

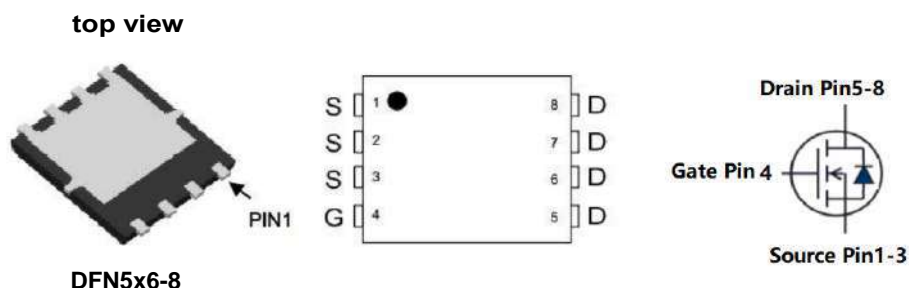


Features

- High ruggedness
- Low Gate Charge (Typ 143nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: Synchronous Rectification, Li Battery Protect Board, Inverter

Product Summary

V_{DS}	30	V
$R_{DS(on), Typ} @ V_{GS}=10\text{ V}$	1.7	mΩ
I_D	150	A



Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DSS}	Drain to source voltage	30	V
I_D	Continuous drain current (@ $T_c=25^\circ\text{C}$)	150*	A
	Continuous drain current (@ $T_c=100^\circ\text{C}$)	78*	A
I_{DM}	Drain current pulsed(note 1)	600	A
I_{DSM}	Continuous drain current (@ $T_a=25^\circ\text{C}$)	30	A
	Continuous drain current (@ $T_a=70^\circ\text{C}$)	24	A
V_{GS}	Gate to source voltage	± 20	V
E_{AS}	Single pulsed avalanche energy (note 2)	576	mJ
E_{AR}	Repetitive avalanche energy (note 1)	57	mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5	V/ns
P_D	Total power dissipation (@ $T_c=25^\circ\text{C}$)	43	W
	Total power dissipation (@ $T_a=25^\circ\text{C}$)	2.6	W
T_{STG}, T_J	Operating junction temperature & storage temperature	-55 ~ + 150	$^\circ\text{C}$

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	1.8	$^\circ\text{C/W}$
R_{thja}	Thermal resistance, Junction to ambient	62	$^\circ\text{C/W}$

Note: R_{thja} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{thjc} is guaranteed by design while R_{thca} is determined by the user's board design.

Electrical characteristic ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	$V_{GS}=0V, I_D=250\mu A$	30			V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown voltage temperature coefficient	$I_D=250\mu A$, referenced to 25°C		0.02		$V/^\circ\text{C}$
I_{DSS}	Drain to source leakage current	$V_{DS}=30V, V_{GS}=0V$			1	μA
		$V_{DS}=24V, T_J=125^\circ\text{C}$			50	μA
I_{GSS}	Gate to source leakage current, forward	$V_{GS}=20V, V_{DS}=0V$			100	nA
	Gate to source leakage current, reverse	$V_{GS}=-20V, V_{DS}=0V$			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2		2.4	V
$R_{DS(ON)}$	Drain to source on state resistance	$V_{GS}=4.5V, I_D=30A, T_J=25^\circ\text{C}$		3.4	4.5	$m\Omega$
		$V_{GS}=10V, I_D=30A, T_J=25^\circ\text{C}$		1.7	2.5	$m\Omega$
G_{fs}	Forward transconductance	$V_{DS}=5V, I_D=30A$		73		S
Dynamic characteristics						
C_{iss}	Input capacitance	$V_{GS}=0V, V_{DS}=15V, f=1\text{MHz}$		6272		pF
C_{oss}	Output capacitance			1022		
C_{rss}	Reverse transfer capacitance			718		
$t_{d(on)}$	Turn on delay time	$V_{DS}=15V, I_D=30A, R_G=4.7\Omega, V_{GS}=10V$ (note 4,5)		20		ns
t_r	Rising time			58		
$t_{d(off)}$	Turn off delay time			158		
t_f	Fall time			77		
Q_g	Total gate charge	$V_{DS}=24V, V_{GS}=10V, I_D=30A, I_G=5mA$ (note 4,5)		143		nC
Q_{gs}	Gate-source charge			17		
Q_{gd}	Gate-drain charge			43		
R_g	Gate resistance	$V_{DS}=0V$, Scan F mode		4.2		Ω

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			150	A
I_{SM}	Pulsed source current				600	A
V_{SD}	Diode forward voltage drop.	$I_S=45A, V_{GS}=0V$			1.4	V
t_{rr}	Reverse recovery time	$I_S=30A, V_{GS}=0V,$		26		ns
Q_{rr}	Reverse recovery charge	$di_F/dt=100A/\mu s$		10		nC

※. Notes

1. Repeattive rating : pulse width limited by junction temperature.
2. $L=0.5mH, I_{AS}=48A, V_{DD}=30V, R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
3. $I_{SD} \leq 30A, di/dt = 100A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ\text{C}$
4. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

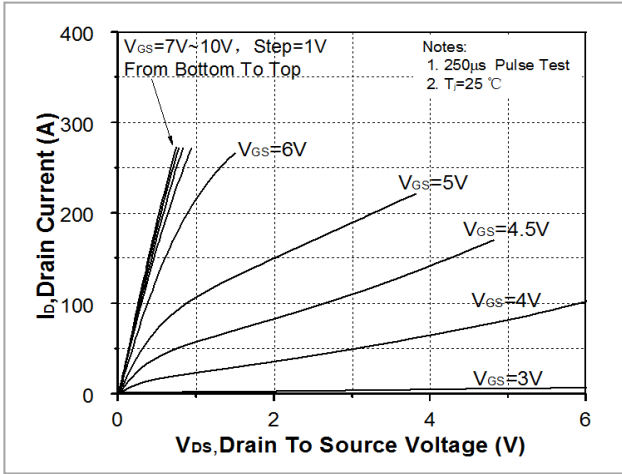


Fig. 2. Transfer Characteristics

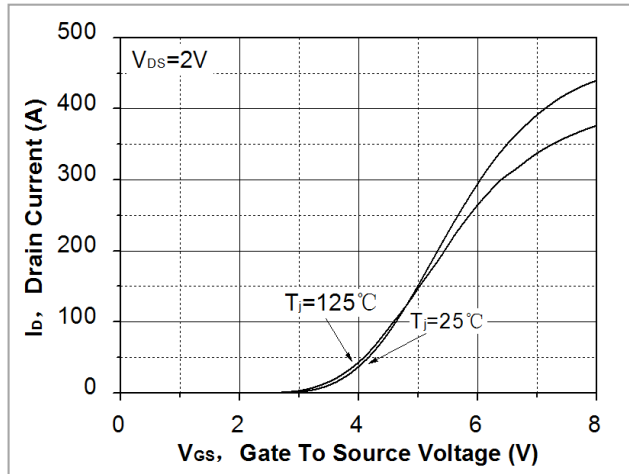


Fig. 3. On-resistance variation vs. drain current and gate voltage

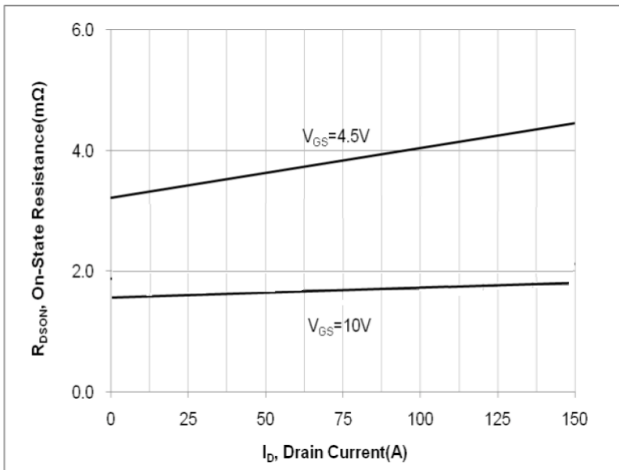


Fig. 4. On-state current vs. diode forward voltage

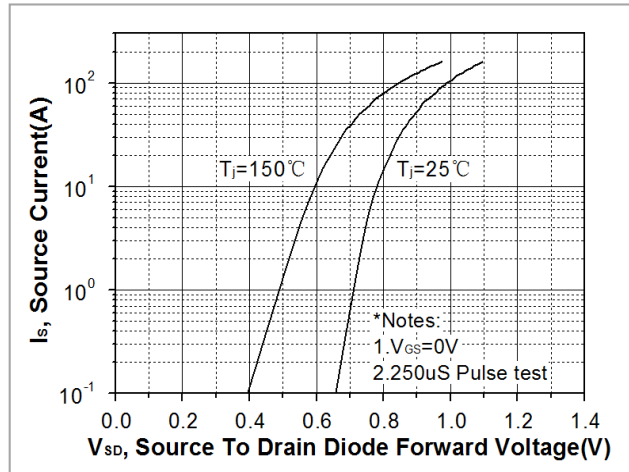


Fig 5. Breakdown voltage variation vs. junction temperature

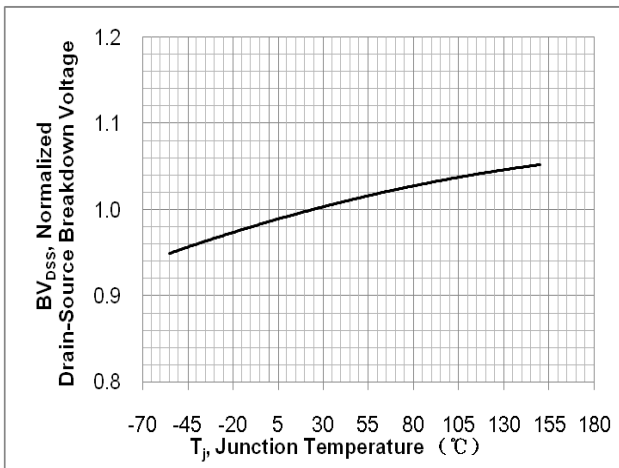


Fig. 6. On-resistance variation vs. junction temperature

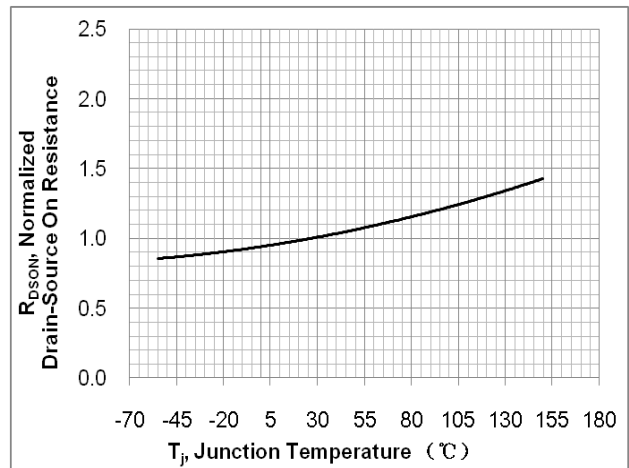


Fig. 7. Gate charge characteristics

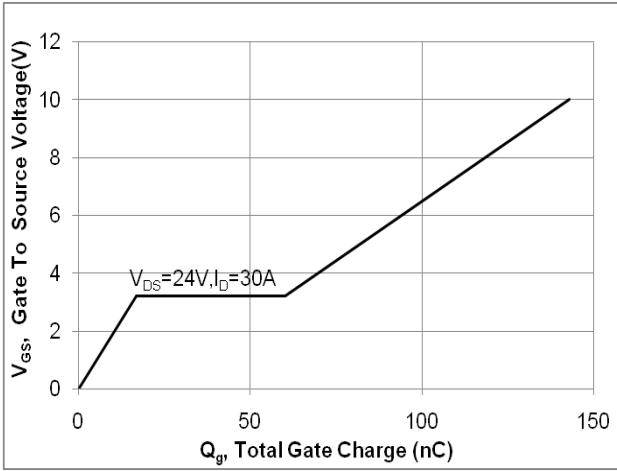


Fig. 8. Capacitance Characteristics

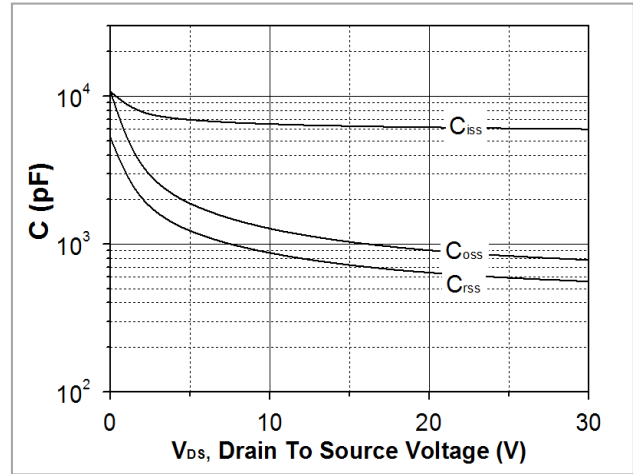


Fig. 9. Maximum safe operating area

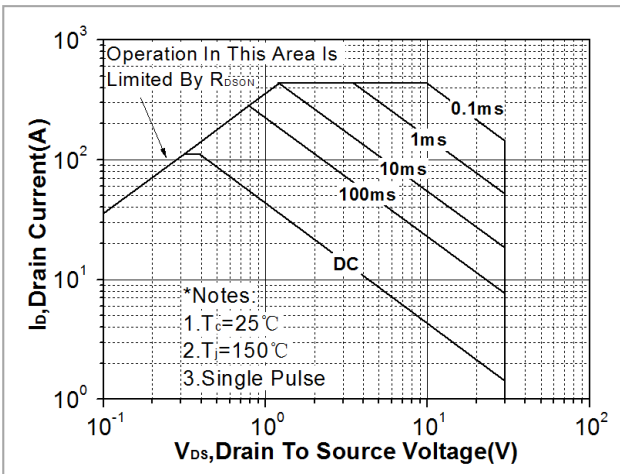


Fig. 10. Maximum drain current vs. case temperature

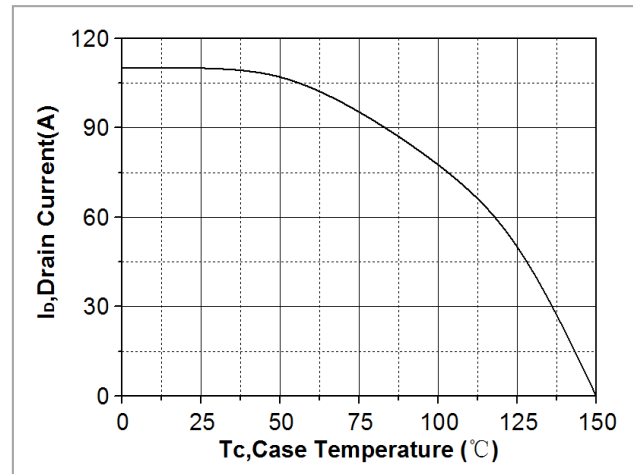


Fig. 11. Transient thermal response curve

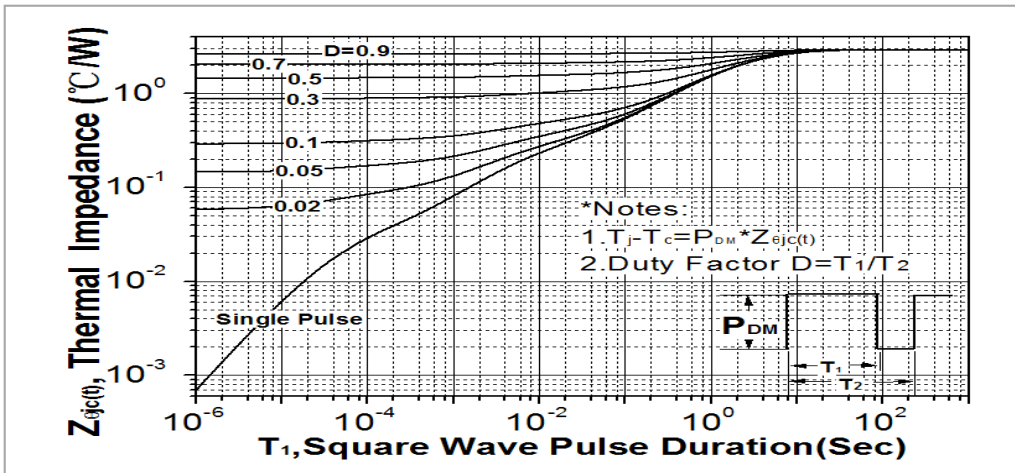


Fig. 12. Gate charge test circuit & waveform

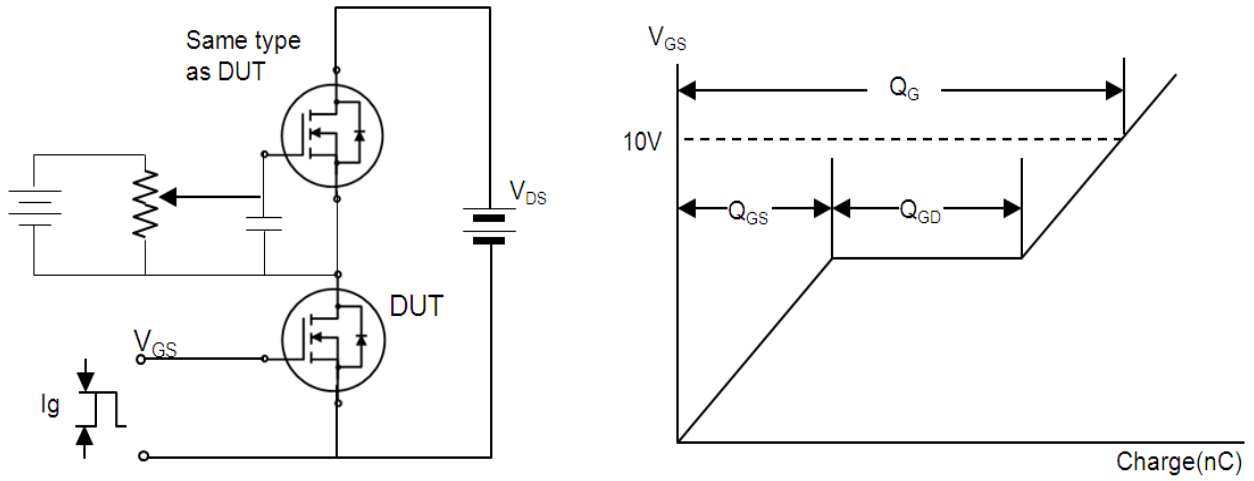


Fig. 13. Switching time test circuit & waveform

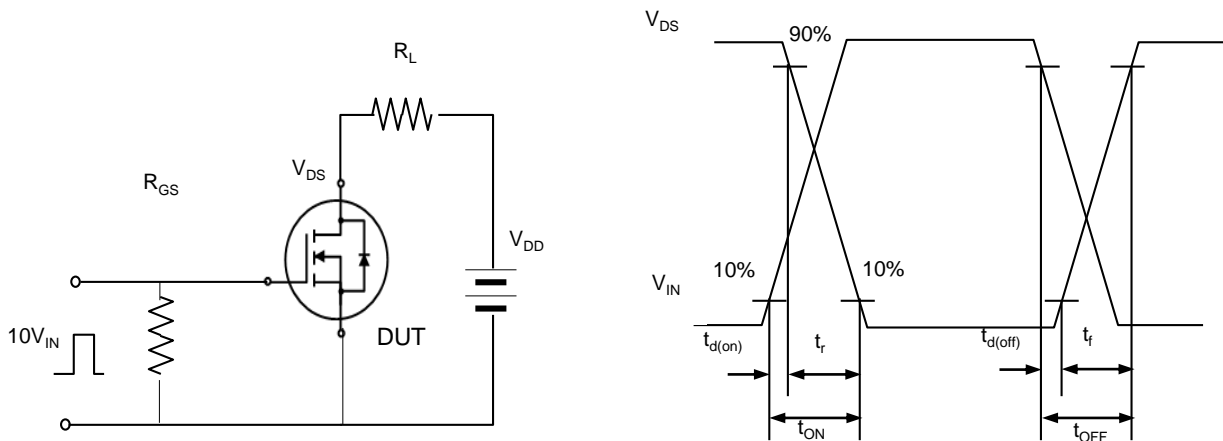


Fig. 14. Unclamped Inductive switching test circuit & waveform

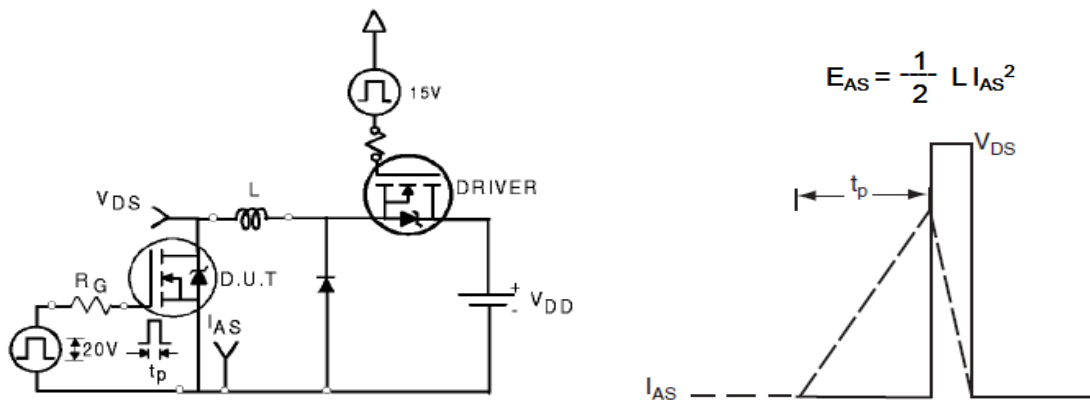
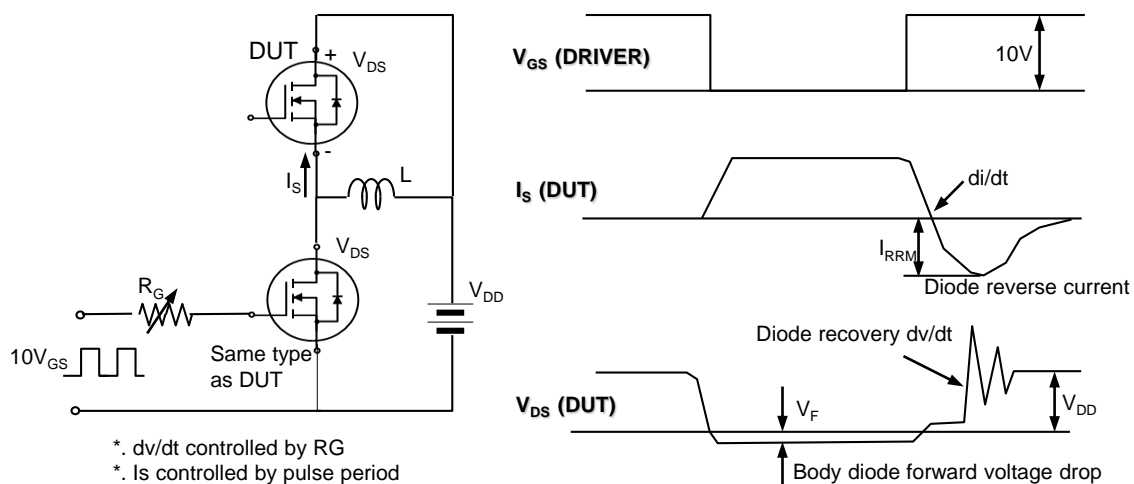


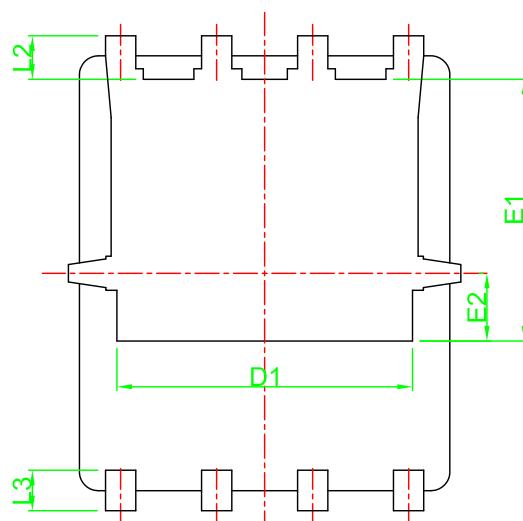
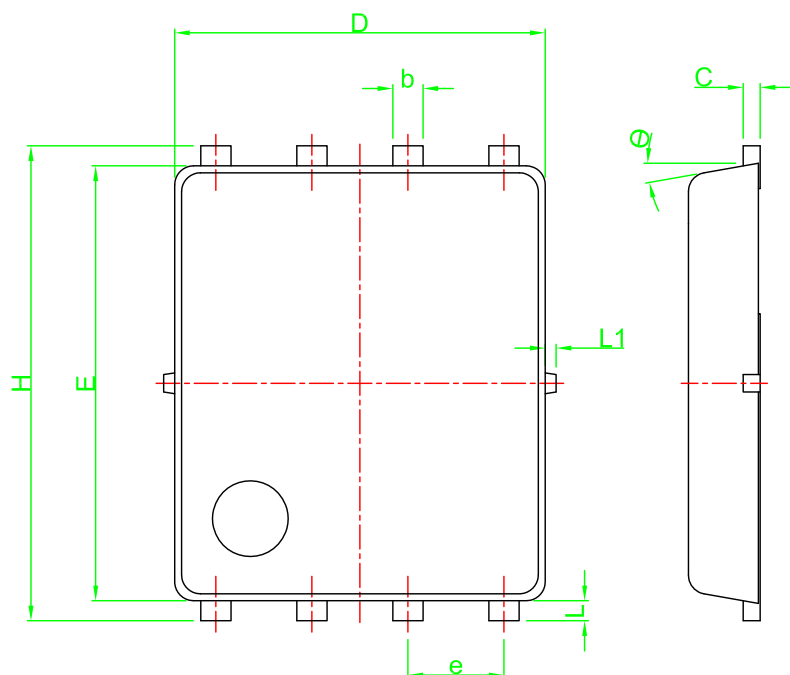
Fig. 15. Peak diode recovery dv/dt test circuit & waveform



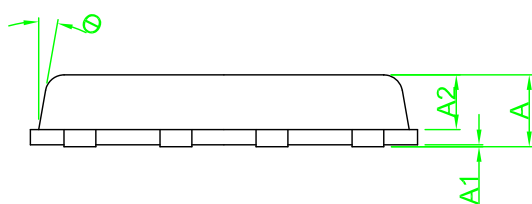
Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
JMN30N150Q-R	30N150	DFN5*6-8	Tape&Reel	4000/Reel

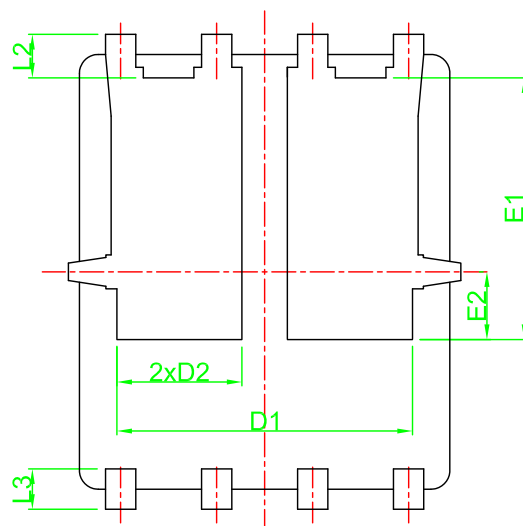
PACKAGE	MARKING
DFN5*6-8	<p>The diagram shows a rectangular marking area containing the text '30N150'. Above this text are two empty boxes, with an arrow pointing to the label 'Lot Number'. Below the text are four empty boxes, with an arrow pointing to the label 'Date Code'.</p>



TYPE I



DFN5*6-8



TYPE II

Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.85	1.00	0.033	0.039
A1	0.01	0.05	0.000	0.002
A2	0.69	0.75	0.027	0.030
b	0.40	0.45	0.016	0.018
C	0.20	0.30	0.008	0.012
D	4.80	4.95	0.189	0.195
D1	3.91	4.06	0.154	0.160
D2	1.60	1.80	0.063	0.071
e	1.27 TYP		0.05 TYP	
E	5.65	5.80	0.222	0.228
E1	3.46	3.50	0.136	0.138
E2	0.80	0.95	0.031	0.037
L	0.15	0.3	0.006	0.012
L1	0.08	0.15	0.003	0.006
L2	0.58	0.73	0.023	0.029
L3	0.45	0.60	0.018	0.024
H	6.15	6.28	0.242	0.247
θ	8°	12°	8°	12°

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