昌德微电 THUNDER

TH3N150PN

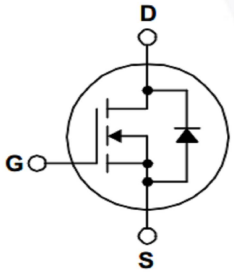
RoHS SGS

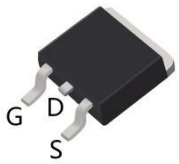
Thunder High Power Products

Silicon N-Channel Planar Power MOSFET

Description

The TH3N150PN utilizes the latest processing techniques to achieve low on-resistance per silicon area. Additional features of this MOSFET are 150℃ operating junction temperature and high repetitive peak current capability. These features combine to make this MOSFET a highly efficient, robust and reliable device for PDP driving applications. It can be used in a wide variety of applications.





THUNDER TO-263

General Features

- V_{DS}=1500V,I_D=3A
- Low ON Resistance,$R_{DS(ON),}$typ.=5.7Ω@V_{GS}=10V,I_D=1.5A
- Low reverse transfer capacitance
- Low Qg for fast response
- Short fall & rise times for fast switching
- 100% single pulse avalanche energy Test

Application

- Adaptor
- Charger
- SMPS Standby Power

Product Summary

V_{DS}	1500V
$R_{DS(on),}$typ.	5.7Ω
I_D	3A

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	1500	V
Continuous drain current T_C = 25°C (Silicon limit)	I_D	3	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	I_{DM}	12	A
Avalanche energy, single pulse (L=10mH, Rg=25Ω)	E_{AS}	307	mJ
Gate-Source voltage	V_{GS}	±30	V
Power dissipation (T_C = 25°C)	P_D	186	W
Operating junction and storage temperature	T_j , T_{stg}	-55…+150	°C

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.67	℃/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	55	

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	1500	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2.5	-	4.5	V	V_{DS}=V_{GS}, I_D=250uA
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=1500V, V_{GS}=0V T_j=25℃
		-	-	10	μA	V_{DS}=1200V, V_{GS}=0V T_j=125℃
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±30V, V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	5.7	6.8	Ω	V_{GS}=10V, I_D=1.5A
Transconductance	g_{fs}	-	3.0	-	S	V_{DS}=40V, I_D=1.5A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	1252	-	pF	V_{GS}=0V, V_{DS}=25V, f=1MHz
Output Capacitance	C_{oss}	-	117	-		
Reverse Transfer Capacitance	C_{rss}	-	16	-		
Gate Total Charge	Q_g	-	36	-	nC	V_{GS}=10V, V_{DS}=1200V, I_D=3A
Gate-Source charge	Q_{gs}	-	9.5	-		
Gate-Drain charge	Q_{gd}	-	12	-		
Turn-on delay time	$t_{d(on)}$	-	25	-	ns	V_{DD}=750V, I_D=3A, R_G=25Ω
Rise time	t_r	-	48	-		
Turn-off delay time	$t_{d(off)}$	-	57	-		
Fall time	t_f	-	52	-		
Gate resistance	R_G	-	1.381	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	-	1.5	V	V_{GS}=0V, I_{DS}=3A
Body Diode Continuous Forward Current	I_S	-	-	3	A	T_C=25°C
Body Diode Reverse Recovery Time	t_{rr}	-	255	-	ns	T_C=25°C, I_S=3A, di/dt=100A/us
Body Diode Reverse Recovery Charge	Q_{rr}	-	1.1	-	μC	

Typical Performance Characteristics

Figure 1. Maximum Transient Thermal Impedance

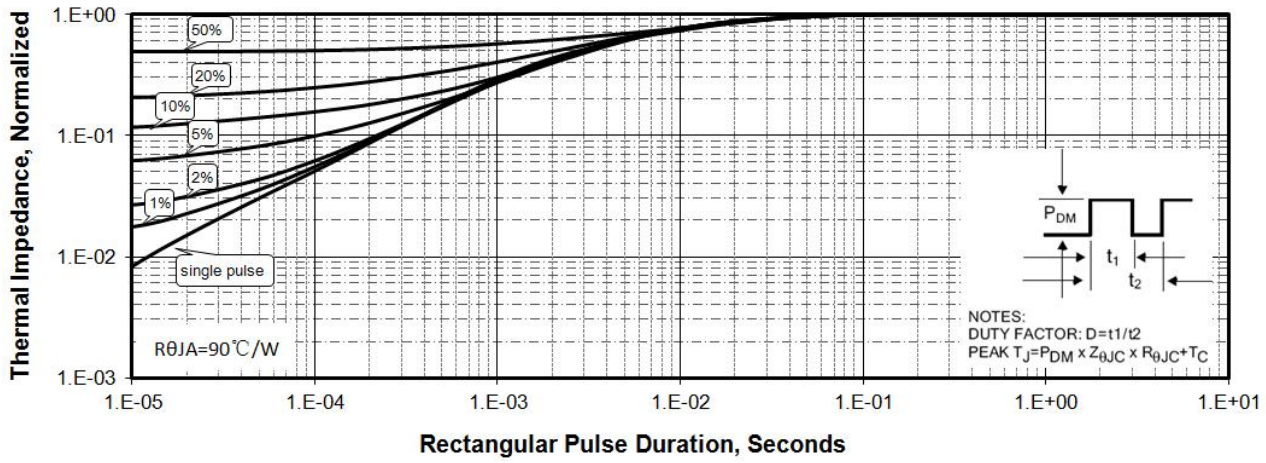


Figure 2 . Max. Power Dissipation vs Case Temperature

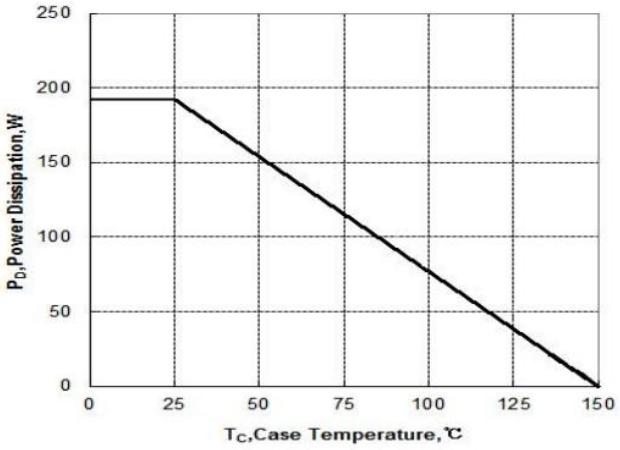


Figure 3 .Maximum Continuous Drain Current vs Tc

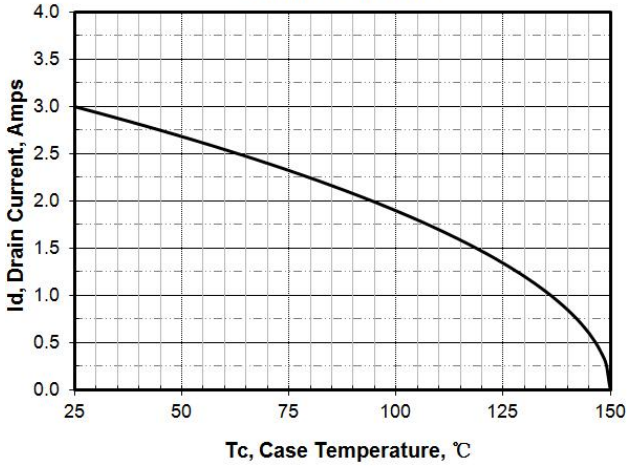


Figure 4. Output Characteristics

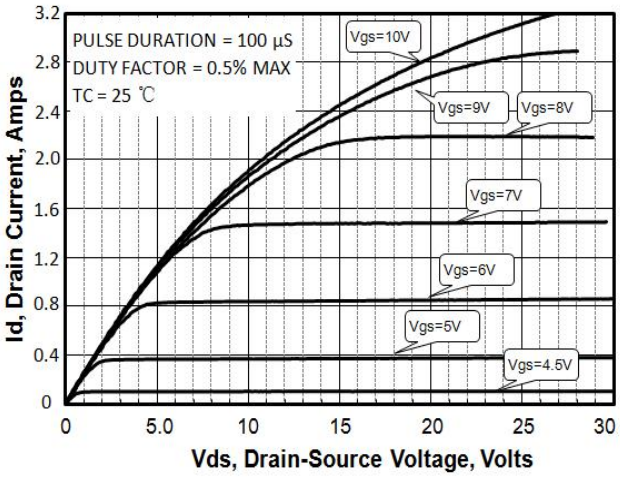


Figure 5. Rdson vs Gate Voltage

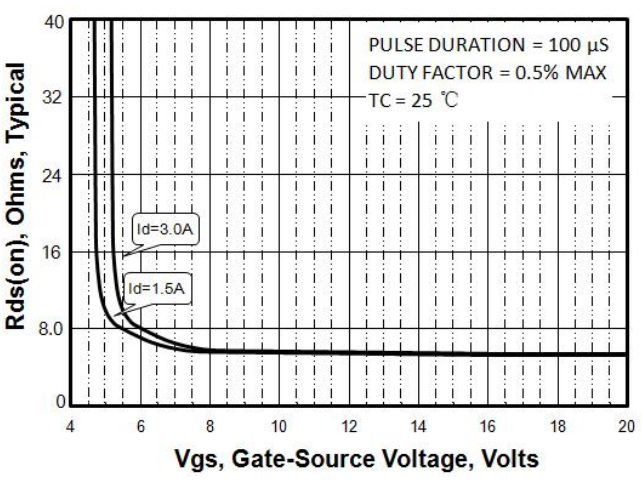


Figure 6. Peak Current Capability

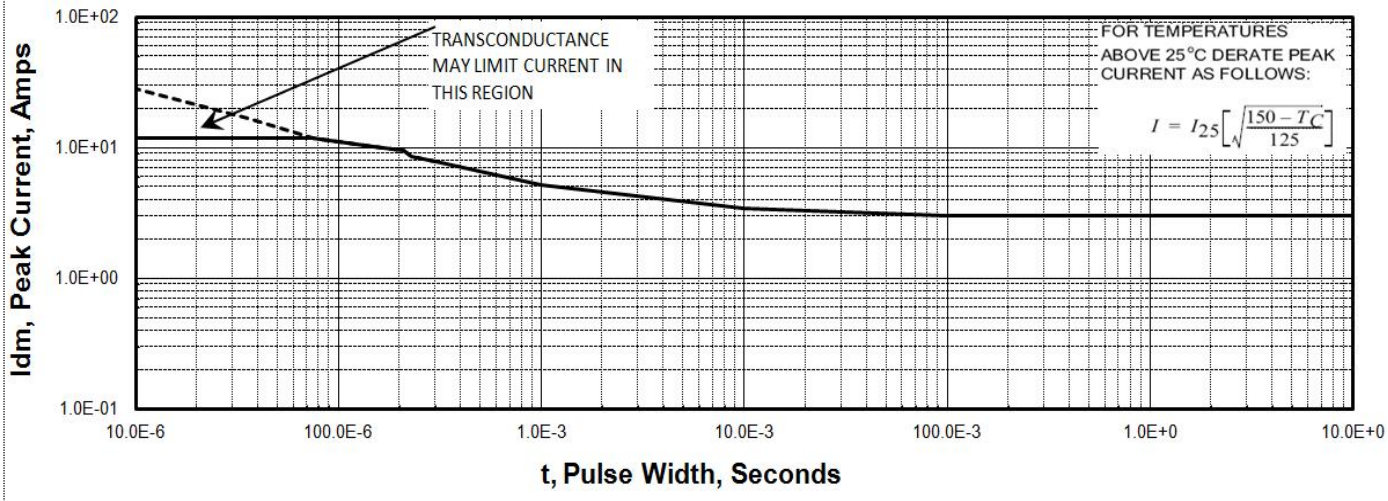


Figure 7. Transfer Characteristics

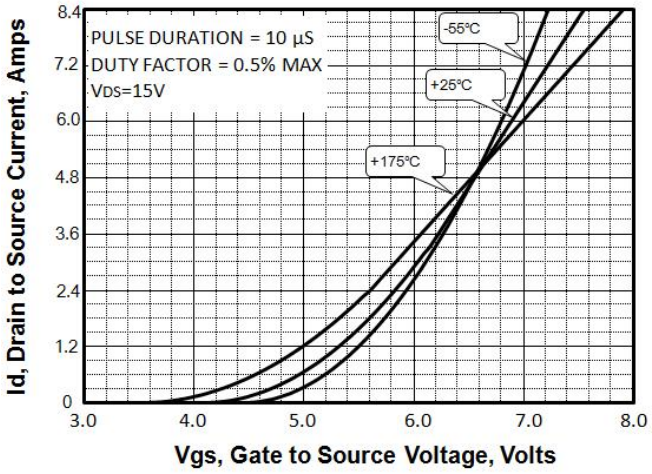


Figure 8. Unclamped Inductive Switching Capability

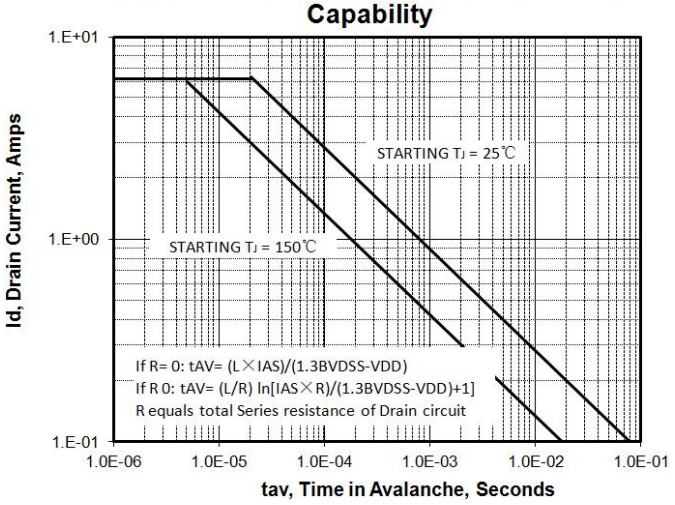


Figure 9. Drain to Source ON Resistance vs Drain Current

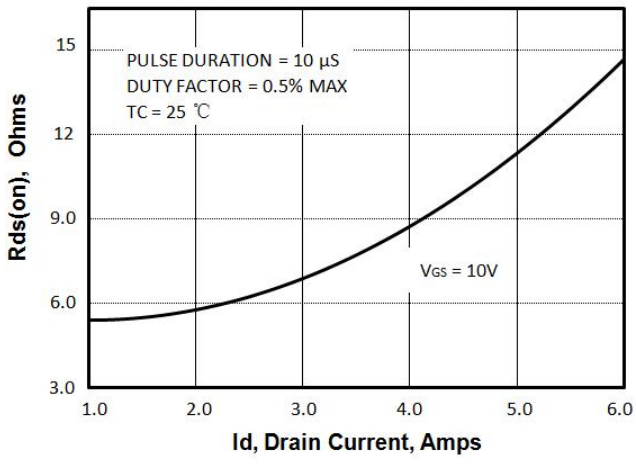


Figure 10. Rdson vs Junction Temperature

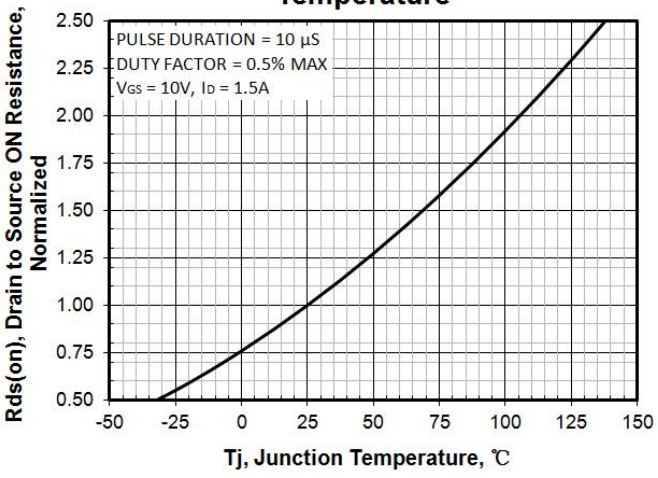


Figure 11.Breakdown Voltage vs Temperature

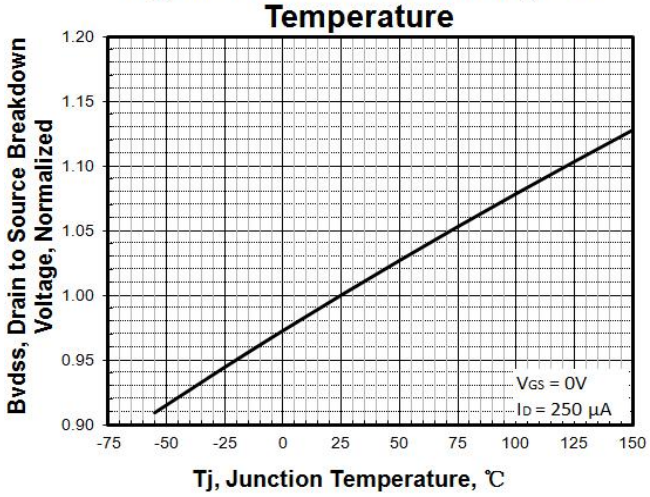


Figure 12.Threshold Voltage vs Temperature

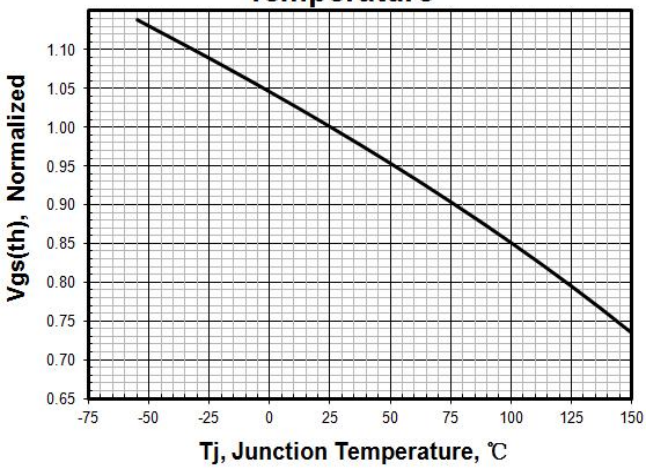


Figure 13 . Maximum Safe Operating Area

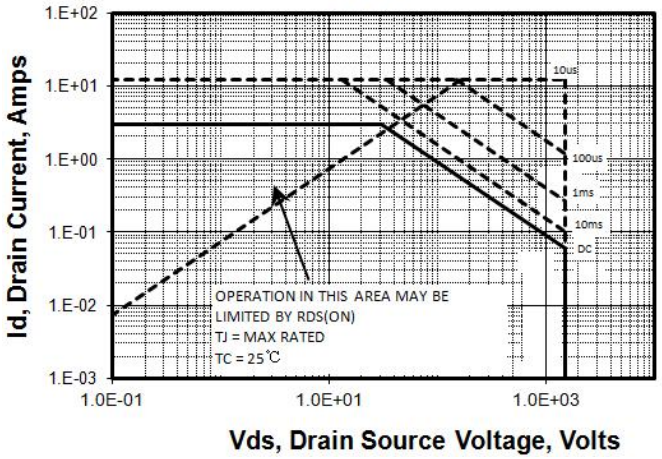


Figure 14.Body Diode Transfer Characteristics

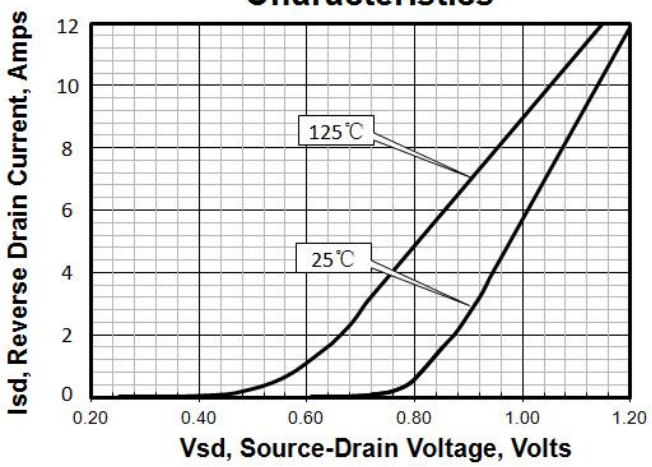


Figure 15. Capacitance vs Vds

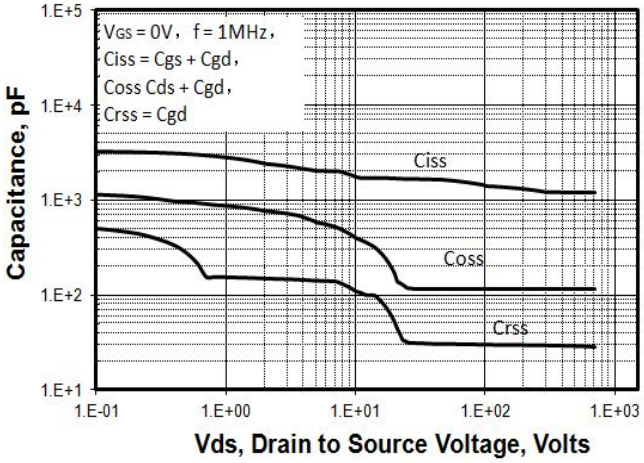
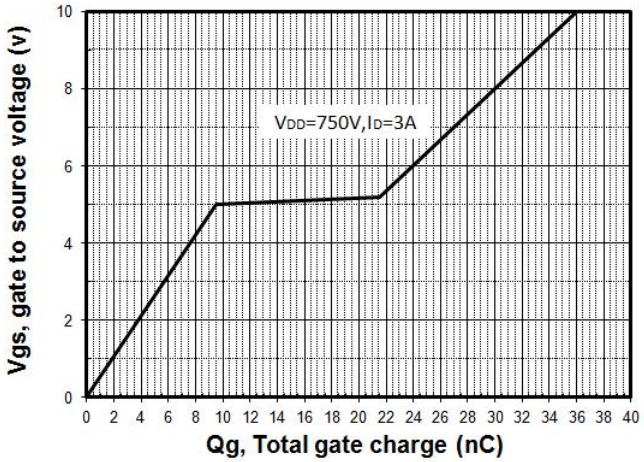


Figure 16 .Typical Gate Charge



Test Circuits and Waveforms

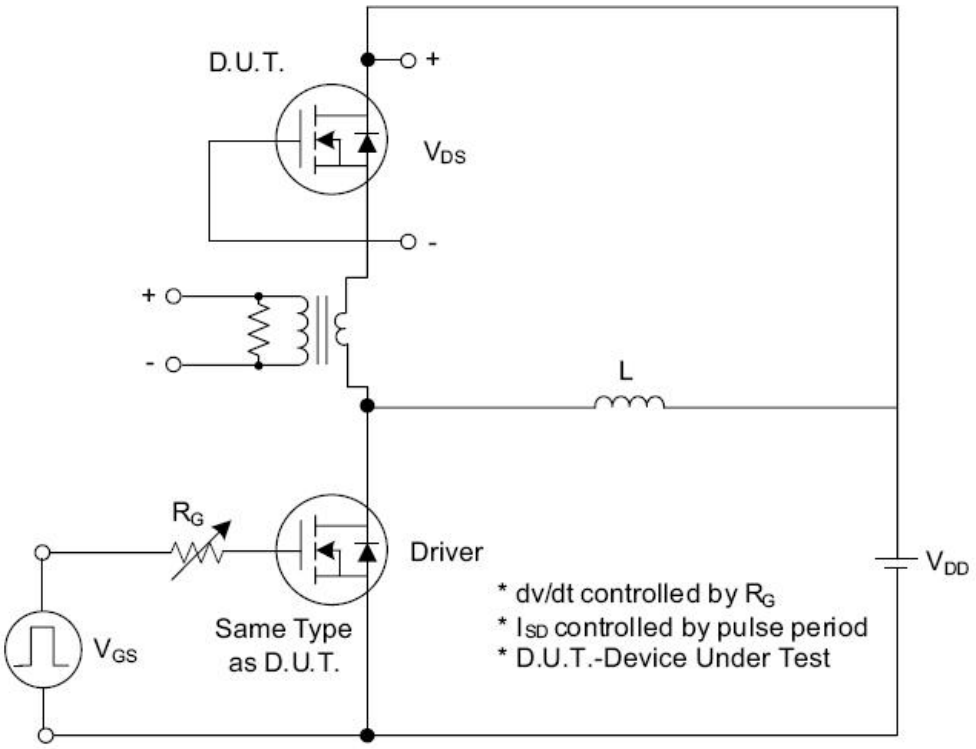


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

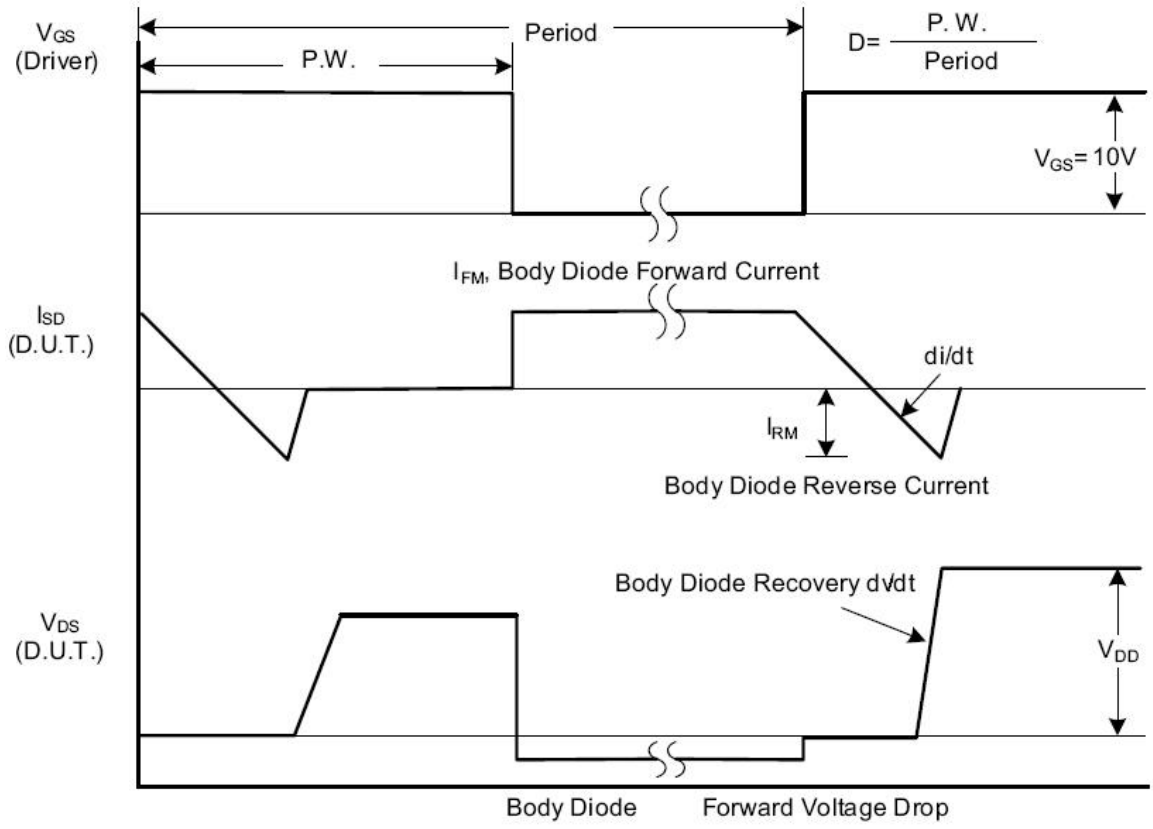


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

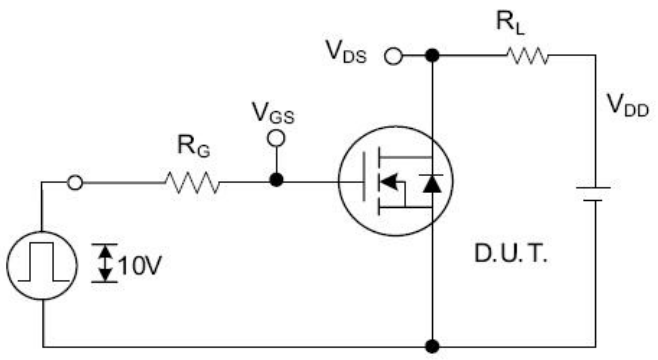


Fig. 2.1 Switching Test Circuit

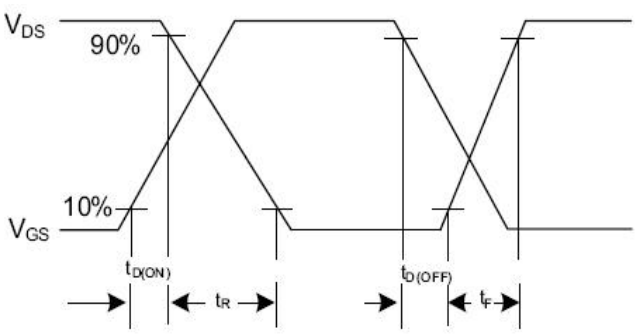


Fig. 2.2 Switching Waveforms

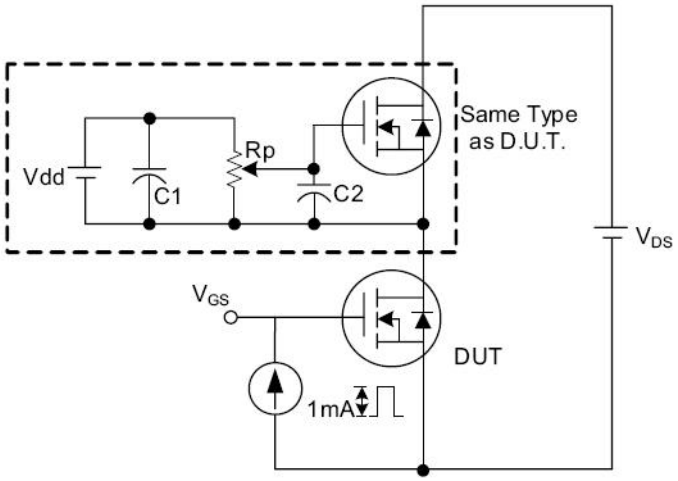


Fig. 3 . 1 Gate Charge Test Circuit

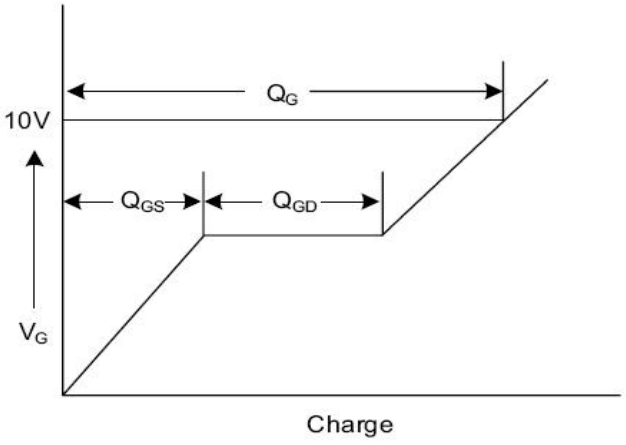


Fig. 3 . 2 Gate Charge Waveform

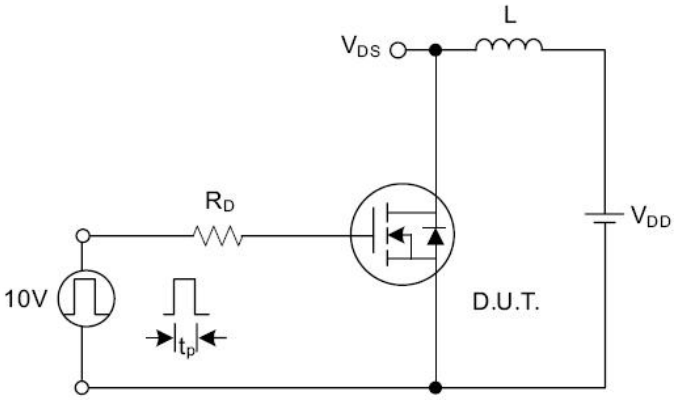


Fig. 4.1 Unclamped Inductive Switching Test Circuit

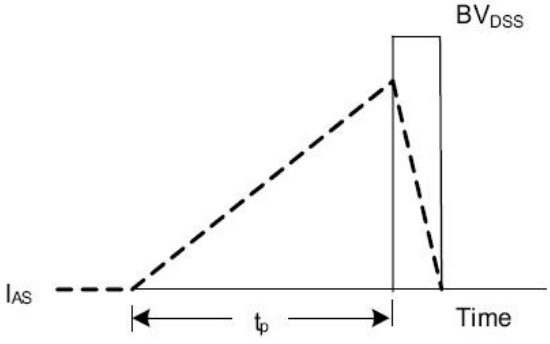
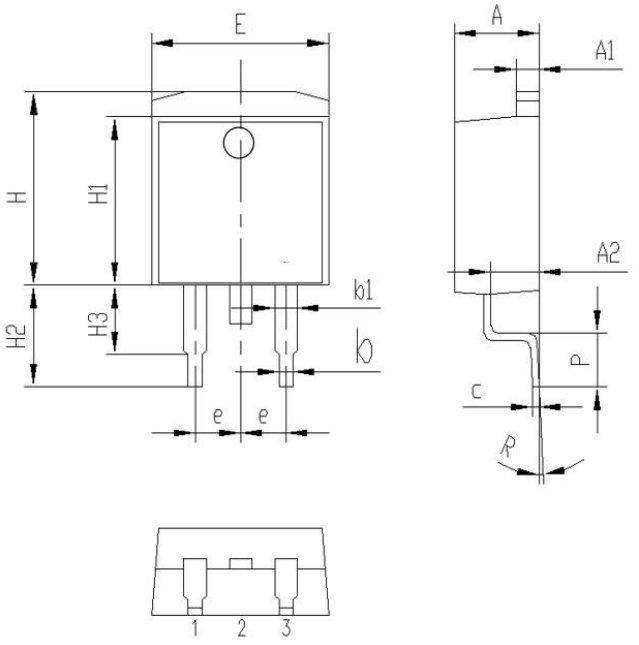


Fig. 4.2 Unclamped Inductive Switching Waveforms

Package Information

TO-263 PACKAGE



基本尺寸

Symbol	单位 mm		
	Min	Nom	Max
A	4.40	4.6	4.80
A1	1.17	1.27	1.37
A2	2.40	2.6	2.80
b	0.60	0.8	1.00
b1	1.05	1.25	1.45
c	0.28	0.38	0.48
e	2.34	2.54	2.74
E	9.9	10.1	10.3
H	9.90	10.1	10.3
H1	8.50	8.7	8.90
H2	4.80	5.00	5.20
H3	2.60	2.8	3.00
R	0°	3°	6°
P	2.40	2.70	3.00

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-Headquarters

WuXi Thunder Microelectronics Incorporated Limited

Building E1-9, No.200 LingHu Road, XinWu district,WuXi,China 214135

Tel:+86-510-85160109 Fax:+86-510-85160109