



TXTD360P04L2-G

Silicon P-Channel Power MOSFET

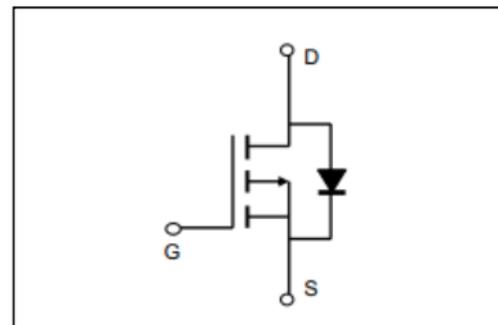
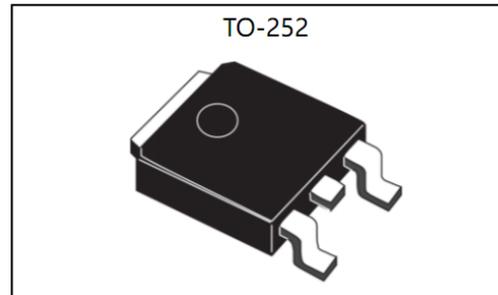
General Description :

The TXTD360P04L2-G uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is TO-252, which accords with the RoHS standard and Halogen-free.

V_{DSS}	-40	V
I_D	-20	A
P_D	27.7	W
$R_{DS(ON)type}$	28	m Ω

Features :

- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation



Applications :

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Absolute ($T_c = 25^\circ\text{C}$ unless otherwise specified) :

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	-40	V
I_D	Continuous Drain Current	-20	A
I_{DM}	Pulsed Drain Current	-70	A
V_{GS}	Gate-to-Source Voltage	± 18	V
P_D	Power Dissipation	27.7	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ\text{C}$



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Electrical Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified) :

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Unit
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-40	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=-40V, V_{GS}=0V, T_a=25^\circ\text{C}$	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+18V$	--	--	0.1	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-18V$	--	--	-0.1	μA

ON Characteristics ^{a3}						
Symbol	Parameter	Test Conditions	Rating			Unit
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-10A$	--	28	36	m Ω
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=-4.5V, I_D=-8A$	--	36	55	m Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	1.0	2.0	3.0	V

Pulse width $t_p \leq 380\mu s, \delta \leq 2\%$

Dynamic Characteristics ^{a4}						
Symbol	Parameter	Test Conditions	Rating			Unit
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=-20V$ $f=1.0\text{MHz}$	--	1350	--	pF
C_{oss}	Output Capacitance		--	88	--	
C_{rss}	Reverse Transfer Capacitance		--	79	--	

Resistive Switching Characteristics ^{a4}						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-20V, I_D=-8A$ $V_{GS}=-10V, R_G=3\Omega$	--	11	--	ns
t_r	Rise Time		--	8	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	50	--	
t_f	Fall Time		--	50	--	
Q_g	Total Gate Charge	$V_{DD}=-20V, I_D=-8A$ $V_{GS}=-10V$	--	25	--	nC
Q_{gs}	Gate to Source Charge		--	4	--	
Q_{gd}	Gate to Drain Charge		--	6	--	



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Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I _S	Continuous Source Current ^{a2} (Body Diode)		--	--	-20	A
V _{SD}	Diode Forward Voltage ^{a3}	I _S =-8A, V _{GS} =0V	--	--	-1.2	V

Symbol	Parameter	Typ.	Units
R _{θJA}	Thermal Resistance Junction-Ambient. ^{a2}	60	°C /W

^{a2} : Surface Mounted on FR4 Board, t_s≤10sec.

^{a3} : Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

^{a4} : Guaranteed by design, not subject to production



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Characteristics Curve:

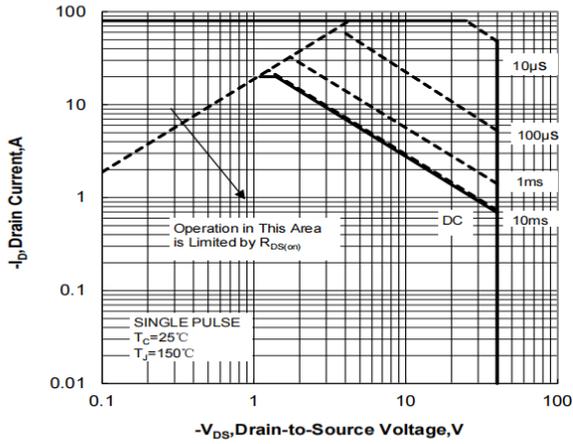


Figure 1 . Maximum Safe Operating Area

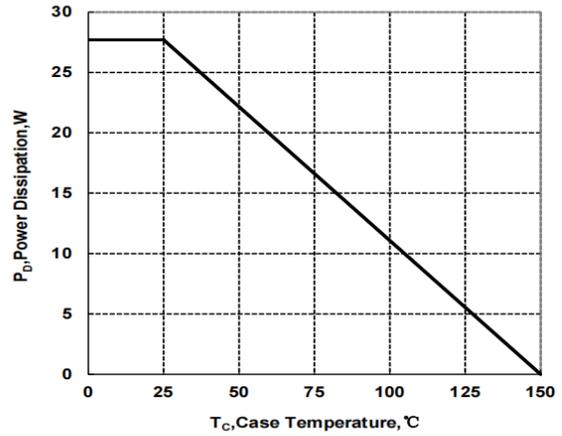


Figure 2. Maximum Power Dissipation vs Case Temperature

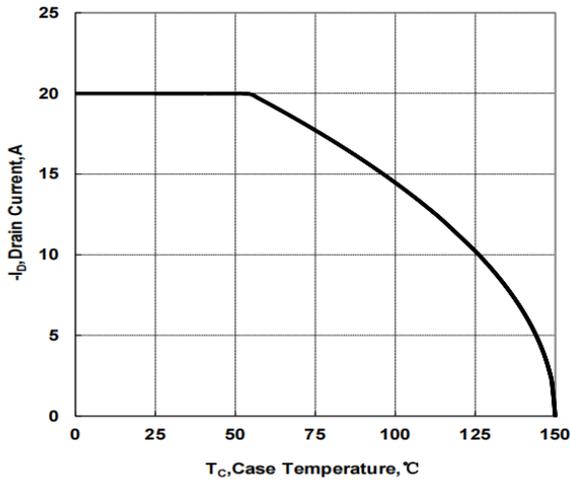


Figure 3. Maximum Continuous Drain Current vs Case Temperature

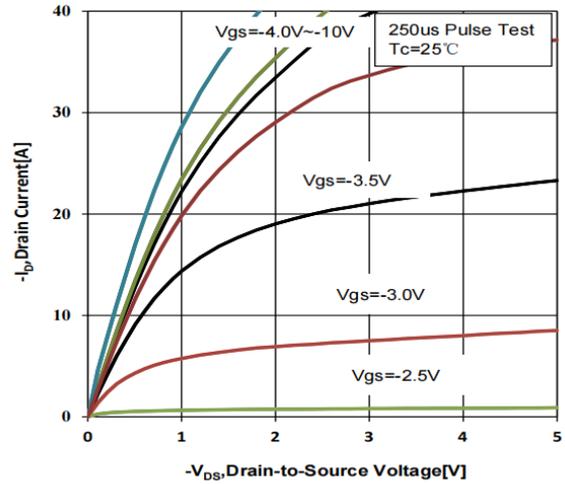


Figure 4. Typical output Characteristics

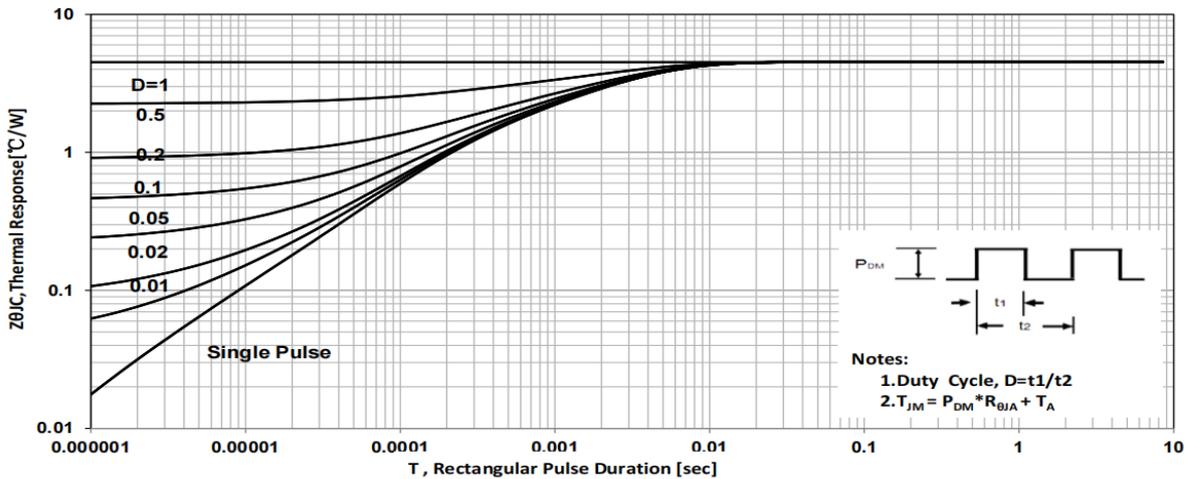


Figure 5 Maximum Effective Thermal Impedance , Junction to Case



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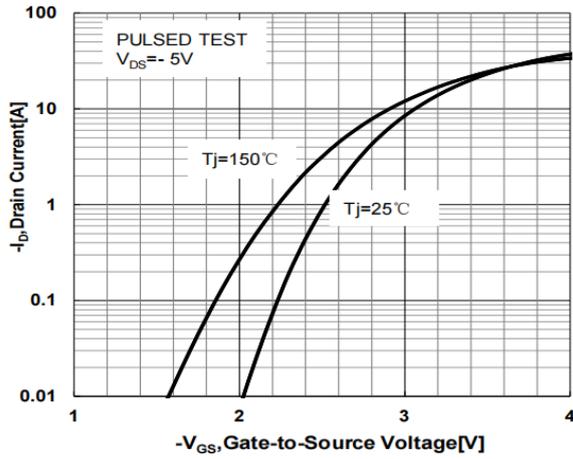


Figure 6 Typical Transfer Characteristics

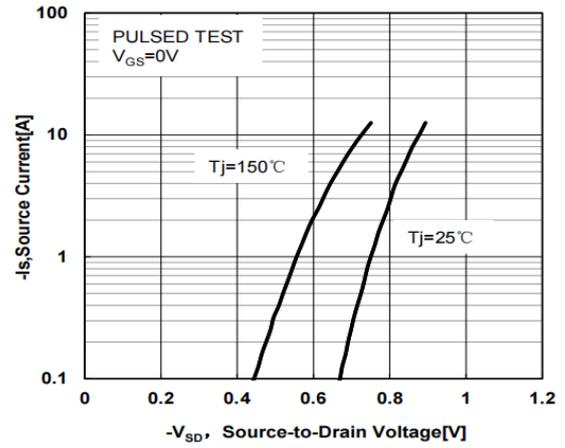


Figure 7 Typical Body Diode Transfer Characteristics

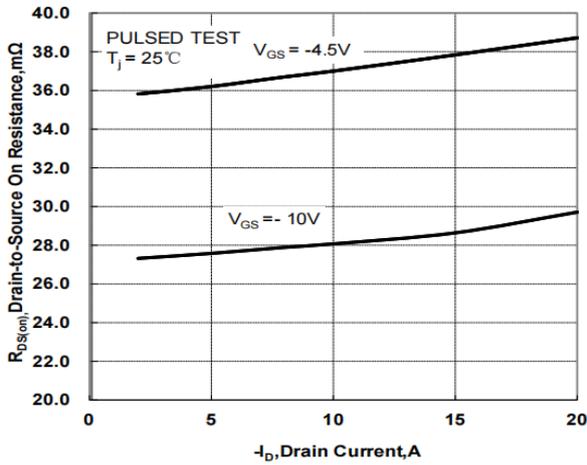


Figure 8. Drain-to-Source On Resistance vs Drain Current

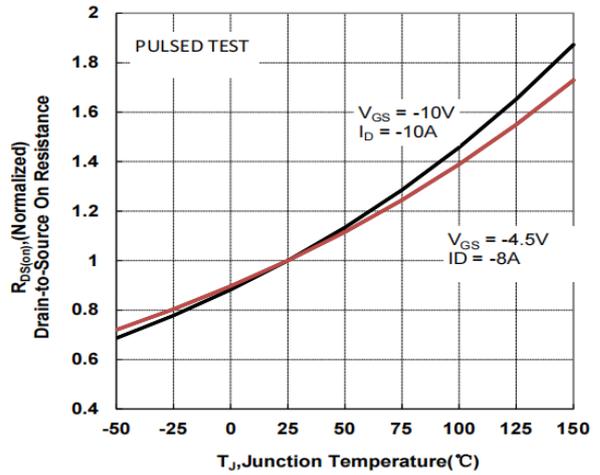


Figure 9. Normalized On Resistance vs Junction Temperature

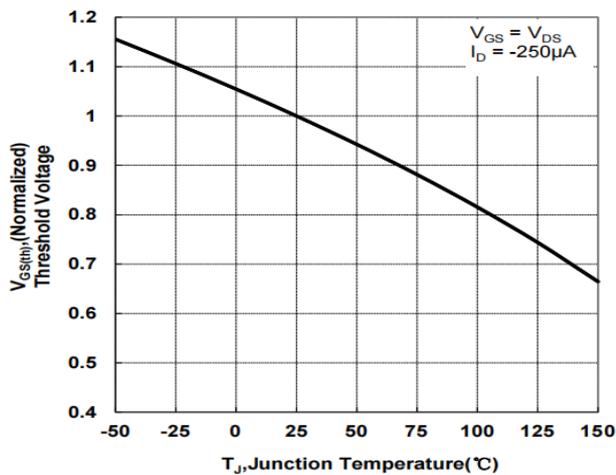


Figure 10. Normalized Threshold Voltage vs Junction Temperature

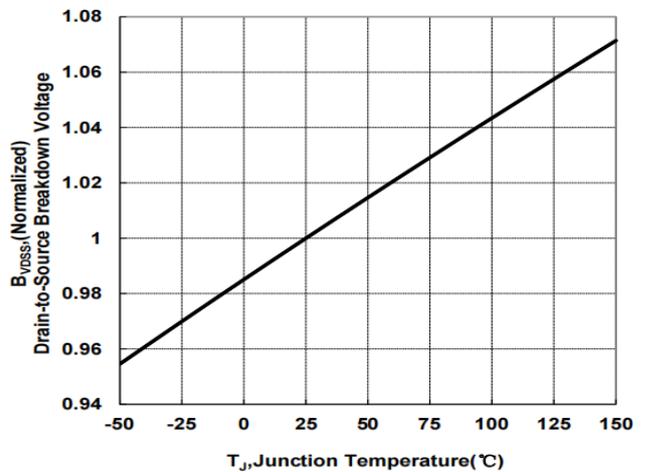


Figure 11. Normalized Breakdown Voltage vs Junction Temperature



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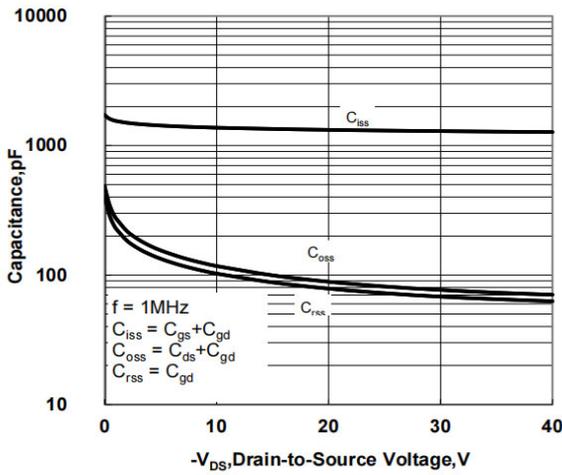


Figure 12. Capacitance Characteristics

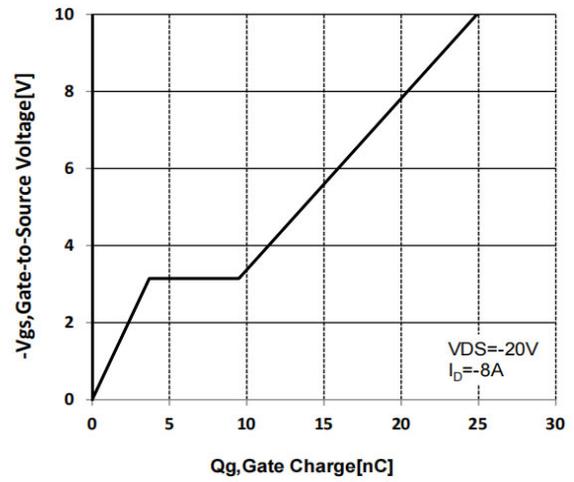


Figure 13 Typical Gate Charge vs Gate to Source Voltage

Test Circuit and Waveform

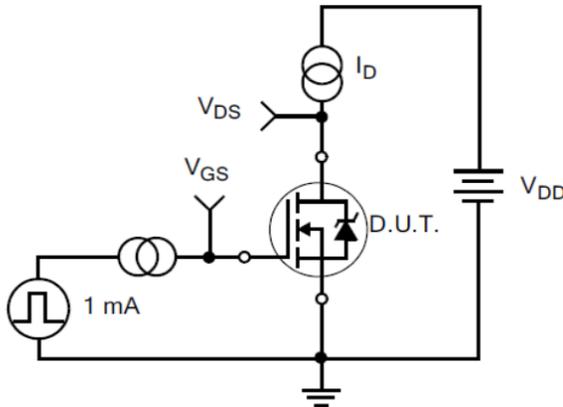


Figure 14. Gate Charge Test Circuit

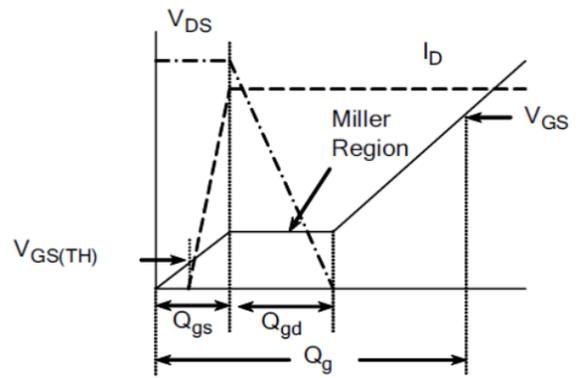


Figure 15. Gate Charge Waveforms

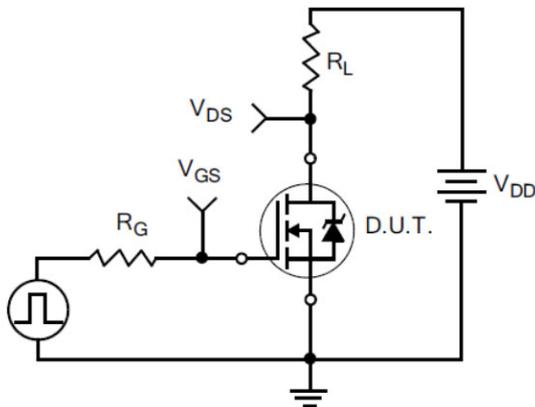


Figure 16. Resistive Switching Test Circuit

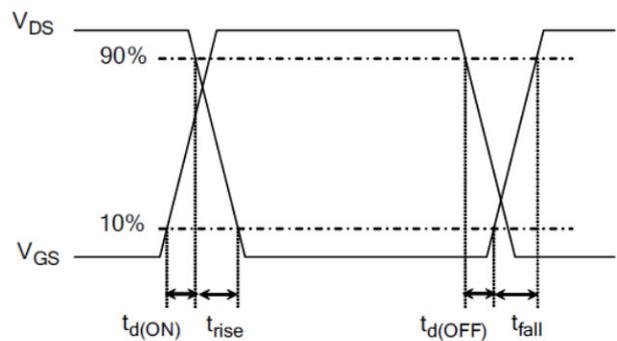


Figure 17. Resistive Switching Waveforms



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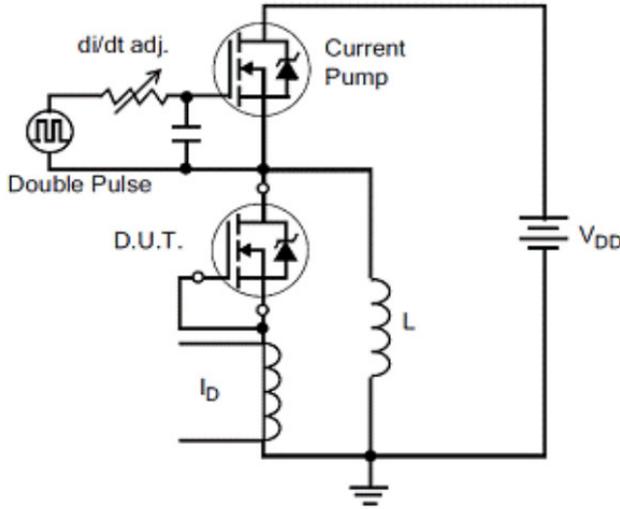


Figure 18. Diode Reverse Recovery Test Circuit

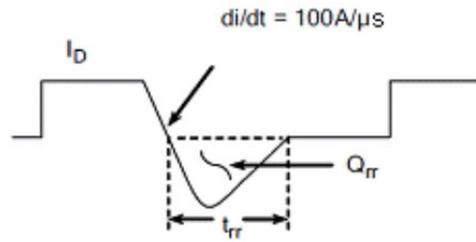


Figure 19. Diode Reverse Recovery Waveform

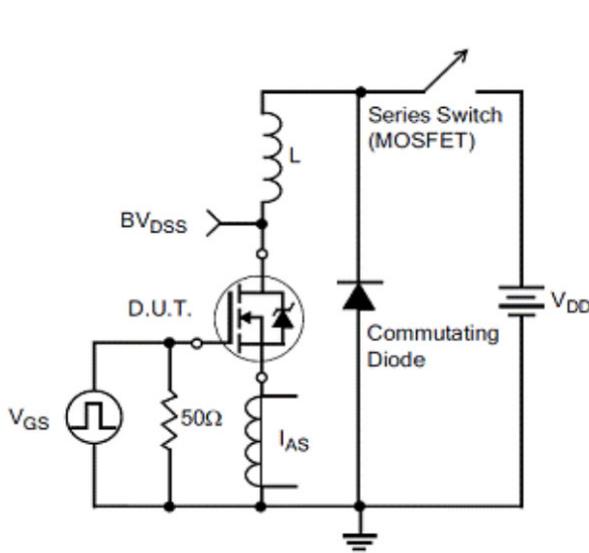


Figure 20. Unclamped Inductive Switching Test Circuit

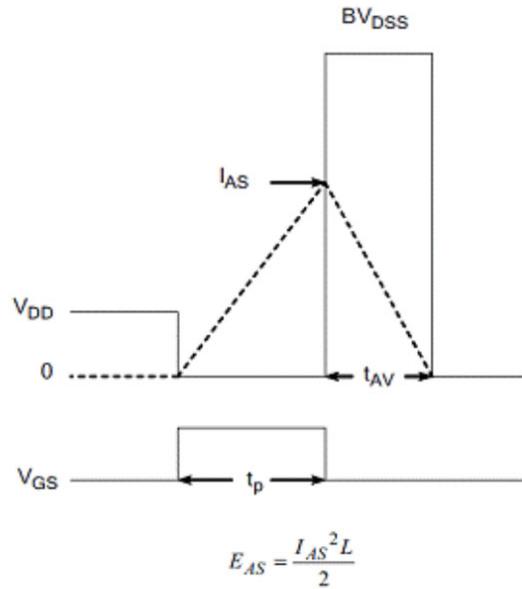


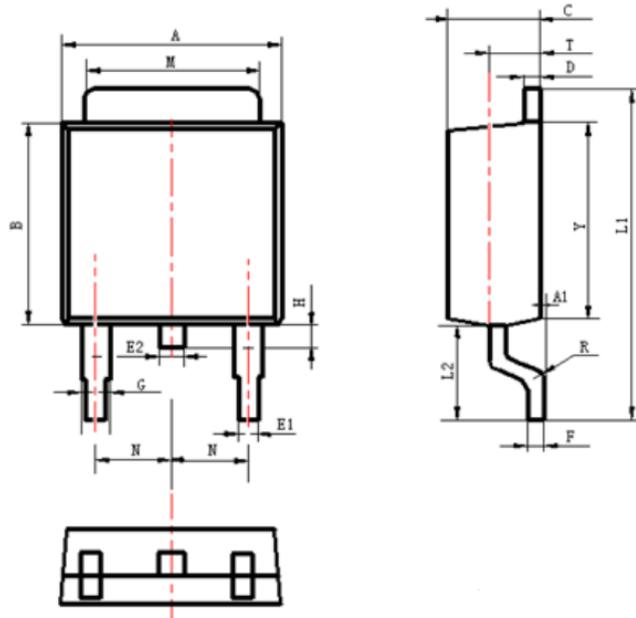
Figure 21. Unclamped Inductive Switching Waveform



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Package Information:



Items	Values(mm)	
	MIN	MAX
A	6.30	6.90
A1	0	0.16
B	5.70	6.30
C	2.10	2.50
D	0.30	0.70
E1	0.60	0.90
E2	0.70	1.00
F	0.30	0.60
G	0.70	1.20
L1	9.60	10.50
L2	2.70	3.10
H	0.40	1.00
M	5.10	5.50
N	2.09	2.49
R	0.3	
T	1.40	1.60
Y	5.10	6.30

TO-252 Package