

Product Summary

BV _{DSS}	R _{Ds(ON)} Max	I _D Max T _C = +25°C
80V	17mΩ @ V _{GS} = 10V	44A
	22mΩ @ V _{GS} = 4.5V	38A

Features

- Low R_{Ds(ON)} – Ensures On-State Losses Are Minimized
- High Conversion Efficiency
- Low Input Capacitance
- Fast Switching Speed
- **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-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.
- This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>

Description and Applications

This 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.

- Synchronous rectifiers
- Backlighting
- Power-management functions
- DC-DC converters

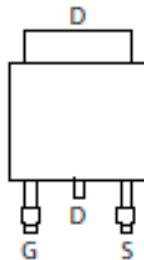
Mechanical Data

- Package: TO252
- Package Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.33 grams (Approximate)

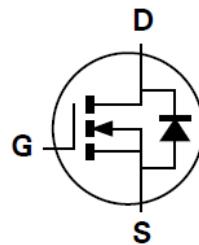
TO252 (DPAK)



Top View



Pinout Top View



Equivalent Circuit

Ordering Information (Note 4)

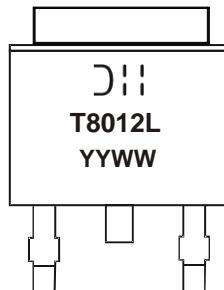
Orderable Part Number	Package	Packing	
		Qty.	Carrier
DMT8012LK3-13	TO252 (DPAK)	2,500	Tape & Reel

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

TO252 (DPAK)



DII = Manufacturer's Marking
 T8012L = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 25 = 2025)
 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}	80	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current (Note 5) $V_{GS} = 10\text{V}$	I_D	44 28	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)	I_{DM}	80	A
Maximum Continuous Body Diode Forward Current (Note 5)	I_S	3	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle = 1%)	I_{SM}	80	A
Avalanche Current, $L = 0.1\text{mH}$	I_{AS}	11.6	A
Avalanche Energy, $L = 0.1\text{mH}$	E_{AS}	10.2	mJ

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

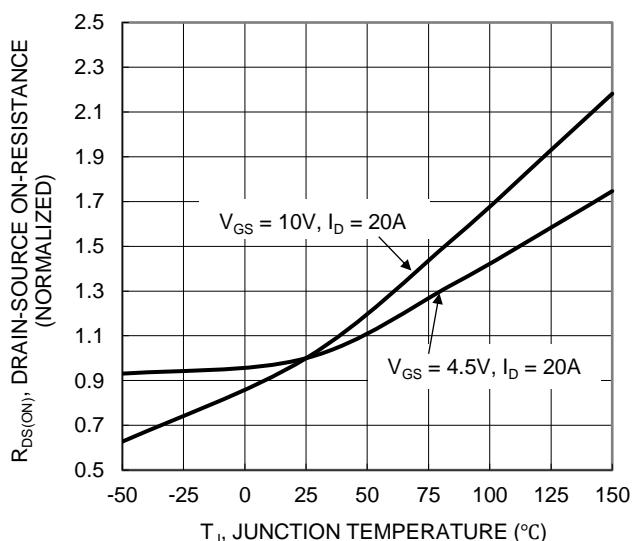
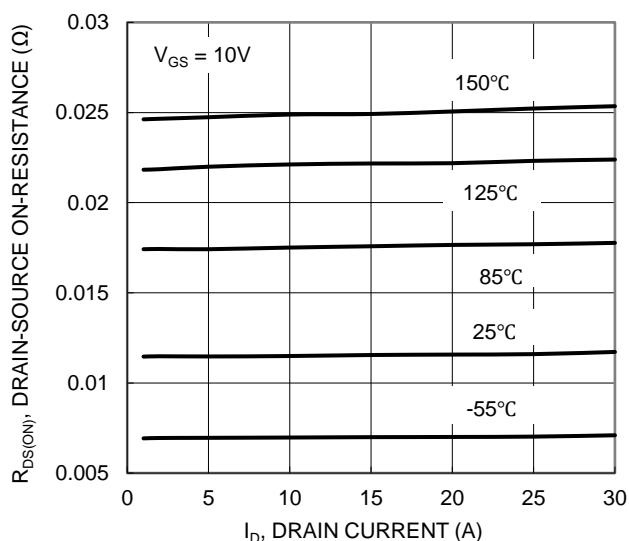
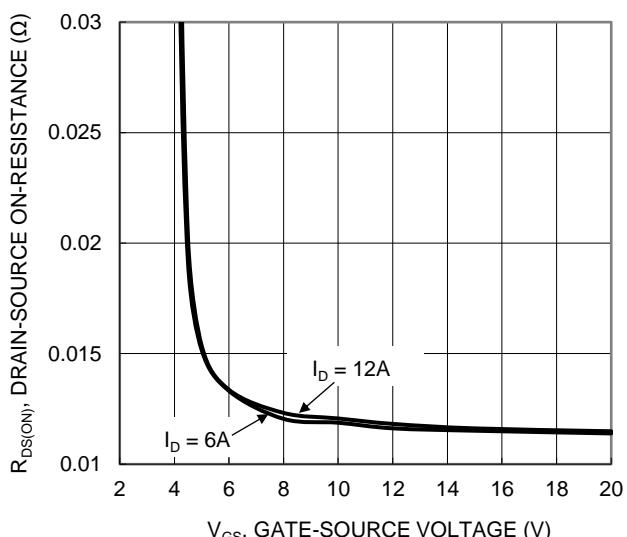
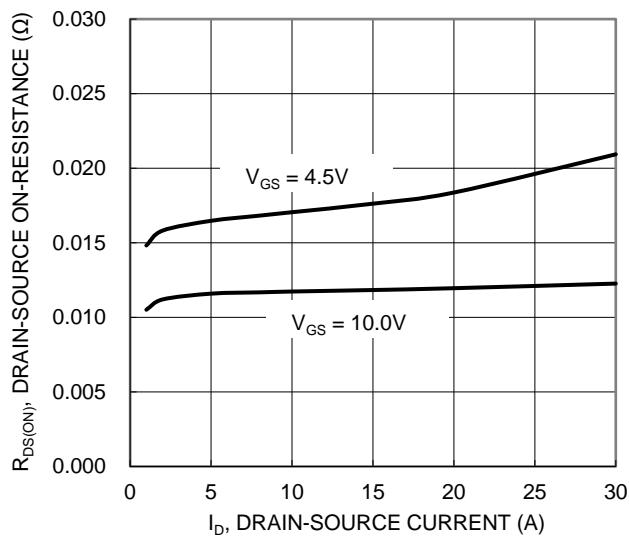
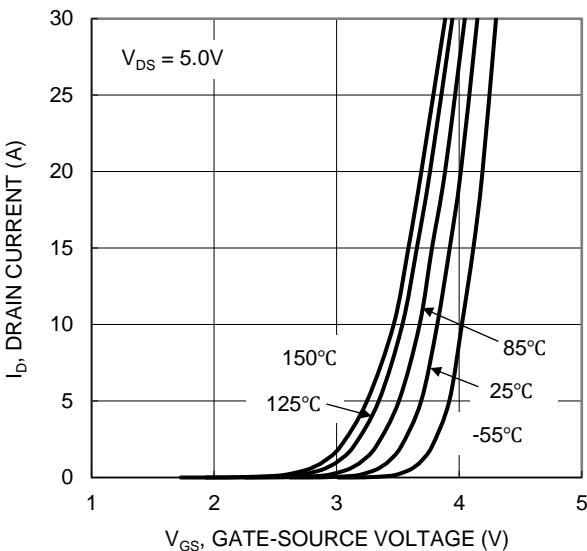
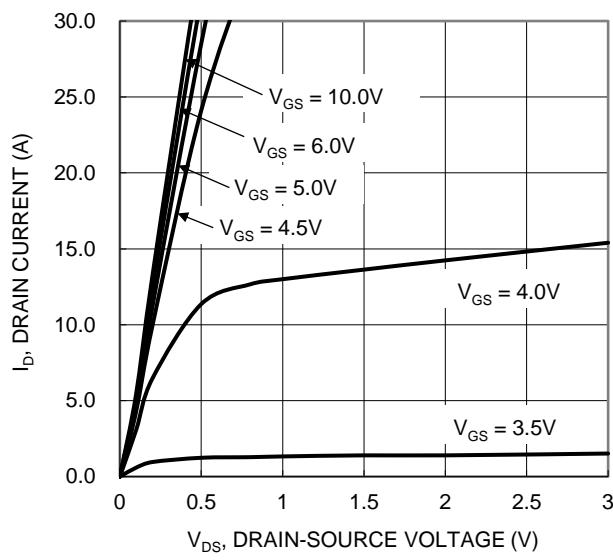
Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	2.7	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	47	°C/W
Total Power Dissipation (Note 6)	P_D	50	W
Thermal Resistance, Junction to Case (Note 6)	$R_{\theta JC}$	2.5	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

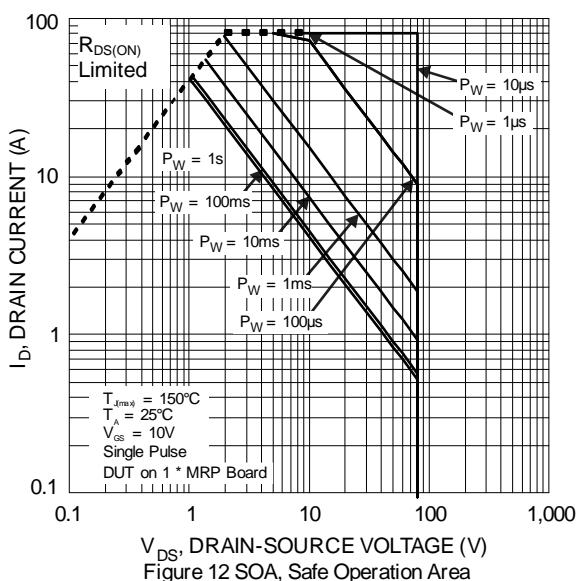
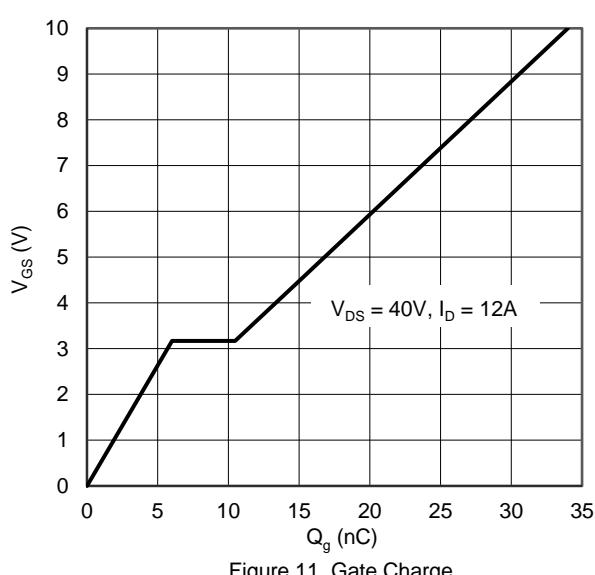
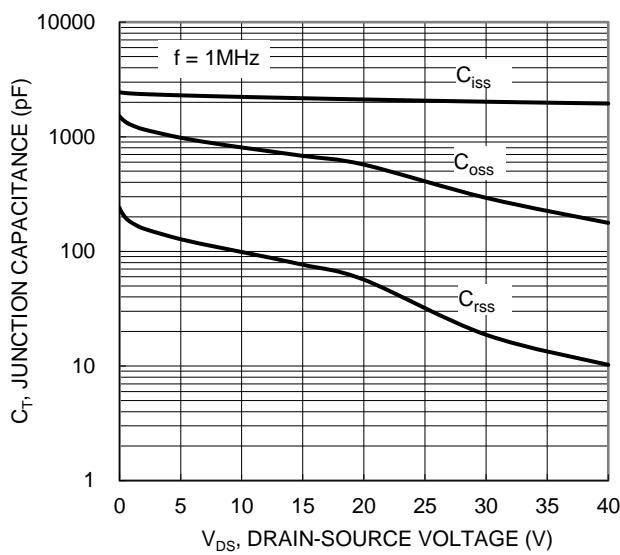
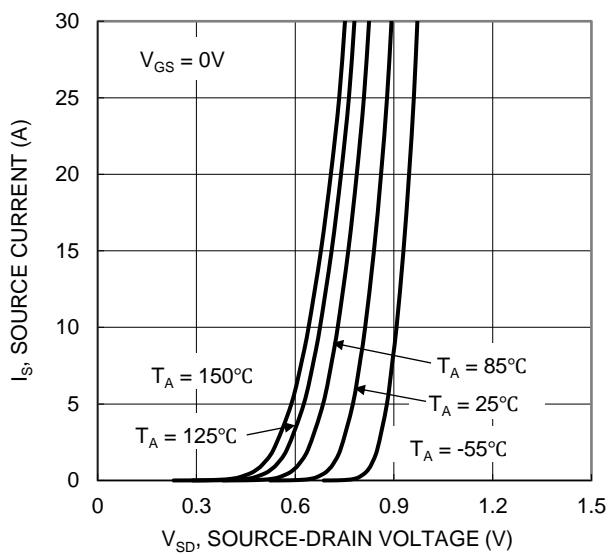
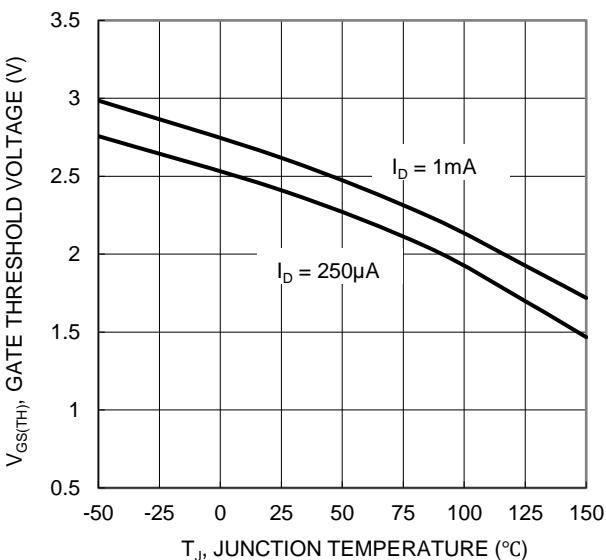
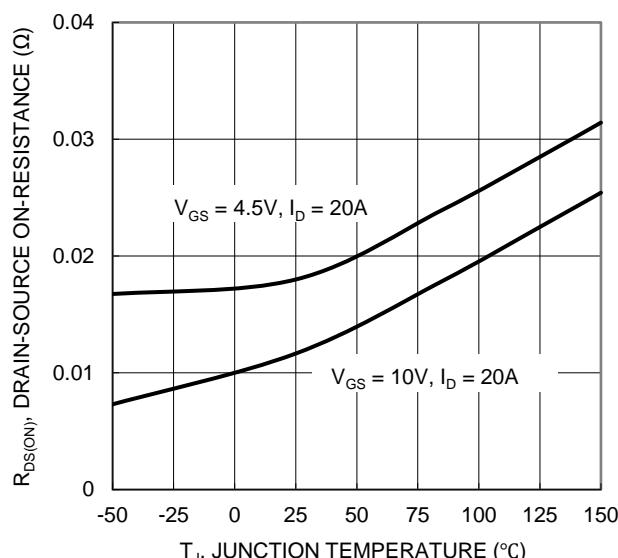
Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.
 6. Device mounted on infinite heatsink and measured by thermal couple attached on bottom heatsink of package.

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}	80	—	—	V	$\text{V}_{\text{GS}} = 0\text{V}, \text{I}_D = 1\text{mA}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$\text{V}_{\text{DS}} = 64\text{V}, \text{V}_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$\text{V}_{\text{GS}} = \pm 20\text{V}, \text{V}_{\text{DS}} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$\text{V}_{\text{GS(TH)}}$	1	—	3	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}, \text{I}_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS(ON)}}$	—	12	17	$\text{m}\Omega$	$\text{V}_{\text{GS}} = 10\text{V}, \text{I}_D = 12\text{A}$
		—	18.2	22		$\text{V}_{\text{GS}} = 4.5\text{V}, \text{I}_D = 6\text{A}$
Diode Forward Voltage	V_{SD}	—	0.9	1.2	V	$\text{V}_{\text{GS}} = 0\text{V}, \text{I}_S = 25\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	1,949	—	pF	$\text{V}_{\text{DS}} = 40\text{V}, \text{V}_{\text{GS}} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	177	—		
Reverse Transfer Capacitance	C_{rss}	—	10	—		
Gate Resistance	R_g	—	0.7	—	Ω	$\text{V}_{\text{DS}} = 0\text{V}, \text{V}_{\text{GS}} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge ($\text{V}_{\text{GS}} = 4.5\text{V}$)	Q_g	—	15	—	nC	$\text{V}_{\text{DS}} = 40\text{V}, \text{I}_D = 12\text{A}$
Total Gate Charge ($\text{V}_{\text{GS}} = 10\text{V}$)	Q_g	—	34	—		
Gate-Source Charge	Q_{gs}	—	6	—		
Gate-Drain Charge	Q_{gd}	—	4.5	—		
Turn-On Delay Time	$\text{t}_{\text{D(ON)}}$	—	4.9	—	ns	$\text{V}_{\text{DD}} = 40\text{V}, \text{V}_{\text{GS}} = 10\text{V}$ $\text{I}_D = 12\text{A}, \text{R}_g = 1.6\Omega$
Turn-On Rise Time	t_R	—	3.8	—		
Turn-Off Delay Time	$\text{t}_{\text{D(OFF)}}$	—	16.5	—		
Turn-Off Fall Time	t_F	—	3.5	—		
Body Diode Reverse-Recovery Time	t_{RR}	—	30.2	—	ns	$\text{I}_F = 12\text{A}, \text{di/dt} = 100\text{A}/\mu\text{s}$
Body Diode Reverse-Recovery Charge	Q_{rr}	—	34.6	—	nC	

Notes: 7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.





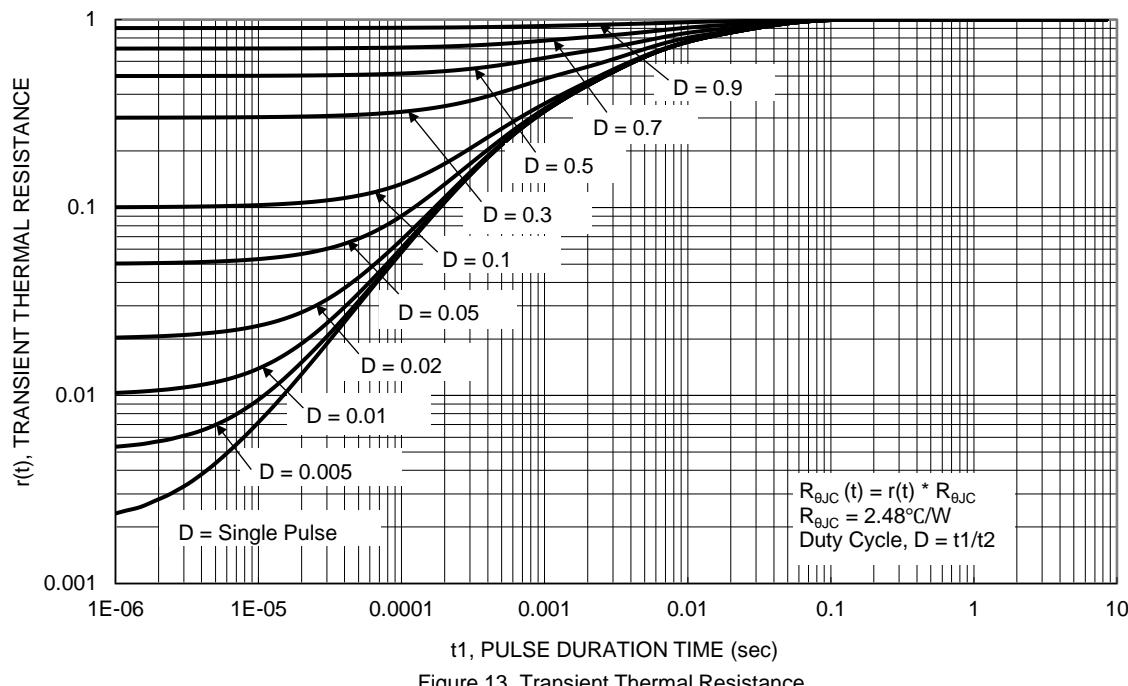
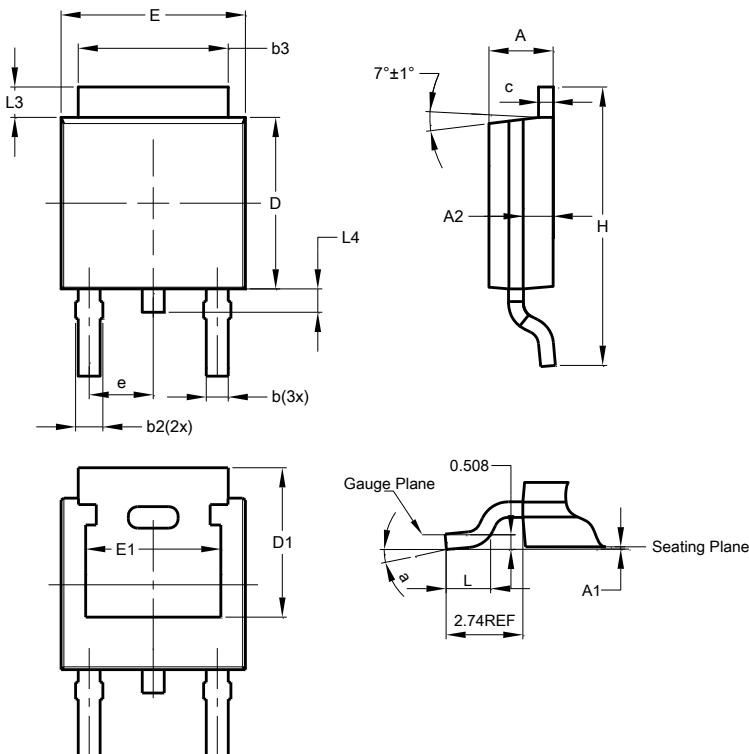


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

TO252 (DPAK)



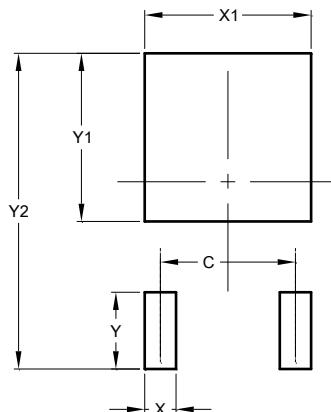
TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.50	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	--	--
e	2.286 BSC		
E	6.45	6.70	6.58
E1	4.32	--	--
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	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)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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