

## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub>	I <sub>D</sub> T <sub>C</sub> = +25°C
600V	4.5Ω @ V <sub>GS</sub> = 10V	2.5A

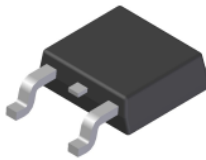
## Description

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

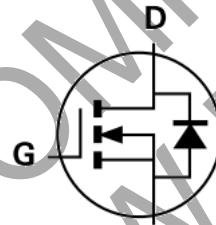
## Applications

- Motor controls
- Backlighting
- DC-DC converters
- Power management functions

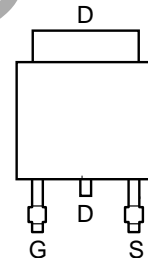
TO252 (DPAK) (Type TH)



Top View



Equivalent Circuit



Top View  
Pin Out Configuration

## Features

- Low Input Capacitance
- High BV<sub>DSS</sub> 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-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

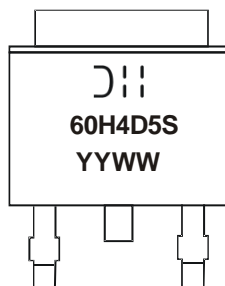
- Package: TO252
- Package Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Terminal Connections: See Diagram Below
- Weight: 0.33 grams (Approximate)

## Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMN60H4D5SK3-13	TO252 (DPAK) (Type TH)	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



= Manufacturer's Marking  
 60H4D5S = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Last Two Digits of Year (ex: 22 = 2022)  
 WW or WW = Week Code (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	600	V
Gate-Source Voltage			V <sub>GSS</sub>	±30	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = 10V	Steady State	T <sub>C</sub> = +25°C	I <sub>D</sub>	2.5	A
		T <sub>C</sub> = +100°C		1.6	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I <sub>DM</sub>	2.6	A
Avalanche Current (Note 6)	L = 60mH		I <sub>AS</sub>	1.0	A
Avalanche Energy (Note 6)	L = 60mH		E <sub>AS</sub>	33	mJ
Peak Diode Recovery dv/dt (Note 7)			dv/dt	5	V/ns

**Thermal Characteristics**

Characteristic		Symbol	Max	Unit
Power Dissipation (Note 5)	T <sub>C</sub> = +25°C	P <sub>D</sub>	41	W
	T <sub>C</sub> = +100°C		16	
Thermal Resistance, Junction to Case (Note 5)		R <sub>θJC</sub>	3.0	°C/W
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	600	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	—	—	1	µA	V <sub>DS</sub> = 600V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	2.0	—	4.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	4.5	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 1.0A
Diode Forward Voltage	V <sub>SD</sub>	—	—	1.5	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 2.0A
<b>DYNAMIC CHARACTERISTICS (Note 6)</b>						
Input Capacitance	C <sub>iss</sub>	—	273.5	—	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	30.8	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	4.2	—		
Gate Resistance	R <sub>g</sub>	—	3.5	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge	Q <sub>g</sub>	—	8.2	—	nC	V <sub>GS</sub> = 10V, V <sub>DS</sub> = 480V I <sub>D</sub> = 2A
Gate-Source Charge	Q <sub>gs</sub>	—	1.1	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	3.7	—		
Turn-On Delay Time	t <sub>d(ON)</sub>	—	9.8	—	ns	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 300V R <sub>G</sub> = 25Ω, I <sub>D</sub> = 2A
Turn-On Rise Time	t <sub>r</sub>	—	10.5	—		
Turn-Off Delay Time	t <sub>d(OFF)</sub>	—	33.4	—		
Turn-Off Fall Time	t <sub>f</sub>	—	13.2	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	172	—	ns	dI/dt = 100A/µs, V <sub>GS</sub> = 0V I <sub>F</sub> = 2A
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	682	—	µC	

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

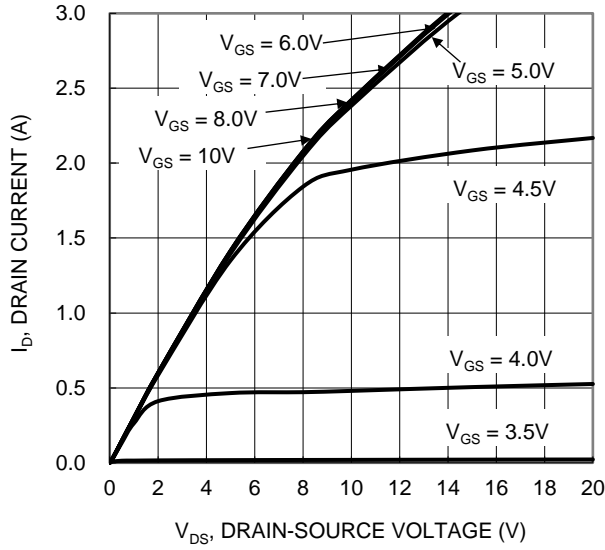


Figure 1. Typical Output Characteristic

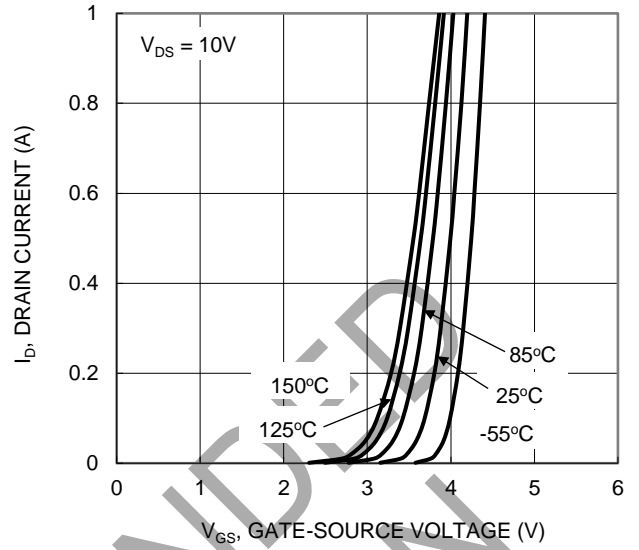


Figure 2. Typical Transfer Characteristic

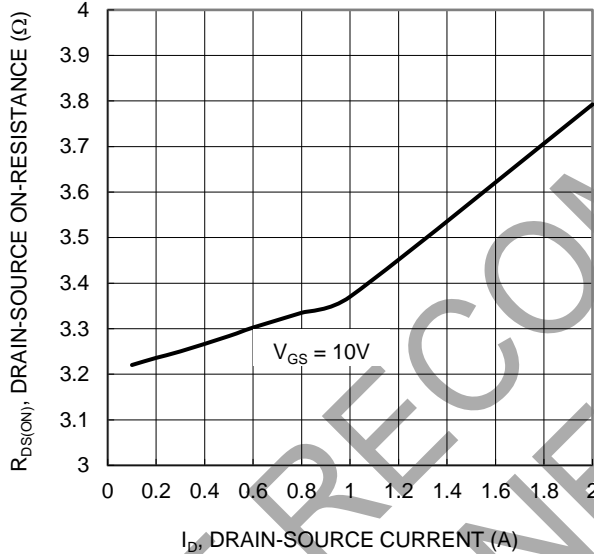


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

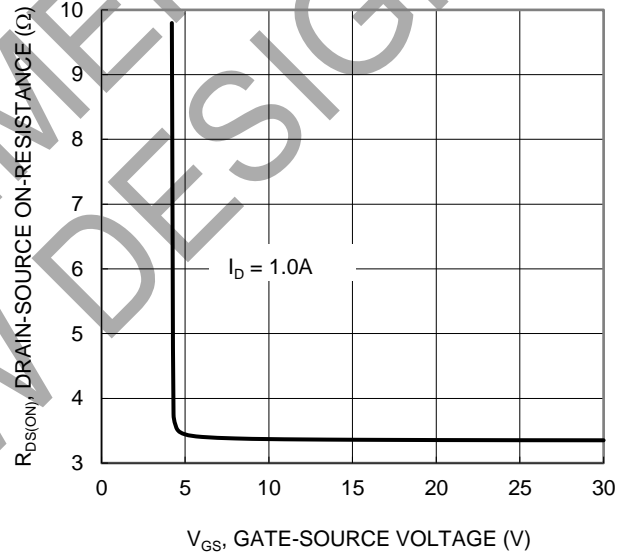


Figure 4. Typical Transfer Characteristic

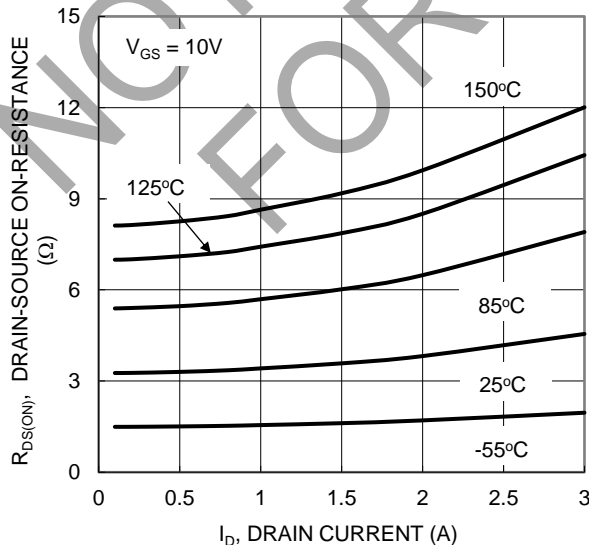


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

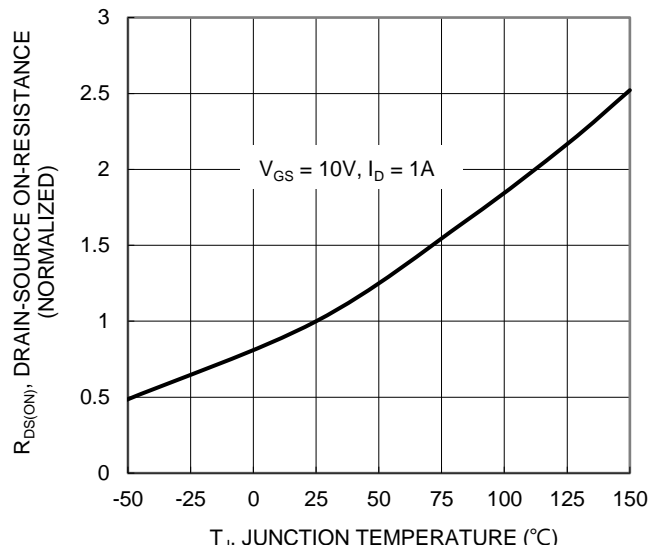
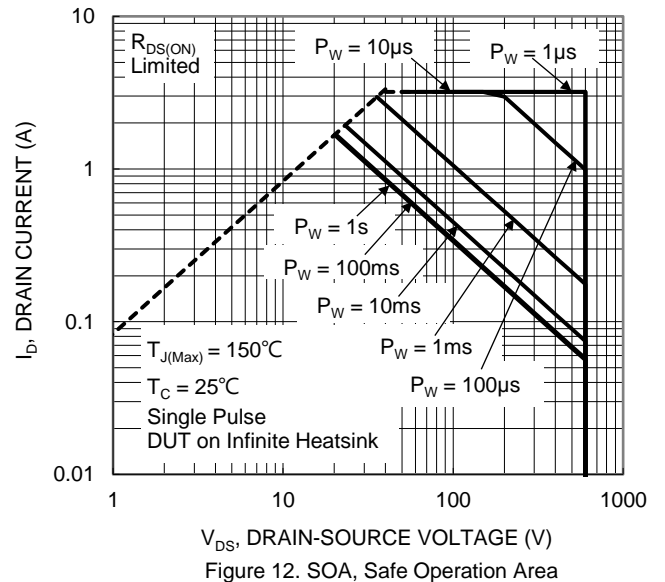
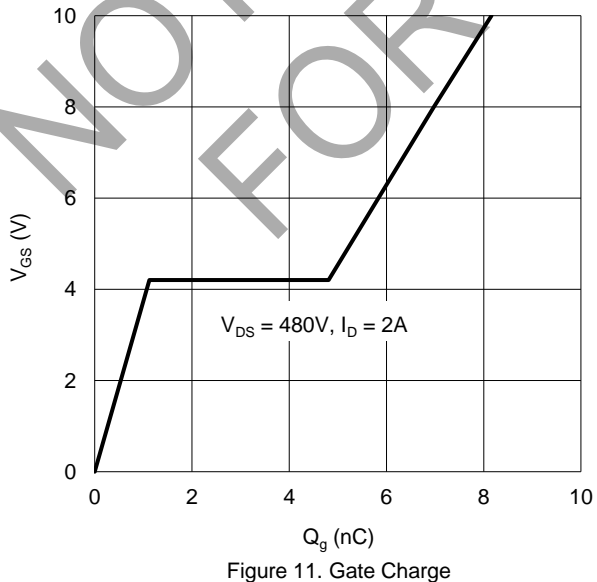
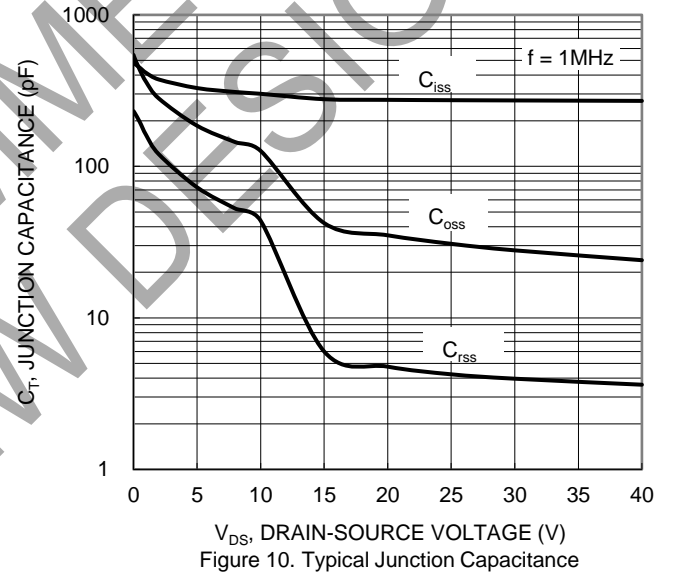
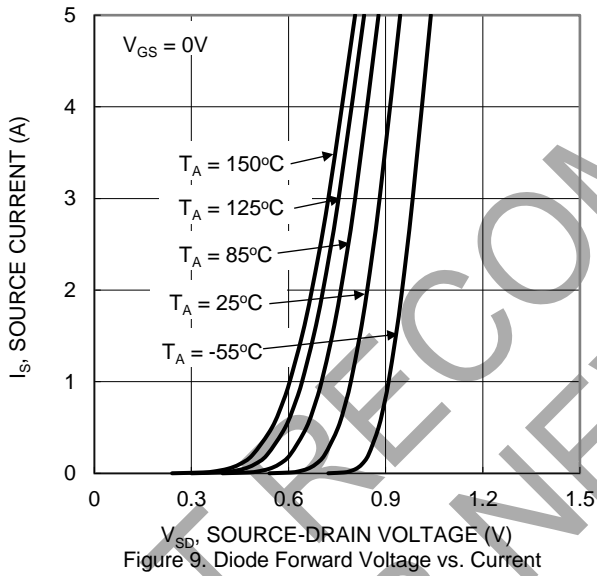
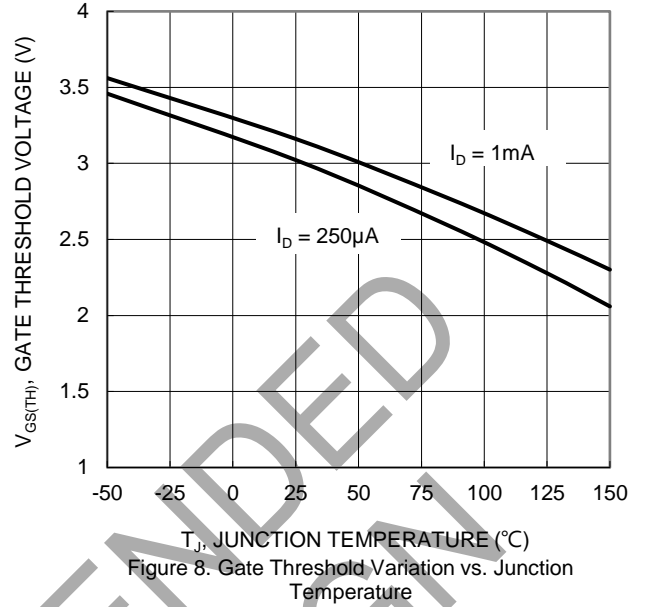
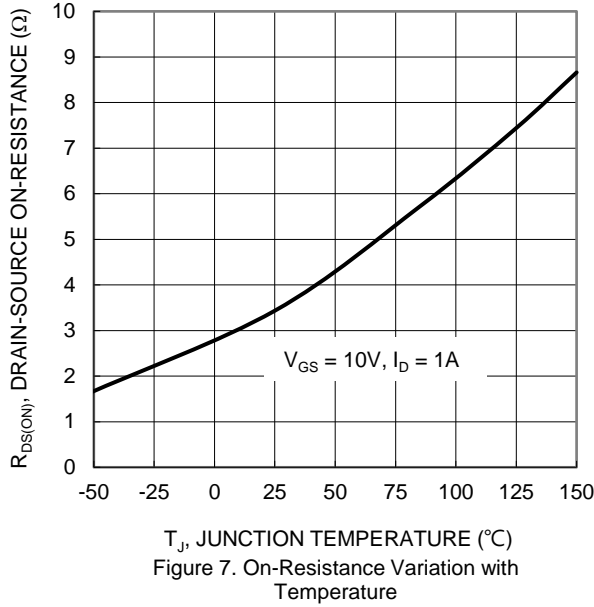


Figure 6. On-Resistance Variation with Temperature



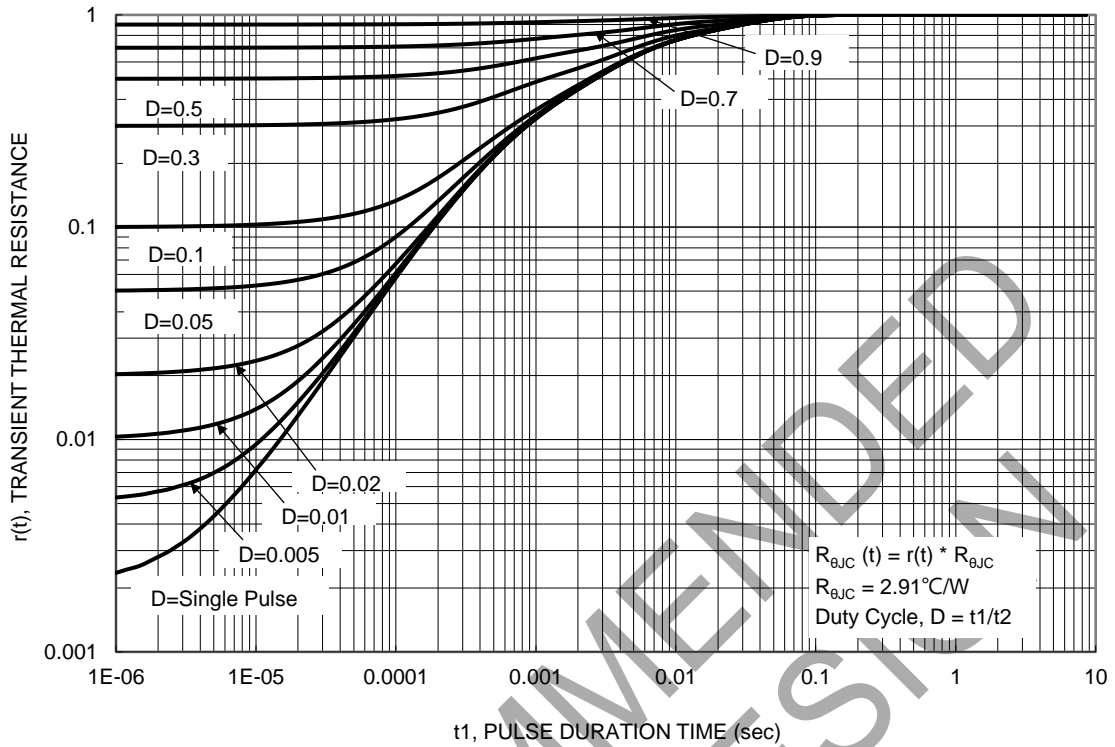


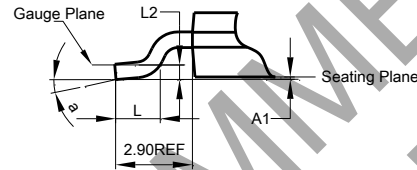
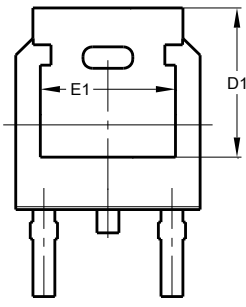
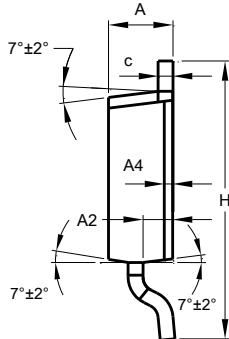
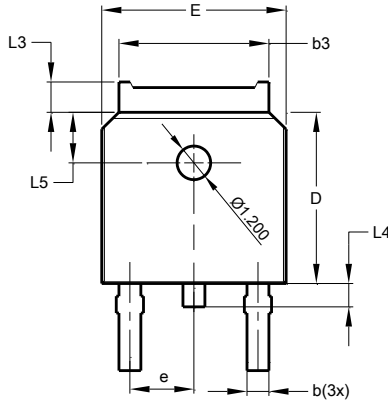
Figure 13. Transient Thermal Resistance

NOT RECOMMENDED FOR NEW DESIGN

**Package Outline Dimensions**

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

**TO252 (DPAK) (Type TH)**

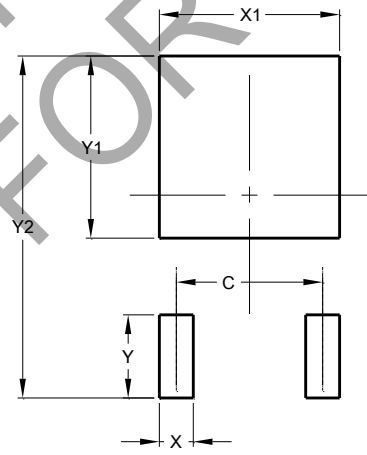


TO252 (DPAK) (Type TH)			
Dim	Min	Max	Typ
A	2.20	2.38	2.30
A1	0.00	0.10	-
A2	0.97	1.17	1.07
A4	0.10 REF		
b	0.72	0.85	0.78
b3	5.23	5.45	5.33
c	0.47	0.58	0.53
D	6.00	6.20	6.10
D1	5.30 REF		
e	2.286 BSC		
E	6.50	6.70	6.60
E1	4.70	4.92	4.83
H	9.90	10.30	10.10
L	1.40	1.70	1.60
L2	0.51 BSC		
L3	0.90	1.25	-
L4	0.60	1.00	0.80
L5	1.70	1.90	1.80
a	0°	8°	-
All Dimensions in mm			

**Suggested Pad Layout**

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

**TO252 (DPAK) (Type TH)**



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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