

Features ➤ Split Gate Trench MOSFET technology ➤ Excellent package for heat dissipation ➤ High density cell design for low $R_{DS(ON)}$	<i>Bvdss</i>	<i>Rdson</i>	<i>ID</i>
	-60V	3.4mΩ	-150A
	Application ➤ DC-DC Converters ➤ Synchronous-rectification applications ➤ Power management functions		



Package			
Marking and pin assignment	TO-263 top view		Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
150P06	S150P06G	TO-263	800

Absolute Maximum Ratings ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C=25^{\circ}\text{C}$	I_D	-150	A
	$T_C=100^{\circ}\text{C}$	I_D	-91.7	A
Pulsed Drain Current		I_{DM}^1	-580	A
Single Pulse Avalanche Energy		E_{AS}^2	2058	mJ
Power Dissipation	$T_C = 25^{\circ}\text{C}$	P_D	183	W
Operating junction and storage temperature		T_J, T_{STG}	150, -55 ~ 150	$^{\circ}\text{C}$
Maximum Temperature for Soldering		T_L	260	$^{\circ}\text{C}$



Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.68	$^{\circ}\text{C/W}$
Thermal Resistance, Junction -to-Ambient	$R_{\theta JA}$	60	$^{\circ}\text{C/W}$

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HLS150P06G	TO-263	1	2	3	Tape Reel

Electrical Characteristics ($T_j=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-60	-	-	V
Gate-body Leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -60V, V_{GS} = 0V$	-	-	1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-2	-2.4	-2.8	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -20A$	-	3.4	4.1	m Ω
Input Capacitance	C_{ISS}	$V_{DS} = -30V, V_{GS} = 0V,$ $f = 1MHz$	-	9123	-	pF
Output Capacitance	C_{OSS}		-	1583	-	
Reverse Transfer Capacitance	C_{RSS}		-	85.6	-	
Total Gate Charge	Q_g	$V_{GS} = -10V, V_{DS} = -30V, I_D = -10A$	-	135	-	nC
Gate-Source Charge	Q_{gs}		-	28	-	
Gate-Drain Charge	Q_{gd}		-	22.4	-	
Turn-On Delay Time	$T_{d(on)}$	$V_{GS} = -10V, V_{DS} = -30V,$ $R_G = 3\Omega, I_D = -10A$	-	70	-	ns
Rise Time	T_R		-	45	-	
Turn-Off Delay Time	$T_{d(off)}$		-	165	-	
Fall Time	T_F		-	50	-	
Diode Forward Current	I_S	$T_C = 25^{\circ}\text{C}$	-	-	-150	A
Diode Forward Voltage	V_{SD}	$I_S = -20A, V_{GS} = 0V$	-	-	-1.2	V
Reverse Recovery time	T_{rr}	$I_S = -10A, V_{DD} = -30V$	-	45	-	ns
Reverse Recovery Charge	Q_{rr}	$dI/dt = 100A/\mu s$	-	100	-	nC

Note :

1.Repetitive rating; pulse width limited by maximum junction temperature

2. $V_{DD} = 30V, L = 0.3mH, R_G = 25\Omega$, Starting $T_j = 25^{\circ}\text{C}$

Typical Performance Characteristics

Fig1:Typ. output characteristics

$$I_D = f(-V_{DS})$$

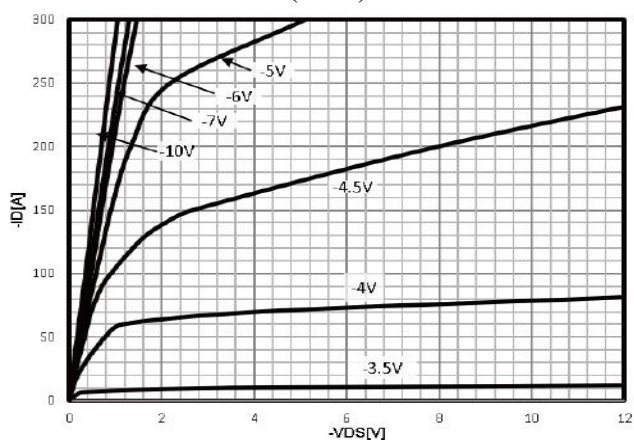


Fig2:Typ. drain-source on resistance

$$R_{DS(on)} = f(-I_D)$$

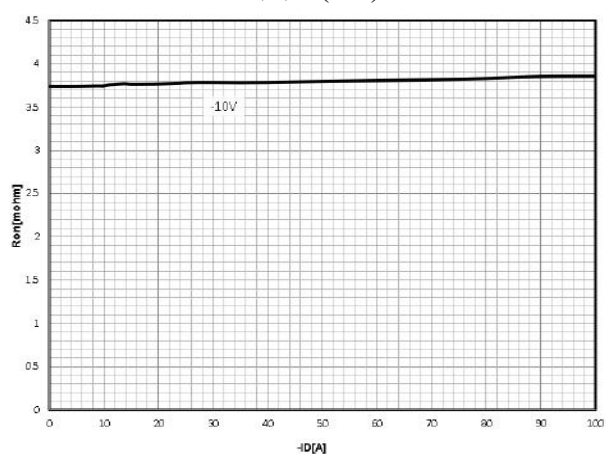


Fig3:Typ. transfer characteristics

$$-I_D = f(-V_{GS})$$

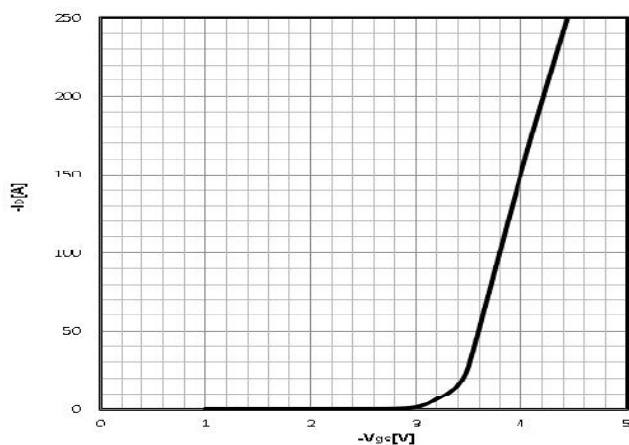


Fig4:Drain-source on-state resistance

$$R_{DS(on)} = f(T_J); I_D = -15A; V_{GS} = -10V$$

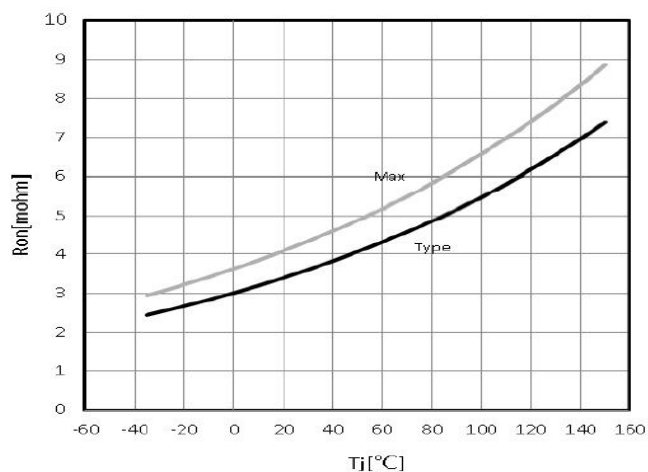


Fig5:Gate Threshold Voltage

$$-V_{TH} = f(T_J); I_D = -250\mu A$$

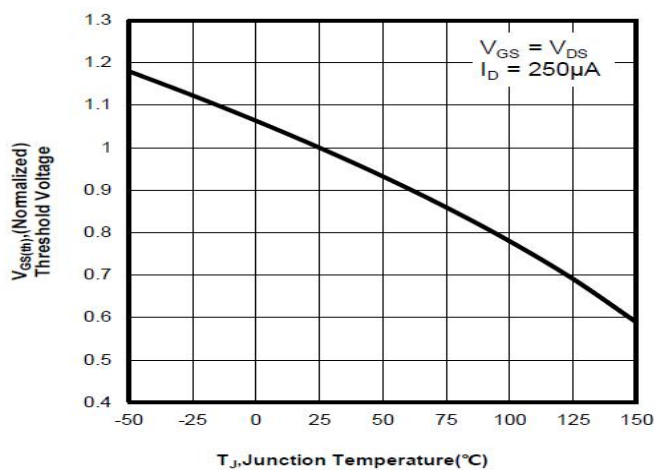


Fig6:Drain-source breakdown voltage

$$V_{BR(DSS)} = f(T_J); I_D = -250\mu A$$

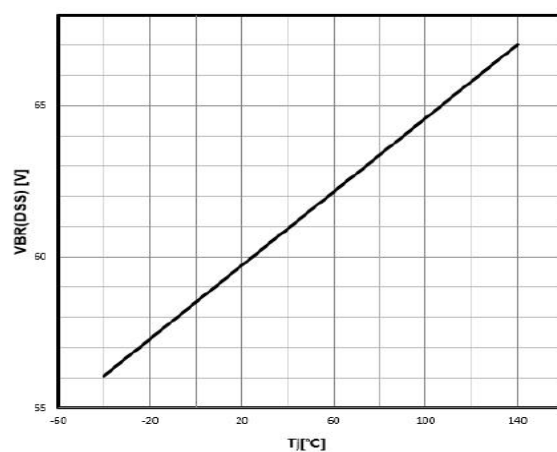


Fig7:Typ. gate charge

$V_{GS}=f(Q_g)$, $I_D=-15A$;

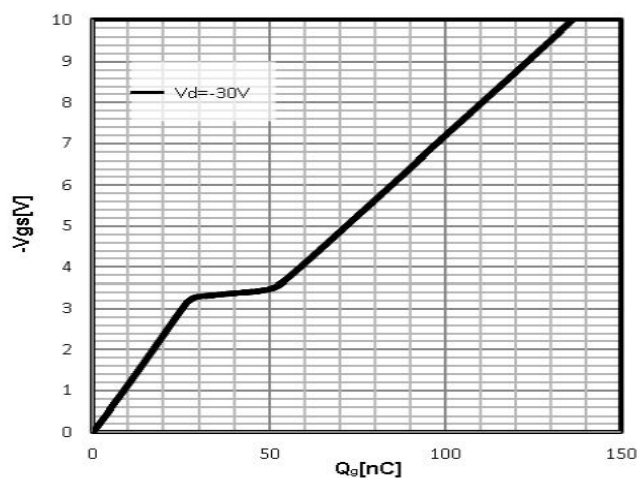


Fig8:Typ. capacitances

$C=f(V_{DS})$; $V_{GS}=0V$; $f=1MHz$

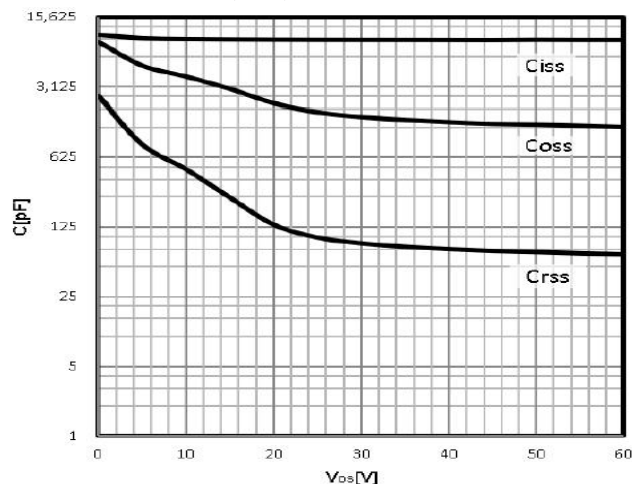


Fig9:Power Dissipation

$P_{tot}=f(T_c)$

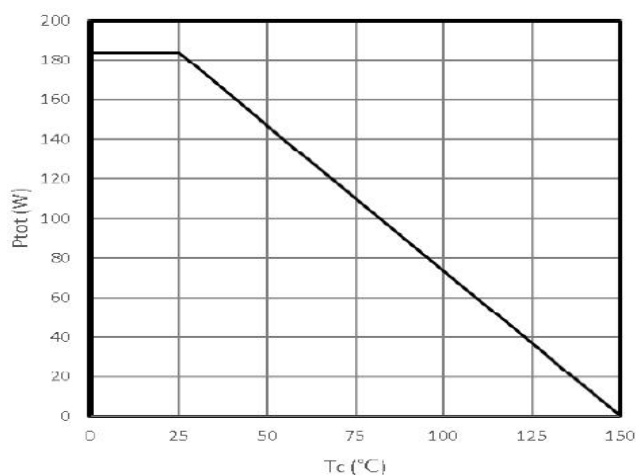


Fig10:Maximum Drain Current

$-I_D=f(T_c)$

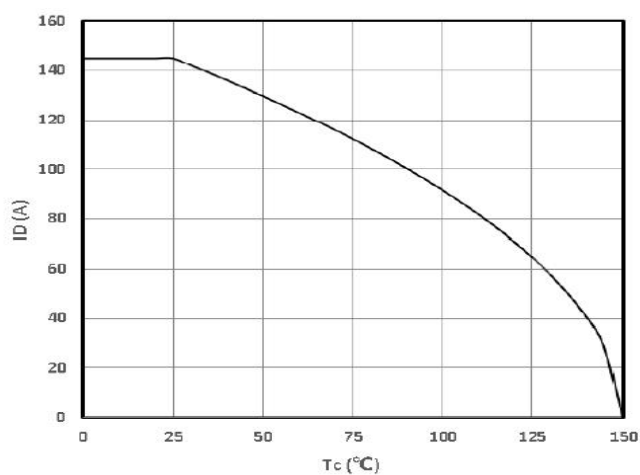


Fig11:Safe operating area

$I_D=f(V_{DS})$

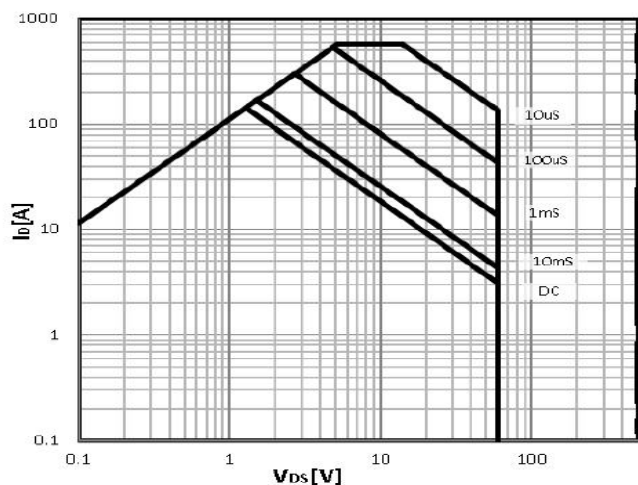


Fig12:Body Diode Forward Voltage Variation

$-I_F=f(-V_{DS})$

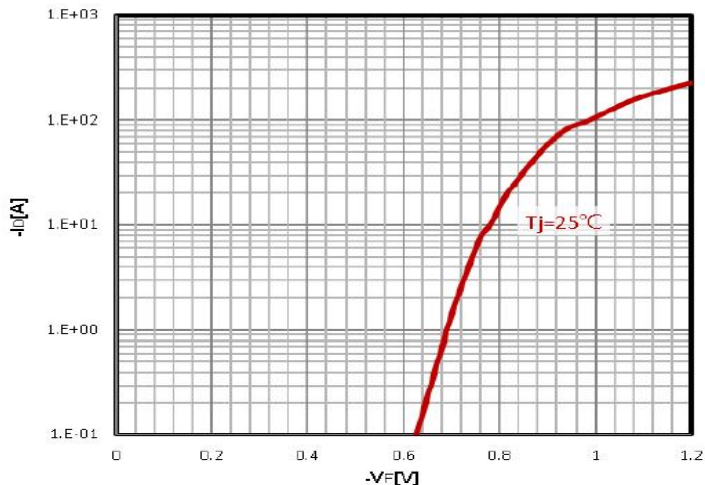
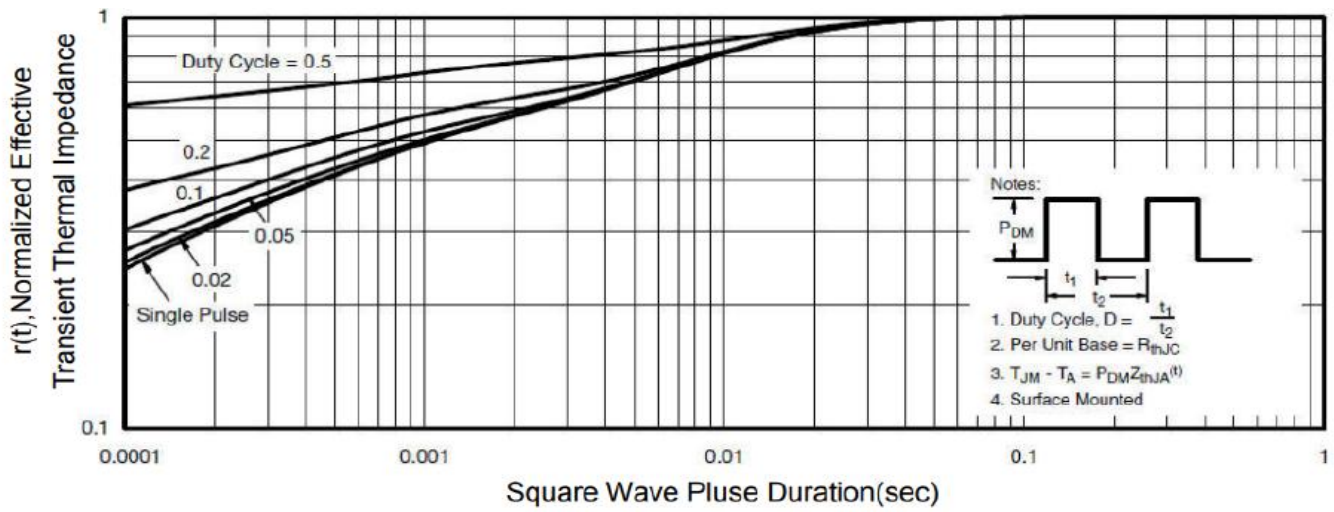


Figure 13: Max. Transient Thermal Impedance

$$Z_{thJC}=f(t_p)$$



Test Circuit and Waveform:

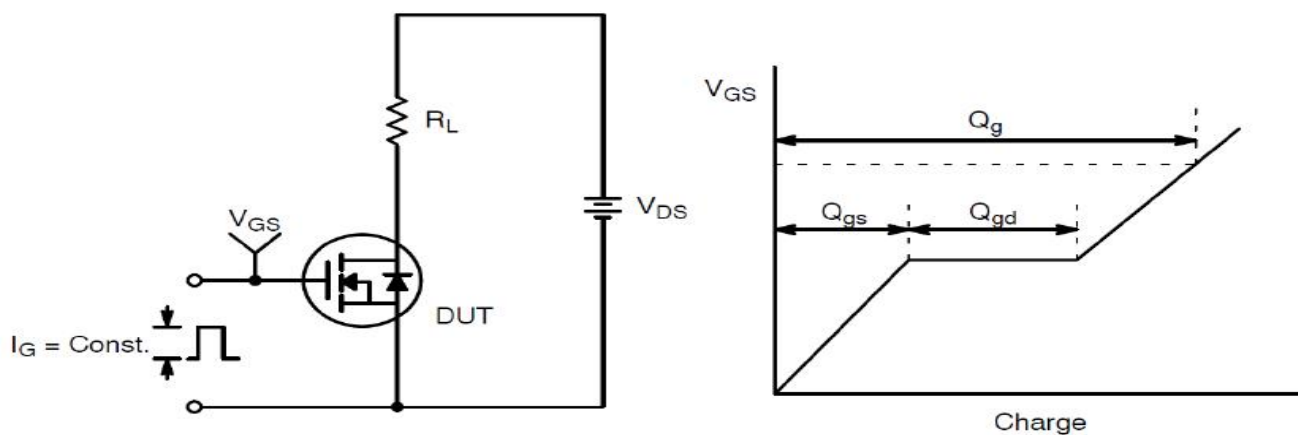


Figure.1: Gate Charge Test Circuit & Waveform

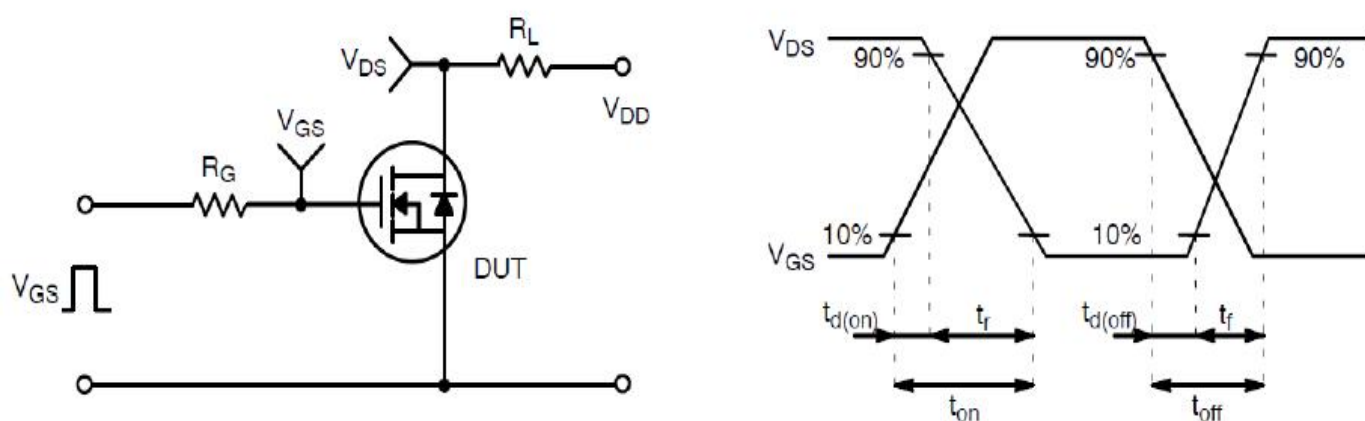


Figure.2: Resistive Switching Test Circuit & Wave forms

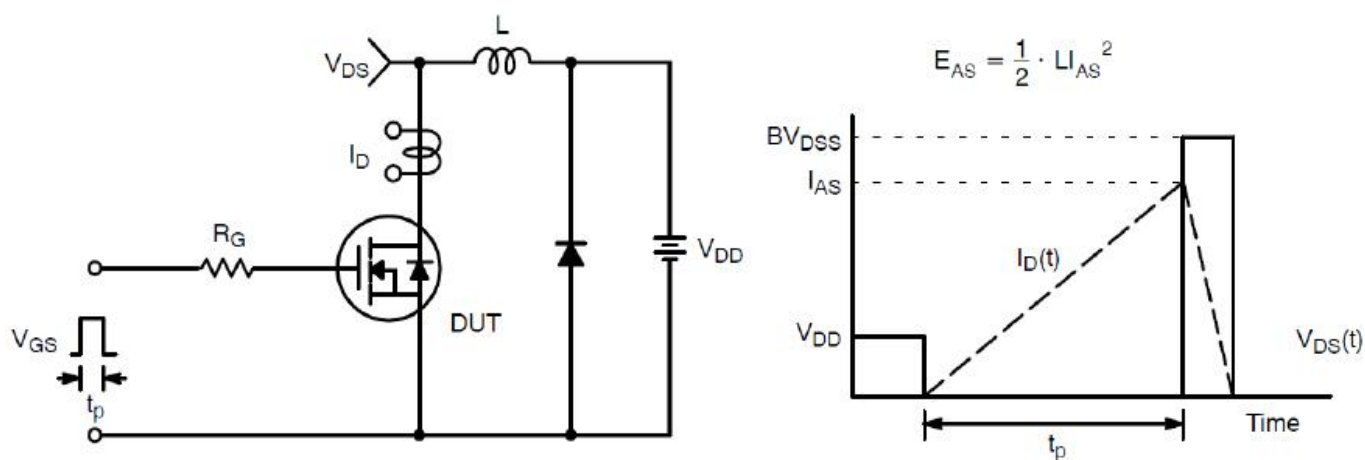
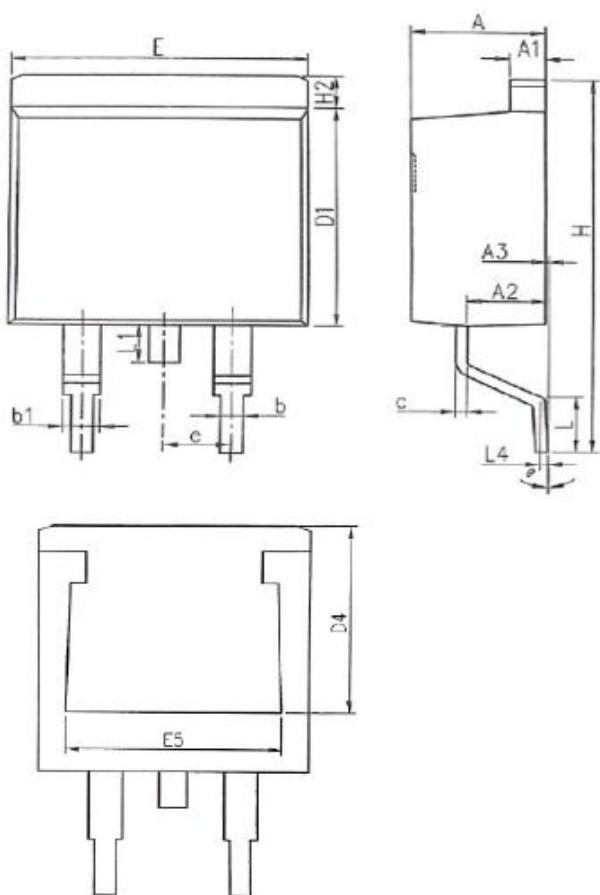


Figure.3: Unclamped inductive Switching Test Circuit & Wave forms

Package Dimensions TO263

COMMON DIMENSIONS



SYMBOL	MM	
	MIN	MAX
A	4.37	4.89
A1	1.17	1.42
A2	2.20	2.90
A3	0.00	0.25
b	0.70	0.96
b1	1.17	1.47
c	0.28	0.60
D1	8.45	9.30
D4	6.60	-
E	9.80	10.40
E5	7.06	-
e	2.54BSC	
H	14.70	15.70
H2	1.07	1.47
L	2.00	2.80
L1	-	1.75
L4	0.254BSC	
θ	0°	9°



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