EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

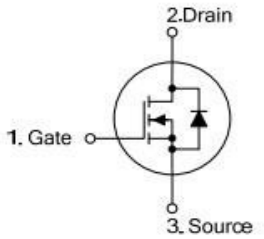
Product Specification

Domestic Part Number	IRFP4332
Overseas Part Number	IRFP4332
Equivalent Part Number	IRFP4332

Silicon N-Channel Power MOSFET

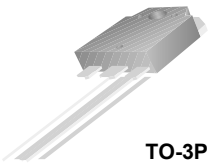
Description

IRFP4332, the silicon N-channel Enhanced MOSFETs, is obtained by advanced MOSFET technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor is suitable device for SMPS, high speed switching and general purpose applications.



General Features

① V_{DS}=250V, R_{dson}<35mΩ @V_{GS}=10V, I_D=90A (Typ:26mΩ)
② Fast Switching
③ Low Crss
④ 100% avalanche tested
⑤ Improved dv/dt capability
⑥ RoHS product



TO-3P

Application

① High frequency switching mode power supply

ABSOLUTE RATINGS

at TC = 25°C, unless otherwise specified

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	250	V
I_D	Continuous Drain Current	90	A
	Continuous Drain Current T_C = 100°C	73	A
I_{DM}	Pulsed Drain Current(Note1)	360	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy(Note2)	4200	mJ
$d_{v/dt}$	Peak Diode Recovery dv/dt(Note3)	5.0	V/ns
P_D	Power Dissipation	830	W
	Derating Factor above 25°C	6.7	W/℃
T_J， T_{stg}	Operating Junction and Storage Temperature Range	150，–55 to 150	℃
T_L	Maximum Temperature for Soldering	300	℃

Thermal characteristics

Symbol	Parameter	RATINGS	Units
RθJC	Junction-to-Case	0.15	℃/W
RθJA	Junction-to-Ambient	62.5	℃/W

Electrical Characteristics

at T_C = 25°C, unless otherwise specified

OFF Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	250	--	--	V
$\Delta B_{VDSS}/\Delta T_J$	Bvdss Temperature Coefficient	I_D=250uA, Reference25℃	--	0.2	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS} =250V, V_{GS}= 0V, T_j= 25℃	--	--	10	μA
		V_{DS} =200V, V_{GS}= 0V, T_j = 125℃	--	--	100	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+30V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-30V	--	--	-100	nA

ON Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On- Resistance	V_{GS}=10V, I_D=45A(Note4)	--	26	35	mΩ
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS} = VGS, I_D= 250μA(Note4)	2.0	--	4.0	V

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
R_g	Gate resistance	f = 1.0MHz	--	1.1	--	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	--	9650	--	PF
C_{oss}	Output Capacitance		--	930	--	
C_{rss}	Reverse Transfer Capacitance		--	42	--	

Switching Characteristics						
Symbol	**Parameter**	**Test Conditions**	**Values**			**Units**
			Min.	**Typ.**	**Max.**	
$t_{d(ON)}$	Turn-on Delay Time	I_D =45A V_{DD} = 125V V_{GS} = 10V R_G =1Ω	--	51	--	ns
t_r	Rise Time		--	174	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	40	--	
t_f	Fall Time		--	162	--	
Q_g	Total Gate Charge	I_D =90A V_{DD} =200V V_{GS} = 10V	--	148	--	nC
Q_{gs}	Gate to Source Charge		--	36	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	55	--	

Source-Drain Diode Characteristics						
Symbol	**Parameter**	**Test Conditions**	**Values**			**Units**
			Min.	**Typ.**	**Max.**	
I_S	Continuous Source Current (Body Diode)	T_C=25 °C	--	--	90	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	360	A
V_{SD}	Diode Forward Voltage	I_S=90A, V_{GS}=0V(Note4)	--	--	1.2	V
T_{rr}	Reverse Recovery Time	I_S=45A, T_j = 25°C dIF/dt=100A/us, V_{GS}=0V	--	260	--	ns
Q_{rr}	Reverse Recovery Charge		--	2950	--	nC

Note1: Pulse width limited by maximum junction temperature
Note2: L=10mH, V_{Ds}=50V, Start T_J=25℃
Note3: ISD =90A,di/dt ≤100A/us,VDD≤BVDS, Start TJ=25℃
Note4: Pulse width tp≤300μs, δ≤2%

Characteristics Curves

Figure 1 Safe Operating Area

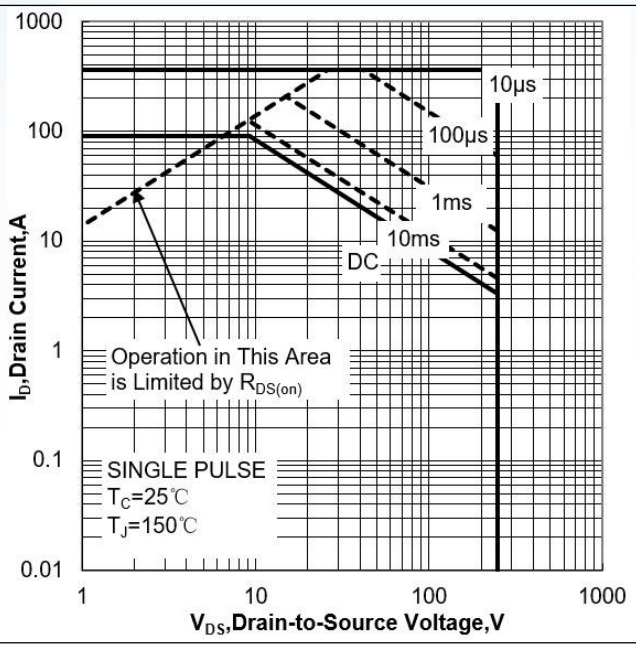


Figure 2 Power Dissipation

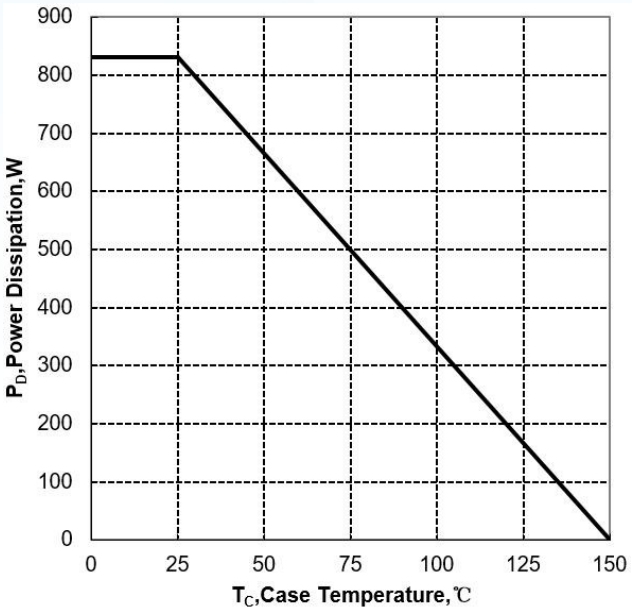


Figure 3a Max Thermal Impendance

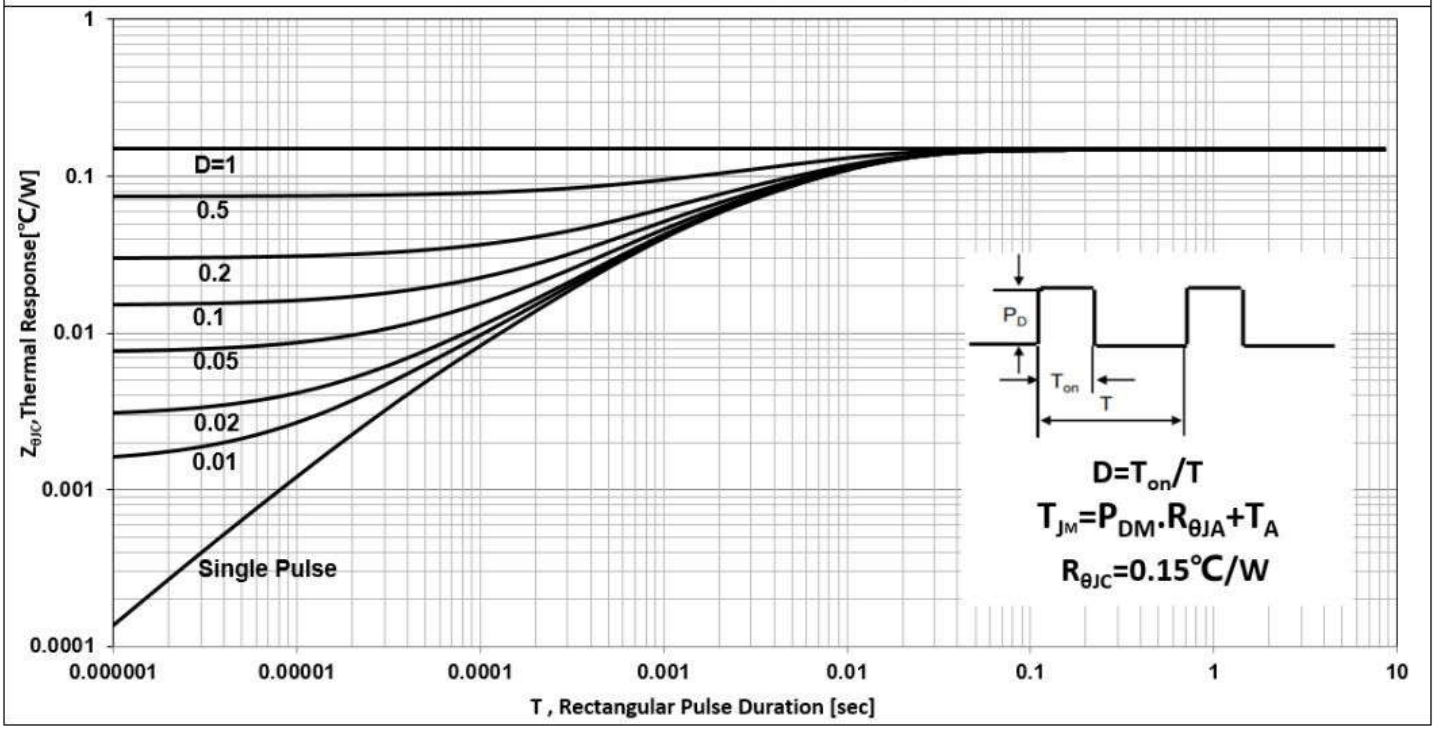


Figure 4 Typical Output Characteristics

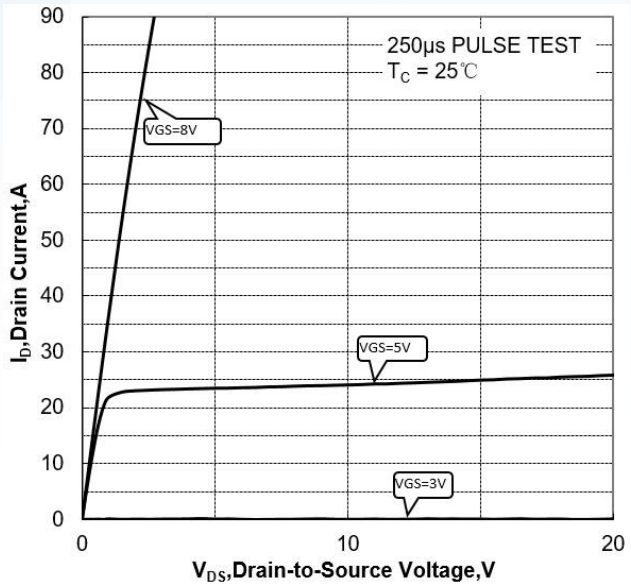


Figure 5 Typical Transfer Characteristics

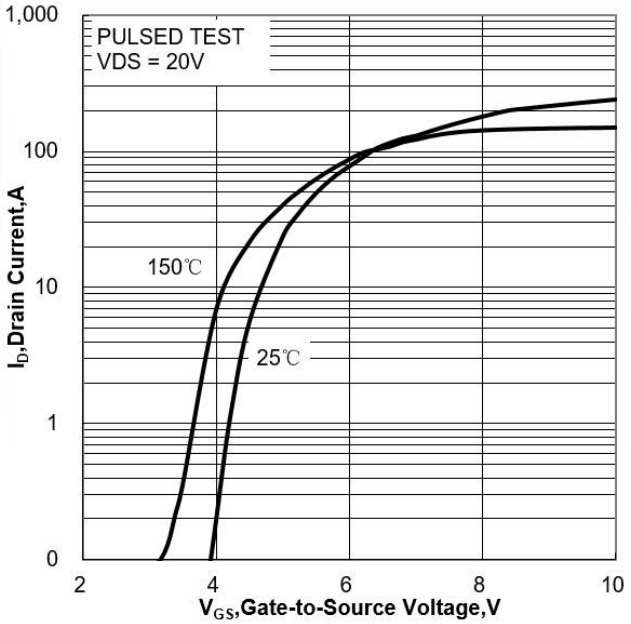


Figure 6 Typical Drain to Source ON Resistance vs Drain Current

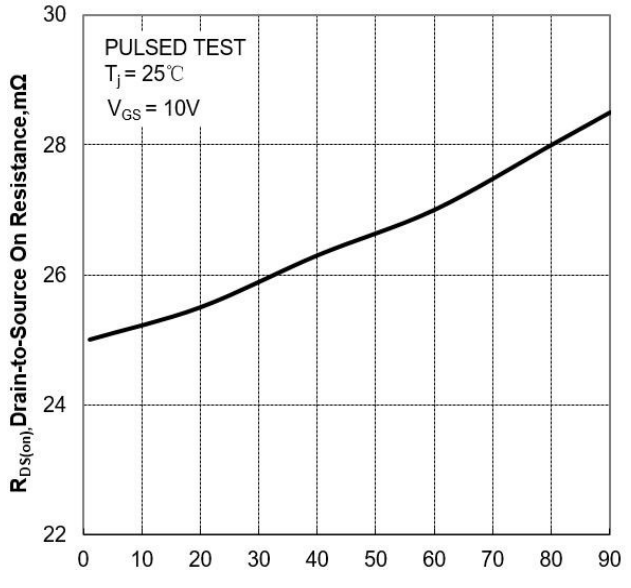


Figure 7 Typical Drian to Source on Resistance vs Junction Temperature

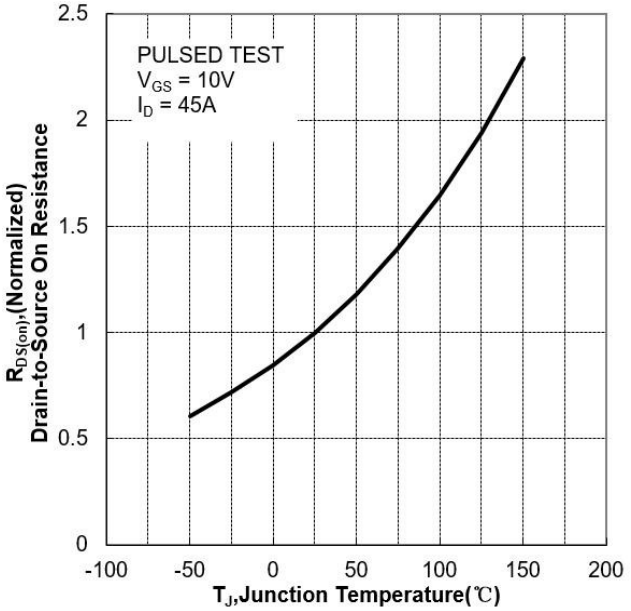


Figure 8 Typical Theshold Voltage vs Junction Temperature

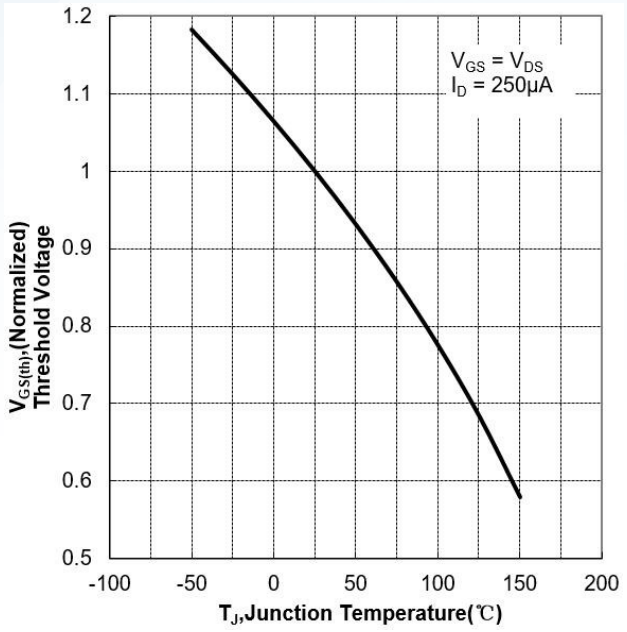


Figure 9 Typical Breakdown Voltage vs Junction Temperature

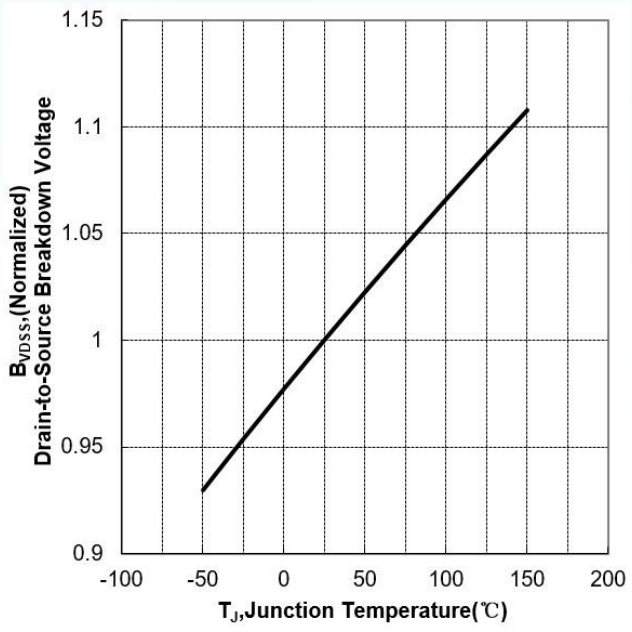


Figure 10 Typical Theshold Voltage vs Junction Temperature

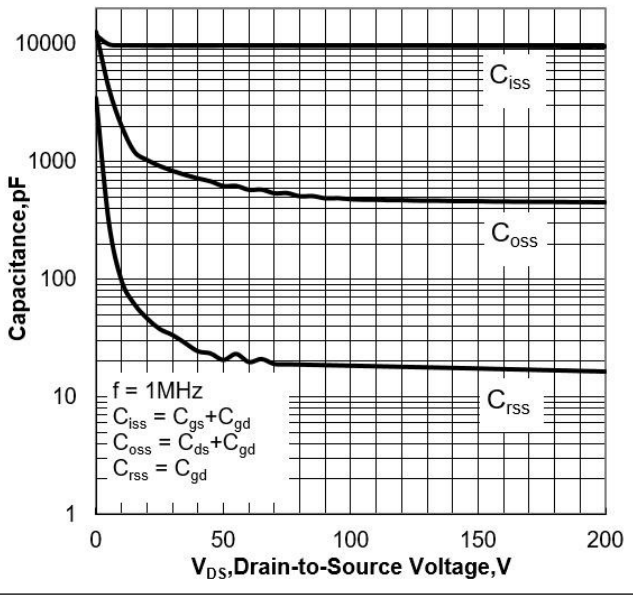
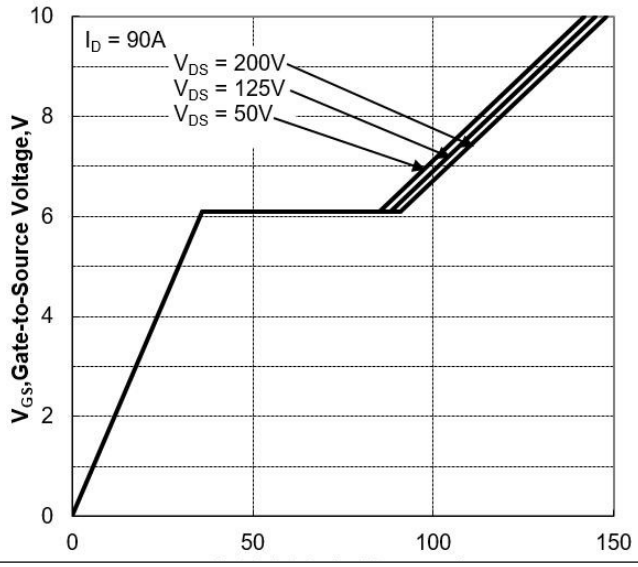


Figure 11 Typical Breakdown Voltage vs Junction Temperature



Test Circuit and Waveform

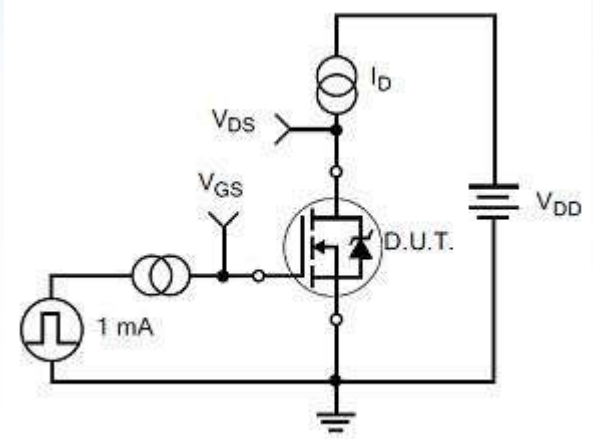
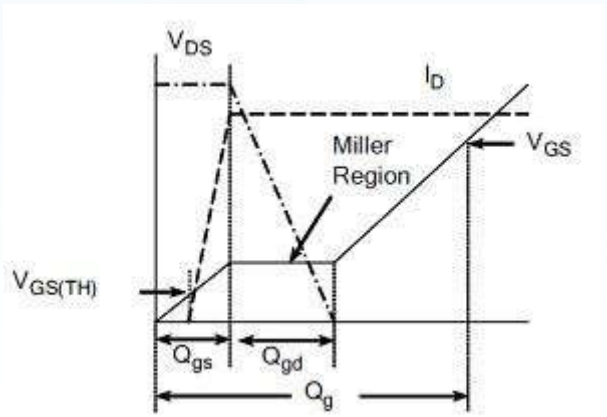
Figure 12 Gate Charge Test Circuit	Figure 13 Gate Charge Waveforms
	

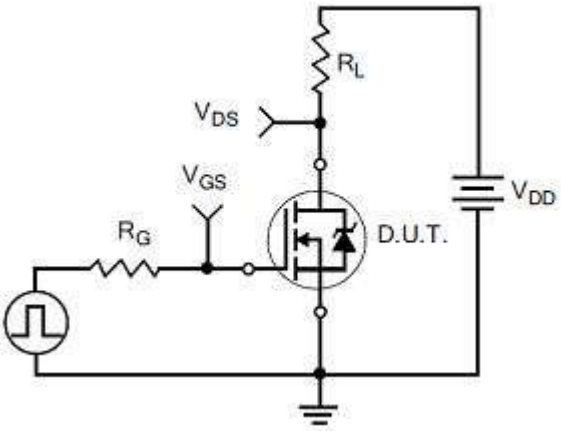
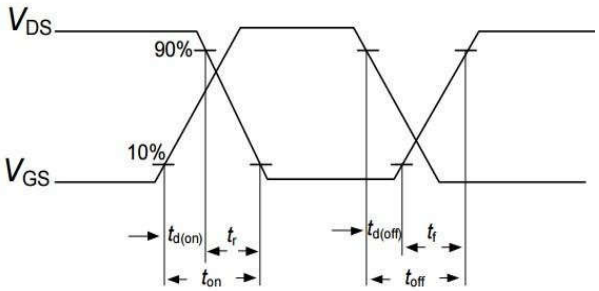
Figure 14 Resistive Switching Test Circuit	Figure 15 Resistive Switching Waveforms
	

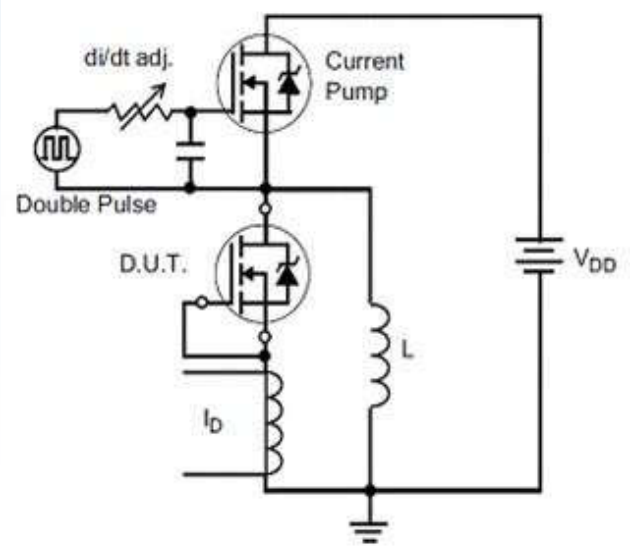
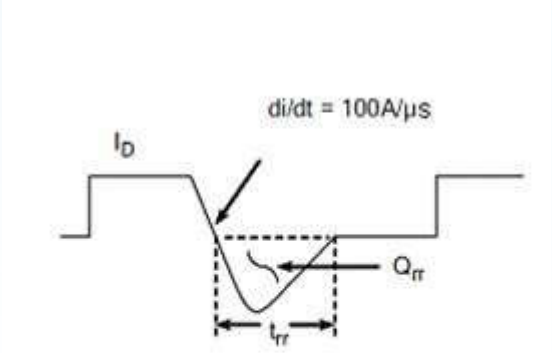
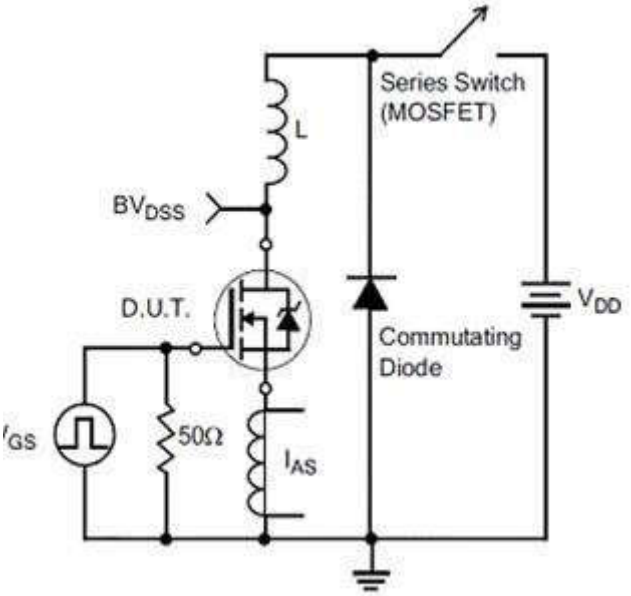
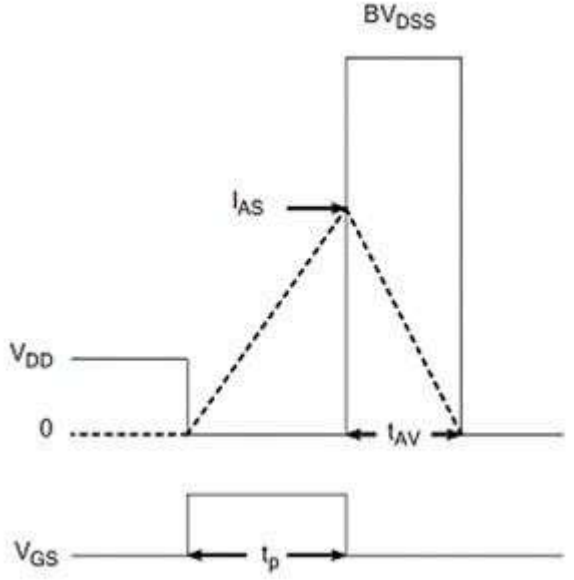
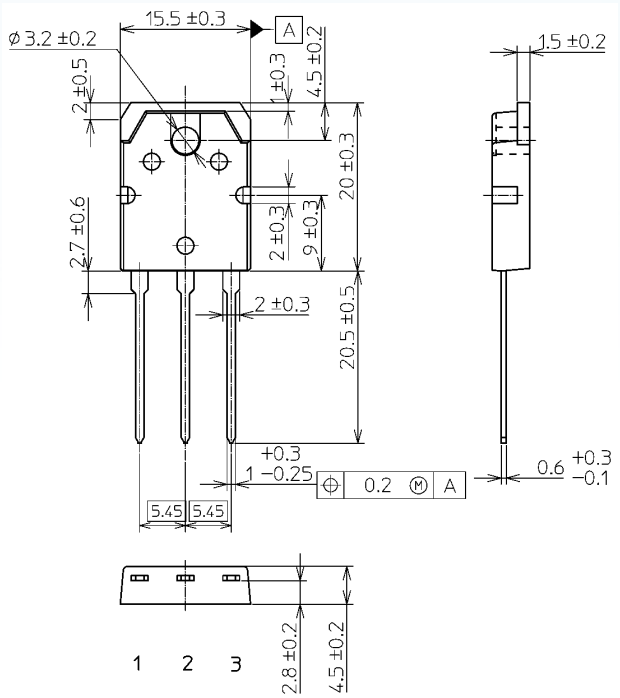
Figure 16 Diode Reverse Recovery Test Circuit	Figure 17 Diode Reverse Recovery Waveform
	

Figure 18 Unclamped Inductive Switching Test	Figure 19 Unclamped Inductive Switching
	

Package Description



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