



**THE DATASHEET OF  
DMN3008SFGQ-13**



## Product Summary

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> Max T <sub>c</sub> = +25°C
30V	4.4mΩ @ V <sub>GS</sub> = 10V	62A
	5.5mΩ @ V <sub>GS</sub> = 4.5V	56A

## Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Backlighting
- Power-management functions
- DC-DC converters

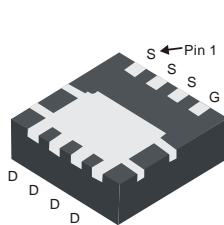
## Features and Benefits

- Low R<sub>DS(ON)</sub> – Ensures On-State Losses Are Minimized
- Small, Form Factor Thermally Efficient Package Enables Higher Density End Products
- Occupies Only 33% of the Board Area Occupied by SO-8 Enabling Smaller End Products
- 100% Unclamped Inductive Switch (UIS) Test in Production
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMN3008SFGQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

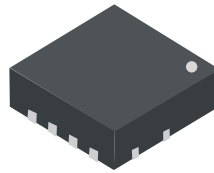
## Mechanical Data

- Package: PowerDI<sup>®</sup>3333-8
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish — Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 <sup>Ⓜ</sup>
- Weight: 0.034 grams (Approximate)

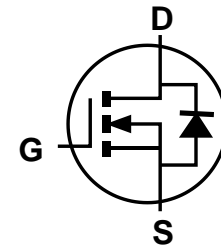


Bottom View

PowerDI3333-8



Top View



Equivalent Circuit

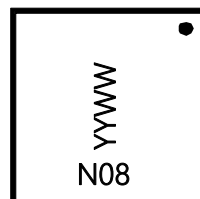
## Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMN3008SFGQ-7	PowerDI3333-8	2,000	Tape & Reel
DMN3008SFGQ-13	PowerDI3333-8	3,000	Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  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

PowerDI3333-8



N08 = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 23 = 2023)  
 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>	30	V
Gate-Source Voltage		V <sub>GSS</sub>	±20	V
Continuous Drain Current (Note 6) V <sub>GS</sub> = 10V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	17.6 14.1	A
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	23.0 18.4	A
	Steady State	T <sub>C</sub> = +25°C T <sub>C</sub> = +70°C	62 50	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)		I <sub>DM</sub>	80	A
Maximum Continuous Body Diode Forward Current (Note 6)		I <sub>S</sub>	2	A
Avalanche Current, L = 0.1mH		I <sub>AS</sub>	45	A
Avalanche Energy, L = 0.1mH		E <sub>AS</sub>	101	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T <sub>A</sub> = +25°C	P <sub>D</sub>	0.9	W
	T <sub>A</sub> = +70°C		0.6	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R <sub>θJA</sub>	134	°C/W
	t < 10s		79	°C/W
Total Power Dissipation (Note 6)	T <sub>A</sub> = +25°C	P <sub>D</sub>	2.1	W
	T <sub>A</sub> = +70°C		1.3	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R <sub>θJA</sub>	58	°C/W
	t < 10s		34	°C/W
Thermal Resistance, Junction to Case (Note 6)		R <sub>θJC</sub>	4.8	°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</b> (Note 7)						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250µA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	10	µA	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b> (Note 7)						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1	—	2.3	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	3.9	4.4	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 13.5A
		—	4.6	5.5		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 13.5A
Diode Forward Voltage	V <sub>SD</sub>	—	0.75	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 1A
<b>DYNAMIC CHARACTERISTICS</b> (Note 8)						
Input Capacitance	C <sub>ISS</sub>	—	3,690	—	pF	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1MHz
Output Capacitance	C <sub>OSS</sub>	—	530	—	pF	
Reverse Transfer Capacitance	C <sub>RSS</sub>	—	459	—	pF	
Gate Resistance	R <sub>G</sub>	—	0.9	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>G</sub>	—	41	—	nC	V <sub>DS</sub> = 24V, I <sub>D</sub> = 27A
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>G</sub>	—	86	—	nC	
Gate-Source Charge	Q <sub>GS</sub>	—	9.2	—	nC	
Gate-Drain Charge	Q <sub>GD</sub>	—	18.6	—	nC	
Turn-On Delay Time	t <sub>D(ON)</sub>	—	5.7	—	ns	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V, R <sub>L</sub> = 1.11Ω, R <sub>G</sub> = 4.7Ω, I <sub>D</sub> = 13.5A
Turn-On Rise Time	t <sub>R</sub>	—	14.0	—	ns	
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	63.7	—	ns	
Turn-Off Fall Time	t <sub>F</sub>	—	28.4	—	ns	
Reverse Recovery Time	t <sub>RR</sub>	—	19.3	—	ns	I <sub>F</sub> = 13.5A, di/dt = 100A/µs
Reverse Recovery Charge	Q <sub>RR</sub>	—	10.7	—	nC	

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

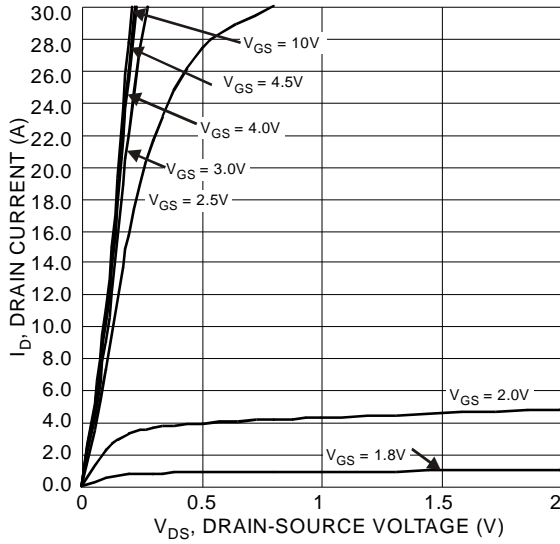


Figure 1 Typical Output Characteristic

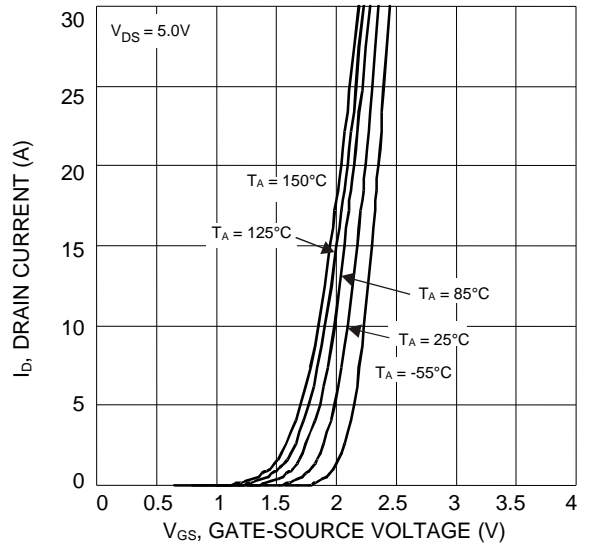


Figure 2 Typical Transfer Characteristic

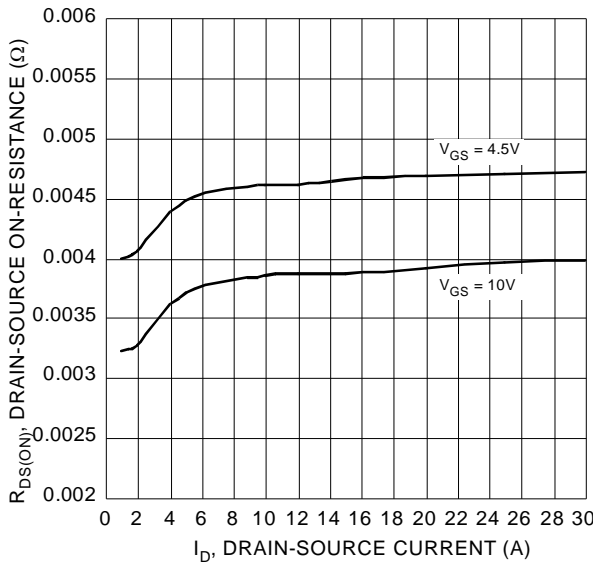


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

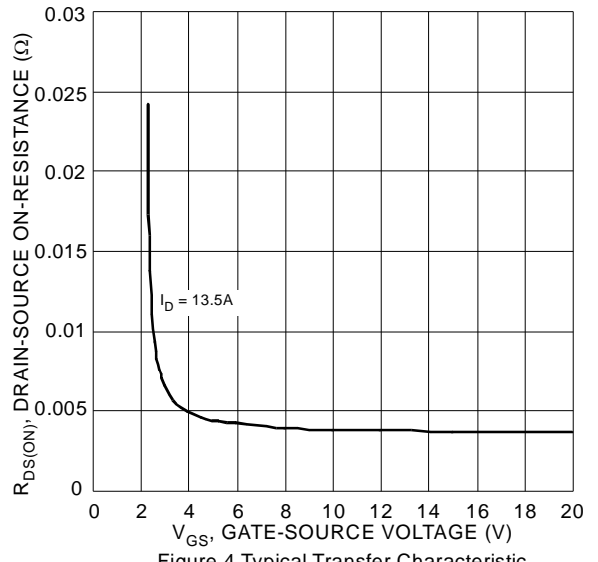


Figure 4 Typical Transfer Characteristic

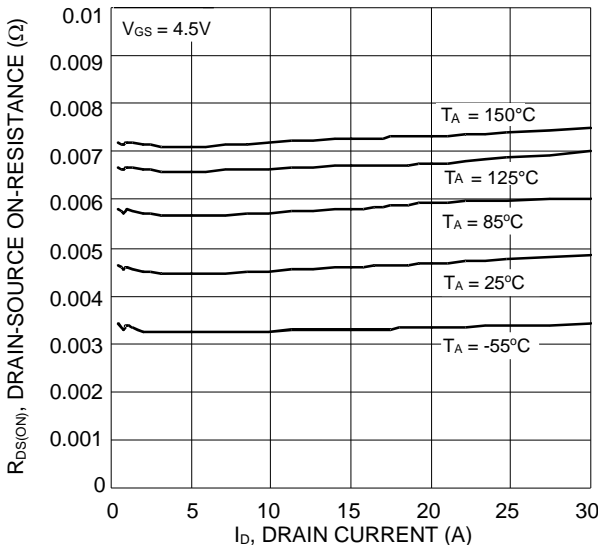


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

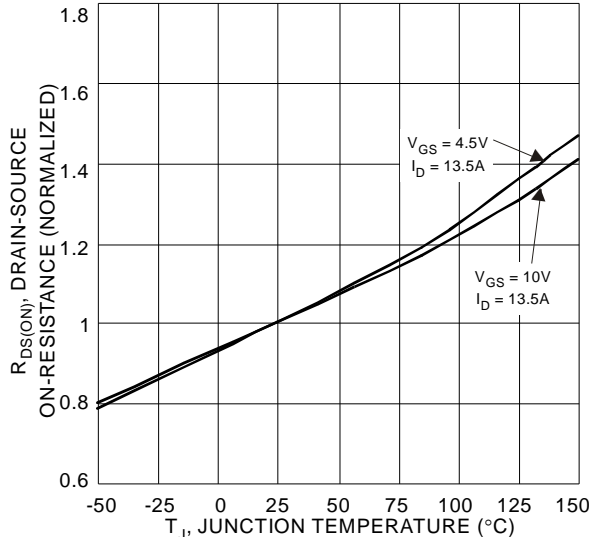


Figure 6 On-Resistance Variation with Temperature

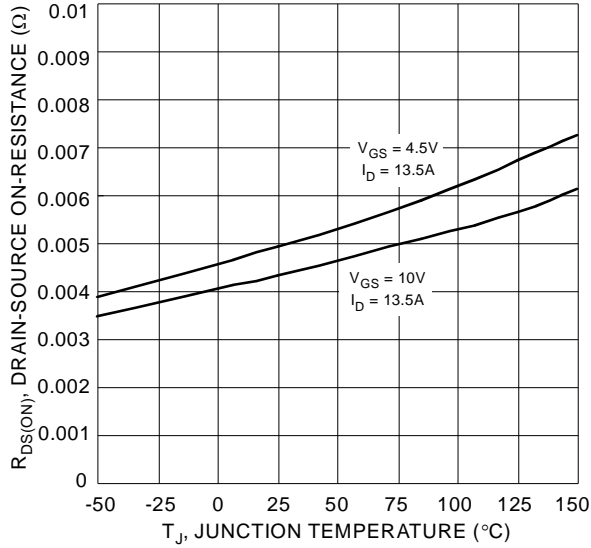


Figure 7 On-Resistance Variation with Temperature

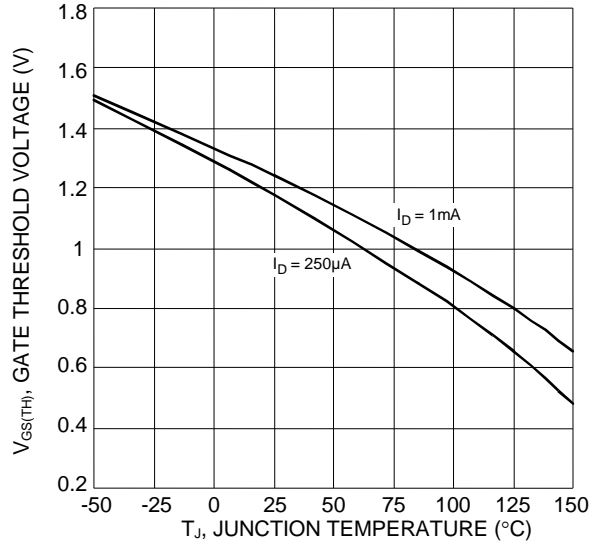


Figure 8 Gate Threshold Variation vs. Junction Temperature

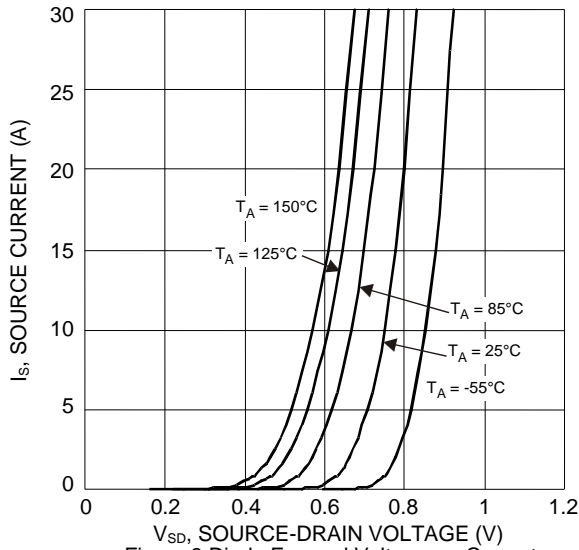


Figure 9 Diode Forward Voltage vs. Current

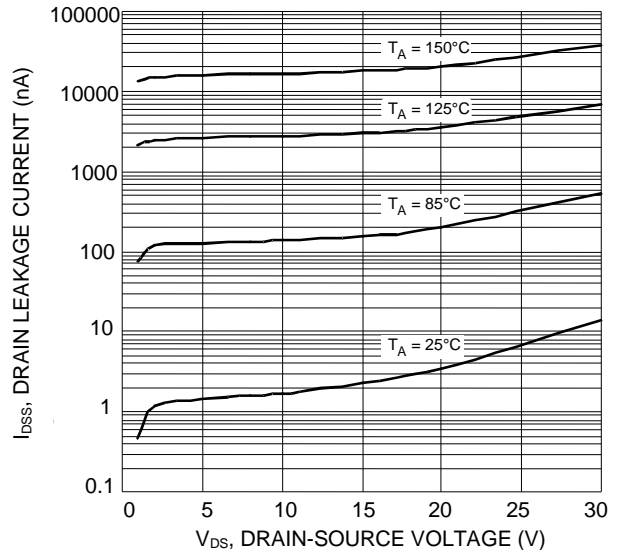


Figure 10 Typical Drain-Source Leakage Current vs. Voltage

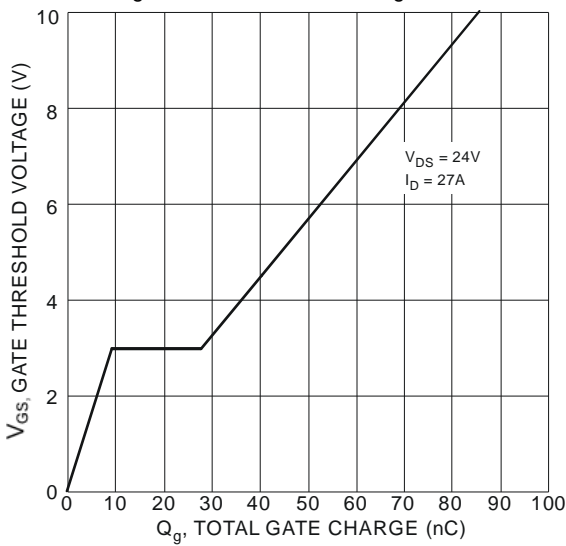


Figure 11 Gate Charge

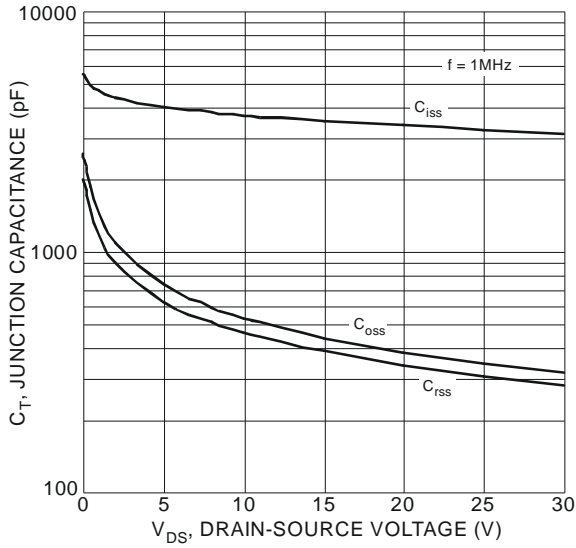


Figure 12 Typical Junction Capacitance

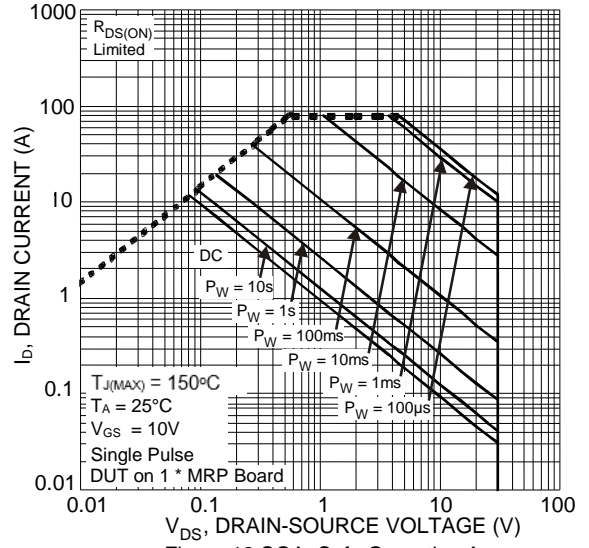


Figure 13 SOA, Safe Operation Area

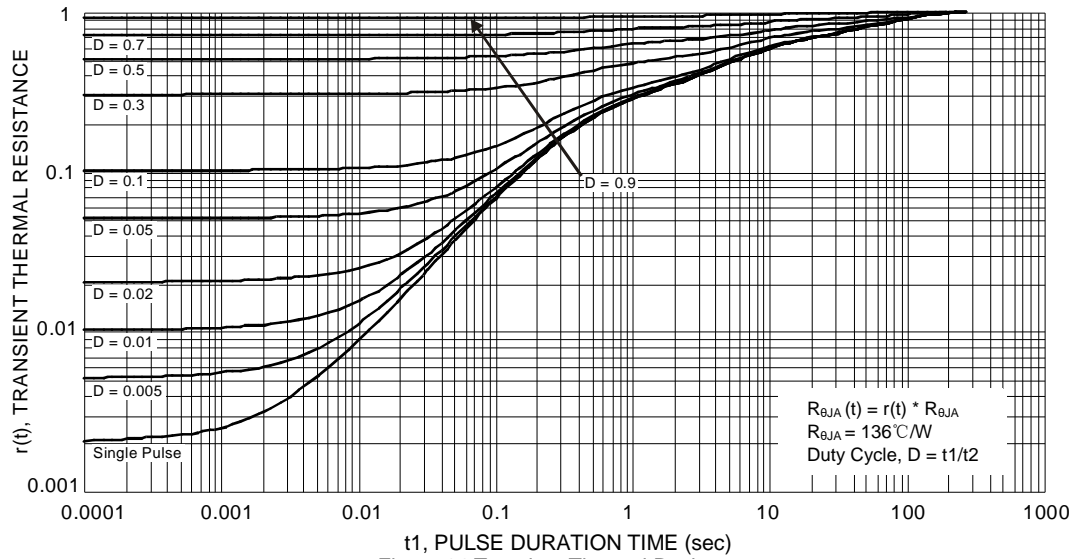


Figure 14 Transient Thermal Resistance



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