

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

DESCRIPTION

The 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.

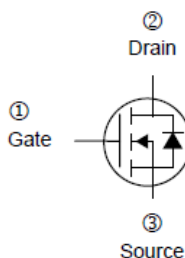
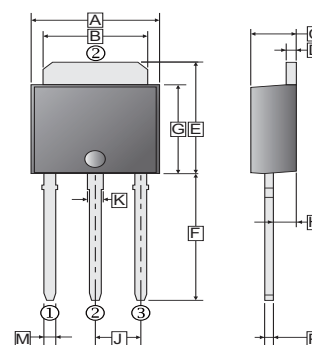
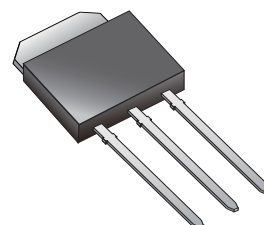
FEATURES

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

APPLICATION

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

TO-251P



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.40	6.80	G	6.00	6.30
B	5.20	5.50	H	0.90	1.50
C	2.20	2.40	J	2.30	
D	0.40	0.60	K	0.60	0.90
E	6.80	7.20	M	0.70	1.20
F	4.00		P	0.40	0.60

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	300	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	I_D	5.8	A
$T_C=25^\circ\text{C}$			
Pulsed Drain Current ²	I_{DM}	20	A
Continuous Source Current (Diode Conduction) ¹	I_S	10	A
Power Dissipation ¹	P_D	40	W
$T_C=25^\circ\text{C}$			
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ 175	$^\circ\text{C}$
Thermal Resistance Data			
Maximum Junction to Ambient ¹	$R_{\theta JA}$	62.5	$^\circ\text{C} / \text{W}$
Maximum Junction to Case	$R_{\theta JC}$	3.75	

Notes:

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

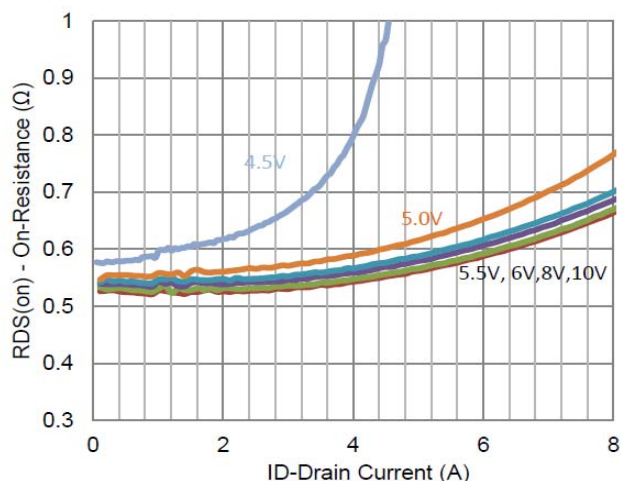
ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test conditions
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	3.5	V	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$
Gate-Body Leakage	I_{GSS}	-	-	± 10	nA	$V_{DS}=0$, $V_{GS}=\pm 20\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS}=240\text{V}$, $V_{GS}=0$
		-	-	25		$V_{DS}=240\text{V}$, $V_{GS}=0$, $T_J=55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(ON)}$	10	-	-	A	$V_{DS}=5\text{V}$, $V_{GS}=10\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	600	m Ω	$V_{GS}=10\text{V}$, $I_D=2.9\text{A}$
		-	-	900		$V_{GS}=5.5\text{V}$, $I_D=2.6\text{A}$
Forward Transconductance ¹	g_{FS}	-	10	-	S	$V_{DS}=15\text{V}$, $I_D=2.9\text{A}$
Diode Forward Voltage	V_{SD}	-	0.8	-	V	$I_S=5\text{A}$, $V_{GS}=0$
Dynamic ²						
Total Gate Charge	Q_g	-	13.5	-	nC	$I_D=2.9\text{A}$ $V_{DS}=120\text{V}$ $V_{GS}=10\text{V}$
Gate-Source Charge	Q_{gs}	-	4.1	-		
Gate-Drain Charge	Q_{gd}	-	3.4	-		
Turn-On Delay Time	$T_{d(ON)}$	-	12.1	-	nS	$V_{DD}=120\text{V}$ $V_{GEN}=10\text{V}$ $R_L=41.4\Omega$ $I_D=2.9\text{A}$ $R_{GEN}=6\Omega$
Rise Time	T_r	-	13.3	-		
Turn-Off Delay Time	$T_{d(OFF)}$	-	28.9	-		
Fall Time	T_f	-	16.8	-		
Input Capacitance	C_{iss}	-	1092	-	pF	$V_{GS}=0$ $V_{DS}=15\text{V}$ $f=1\text{MHz}$
Output Capacitance	C_{oss}	-	90	-		
Reverse Transfer Capacitance	C_{rss}	-	52	-		

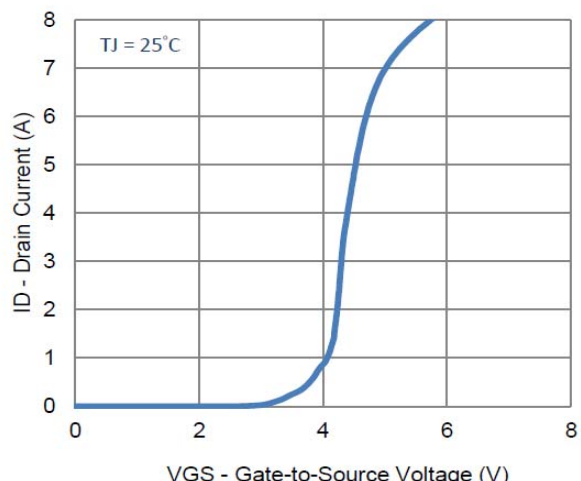
Notes:

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

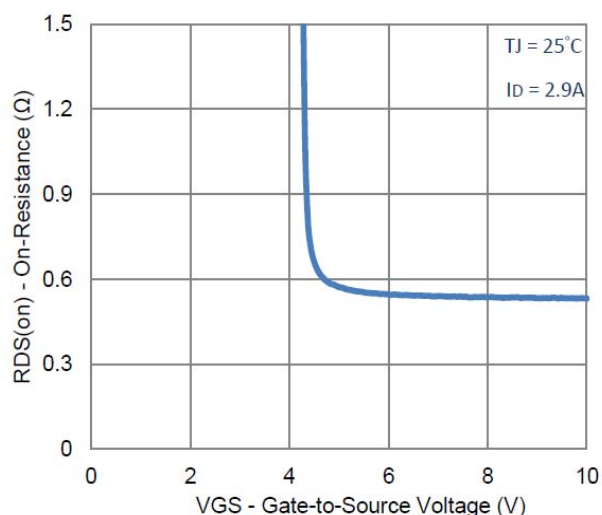
CHARACTERISTIC CURVE



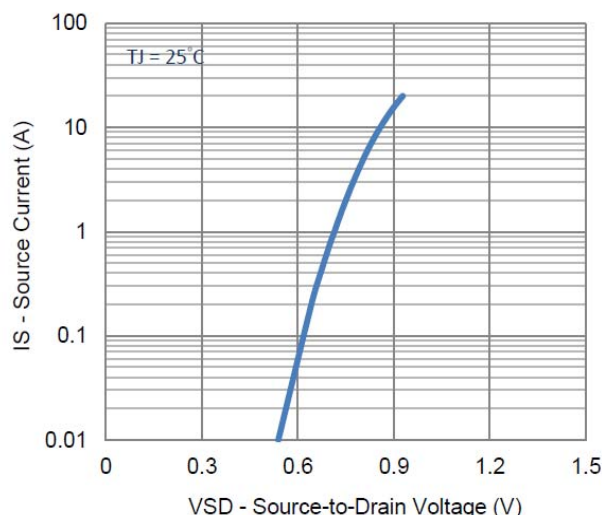
1. On-Resistance vs. Drain Current



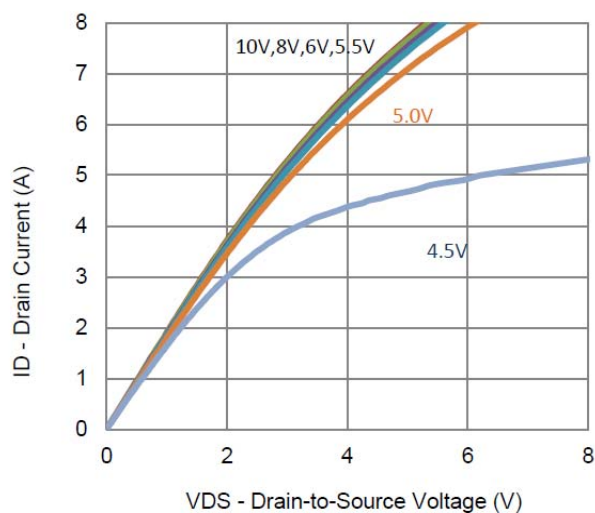
2. Transfer Characteristics



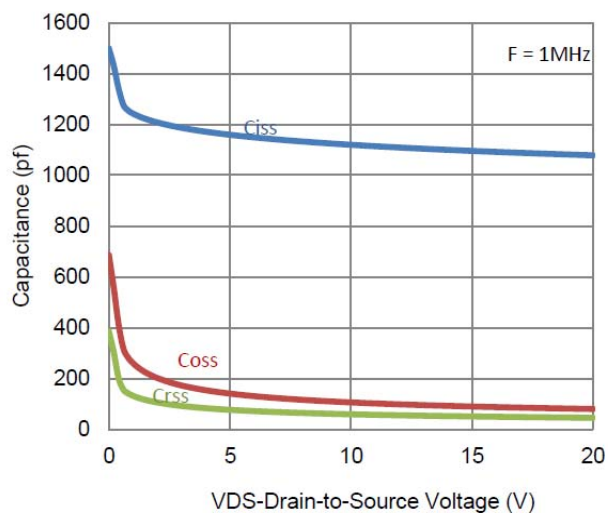
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

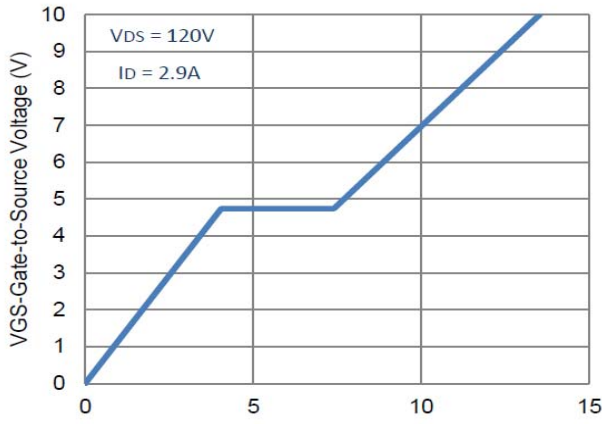


5. Output Characteristics

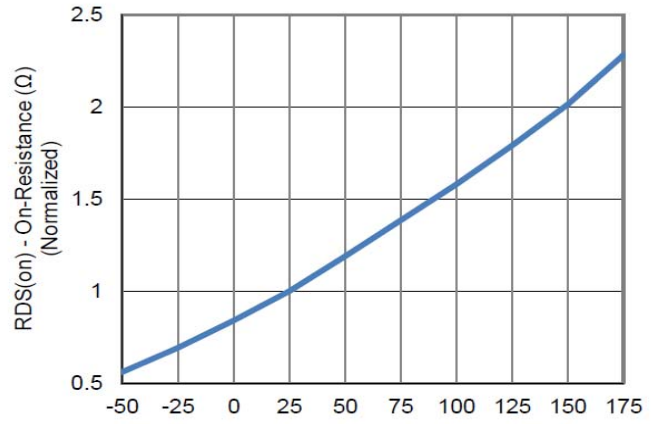


6. Capacitance

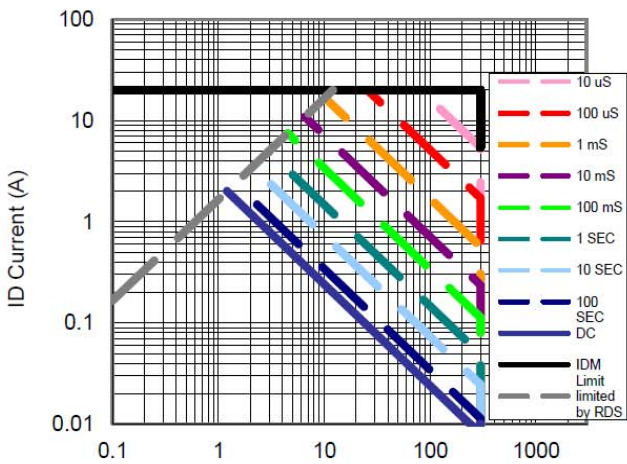
CHARACTERISTIC CURVE



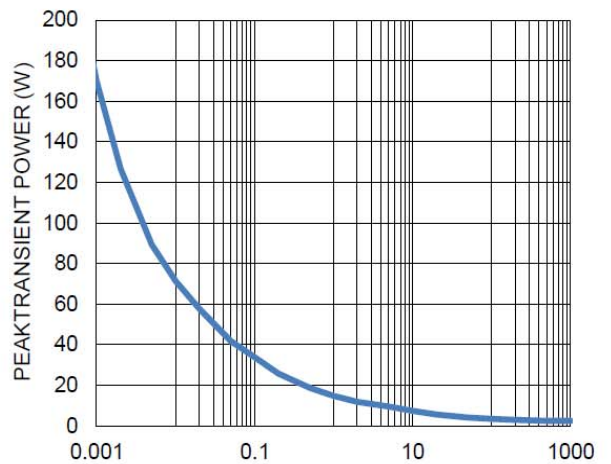
Qg - Total Gate Charge (nC)
7. Gate Charge



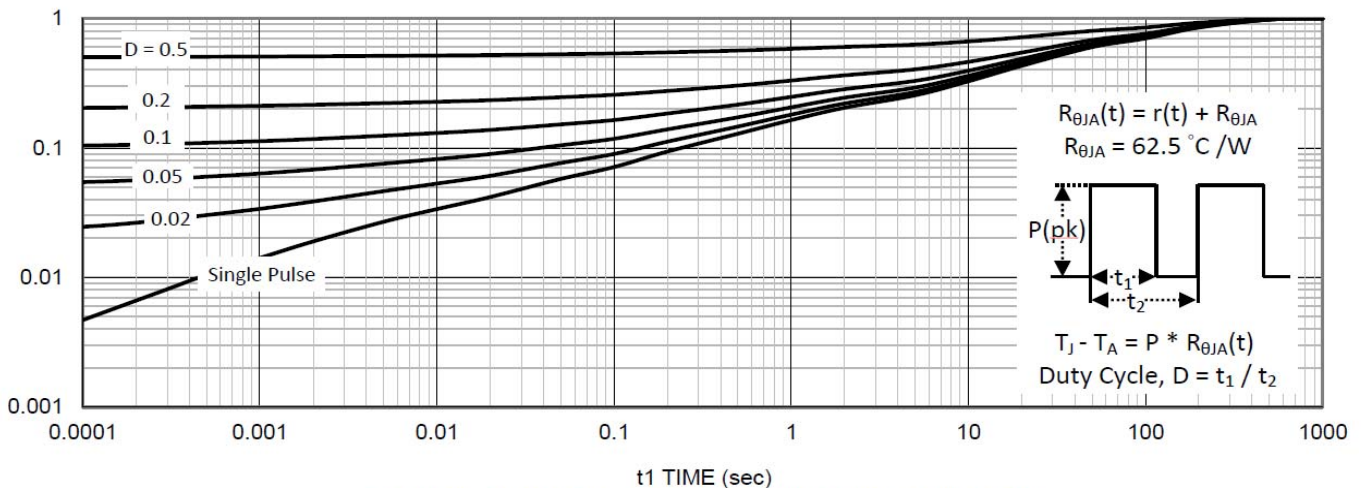
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient