

Product Summary

BV _{DSS}	R _{DSON} Max	I _D T _C = +25°C
60V	6mΩ @ V _{GS} = 10V	100A
	10mΩ @ V _{GS} = 4.5V	85A

Description and Applications

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

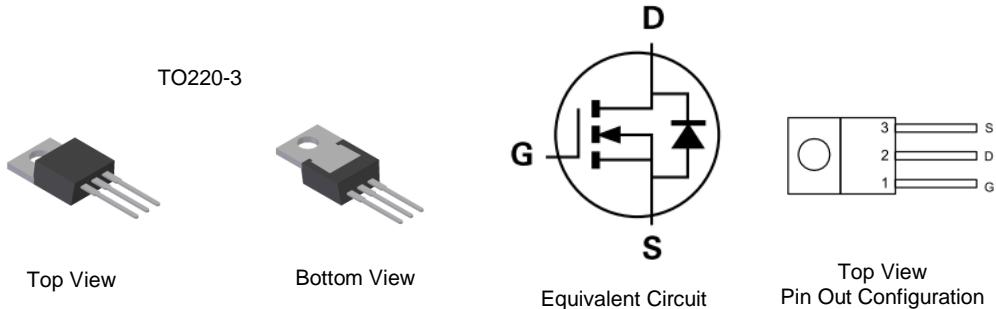
- Engine Management Systems
- Body Control Electronics
- DC-DC Converters

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**

Mechanical Data

- Case: TO220-3
- 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)



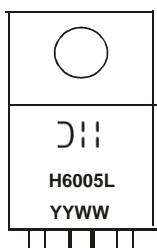
Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH6005LCT	TO220-3	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 <http://www.diodes.com/products/packages.html>.

Marking Information



DII = Manufacturer's Marking
H6005L = Product Type Marking Code
YYWW = Date Code Marking
YY or YY = Last Two Digits of Year (ex: 16 = 2016)
WW or WW = Week Code (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 6)	$T_C = +25^\circ\text{C}$ $T_C = +100^\circ\text{C}$	I_D	100 78	A
Maximum Continuous Body Diode Forward Current (Note 6)	$T_C = +25^\circ\text{C}$	I_S	100	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)	I_{DM}	160	A	
Avalanche Current, L=1mH	I_{AS}	14.8	A	
Avalanche Energy, L=1mH	E_{AS}	98	mJ	

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	2.8	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	52.8	°C/W
Total Power Dissipation (Note 6)	P_D	125	W
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	1.2	°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
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$
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	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	—	3	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	4.5	6	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$
		—	8.8	10	$\text{m}\Omega$	$V_{GS} = 4.5\text{V}, I_D = 12.5\text{A}$
Diode Forward Voltage	V_{SD}	—	—	1.2	V	$V_{GS} = 0\text{V}, I_S = 20\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	2962	—	pF	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	965.2	—		
Reverse Transfer Capacitance	C_{rss}	—	59.8	—		
Gate Resistance	R_g	—	0.66	—	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_g	—	47.1	—	nC	$V_{DD} = 30\text{V}, I_D = 50\text{A}$
Total Gate Charge ($V_{GS} = 4.5\text{V}$)	Q_g	—	23.1	—		
Gate-Source Charge	Q_{gs}	—	10.2	—		
Gate-Drain Charge	Q_{gd}	—	12.5	—		
Turn-On Delay Time	$t_{D(ON)}$	—	8.3	—	ns	$V_{DD} = 30\text{V}, V_{GS} = 10\text{V}, I_D = 30\text{A}, R_g = 3.3\Omega$
Turn-On Rise Time	t_R	—	9.4	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	22	—		
Turn-Off Fall Time	t_F	—	8.9	—		
Reverse Recovery Time	t_{RR}	—	40.4	—	ns	$I_F = 30\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{RR}	—	49.7	—	nC	

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

6. Device mounted on infinite heat sink.

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

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

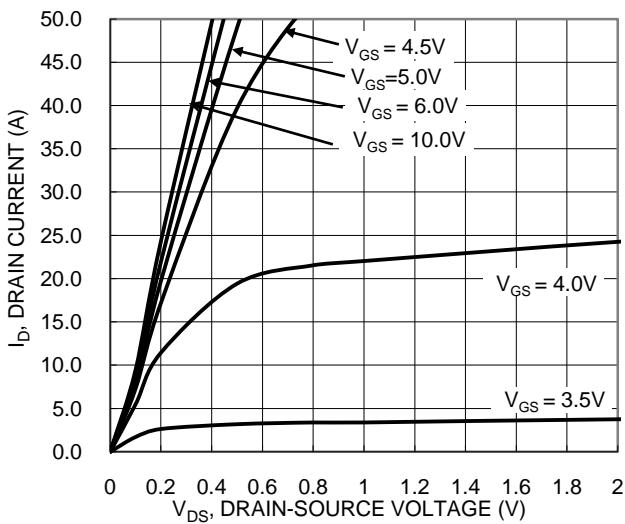


Figure 1. Typical Output Characteristic

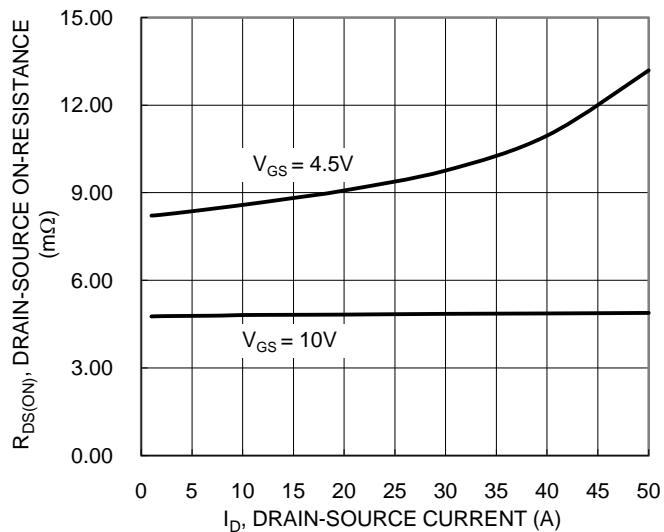


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

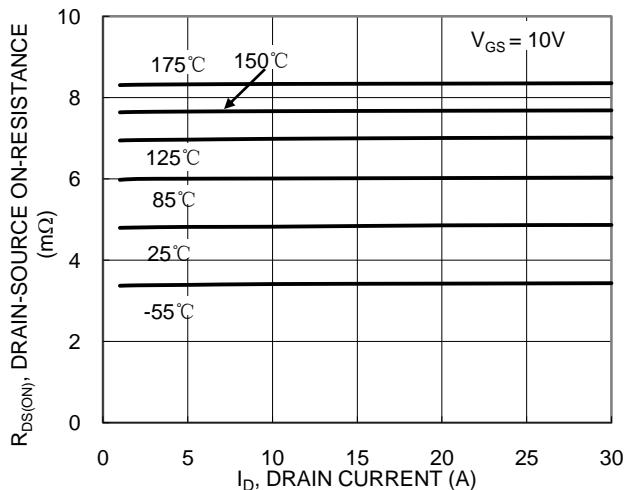


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

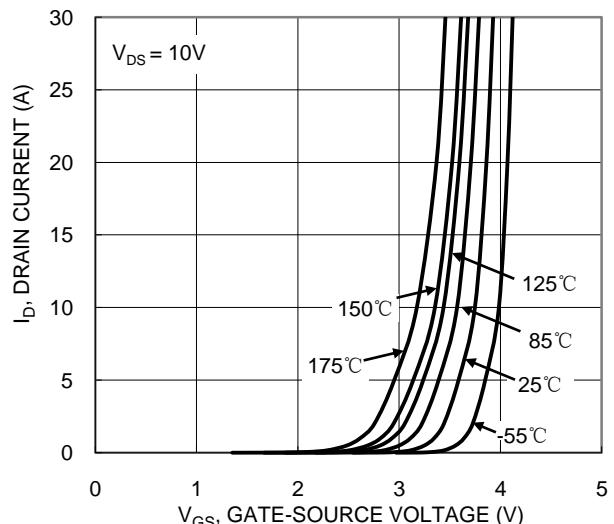


Figure 2. Typical Transfer Characteristic

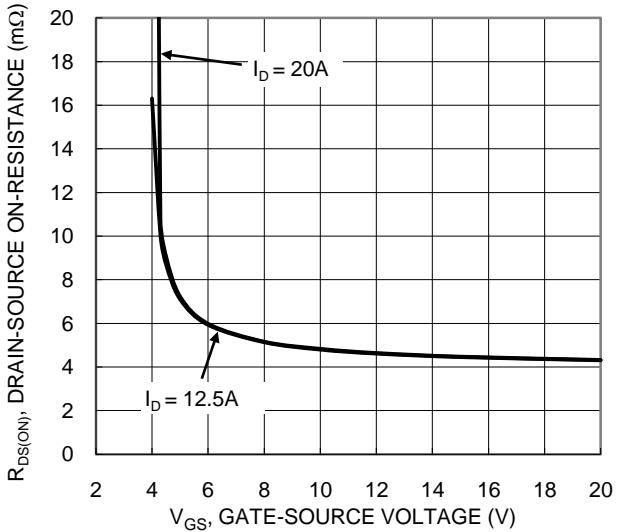


Figure 4. Typical Transfer Characteristic

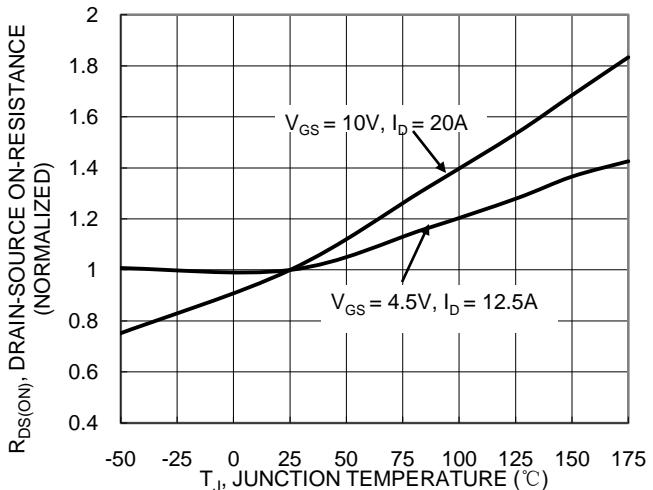
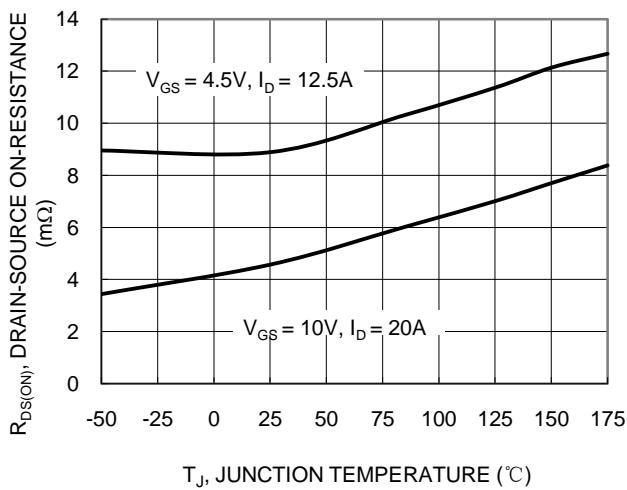
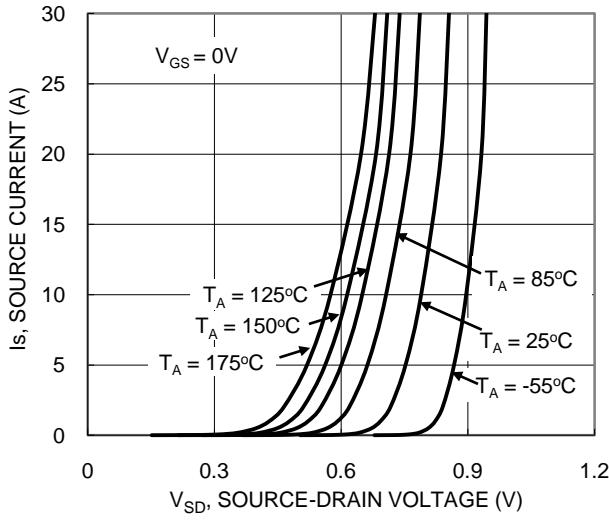


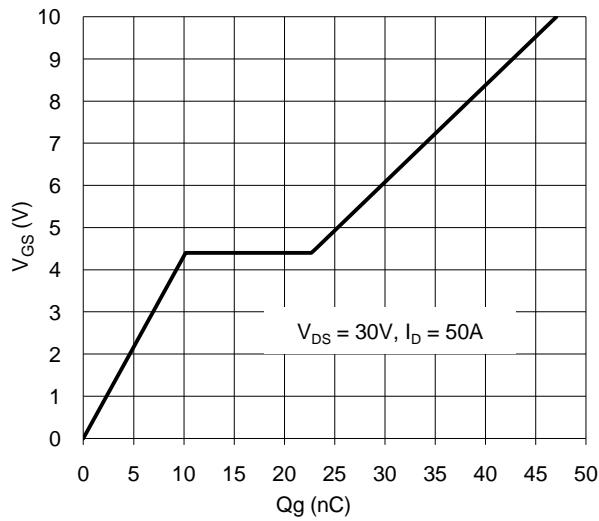
Figure 6. On-Resistance Variation with Temperature



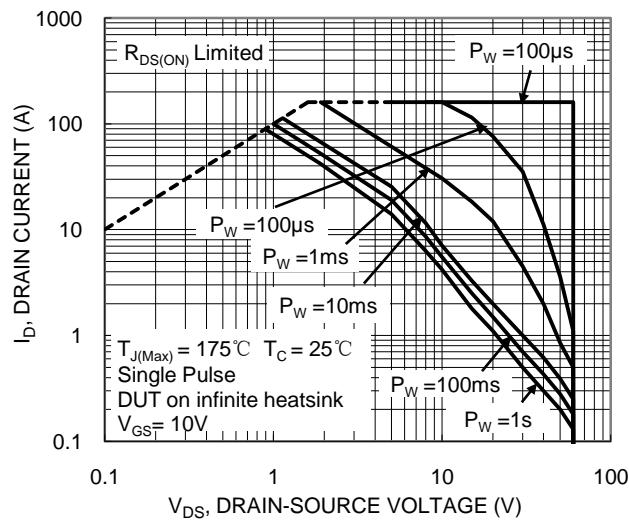
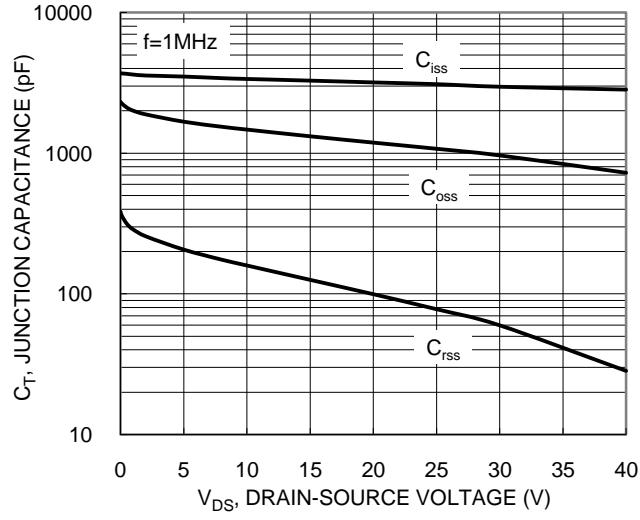
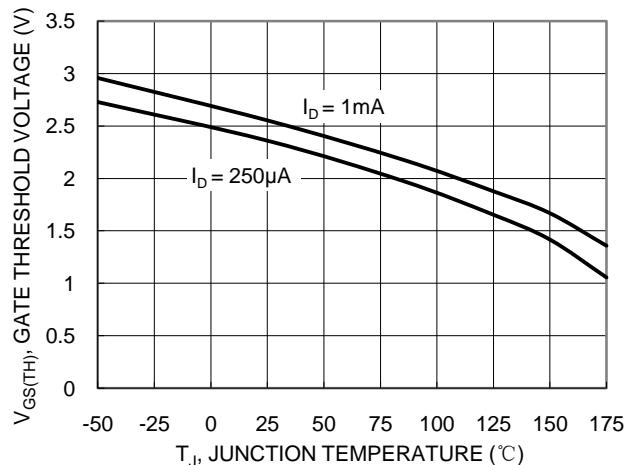
T_J , JUNCTION TEMPERATURE (°C)



$V_{GS} = 0V$



$V_{DS} = 30V, I_D = 50A$



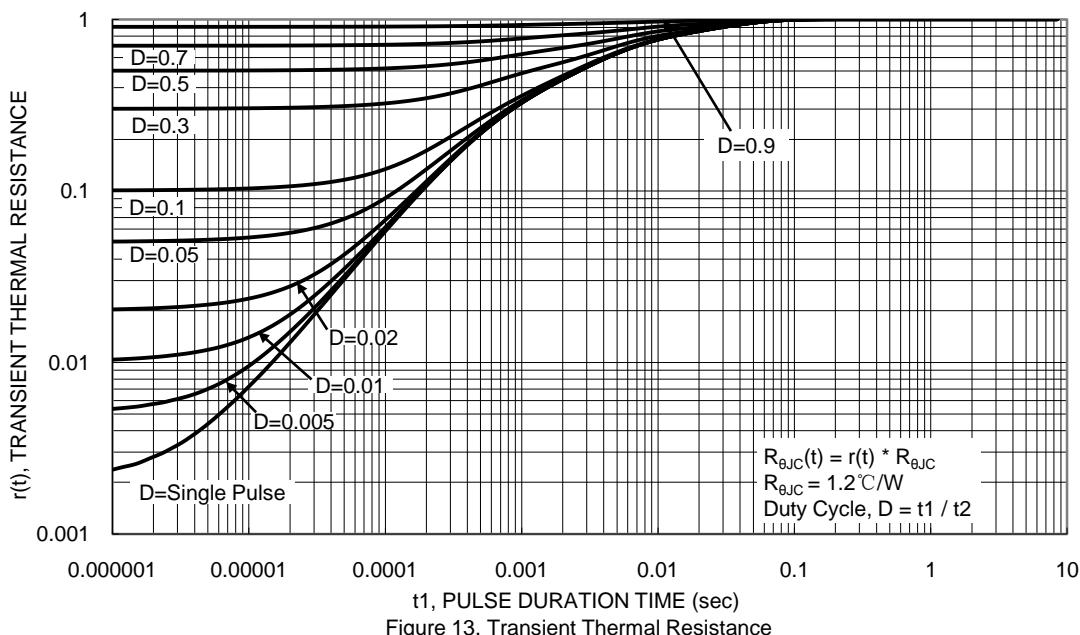
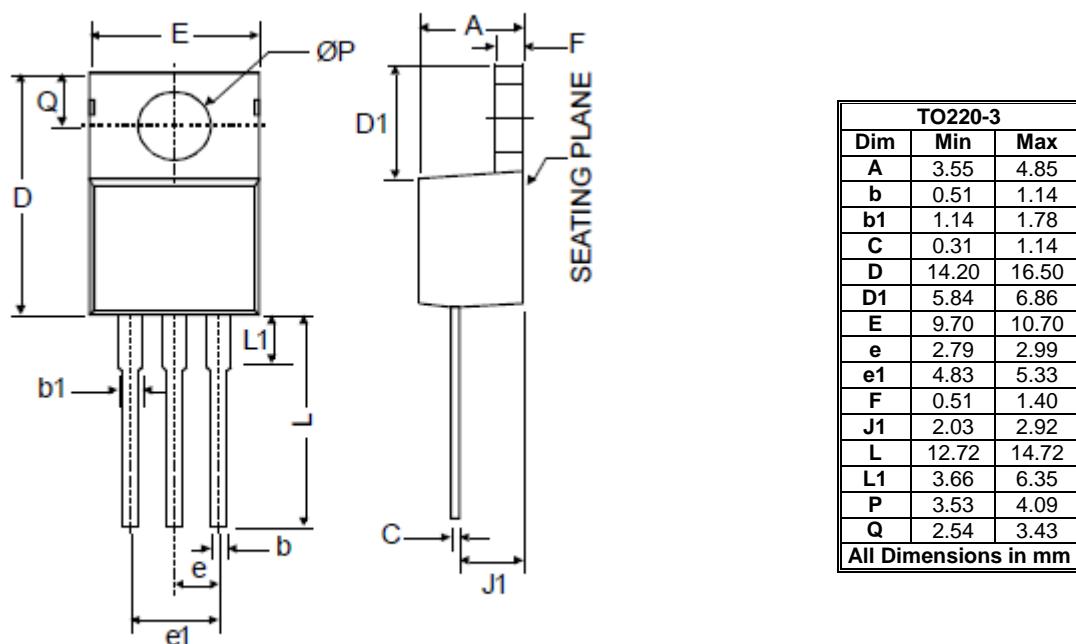


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

TO220-3



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