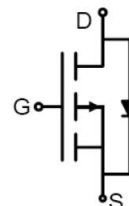


Main Product Characteristics:

V_{DSS}	-60V
$R_{DS(on)}$	26m Ω (typ.)
I_D	-34A



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, $V_{GS} @ 10\text{V}$ ①	-34	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	-24	
I_{DM}	Pulsed Drain Current ②	-136	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation ③	88	W
V_{DS}	Drain-Source Voltage	-60	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	—	1.7	$^{\circ}\text{C}/\text{W}$

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

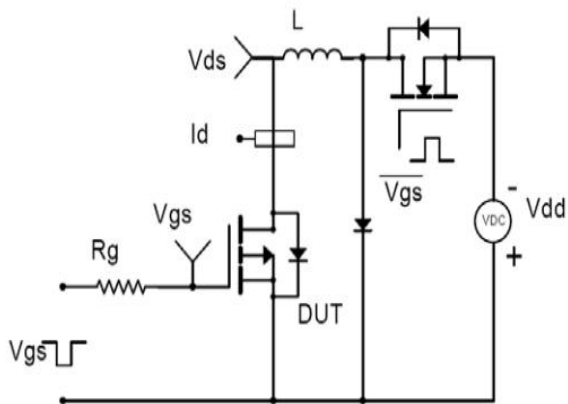
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-60	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	26	34	m Ω	$V_{GS}=-10\text{V}, I_D=-15\text{A}$
		—	31	42		$V_{GS}=-4.5\text{V}, I_D=-10\text{A}$
$V_{GS(th)}$	Gate threshold voltage	-1	—	-2.5	V	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$
I_{DSS}	Drain-to-Source leakage current $T_J=25^{\circ}\text{C}$	—	—	-1	μA	$V_{DS}=-60\text{V}, V_{GS}=0\text{V}$,
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS}=20\text{V}, V_{DS}=0\text{V}$
		—	—	-100		$V_{GS}=-20\text{V}, V_{DS}=0\text{V}$
gfs	Transconductance	—	27	—	S	$V_{DS}=-5\text{V}, I_D=-20\text{A}$
Q_g	Total gate charge	—	67	—	nC	$T_J=25^{\circ}\text{C}, V_{GS}=-10\text{V},$ $V_{DS}=-30\text{V}, I_D=-20\text{A}$
Q_{gs}	Gate-to-Source charge	—	10.3	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	14	—		
$t_{d(on)}$	Turn-on delay time	—	15	—	ns	$V_{GS}=-10\text{V}$ $V_{DS}=-30\text{V}$ $R_G=3\Omega$ $R_L=1.5\Omega$
t_r	Rise time	—	13	—		
$t_{d(off)}$	Turn-Off delay time	—	93	—		
t_f	Fall time	—	36	—		
C_{iss}	Input capacitance	—	3605	—	pF	$V_{GS}=0\text{V}$ $V_{DS}=-30\text{V}$ $f=1\text{MHz}$
C_{oss}	Output capacitance	—	144	—		
C_{rss}	Reverse transfer capacitance	—	134	—		

Source-Drain Ratings and Characteristics

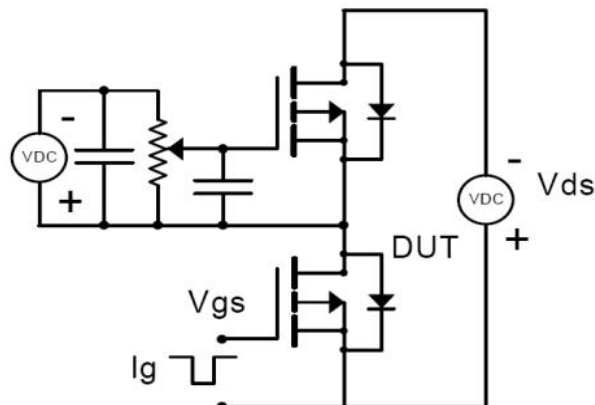
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-34	A	MOSFET symbol showing the integral reverse p-n junction diode 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-136	A	
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	$I_S=-20\text{A}, V_{GS}=0\text{V}$
trr	Reverse Recovery Time	—	23.3	—	ns	$I_F=-20\text{A}, di/dt=100\text{A}/\mu\text{s}$
Qrr	Reverse Recovery Charge	—	21.2	—	nC	

Test Circuits and Waveforms

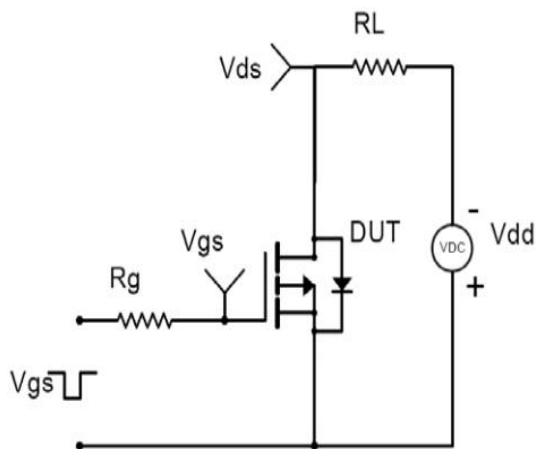
EAS Test Circuit:



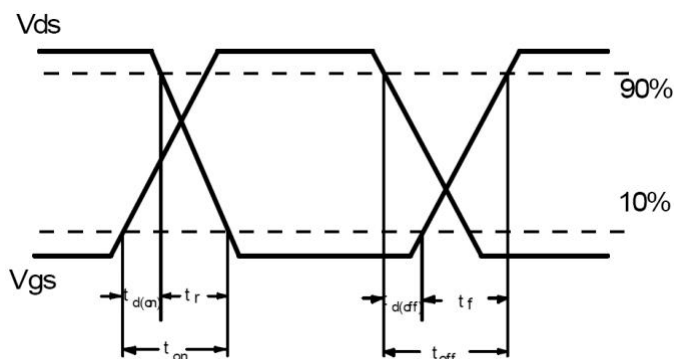
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Waveforms:

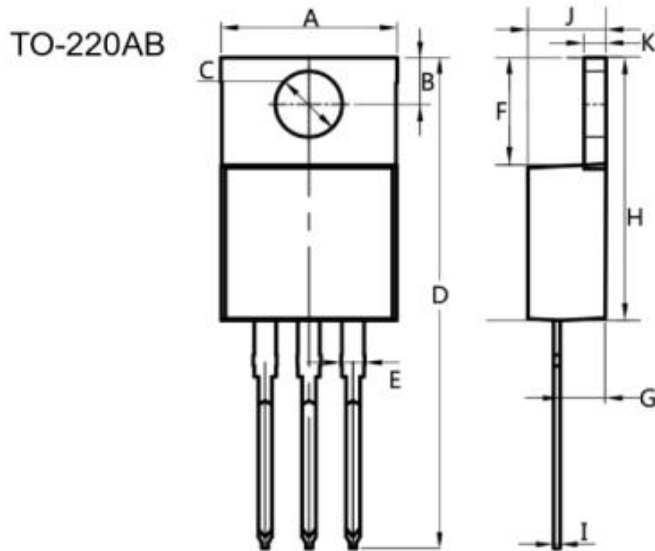


Notes:

- 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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