

Product Summary

BV_{DSS}	R_{DS(ON)}	I_D T_C = +25°C
100V	5mΩ @V _{GS} = 10V	140A

Description

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

Applications

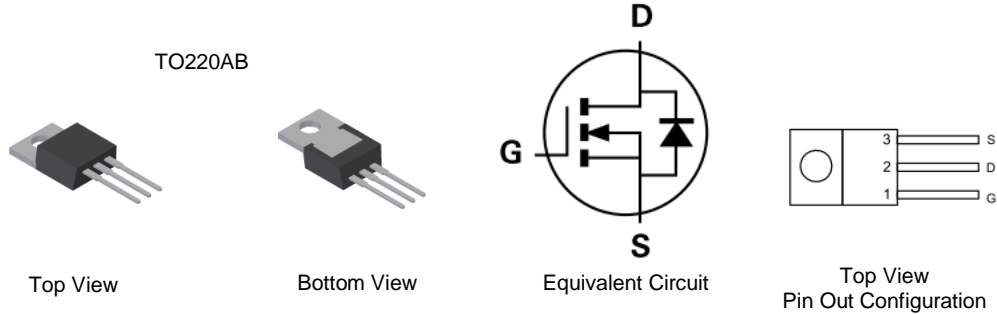
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

Features

- Rated to +175°C – Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching – Ensures More Reliable and Robust End Application
- Low Input Capacitance
- High 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)**

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
DMTH10H005SCT	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 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
- TH1H005S = Product Type Marking Code
- YYWW = Date Code Marking
- YY or YY = Last Two Digits of Year (ex: 17 = 2017)
- WW or WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	100	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current	I _D	140 99	A
		T _C = +25°C T _C = +100°C	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	400	A
Maximum Continuous Body Diode Forward Current	I _S	100	A
		T _C = +25°C	
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)	I _{SM}	400	A
Avalanche Current, L = 3mH (Note 7)	I _{AS}	19	A
Avalanche Energy, L = 3mH (Note 7)	E _{AS}	542	mJ
Avalanche Current, L = 0.1mH	I _{AS}	25	A
Avalanche Energy, L = 0.1mH	E _{AS}	31.2	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	2.9	W
		T _A = +25°C	
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	51	°C/W
Total Power Dissipation	P _D	187	W
		T _C = +25°C	
Thermal Resistance, Junction to Case	R _{θJC}	0.8	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	100	—	—	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 80V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(TH)}	2	—	4	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	3.8	5	mΩ	V _{GS} = 10V, I _D = 13A
Diode Forward Voltage	V _{SD}	—	—	1.3	V	V _{GS} = 0V, I _S = 13A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{ISS}	—	8,474	—	pF	V _{DS} = 50V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{OSS}	—	1,608	—		
Reverse Transfer Capacitance	C _{RSS}	—	78	—		
Gate Resistance	R _g	—	0.41	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _G	—	111.7	—	nC	V _{DD} = 50V, I _D = 13A, V _{GS} = 10V
Gate-Source Charge	Q _{GS}	—	28.9	—		
Gate-Drain Charge	Q _{GD}	—	21.3	—		
Turn-On Delay Time	t _{D(ON)}	—	29.9	—	ns	V _{DD} = 50V, V _{GS} = 10V, I _D = 13A, R _g = 6Ω
Turn-On Rise Time	t _r	—	30.3	—		
Turn-Off Delay Time	t _{D(OFF)}	—	79.7	—		
Turn-Off Fall Time	t _f	—	41.6	—		
Reverse Recovery Time	t _{RR}	—	70	—	ns	I _F = 13A, di/dt = 100A/µs
Reverse Recovery Charge	Q _{RR}	—	181	—	nC	

- 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.

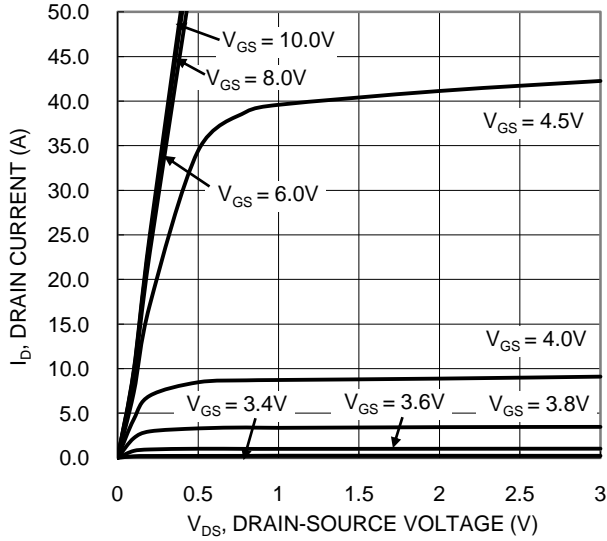


Figure 1. Typical Output Characteristic

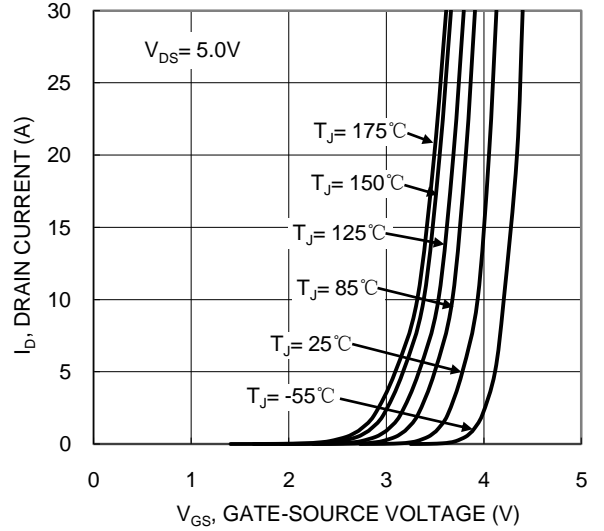


Figure 2. Typical Transfer Characteristic

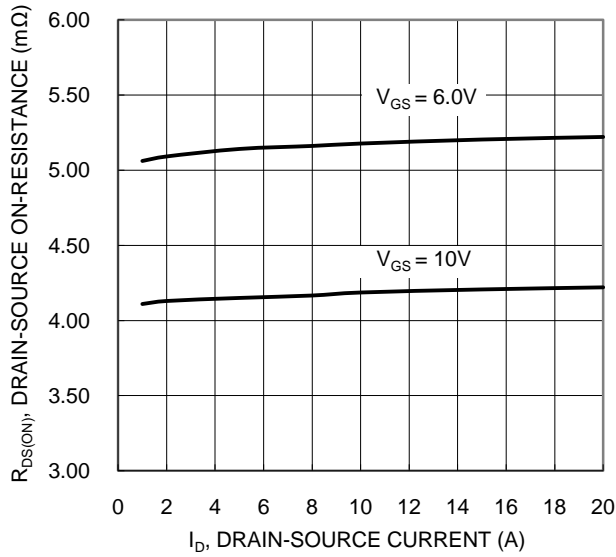


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

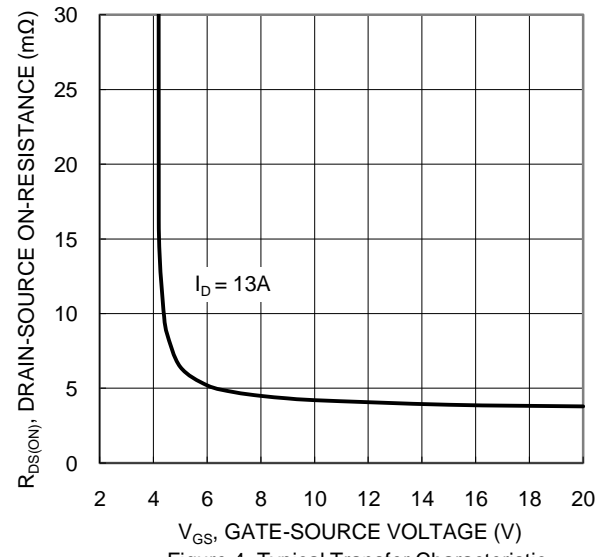


Figure 4. Typical Transfer Characteristic

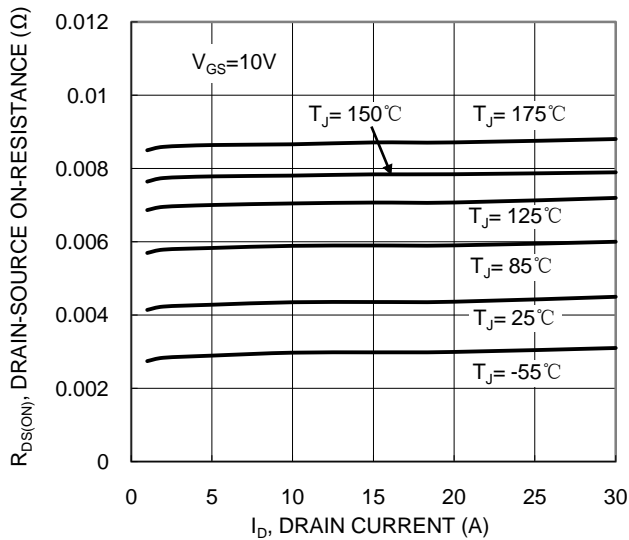


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

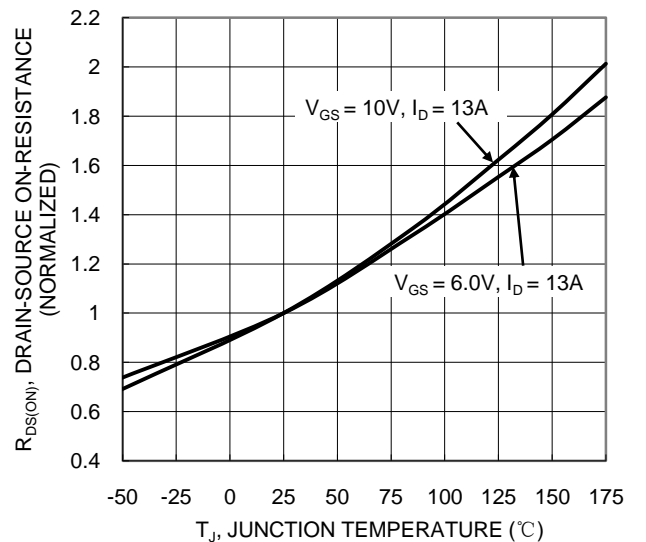


Figure 6. On-Resistance Variation with Temperature

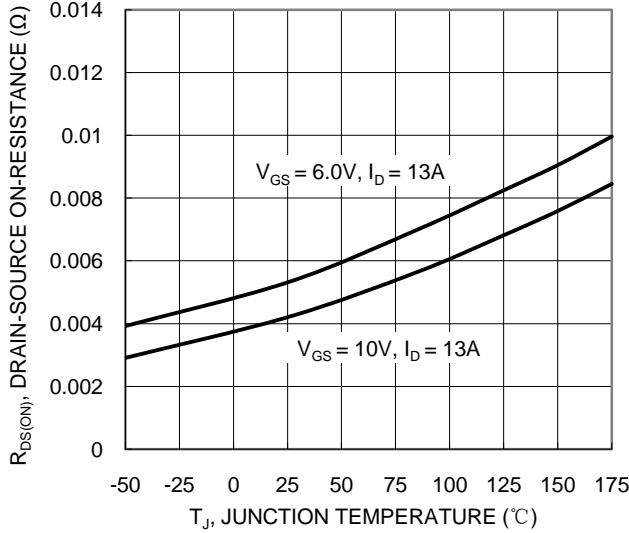


Figure 7. On-Resistance Variation with Temperature

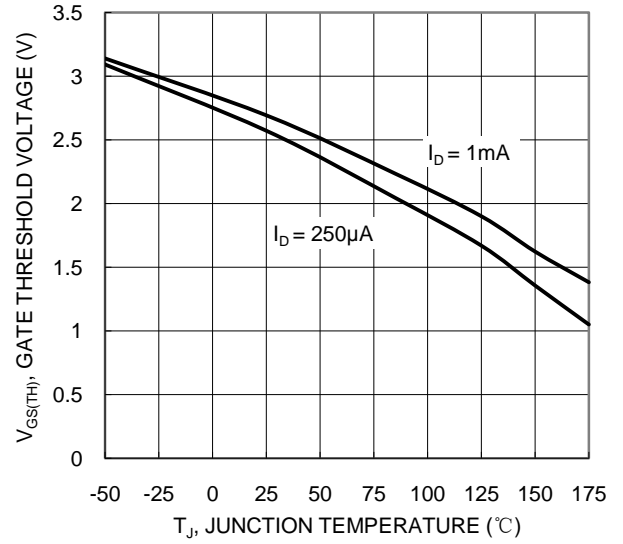


Figure 8. Gate Threshold Variation vs. Temperature

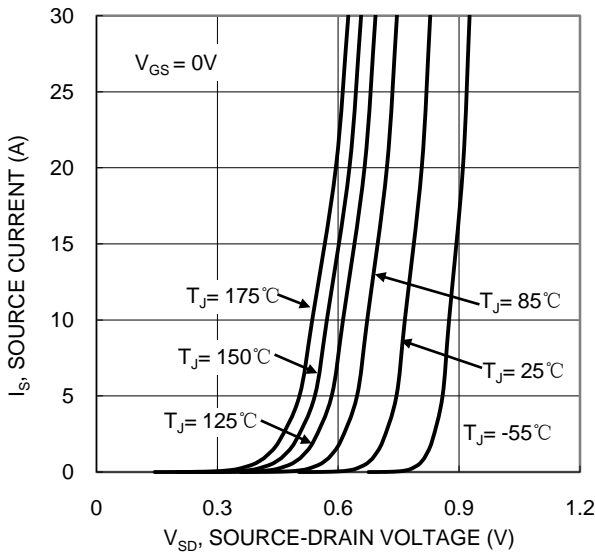


Figure 9. Diode Forward Voltage vs. Current

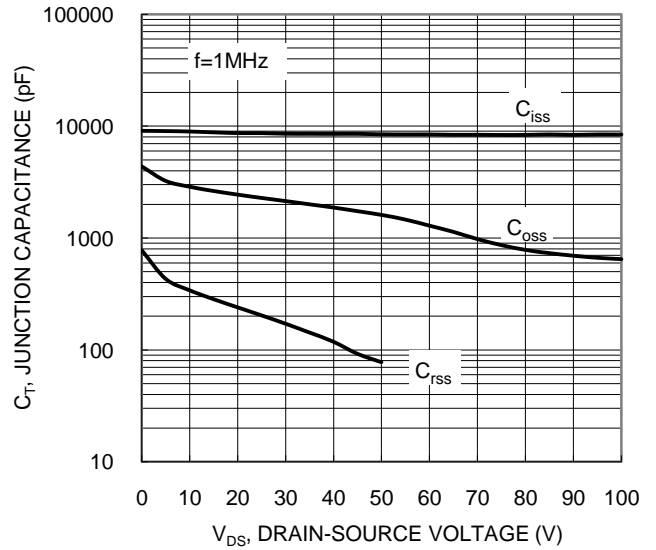


Figure 10. Typical Junction Capacitance

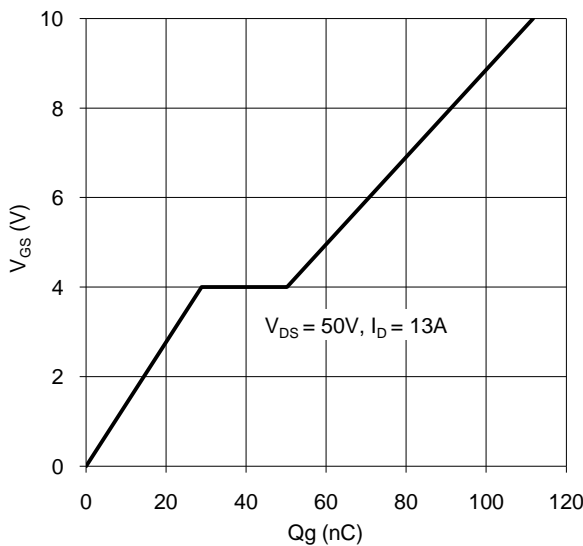


Figure 11. Gate Charge

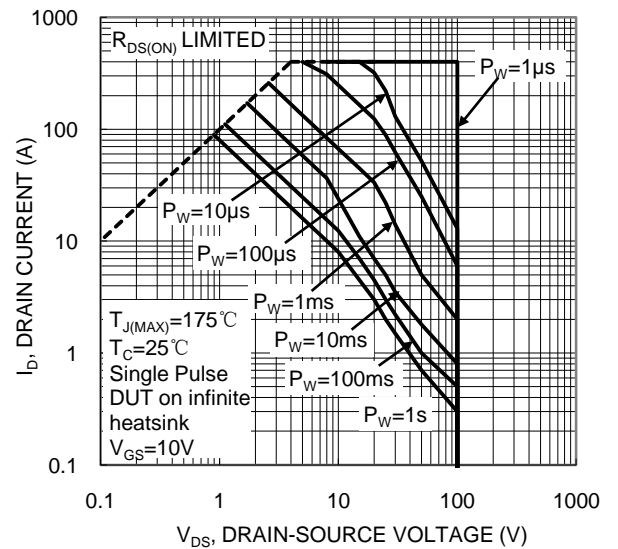


Figure 12. SOA, Safe Operation Area

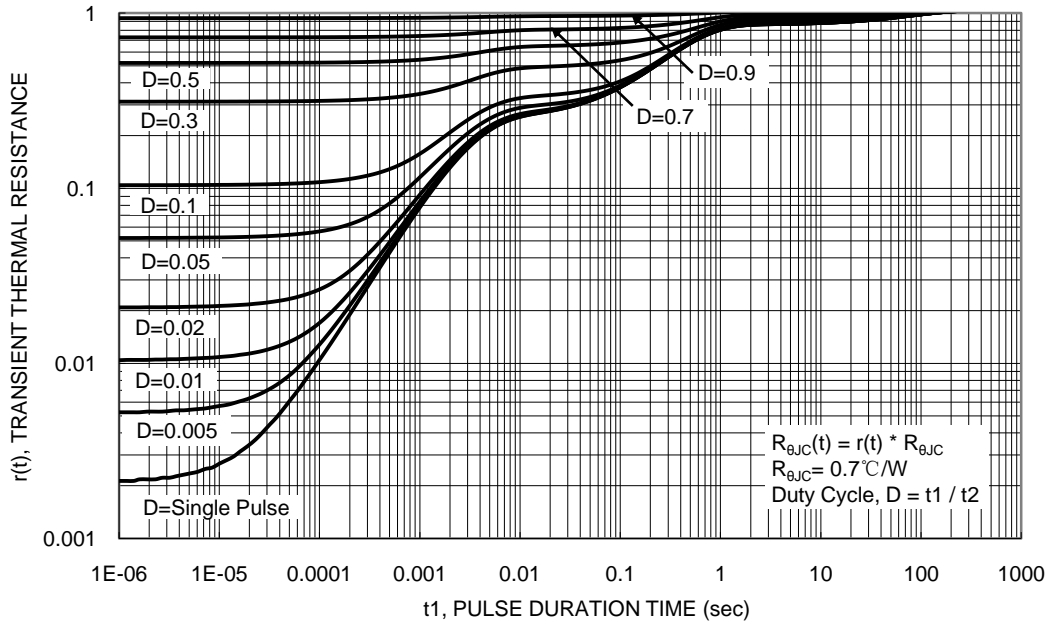
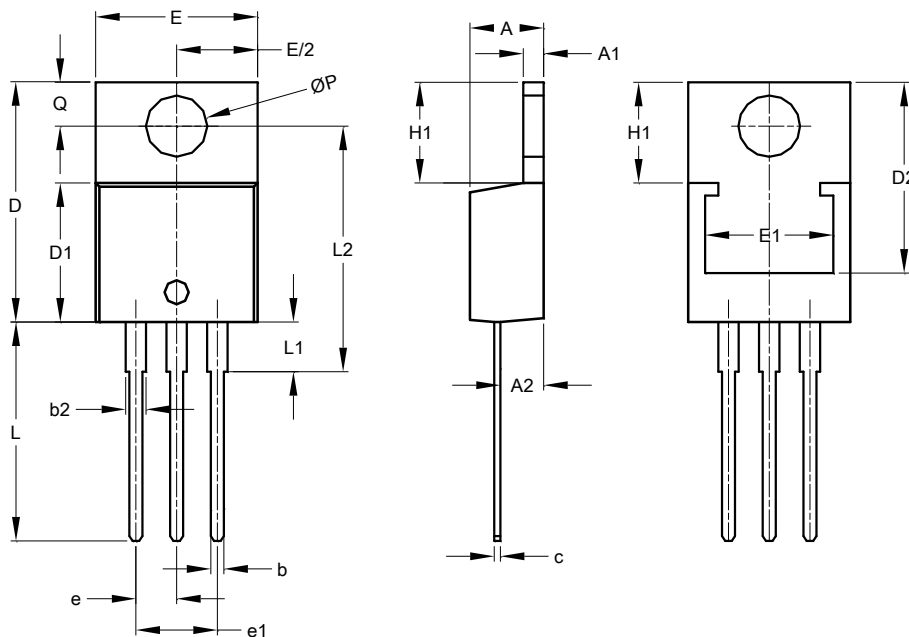


Figure 13. Transient Thermal Resistance

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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