
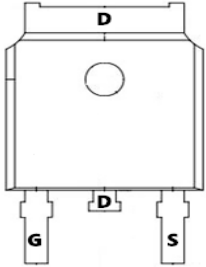


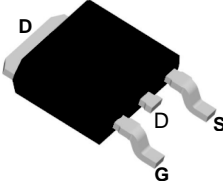
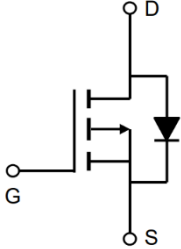
TMP30100D

P -Channel Enhancement Mosfet

<p>General Description</p> <ul style="list-style-type: none"> • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM 	<p>General Features</p> <p>$V_{DS} = -30V$ $I_D = -100A$</p> <p>$R_{DS(ON)} = 3.6\ m\Omega$ (typ.) @ $V_{GS} = -10V$</p> <p>100% UIS Tested 100% R_g Tested</p> 
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D:TO-252-3L

Marking: 100P03

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	$T_C = 25^\circ C$	-100
		$T_C = 100^\circ C$	-67
Pulsed Drain Current ¹	I_{DM}	-360	A
Single Pulse Avalanche Energy ²	EAS	125	mJ
Total Power Dissipation	$T_C = 25^\circ C$	P_D	60
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	$R_{\theta JA}$	50	°C/W
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	1.58	°C/W

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Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V_{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-30	-	-	V
Gate-body Leakage current	I_{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	V _{DS} = -30V, V _{GS} = 0V	-	-	-1	μA
	T _J =100°C		-	-	-100	
Gate-Threshold Voltage	V_{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.5	-2.5	V
Drain-Source On-Resistance ⁴	R_{DS(on)}	V _{GS} = -10V, I _D = -30A	-	3.6	5.6	mΩ
		V _{GS} = -4.5V, I _D = -15A	-	5.5	6.2	
Forward Transconductance ⁴	g_{fs}	V _{DS} = -10V, I _D = -30A	-	90	-	S
Dynamic Characteristics⁵						
Input Capacitance	C_{iss}	V _{DS} = -15V, V _{GS} = 0V, f = 1MHz	-	5070	-	pF
Output Capacitance	C_{oss}		-	695	-	
Reverse Transfer Capacitance	C_{rss}		-	580	-	
Gate resistance	R_g	f = 1MHz	-	4	-	Ω
Switching Characteristics⁵						
Total Gate Charge	Q_g	V _{GS} = -10V, V _{DS} = -15V, I _D = -30A	-	146	-	nC
Gate-Source Charge	Q_{gs}		-	21.5	-	
Gate-Drain Charge	Q_{gd}		-	39	-	
Turn-On Delay Time	t_{d(on)}	V _{GS} = -10V, V _{DD} = -15V, R _G = 3Ω, I _D = -30A	-	23	-	ns
Rise Time	t_r		-	15	-	
Turn-Off Delay Time	t_{d(off)}		-	129	-	
Fall Time	t_f		-	28	-	
Drain-Source Body Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	I _S = -30A, V _{GS} = 0V	-	-	-1.2	V
Continuous Source Current	T _C =25°C	I_S	-	-	-100	A

Note :

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C
2. The EAS data shows Max. rating . The test condition is V_{DD}= -25V, V_{GS}= -10V, L= 0.1mH, I_{AS}= -50A
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.

Typical Characteristics

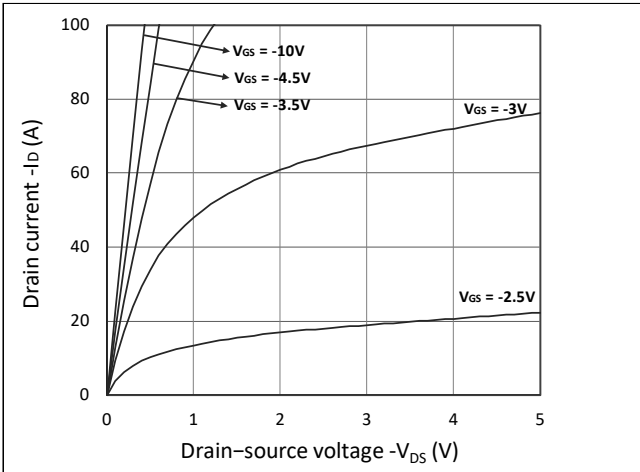


Figure 1. Output Characteristics

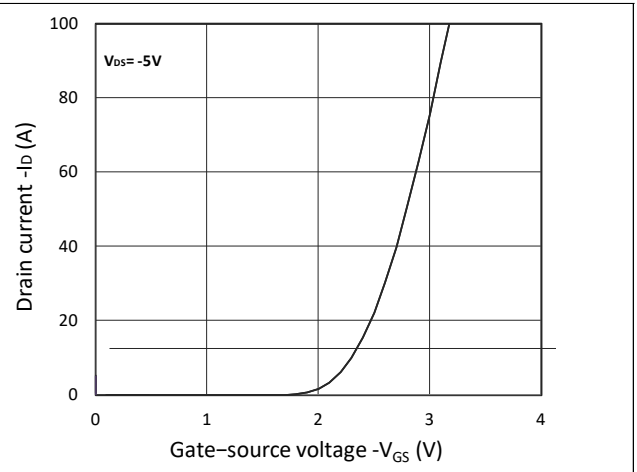


Figure 2. Transfer Characteristics

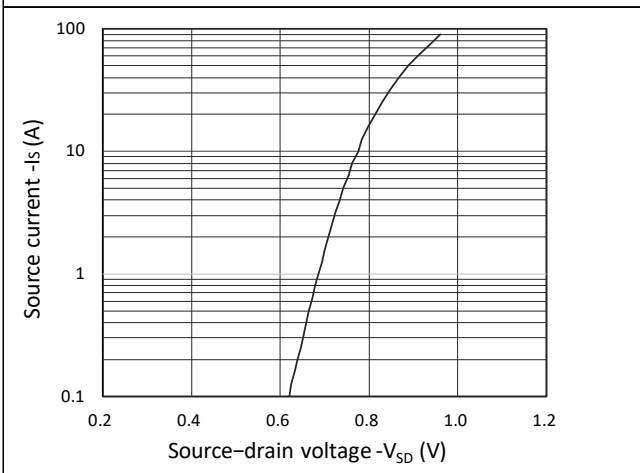


Figure 3. Forward Characteristics of Reverse

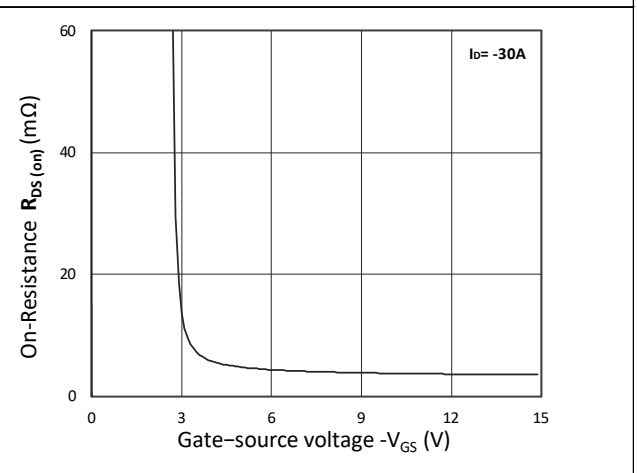


Figure 4. $R_{DS(on)}$ vs. V_{GS}

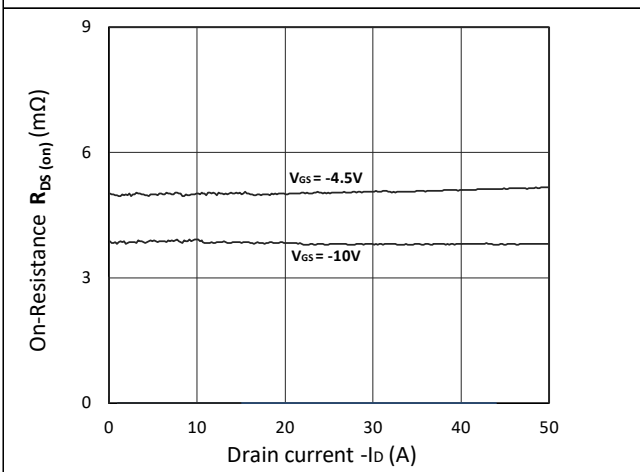


Figure 5. $R_{DS(on)}$ vs. I_D

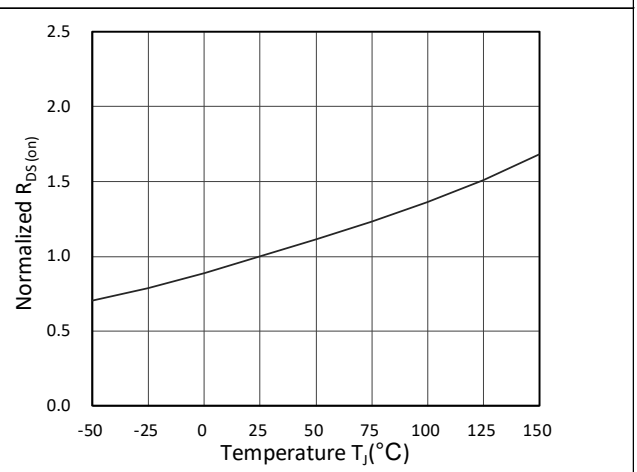


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

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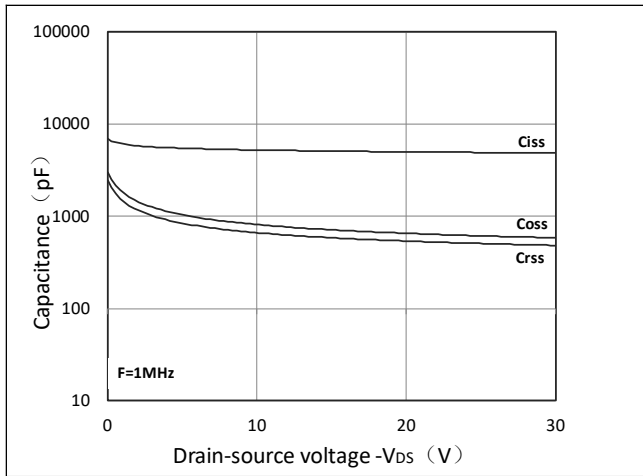


Figure 7. Capacitance Characteristics

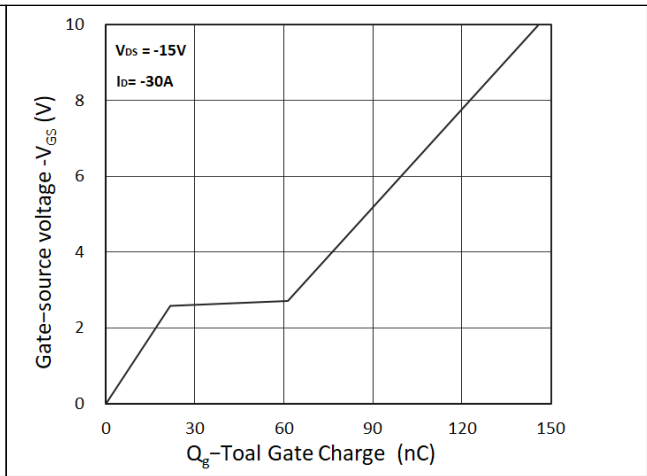


Figure 8. Gate Charge Characteristics

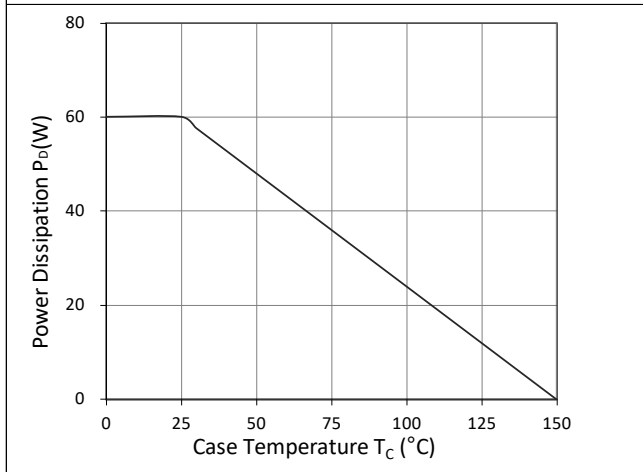


Figure 9. Power Dissipation

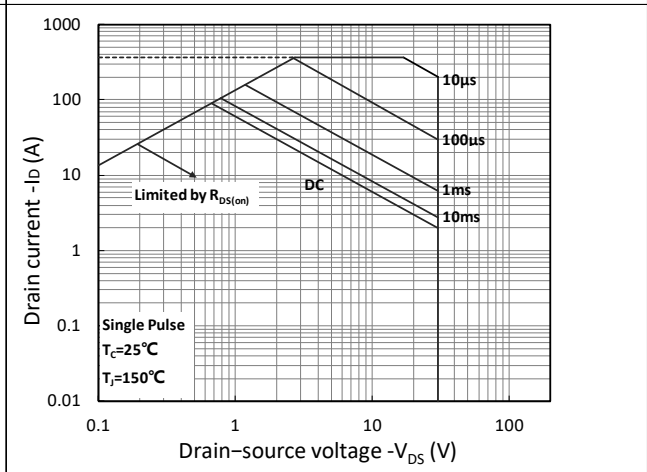


Figure 10. Safe Operating Area

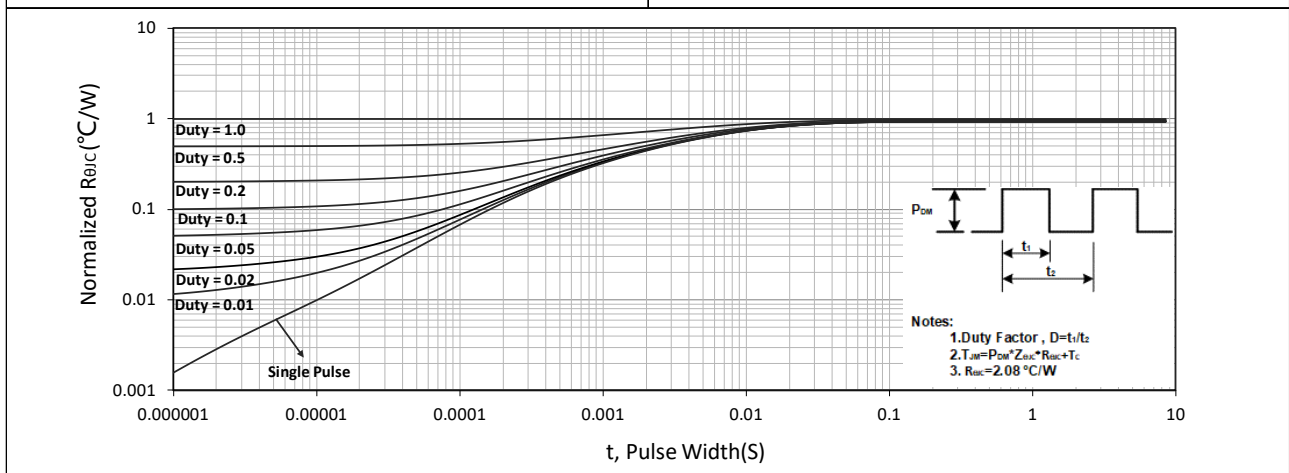


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

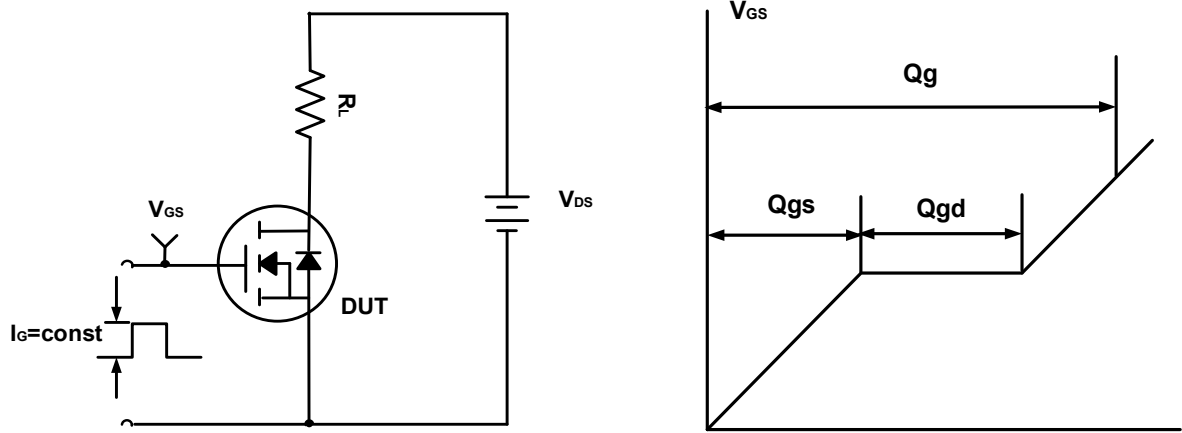


Figure A. Gate Charge Test Circuit & Waveforms

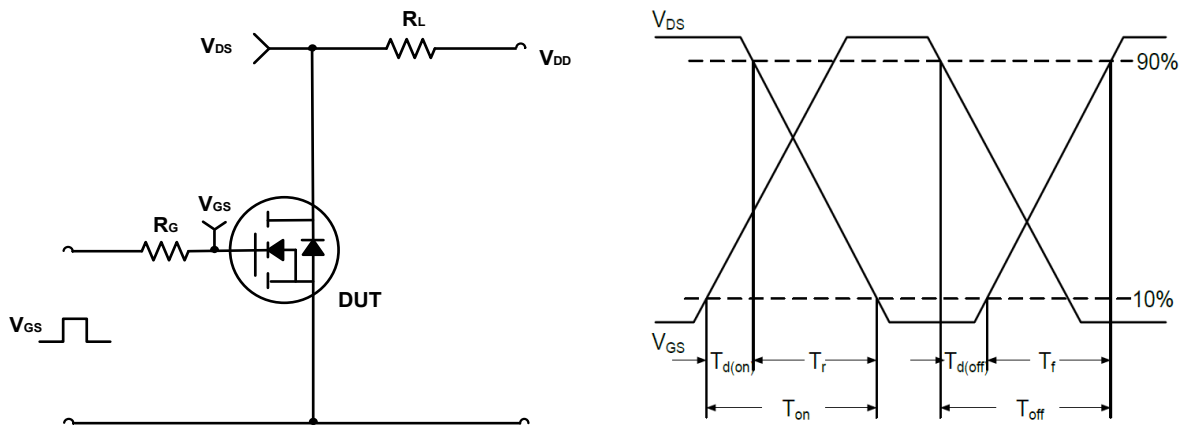


Figure B. Switching Test Circuit & Waveforms

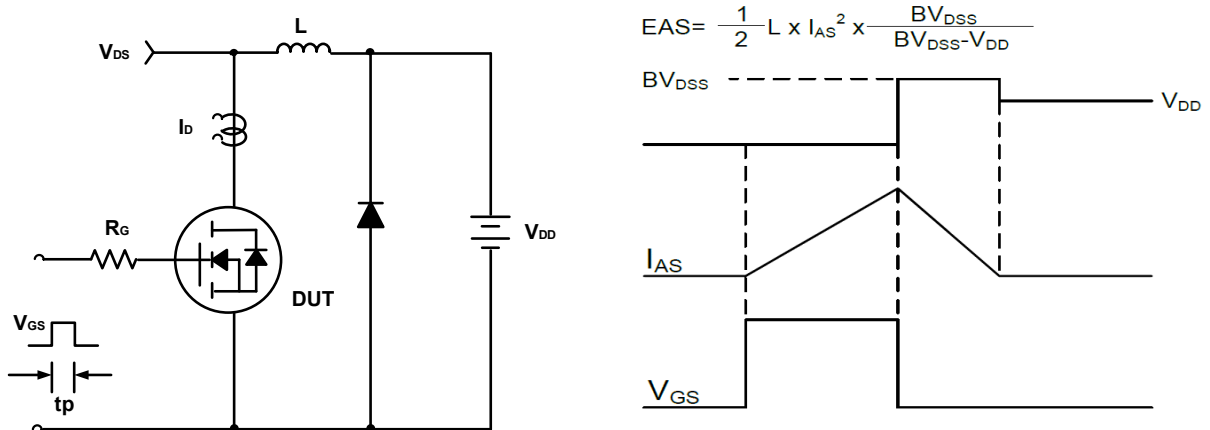
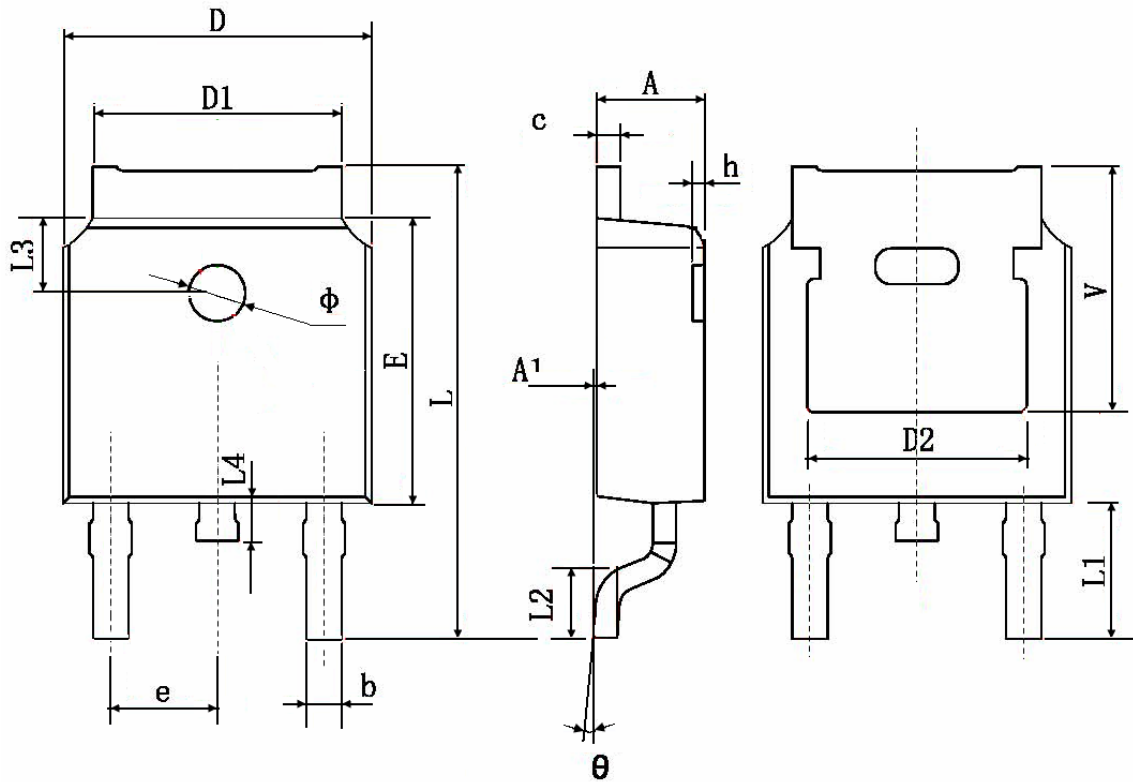


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Package Information: TO-252-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
ϕ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

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