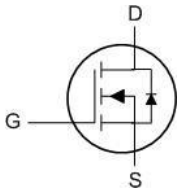
WLE160N06G

N-Ch 60V Fast Switching MOSFETs

Features

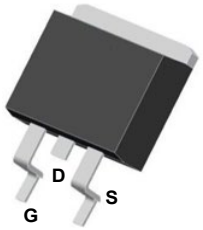
- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$



Applications

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

TO263 Pin Configuration



Product Summary

BVDSS	RDSON	ID
60V	2.6mΩ	160A

Absolute Maximum Ratings:

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		60	V
I_D	Continuous Drain Current	T_C = 25 °C	160	A
	Continuous Drain Current	T_C = 100 °C	101	A
I_{DM}[a1]	Pulsed Drain Current		641	A
E_{AS}[a2]	Single pulse avalanche energy		189	mJ
V_{GS}	Gate-to-Source Voltage		±20	V
P_D	Power Dissipation		113	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		150, –55 to 150	℃
T_L	Maximum Temperature for Soldering		260	℃

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.11	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	39.4	℃/W

Electrical Characteristics (Tc= 25℃ unless otherwise specified):

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS} = 60V, V_{GS}= 0V	--	--	1	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+20V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-20V	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D = 250μA	1.2	--	2.2	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=20A	--	2.6	2.9	mΩ

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 30V f = 1.0MHz	--	4610	6915	pF
C_{oss}	Output Capacitance		--	2188	3282	
C_{rss}	Reverse Transfer Capacitance		--	66	132	
R_g	Gate resistance		--	0.93	18.8	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =40A V_{DS} = 30V V_{GS} = 10V R_G = 2.7Ω	--	14.13	--	ns
tr	Rise Time		--	63.73	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	46.8	--	
t_f	Fall Time		--	105.07	--	
Q_g	Total Gate Charge	V_{GS} =10V V_{DS} = 30V I_D =40A	--	74.37	111.56	nC
Q_{gs}	Gate Source Charge		--	17.26	--	
Q_{gd}	Gate Drain Charge		--	9.44	18.88	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C =25 °C	--	--	160	A
V_{SD}	Diode Forward Voltage	I_S=40A, V_{GS}=0V	--	0.83	1.2	V
t_{rr}	Reverse Recovery time	I_S=40A, dI/dt=300A/μs	--	52.78	105.56	ns
Q_{rr}	Reverse Recovery Charge		--	56.31	112.62	nC

[a1]: Repetitive rating; pulse width limited by maximum junction temperature [a2]: VDD=30V, L=0.3mH, Rg=25Ω, Starting TJ=25 ℃

TypicalTPerformanceTCharacteristics

Fig 1: Output Characteristics

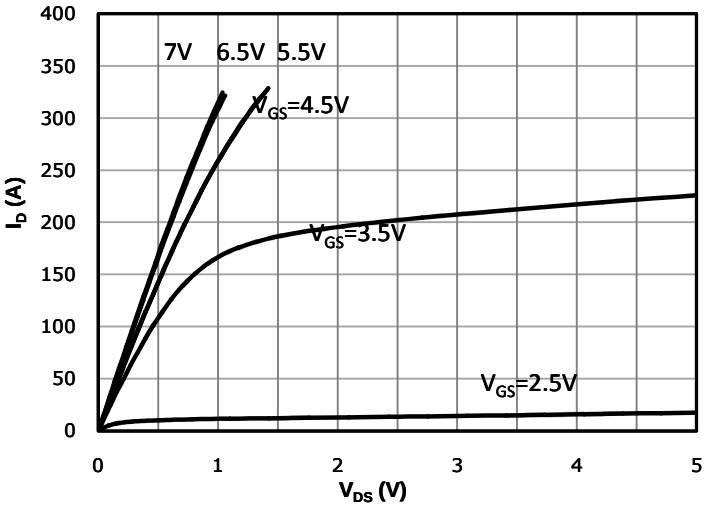


Fig 2: Transfer Characteristics

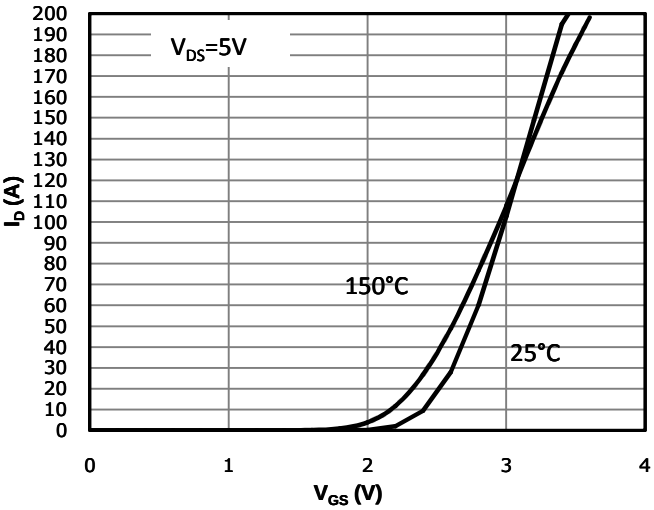


Fig 3: Rds(on) vs Drain Current and Gate Voltage

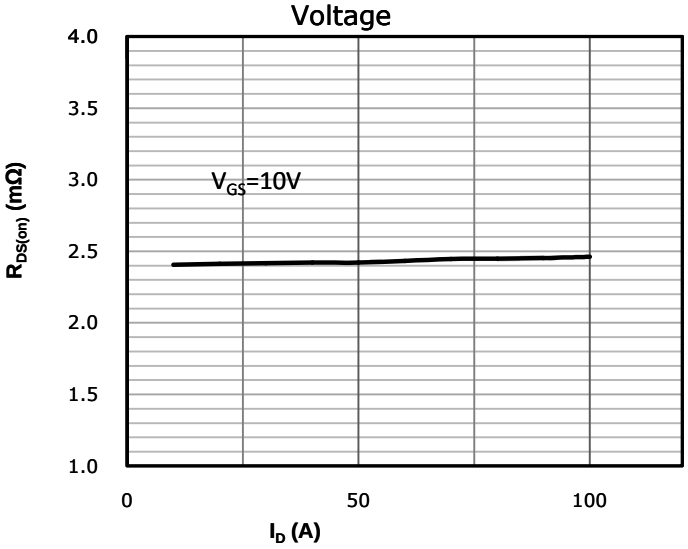


Fig 4: Rds(on) vs Gate Voltage

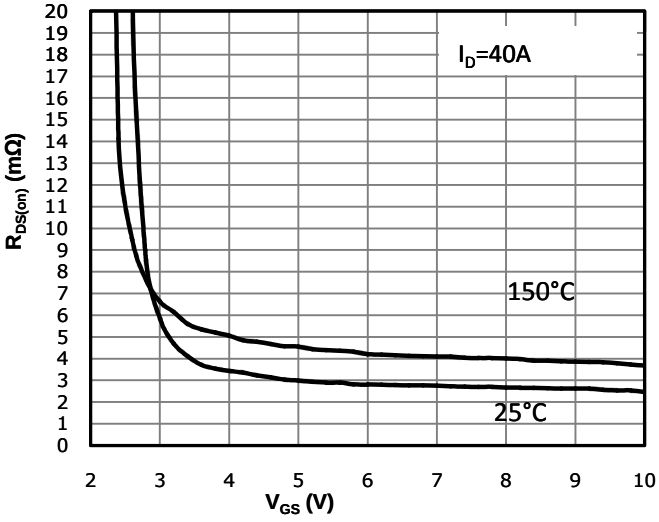


Fig 5: Rds(on) vs. Temperature

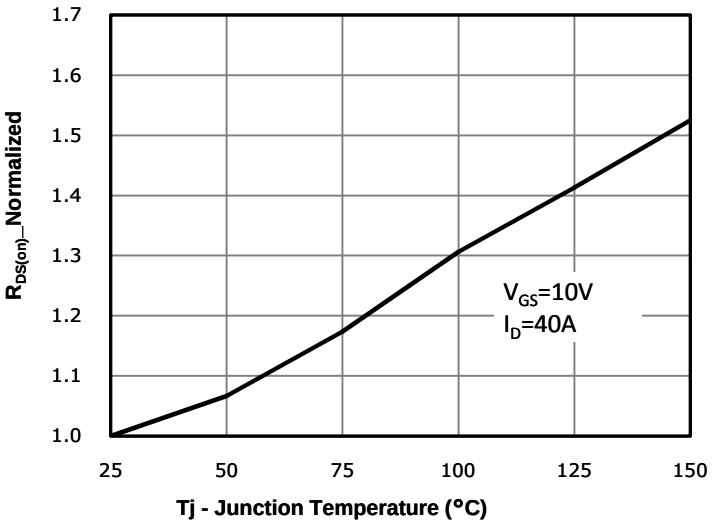


Fig 6: Capacitance Characteristics

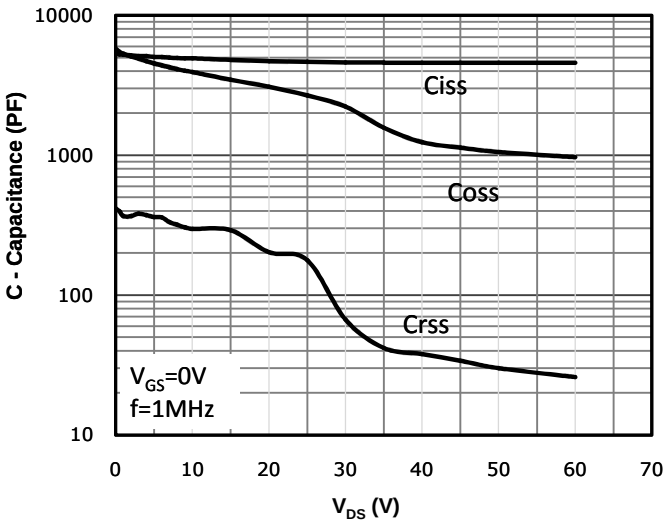


Fig 7: Gate ChargeCharacteristics

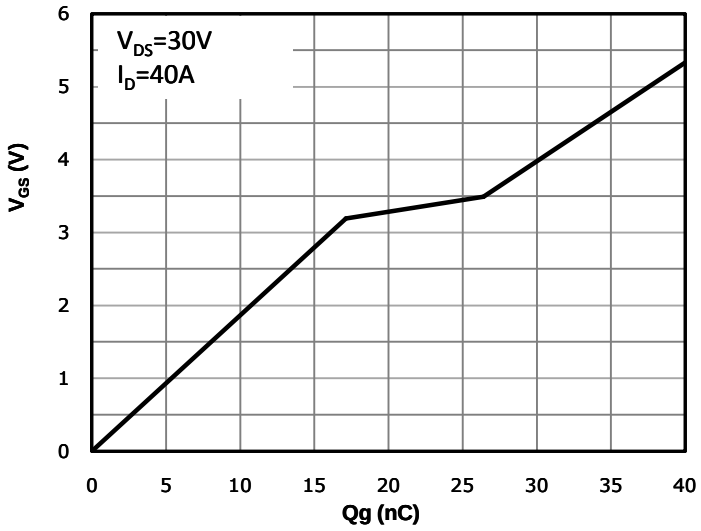


Fig 8: Body-diode Forward Characteristics

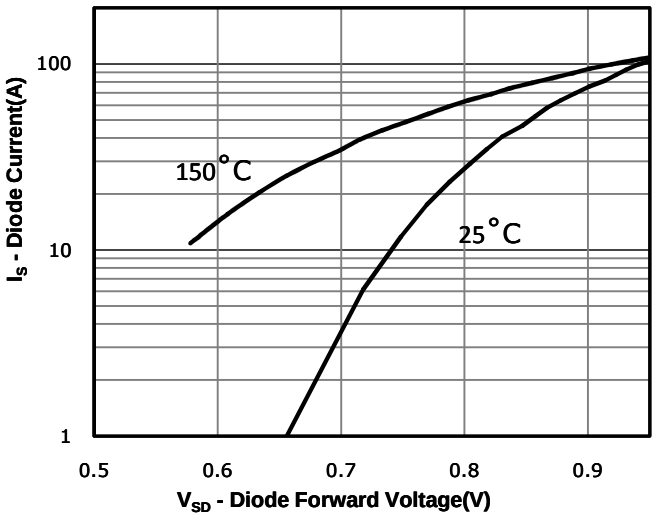


Fig 9: Power Dissipation

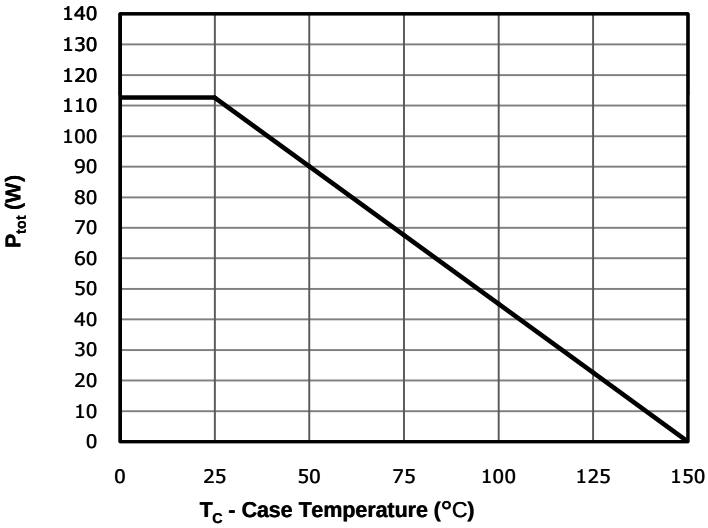


Fig 10: Drain Current Derating

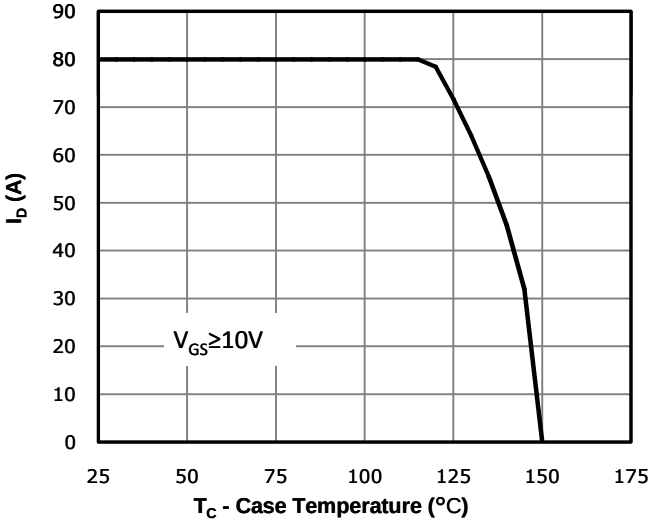


Fig 11: Safe Operating Area

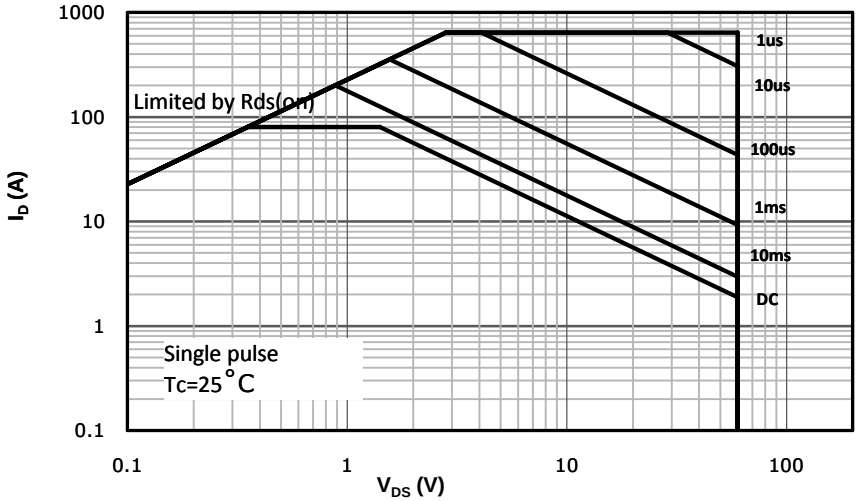
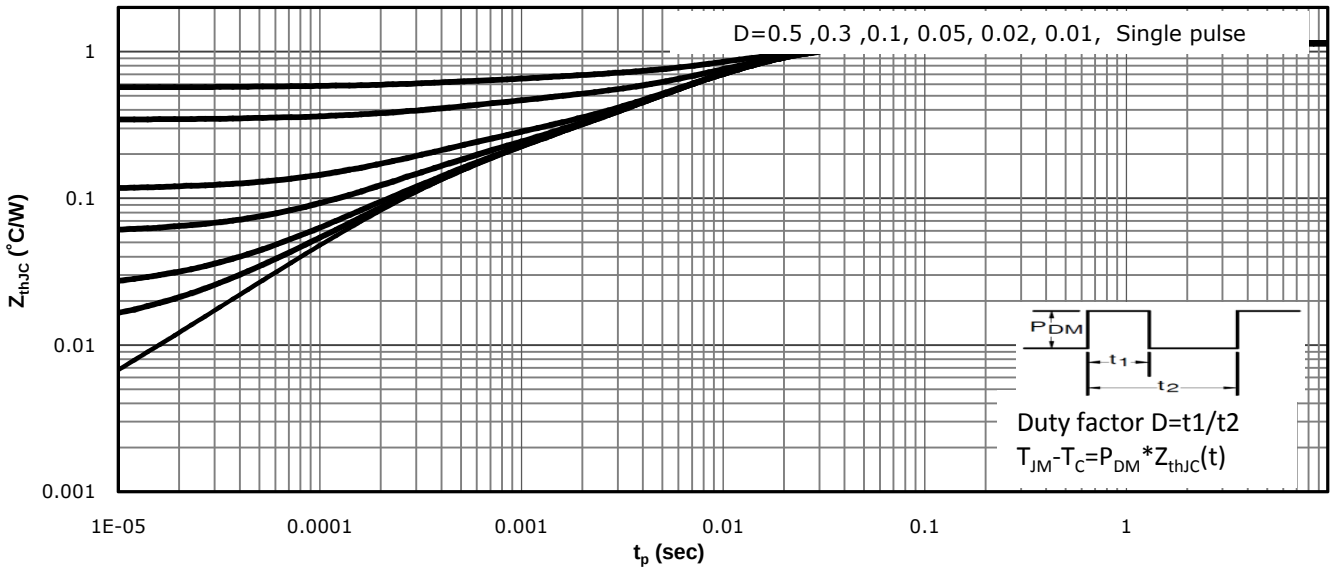
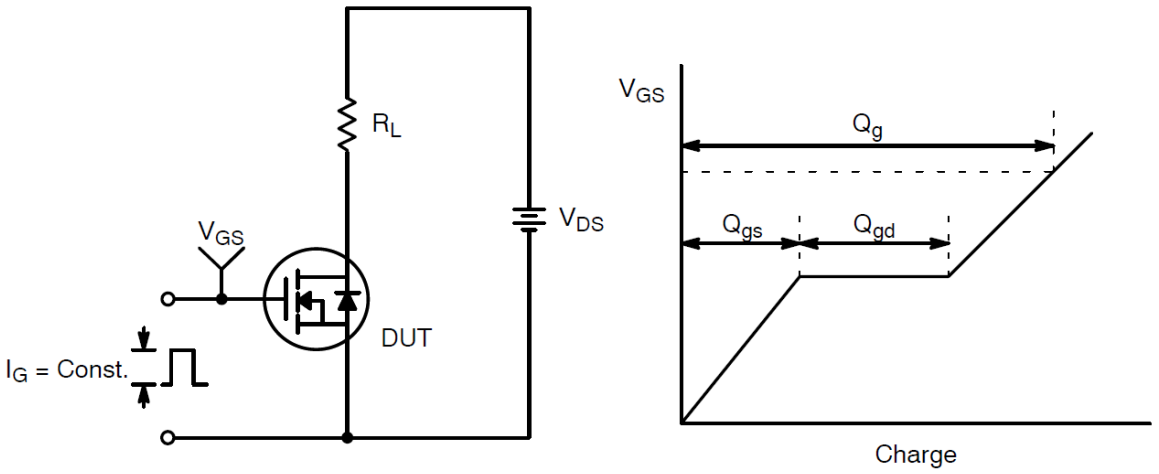


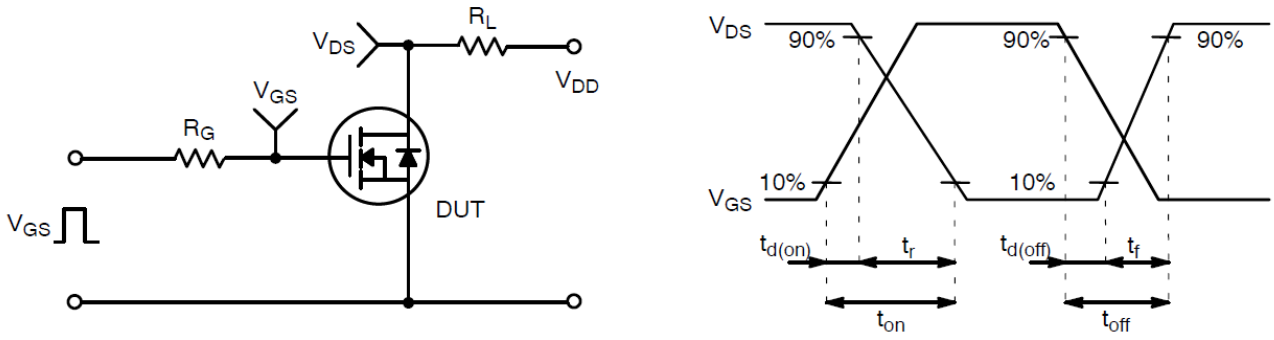
Fig 12: Max. Transient Thermal Impedance



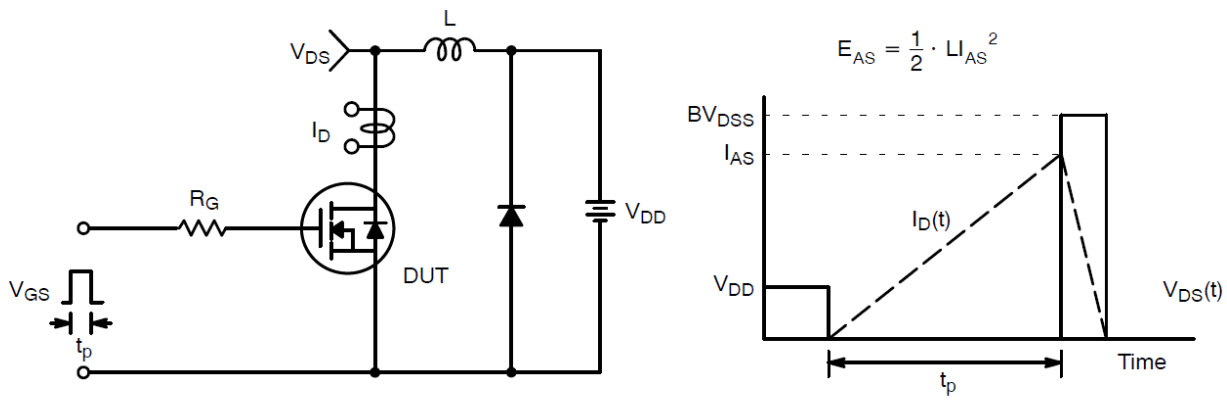
Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform

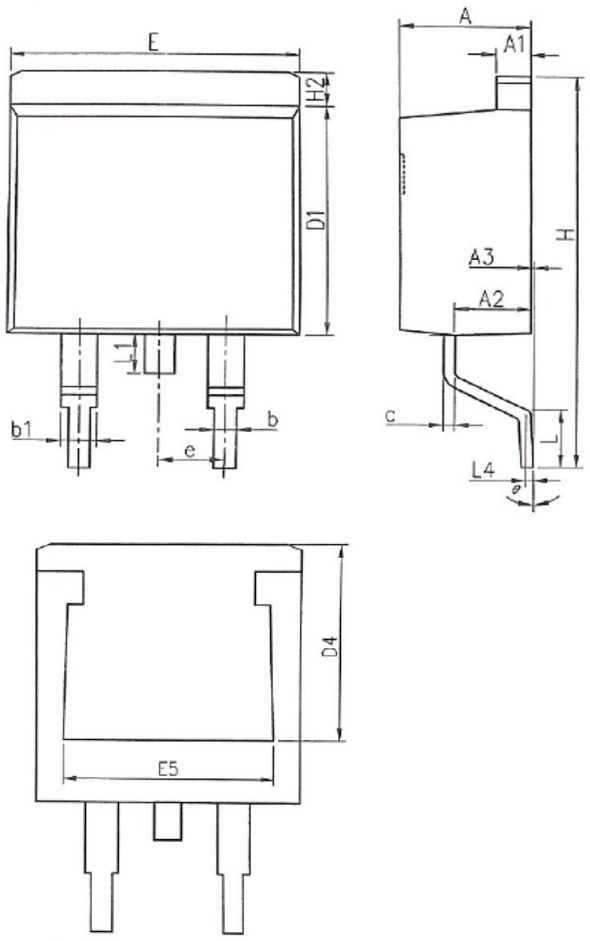


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

Mechanical Dimensions for TO-263



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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