

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

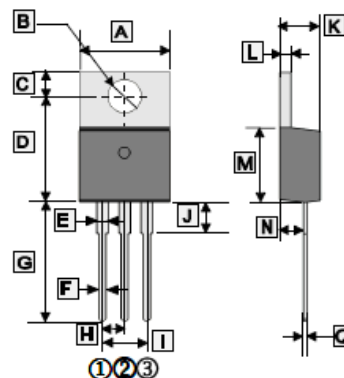
DESCRIPTION

This advanced high voltage MOSFET is designed to withstand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain-to-source diode with fast recovery time. It is designed for high voltage, high speed switching applications such as power supplies, converters, power motor control and bridge circuits.

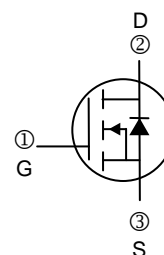
FEATURES

- High current rating
- Low $R_{DS(ON)}$
- Lower capacitance
- Lower total gate charge
- Tighter VSD specifications
- Specified avalanche energy

TO-220J



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	10.010	10.350	I	4.980	5.180
B	3.735	3.935	J	3.560	3.960
C	2.590	2.890	K	4.470	4.670
D	12.060	12.460	L	1.200	1.400
E	1.170	1.370	M	8.500	8.900
F	0.710	0.910	N	2.520	2.820
G	13.400	13.800	Q	0.330	0.650
H	2.540 TYP.				



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current	I_D	4	A
Pulsed Drain Current	I_{DM}	16	A
Single Pulse Avalanche Energy ¹	E_{AS}	280	mJ
Power Dissipation	P_D	2	W
Maximum Lead Temperature for Soldering Purposes @ 1/8" from case for 5 seconds	T_L	260	$^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Thermal Resistance Rating			
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$

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

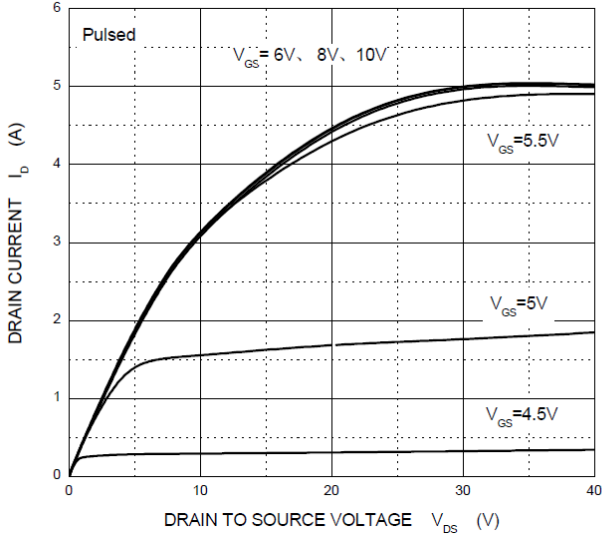
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	650	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
Drain-Source Diode Forward Voltage ²	V_{SD}	-	-	1.5	V	$V_{GS}=0, I_S=4\text{A}$
Drain-Source Leakage Current	I_{DSS}	-	-	25	μA	$V_{DS}=600\text{V}, V_{GS}=0$
Gate-Body Leakage Current ²	I_{GSS}	-	-	± 100	nA	$V_{DS}=0\text{V}, V_{GS}=\pm 30\text{V}$
On Characteristics ²						
Gate Threshold Voltage	$V_{GS(th)}$	2	-	4	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	-	3	Ω	$V_{GS}=10\text{V}, I_D=2\text{A}$
Dynamic Characteristics						
Input Capacitance	C_{iss}	-	760	-	pF	$V_{DS}=25\text{V}$ $V_{GS}=0$ $f=1\text{MHz}$
Output Capacitance	C_{oss}	-	180	-		
Reverse Transfer Capacitance	C_{rss}	-	20	-		
Switching Characteristics						
Total Gate Charge	Q_g	-	5	-	nC	$V_{DS}=480\text{V}$ $V_{GS}=10\text{V}$ $I_D=4\text{A}$
Gate-Source Charge	Q_{gs}	-	2.7	-		
Gate-Drain ("Miller") Change	Q_{gd}	-	2	-		
Turn-on Delay Time	$T_{d(on)}$	-	20	-	nS	$V_{DD}=300\text{V}$ $V_{GS}=10\text{V}$ $R_G=9.1\Omega$ $I_D=4\text{A}$
Rise Time	T_r	-	10	-		
Turn-off Delay Time	$T_{d(off)}$	-	40	-		
Fall Time	T_f	-	20	-		

Notes:

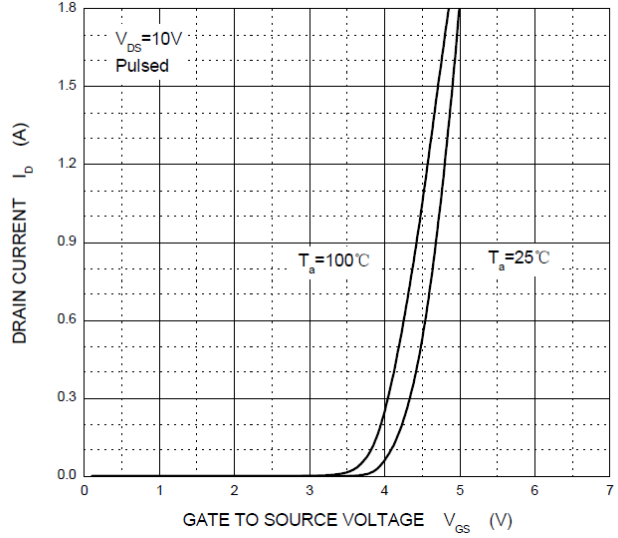
- E_{AS} condition: $L=30\text{mH}, I_L=4\text{A}, V_{DD}=100\text{V}, R_G=25\Omega$, starting $T_J=25^\circ\text{C}$.
- Pulse Test : Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

CHARACTERISTICS CURVE

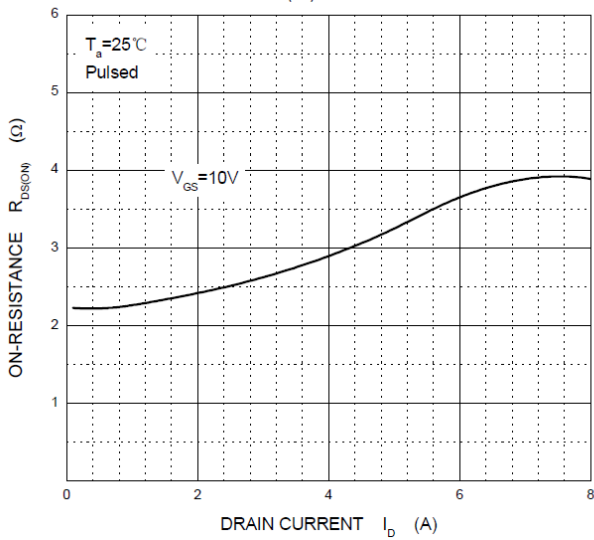
Output Characteristics



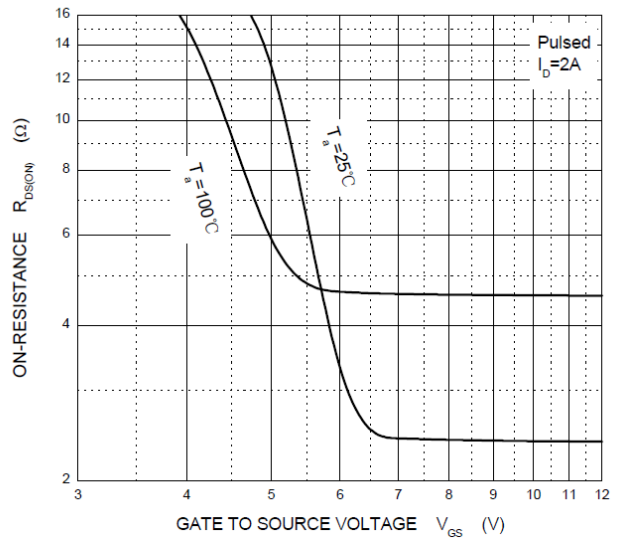
Transfer Characteristics



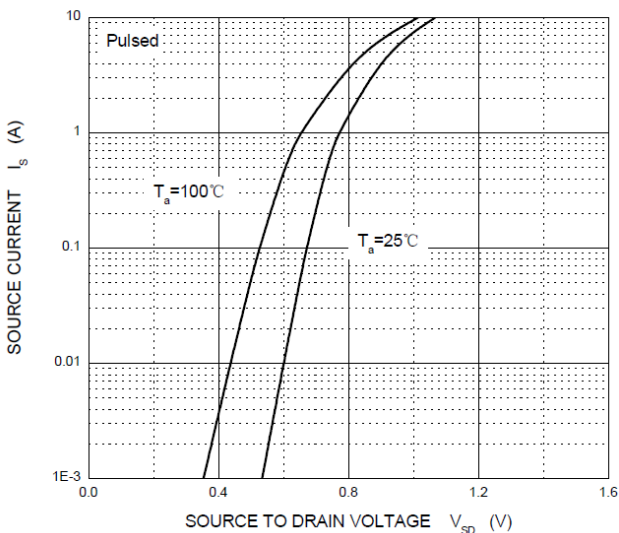
$R_{DS(ON)} - I_D$



$R_{DS(ON)} - V_{GS}$



$I_S - V_{SD}$



Threshold Voltage

