

## Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	$I_D$ $T_C = +25^\circ\text{C}$
100V	9.5m $\Omega$ @ $V_{GS} = 10\text{V}$	TO220AB	108A

## Description

This new generation MOSFET features low on-resistance and fast switching, making it ideal for high-efficiency power management applications.

## Applications

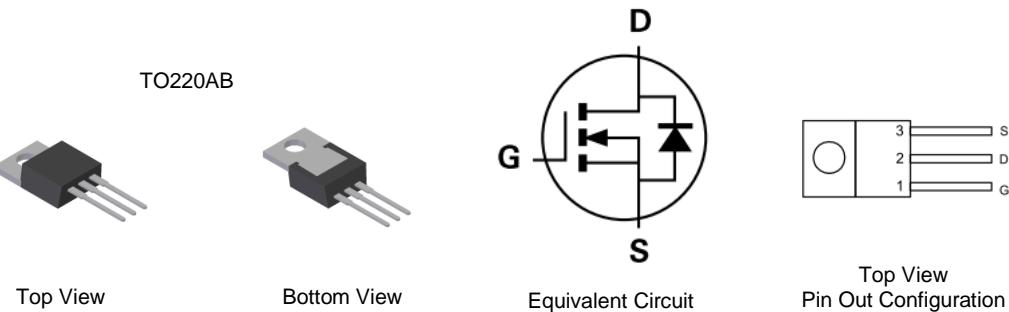
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

## Features

- Rated to  $+175^\circ\text{C}$  – Ideal for High Ambient Temperature Environments
- Low Input Capacitance
- High  $\text{BV}_{DSS}$  Rating for Power Application
- Low Input/Output Leakage
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: TO220AB
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Terminal Connections: See Diagram Below
- Weight: TO220AB – 1.85 grams (Approximate)



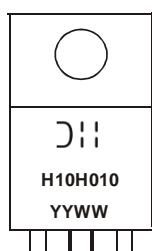
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH10H010LCT	TO220AB	50 pieces/tube

Notes:

1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



DII = Manufacturer's Marking

H10H010 = Product Type Marking Code

YYWW = Date Code Marking

YY or YY = Last Two Digits of Year (ex: 15 = 2015)

WW or WW = Week Code (01 to 53)

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Drain-Source Voltage	$V_{DSS}$	100	V	
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current	$T_C = +25^\circ\text{C}$ $T_C = +100^\circ\text{C}$	$I_D$	108 76	A
Maximum Continuous Body Diode Forward Current	$T_C = +25^\circ\text{C}$	$I_S$	90	A
Pulsed Drain Current (10 $\mu\text{s}$ pulse, duty cycle = 1%)	$I_{DM}$	92	A	
Avalanche Current, L=0.3mH (Note 7)	$I_{AS}$	10	A	
Avalanche Energy, L=0.3mH (Note 7)	$E_{AS}$	15	mJ	

**Thermal Characteristics**

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	$P_D$	2.4	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	61	°C/W
Total Power Dissipation	$P_D$	166	W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.9	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +175	°C

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	100	—	—	V	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 80\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	1.4	1.9	3.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	6.9	9.5	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 13\text{A}$
Diode Forward Voltage	$V_{SD}$	—	0.8	1.3	V	$V_{GS} = 0\text{V}, I_S = 13\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	$C_{iss}$	—	2592	—	pF	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$	—	792	—		
Reverse Transfer Capacitance	$C_{rss}$	—	45	—		
Gate Resistance	$R_G$	—	2	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge	$Q_g$	—	53.7	—	nC	$V_{DD} = 50\text{V}, I_D = 13\text{A},$ $V_{GS} = 10\text{V}$
Gate-Source Charge	$Q_{gs}$	—	10.6	—		
Gate-Drain Charge	$Q_{gd}$	—	8.2	—		
Turn-On Delay Time	$t_{D(ON)}$	—	11.6	—	ns	$V_{DD} = 50\text{V}, V_{GS} = 10\text{V},$ $I_D = 13\text{A}, R_G = 6\Omega$
Turn-On Rise Time	$t_R$	—	14.1	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	42.9	—		
Turn-Off Fall Time	$t_F$	—	22	—		
Reverse Recovery Time	$t_{RR}$	—	49.8	—	ns	$I_F = 13\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{RR}$	—	85.1	—		

Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.

6. Short duration pulse test used to minimize self-heating effect.

7. Guaranteed by design. Not subject to product testing.

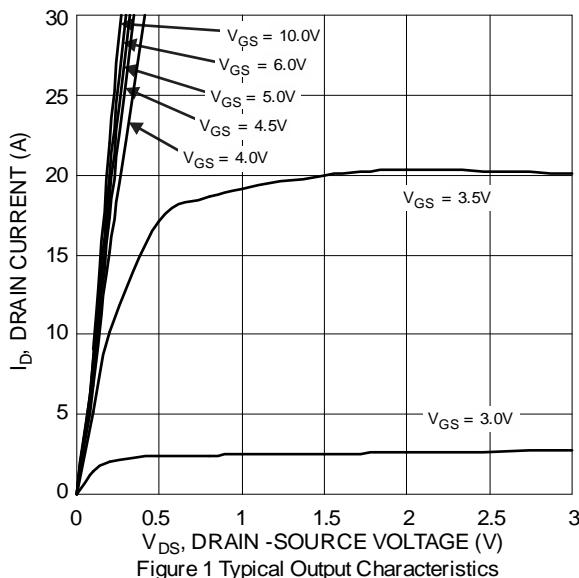


Figure 1 Typical Output Characteristics

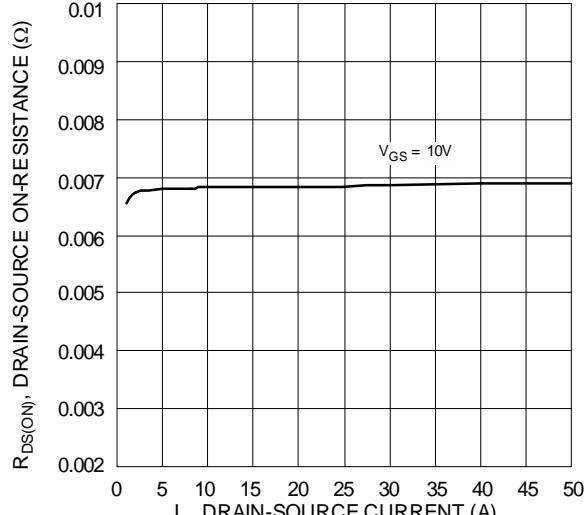


Figure 3 Typical On-Resistance vs.  
Drain Current and Gate Voltage

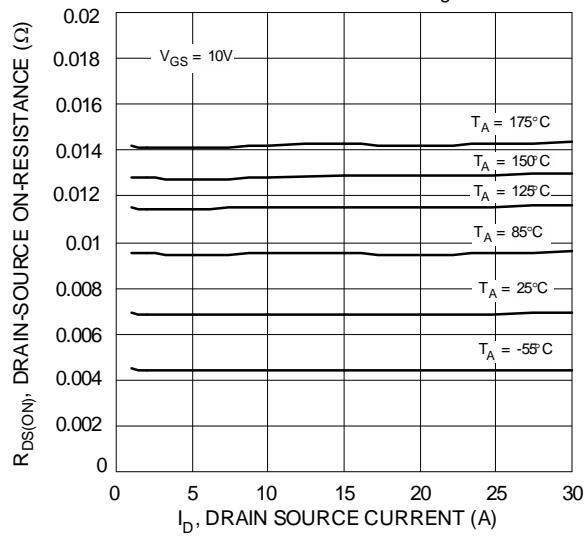


Figure 5 Typical On-Resistance vs.  
Drain Current and Junction Temperature

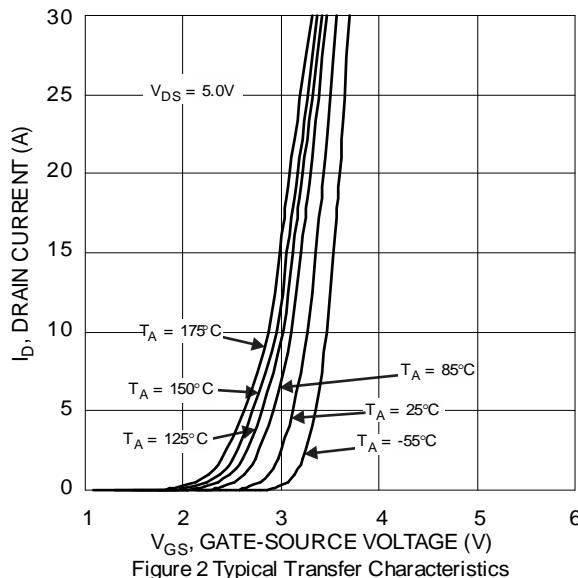


Figure 2 Typical Transfer Characteristics

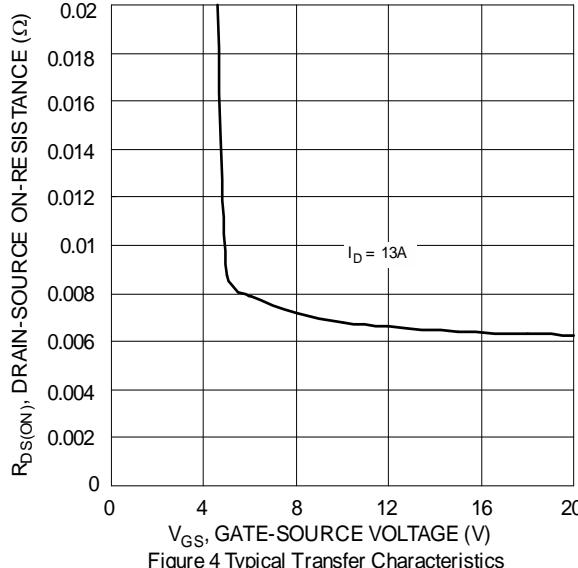


Figure 4 Typical Transfer Characteristics

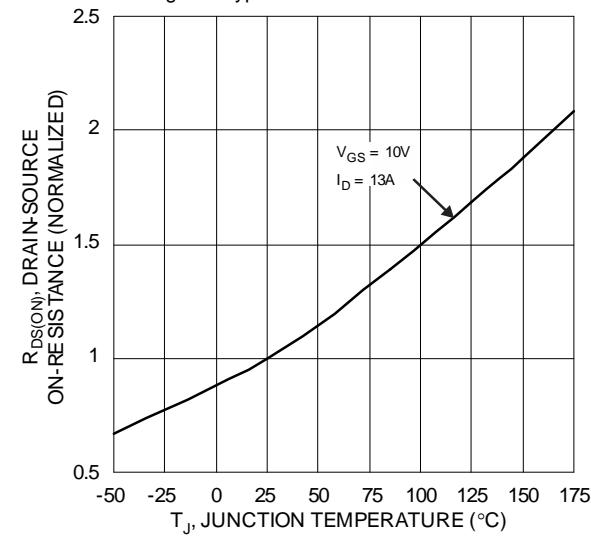
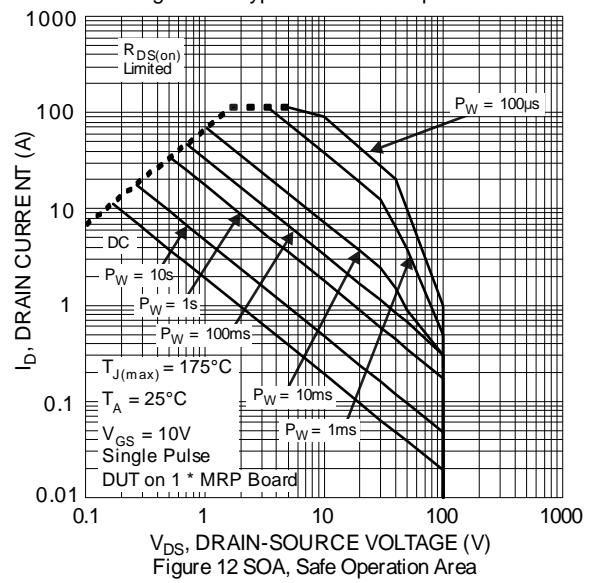
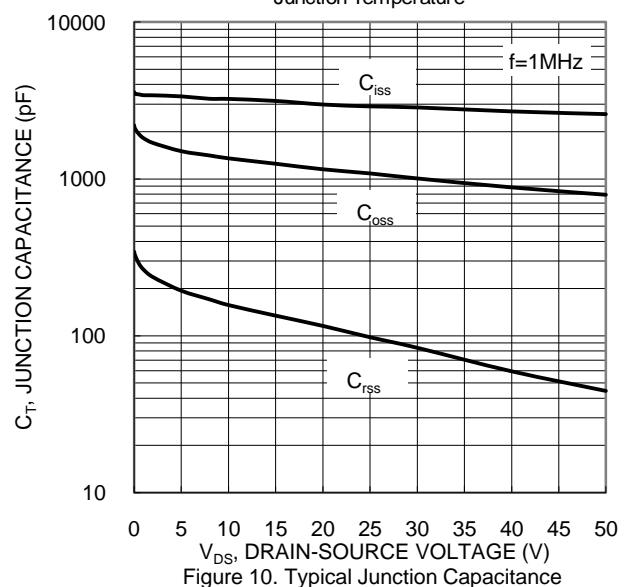
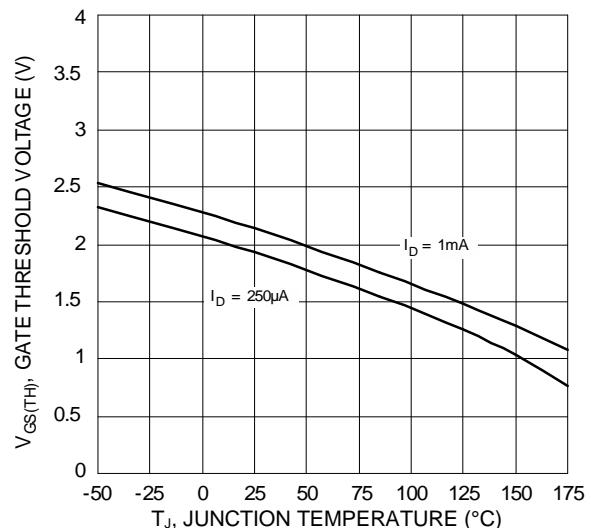
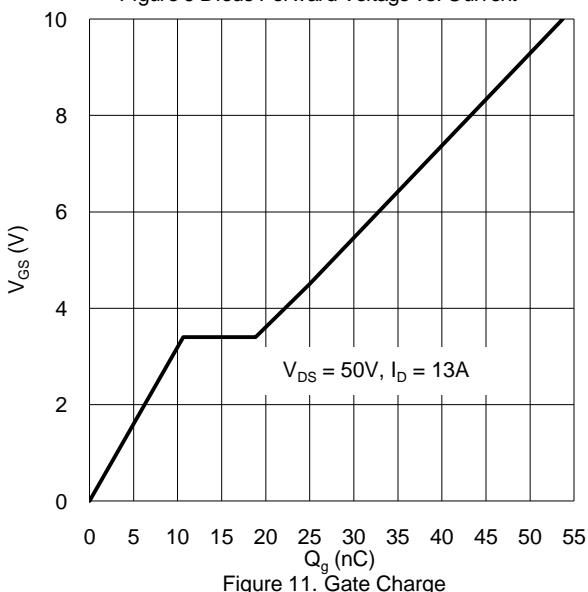
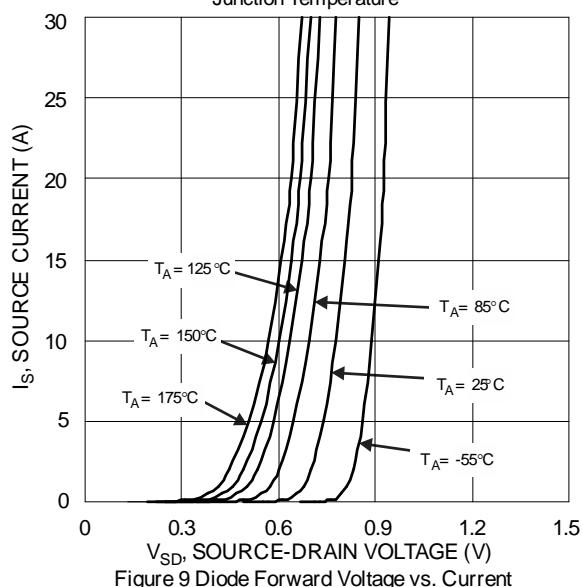
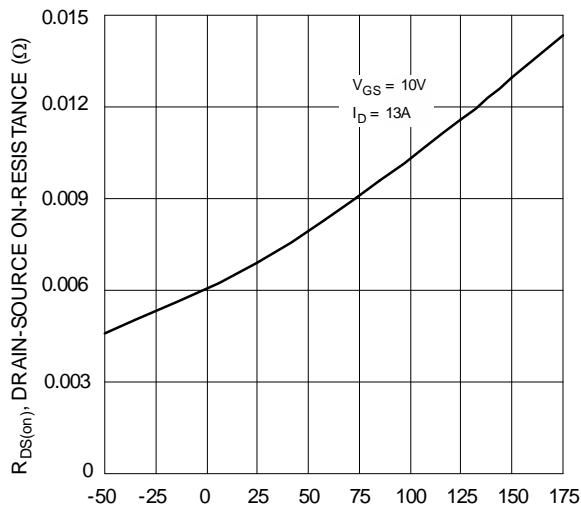


Figure 6 On-Resistance Variation with  
Junction Temperature



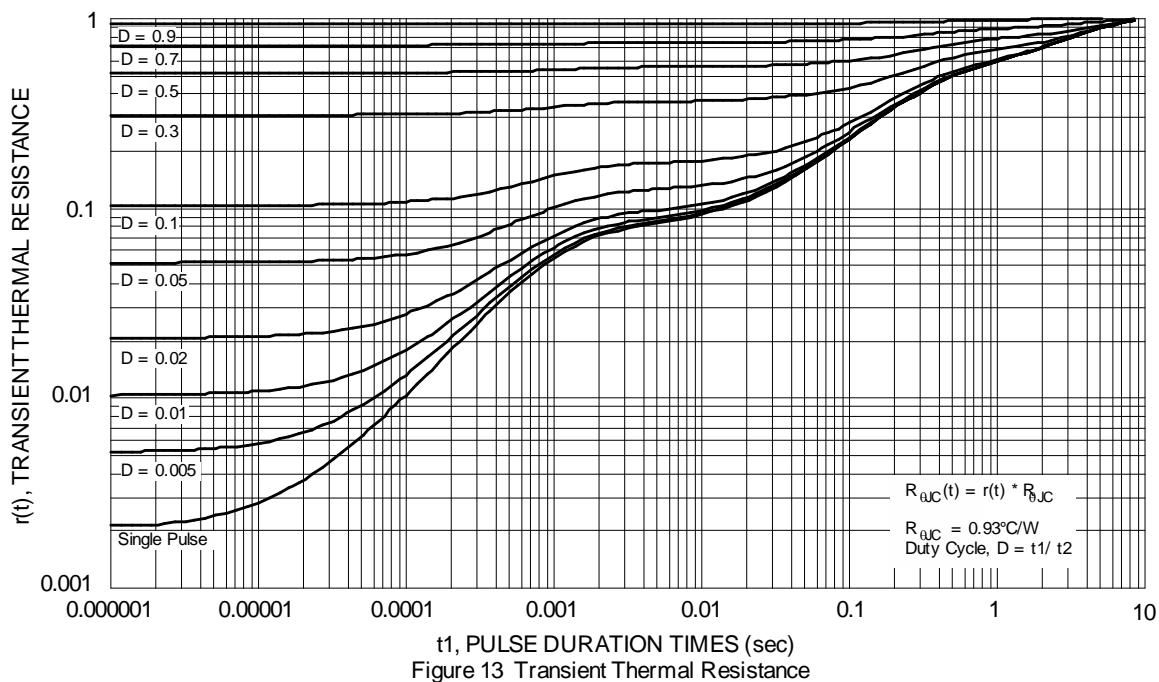
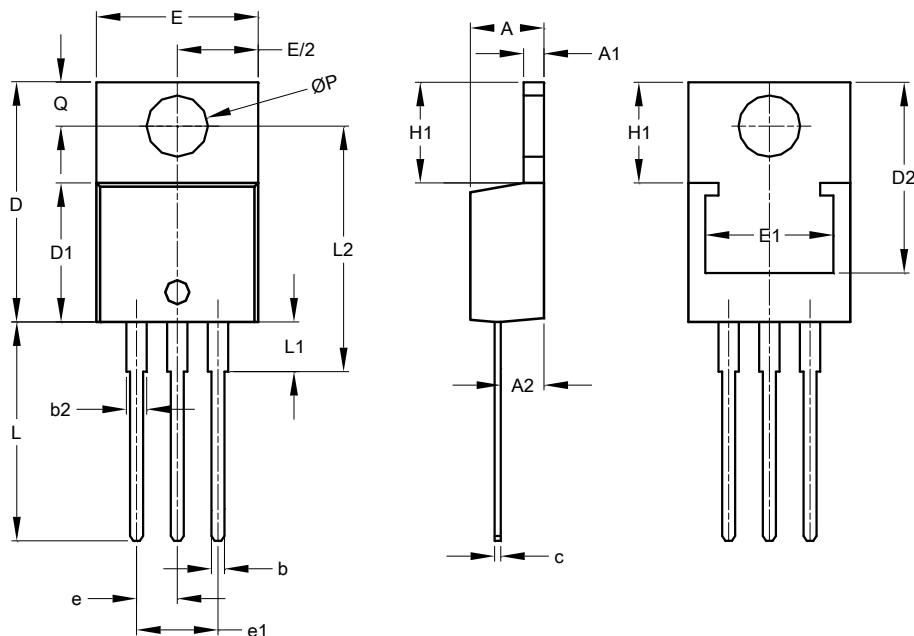


Figure 13 Transient Thermal Resistance

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

TO220AB



TO220AB			
Dim	Min	Max	Typ
<b>A</b>	3.56	4.82	-
<b>A1</b>	0.51	1.39	-
<b>A2</b>	2.04	2.92	-
<b>b</b>	0.39	1.01	0.81
<b>b2</b>	1.15	1.77	1.24
<b>c</b>	0.356	0.61	-
<b>D</b>	14.22	16.51	-
<b>D1</b>	8.39	9.01	-
<b>D2</b>	11.45	12.87	-
<b>e</b>	-	-	2.54
<b>e1</b>	-	-	5.08
<b>E</b>	9.66	10.66	-
<b>E1</b>	6.86	8.89	-
<b>H1</b>	5.85	6.85	-
<b>L</b>	12.70	14.73	-
<b>L1</b>	-	6.35	-
<b>L2</b>	15.80	16.20	16.00
<b>P</b>	3.54	4.08	-
<b>Q</b>	2.54	3.42	-

All Dimensions in mm

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