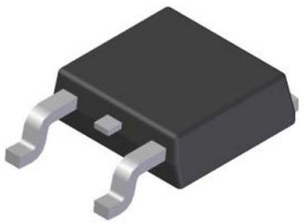
DMN15H310SK3-13 Datasheet



DiGi Electronics Part Number	DMN15H310SK3-13-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DMN15H310SK3-13
Description	MOSFET N-CH 150V 8.3A TO252
Detailed Description	N-Channel 150 V 8.3A (Tc) 32W (Ta) Surface Mount TO-252-3

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
DMN15H310SK3-13	Diodes Incorporated
Series:	Product Status:
-	Active
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
150 V	8.3A (Tc)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
4V, 10V	310mOhm @ 1.5A, 10V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
3V @ 250µA	8.7 nC @ 10 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±20V	405 pF @ 25 V
FET Feature:	Power Dissipation (Max):
-	32W (Ta)
Operating Temperature:	Grade:
-55°C ~ 155°C (TJ)	Automotive
Qualification:	Mounting Type:
AEC-Q101	Surface Mount
Supplier Device Package:	Package / Case:
TO-252-3	TO-252-3, DPAK (2 Leads + Tab), SC-63
Base Product Number:	
DMN15	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0095	

Green

DMN15H310SK3

150V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D T_C = +25°C
150V	310mΩ @ V_{GS} = 10V	8.3A
	330mΩ @ V_{GS} = 5.0V	8.0A

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

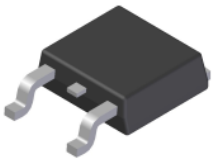
Features

- Low $R_{DS(ON)}$ – ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

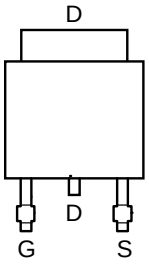
Mechanical Data

- Case: 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: 0.33 grams (Approximate)

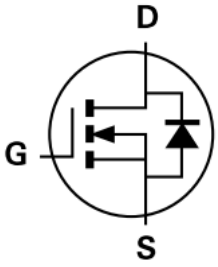
TO252 (DPAK)



Top View



Top View



Internal Schematic

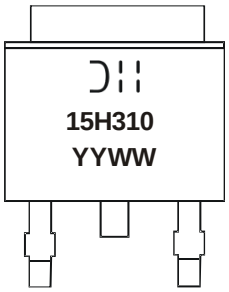
Ordering Information (Note 4)

Part Number	Case	Packaging
DMN15H310SK3-13	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 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

TO252 (DPAK)



=Manufacturer's Marking
15H310= Product Type Marking Code
YYWW = Date Code Marking
YY = Last Digit of Year (ex: 15 = 2015)
WW = Week Code (01 to 53)

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

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	150	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current, V_{GS} = 10V	T_C = +25°C T_C = +100°C	I_D	8.3 5.2	A
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%)		I_{DM}	10	A
Maximum Body Diode Continuous Current (note 5)		I_S	2.6	A
Avalanche Current, L = 3mH (Note 6)		I_{AS}	0.5	A
Avalanche Energy, L = 3mH (Note 6)		E_{AS}	0.36	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation	T_C = +25°C	P_D	32	W
	T_C = +100°C		12	
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	49	°C/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	3.9	
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}	150	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 120V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	2.6	3	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	180	310	mΩ	V_{GS} = 10V, I_D = 1.5A
		—	195	330		V_{GS} = 5.0V, I_D = 1.0A
		—	242	350		V_{GS} = 4.0V, I_D = 1.0A
Diode Forward Voltage	V_{SD}	—	0.8	1.2	V	V_{GS} = 0V, I_S = 1.7A
DYNAMIC CHARACTERISTICS (Note 6)						
Input Capacitance	C_{iss}	—	405	—	pF	V_{DS} = 25V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	40	—		
Reverse Transfer Capacitance	C_{rss}	—	20	—		
Gate Resistance	R_G	—	2.88	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 5.0V)	Q_g	—	4.6	—	nC	V_{DS} = 80V, I_D = 7.3A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	8.7	—		
Gate-Source Charge	Q_{gs}	—	1.7	—		
Gate-Drain Charge	Q_{gd}	—	1.8	—		
Turn-On Delay Time	$t_{D(ON)}$	—	3.5	—	ns	V_{DD} = 50V, V_{GS} = 10V, R_G = 25Ω, I_D = 7.3A
Turn-On Rise Time	t_R	—	7.8	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	22	—		
Turn-Off Fall Time	t_F	—	11	—		
Reverse Recovery Time	t_{RR}	—	38	—	ns	I_F = 7.3A, di/dt = 100A/µs
Reverse Recovery Charge	Q_{RR}	—	53	—	nC	I_F = 7.3A, di/dt = 100A/µs

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.
6. Guaranteed by design. Not subject to product testing.
7. Short duration pulse test used to minimize self-heating effect.

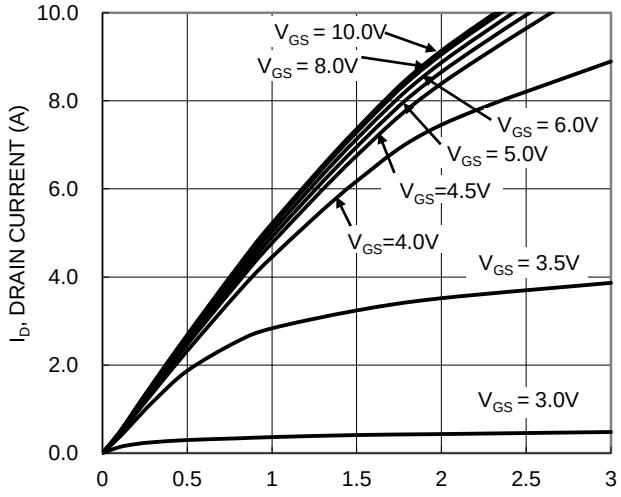


Figure 1. Typical Output Characteristic

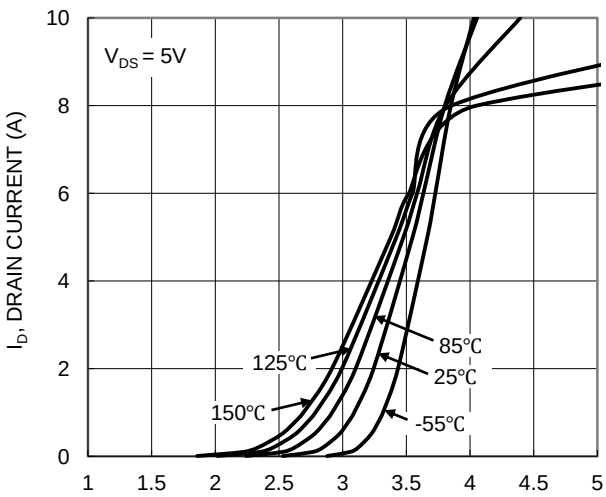


Figure 2. Typical Transfer Characteristic

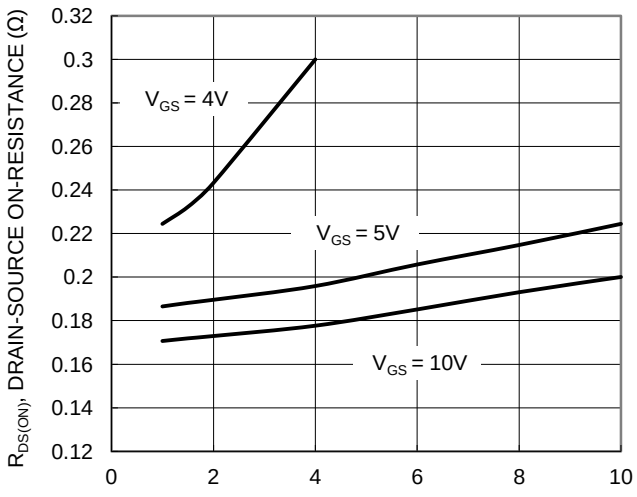


Figure 3. Typical On-Resistance vs Drain Current and Gate Voltage

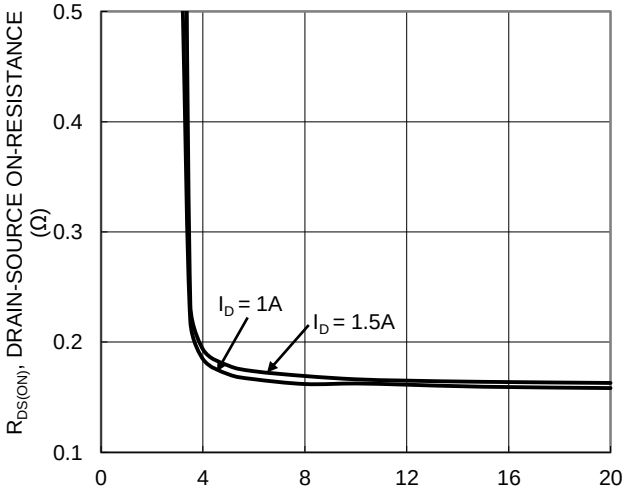


Figure 4. Typical Transfer Characteristic

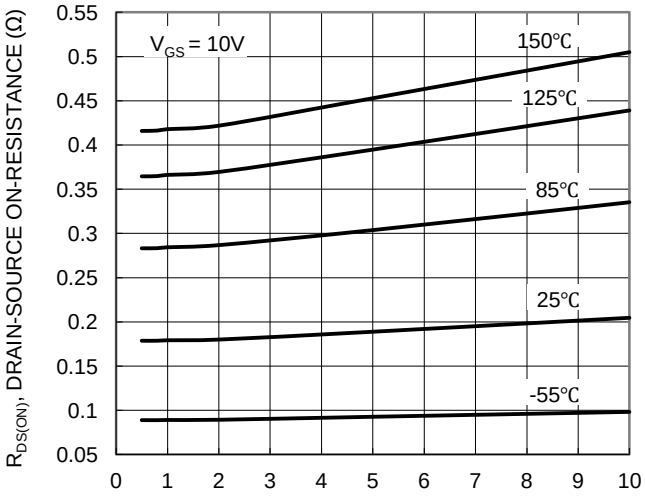


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

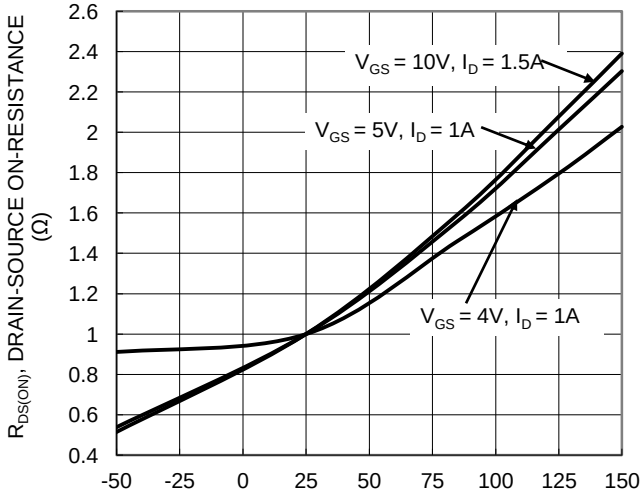


Figure 6. On-Resistance Variation with Junction Temperature

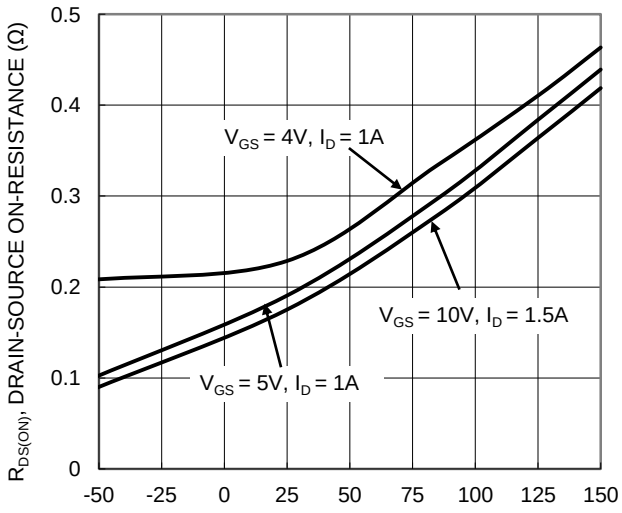


Figure 7. On-Resistance Variation with Junction Temperature

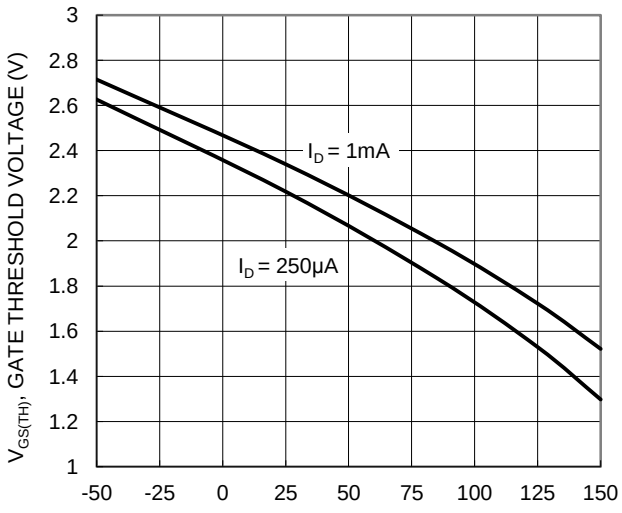


Figure 8. Gate Threshold Variation vs. Junction Temperature

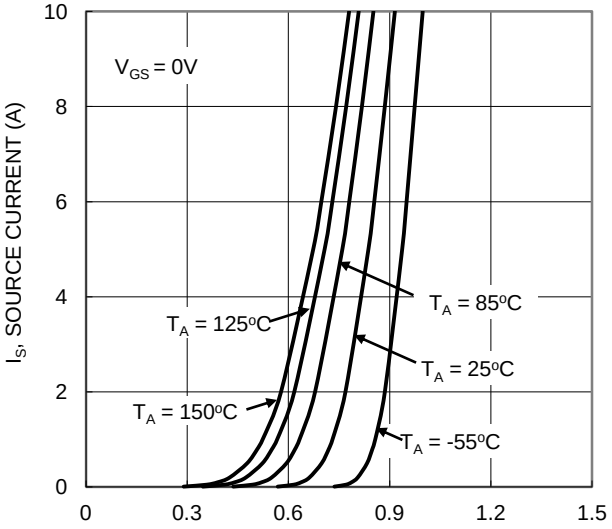


Figure 9. Diode Forward Voltage vs. Current

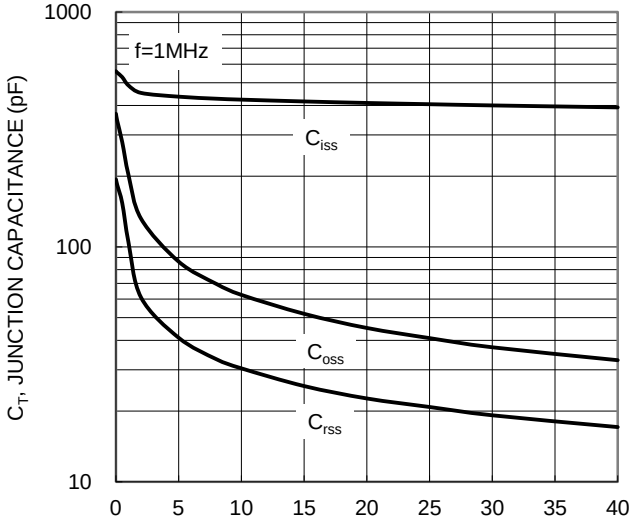


Figure 10. Typical Junction Capacitance

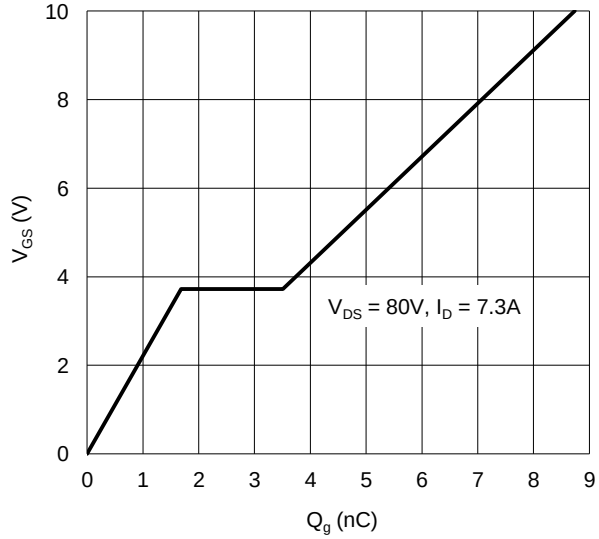


Figure 11. Gate Charge

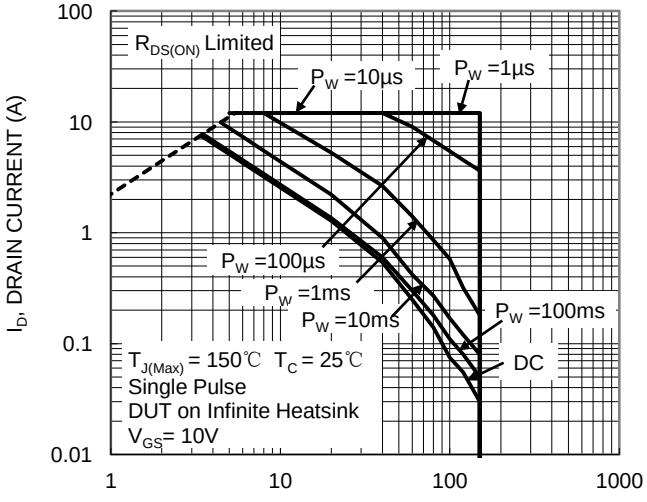


Figure 12. SOA, Safe Operation Area

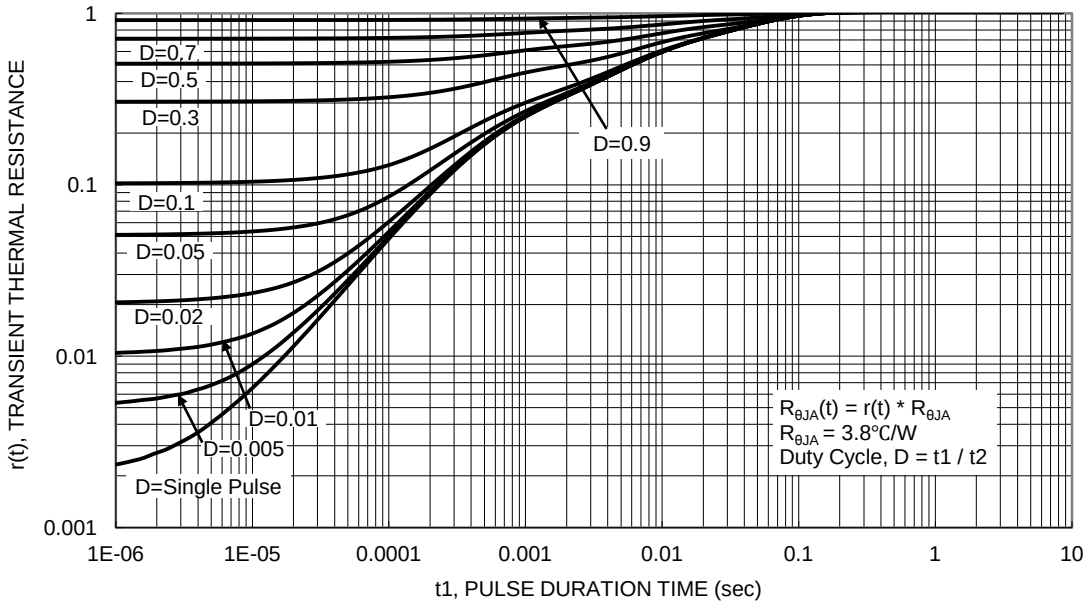
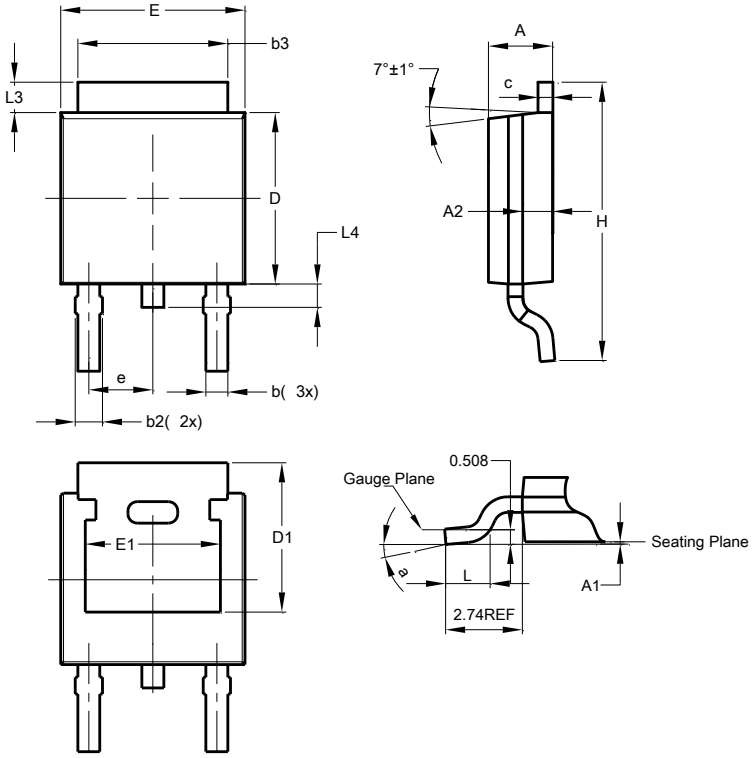


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

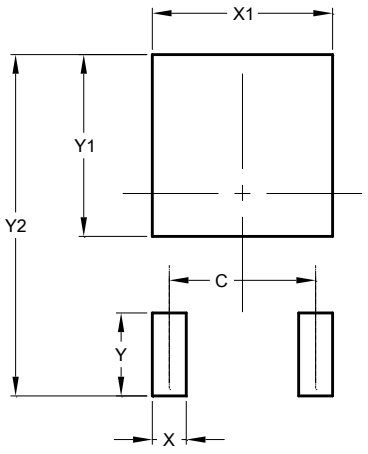
Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.



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	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
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 AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.



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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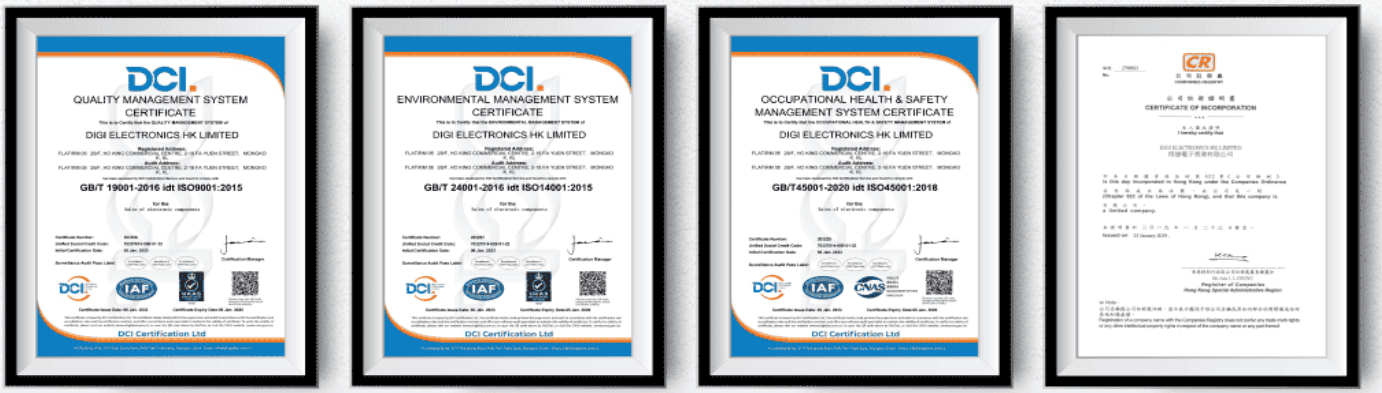

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