

**Main Product Characteristics:**

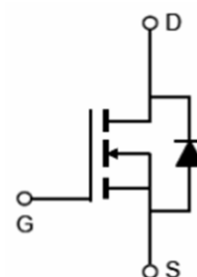
$V_{DSS}$	30V
$R_{DS(on)}$	3.6m $\Omega$ (Typ.)
$I_D$	90A



TO-252 (DPAK)



Marking and Pin Assignments



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
$I_D$ @ TC = 25°C	Continuous Drain Current, $V_{GS}$ @ 10V <sup>①</sup>	90	A
$I_{DM}$	Pulsed Drain Current <sup>②</sup>	360	
$P_D$ @TC = 25°C	Power Dissipation <sup>③</sup>	75	W
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-to-Source Voltage	± 20	V
$E_{AS}$	Single Pulse Avalanche Energy @ L=0.1mH	90	mJ
$T_J$ $T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	°C

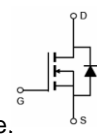
## Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
R <sub>θJC</sub>	Junction-to-case ③	—	2	°C/W
R <sub>θJA</sub>	Junction-to-Ambient ④	—	50	°C/W

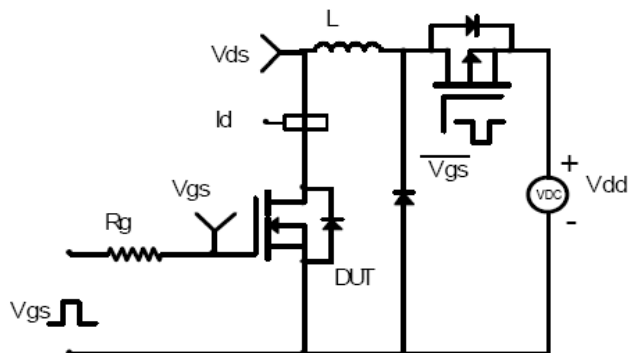
## Electrical Characterizes @T<sub>A</sub>=25°C unless otherwise specified

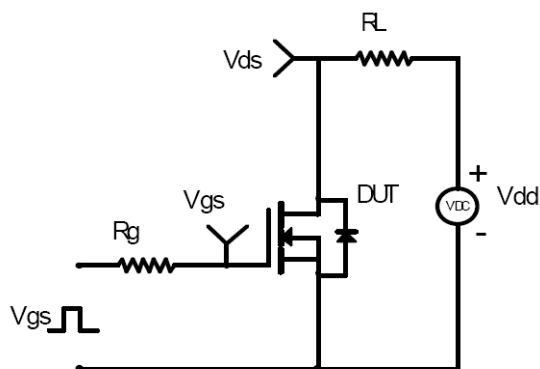
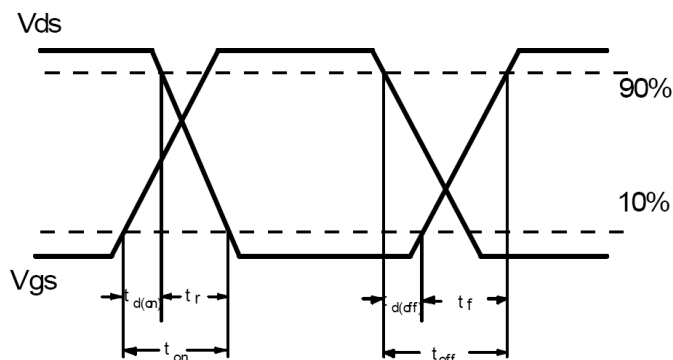
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source breakdown voltage	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
R <sub>DS(on)</sub>	Static Drain-to-Source on-resistance	—	3.6	6	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =15A
V <sub>GS(th)</sub>	Gate threshold voltage	1	—	3	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA
I <sub>DSS</sub>	Drain-to-Source leakage current	—	—	1	μA	V <sub>DS</sub> =30V, V <sub>GS</sub> = 0V
I <sub>GSS</sub>	Gate-to-Source forward leakage	—	—	100	nA	V <sub>GS</sub> =20V
		—	—	-100		V <sub>GS</sub> = -20V
Q <sub>g</sub>	Total gate charge	—	35	—	nC	I <sub>D</sub> = 32A, V <sub>DS</sub> =15V, V <sub>GS</sub> = 4.5V
Q <sub>gs</sub>	Gate-to-Source charge	—	8	—		
Q <sub>gd</sub>	Gate-to-Drain("Miller") charge	—	18	—		
t <sub>d(on)</sub>	Turn-on delay time	—	12	—	ns	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =15V, R <sub>GEN</sub> =2Ω I <sub>D</sub> = 32A
t <sub>r</sub>	Rise time	—	63	—		
t <sub>d(off)</sub>	Turn-Off delay time	—	41	—		
t <sub>f</sub>	Fall time	—	11	—		
C <sub>iss</sub>	Input capacitance	—	3833	—	pF	V <sub>GS</sub> = 0V V <sub>DS</sub> = 15V f = 800kHz
C <sub>oss</sub>	Output capacitance	—	459	—		
C <sub>rss</sub>	Reverse transfer capacitance	—	427	—		

## Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	90	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode)	—	—	360	A	
V <sub>SD</sub>	Diode Forward Voltage	—	—	1.2	V	I <sub>S</sub> =2.8A, V <sub>GS</sub> =0V
t <sub>rr</sub>	Reverse Recovery Time	—	16	—	ns	I <sub>S</sub> =30A, di/dt=100A/us
Q <sub>rr</sub>	Reverse Recovery Charge	—	8.8	—	nC	

## Test Circuits and Waveforms

**EAS Test Circuit:**

**Gate Charge Test Circuit:**

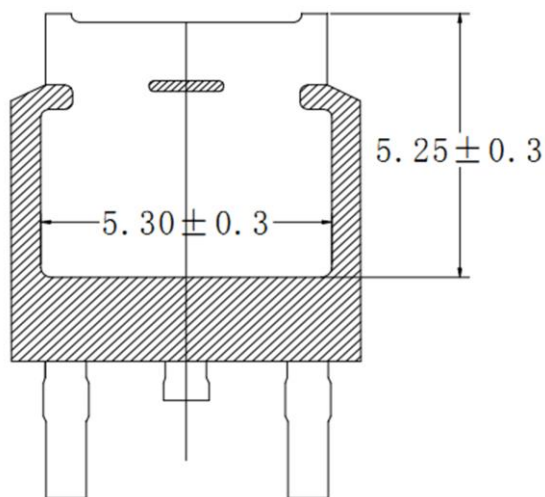
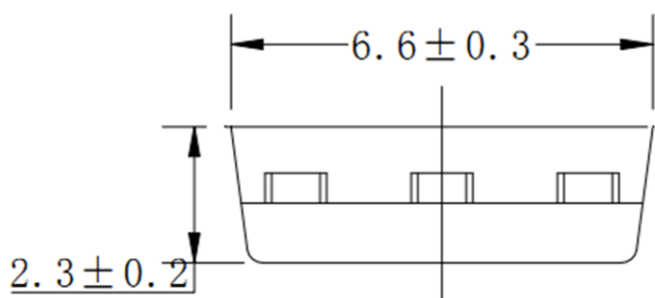
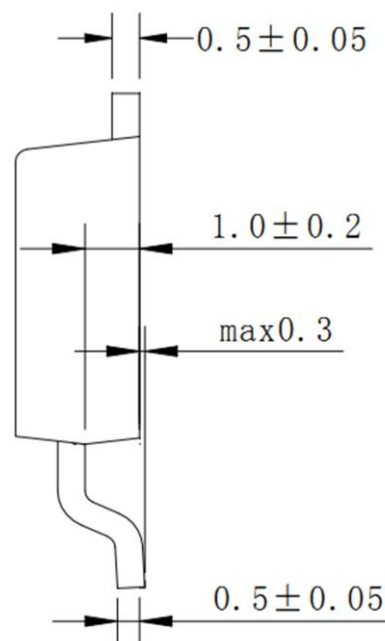
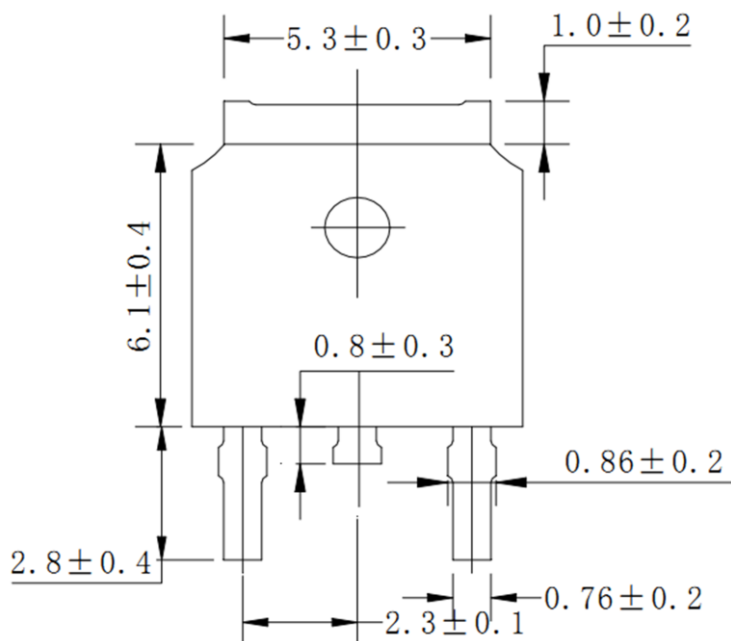
**Switching Time Test Circuit:**

**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 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  $T_A = 25^\circ\text{C}$

**Mechanical Data:**

TO-252 Package Outline(Unit:mm)



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