
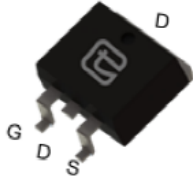


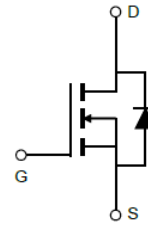
**60V N-Channel Trench MOSFET**

<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>● Trench Power technology</li> <li>● Low <math>R_{DS(ON)}</math></li> <li>● Low Gate Charge</li> <li>● Optimized for fast-switching applications</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>● Synchronous Rectification in DC/DC and AC/DC Converters</li> <li>● Isolated DC/DC Converters in Telecom and Industrial</li> </ul>	<p><b>Product Summary</b></p> <table border="0"> <tr> <td><math>V_{DS}</math></td> <td>60V</td> </tr> <tr> <td><math>I_D</math> (at <math>V_{GS}=10V</math>)</td> <td>105A</td> </tr> <tr> <td><math>R_{DS(ON)}</math> (at <math>V_{GS}=10V</math>)</td> <td>&lt; 7.5m<math>\Omega</math></td> </tr> </table> <p>100% UIS Tested</p> 	$V_{DS}$	60V	$I_D$ (at $V_{GS}=10V$ )	105A	$R_{DS(ON)}$ (at $V_{GS}=10V$ )	< 7.5m $\Omega$
$V_{DS}$	60V						
$I_D$ (at $V_{GS}=10V$ )	105A						
$R_{DS(ON)}$ (at $V_{GS}=10V$ )	< 7.5m $\Omega$						

TO-263



TO-220



Part Number	Package Type	Form	Marking
TTB105N06A	TO-263	Tape&Reel	105N06A
TTP105N06A	TO-220	Tube	105N06A

**Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$  unless otherwise noted)**

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>B</sup>	$I_D$	$T_C = 25^\circ\text{C}$	105
		$T_C = 100^\circ\text{C}$	73.5
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	315	A
Avalanche Current <sup>A</sup>	$I_{AS}$	30	A
Single Pulse Avalanche Energy $L = 0.3\text{mH}$ <sup>A</sup>	$E_{AS}$	135	mJ
Power Dissipation <sup>C</sup>	$P_D$	$T_C = 25^\circ\text{C}$	187.5
		$T_C = 100^\circ\text{C}$	93.8
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 175	$^\circ\text{C}$

**Thermal Characteristics**

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Case	$R_{\theta JC}$	0.8	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient	$R_{\theta JA}$	100	



Electrical Characteristics( $T_J = 25^\circ\text{C}$ unless otherwise noted)							
Symbol	Parameter	Conditions	Value			Units	
			Min	Typ	Max		
<b>STATIC PARAMETERS</b>							
$BV_{DSS}$	Drain-Source Breakdown Voltage	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	60	--	--	V	
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$	$T_J = 25^\circ\text{C}$	--	--	1	$\mu\text{A}$
			$T_J = 100^\circ\text{C}$	--	--	25	
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$	--		$\pm 100$	nA	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2	3	4	V	
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{V}, I_D = 30\text{A}$	--	6.2	7.5	$\text{m}\Omega$	
$g_{FS}$	Forward Transconductance	$V_{DS} = 10\text{V}, I_D = 25\text{A}$	--	25	--	S	
$V_{SD}$	Diode Forward Voltage	$I_S = 30\text{A}, V_{GS} = 0\text{V}$	--	--	1	V	
$I_S$	Maximum Body-Diode Continuous Current <sup>B</sup>		--	--	105	A	
<b>DYNAMIC PARAMETERS</b>							
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 30\text{V}, f = 1\text{MHz}$	--	4211	--	$\text{pF}$	
$C_{oss}$	Output Capacitance		--	298	--		
$C_{rss}$	Reverse Transfer Capacitance		--	264	--		
<b>SWITCHING PARAMETERS</b>							
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS} = 10\text{V}, V_{DS} = 30\text{V}, I_D = 30\text{A}$	--	82	--	nC	
$Q_{gs}$	Gate Source Charge		--	22	--		
$Q_{gd}$	Gate Drain Charge		--	23	--		
$t_{D(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{V}, V_{DS} = 30\text{V}, I_D = 30\text{A}, R_G = 3\Omega$	--	20	--	ns	
$t_r$	Turn-On Rise Time		--	18	--		
$T_{D(off)}$	Turn-Off Delay Time		--	50	--		
$t_f$	Turn-Off Fall Time		--	80	--		
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F = 20\text{A}, di/dt = 100\text{A}/\mu\text{s}$	--	50	--	ns	
$Q_{rr}$	Body Diode Reverse Recovery Charge		--	95	--	nC	

A. Single pulse width limited by maximum junction temperature.

B. The maximum current rating is package limited.

C. The power dissipation  $P_D$  is based on  $T_{J(MAX)} = 175^\circ\text{C}$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

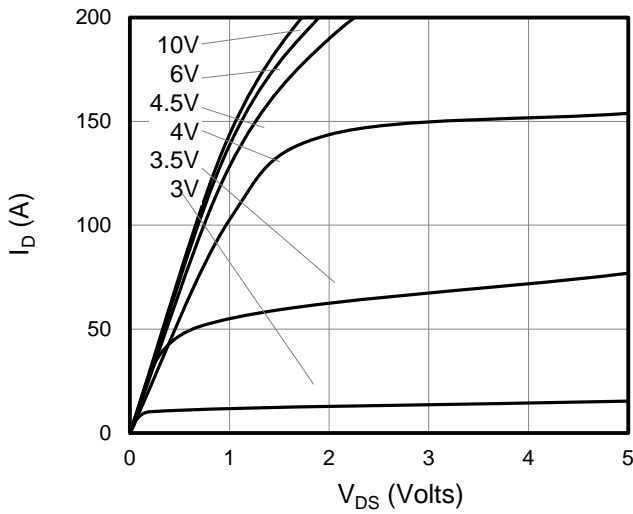


Figure 1: On-Region Characteristics

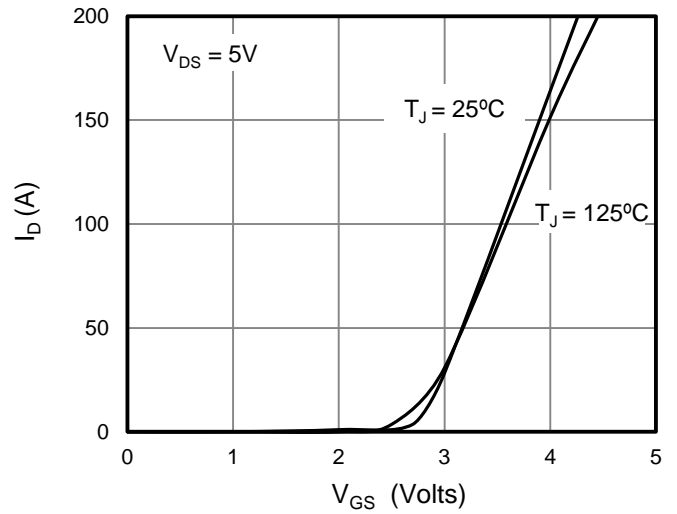


Figure 2: Transfer Characteristics

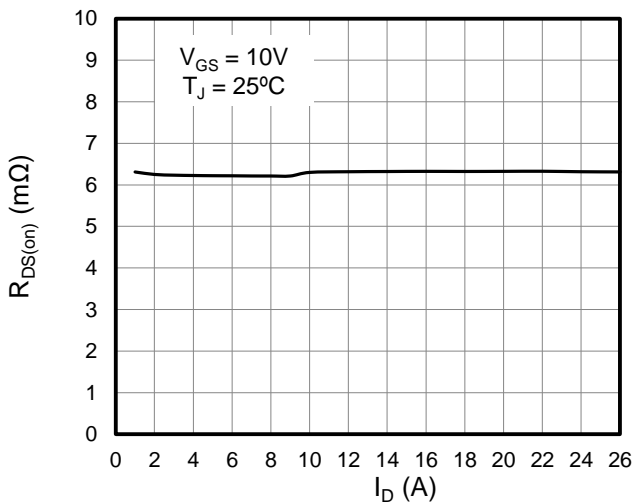


Figure 3: On-Resistance vs. Drain Current

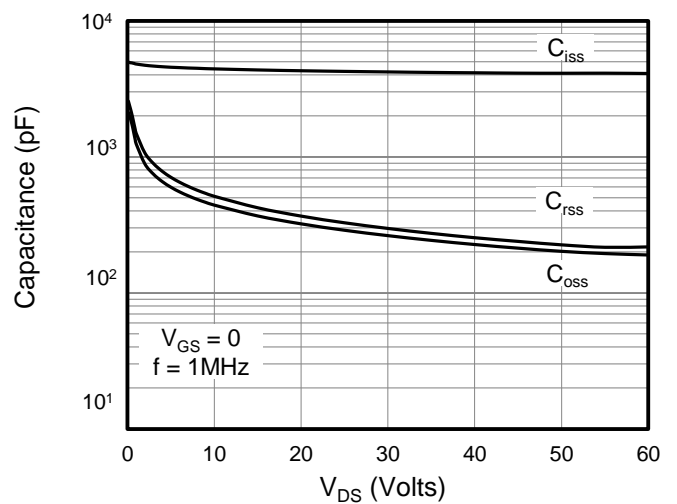


Figure 4: Capacitance Characteristics

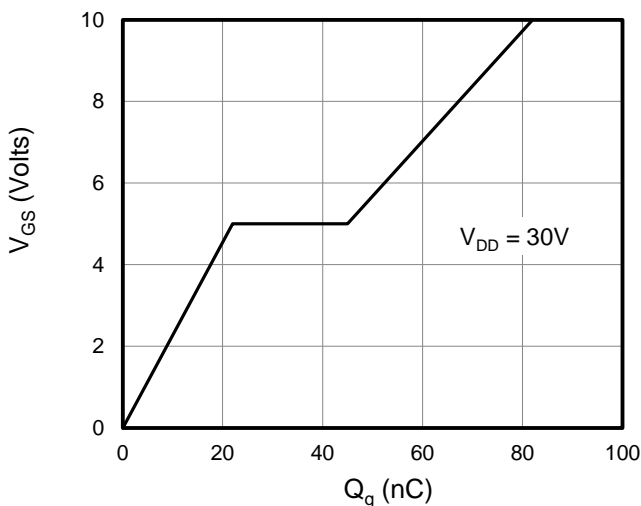


Figure 5: Gate Charge Characteristics

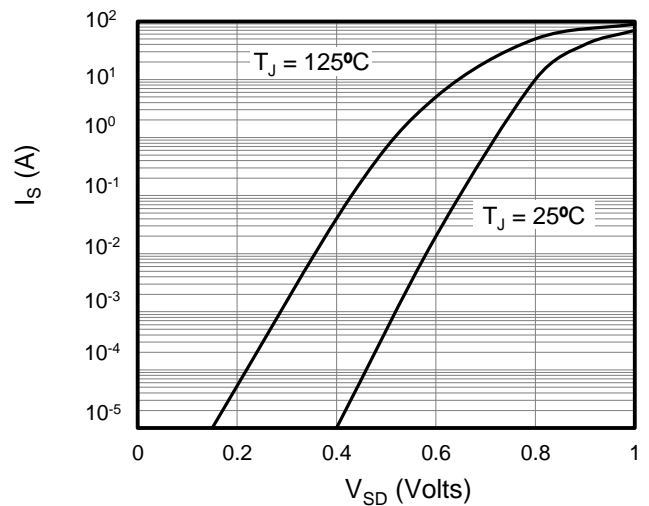


Figure 6: Body Diode Forward Voltage



Typical Characteristics  $T_J = 25^{\circ}\text{C}$ , unless otherwise noted

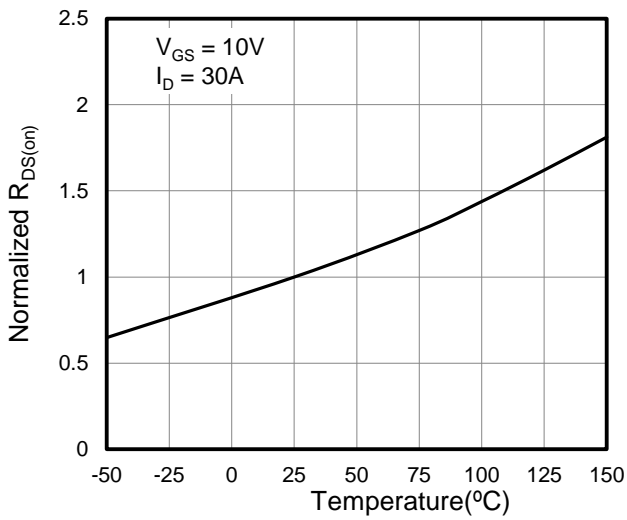


Figure 7: On-Resistance vs. Junction Temperature

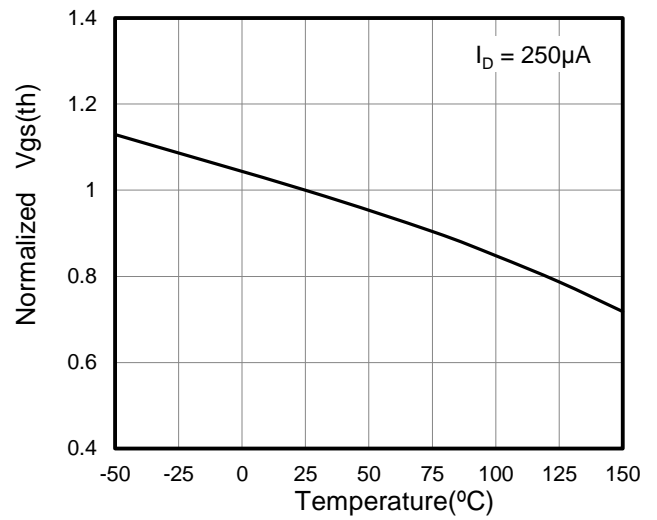


Figure 8:  $V_{GS(th)}$  vs. Junction Temperature

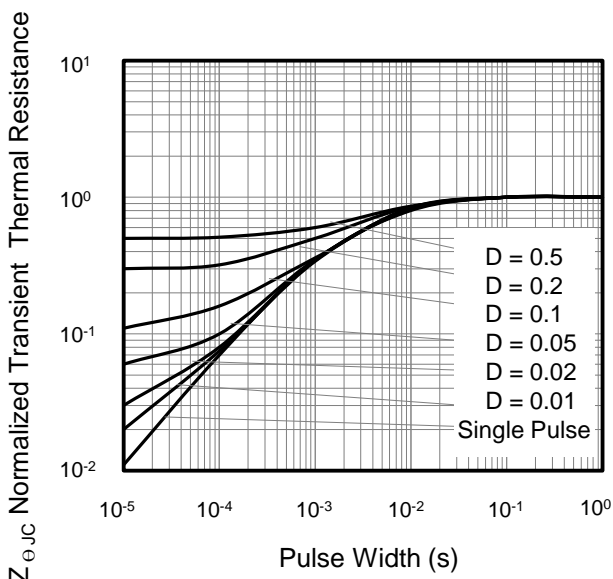


Figure 9: Normalized Transient Thermal Resistance

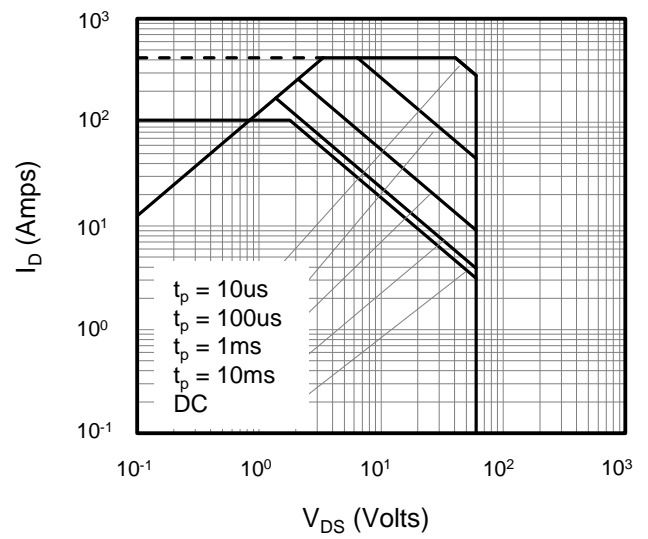


Figure 10: Safe Operating Area



Figure A: Gate Charge Test Circuit and Waveform

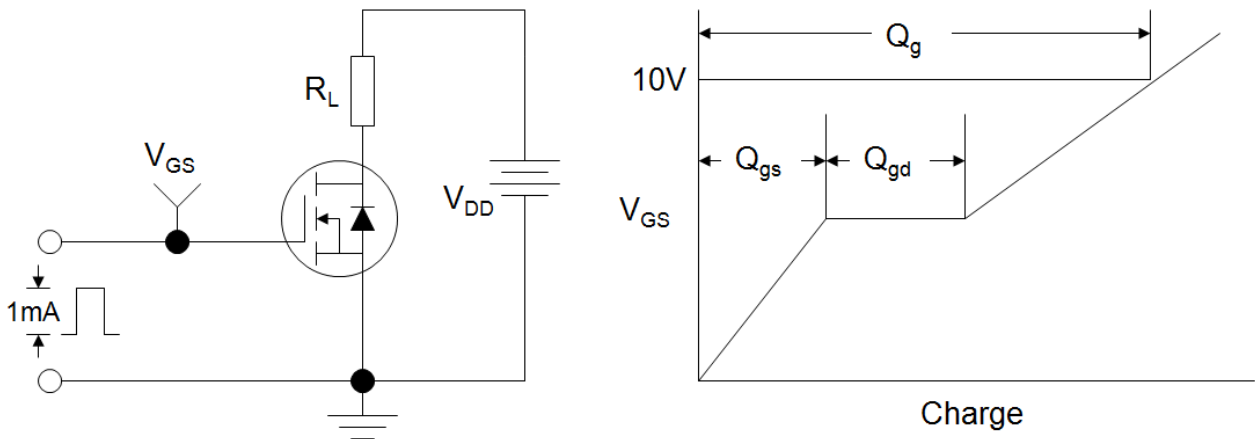


Figure B: Resistive Switching Test Circuit and Waveform

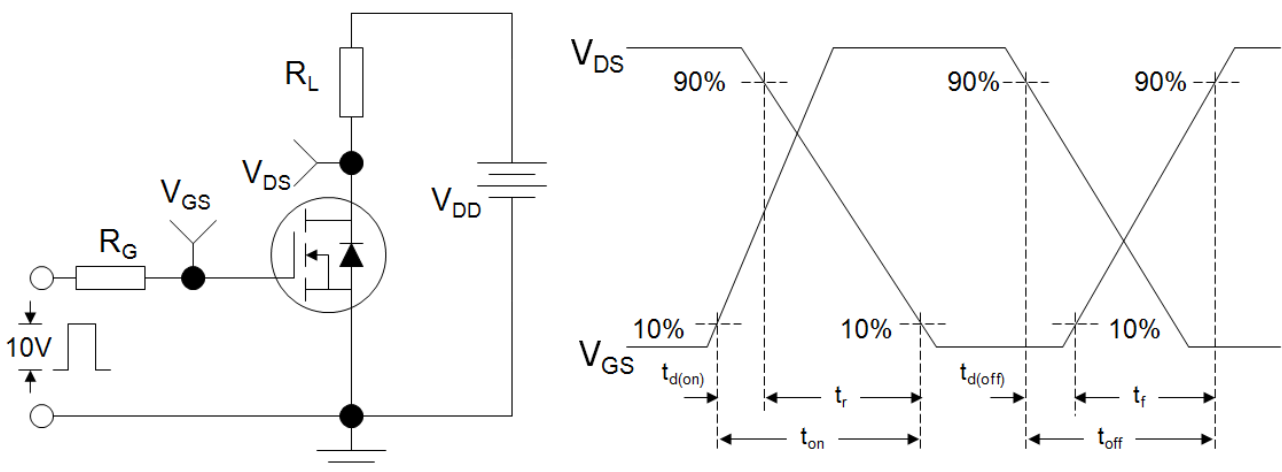
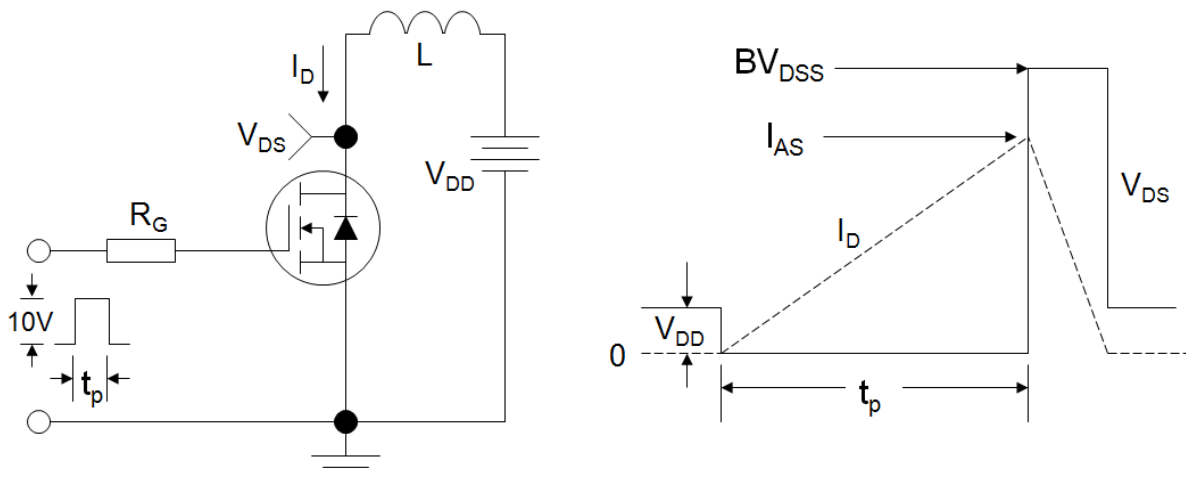
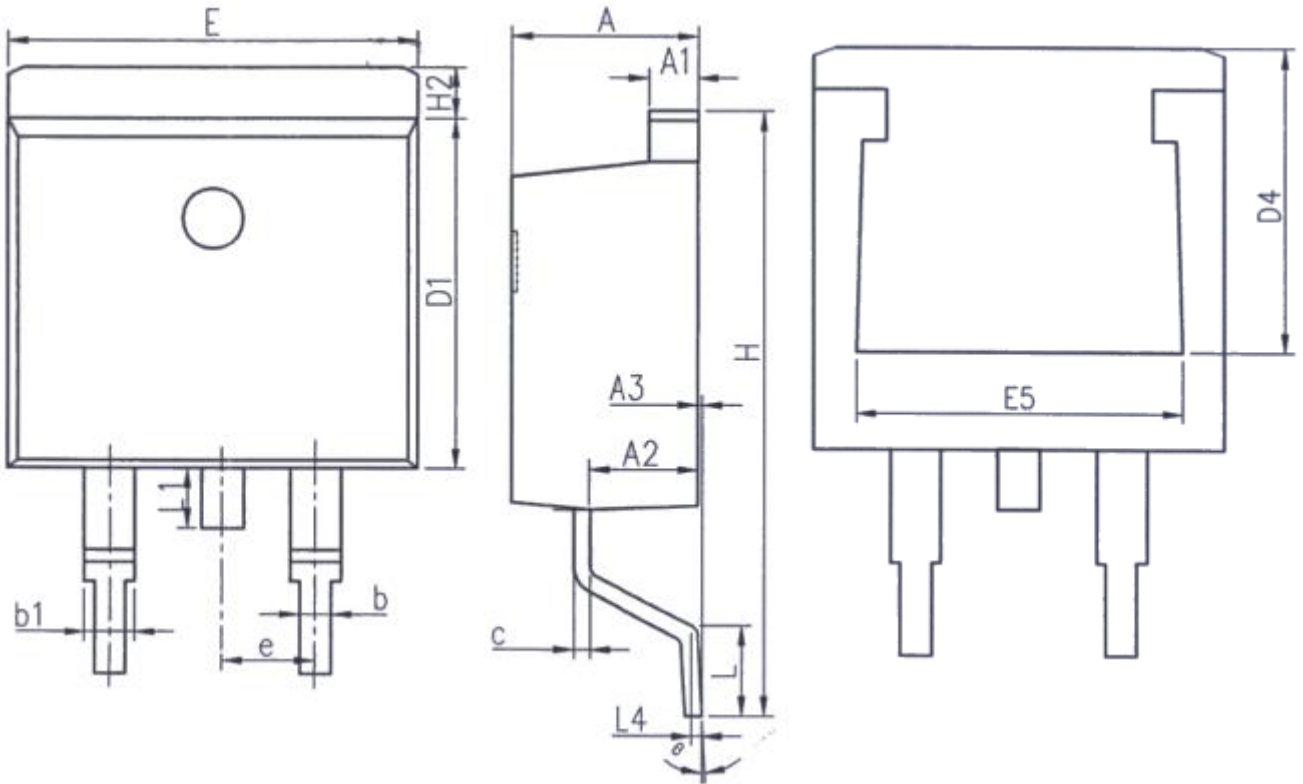


Figure C: Unclamped Inductive Switching Test Circuit and Waveform





### TO-263(华天)

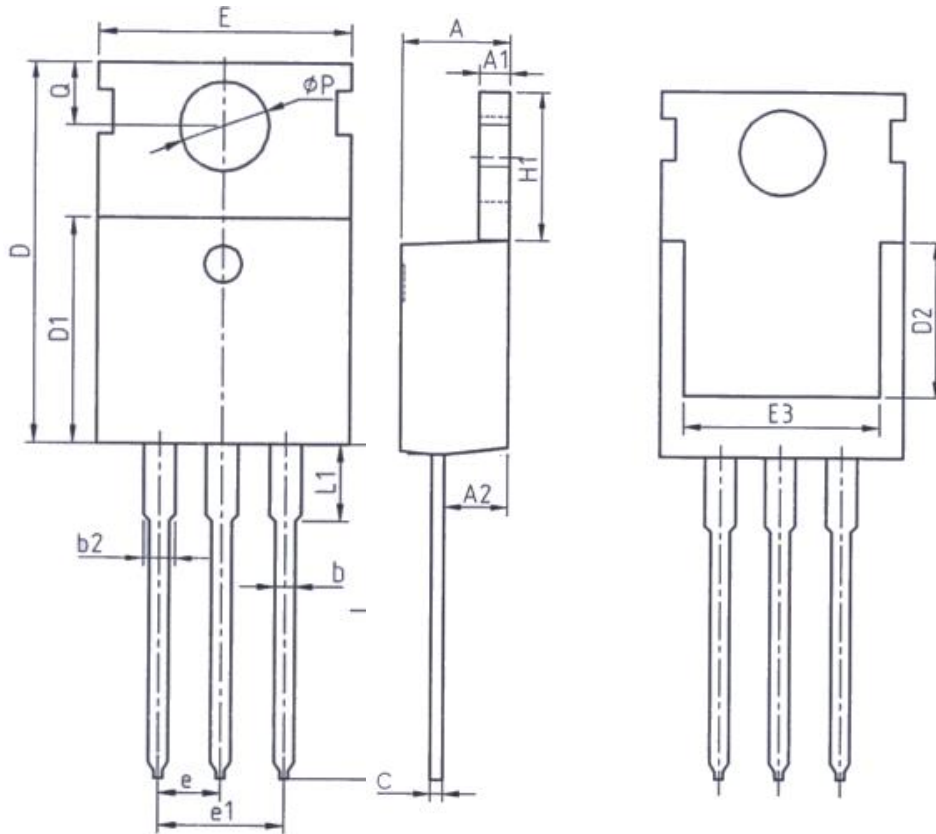


Unit: mm			
Symbol	Min	Nom	Max
A	4.40	4.50	4.60
A1	1.25	1.30	1.35
A2	2.20	2.40	2.60
A3	0	0.10	0.25
b	0.76	-	0.89
b1	1.23	-	1.37
c	0.47	-	0.60
D1	9.10	9.20	9.30
D4	8.00	-	-

Unit: mm			
Symbol	Min	Nom	Max
E	9.80	9.90	10.00
E5	7.80	-	-
e	2.54BSC		
H	14.90	15.30	15.70
H2	1.17	1.27	1.40
L	2.00	2.30	2.60
L1	-	-	1.75
L4	0.25BSC		
$\theta$	0°		8°



## TO-220(华天)



Unit: mm		
Symbol	Min.	Max.
A	4.37	4.77
A1	1.25	1.45
A2	2.20	2.60
b	0.70	0.95
b2	1.17	1.47
c	0.40	0.65
D	15.10	16.10
D1	8.80	9.40
D2	5.50	-

Unit: mm		
Symbol	Min.	Max.
E	9.70	10.30
E3	7.00	-
e	2.54BSC	
e1	5.08BSC	
H1	6.25	6.85
L	12.75	13.80
L1	-	3.40
P	3.40	3.80
Q	2.60	3.00



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