

Product Summary

BV _{DSS}	R _{DS(ON)}	I _D T _C = +25°C
600V	0.75Ω@V _{GS} = 10V	12A

Features and Benefits

- 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)**
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.
<https://www.diodes.com/quality/product-definitions/>

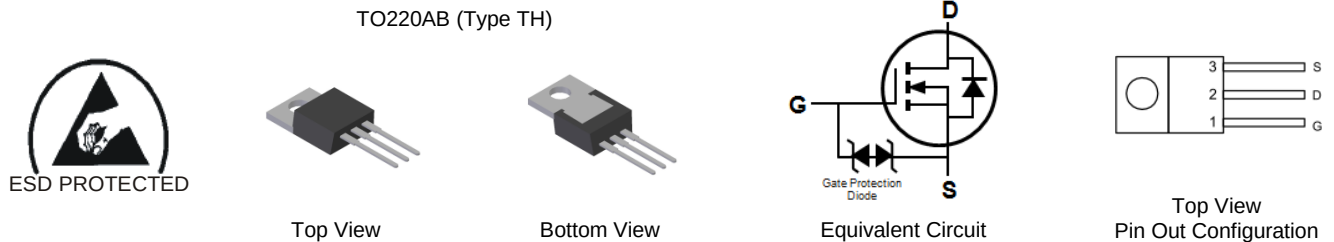
Description and Applications

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

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

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)

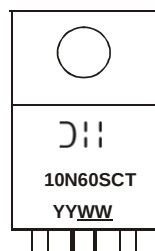


Ordering Information (Note 4)

Part Number	Case	Packaging
DMG10N60SCT	TO220AB (Type TH)	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



D = Manufacturer's Marking
 10N60SCT = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 20 = 2020)
 WW = Week Code (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	600	V
Gate-Source Voltage			V _{GSS}	±30	V
Continuous Drain Current (Note 5) V _{GS} = 10V	Steady State	T _C = +25°C T _C = +100°C	I _D	12 7.9	A
Continuous Drain Current (Note 5) V _{GS} = 10V	Steady State	T _A = +25°C	I _D	1.5	A
Maximum Body Diode Forward Current (Note 5)			I _S	12	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I _{DM}	15	A
Avalanche Current, L = 60mH (Note 6)			I _{AS}	4.3	A
Avalanche Energy, L = 60mH (Note 6)			E _{AS}	550	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _C = +25°C	P _D	178	W
	T _C = +100°C		71	
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	2.5	W
Thermal Resistance, Junction to Ambient (Note 5)		R _{θJA}	49	°C/W
Thermal Resistance, Junction to Case (Note 5)		R _{θJC}	0.7	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	600	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 600V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	10	μA	V _{GS} = ±24V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	2	3.2	4	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	0.6	0.75	Ω	V _{GS} = 10V, I _D = 5A
Diode Forward Voltage	V _{SD}	—	—	1	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 6)						
Input Capacitance	C _{iss}	—	1587	—	pF	V _{DS} = 25V, f = 1.0MHz, V _{GS} = 0
Output Capacitance	C _{oss}	—	149	—		
Reverse Transfer Capacitance	C _{rss}	—	10	—		
Gate Resistance	R _G	—	1.5	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	35	—	nC	V _{DS} = 480V, I _D = 10A, V _{GS} = 10V
Gate-Source Charge	Q _{gs}	—	6	—		
Gate-Drain Charge	Q _{gd}	—	13	—		
Turn-On Delay Time	t _{D(ON)}	—	25	—	ns	V _{DS} = 300V, R _G = 25Ω, I _D = 10A, V _{GS} = 10V
Turn-On Rise Time	t _R	—	45	—		
Turn-Off Delay Time	t _{D(OFF)}	—	97	—		
Turn-Off Fall Time	t _F	—	48	—		
Body Diode Reverse Recovery Time	t _{RR}	—	319	—	ns	V _{DS} = 100V, I _F = 10A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	3.5	—	μC	

Notes: 5. Device mounted on an infinite heatsink.
6. Guaranteed by design. Not subject to production testing.
7. Short duration pulse test used to minimize self-heating effect.

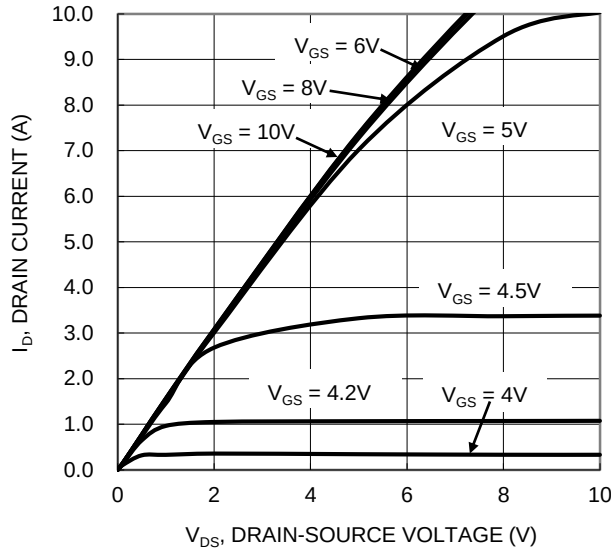


Figure 1. Typical Output Characteristic

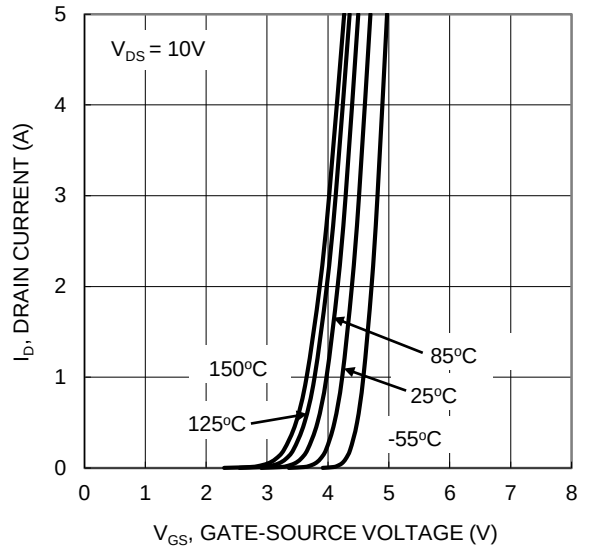


Figure 2. Typical Transfer Characteristic

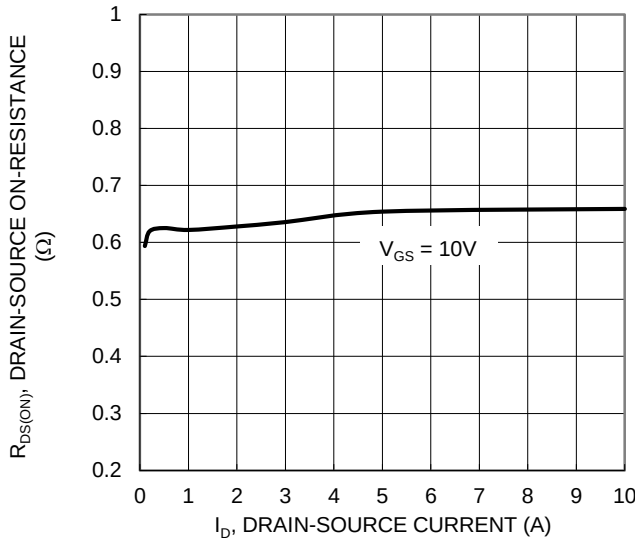


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

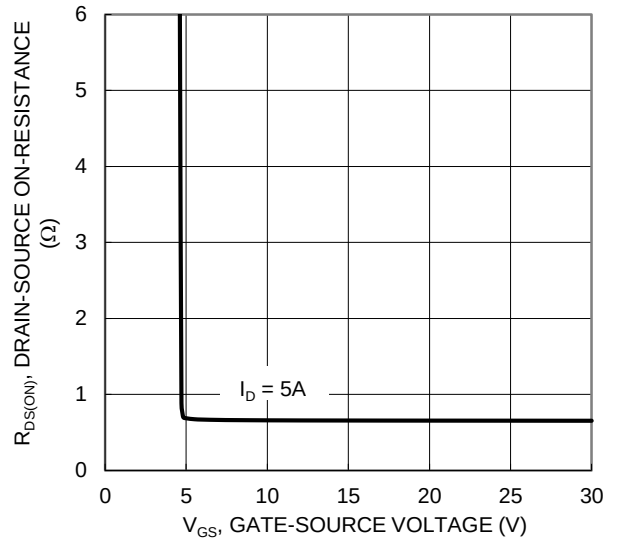


Figure 4. Typical Transfer Characteristic

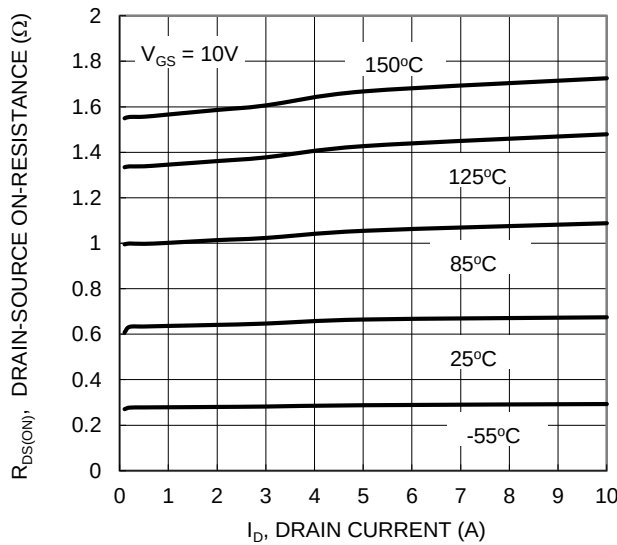


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

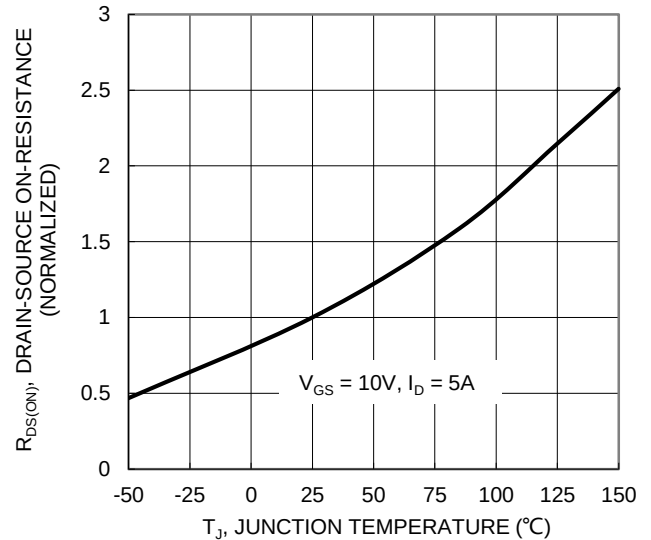
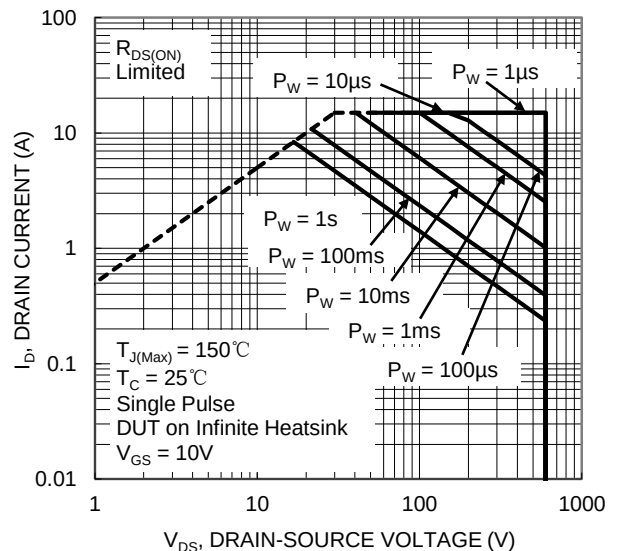
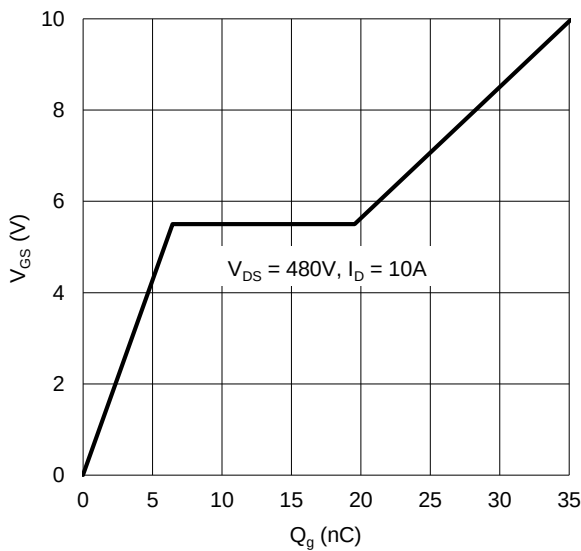
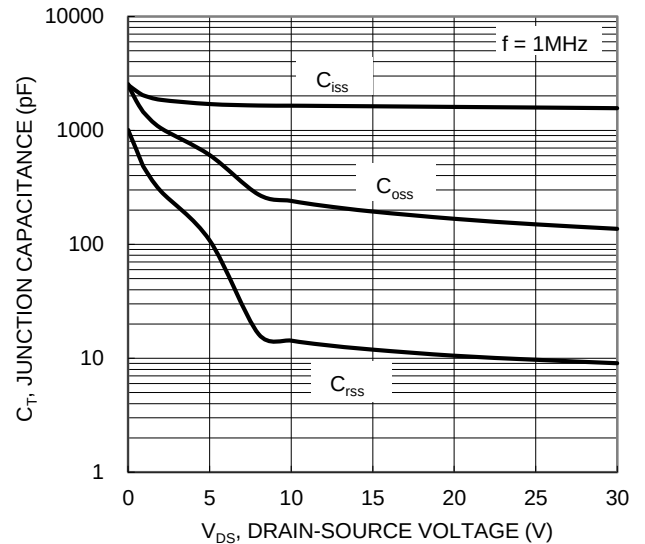
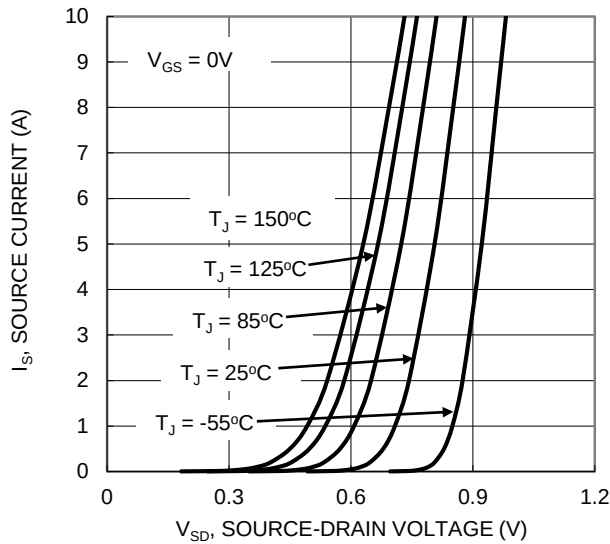
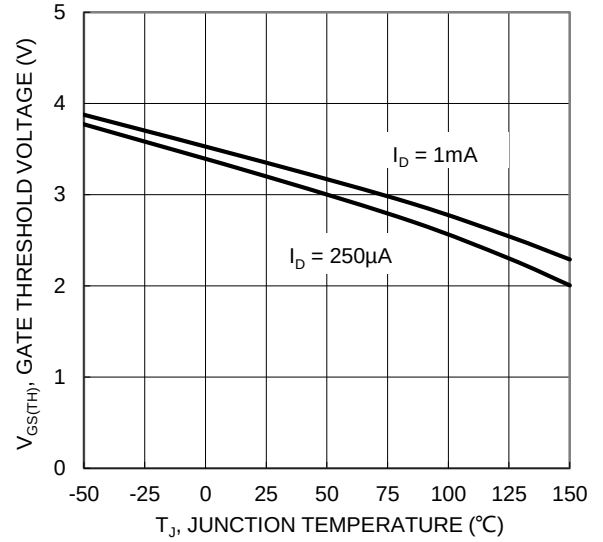
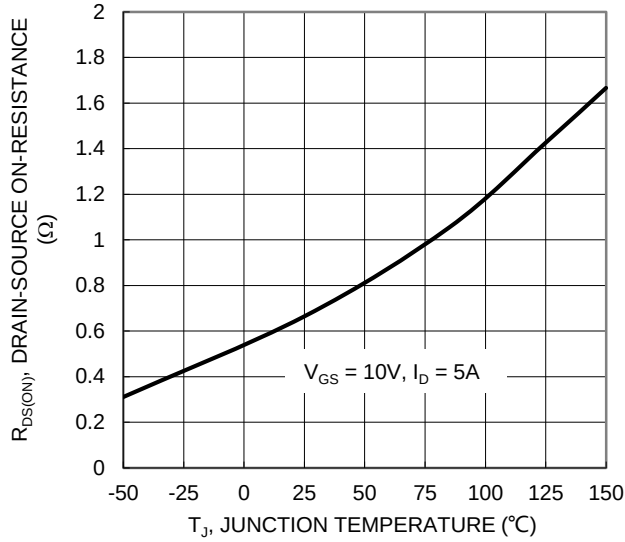


Figure 6. On-Resistance Variation with Junction Temperature



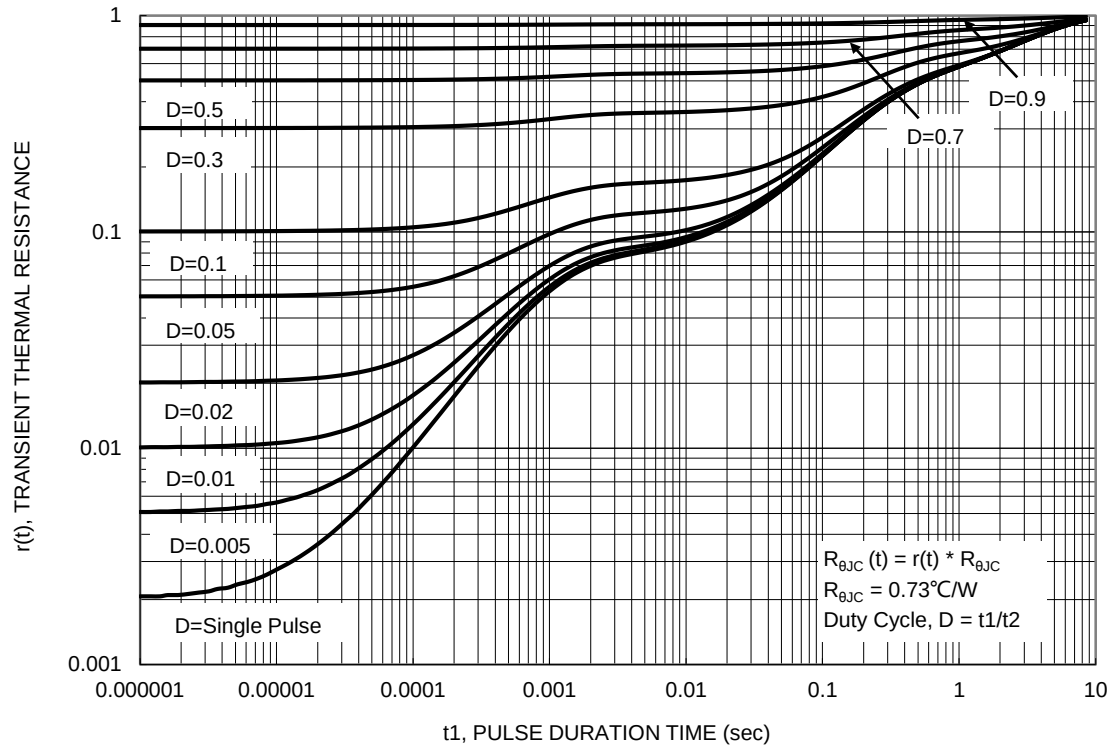
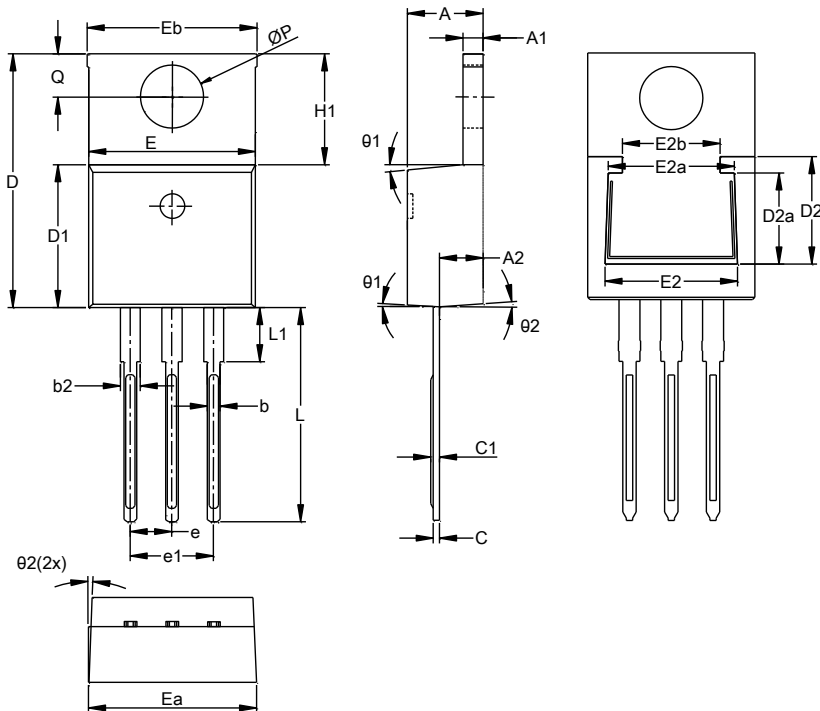


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

TO220AB (Type TH)



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Dim	Min	Max	Typ
A	4.27	4.87	4.57
A1	1.12	1.42	1.27
A2	2.39	2.99	2.69
b	0.70	1.01	0.81
b2	1.17	1.50	1.27
c	0.30	0.53	0.38
c1	0.38	0.72	0.56
D	14.60	15.40	15.00
D1	8.40	9.00	8.70
D2	5.33	6.63	6.33
D2a	4.54	5.84	5.54
e	2.54 BSC		
e1	5.08 BSC		
E	9.88	10.50	10.16
Ea	9.90	10.45	10.10
Eb	9.90	10.65	10.25
E2	7.06	8.36	8.06
E2a	6.67	7.97	7.67
E2b	4.94	6.24	5.94
H1	5.70	6.65	6.30
L	13.00	13.80	13.40
L1	-	4.10	3.75
Q	2.50	2.99	2.74
ϕP	3.70	3.99	3.84
θ_1	4°	10°	7°
θ_2	0°	6°	3°
All Dimensions in mm			

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