

Main Product Characteristics:

V_{DSS}	900V
$R_{DS(on)}$	1.4ohm(typ.)
I_D	6A


TO-220

Marking and Pin Assignment

Schematic Diagram
Features and Benefits:

- Advanced trench 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 trench 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 @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V ①	6	A
I_{DM}	Pulsed Drain Current ②	24	
P_D @TC = 25°C	Power Dissipation ③	45	W
	Linear Derating Factor	0.29	W/°C
V_{DS}	Drain-Source Voltage	900	V
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy	700	mJ
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

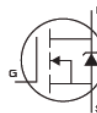
Thermal Resistance

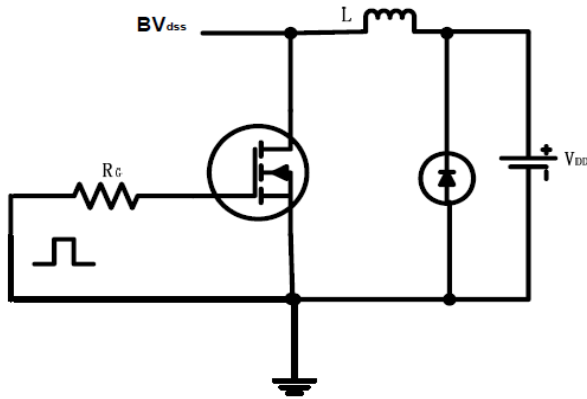
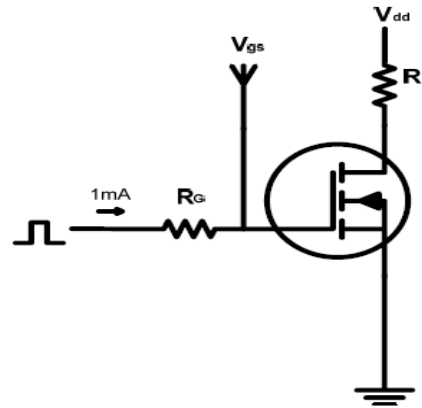
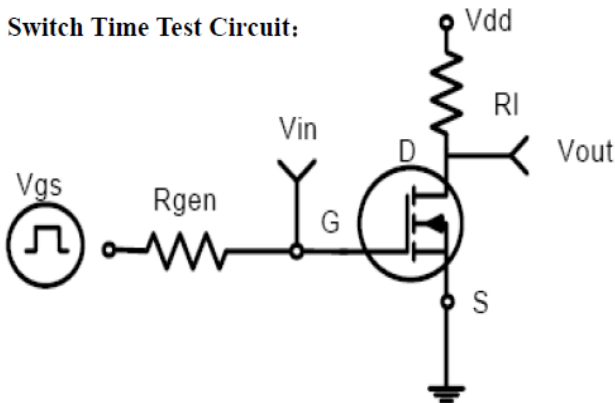
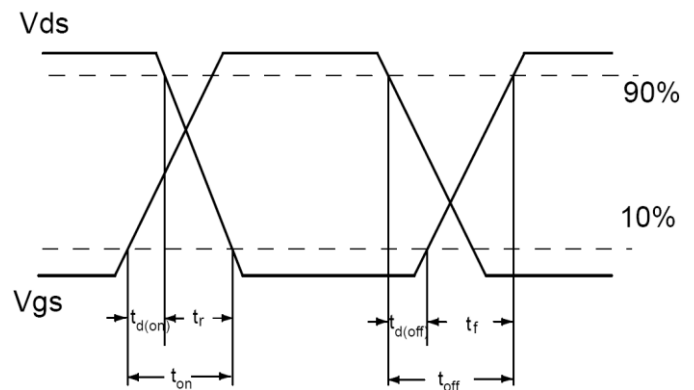
Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	2.78	°C/W
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10s$) ④	—	100	°C/W

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

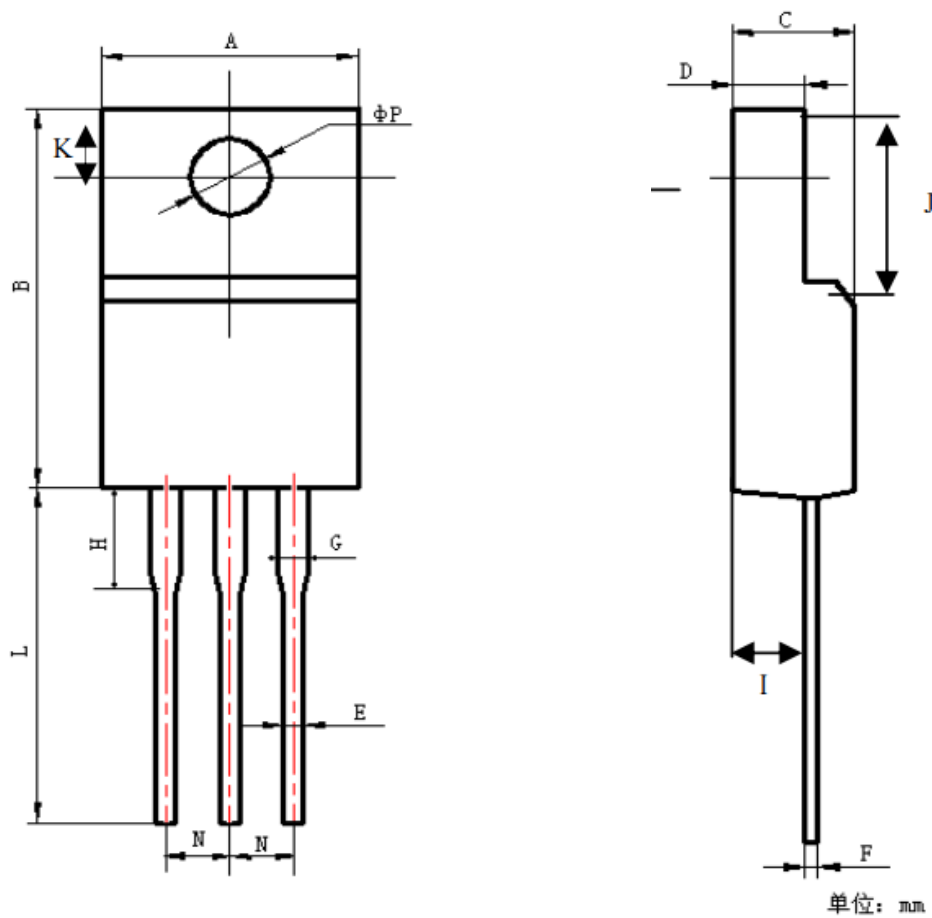
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	900	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	1.4	1.9	Ω	$V_{GS}=10V, I_D=3A$
$V_{GS(th)}$	Gate threshold voltage	3	—	5	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 900V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 30V$
		—	—	-100		$V_{GS} = -30V$
Q_g	Total gate charge	—	35	—	nC	$I_D = 6A,$ $V_{DS}=450V,$ $V_{GS} = 10V$
Q_{gs}	Gate-to-Source charge	—	8	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	15	—		
$t_{d(on)}$	Turn-on delay time	—	20	—	ns	$V_{GS}=10V, V_{DS} = 450V,$ $R_{GEN}=9.1\Omega$ $I_D = 6A$
t_r	Rise time	—	45	—		
$t_{d(off)}$	Turn-Off delay time	—	30	—		
t_f	Fall time	—	35	—		
C_{iss}	Input capacitance	—	1450	—	pF	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1MHz$
C_{oss}	Output capacitance	—	130	—		
C_{rss}	Reverse transfer capacitance	—	20	—		

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	6	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	24	A	
V_{SD}	Diode Forward Voltage	—	—	1.5	V	$I_S=6A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	—	390	—	ns	$T_J = 25^\circ\text{C}, I_F = 6A, di/dt = 100A/\mu s$
Q_{rr}	Reverse Recovery Charge	—	1400	—	nC	

Test circuits and Waveforms
EAS test circuits:

Gate charge test circuit:

Switch Time Test Circuit:

Switch 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 PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ C$

Mechanical Data:


Item	Spec. (mm)	
	MIN	MAX
A	9.70	10.46
B	15.00	16.27
C	4.28	4.90
D	2.34	2.98
E	0.70	0.92
F	0.40	0.62
G	0.97	1.55
H	2.80	3.80
I	2.15	3.15
J	6.40	7.08
K	2.90	3.70
L	12.58	13.6
N	2.34	2.74
ΦP	3.00	3.45

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