

Product Summary

BV_{DSS}	R_{DS(ON)} MAX	I_D MAX T_C = +25°C
60V	8.0mΩ @ V _{GS} = 10V	130A

Description

This new generation MOSFET is designed to minimize the on-state resistance (R_{DS(ON)}), yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

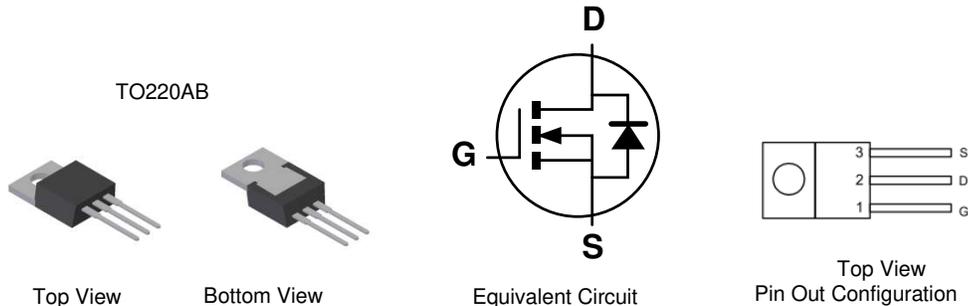
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

Features

- Rated to +175°C—Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching—Ensures More Reliable and Robust End Application
- Low Input Capacitance
- 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**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([DMNH6008SCTQ](#))**

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: 1.85 grams (Approximate)

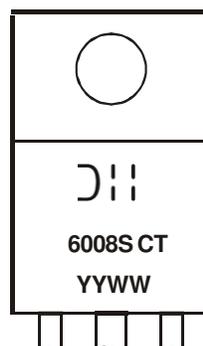


Ordering Information (Note 4)

Part Number	Case	Packaging
DMNH6008SCT	TO220AB	50 Pieces/Tube

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



ⓁⓂ = Manufacturer's Marking
 6008SCT = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 18 = 2018)
 WW = Week (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	20	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	I_D	130	A
Steady State $T_C = +25^\circ\text{C}$		90	
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%) $T_C = +100^\circ\text{C}$	I_{DM}	200	A
Maximum Continuous Body Diode Forward Current (Note 5)	I_S	80	A
Avalanche Current (Note 6) $L=0.1\text{mH}$	I_{AS}	62	A
Avalanche Energy (Note 6) $L=0.1\text{mH}$	E_{AS}	190	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) $T_C = +25^\circ\text{C}$	P_D	210	W
$T_C = +100^\circ\text{C}$		100	
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	0.7	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 48\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 16\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	6.0	8.0	m Ω	$V_{GS} = 10\text{V}, I_D = 20\text{A}$
Diode Forward Voltage	V_{SD}	—	0.7	1.2	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{ISS}	—	2,596	—	pF	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{OSS}	—	437	—		
Reverse Transfer Capacitance	C_{RSS}	—	118	—		
Gate Resistance	R_g	—	2.0	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	40	—	nC	$V_{DD} = 30\text{V}, I_D = 20\text{A}$
Total Gate Charge ($V_{GS} = 4.5\text{V}$)	Q_g	—	21	—		
Gate-Source Charge	Q_{gs}	—	8.3	—		
Gate-Drain Charge	Q_{gd}	—	11.8	—		
Turn-On Delay Time	$t_{D(ON)}$	—	5.7	—	ns	$V_{DD} = 30\text{V}, V_{GS} = 10\text{V},$ $R_g = 1\Omega, I_D = 20\text{A}$
Turn-On Rise Time	t_R	—	5.0	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	15.6	—		
Turn-Off Fall Time	t_F	—	3.4	—		
Reverse Recovery Time	t_{RR}	—	33	—	ns	$I_F = 20\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{RR}	—	33	—	nC	

- Notes:
- Device mounted on an infinite heatsink.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep $T_J = +25^\circ\text{C}$.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

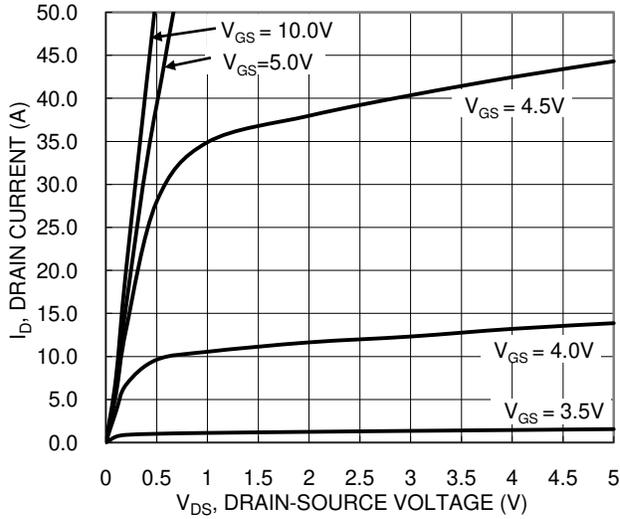


Figure 1. Typical Output Characteristic

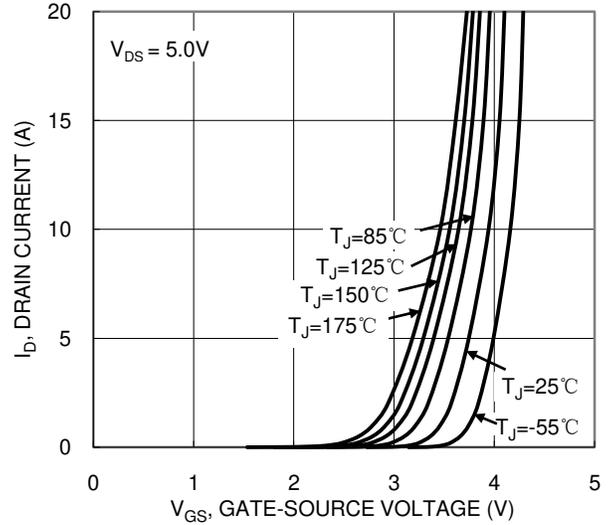


Figure 2. Typical Transfer Characteristic

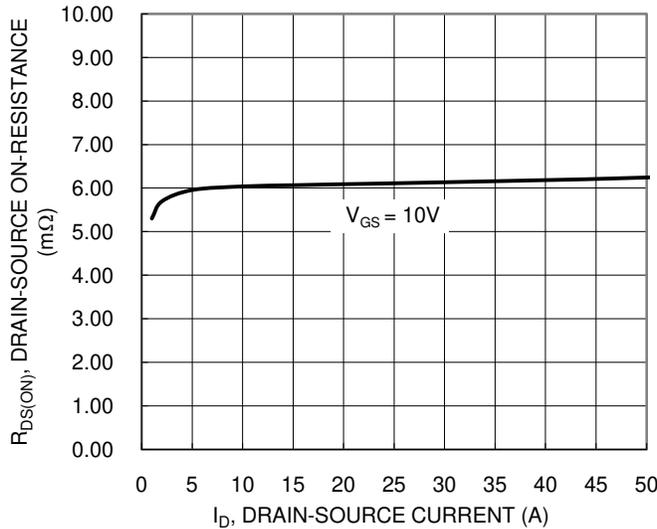


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

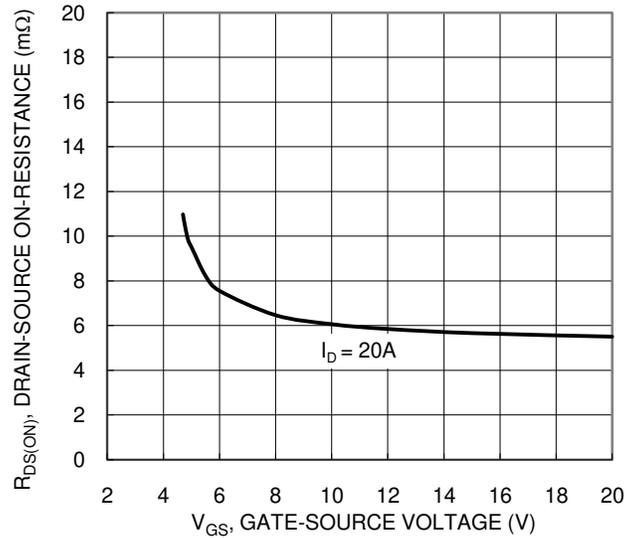


Figure 4. Typical Transfer Characteristic

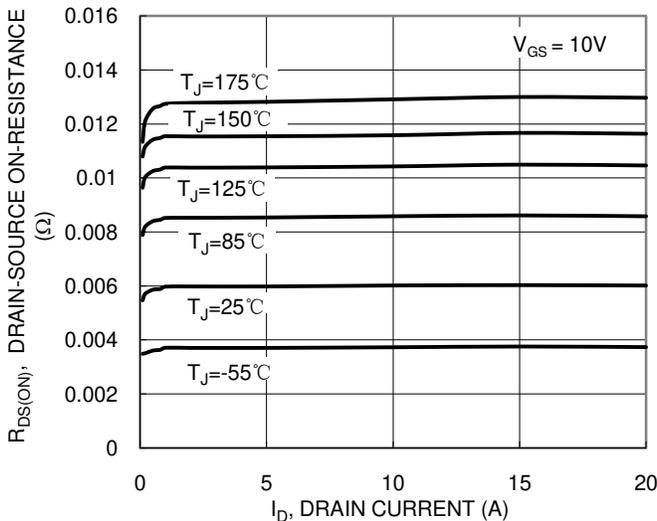


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

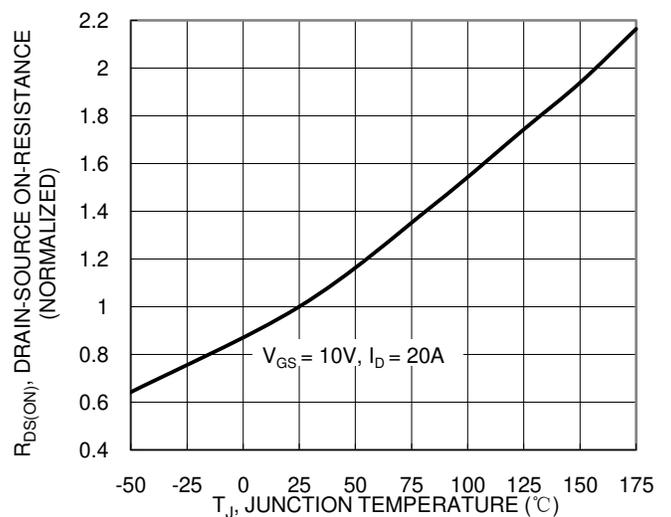


Figure 6. On-Resistance Variation with Temperature

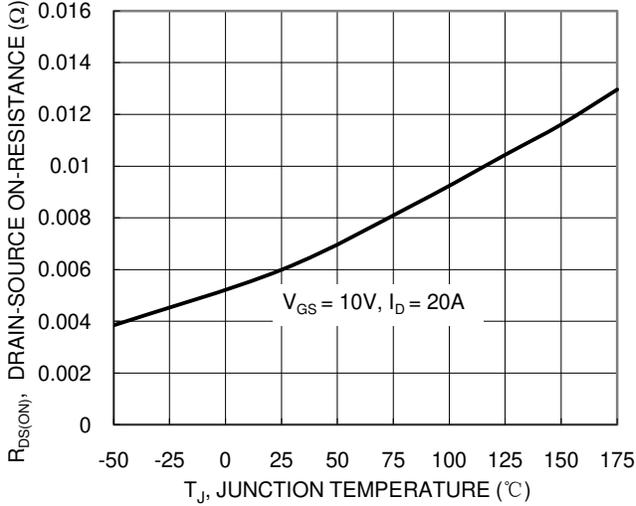


Figure 7. On-Resistance Variation with Temperature

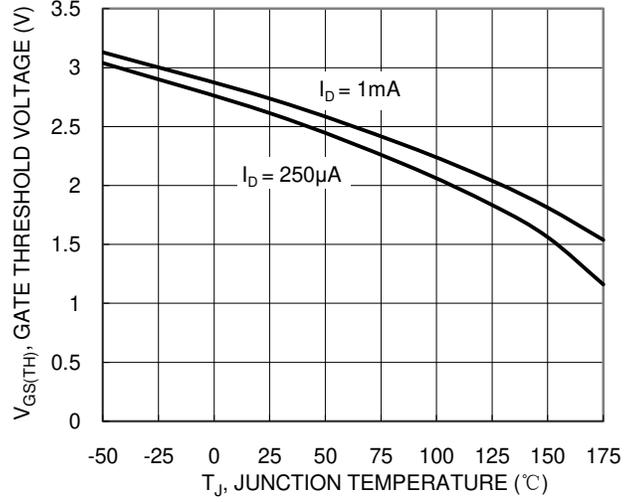


Figure 8. Gate Threshold Variation vs. Junction Temperature

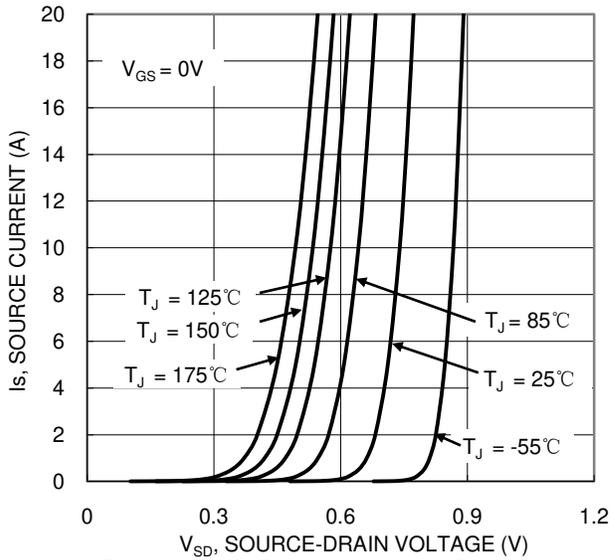


Figure 9. Diode Forward Voltage vs. Current

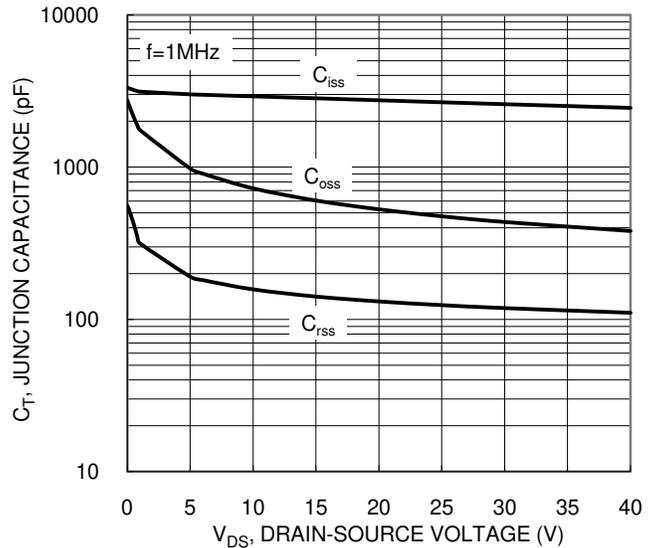


Figure 10. Typical Junction Capacitance

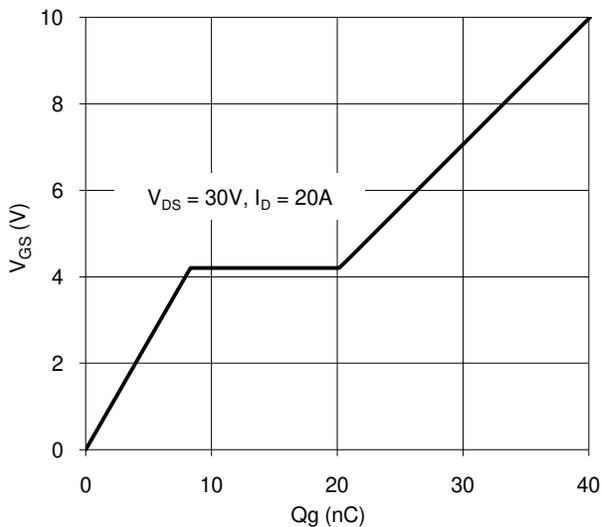


Figure 11. Gate Charge

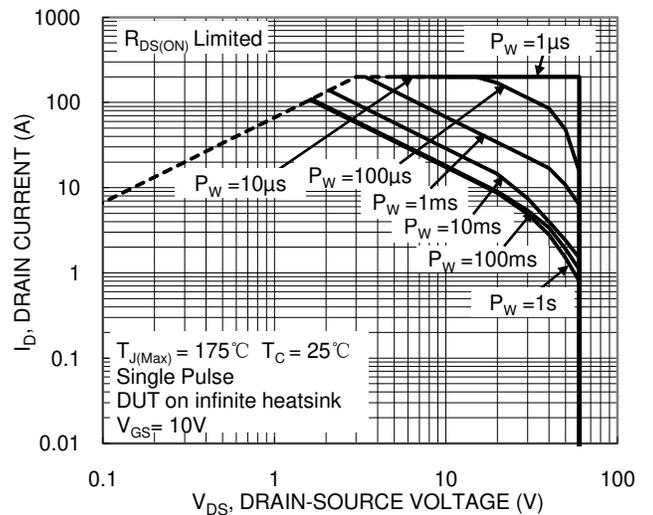


Figure 12. SOA, Safe Operation Area

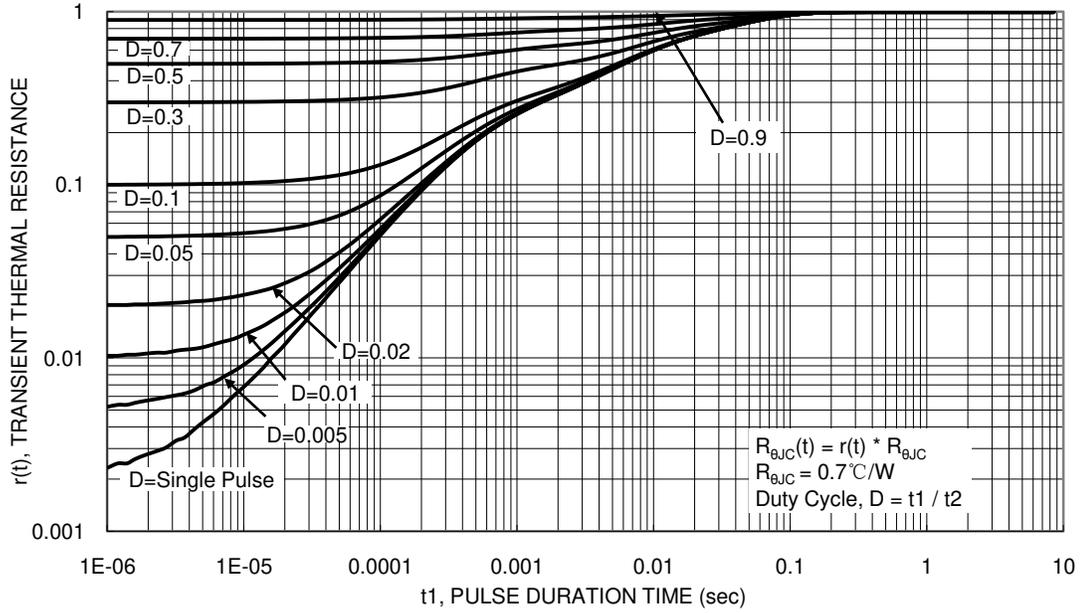
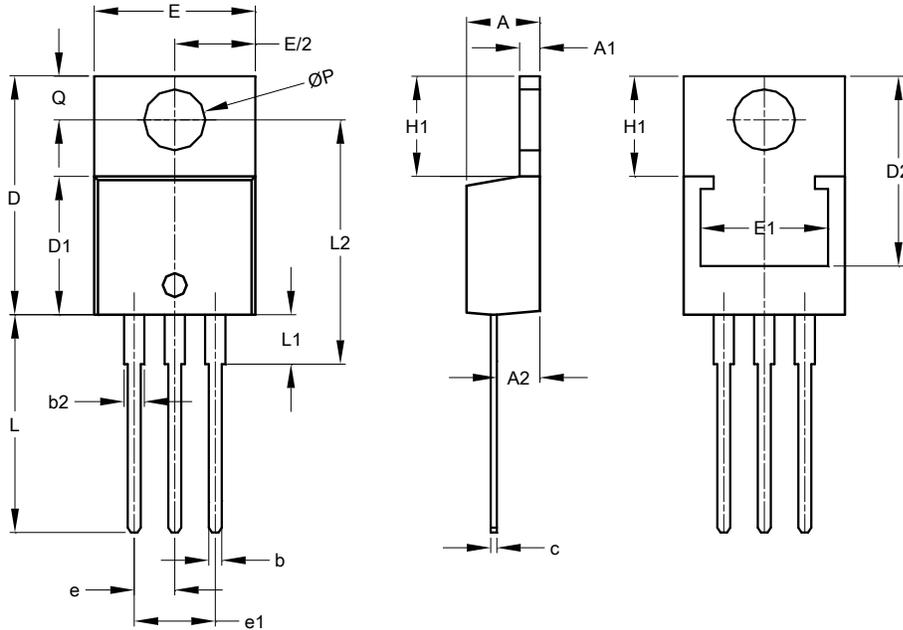


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

TO220AB



TO220AB			
Dim	Min	Max	Typ
A	3.56	4.82	—
A1	0.51	1.39	—
A2	2.04	2.92	—
b	0.39	1.01	0.81
b2	1.15	1.77	1.24
c	0.356	0.61	—
D	14.22	16.51	—
D1	8.39	9.01	—
D2	11.45	12.87	—
e	—	—	2.54
e1	—	—	5.08
E	9.66	10.66	—
E1	6.86	8.89	—
H1	5.85	6.85	—
L	12.70	14.73	—
L1	—	4.42	—
L2	15.80	17.51	16.00
P	3.54	4.08	—
Q	2.54	3.42	—
All Dimensions in mm			

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