

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

FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe DFN3x3-8PP saves board space
- Fast switching speed
- High performance trench technology

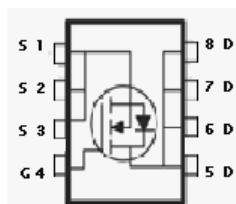
APPLICATION

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

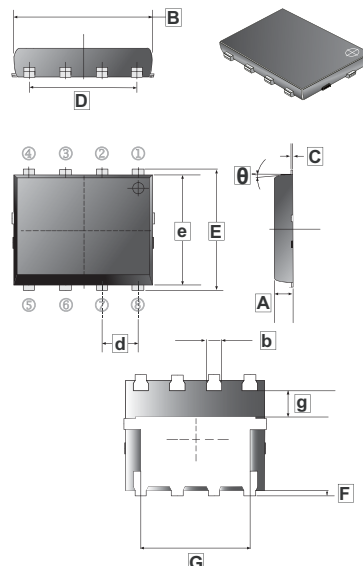
PACKAGE INFORMATION

Package	MPQ	Leader Size
DFN3x3-8PP	3K	13 inch

Top View



DFN3x3-8PP



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	0.70	0.90	θ	0°	12°
B	3.00BSC		b	0.20	0.40
C	0.10	0.25	d	0.65BSC	
D	1.80	2.3	e	3.00BSC	
E	3.2BSC		q	0.70(TYP.)	
F	0.01	0.02			
G	2.35BSC				

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

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ¹	$T_A=25^\circ\text{C}$	I_D	6.2	A
	$T_A=70^\circ\text{C}$		4.6	A
Pulsed Drain Current ²		I_{DM}	50	A
Continuous Source Current (Diode Conduction) ¹		I_S	5	A
Total Power Dissipation ¹	$T_A=25^\circ\text{C}$	P_D	3.5	W
	$T_A=70^\circ\text{C}$		2	W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	$^\circ\text{C}$
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient (Max.) ¹	$t \leq 10 \text{ sec}$	$R_{\theta JA}$	35	$^\circ\text{C} / \text{W}$
	Steady State		81	$^\circ\text{C} / \text{W}$

Notes:

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

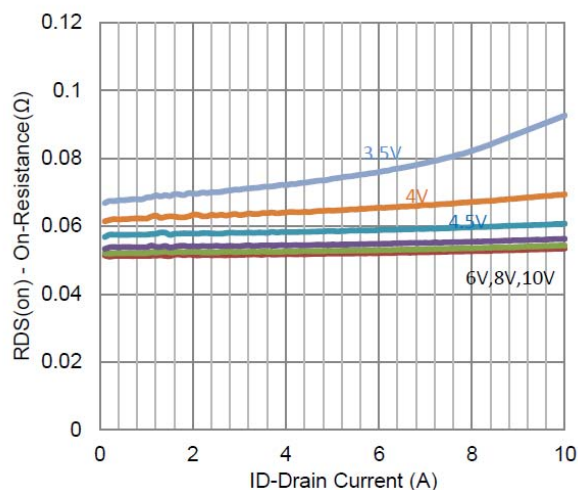
ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	-	V	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$
Gate-Body Leakage Current	I_{GSS}	-	-	± 10	μA	$V_{DS}=0$, $V_{GS}= \pm 20\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS}=80\text{V}$, $V_{GS}=0$
		-	-	5		$V_{DS}=80\text{V}$, $V_{GS}=0$, $T_J=55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(on)}$	3.1	-	-	A	$V_{DS}=5\text{V}$, $V_{GS}=10\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	62	m Ω	$V_{GS}=10\text{V}$, $I_D=5\text{A}$
		-	-	72		$V_{GS}=4.5\text{V}$, $I_D=4.9\text{A}$
Forward Transconductance ¹	g_{fs}	-	10	-	S	$V_{DS}=15\text{V}$, $I_D=5\text{A}$
Diode Forward Voltage	V_{SD}	-	0.73	-	V	$I_S=2.5\text{A}$, $V_{GS}=0$
Dynamic ²						
Total Gate Charge	Q_g	-	12	-	nC	$V_{DS}=50\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=5\text{A}$
Gate-Source Charge	Q_{gs}	-	4.1	-		
Gate-Drain Charge	Q_{gd}	-	6.2	-		
Input Capacitance	C_{iss}	-	1098	-	pF	$V_{DS}=15\text{V}$, $V_{GS}=0$ $f=1\text{MHz}$
Output Capacitance	C_{oss}	-	120	-		
Reverse Transfer Capacitance	C_{rss}	-	76	-		
Turn-On Delay Time	$T_{d(on)}$	-	7	-	nS	$V_{DD}=50\text{V}$ $I_D=5\text{A}$ $V_{GEN}=10\text{V}$ $R_L=10\Omega$ $R_{GEN}=6\Omega$
Rise Time	T_r	-	11	-		
Turn-Off Delay Time	$T_{d(off)}$	-	54	-		
Fall Time	T_f	-	26	-		

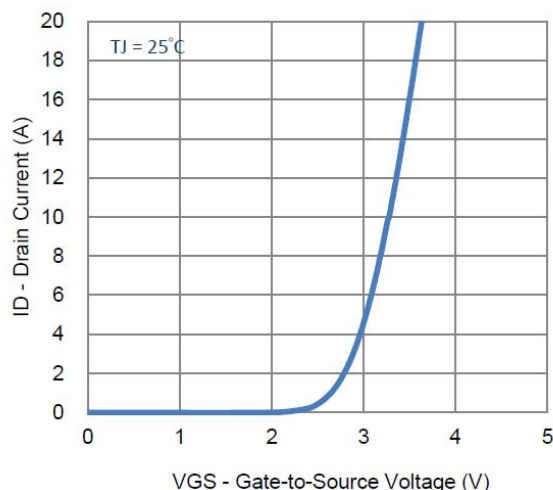
Notes:

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

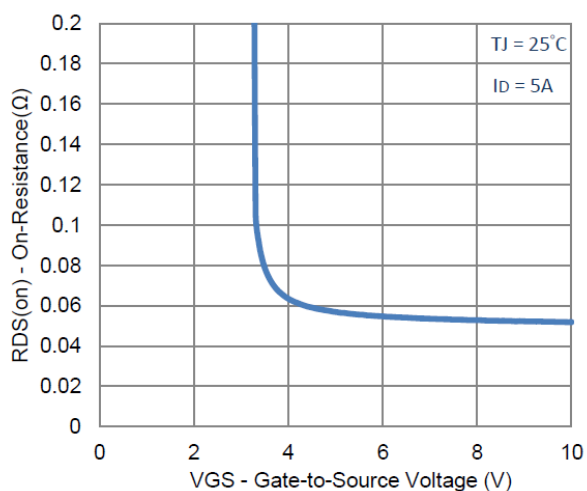
Typical Electrical Characteristics



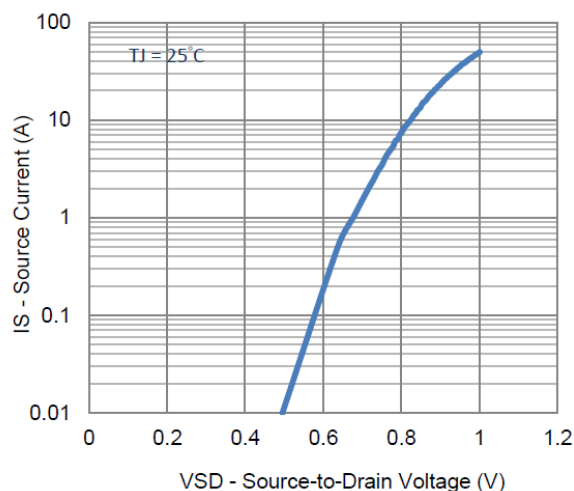
1. On-Resistance vs. Drain Current



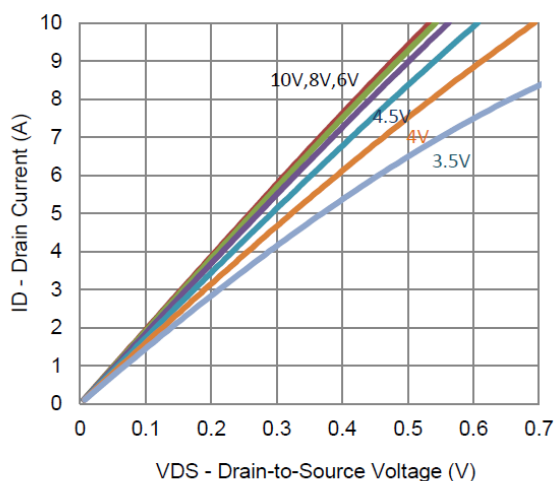
2. Transfer Characteristics



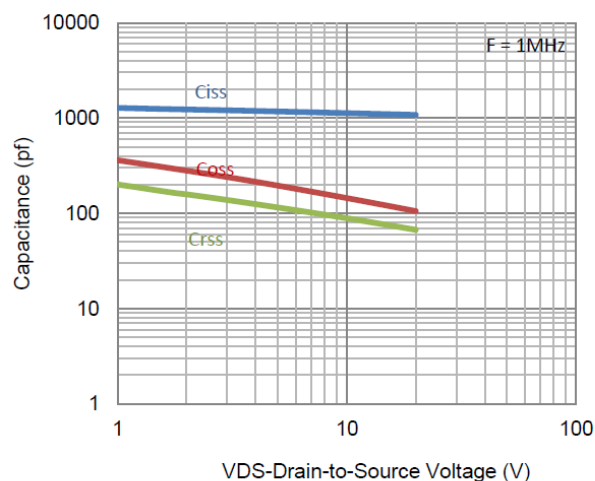
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

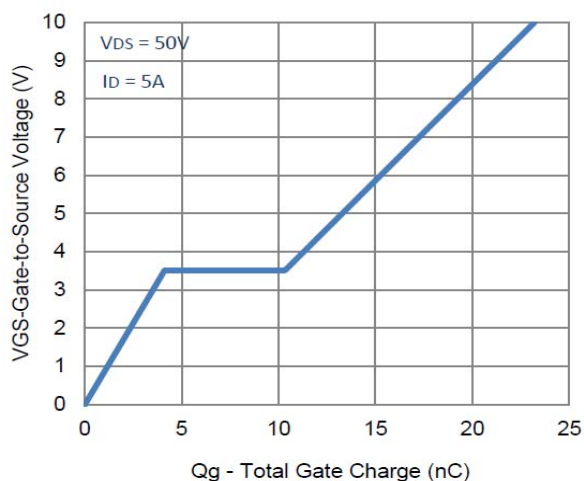


5. Output Characteristics

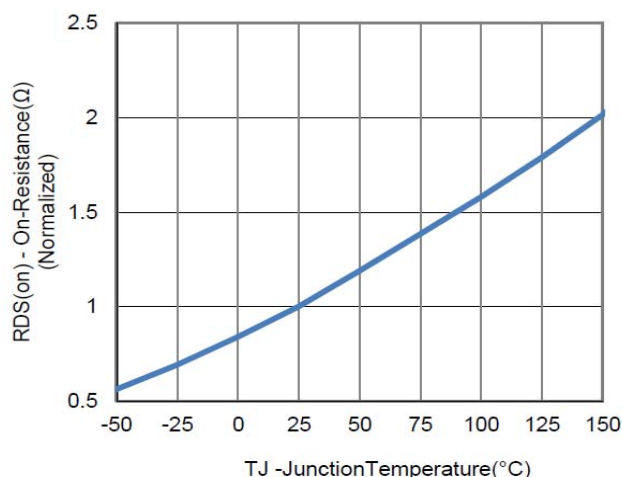


6. Capacitance

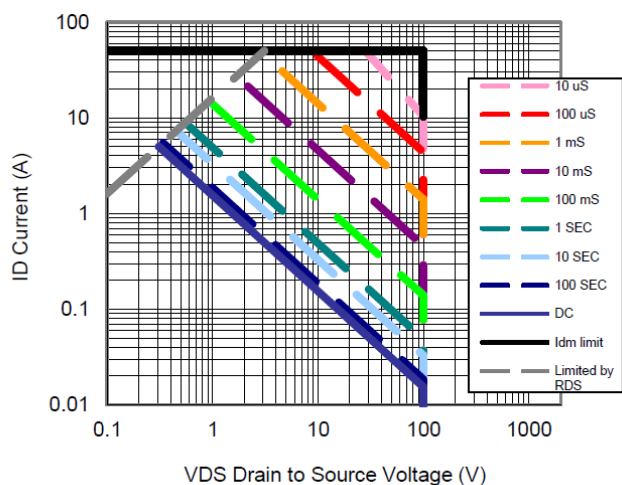
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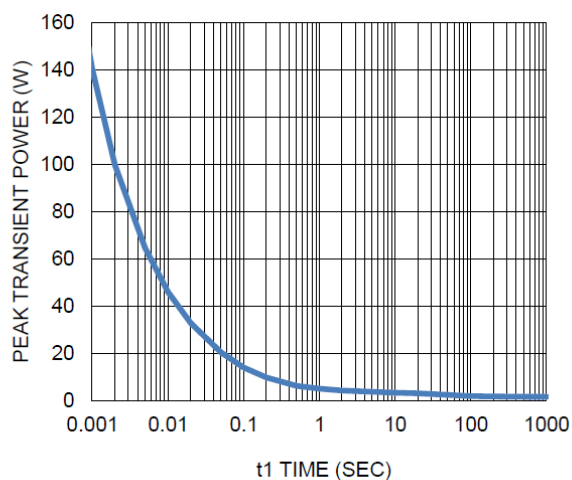
7. Gate Charge



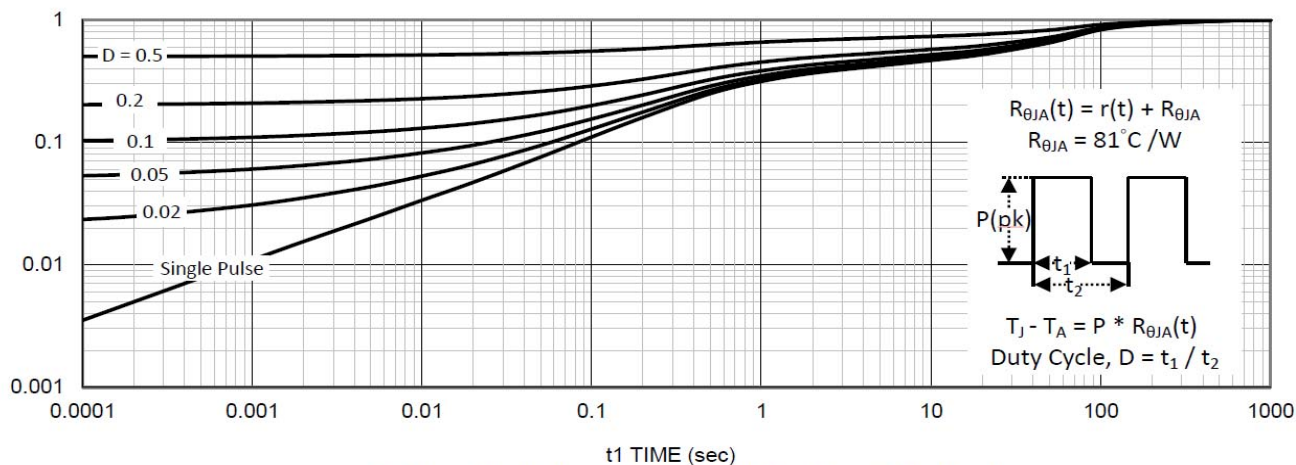
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient