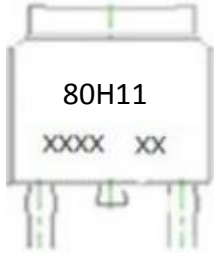
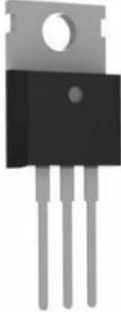
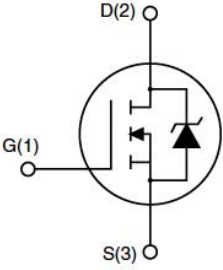


# 80H11

# N-Channel Trench Power MOSFET

<p><b>Features</b></p> <ul style="list-style-type: none"> <li>• VDS=80V; ID=120A@ VGS=10V; RDS(ON)&lt;6.8mΩ @ VGS=10V</li> <li>• Special Designed for E-Bike Controller Application</li> <li>• Ultra Low On-Resistance</li> <li>• High UIS and UIS 100% Test</li> </ul>	<p><b>Application</b></p> <ul style="list-style-type: none"> <li>• 64V E-Bike Controller Applications</li> <li>• Hard Switched and High Frequency Circuits</li> <li>• Uninterruptible Power Supply</li> </ul>
<p><b>Package</b></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Marking and pin assignment</p> </div> <div style="text-align: center;">  <p>TO-220top view</p> </div> <div style="text-align: center;">  <p>Schematic diagram</p> </div> </div>	

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
80H11	80H11	TO-220	-	-	-

**Table 1. Absolute Maximum Ratings (TA=25°C)**

Symbol	Parameter	Value	Unit
V <sub>DS</sub>	Drain-Source Voltage (V <sub>GS</sub> =0V)	80	V
V <sub>GS</sub>	Gate-Source Voltage (V <sub>DS</sub> =0V)	±20	V
I <sub>D(DC)</sub>	Drain Current (DC) at Tc=25°C	120	A
I <sub>D(DC)</sub>	Drain Current (DC) at Tc=100°C	84	A
I <sub>DM (pluse)</sub>	Drain Current-Continuous@ Current-Pulsed <b>(Note 1)</b>	460	A
dv/dt	Peak Diode Recovery Voltage	7.1	V/ns
P <sub>D</sub>	Maximum Power Dissipation(Tc=25°C)	214	W
	Derating Factor	1.43	W/°C
E <sub>AS</sub>	Single Pulse Avalanche Energy <b>(Note 2)</b>	704	mJ
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55 To 175	°C

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=40V, V<sub>G</sub>=10V, R<sub>G</sub>=25 Ω

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**Table 2. Thermal Characteristic**

Symbol	Parameter	Value	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	---	0.7	$^{\circ}C/W$

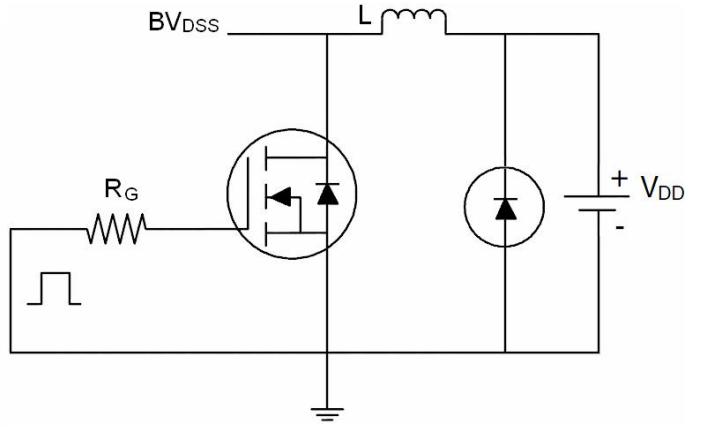
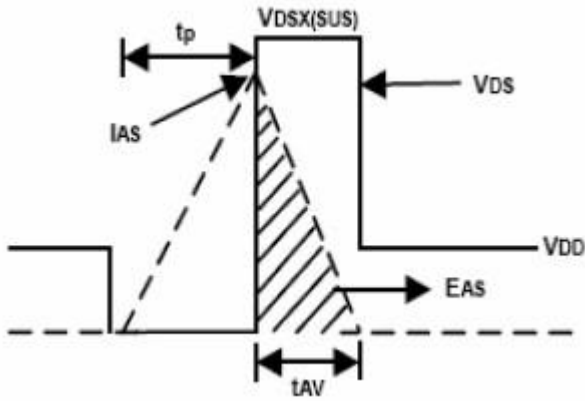
**Table 3. Electrical Characteristics (TA=25 $^{\circ}C$  unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	80			V
$I_{DSS}$	Zero Gate Voltage Drain Current(Tc=25 $^{\circ}C$ )	$V_{DS}=78V, V_{GS}=0V$			1	$\mu A$
$I_{DSS}$	Zero Gate Voltage Drain Current(Tc=125 $^{\circ}C$ )	$V_{DS}=75V, V_{GS}=0V$			10	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2		4	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=40A$		5.5	6.8	m $\Omega$
<b>Dynamic Characteristics</b>						
$g_{FS}$	Forward Transconductance	$V_{DS}=10V, I_D=15A$	25			S
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$		7190		PF
$C_{oss}$	Output Capacitance			463		PF
$C_{rss}$	Reverse Transfer Capacitance			284		PF
$Q_g$	Total Gate Charge	$V_{DS}=50V, I_D=40A, V_{GS}=10V$		139		nC
$Q_{gs}$	Gate-Source Charge			26		nC
$Q_{gd}$	Gate-Drain Charge			51		nC
<b>Switching Times</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=30V, I_D=40A, R_L=15\Omega, V_{GS}=10V, R_G=2.5\Omega$		30		nS
$t_r$	Turn-on Rise Time			50		nS
$t_{d(off)}$	Turn-Off Delay Time			79		nS
$t_f$	Turn-Off Fall Time			23		nS
<b>Source-Drain Diode Characteristics</b>						
$I_{SD}$	Source-drain Current(Body Diode)			120		A
$I_{SDM}$	Pulsed Source-Drain Current(Body Diode)			460		A
$V_{SD}$	Forward On Voltage <small>(note 1)</small>	$T_J=25^{\circ}C, I_{SD}=40A, V_{GS}=0V$		0.87	0.99	V
$t_{rr}$	Reverse Recovery Time <small>(note 1)</small>	$T_J=25^{\circ}C, I_F=75A, di/dt=100A/\mu s$		36		nS
$Q_{rr}$	Reverse Recovery Charge <small>(note 1)</small>			63		nC
$t_{on}$	Forward Turn-on Time	Intrinsic turn-on time is negligible(turn-on is dominated by $L_S+L_D$ )				

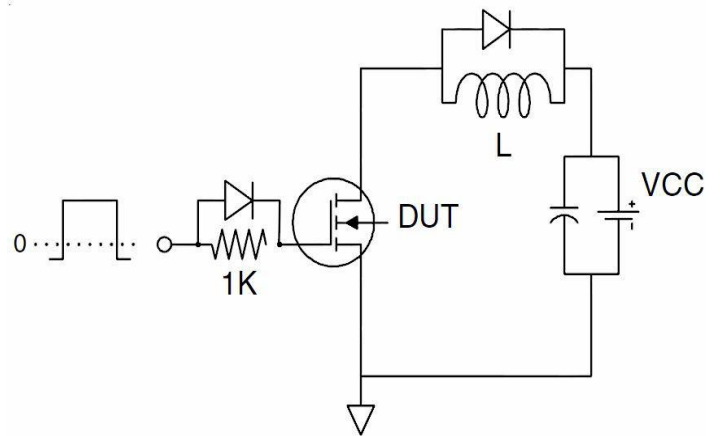
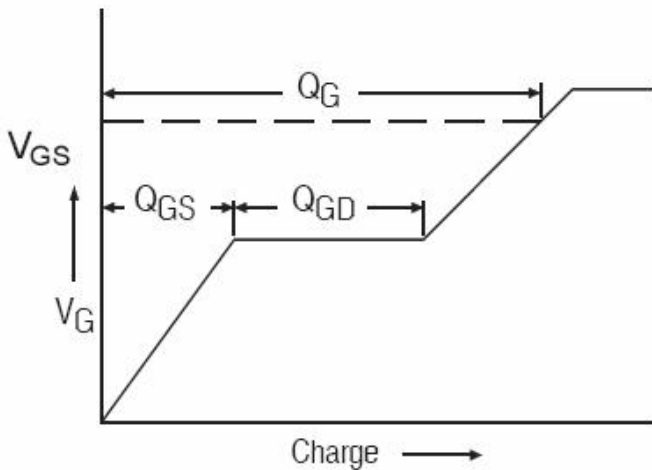
Notes 1. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 1.5\%$ ,  $R_G=25\Omega$ , Starting  $T_J=25^{\circ}C$

Test Circuit

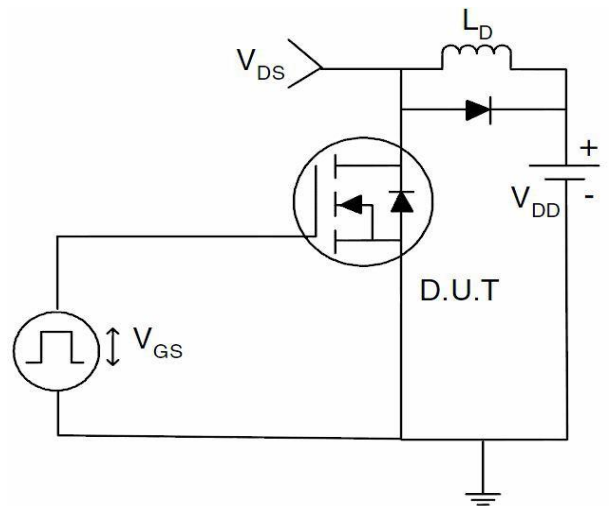
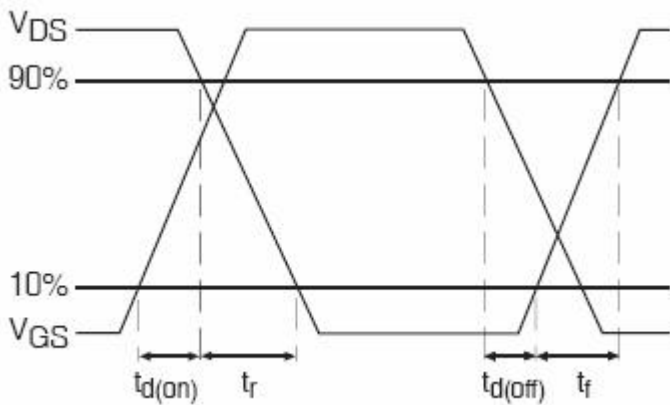
1)  $E_{AS}$  Test Circuits



2) Gate Charge Test Circuit:



3) Switch Time Test Circuit:



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## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Output Characteristics

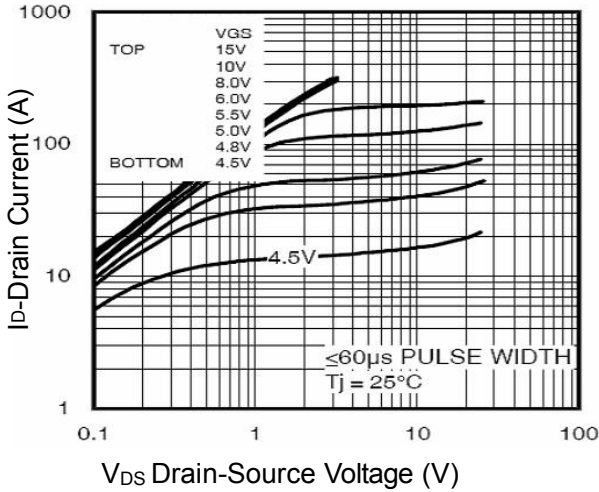


Figure2. Transfer Characteristics

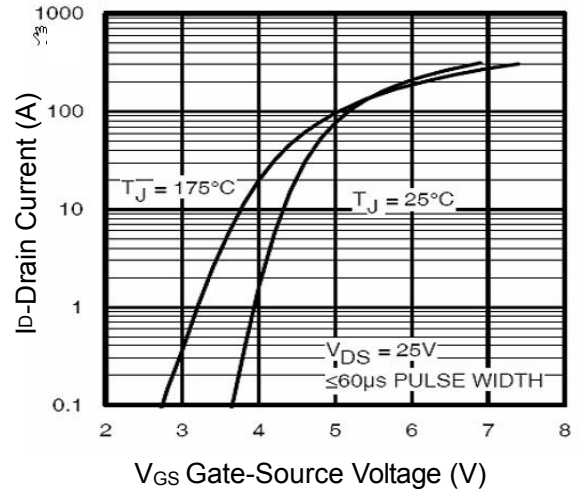


Figure3. ID vs Junction Temperature

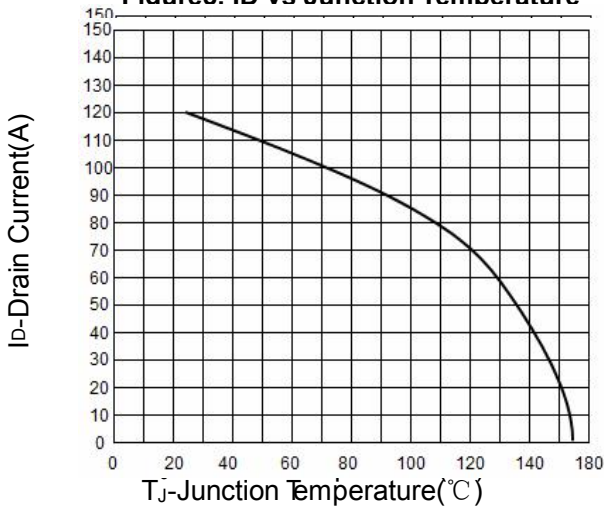


Figure4. Rds(on) Vs Junction Temperature

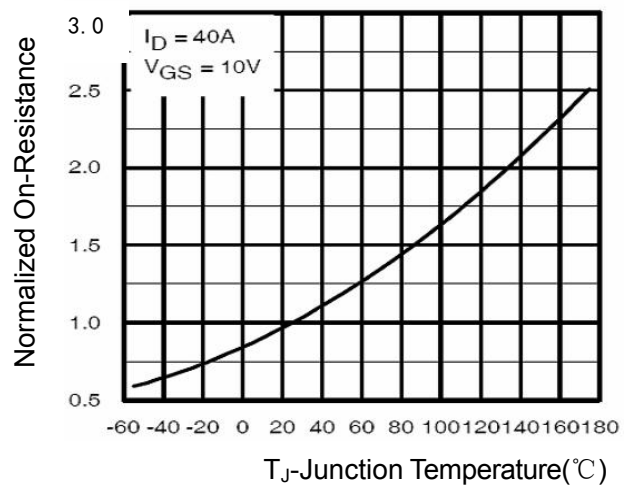


Figure5. BVDS vs Junction Temperature

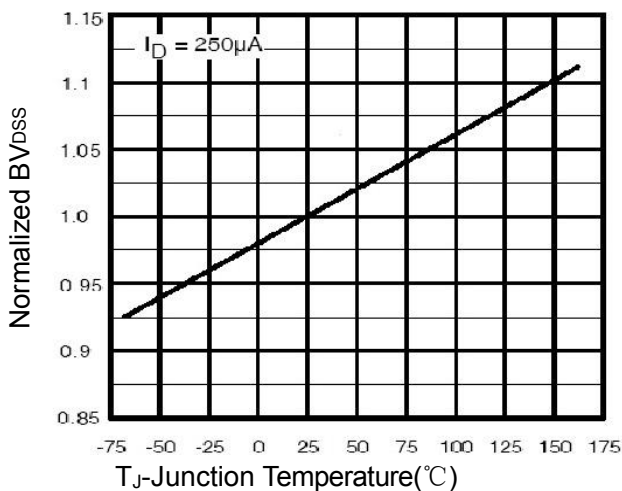
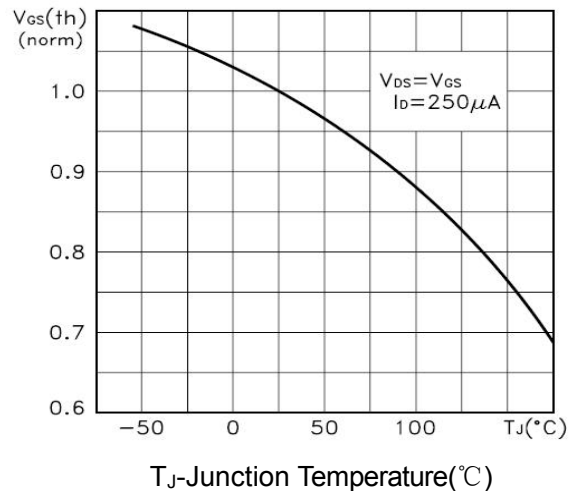


Figure6. VGS(th) vs Junction Temperature



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Figure7. Gate Charge

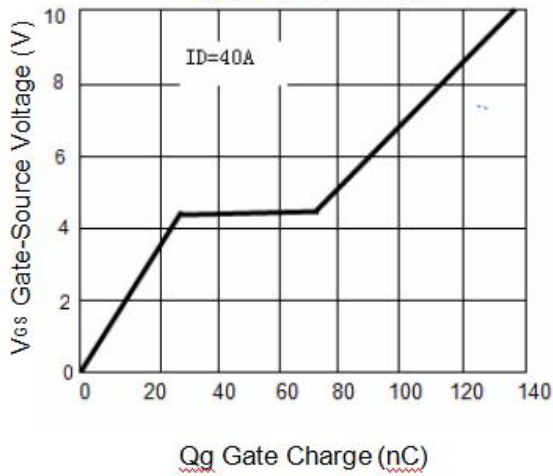


Figure8. Capacitance vs Vds

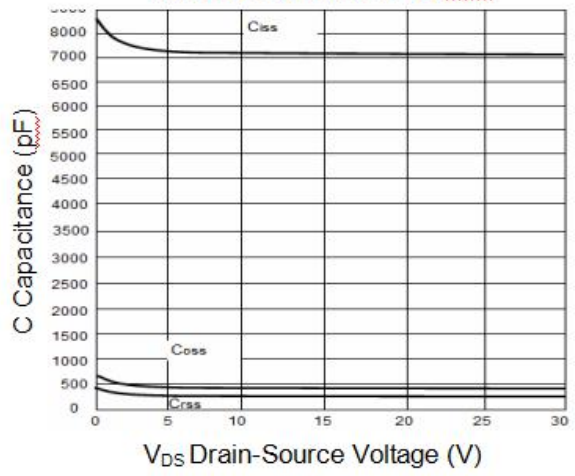


Figure9. Source- Drain Diode Forward

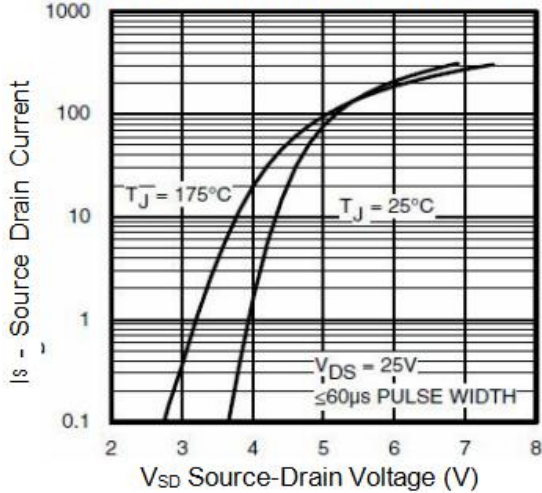


Figure10. Safe Operation Area

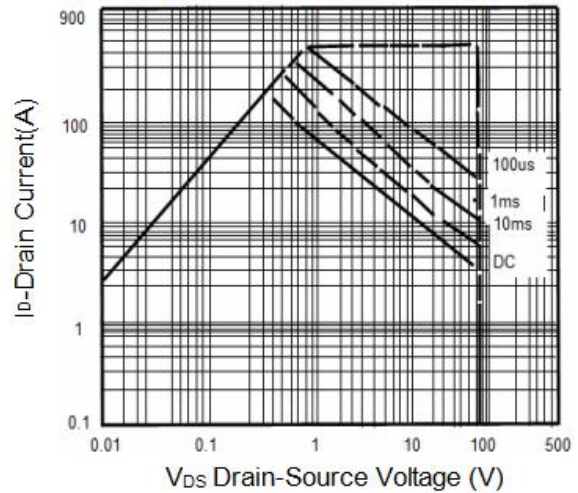
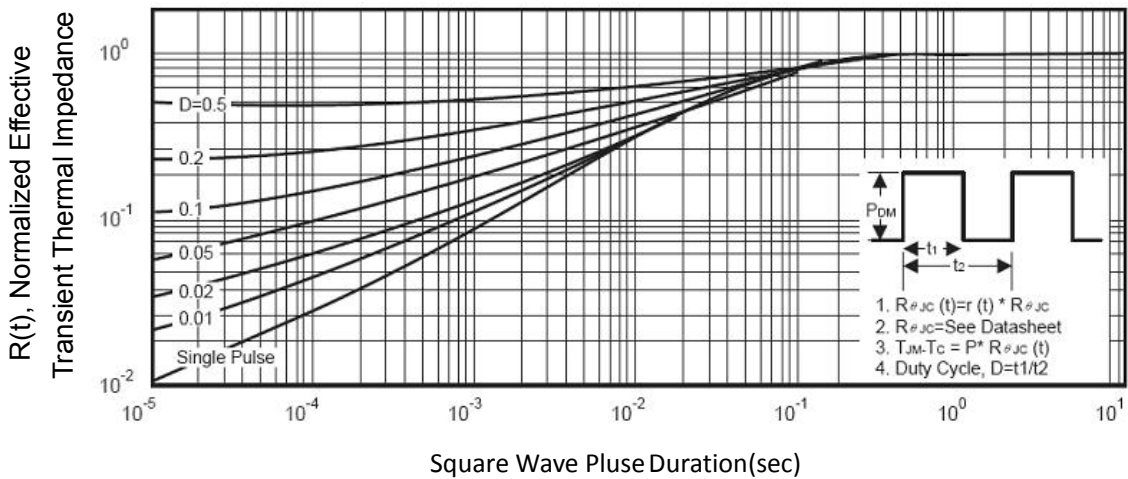
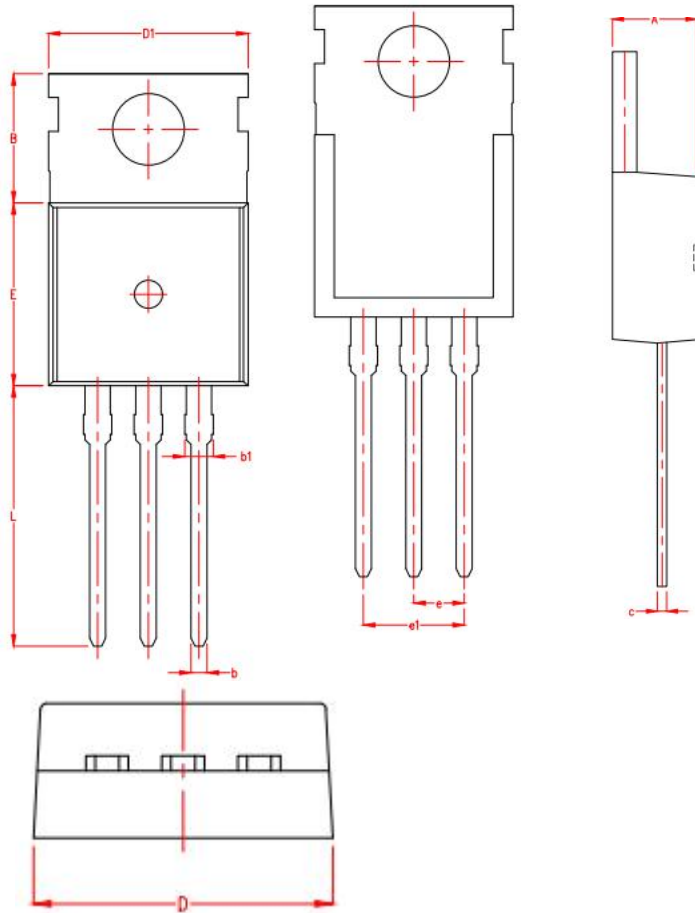


Figure11. Normalized Maximum Transient Thermal Impedance



TO-220 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.45	4.50	4.55
B	6.40	6.50	6.60
b	0.80TYP.		
b1	1.24	1.27	1.30
c	0.48	0.50	0.52
D	9.95	10.00	10.05
D1	9.80	10.00	10.20
E	9.15	9.20	9.25
e	2.51	2.54	2.57
e1	5.05	5.08	5.11
L	12.95	13.10	13.25