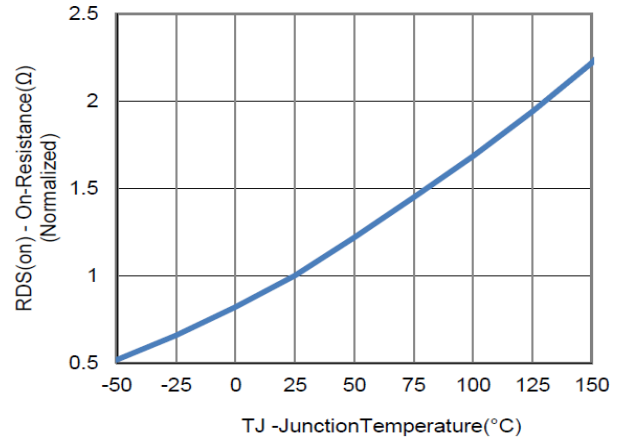


**6. Capacitance**

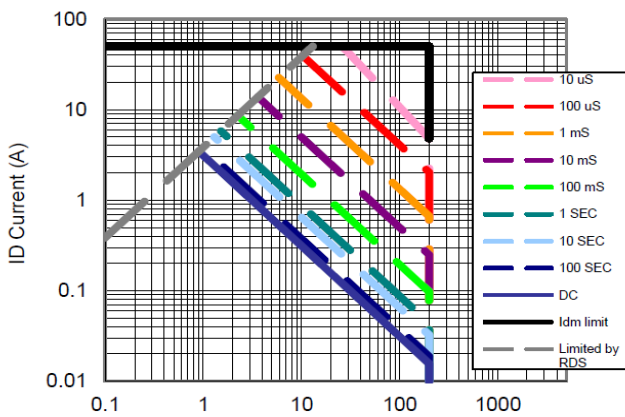
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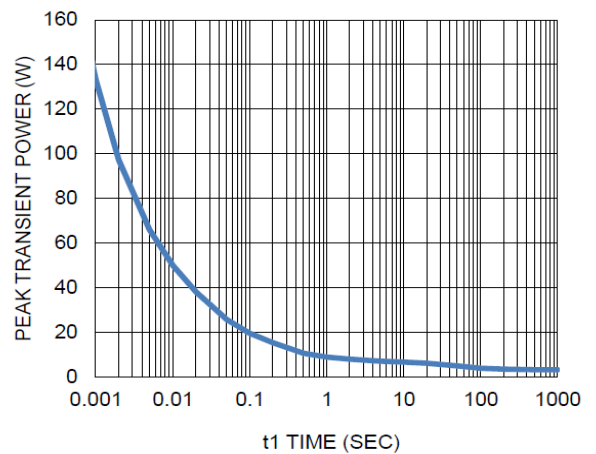
**7. Gate Charge**



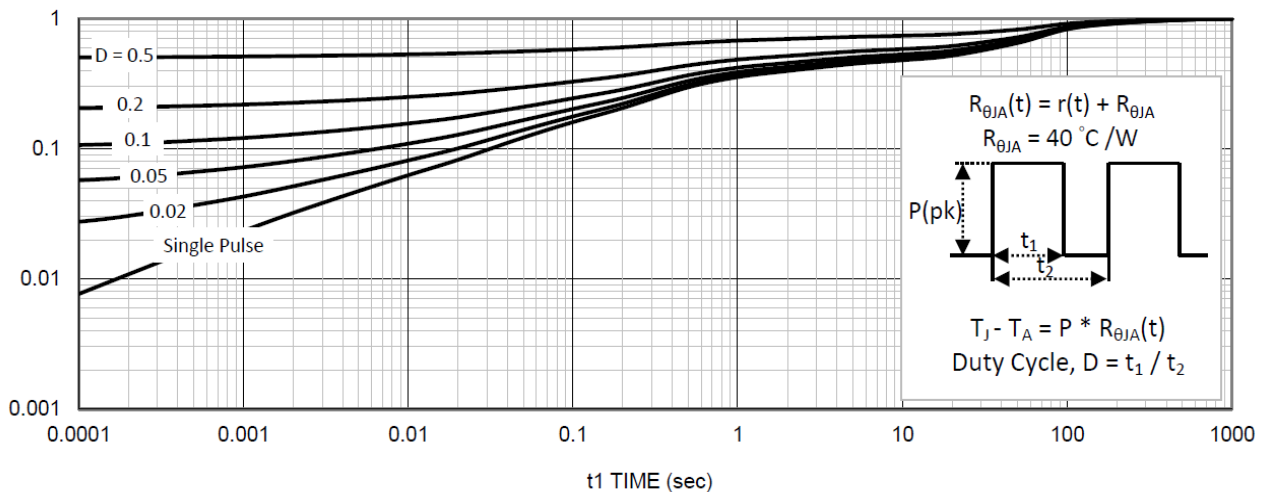
**8. Normalized On-Resistance Vs Junction Temperature**



**9. Safe Operating Area**



**10. Single Pulse Maximum Power Dissipation**



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