

## Product Summary

$BV_{DSS}$	$R_{DS(ON)} \text{ Max}$	$I_D$ $T_c = +25^\circ\text{C}$
100V	15mΩ @ $V_{GS} = 10\text{V}$	52.5A
	18mΩ @ $V_{GS} = 6.0\text{V}$	49.5A
	25mΩ @ $V_{GS} = 4.5\text{V}$	40.8A

## Features

- Rated to +175°C – Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching – Ensures More Reliable and Robust End Application
- Low  $R_{DS(ON)}$  – Minimizes Power Losses
- Low  $Q_G$  – Minimizes Switching Losses
- 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 ([DMTH10H015LK3Q](#))

## Description

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

## Applications

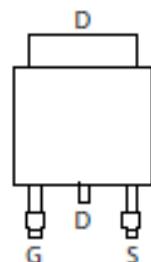
- Power Management Functions
- DC-DC Converters
- Backlighting

## Mechanical Data

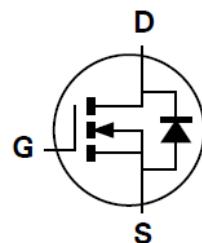
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.33grams (Approximate)



Top View



Pin Out Top View



Equivalent Circuit

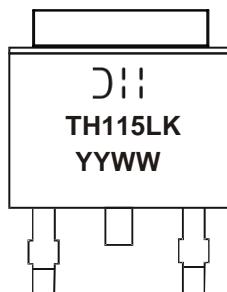
## Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH10H015LK3-13	TO252 (DPAK)	2,500/Tape & Reel

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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



DII = Manufacturer's Marking  
TH115LK = Product Type Marking Code  
YYWW = Date Code Marking  
YY = Last Two Digits of Year (ex: 17 = 2017)  
WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	100	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current, $V_{GS} = 10\text{V}$	$T_C = +25^\circ\text{C}$ $T_C = +100^\circ\text{C}$	$I_D$	52.5 37.1
Pulsed Drain Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)	$I_{DM}$	150	A
Pulsed Body Diode Forward Current (10 $\mu\text{s}$ Pulse, Duty Cycle = 1%)	$I_{SM}$	150	A
Maximum Continuous Body Diode Forward Current (Note 6)	$I_S$	2.6	A
Avalanche Current, $L = 3\text{mH}$	$I_{AS}$	7.5	A
Avalanche Energy, $L = 3\text{mH}$	$E_{AS}$	85	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	$P_D$	2.1	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	69	$^\circ\text{C}/\text{W}$
Total Power Dissipation (Note 6)	$P_D$	3.5	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	42	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2	
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
<b>OFF CHARACTERISTICS</b> (Note 7)						
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</b> (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1.4	—	3.5	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	10.7	15	$\text{m}\Omega$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$
		—	13.1	18		$V_{GS} = 6\text{V}, I_D = 20\text{A}$
		—	18.2	25		$V_{GS} = 4.5\text{V}, I_D = 5\text{A}$
Diode Forward Voltage	$V_{SD}$	—	—	1.3	V	$V_{GS} = 0\text{V}, I_S = 20\text{A}$
<b>DYNAMIC CHARACTERISTICS</b> (Note 8)						
Input Capacitance	$C_{iss}$	—	1,871	—	pF	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	$C_{oss}$	—	261	—		
Reverse Transfer Capacitance	$C_{rss}$	—	6.9	—		
Gate Resistance	$R_G$	—	1	—	nC	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge	$Q_G$	—	33.3	—		$V_{DD} = 50\text{V}, I_D = 10\text{A},$ $V_{GS} = 10\text{V}$
Gate-Source Charge	$Q_{GS}$	—	6.9	—		
Gate-Drain Charge	$Q_{GD}$	—	5.1	—		
Turn-On Delay Time	$t_{D(ON)}$	—	6.5	—	ns	$V_{DD} = 50\text{V}, V_{GS} = 10\text{V},$ $I_D = 10\text{A}, R_G = 6\Omega$
Turn-On Rise Time	$t_R$	—	7.0	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	19.7	—		
Turn-Off Fall Time	$t_F$	—	8.1	—		
Reverse Recovery Time	$t_{RR}$	—	37.9	—	nC	$I_F = 10\text{A}, di/dt = 100\text{A}/\mu\text{s}$
Reverse Recovery Charge	$Q_{RR}$	—	51.9	—		

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.

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

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

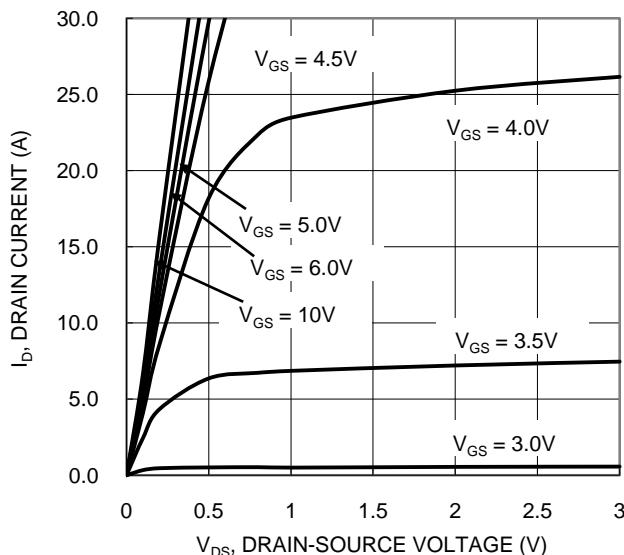


Figure 1. Typical Output Characteristic

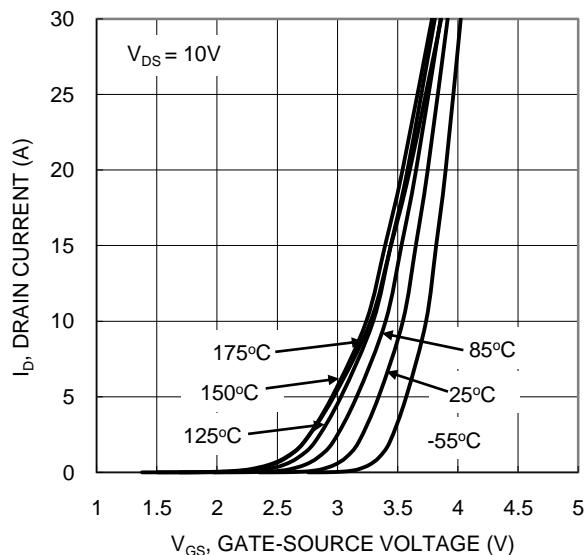


Figure 2. Typical Transfer Characteristic

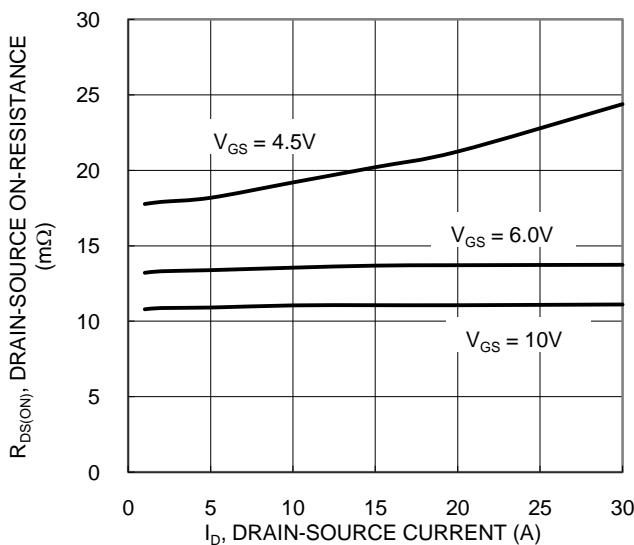


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

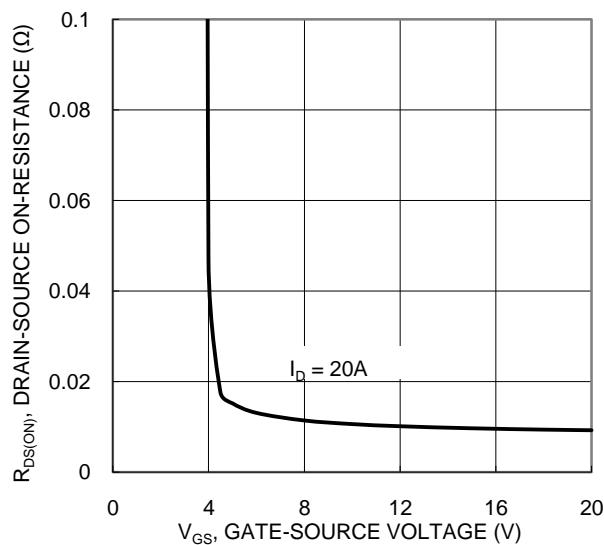


Figure 4. Typical Transfer Characteristic

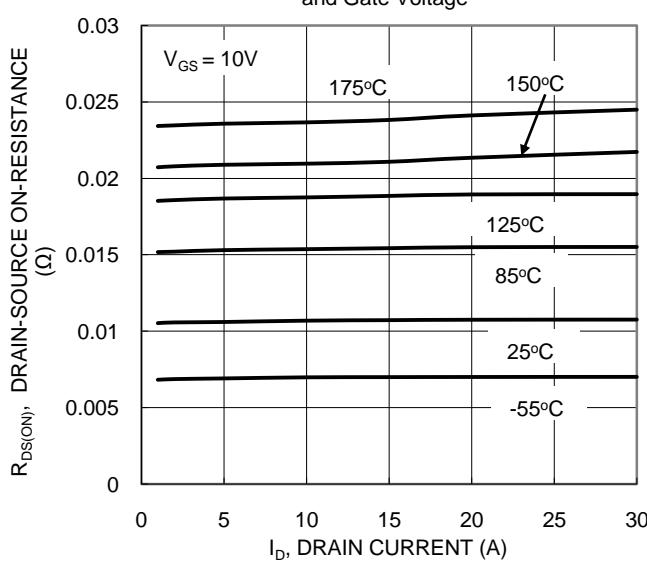


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

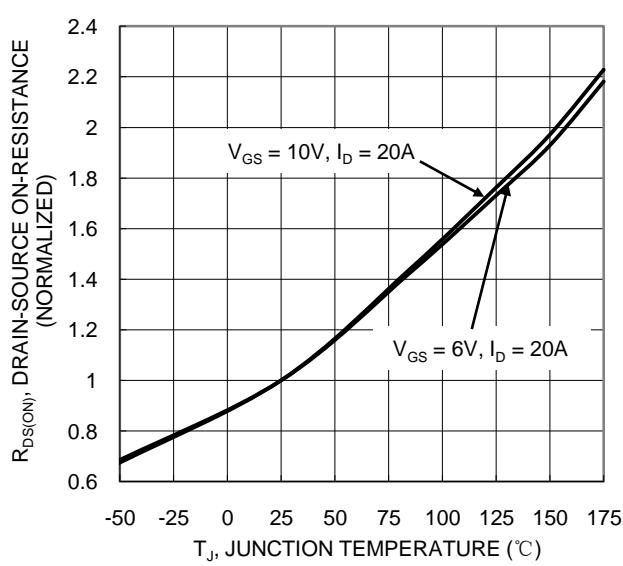


Figure 5. On-Resistance Variation with Junction Temperature

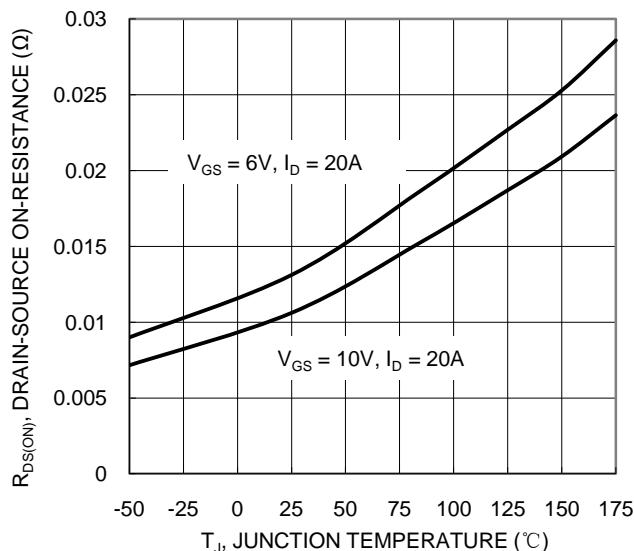


Figure 7. On-Resistance Variation with Junction Temperature

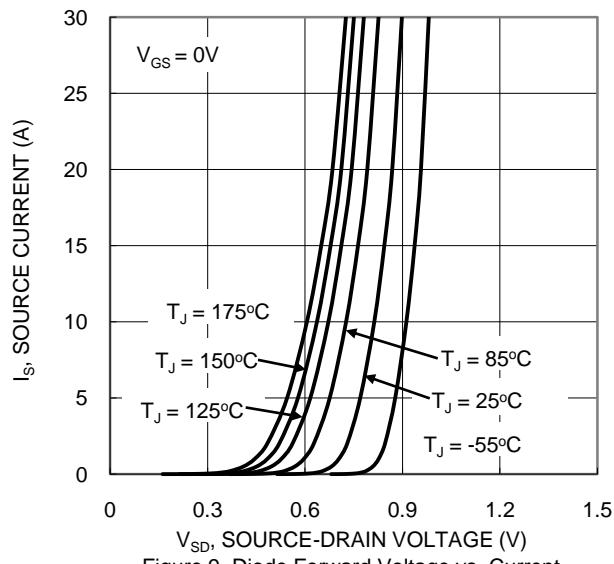


Figure 9. Diode Forward Voltage vs. Current

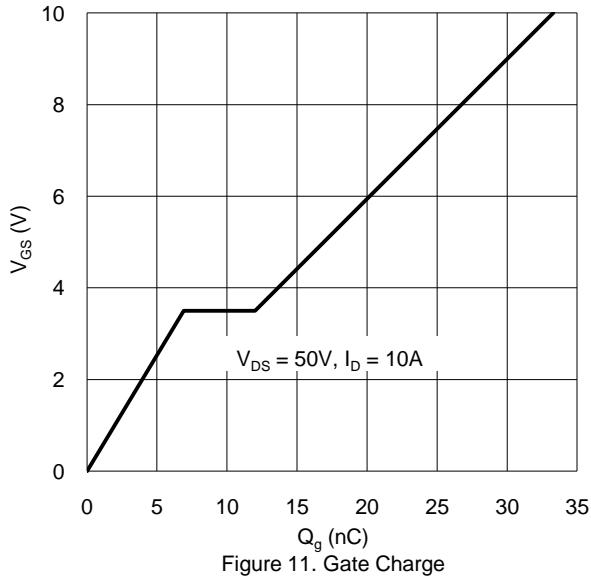


Figure 11. Gate Charge

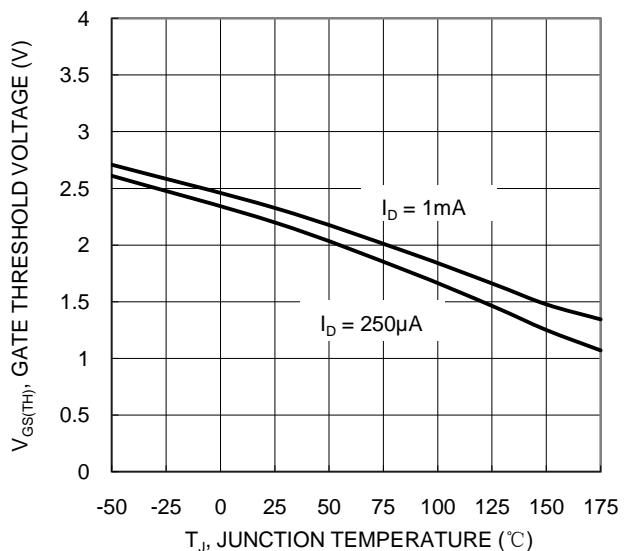


Figure 8. Gate Threshold Variation vs. Junction Temperature

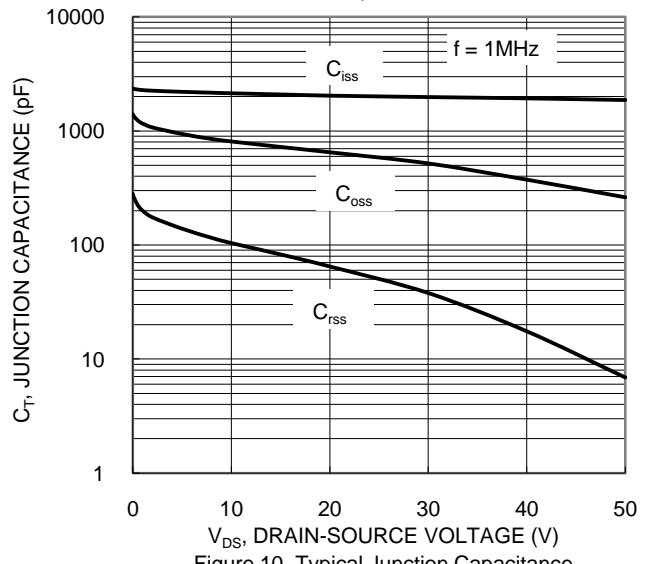


Figure 10. Typical Junction Capacitance

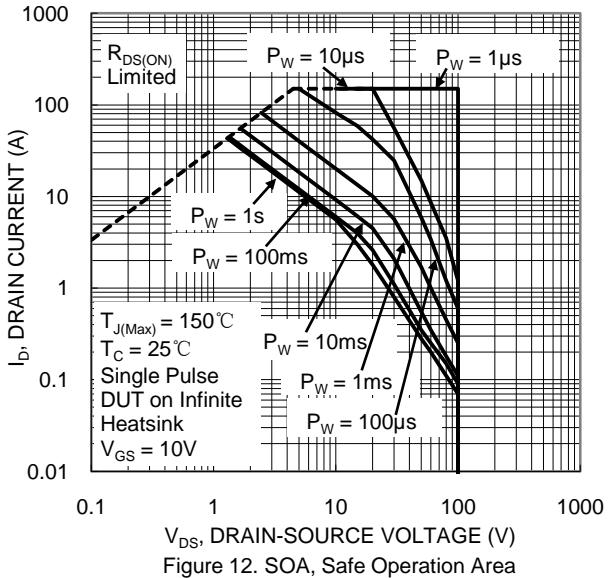


Figure 12. SOA, Safe Operation Area

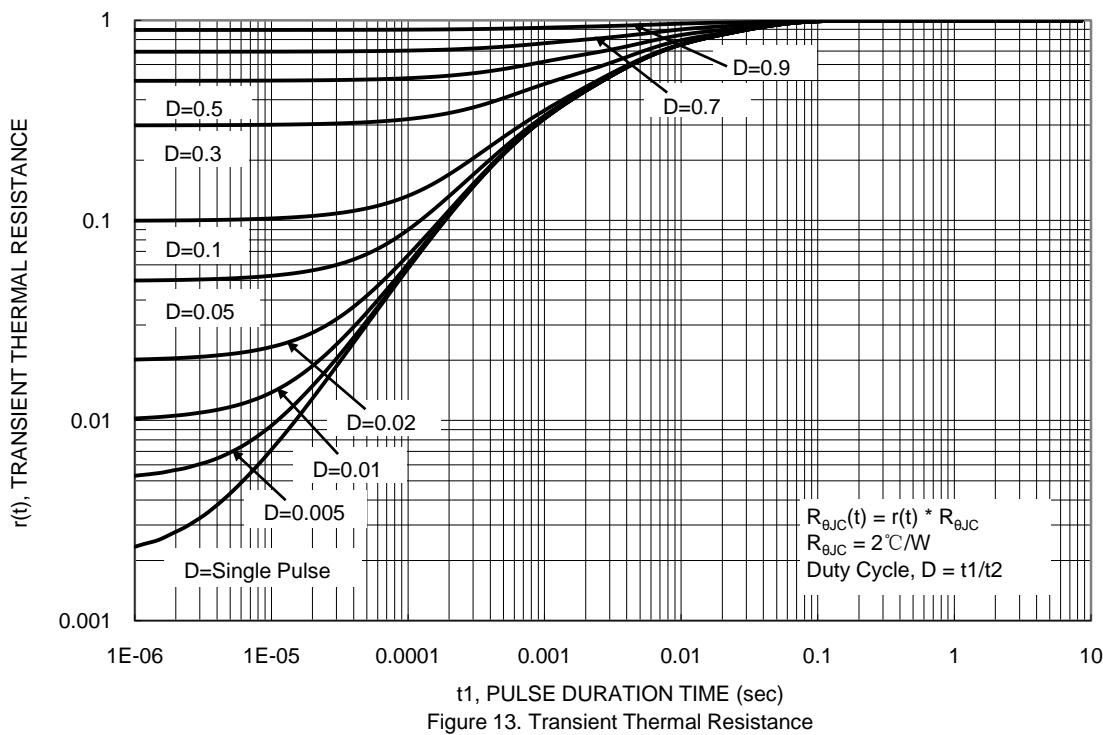
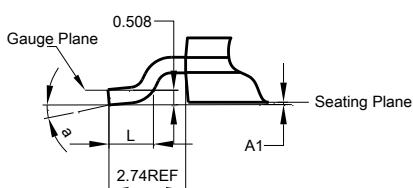
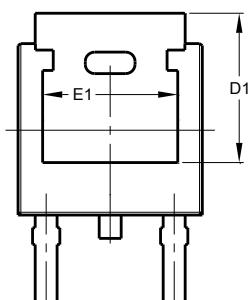
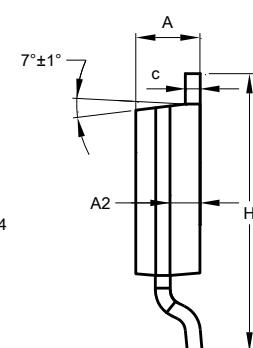
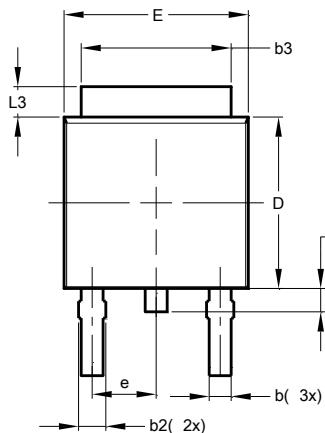


Figure 13. Transient Thermal Resistance

## Package Outline Dimensions

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

TO252 (DPAK)



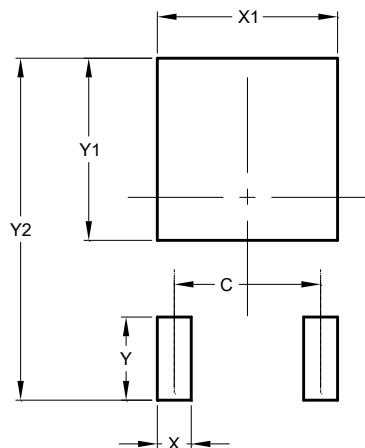
TO252 (DPAK)			
Dim	Min	Max	Typ
<b>A</b>	2.19	2.39	2.29
<b>A1</b>	0.00	0.13	0.08
<b>A2</b>	0.97	1.17	1.07
<b>b</b>	0.64	0.88	0.783
<b>b2</b>	0.76	1.14	0.95
<b>b3</b>	5.21	5.46	5.33
<b>c</b>	0.45	0.58	0.531
<b>D</b>	6.00	6.20	6.10
<b>D1</b>	5.21	-	-
<b>e</b>	-	-	2.286
<b>E</b>	6.45	6.70	6.58
<b>E1</b>	4.32	-	-
<b>H</b>	9.40	10.41	9.91
<b>L</b>	1.40	1.78	1.59
<b>L3</b>	0.88	1.27	1.08
<b>L4</b>	0.64	1.02	0.83
<b>a</b>	0°	10°	-

All Dimensions in mm

## Suggested Pad Layout

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

TO252 (DPAK)



Dimensions	Value (in mm)
<b>C</b>	4.572
<b>X</b>	1.060
<b>X1</b>	5.632
<b>Y</b>	2.600
<b>Y1</b>	5.700
<b>Y2</b>	10.700

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