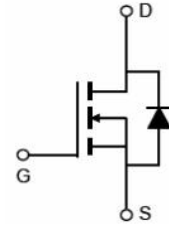


Main Product Characteristics:

V_{DSS}	80V
$R_{DS(on)}$	7.3m Ω (typ.)
I_D	90A


TO-220

Schematic Diagram
Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V$ ①	90	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V$ ①	63	
I_{DM}	Pulsed Drain Current②	360	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation③	125	W
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-to-Source Voltage	± 20	V
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

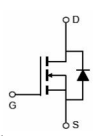
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	1	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

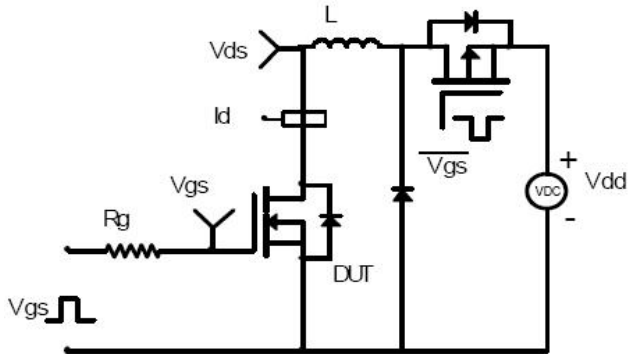
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	80	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	7.3	8.7	m Ω	$V_{GS}=10V, I_D=40A$
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	$V_{DS}=V_{GS}, I_D=250\mu A$
I_{DSS}	Drain-to-Source leakage current $T_J=25^{\circ}\text{C}$	—	—	1	μA	$V_{DS}=80V, V_{GS}=0V,$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS}=20V, V_{DS}=0V$
		—	—	-100		$V_{GS}=-20V, V_{DS}=0V$
Q_g	Total gate charge	—	95	—	nC	$T_J=25^{\circ}\text{C}, V_{GS}=10V,$ $V_{DS}=40V, I_D=40A$
Q_{gs}	Gate-to-Source charge	—	18	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	39	—		
$t_{d(on)}$	Turn-on delay time	—	26	—	ns	$V_{GS}=10V$ $V_{DS}=40V$ $R_G=3\Omega$ $R_L=1\Omega$
t_r	Rise time	—	19	—		
$t_{d(off)}$	Turn-Off delay time	—	59	—		
t_f	Fall time	—	25	—		
C_{iss}	Input capacitance	—	4163	—	pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1\text{MHz}$
C_{oss}	Output capacitance	—	249	—		
C_{rss}	Reverse transfer capacitance	—	181	—		

Source-Drain Ratings and Characteristics

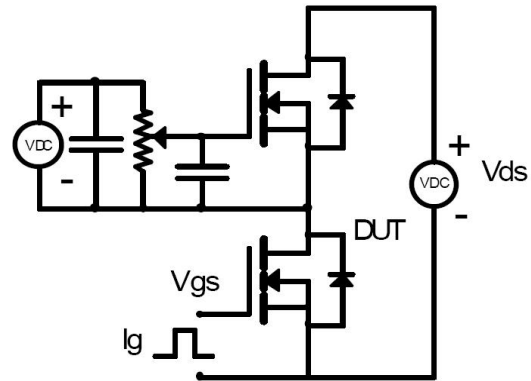
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	90	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	360	A	
V_{SD}	Diode Forward Voltage	—	—	1.2	V	$I_S=40A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	—	8	—	ns	$T_J = 25^{\circ}\text{C}, I_F = 20A, di/dt =$ $500A/\mu s$
Q_{rr}	Reverse Recovery Charge	—	35	—	nC	

Test Circuits and Waveforms

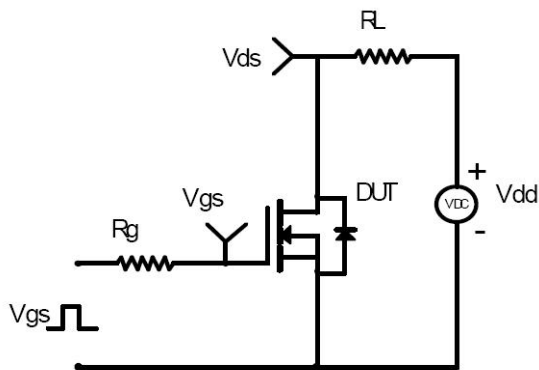
EAS Test Circuit:



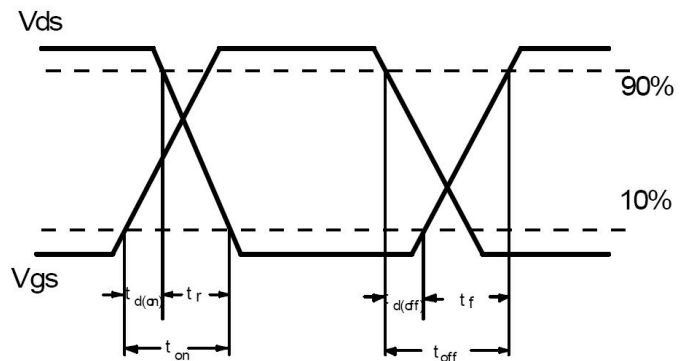
Gate Charge Test Circuit:



Switching Time Test Circuit:

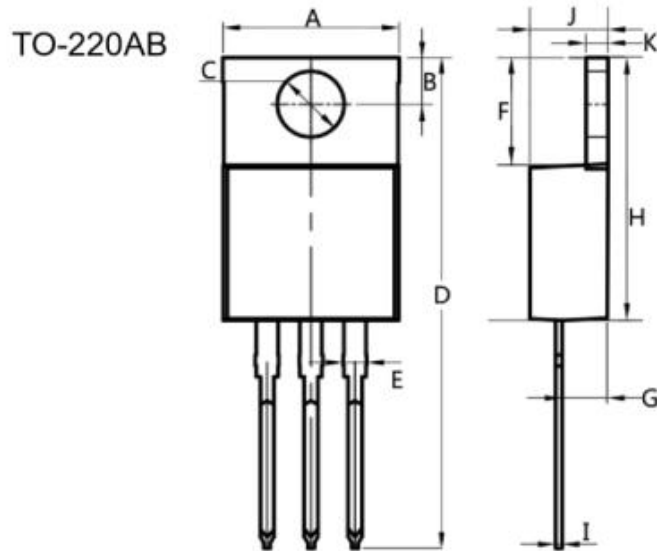


Switching Waveforms:



Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation P_D is based on max. junction temperature, using junction-to-case thermal resistance.

Mechanical Data:
Unit:mm


Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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