
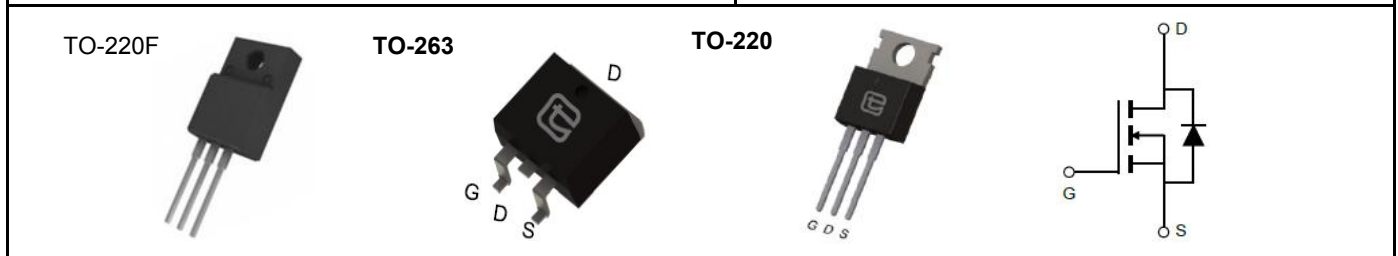




85V N-Channel Trench MOSFET(Preliminary)

<p>General Description</p> <ul style="list-style-type: none"> ● Trench Power technology ● Low $R_{DS(ON)}$ ● Low Gate Charge ● Optimized for fast-switching applications <p>Applications</p> <ul style="list-style-type: none"> ● Synchronous Rectification in DC/DC and AC/DC Converters ● Isolated DC/DC Converters in Telecom and Industrial 	<p>Product Summary</p> <table border="0"> <tr> <td>V_{DS}</td> <td>85V</td> </tr> <tr> <td>I_D (at $V_{GS}=10V$)</td> <td>145A</td> </tr> <tr> <td>$R_{DS(ON)}$ (at $V_{GS}=10V$)</td> <td>< 5.9mΩ</td> </tr> </table> <p>100% UIS Tested 100% DVDS Tested</p> 	V_{DS}	85V	I_D (at $V_{GS}=10V$)	145A	$R_{DS(ON)}$ (at $V_{GS}=10V$)	< 5.9m Ω
V_{DS}	85V						
I_D (at $V_{GS}=10V$)	145A						
$R_{DS(ON)}$ (at $V_{GS}=10V$)	< 5.9m Ω						



Part Number	Package Type	Form	Marking
TTA145N08A	TO-220F	Tape&Reel	145N08A
TTB145N08A	TO-263	Tape&Reel	145N08A
TTP145N08A	TO-220	Tube	145N08A

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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^B	I_D	$T_C = 25^\circ C$	105
		$T_C = 100^\circ C$	102
Pulsed Drain Current ^A	I_{DM}	435	A
Avalanche Current ^A	I_{AS}	56	A
Single Pulse Avalanche Energy ^A	E_{AS}	470	mJ
Power Dissipation ^C	P_D	$T_C = 25^\circ C$	272
		$T_C = 100^\circ C$	136
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 175	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Case	$R_{\theta JC}$	0.55	$^\circ C/W$
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		
STATIC PARAMETERS							
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	85	--	--	V	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 85\text{V}, V_{GS} = 0\text{V}$	$T_J = 25^\circ\text{C}$	--	--	1	μA
			$T_J = 125^\circ\text{C}$	--	--	100	
I_{GSS}	Gate-Body Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$	--	--	± 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	$V_{GS} = 10\text{V}, I_D = 30\text{A}$	--	4.8	5.9	m Ω	
g_{FS}	Forward Transconductance	$V_{DS} = 5\text{V}, I_D = 20\text{A}$	--	45	--	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 ^B		--	--	105	A	
DYNAMIC PARAMETERS							
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 45\text{V}, f = 1\text{MHz}$	--	9532	--	μF	
C_{oss}	Output Capacitance		--	397	--		
C_{rss}	Reverse Transfer Capacitance		--	362	--		
R_g	Gate Resistance	$f = 1\text{MHz}$	--	2.1	--	Ω	
SWITCHING PARAMETERS							
Q_g	Total Gate Charge	$V_{GS} = 10\text{V}, V_{DS} = 45\text{V}, I_D = 20\text{A}$	--	168	--	nC	
Q_{gs}	Gate Source Charge		--	39.8	--		
Q_{gd}	Gate Drain Charge		--	45.8	--		
$t_{D(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{V}, V_{DS} = 45\text{V}, I_D = 20\text{A}, R_G = 1.6\Omega$	--	52.8	--	ns	
t_r	Turn-On Rise Time		--	44.6	--		
$T_{D(off)}$	Turn-Off Delay Time		--	105.5	--		
t_f	Turn-Off Fall Time		--	20.4	--		
t_{rr}	Body Diode Reverse Recovery Time	$I_F = 20\text{A}, di/dt = 100\text{A}/\mu\text{s}$	--	46.8	--	ns	
Q_{rr}	Body Diode Reverse Recovery Charge		--	73	--	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 ELECTRICAL AND THERMAL CHARACTERISTICS

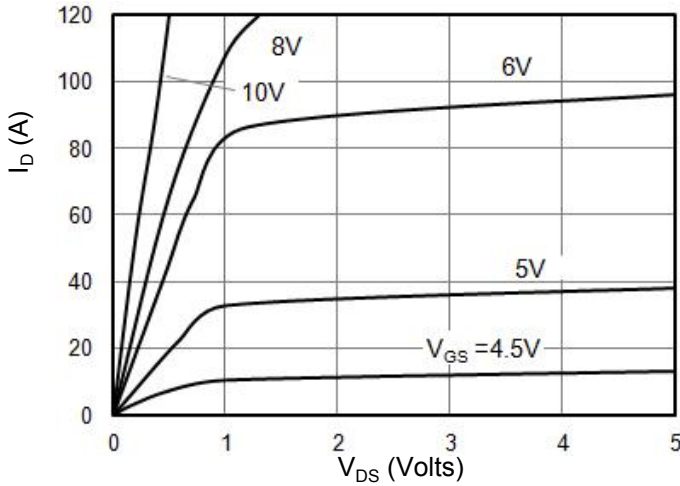


Figure 1: On-Region Characteristics

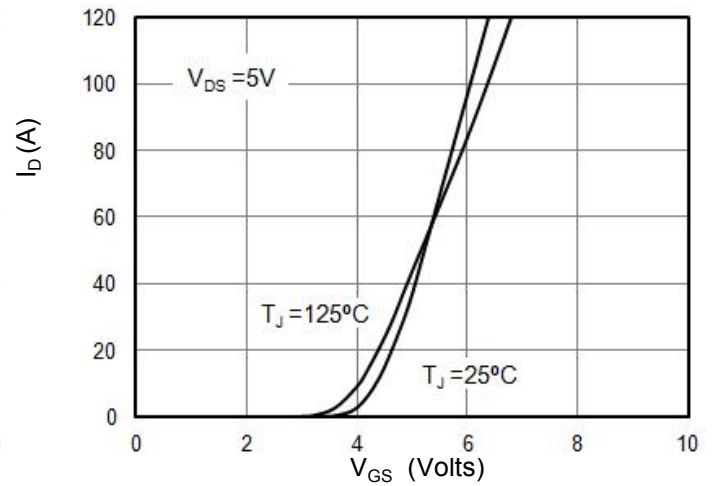


Figure 2: Transfer Characteristics

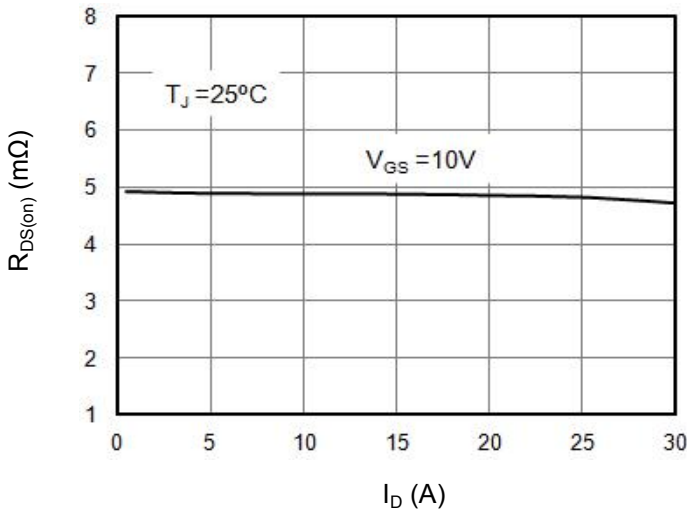


Figure 3: On-Resistance vs. Drain Current

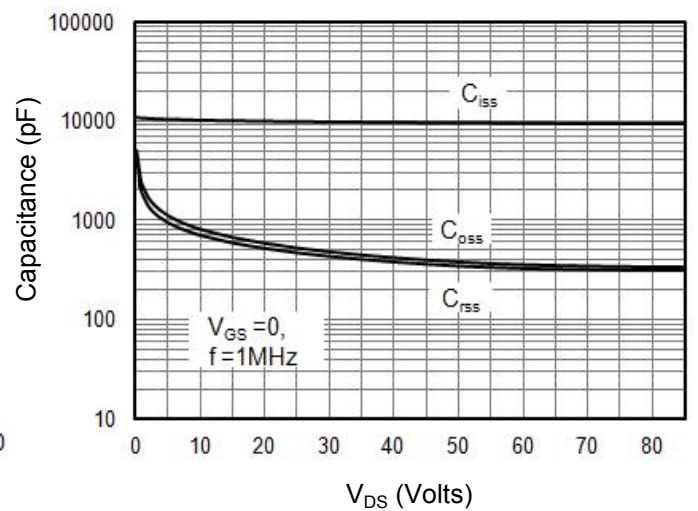


Figure 4: Capacitance Characteristics

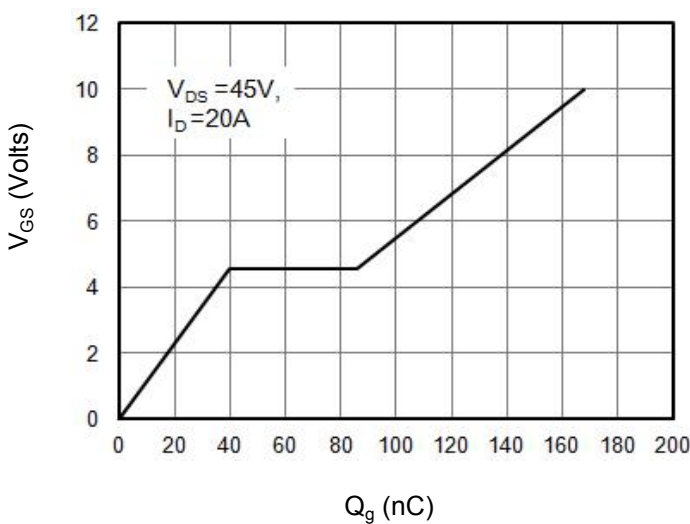


Figure 5: Gate Charge Characteristics

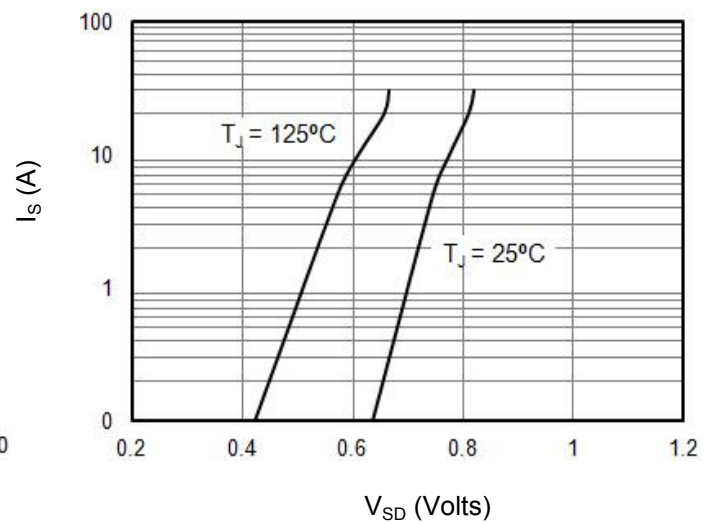


Figure 6: Body Diode Forward Voltage



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

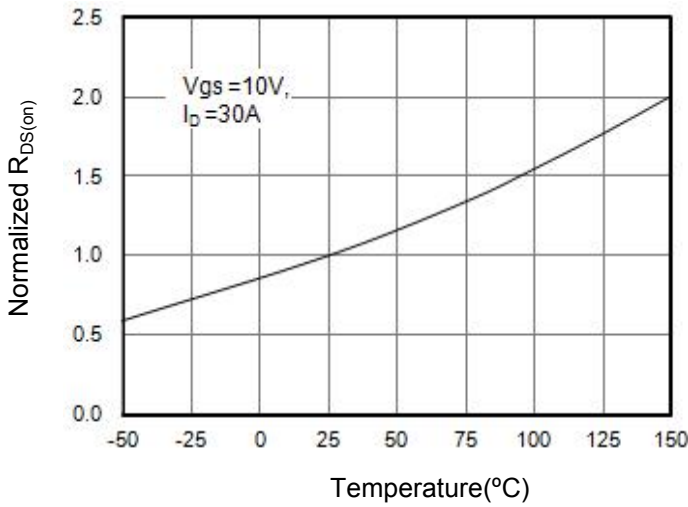


Figure 7: On-Resistance vs. Junction Temperature

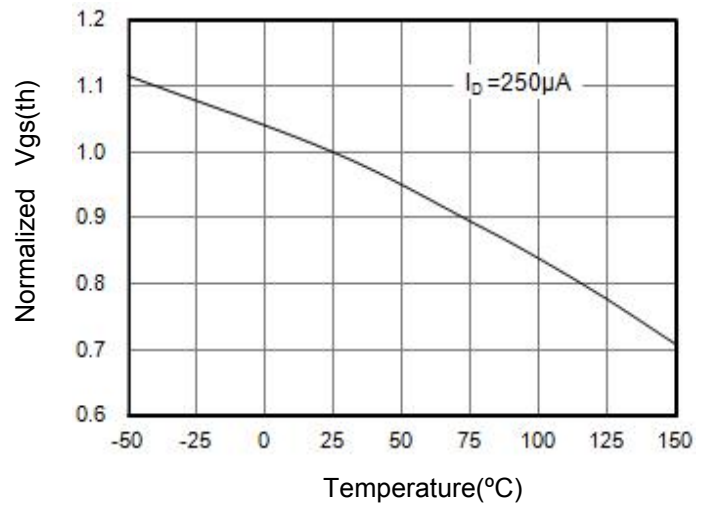


Figure 8: Vgs(th) vs. Junction Temperature

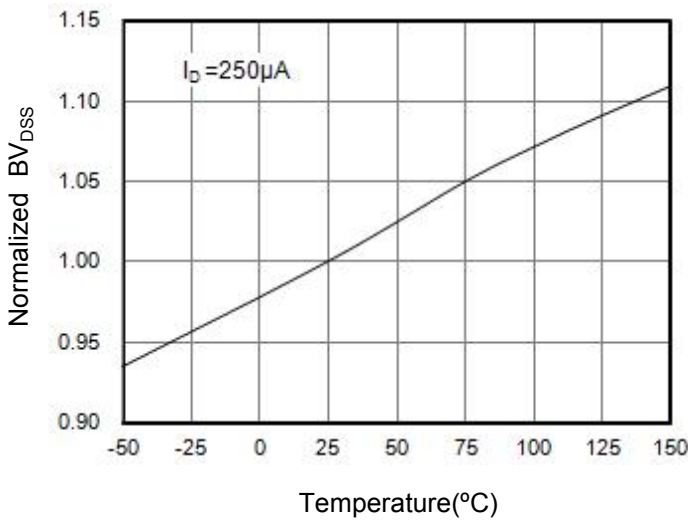


Figure 9: BV_DS vs. Junction Temperature

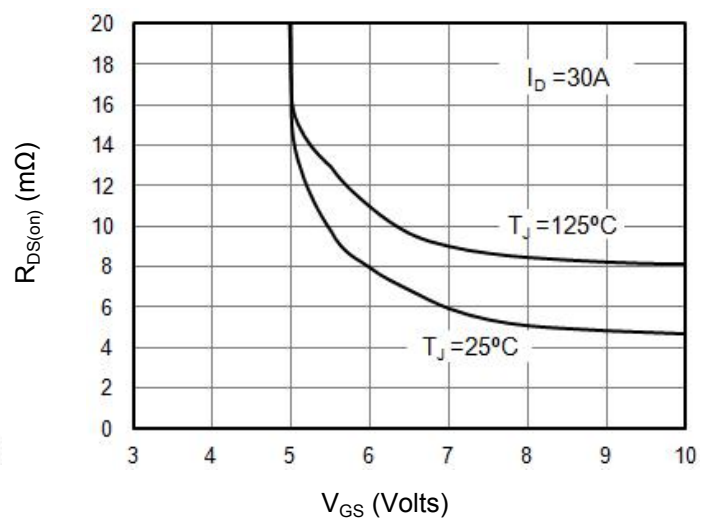


Figure 10: On-Resistance vs. Gate-Source Voltage

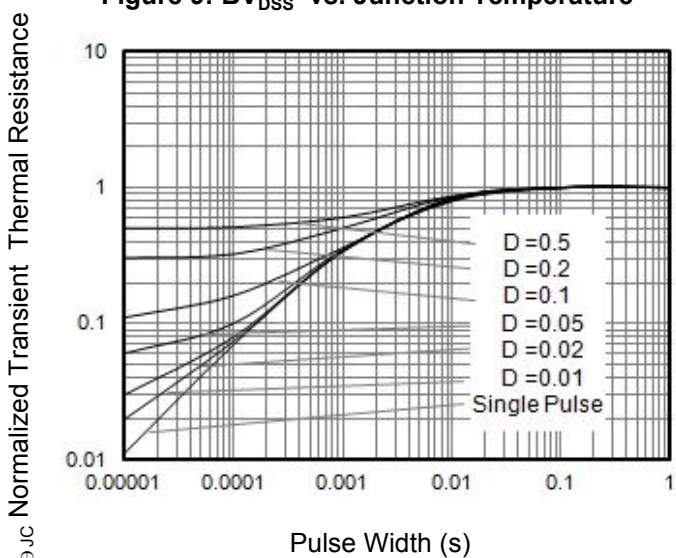


Figure 11: Normalized Transient Thermal Resistance

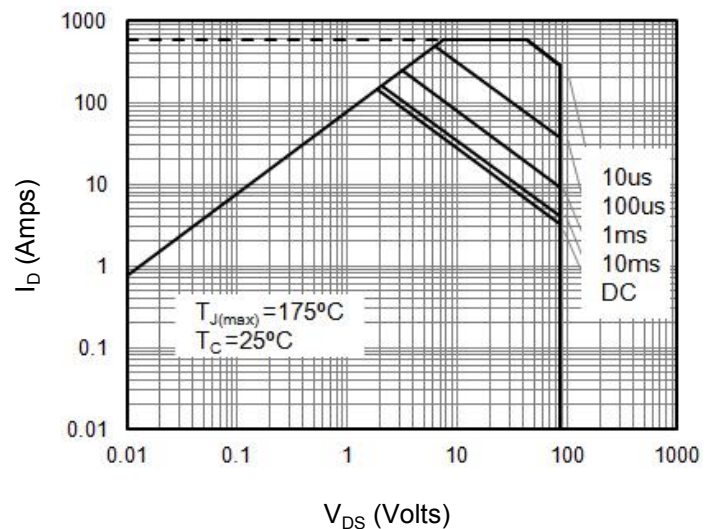


Figure 12: Safe Operating Area



Figure A: Gate Charge Test Circuit and Waveforms

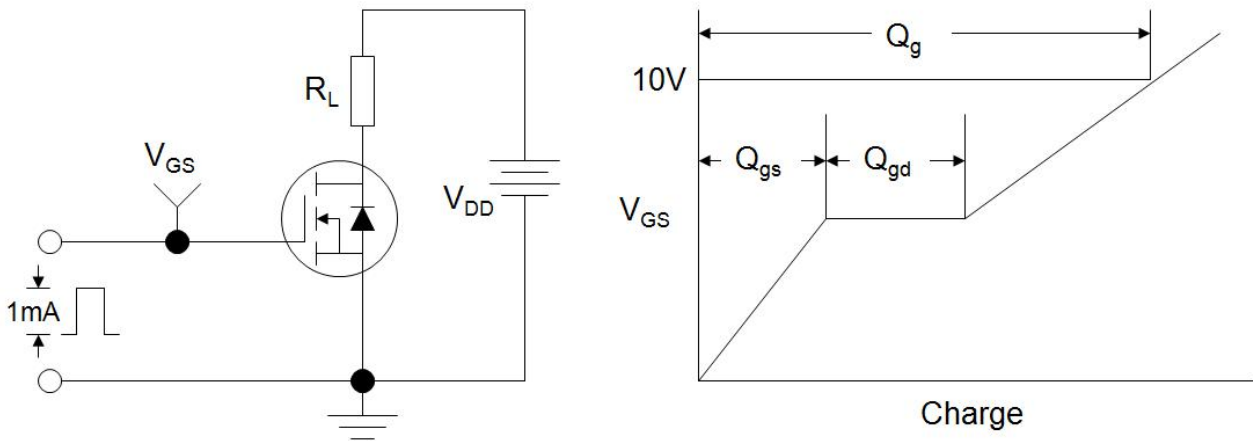


Figure B: Resistive Switching Test Circuit and Waveforms

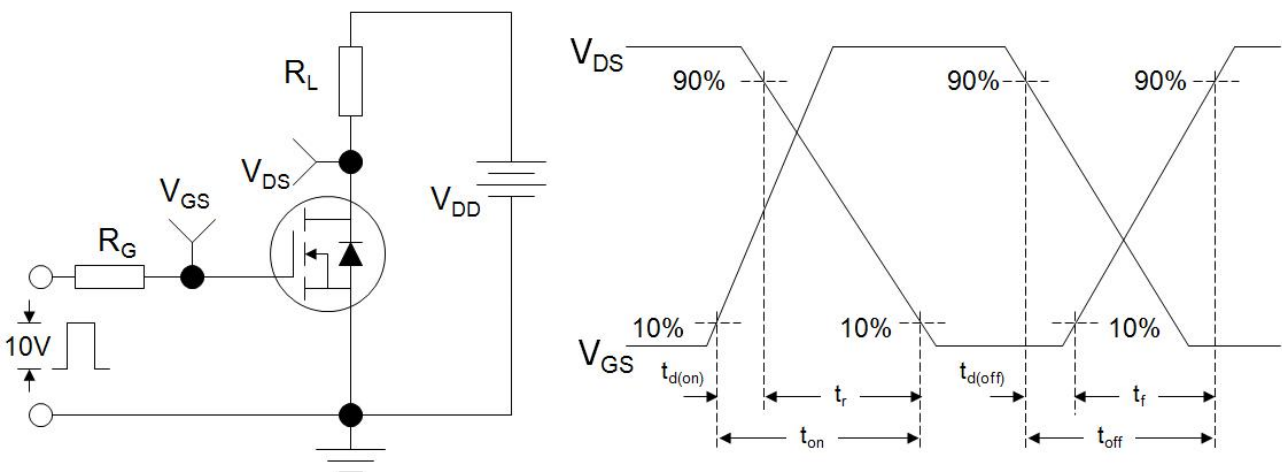
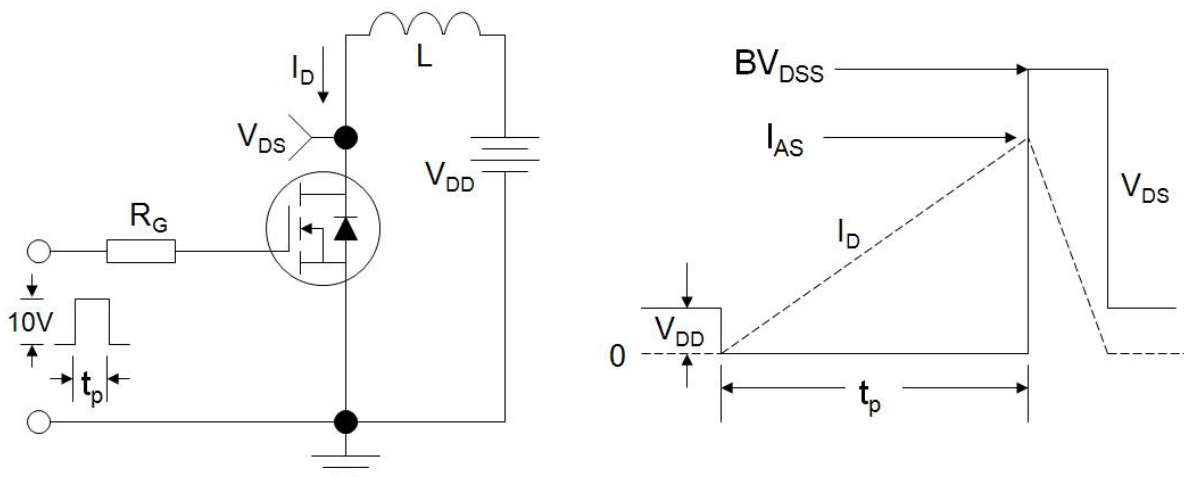
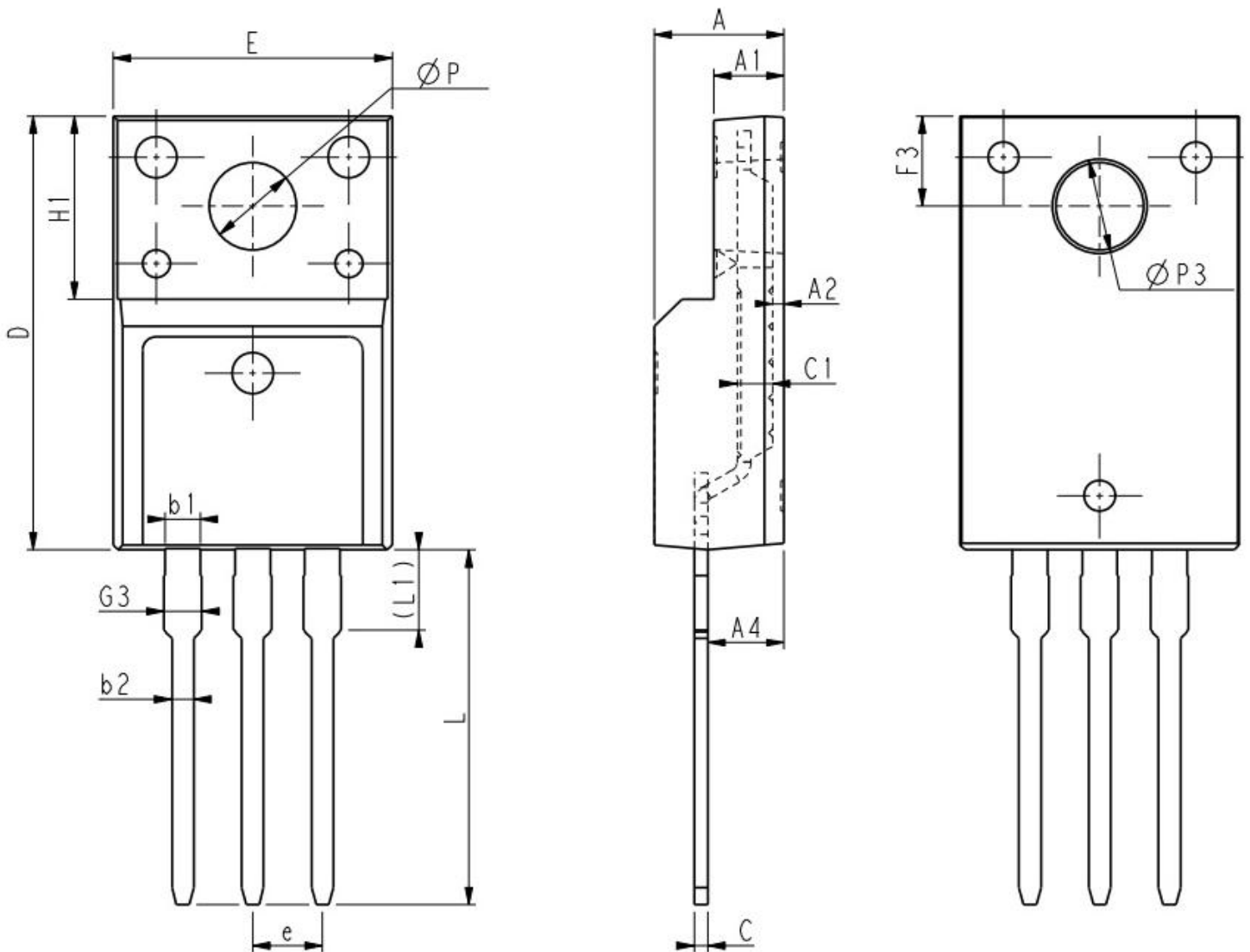


Figure C: Unclamped Inductive Switching (UIS) Test Circuit and Waveforms





TO-220F (华羿)

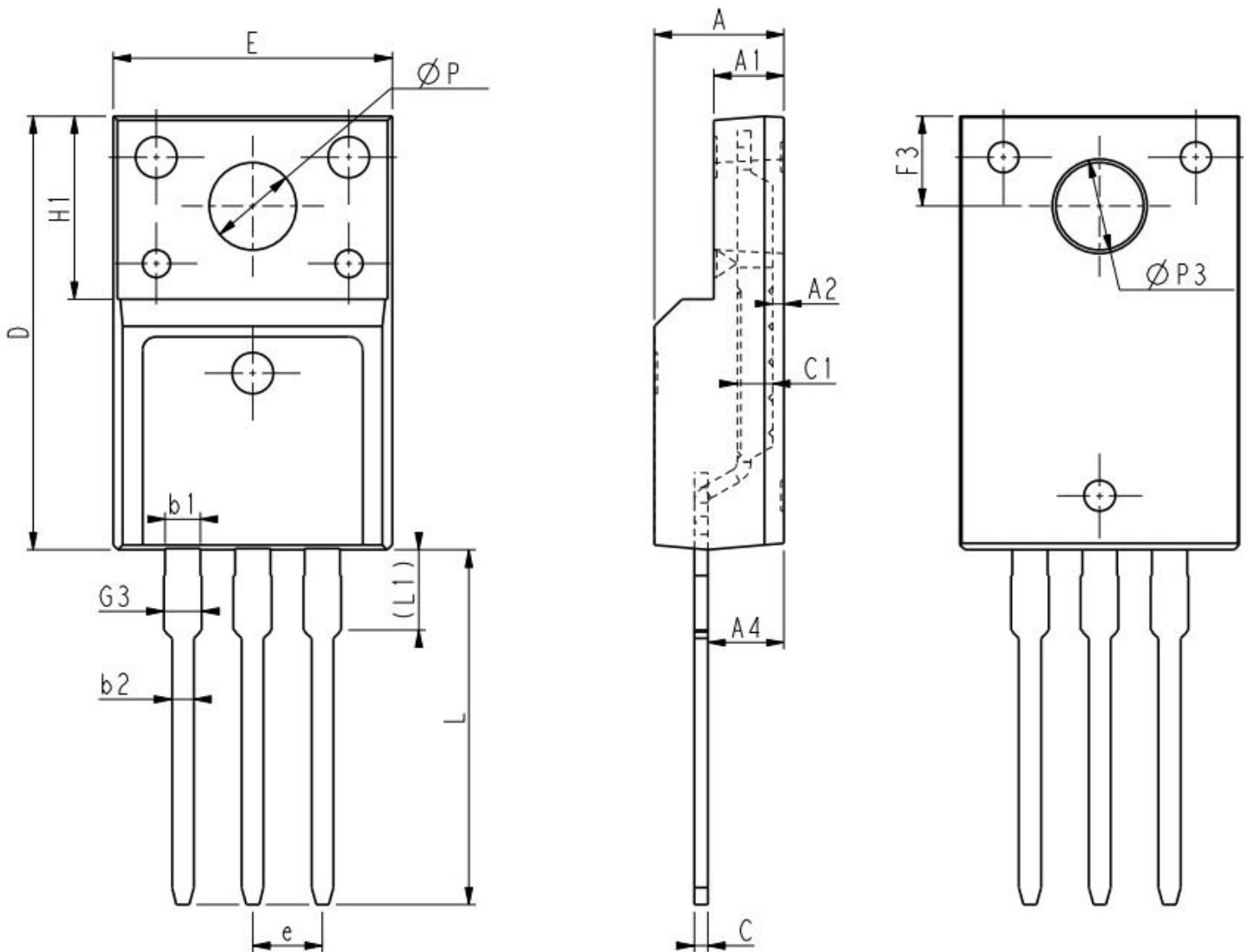


Unit:mm			
Symbol	Min.	Nom	Max.
E	9.96	10.16	10.36
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2	0.30	0.45	0.60
A4	2.56	2.76	2.96
c	0.40	0.50	0.65
c1	1.20	1.30	1.35
D	15.57	15.87	16.17
H1	6.70REF		

Unit:mm			
Symbol	Min.	Nom	Max.
e	2.54BSC		
L	12.68	12.98	13.28
L1	2.93	3.03	3.13
ΦP	3.03	3.18	3.38
$\Phi P3$	3.15	3.45	3.65
F3	3.15	3.30	3.45
G3	1.25	1.35	1.55
b1	1.18	1.28	1.43
b2	0.70	0.80	0.95



TO-220F (华羿)

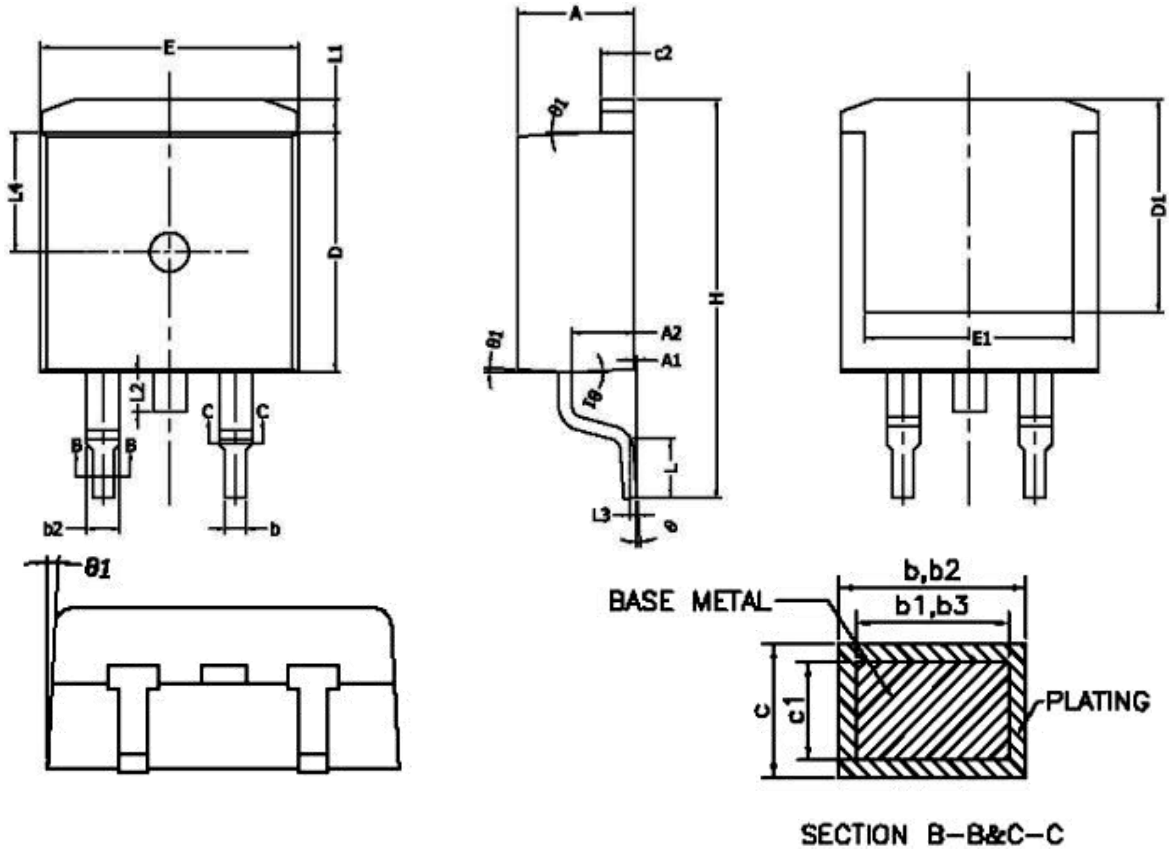


Unit:mm			
Symbol	Min.	Nom	Max.
E	9.96	10.16	10.36
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2	0.30	0.45	0.60
A4	2.56	2.76	2.96
c	0.40	0.50	0.65
c1	1.20	1.30	1.35
D	15.57	15.87	16.17
H1	6.70REF		

Unit:mm			
Symbol	Min.	Nom	Max.
e	2.54BSC		
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L1	2.93	3.03	3.13
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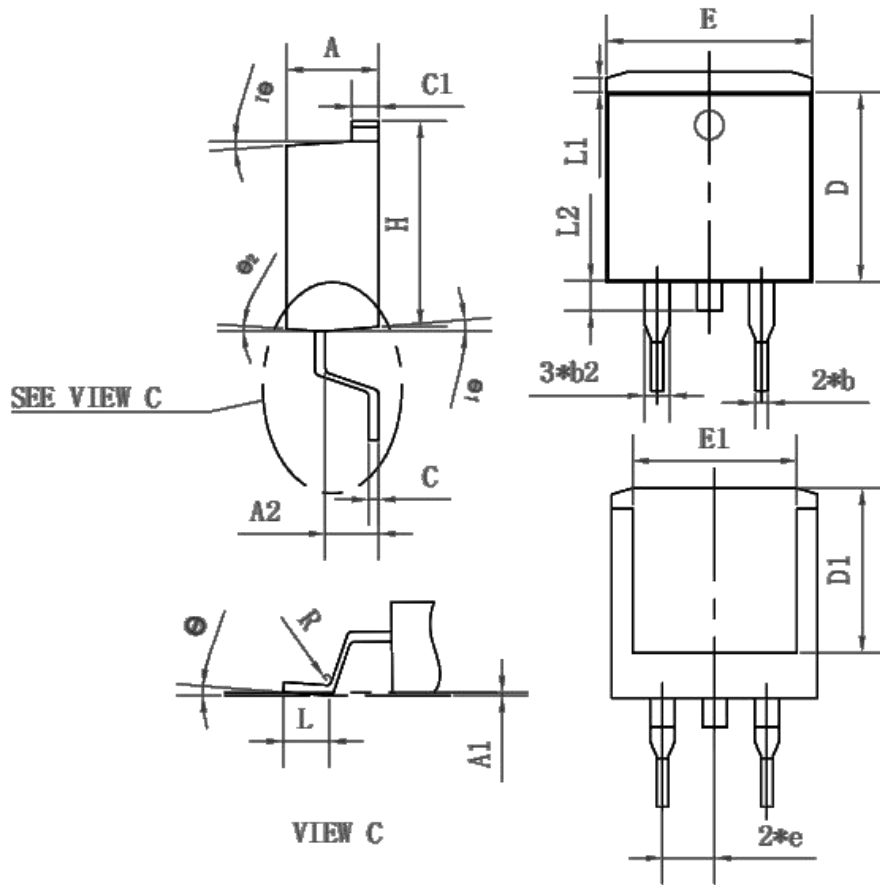
TO-263 (集佳)



SYMBOL	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	0	0.10	0.25
A2	2.20	2.40	2.60
b	0.76	--	0.89
b1	0.75	0.80	0.85
b2	1.23	--	1.37
b3	1.22	1.27	1.32
c	0.47	--	0.60
c1	0.46	0.51	0.56
c2	1.25	1.30	1.35
D	9.10	9.20	9.30
D1	8.00	--	--
E	9.80	9.90	10.00
E1	7.80	--	--
e	2.54 BSC		
H	14.90	15.30	15.70
L	2.00	2.30	2.60
L1	1.17	1.27	1.40
L2	--	--	1.75
L3	0.25BSC		
L4	4.60 REF		
theta	0°	--	8°
theta1	1°	3°	5°



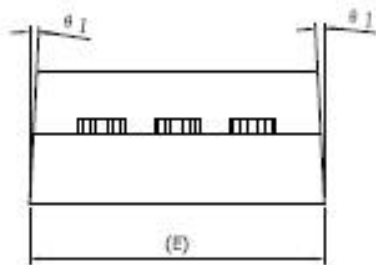
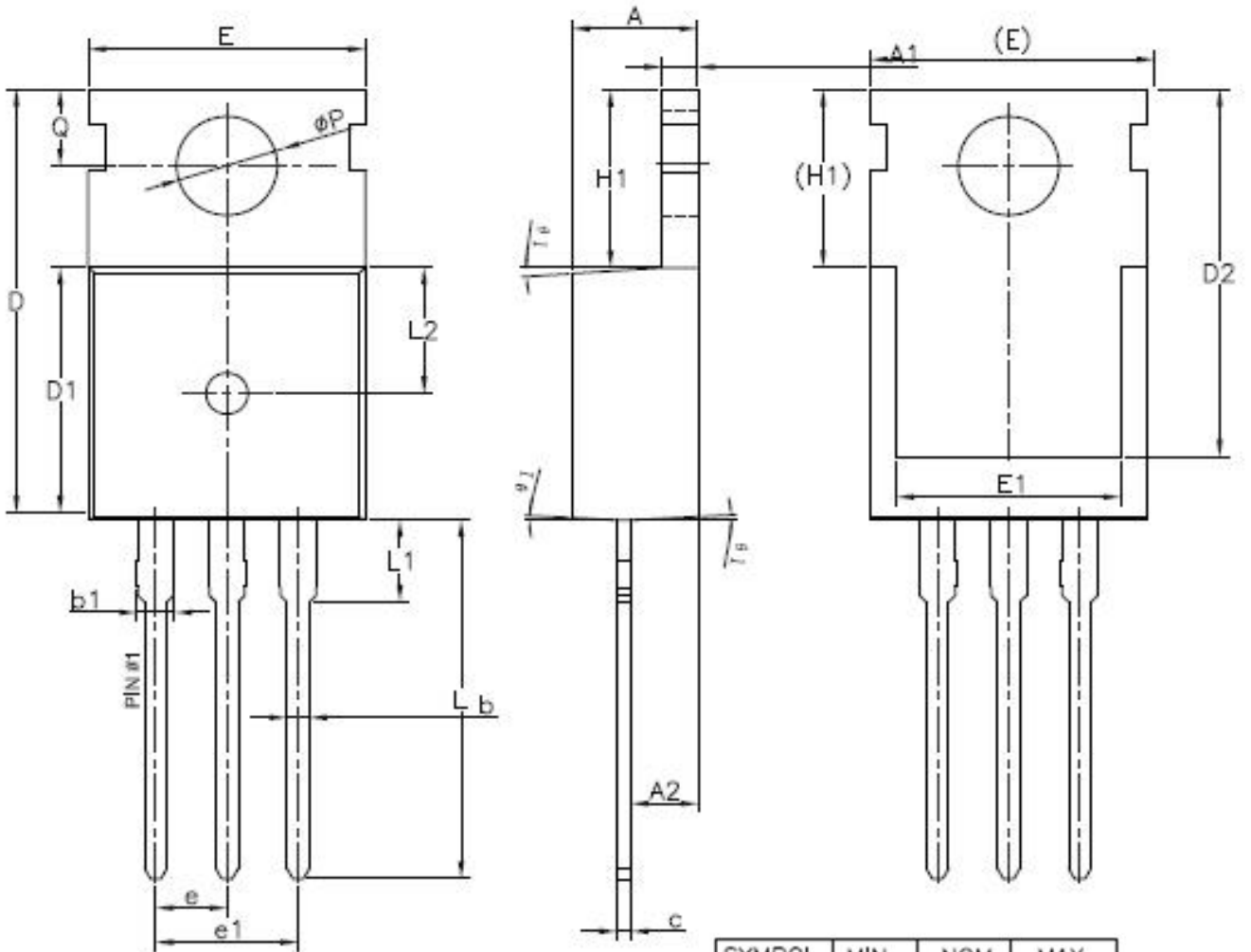
TO-263 (赛力康)



SYMBOL	MIN	NOM	MAX
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.50
b	0.70	0.80	1.00
b2	1.25	1.36	1.38
C	0.45	0.50	0.55
C1	1.29	1.30	1.31
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	-	2.54	-
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
e	0°	4°	8°
e1	4°	7°	10°
e2	0°	3°	6°



TO-220(集佳)



SYMBOL	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	1.27	1.30	1.33
A2	2.30	2.40	2.50
b	0.70	-	0.90
b1	1.27	-	1.40
c	0.45	0.50	0.60
D	15.30	15.70	16.10
D1	9.10	9.20	9.30
D2	13.10	-	13.70
E	9.70	9.90	10.20
E1	7.80	8.00	8.20
e	2.54BSC		
e1	5.08BSC		
H1	6.30	6.50	6.70
L	12.78	13.08	13.38
L1	-	-	3.50
L2	4.60REF		
phi P	3.55	3.60	3.65
Q	2.73	-	2.87
phi 1	1°	3°	5°



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