

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
60V	4.1mΩ @ V _{GS} = 10V	98A
	6.3mΩ @ V _{GS} = 6V	78A
	7mΩ @ V _{GS} = 4.5V	76A

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:

- Synchronous rectifications
- Motor controls
- DC-DC converters
- Power managements

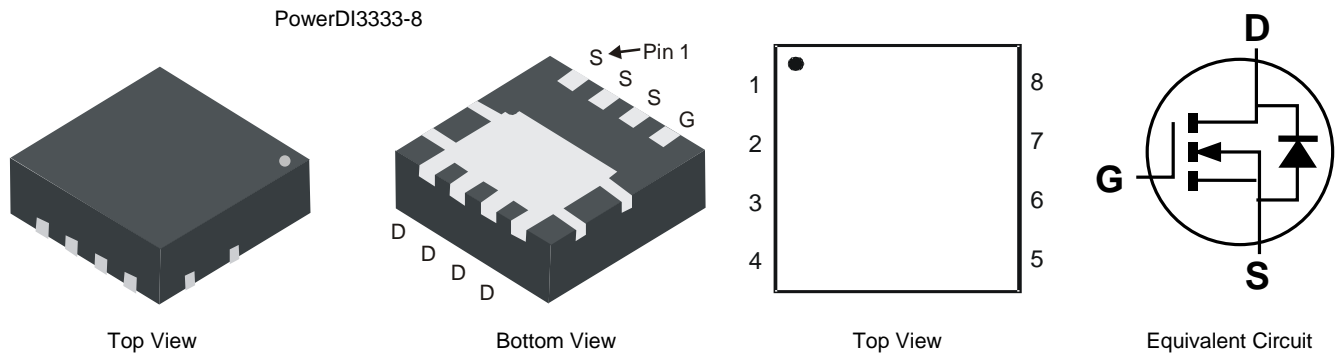
Features and Benefits

- Rated to +175°C – Ideal for High-Ambient Temperature Environments
- 100% Unclamped Inductive Switching (UIS) Test in Production – Ensures More Reliable and Robust End Application
- Low R_{DS(ON)} – Ensures On-State Losses are Minimized
- Small Form Factor Thermally Efficient Package Enables Higher Density End Products
- Occupies Just 33% of the Board Area Occupied by SO-8 Enabling Smaller End Product
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DIODES™ DMTH6005LFGQ 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[®]3333-8
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.029 grams (Approximate)

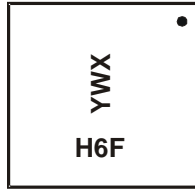


Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMTH6005LFGQ-7	PowerDI3333-8	2000	Tape & Reel
DMTH6005LFGQ-13	PowerDI3333-8	3000	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



H6F = Product Type Marking Code
 YWX = Date Code Marking
 Y = Year (ex: 2 = 2022)
 W = Week (ex: a = week 27; z represents week 52 and 53)
 X = Internal Code (ex: U = Monday)

Date Code Key

Year	2018	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	8	2	3	4	5	6	7	8	9	0	1

Week	1-26	27-52	53
Code	A-Z	a-z	z

Internal Code	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Code	T	U	V	W	X	Y	Z

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	60	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Note 5) V _{GS} = 10V	I _D	T _C = +25°C	98
		T _C = +100°C	69
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	T _A = +25°C	17
		T _A = +100°C	12
Maximum Continuous Body Diode Forward Current (Note 5)	I _S	98	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	392	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)	I _{SM}	392	A
Avalanche Current, L = 1mH	I _{AS}	18.5	A
Avalanche Energy, L = 1mH	E _{AS}	171	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P _D	2.38	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	63	°C/W
Total Power Dissipation (Note 5)	P _D	75	W
Thermal Resistance, Junction to Case (Note 5)	R _{θJC}	2	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

Notes: 5. Thermal resistance from junction to soldering point (on the exposed drain pad).
 6. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

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}	60	—	—	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	μA	V _{DS} = 48V, 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	—	2.5	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	3.4	4.1	mΩ	V _{GS} = 10V, I _D = 20A
		—	4	6.3	mΩ	V _{GS} = 6V, I _D = 5A
		—	5	7	mΩ	V _{GS} = 4.5V, I _D = 5A
Diode Forward Voltage	V _{SD}	—	0.8	1.2	V	V _{GS} = 0V, I _S = 20A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	3223	—	pF	V _{DS} = 30V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	841	—		
Reverse Transfer Capacitance	C _{rss}	—	68	—		
Gate Resistance	R _g	—	0.7	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	47.5	—	nC	V _{DD} = 30V, I _D = 50A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	21.3	—		
Gate-Source Charge	Q _{gs}	—	11.4	—		
Gate-Drain Charge	Q _{gd}	—	4.6	—		
Turn-On Delay Time	t _{D(ON)}	—	6.1	—	ns	V _{DD} = 30V, V _{GS} = 10V I _D = 30A, R _G = 3.3Ω
Turn-On Rise Time	t _R	—	5.9	—		
Turn-Off Delay Time	t _{D(OFF)}	—	33.4	—		
Turn-Off Fall Time	t _F	—	9.9	—		
Body Diode Reverse Recovery Time	t _{RR}	—	43.2	—	ns	I _F = 30A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	50.1	—	nC	

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

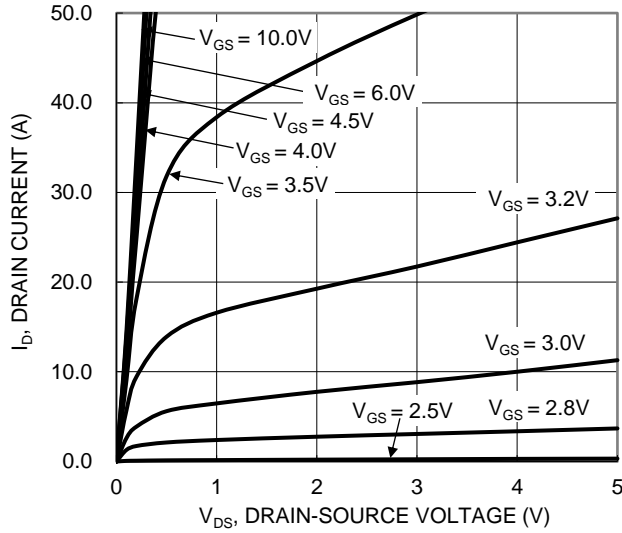


Figure 1. Typical Output Characteristic

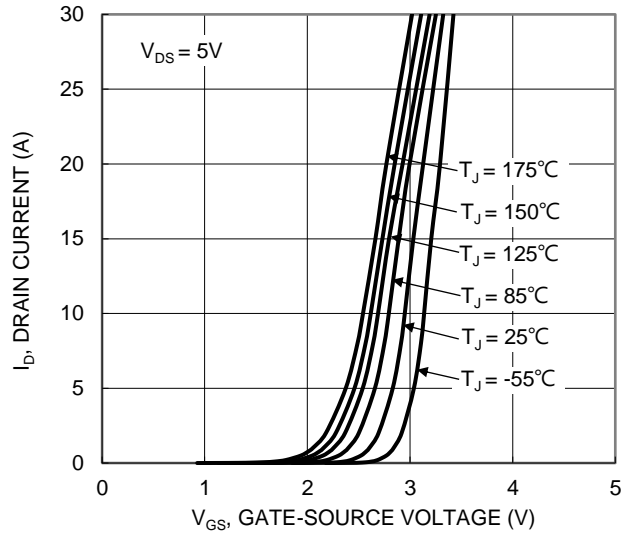


Figure 2. Typical Transfer Characteristic

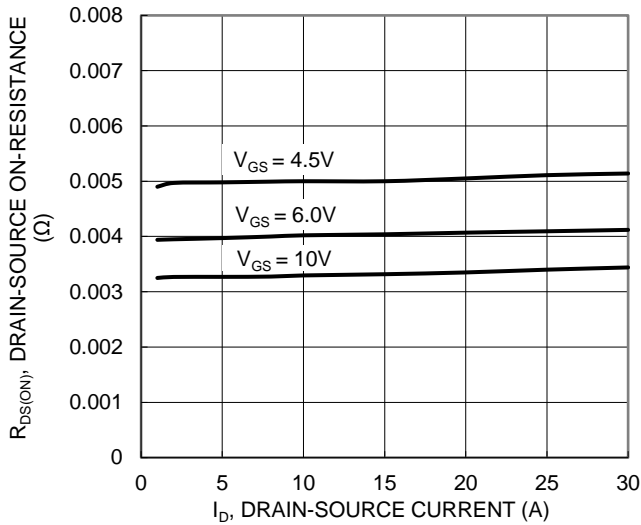


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

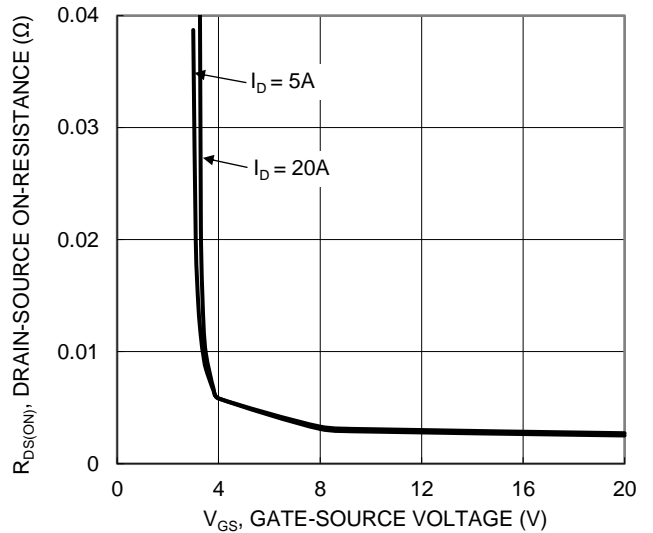


Figure 4. Typical Transfer Characteristic

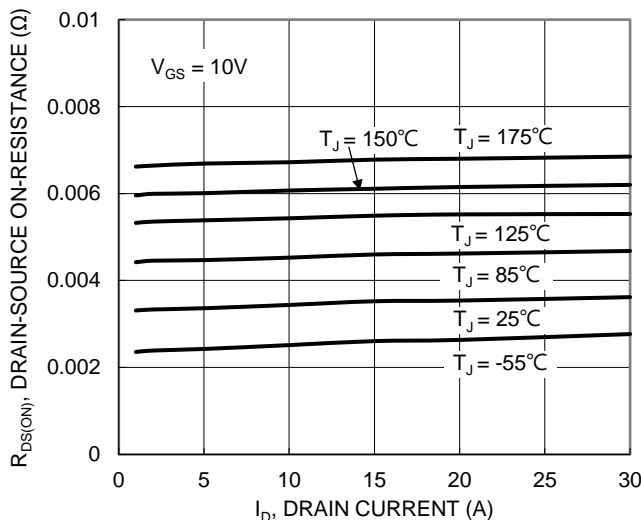


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

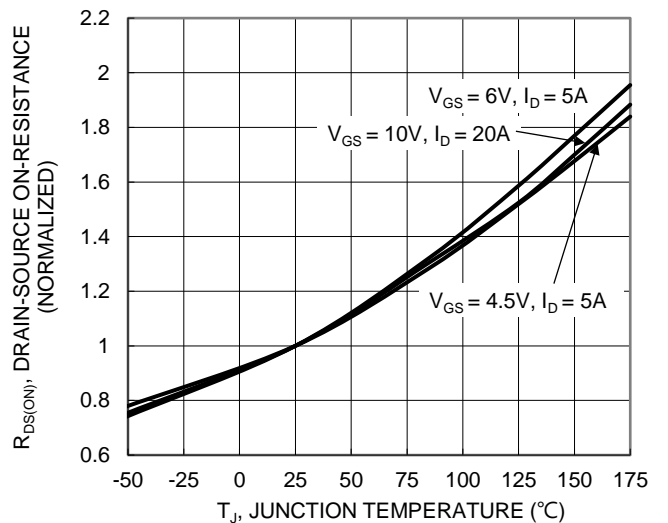


Figure 6. On-Resistance Variation with Junction Temperature

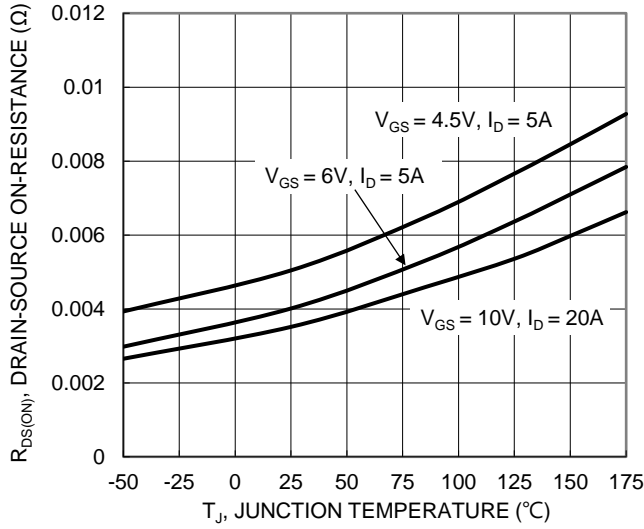


Figure 7. On-Resistance Variation with Junction Temperature

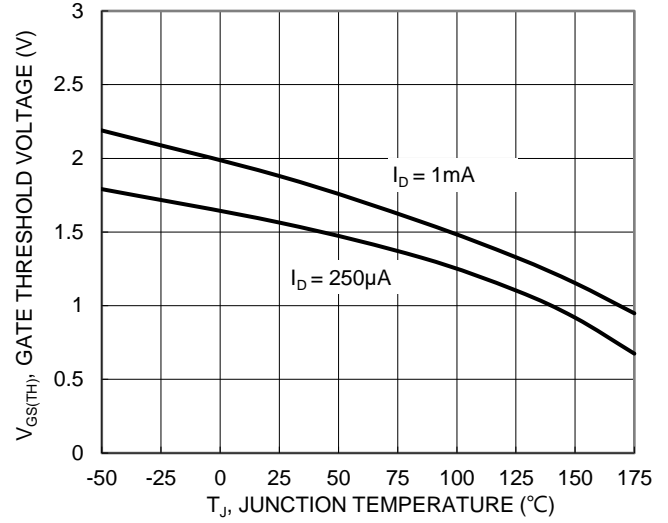


Figure 8. Gate Threshold Variation vs. Junction Temperature

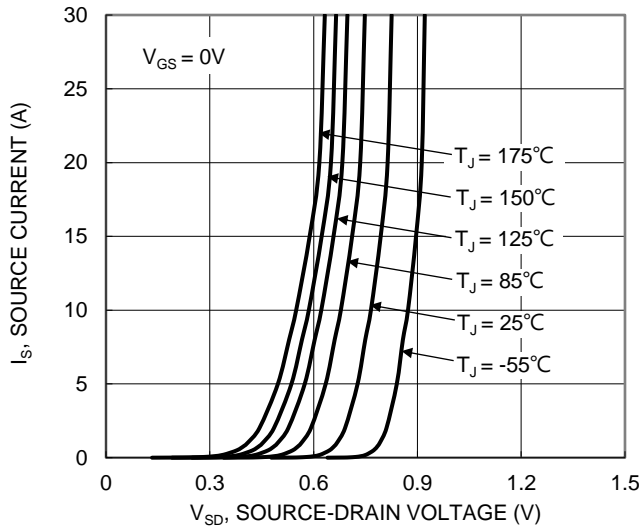


Figure 9. Diode Forward Voltage vs. Current

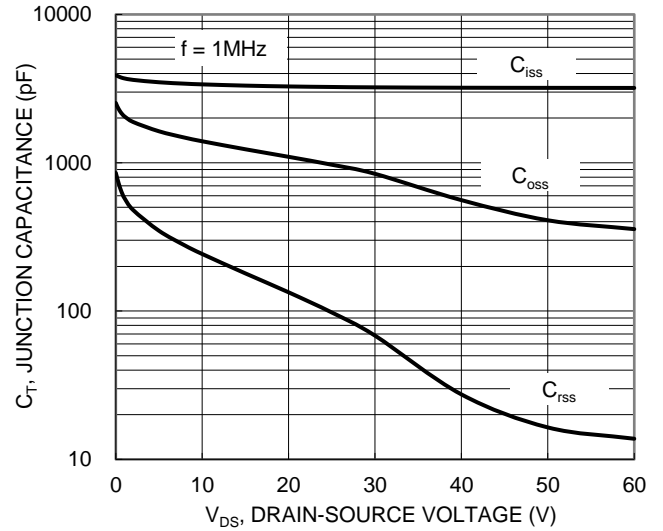


Figure 10. Typical Junction Capacitance

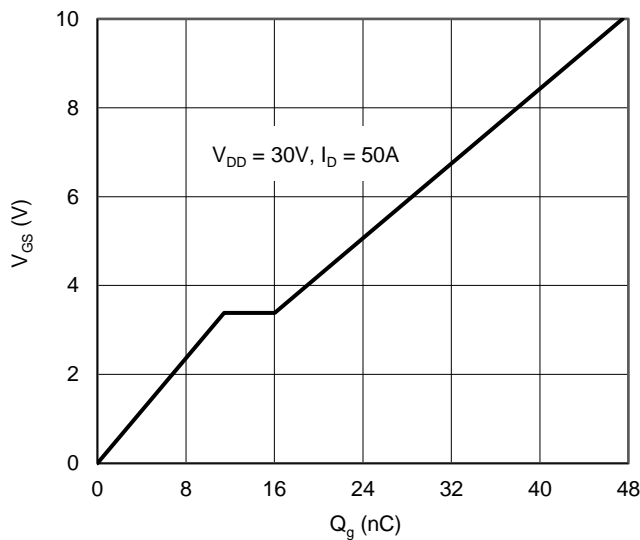


Figure 11. Gate Charge

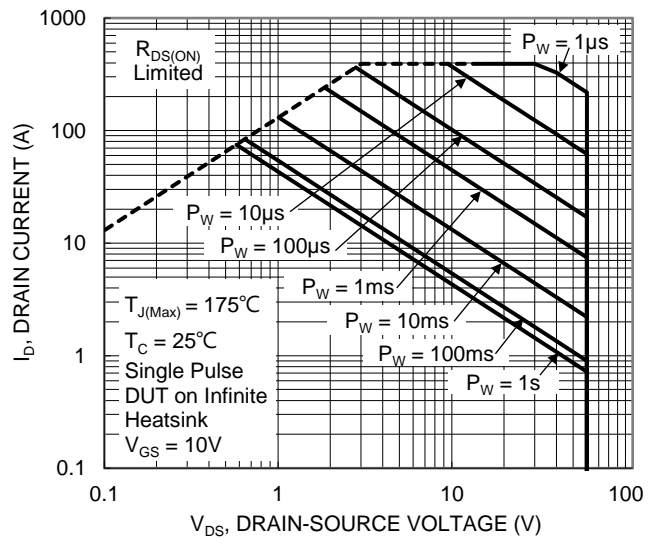


Figure 12. SOA, Safe Operation Area

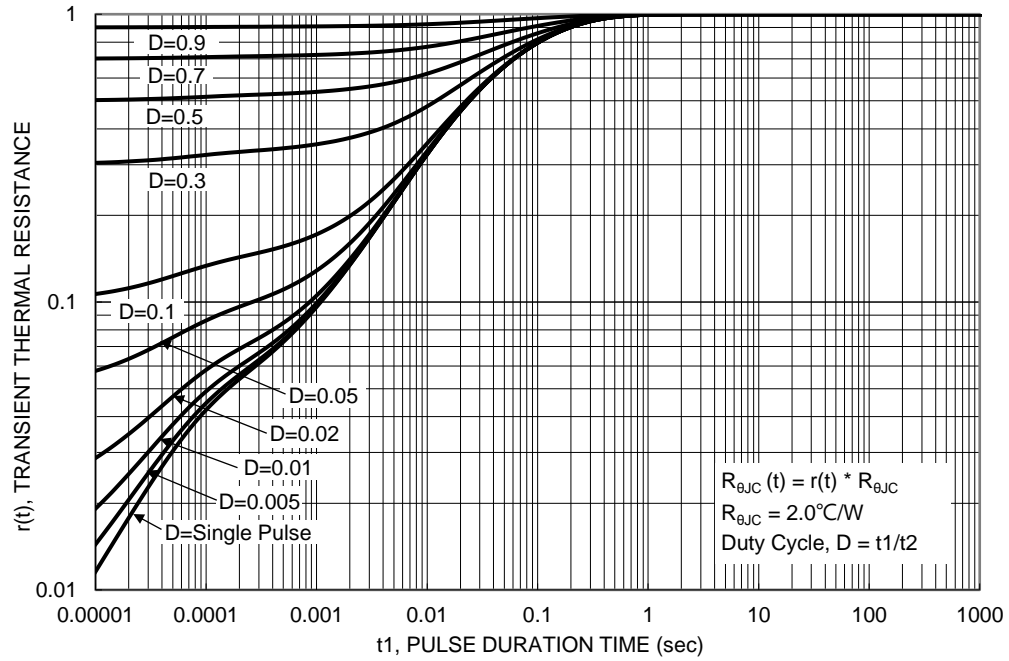


Figure 13. Transient Thermal Resistance

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