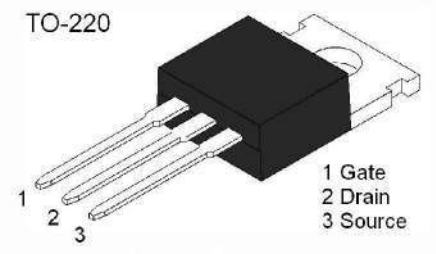
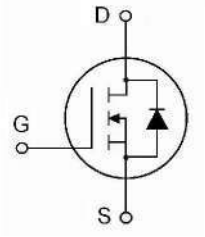
TO-220 Plastic-Encapsulate MOSFETS

N-Channel mode Power MOSFET

Features

- V_{DS} 100V
- I_D 15A
- $R_{DS(ON)}$ (V_{GS} = 10V) < 90mΩ
- High switching speed
- Improved dv/dt capability





Applications

- High-speed current switching
- Solenoid and Relay Drivers
- DC-DC & DC-AC converter

Absolute Maximum Ratings (T_A = 25 ℃)

Parameter		Symbol	Ratings	Units
Gate-Drain Voltage (Note 2)		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current	T_A=25 °C	I_D	15	A
	Pulsed	I_{DM}	64	
Power Dissipation		P_D	125	W
Single pulse avalanche energy		E_{AS}	25	mJ
Junction Temperature		T_J	150	°C
Storage Temperature		T_{STG}	-55～155	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. T_J = +25~+150°C

Thermal Characteristic

Parameter	Symbol	Value	Units
Maximum Thermal Resistance, Junction-case	$R_{\theta JC}$	2.4	°C/W
Maximum Thermal Resistance, Junction-Ambient	$R_{\theta JA}$	62.5	°C/W

Typical Characteristics

Electrical Characteristics (T_j = 25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 100V, V_{GS}= 0V			1	μA
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2		2.4	V
Drain-source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10V,I_D =7A		75	90	mΩ
		V_{GS} = 4.5$_D$ =5		82	100	
Dynamic Characteristics						
Input Capacitance	Ciss	V_{DS} = 25V,V_{GS} = 0V, f = 1.0MHz		1030		pF
Output Capacitance	Coss			50		
Reverse Transfer Capacitance	Crss			39		
Switching Characteristics)						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 10A V_{GS} = 10V, R_{GEN} = 3Ω		13		ns
Turn-on Rise Time	t_r			5.2		
Turn-Off elay Time	$t_{d(off)}$			28		
Turn-Off Fall	t_f			5		
Total Gate Charge	Q_g	V_{DS} =50V, I_D = 10A V_{GS} = 10V		21		nC
Gate-Source Charge	Q_{gs}			3.1		
Gate-Drain Charge	Q_{gd}			6.3		
Drain-Source Diode Characteristics						
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V, I_S =15A			1.2	V
Diode Forward Current	I_S	V_D= V_G =0V			15	A
Pulsed Diode Forward Current	I_{SM}	V_D= V_G =0V			64	A
Reverse Recovery Time	t_{rr}	I_S = 10A, V_{GS} = 0V dI_F/dt =100A/μs		300		ns
Reverse Recovery Charge	Q_{rr}			4.2		nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. E_{AS} condition: Starting T=25 °C, V_{DD}=50V, V_G =10V, R_G=25Ω, L=0.5mH, I_{AS}=9A
3. Pulse Test: Pulse Width≤300us, Duty Cycle ≤0.5%.

Typical Characteristics

Test Circuits and waveforms

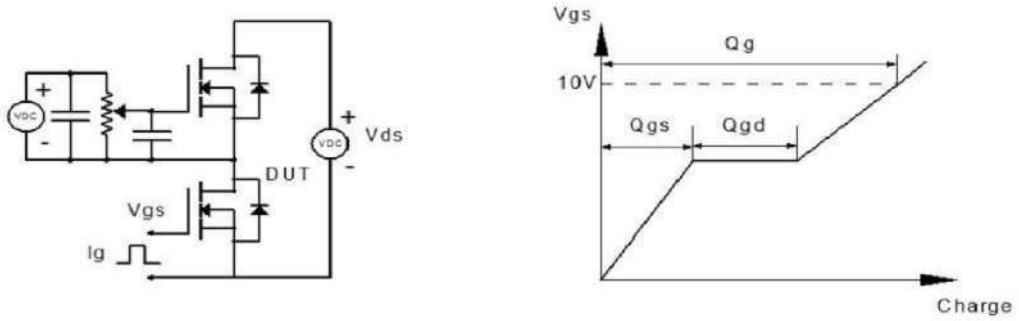


Figure 1. Gate Charge Test Circuit & Waveform

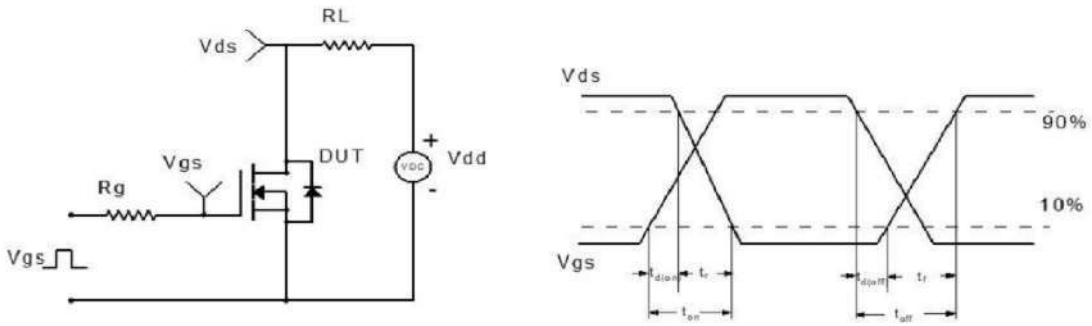


Figure 2: Resistive Switching Test Circuit & Waveform

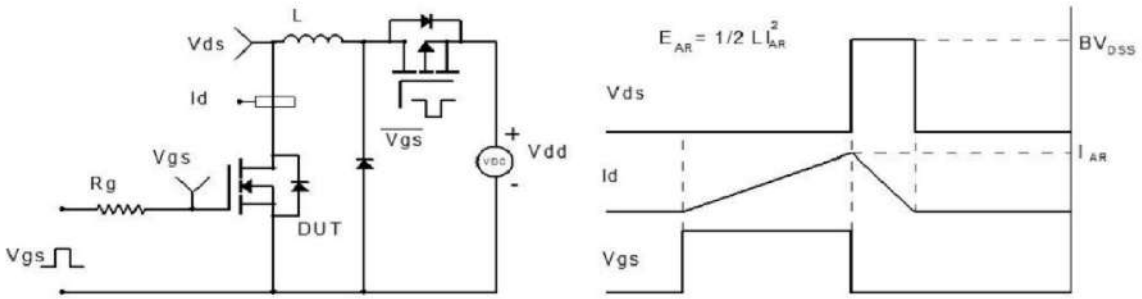


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

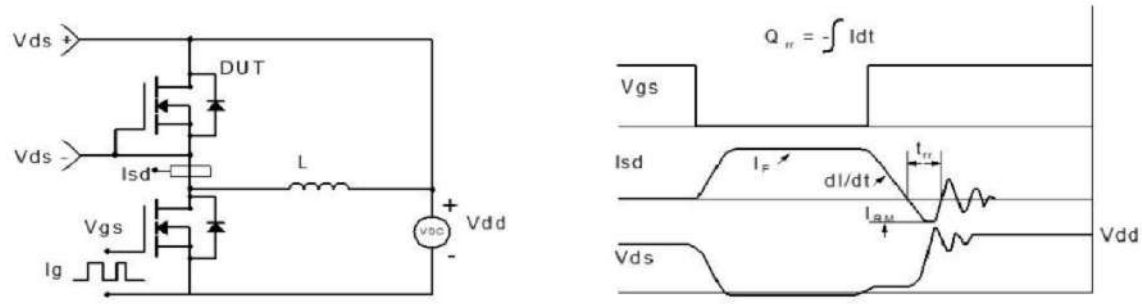


Figure 4: Diode Recovery Test Circuit & Waveform

TO-220 Package Outline Dimensions

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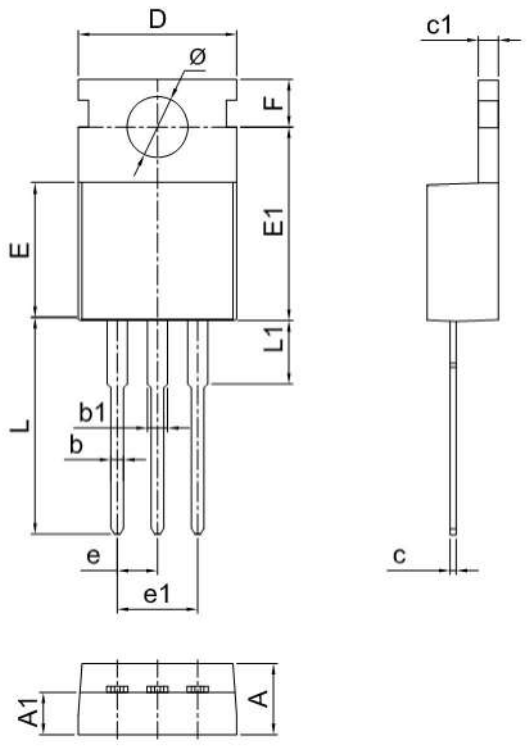

Dim	Dimensions in mm		Dimensions in Inch	
	Min.	Max.	Min.	Max.
A	4.34	4.67	0.171	0.184
A1	2.52	2.82	0.099	0.111
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.30	0.50	0.012	0.020
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
E1	12.00	12.50	0.472	0.492
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	2.60	2.80	0.102	0.110
L	13.20	13.80	0.520	0.543
L1	3.80	4.20	0.150	0.165
Φ	3.60	3.96	0.142	0.156