

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

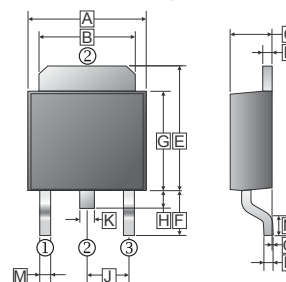
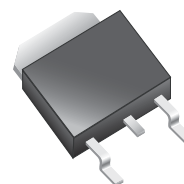
FEATURES

- Low $R_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Miniature TO-252 Surface Mount Package Saves Board Space
- High power and current handling capability
- Low side high current DC-DC Converter applications

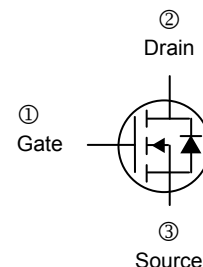
PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-252	2.5K	13 inch

TO-252(D-Pack)



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.4	6.8	J	2.30	REF.
B	5.20	5.50	K	0.70	0.90
C	2.20	2.40	M	0.50	1.1
D	0.45	0.58	N	0.9	1.6
E	6.8	7.3	O	0	0.15
F	2.40	3.0	P	0.43	0.58
G	5.40	6.2			
H	0.8	1.20			



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

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current @ $T_C=25^\circ\text{C}$ ¹	I_D	51	A
Pulsed Drain Current ²	I_{DM}	200	A
Continuous Source Current (Diode Conduction) ¹	I_S	51	A
Power Dissipation @ $T_C=25^\circ\text{C}$ ¹	P_D	50	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ 175	$^\circ\text{C}$
THERMAL RESISTANCE RATINGS			
Maximum Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	40	$^\circ\text{C} / \text{W}$
Maximum Thermal Resistance Junction-Case	$R_{\theta JC}$	3	$^\circ\text{C} / \text{W}$

Notes

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

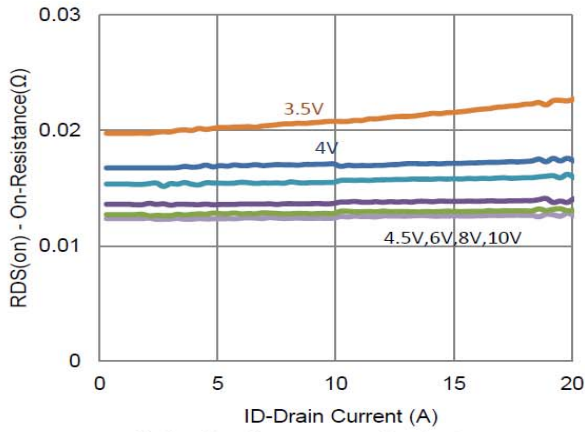
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.0	-	-	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS} = 48\text{V}, V_{GS} = 0\text{V}$
		-	-	25		$V_{DS} = 48\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(ON)}$	35	-	-	A	$V_{DS} = 5\text{V}, V_{GS} = 10\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	13	m Ω	$V_{GS} = 10\text{V}, I_D = 20\text{A}$
		-	-	18		$V_{GS} = 4.5\text{V}, I_D = 16\text{A}$
Forward Transconductance ¹	g_{fs}	-	24	-	S	$V_{DS} = 15\text{V}, I_D = 20\text{A}$
Diode Forward Voltage	V_{SD}	-	0.9	-	V	$I_S = 25.5\text{A}, V_{GS} = 0$
Dynamic ²						
Total Gate Charge	Q_g	-	20	-	nC	$I_D = 20\text{A}$ $V_{DS} = 30\text{V}$ $V_{GS} = 4.5\text{V}$
Gate-Source Charge	Q_{gs}	-	5.9	-		
Gate-Drain Change	Q_{gd}	-	11	-		
Input Capacitance	C_{iss}	-	2022	-	pF	$f = 1\text{MHz}$ $V_{DS} = 15\text{V}$ $V_{GS} = 0$
Output Capacitance	C_{oss}	-	101	-		
Reverse Transfer Capacitance	C_{rss}	-	158	-		
Turn-on Delay Time	$T_{d(on)}$	-	10	-	nS	$V_{DS} = 30\text{V}$ $I_D = 20\text{A}$ $R_L = 1.5\Omega$ $V_{GEN} = 10\text{V}$ $R_{GEN} = 6\Omega$
Rise Time	T_r	-	11	-		
Turn-off Delay Time	$T_{d(off)}$	-	61	-		
Fall Time	T_f	-	19	-		

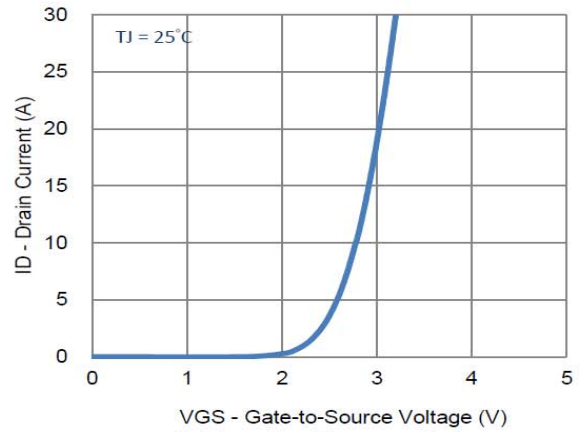
Notes

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

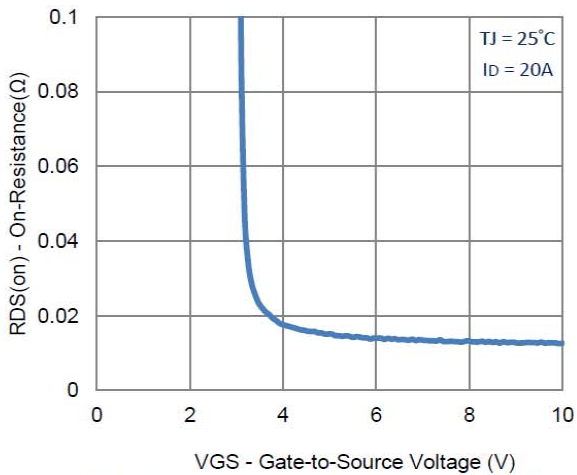
CHARACTERISTICS CURVE



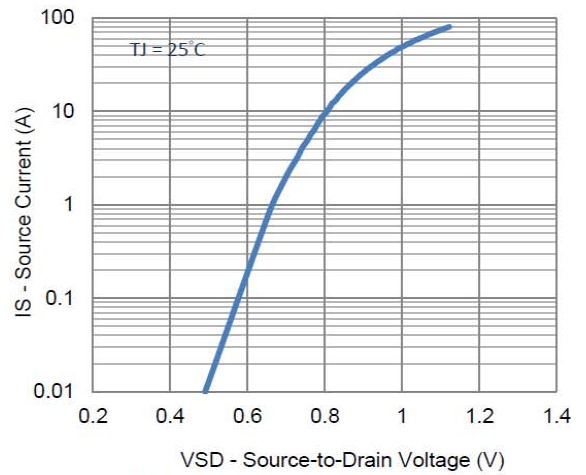
1. On-Resistance vs. Drain Current



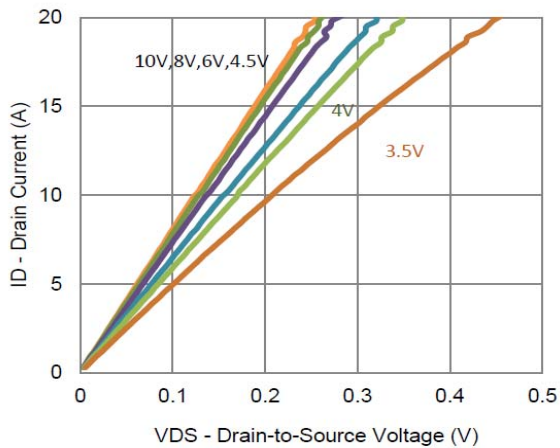
2. Transfer Characteristics



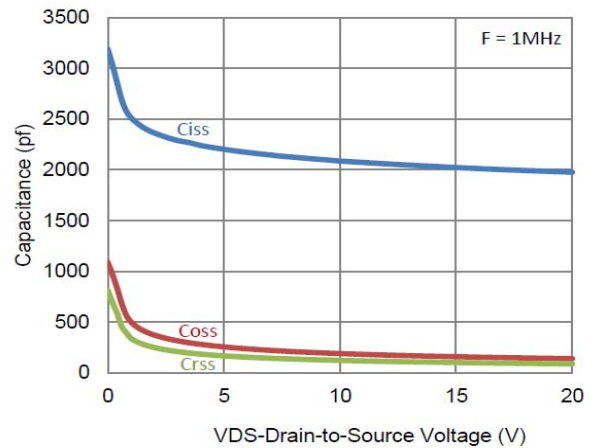
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

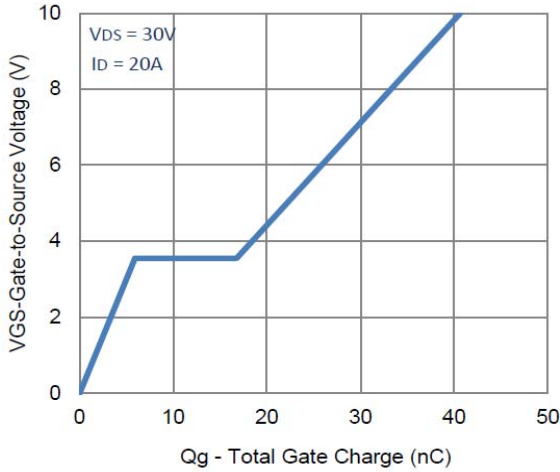


5. Output Characteristics

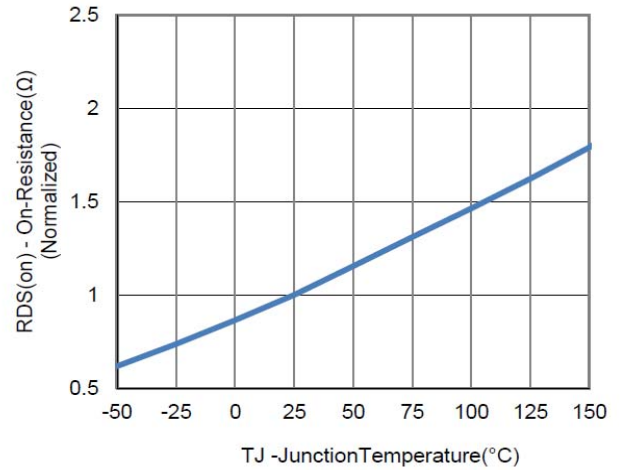


6. Capacitance

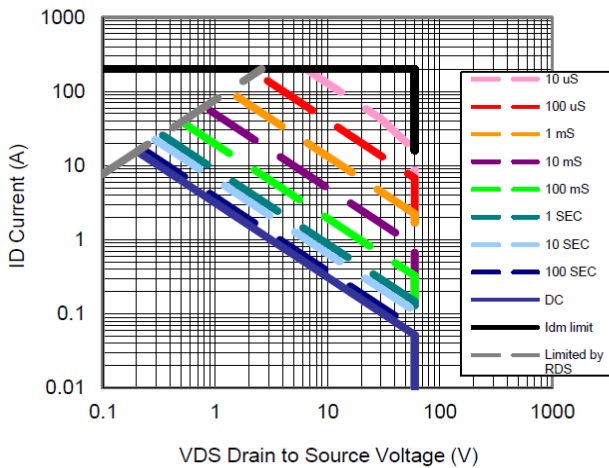
CHARACTERISTICS CURVE



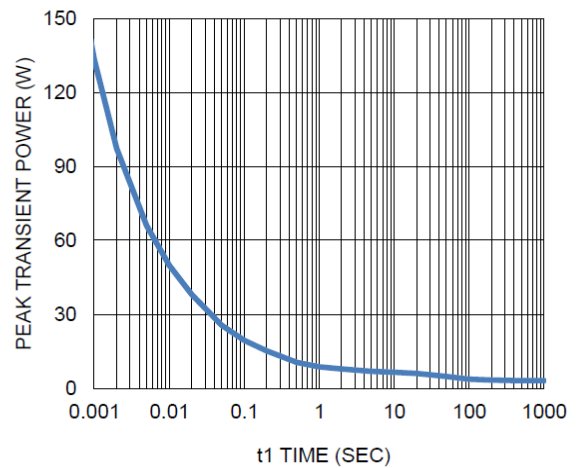
7. Gate Charge



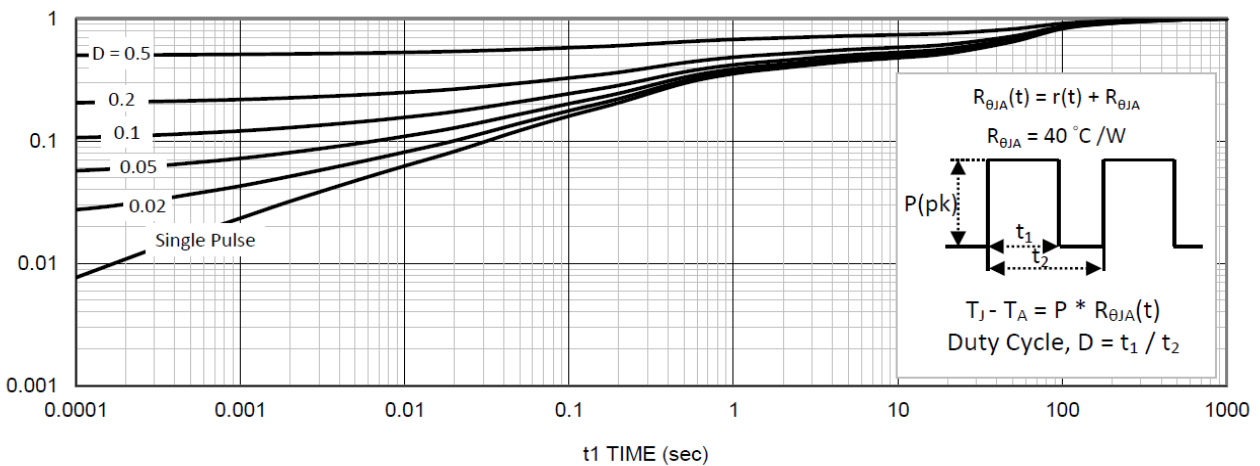
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient