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Lead-free Green

DMT3009UDT

DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

Device	BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max T_C = +25°C
Q1& Q2	30V	11.1mΩ @ V_{GS} = 10V	30A
		15.0mΩ @ V_{GS} = 4.5V	25A

Description

This new generation 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.

Applications

- General Purpose Interfacing Switch
- Power Management Functions

Features and Benefits

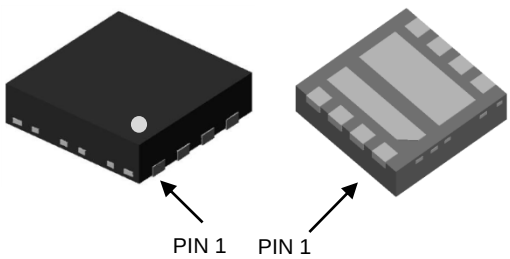
- Ultra Low Gate Threshold Voltage
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, 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

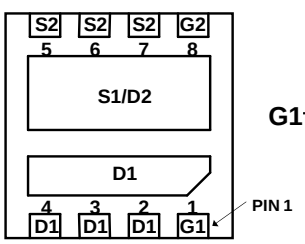
- Case: V-DFN3030-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.02 grams (Approximate)

ESD PROTECTED

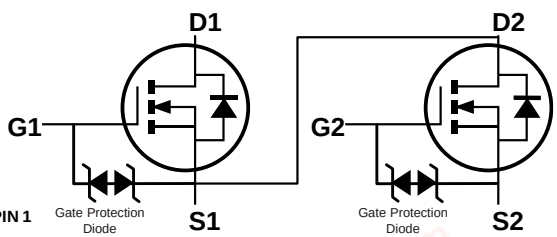
V-DFN3030-8 (Type KS)



Top View Bottom View



Bottom View
Internal Schematic



Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Tape Width	Tape Pitch	Packaging
DMT3009UDT-7	V-DFN3030-8 (Type KS)	12mm	8mm	1,500/Tape & Reel

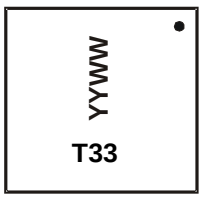
Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- 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/.

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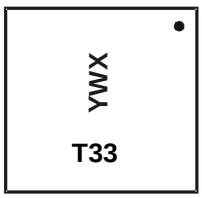
Marking Information

Site 1



T33= Product Type Marking Code
YYWW = Date Code Marking
YY or YY= Last Two Digits of Year (ex: 20 = 2020)
WW = Week Code (01 to 53)

Site 2



T33 = Product Type Marking Code
YWX = Date Code Marking
Y = Year (ex: H = 2020)
W = Week (ex: a = Week 27; z Represents Week 52 and 53)
X = Internal Code (ex: U = Monday)

Date Code Key

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	G	H	I	J	K	L	M	N	O	P	R	S

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

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

Characteristic			Symbol	Q1&Q2	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±12	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	10.6 8.5	A
Continuous Drain Current (Note 7) V_{GS} = 10V	Steady State	T_C = +25°C T_C = +70°C	I_D	30 25	A
Maximum Body Diode Forward Current (Note 6)			I_S	2.1	A
Pulsed Drain Current (100µs Pulse, Duty Cycle = 1%)			I_{DM}	80	A
Pulsed Body Diode Forward Current (100µs Pulse, Duty Cycle = 1%)			I_{SM}	80	A
Avalanche Current (Note 8) L = 0.1mH			I_{AS}	19	A
Avalanche Energy (Note 8) L = 0.1mH			E_{AS}	18	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	1.1	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	112	°C/W
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.9	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	66	°C/W
Total Power Dissipation (Note 7)	T_C = +25°C	P_D	16	W
Thermal Resistance, Junction to Case (Note 7)		$R_{\theta JC}$	8	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_J = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} = 24V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±10V, V_{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(TH)}$	0.5	—	1.8	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	8.6	11.1	mΩ	V_{GS} = 10V, I_D = 11A
		—	11.5	15		V_{GS} = 4.5V, I_D = 7A
Diode Forward Voltage	V_{SD}	—	0.8	1.2	V	V_{GS} = 0V, I_S = 8.8A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	894	—	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	381	—		
Reverse Transfer Capacitance	C_{rss}	—	76	—		
Gate Resistance	R_g	—	1.1	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 10V)	Q_g	—	14.6	—	nC	V_{DS} = 15V, I_D = 10A
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	7.4	—		
Gate-Source Charge	Q_{gs}	—	1.6	—		
Gate-Drain Charge	Q_{gd}	—	3.4	—		
Turn-On Delay Time	$t_{D(ON)}$	—	3.4	—	ns	V_{GS} = 10V, V_{DD} = 15V, R_g = 1Ω, I_D = 8.8A
Turn-On Rise Time	t_R	—	5.5	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	9.6	—		
Turn-Off Fall Time	t_F	—	1.6	—		
Body Diode Reverse Recovery Time	t_{RR}	—	17	—	ns	I_F = 8.8A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{RR}	—	6.7	—	nC	

Notes:
5. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
7. Thermal resistance from junction to soldering point (on the exposed drain pad).
8. UIS in production with L = 0.1mH, starting T_A = +25°C.
9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to product testing.

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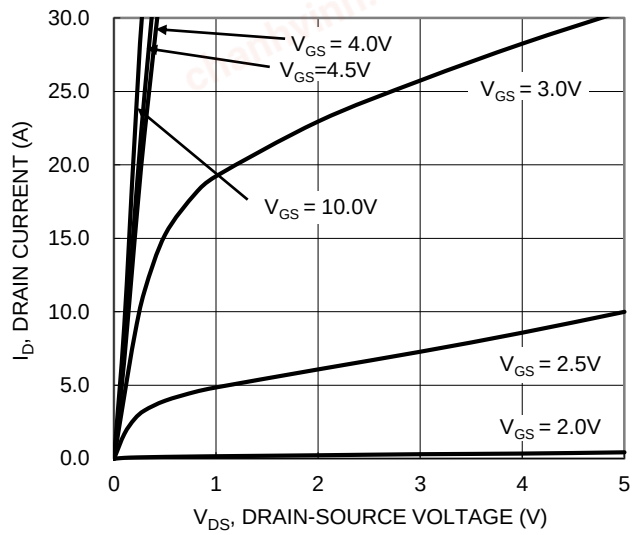


Figure 1. Typical Output Characteristic

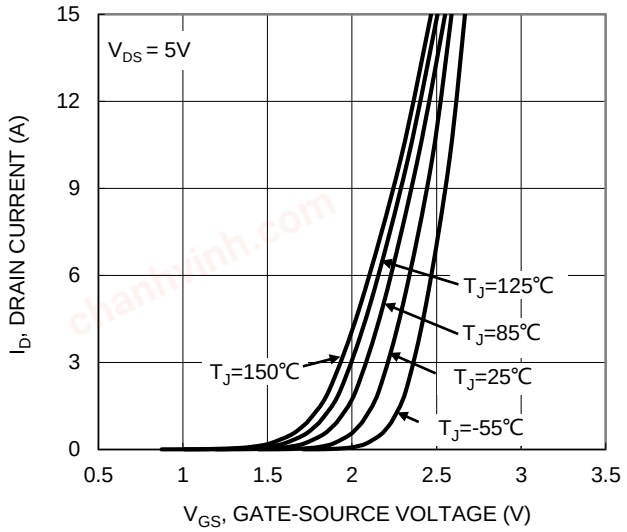


Figure 2. Typical Transfer Characteristic

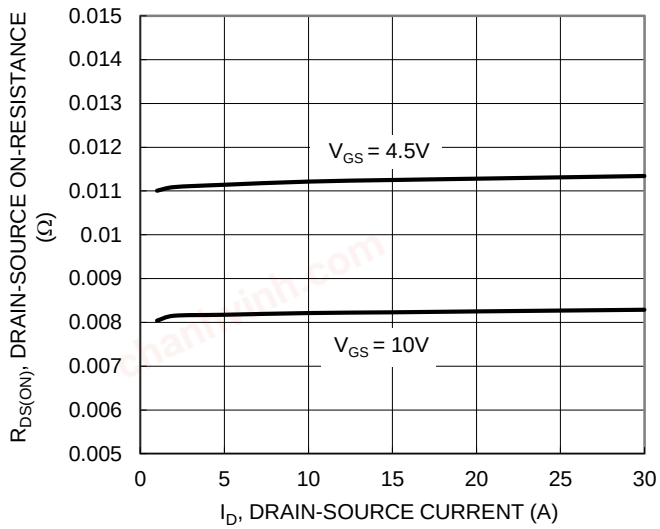


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

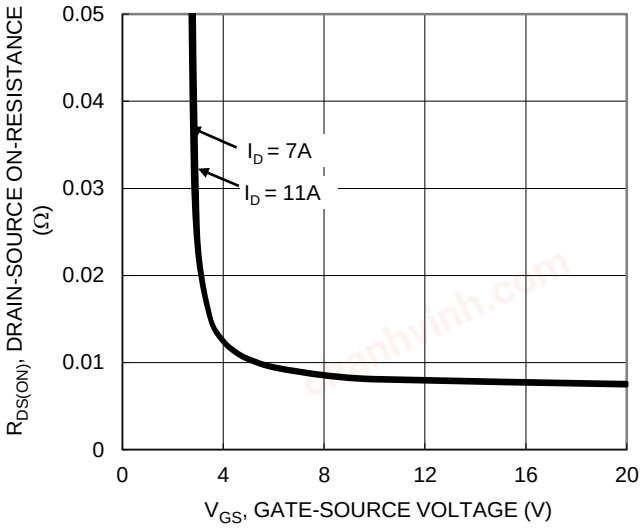


Figure 4. Typical Transfer Characteristic

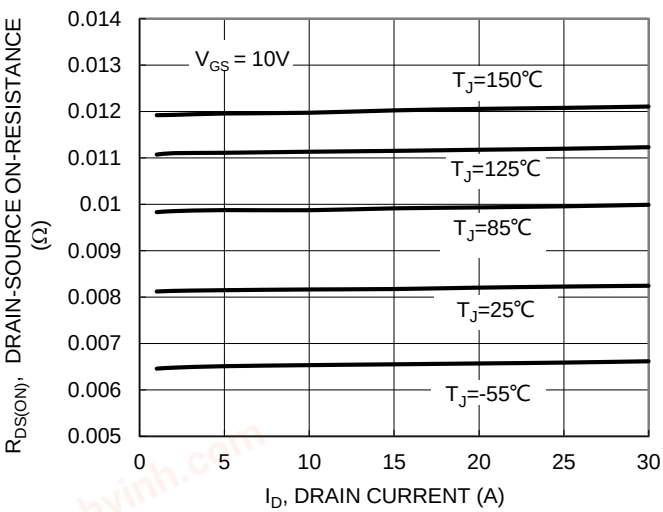


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

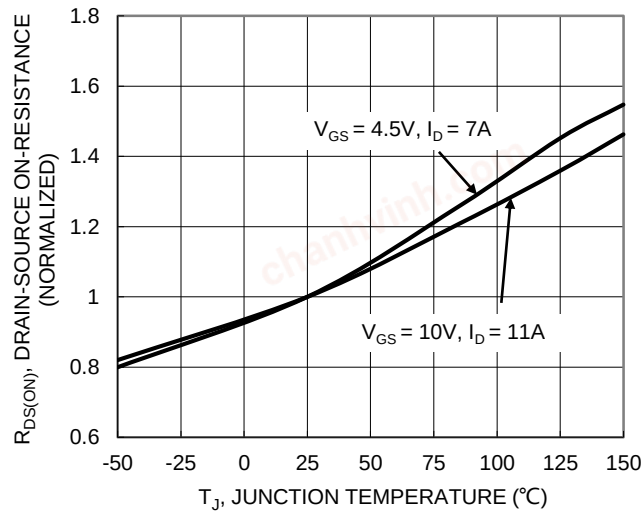


Figure 6. On-Resistance Variation with Junction Temperature

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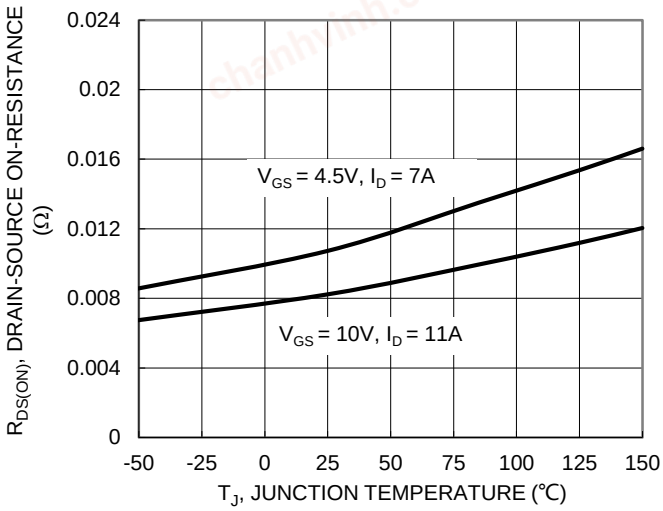


Figure 7. On-Resistance Variation with Junction Temperature

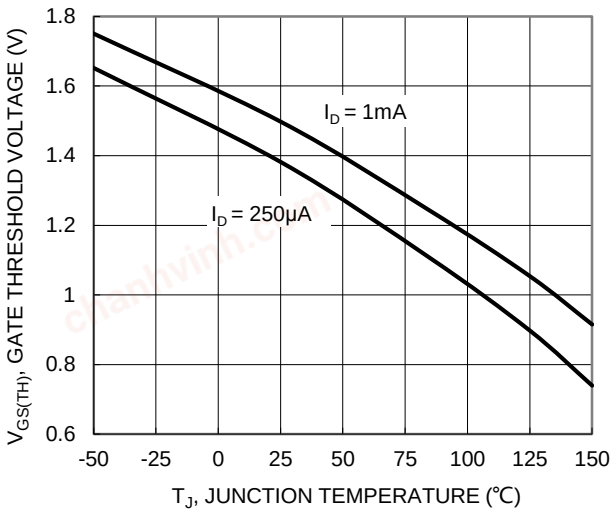


Figure 8. Gate Threshold Variation vs. Junction Temperature

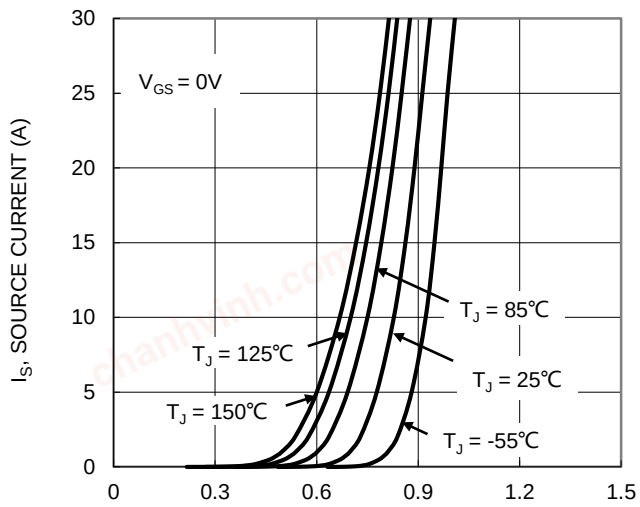


Figure 9. Diode Forward Voltage vs. Current

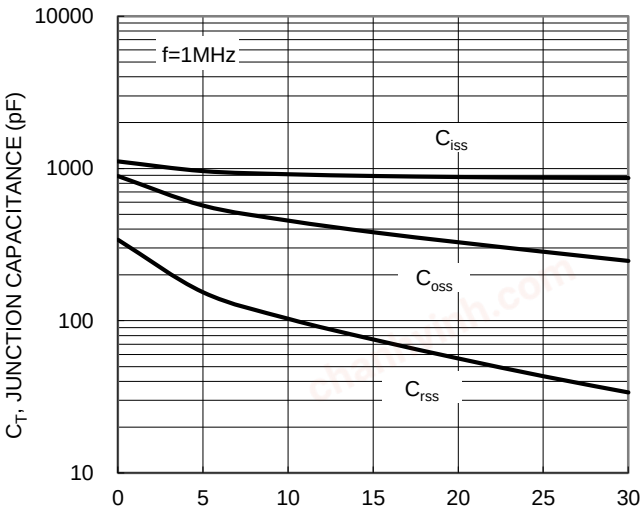


Figure 10. Typical Junction Capacitance

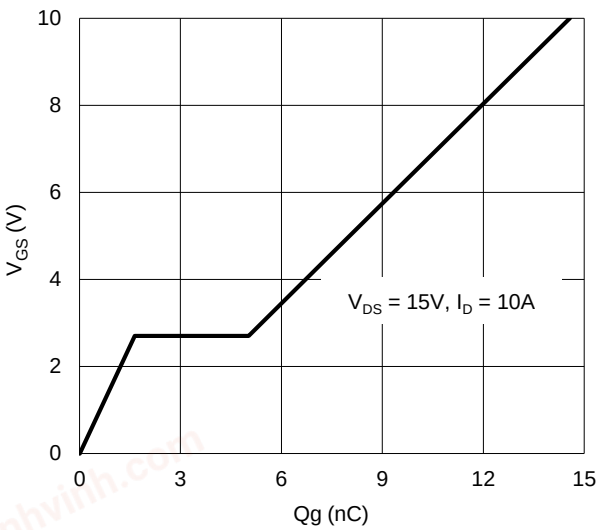


Figure 11. Gate Charge

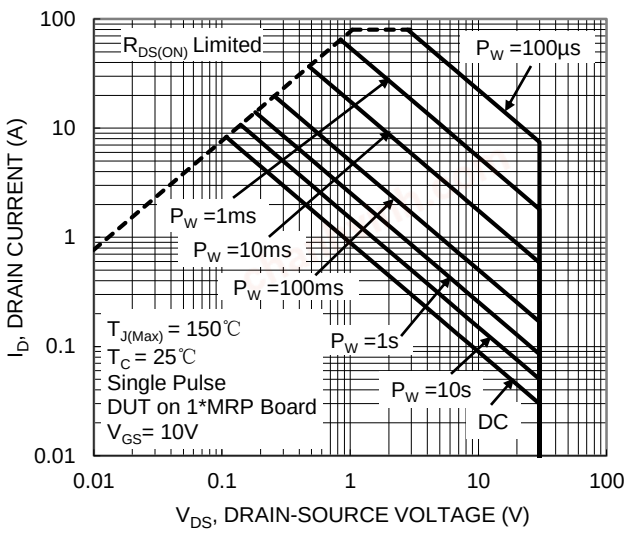


Figure 12. SOA, Safe Operation Area

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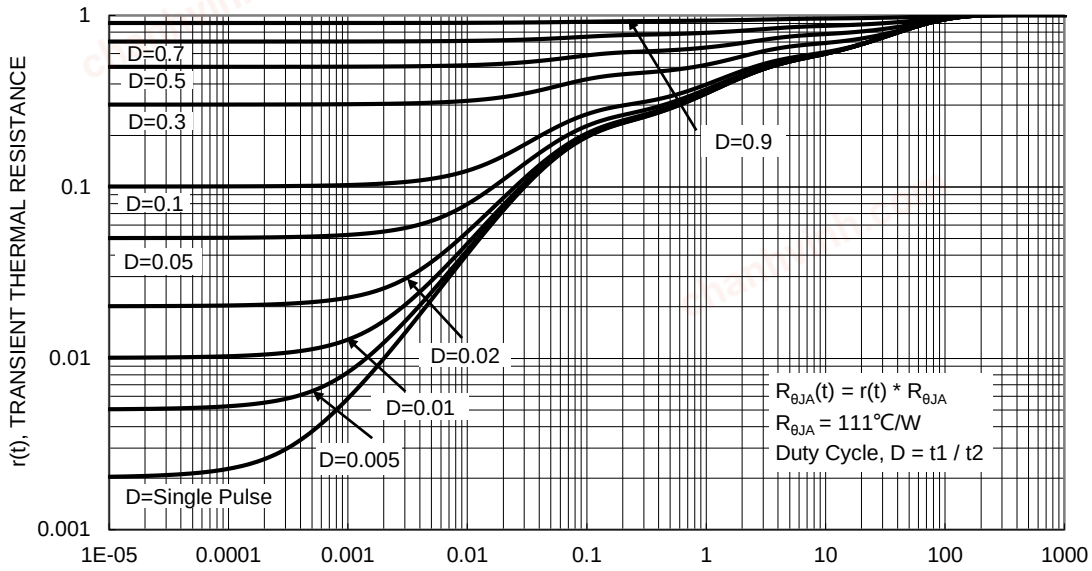


Figure 13. Transient Thermal Resistance

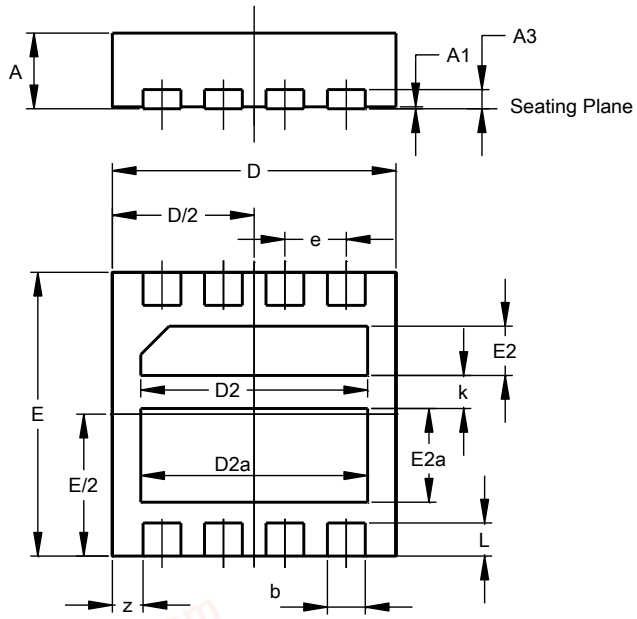
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Package Outline Dimensions

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

V-DFN3030-8 (Type KS)

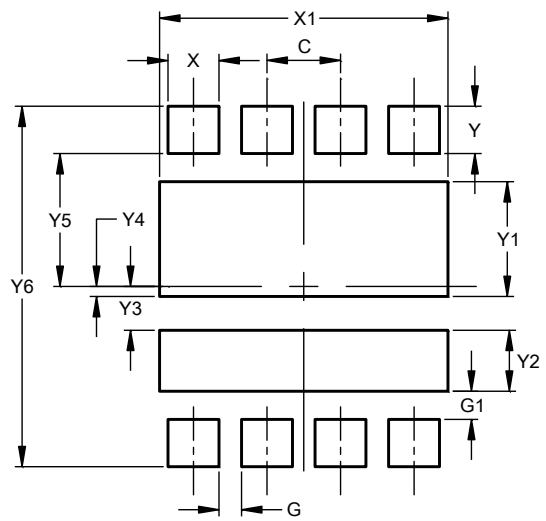


V-DFN3030-8 (Type KS)			
Dim	**Min**	**Max**	**Typ**
A	0.77	0.85	0.80
A1	0.00	0.05	0.02
A3	0.20BSC		
b	0.35	0.45	0.40
D	2.95	3.050	3.00
D2	2.30	2.50	2.40
D2a	2.30	2.50	2.40
E	2.95	3.050	3.00
E2	0.42	0.62	0.52
E2a	0.89	1.09	0.99
e	0.65BSC		
k	-	-	0.35
L	0.30	0.40	0.35
z	0.325BSC		
All Dimensions in mm			

Suggested Pad Layout

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

V-DFN3030-8 (Type KS)



Dimensions	Value (in mm)
C	0.650
G	0.200
G1	0.250
X	0.450
X1	2.550
Y	0.420
Y1	1.019
Y2	0.541
Y3	0.389
Y4	0.089
Y5	1.180
Y6	3.200

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