深圳市富满电子集团股份有限公司
SHEN ZHEN FINE MADE ELECTRONICS GROUP CO., LTD.

6888K (文件编号：S&CIC1741) **68V N-channel enhancement mode MOSFET**

Features

- Extremely Low RDS(on):

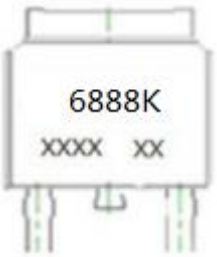
Typ.RDS(on) = 7.9mΩ @VGS=10 V,Id=30 A

- Low gate charge (typical 75 nC)
- Fast switching
- 100% avalanche tested

General Description

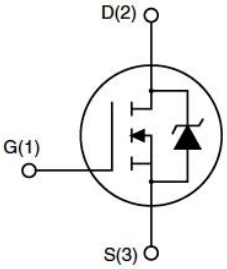
The 6888K uses advanced trench Technology and design to provide excellent RDS(ON) with low gate charge. It can be use in a wide variety of applications.

Package



Marking and pin assignment

TO-252top view



Schematic diagram

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	68	V
I_D	Drain Current - Continuous (TC= 25°C)	80	A
	- Continuous (TC= 70° C)	52*	A
I_{DM}	Drain Current - Pulsed (Note 1)	208*	A
V_{GS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	285	mJ
E_{AR}	Repetive Avalanche Energy (Note 1)	40	mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5.5	V/ns
P_D	Power Dissipation (TC = 25°C)	108	W
	- Derate above 25°C	1.6	W/°C
T_j ,T_{stg}	Operating and Storage Temperature Range	-55 to +150	°C
T	Maximum lead temperature for soldering,purpose, 1/8 from case for 5 seconds	280	°C

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.58	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.8	°C/W

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	68			V
$\triangle BV_{DSS}/\triangle T_j$	Breakdown Voltage Temperature Coefficient	I_D= 250 μA, Referenced to 25°C		68		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 60 V, V_{GS} = 0 V			1	μA
		V_{DS} = 50 V, T_C = 125°C			10	μA
I_{GSSF}	Gate Leakage Current, Forward	V_{GS} = 20 V, V_{DS} = 0 V			100	nA
I_{GSSR}	Gate Leakage Current, Reverse	V_{GS} = -20 V, V_{DS} = 0 V			-100	nA
On Characteristics						
$V_{GS(TH)}$	Gate Threshold voltage	V_{DS} = V_{GS}, I_D = 250 uA	2	3	4	V
$R_{DS(On)}$	Drain-Source on-state resistance	V_{GS} = 10 V, I_D = 30 A		7.9	9.5	mΩ
g_{FS}	Forward Transconductance	V_{DS} = 10 V, I_D = 30 A(Note 3)		34.0		S
Dynamic Characteristics						
C_{iss}	Input capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz		3988		pF
C_{oss}	Output capacitance			339		pF
C_{rss}	Reverse transfer capacitance			312		pF
Switching Characteristics						
$t_{d(on)}$	Turn On Delay Time			22		ns
t_r	Rising Time	V_{DD} = 35 V, ID = 40 A, VGS = 10 V, RG = 4.7 Ω (Note 3, 4)		54		ns
$t_{d(off)}$	Turn Off Delay Time			50		ns
t_f	Fall Time			25		ns
Q_g	Total Gate Charge	V_{DS} = 35 V, ID = 40 A, V_{GS} = 10 V (Note 3, 4)		78		nC
Q_{gs}	Gate-Source Charge			26		nC
Q_{gd}	Gate-Drain Charge			22		nC
R_g	Gate Resistance	V_{DS} = 0 V, Scan F mode		2.4		Ω
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current				80	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current				208	A
V_{SD}	Diode Forward Voltage	V_{GS}= 0 V, I_S = 40 A			1.2	V
I_{rrm}	Reverse recovery current	IS= 40A, VGS = 0V, dIF/dt = 100A/us		-1.2		A
T_{rr}	Reverse recovery time			25		ns
Q_{rr}	Reverse recovery charge			19		nC

Notes:1. Repetitive Rating : Pulse width limited by maximum junction temperature

2. L = 0.95 mH, IAS = 32 A, VDD = 10V, RG = 25 Ω, Starting Tj = 25°C

3. ISD ≤ 40A, di/dt = 100A/us, VDD ≤ BVDSS, Staring Tj =25°C

4. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2% 5. Essentially independent of operating temperature

Typical Characteristics

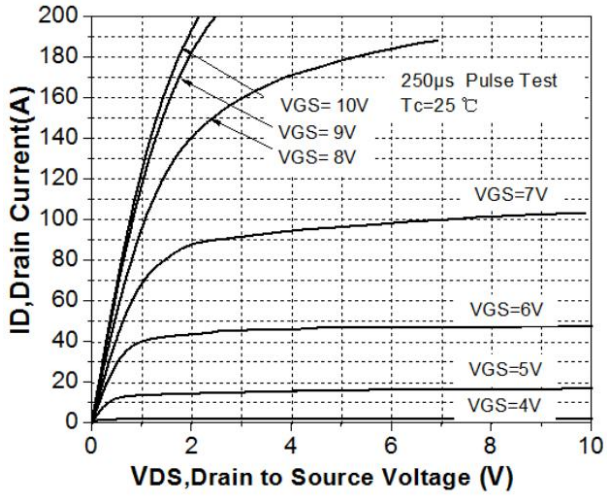


Figure 1. On-Region Characteristics

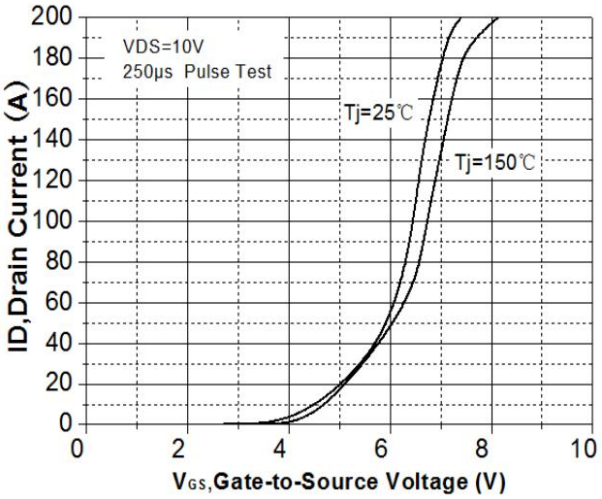


Figure 2. Transfer Characteristics

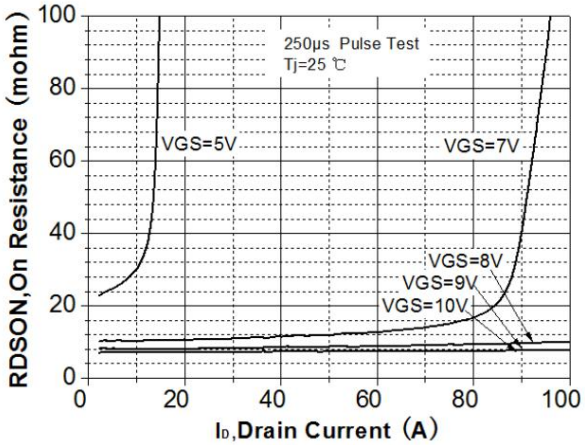


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

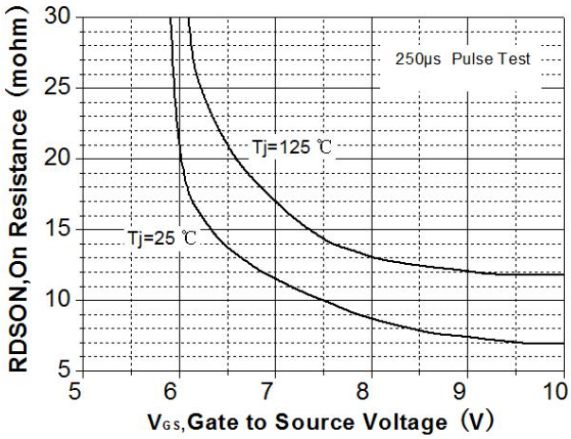


Figure 4. On-Resistance vs. Gate to Source Voltage

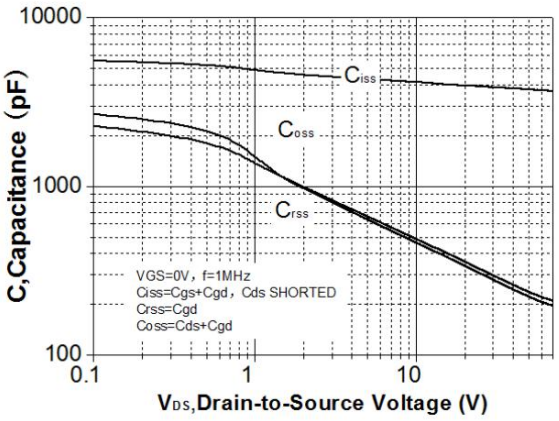


Figure 5. Capacitance Characteristics

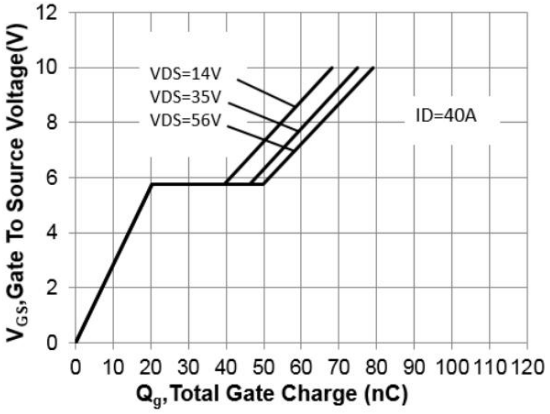


Figure 6. Gate Charge Characteristics

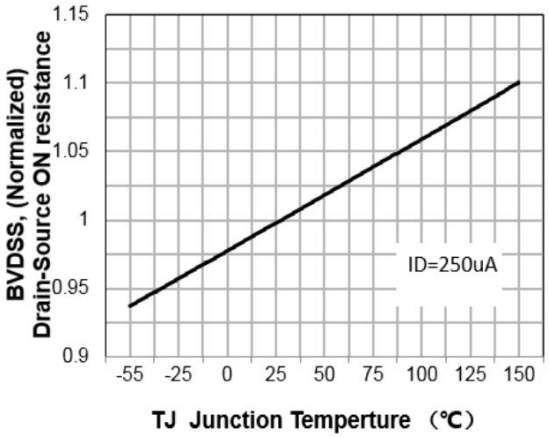


Figure 7. Breakdown Voltage Variation vs Temperature

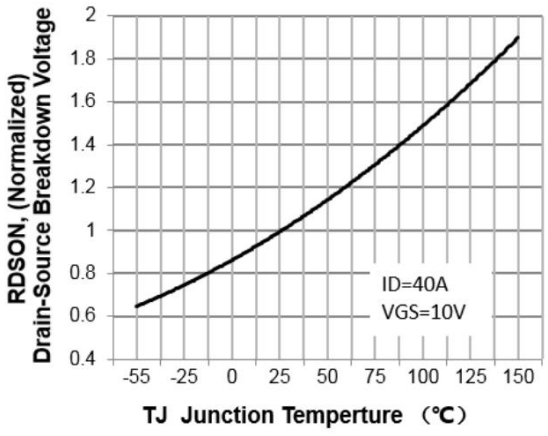


Figure 8. On-Resistance Variation vs Temperature

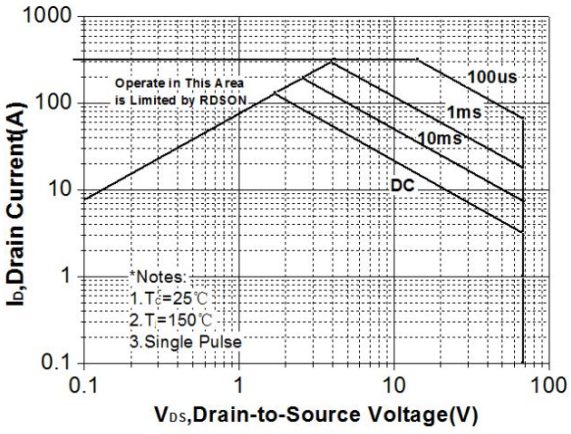


Figure 9. Maximum Safe Operating Area

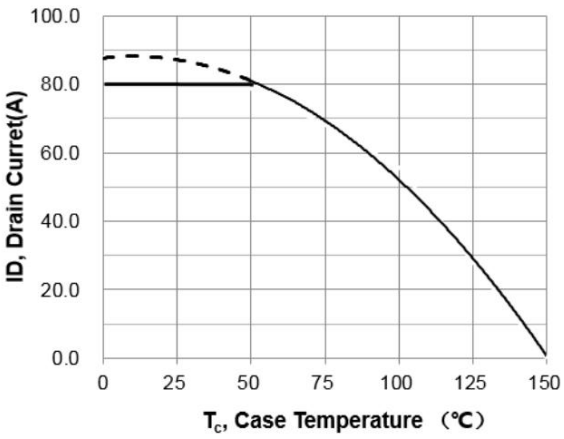


Figure 10. Maximum Drain Current vs Case Temperature

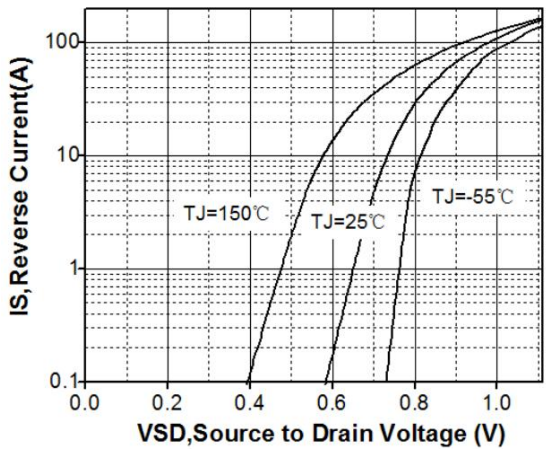


Figure 11. Body Diode Forward Voltage Vs Reverse Drain Current

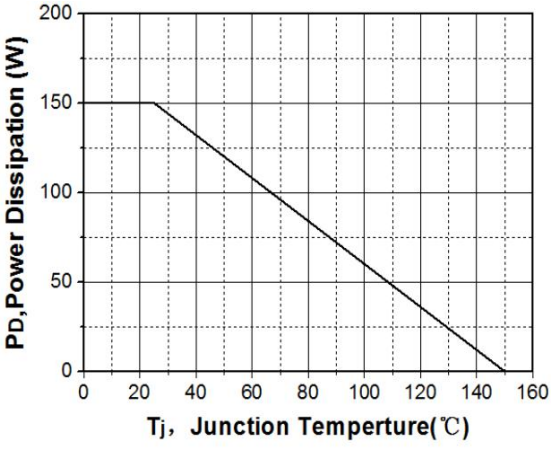


Figure 12 . Power Dissipation vs Junction Temperature

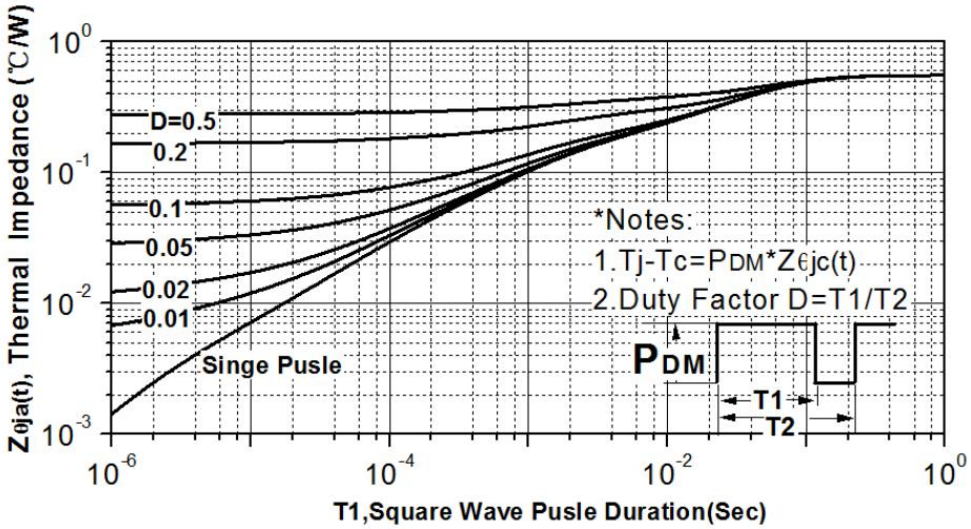


Figure 13. Transient Thermal Response Curve

Test Circuit

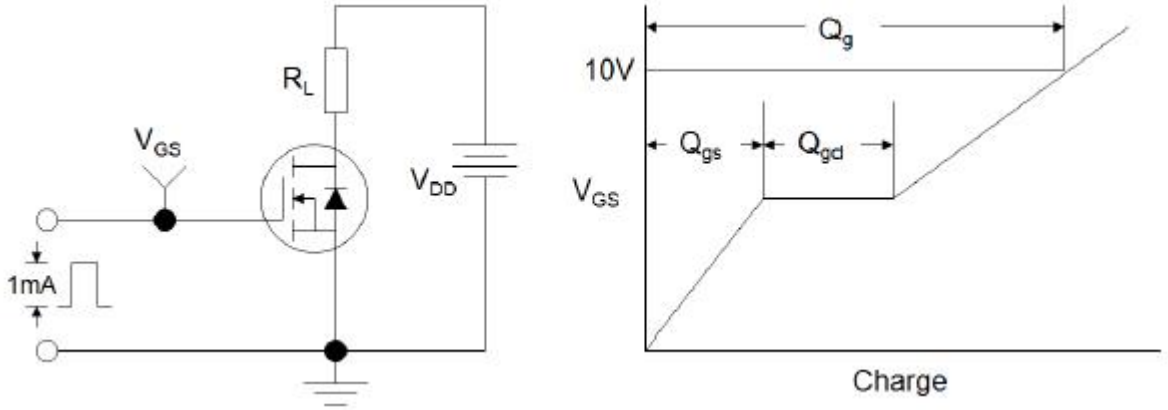


Figure 14. Gate Charge Test Circuit & Waveform

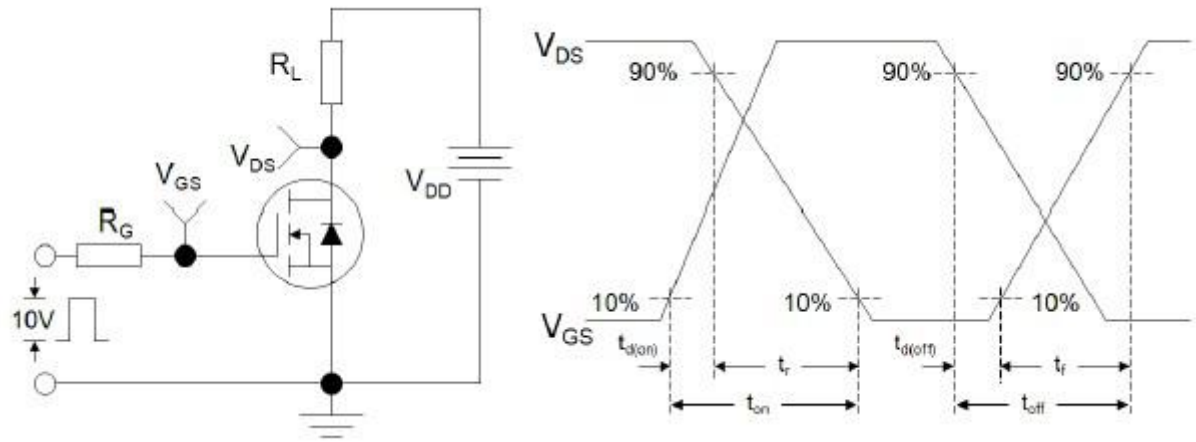


Figure 15. Switching time test circuit & waveform

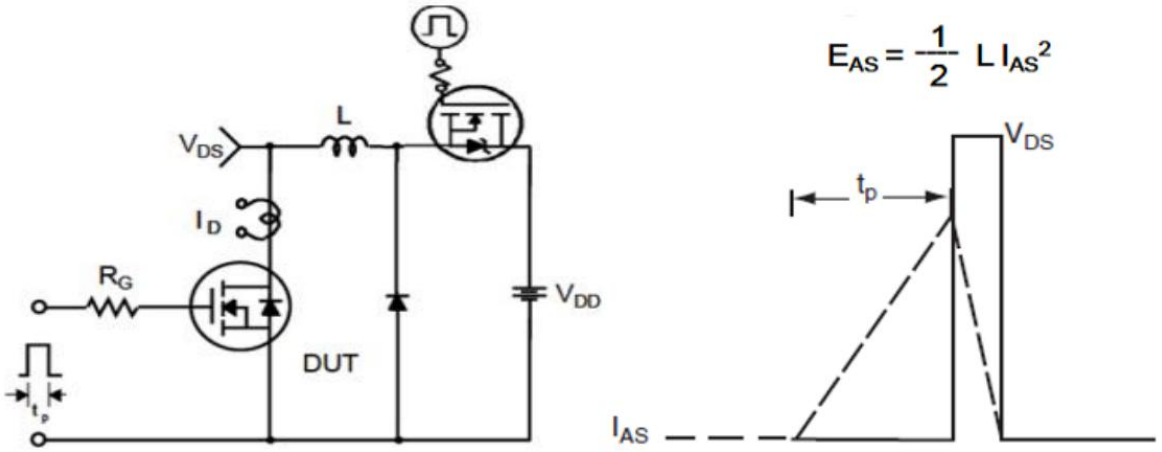


Figure 16. Unclamped Inductive switching test circuit & waveform

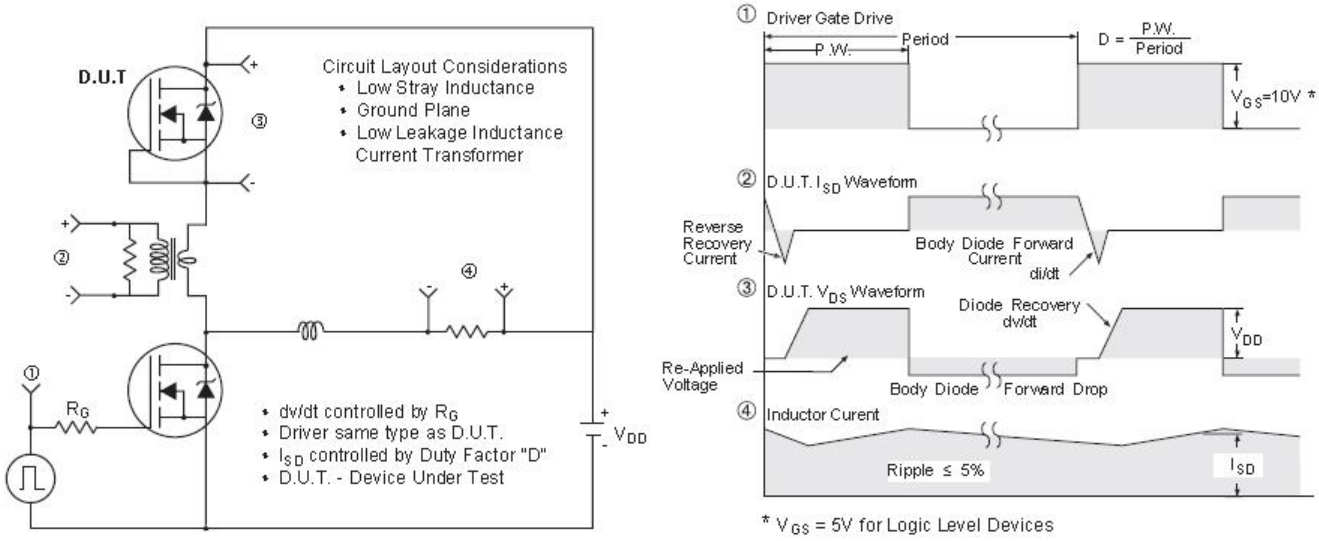
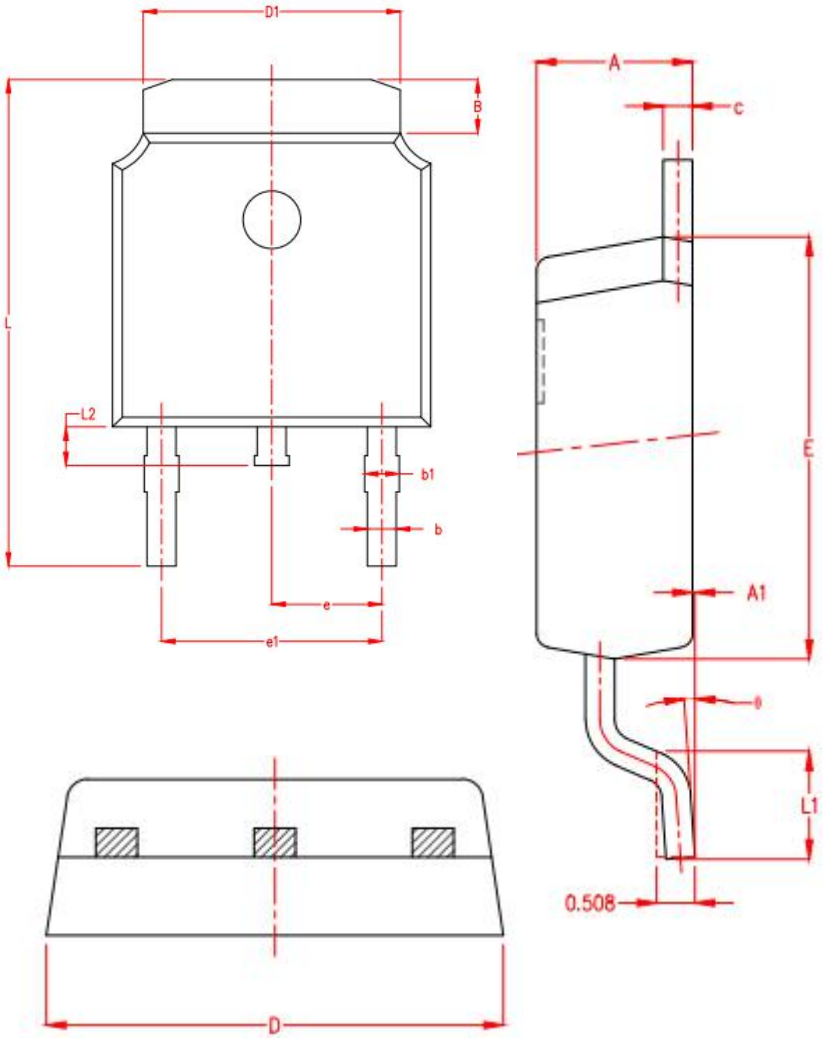


Figure 17. Peak diode recovery dv/dt test circuit & waveform

TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.15	2.25	2.35
A1	0.00	0.06	0.12
B	0.96	1.11	1.26
b	0.59	0.69	0.79
b1	0.69	0.81	0.93
c	0.34	0.42	0.50
D	6.45	6.60	6.75
D1	5.23	5.33	5.43
E	5.95	6.10	6.25
e	2.286TYP.		
e1	4.47	4.57	4.67
L	9.90	10.10	10.30
L1	1.40	1.55	1.70
L2	0.60	0.80	1.00
θ	0°	4°	8°