
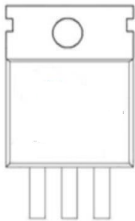
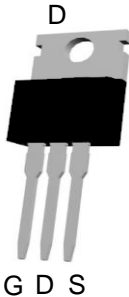
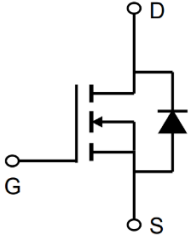


TMG120N15P

N-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>$V_{DS} = 150V$ $I_D = 120A$ $R_{DS(ON)} = 9.5m\Omega$ (typ.) @ $V_{GS} = 10V$</p> <p>100% UIS Tested 100% R_g Tested</p> 
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P:TO-220AB

Marking: G120N15

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)			
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C = 25^\circ C$	120
		$T_C = 100^\circ C$	78
Pulsed Drain Current ¹	I_{DM}	494	A
Single Pulse Avalanche Energy ²	EAS	204.8	mJ
Total Power Dissipation	$T_C = 25^\circ C$	P_D	178.6
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150
Thermal Characteristics			
Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	$R_{\theta JA}$	52	$^\circ C/W$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	0.7	$^\circ C/W$

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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	150	-	-	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} = 150V, V _{GS} = 0V	-	-	1	μA
	T _J =100°C		-	-	100	
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
Drain-Source On-Resistance ⁴	R _{DS(on)}	V _{GS} = 10V, I _D = 20A	-	9.5	11.5	mΩ
Forward Transconductance ⁴	g _{fs}	V _{DS} = 10V, I _D = 20A	-	69	-	S
Dynamic Characteristics⁵						
Input Capacitance	C _{iss}	V _{DS} = 75V, V _{GS} = 0V, f = 1MHz	-	3310	-	pF
Output Capacitance	C _{oss}		-	268	-	
Reverse Transfer Capacitance	C _{rss}		-	9.4	-	
Gate Resistance	R _g	f = 1MHz	-	3.2	-	Ω
Switching Characteristics⁵						
Total Gate Charge	Q _g	V _{GS} = 10V, V _{DS} = 75V, I _D = 20A	-	45	-	nC
Gate-Source Charge	Q _{gs}		-	15	-	
Gate-Drain Charge	Q _{gd}		-	8.5	-	
Turn-On Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DD} = 75V, R _G = 3Ω, I _D = 20A	-	16	-	ns
Rise Time	t _r		-	12	-	
Turn-Off Delay Time	t _{d(off)}		-	30	-	
Fall Time	t _f		-	18	-	
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20A, dI/dt = 100A/μs	-	76	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	182	-	nC
Drain-Source Body Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	I _S = 20A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	T _C = 25°C	I _S	-	-	120	A

Notes:

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} = 50V, V_{GS} = 10V, L = 0.4mH, I_{AS} = 32A.
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.
4. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.



TMG120N15P

N-Channel Enhancement Mosfet

Typical Characteristics

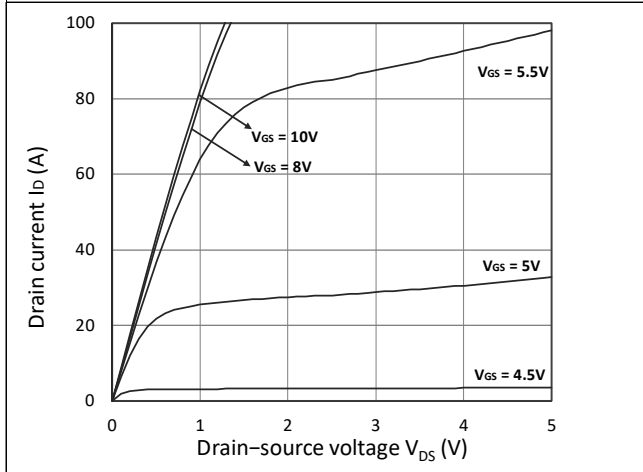


Figure 1. Output Characteristics

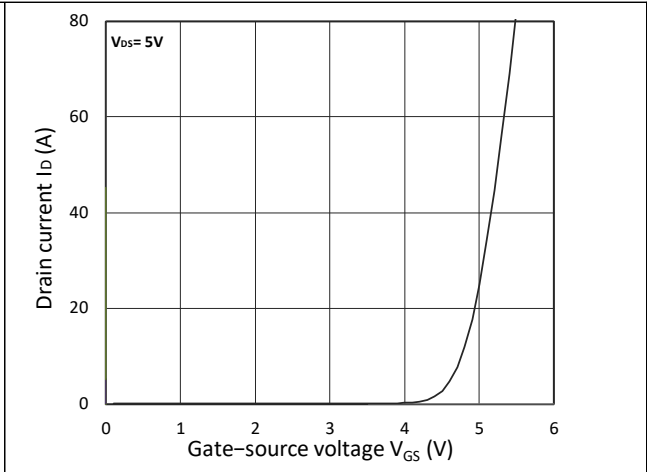


Figure 2. Transfer Characteristics

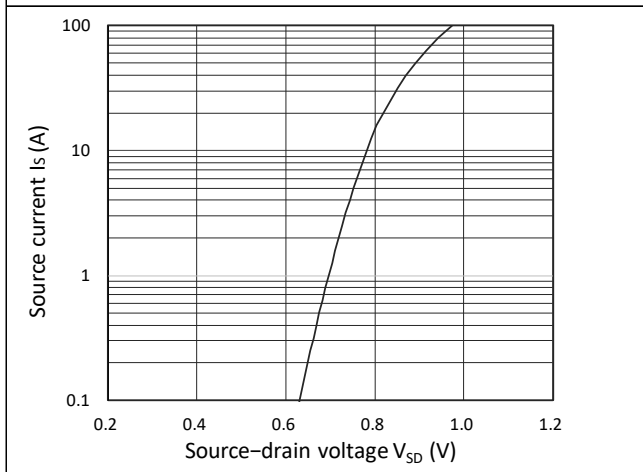


Figure 3. Forward Characteristics of Reverse

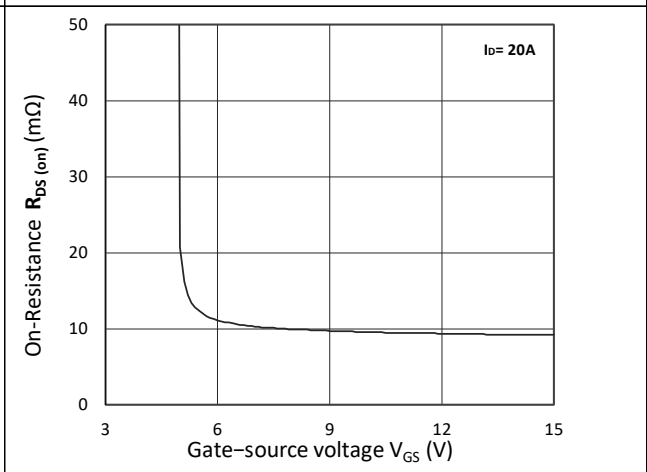


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

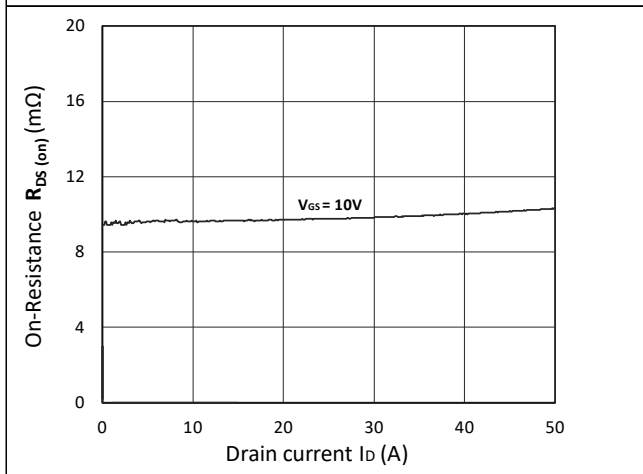


Figure 5. $R_{DS(ON)}$ vs. I_D

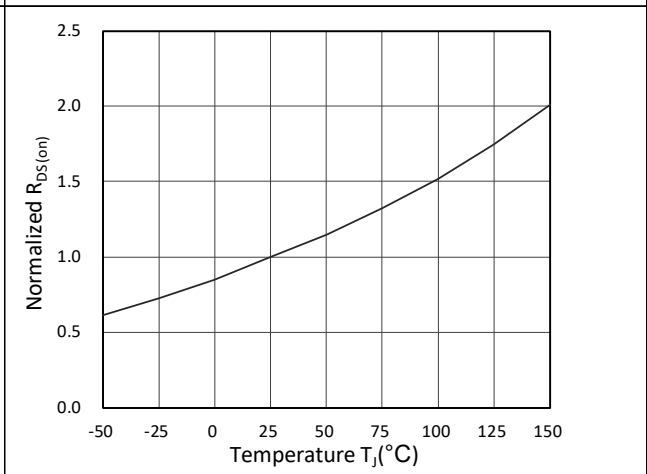


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

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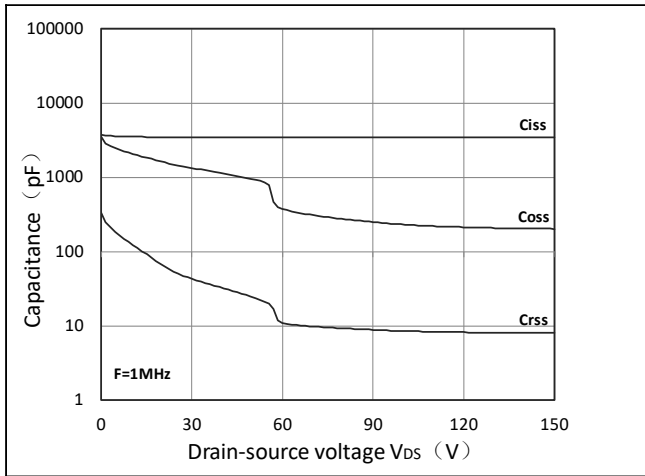


Figure 7. Capacitance Characteristics

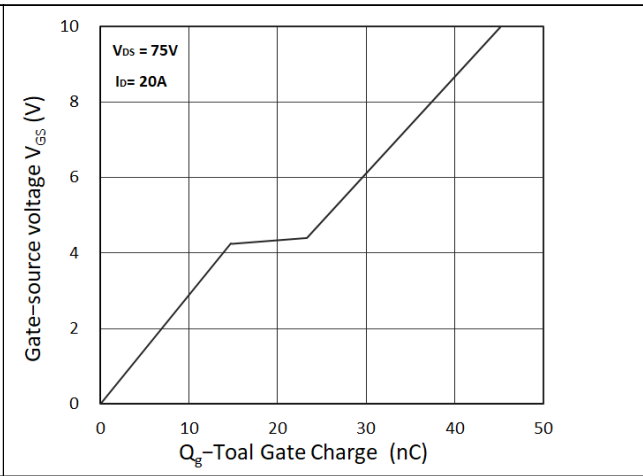


Figure 8. Gate Charge Characteristics

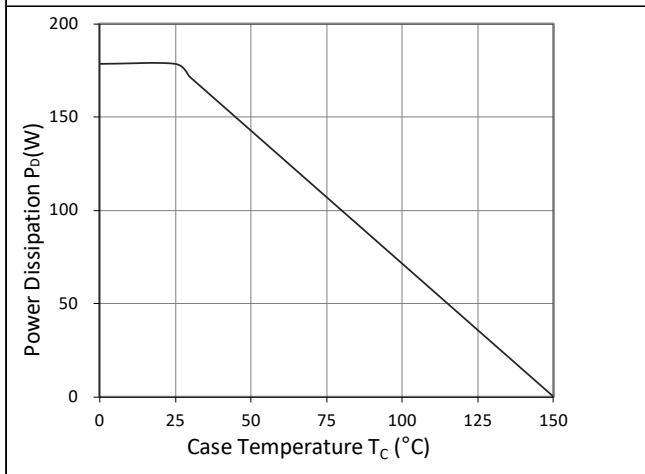


Figure 9. Power Dissipation

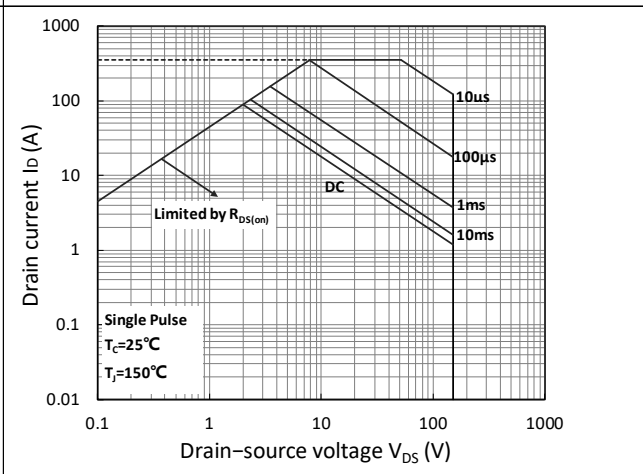


Figure 10. Safe Operating Area

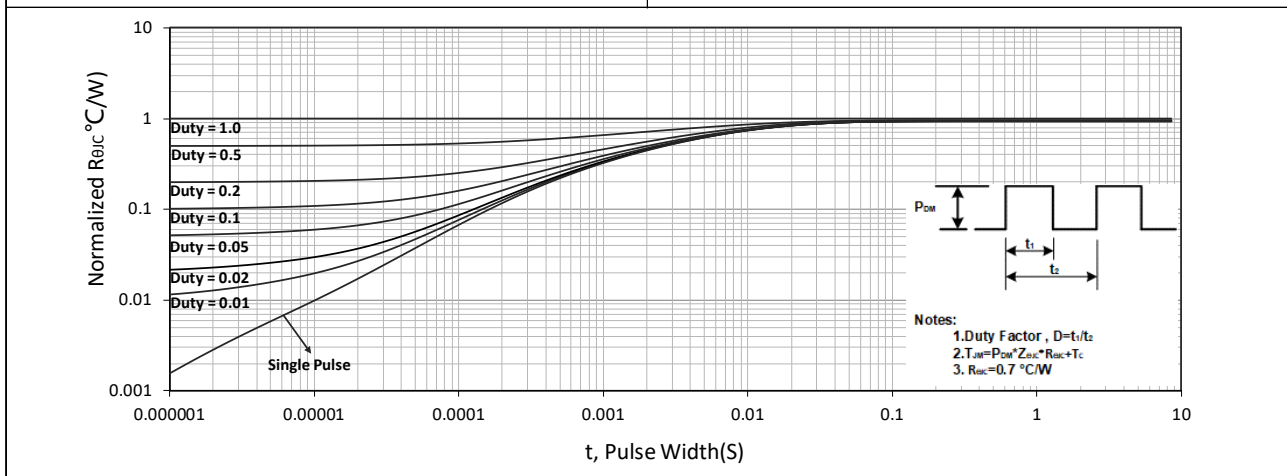


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

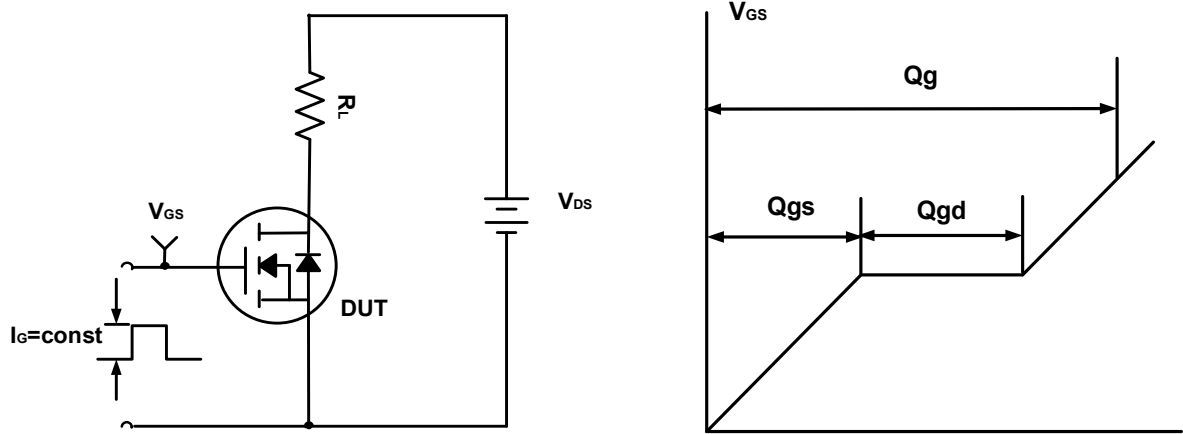


Figure A. Gate Charge Test Circuit & Waveforms

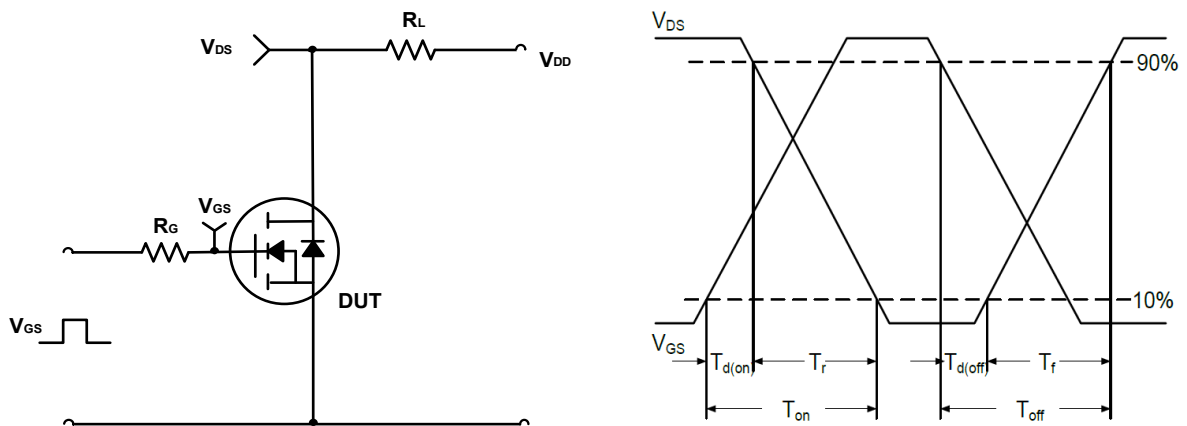


Figure B. Switching Test Circuit & Waveforms

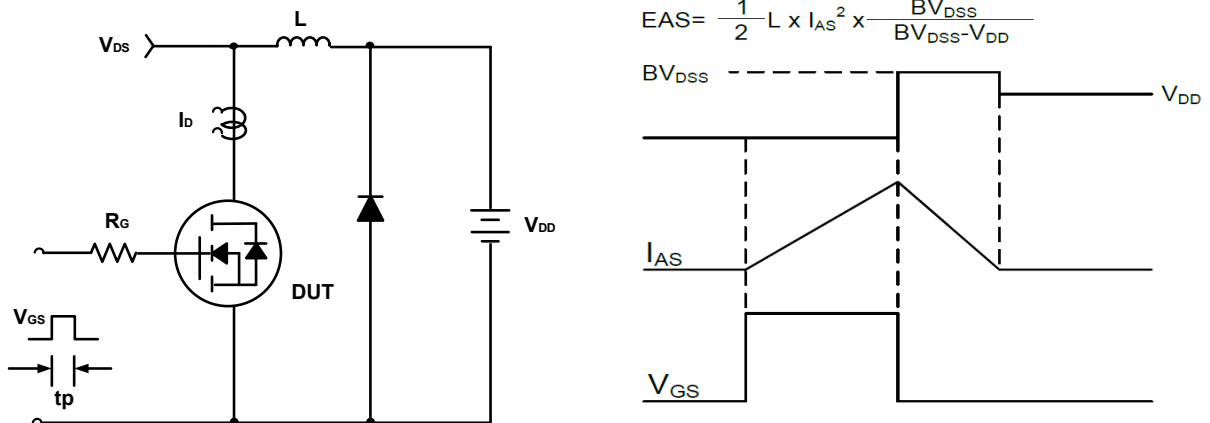
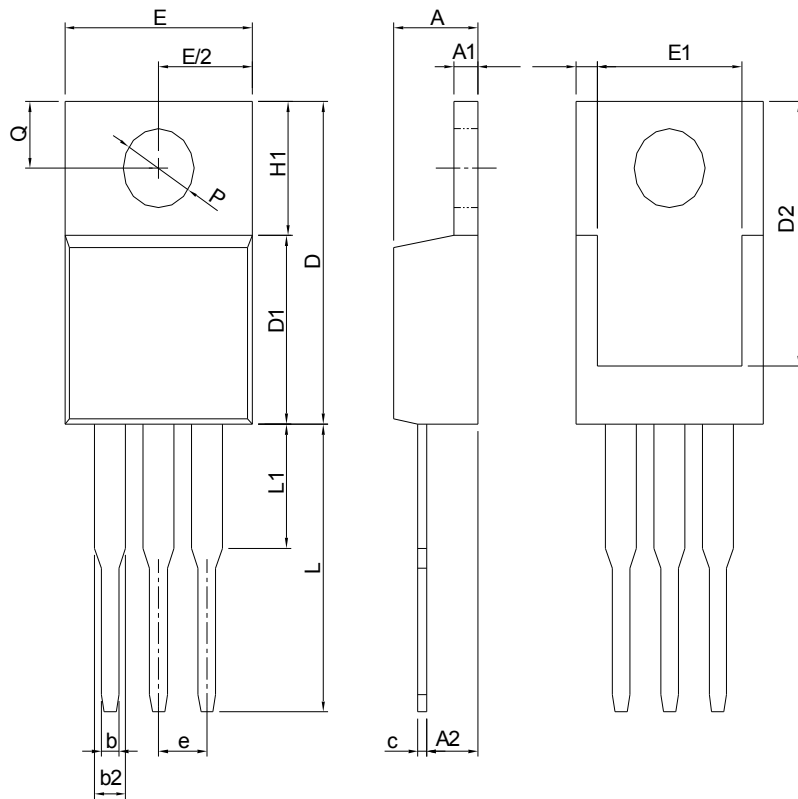


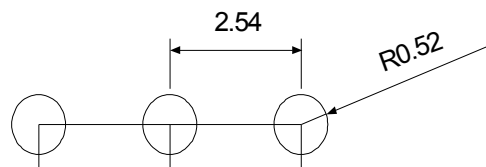
Figure C. Unclamped Inductive Switching Circuit & Waveforms

Package Information:TO-220AB



SYMBOL	TO-220			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.02	0.330	0.355
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380	0.420
E1	6.86	8.89	0.270	0.350
e	2.54 BSC		0.100 BSC	
H1	5.84	6.86	0.230	0.270
L	12.70	14.73	0.500	0.580
L1	-	6.35	-	0.250
P	3.53	4.09	0.139	0.161
Q	2.54	3.43	0.100	0.135

RECOMMENDED LAND PATTERN



UNIT: mm

Note: Follow JEDEC TO-220 AB.