

Product Summary

Device	BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C (Note 10)
Q1 & Q2	30V	11.1mΩ @ V _{GS} = 10V	30A
		13.8mΩ @ V _{GS} = 4.5V	28A
		22.0mΩ @ V _{GS} = 3.8V	22A

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

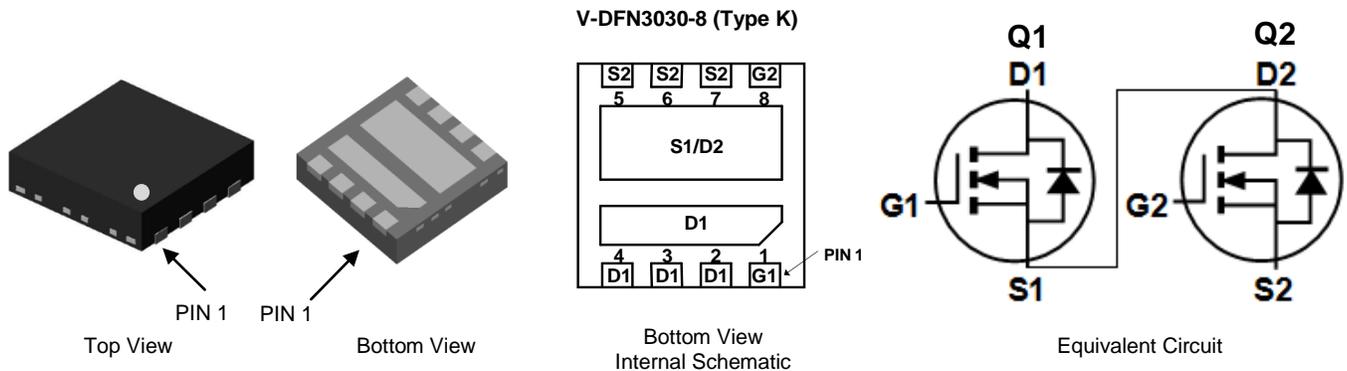
- General Purpose Interfacing Switch
- Power Management Functions

Features and Benefits

- Low Gate Threshold Voltage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: V-DFN3030-8 (Type K)
- 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)



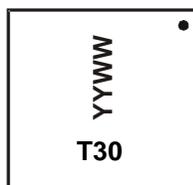
Ordering Information (Note 4)

Part Number	Case	Tape Width	Tape Pitch	Packaging
DMT3009LDT-7	V-DFN3030-8 (Type K)	8mm	4mm	3,000/Tape & Reel
DMT3009LDT-7A	V-DFN3030-8 (Type K)	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 http://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

V-DFN3030-8 (Type K)



T30= Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 18 = 2018)
 WW = Week Code (01 to 53)

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic			Symbol	Q1&Q2	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	+20, -16	V
Continuous Drain Current (Note 6) $V_{GS} = 10\text{V}$	Steady State (Note 10)	$T_C = +25^\circ\text{C}$ $T_C = +70^\circ\text{C}$	I_D	30 25	A
	$t < 10\text{s}$	$T_A = +25^\circ\text{C}$ $T_A = +70^\circ\text{C}$	I_D	14 11	A
Maximum Body Diode Forward Current (Note 6)			I_S	2.1	A
Pulsed Drain Current (100 μs Pulse, Duty Cycle = 1%)			I_{DM}	80	A
Pulsed Body Diode Forward Current (370 μs Pulse, Duty Cycle = 1%)			I_{SM}	80	A
Avalanche Current (Note 7) $L = 0.1\text{mH}$			I_{AS}	19.3	A
Avalanche Energy (Note 7) $L = 0.1\text{mH}$			E_{AS}	18.6	mJ

Thermal Characteristics

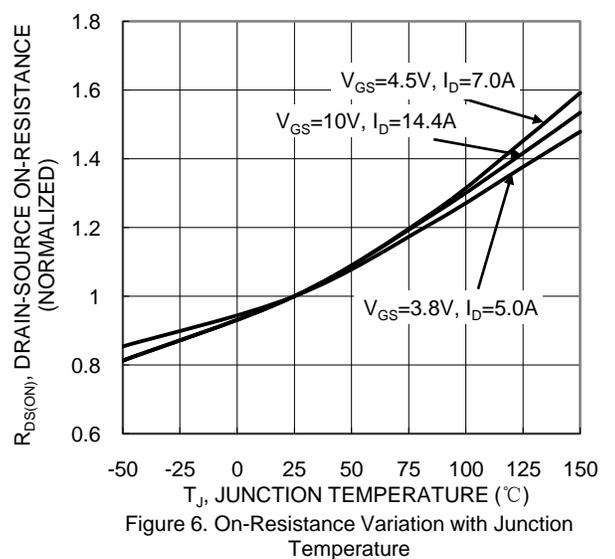
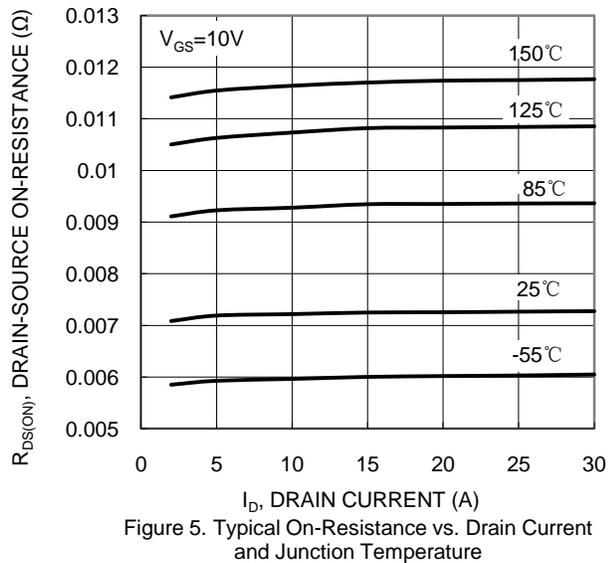
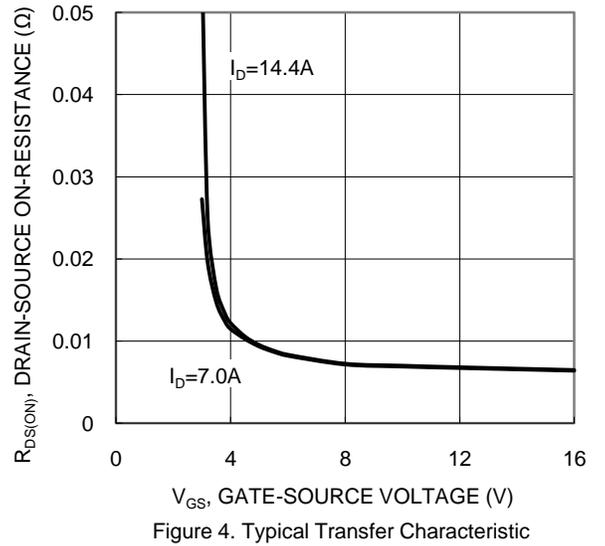
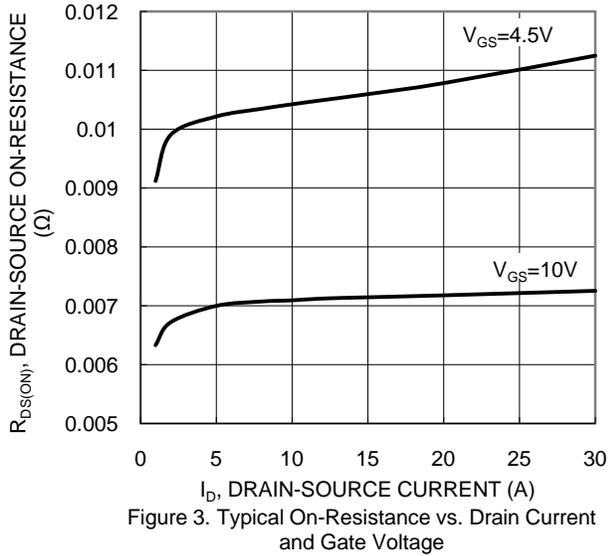
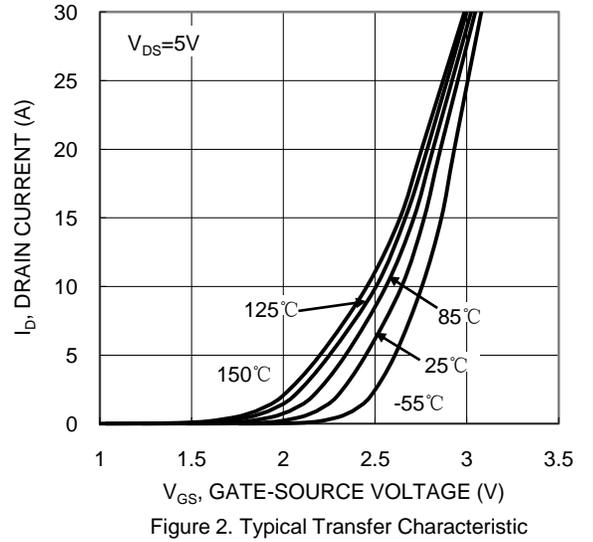
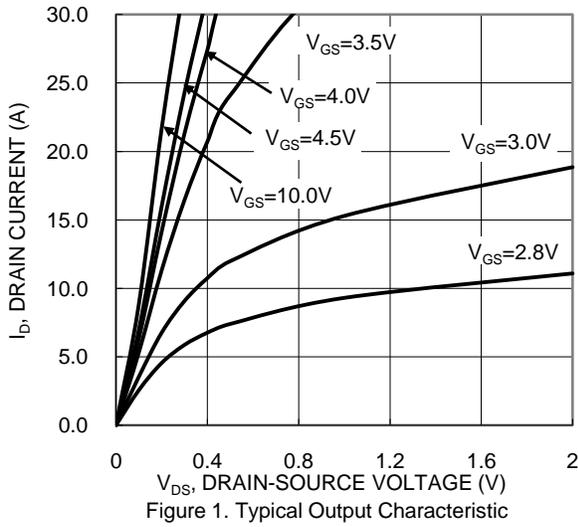
Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	$T_A = +25^\circ\text{C}$	P_D	1.2	W
	$T_A = +70^\circ\text{C}$		0.8	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	107	$^\circ\text{C/W}$
	$t < 10\text{s}$		63	
Total Power Dissipation (Note 6)	$T_A = +25^\circ\text{C}$	P_D	2.0	W
	$T_A = +70^\circ\text{C}$		1.2	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	64	$^\circ\text{C/W}$
	$t < 10\text{s}$		39	
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	7.6	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- 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 1-inch square copper plate.
 7. UIS in production with $L = 0.1\text{mH}$, starting $T_A = +25^\circ\text{C}$.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
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
Zero Gate Voltage Drain Current T _J = +150°C (Note 9)	I _{DSS}	—	—	100	μA	V _{DS} = 24V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = 20V, V _{DS} = 0V V _{GS} = -16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1	—	3	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	7.2	11.1	mΩ	V _{GS} = 10V, I _D = 14.4A
		—	10.5	13.8		V _{GS} = 4.5V, I _D = 7A
		—	13	22.0		V _{GS} = 3.8V, I _D = 5A
Diode Forward Voltage	V _{SD}	—	—	1.2	V	V _{GS} = 0V, I _S = 10A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	748	1,500	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	447	895		
Reverse Transfer Capacitance	C _{rss}	—	43	90		
Gate Resistance	R _g	—	1.0	2.0	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	13.8	20	nC	V _{DS} = 15V, I _D = 14.4A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	6.4	9		
Gate-Source Charge	Q _{gs}	—	2.2	5		
Gate-Drain Charge	Q _{gd}	—	2.2	5	ns	V _{GS} = 10V, V _{DD} = 15V, R _g = 1Ω, I _D = 10A
Turn-On Delay Time	t _{D(ON)}	—	3.5	7		
Turn-On Rise Time	t _r	—	5.0	10		
Turn-Off Delay Time	t _{D(OFF)}	—	8.6	17		
Turn-Off Fall Time	t _f	—	1.4	3	ns	I _F = 10A, di/dt = 100A/μs
Body Diode Reverse Recovery Time	t _{RR}	—	18	33		
Body Diode Reverse Recovery Charge	Q _{RR}	—	7.7	15	nC	I _F = 10A, di/dt = 100A/μs

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



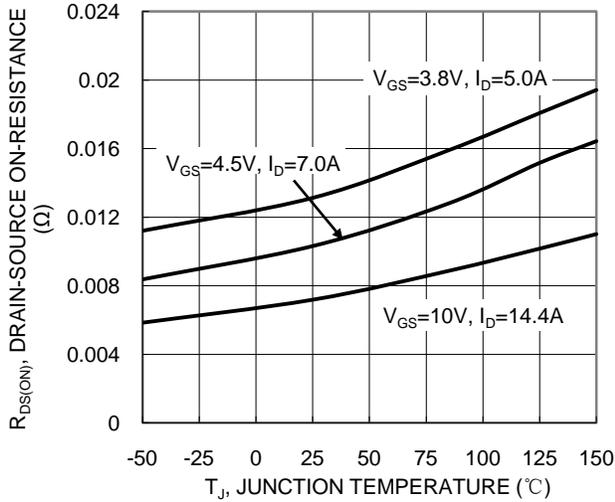


Figure 7. On-Resistance Variation with Junction Temperature

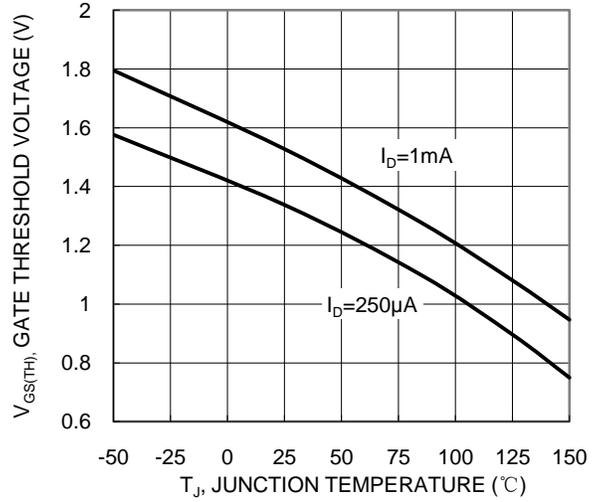


Figure 8. Gate Threshold Variation vs. Junction Temperature

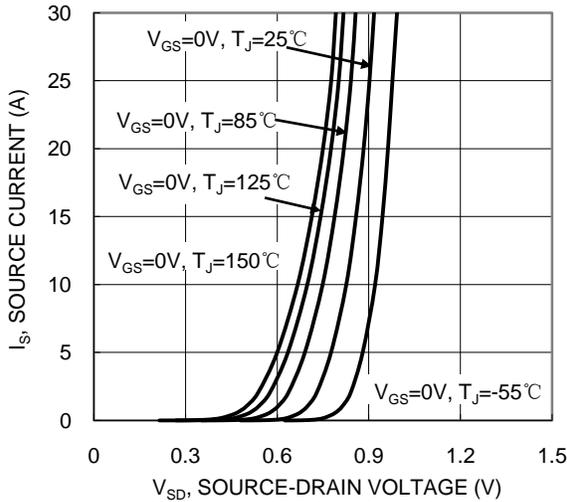


Figure 9. Diode Forward Voltage vs. Current

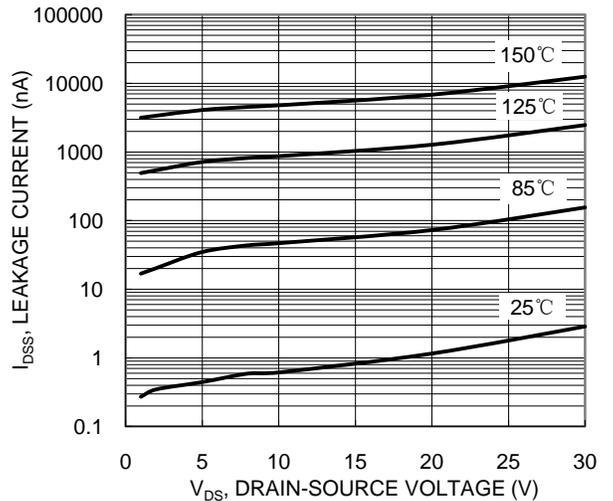


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

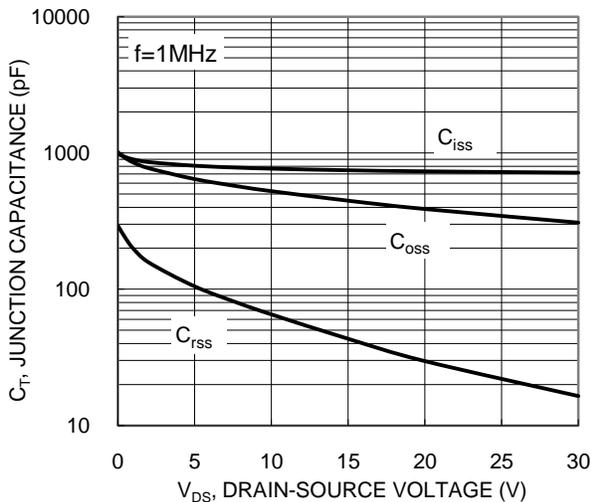


Figure 11. Typical Junction Capacitance

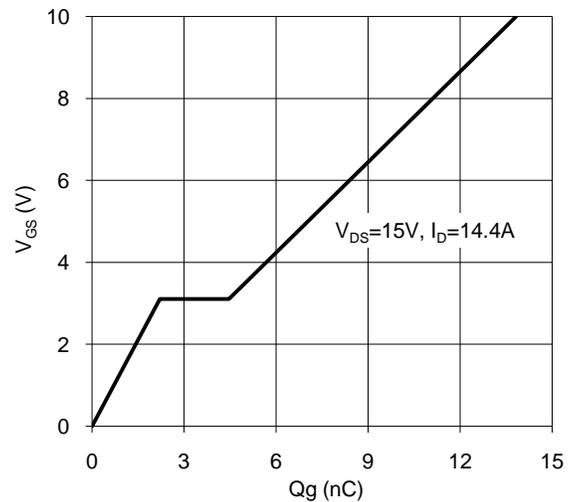


Figure 12. Gate Charge

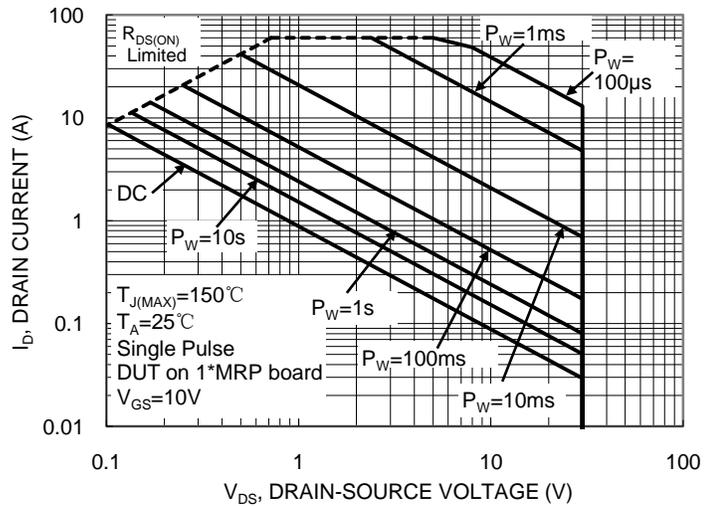


Figure 13. SOA, Safe Operation Area

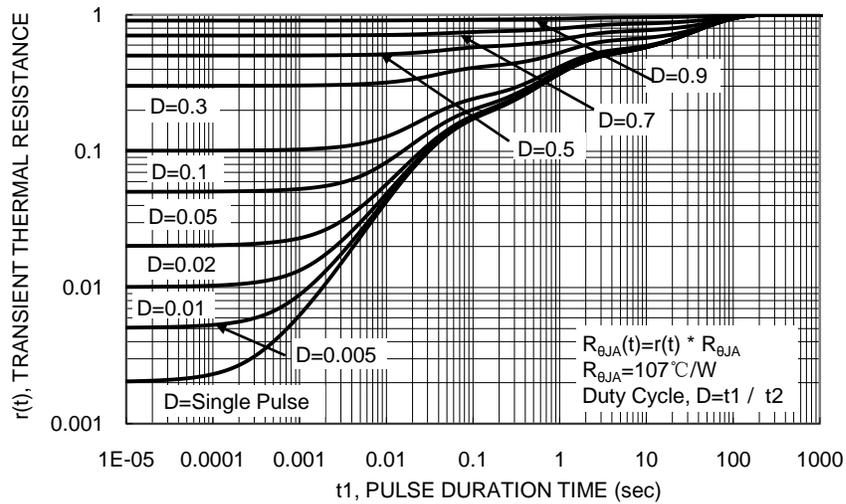
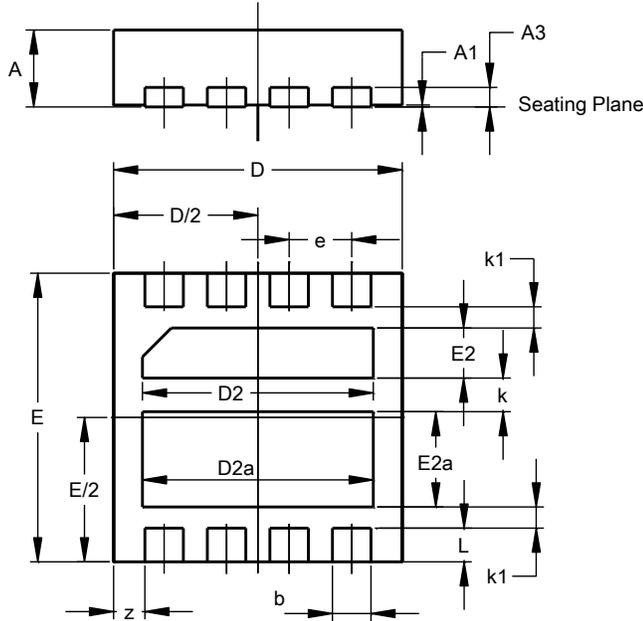


Figure 14. Transient Thermal Resistance

Package Outline Dimensions

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

V-DFN3030-8 (Type K)

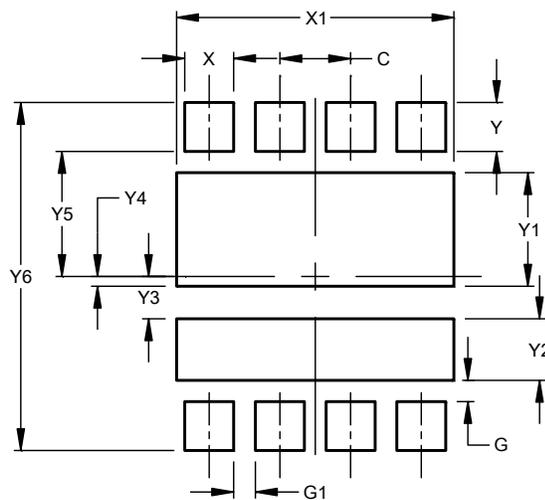


V-DFN3030-8 (Type K)			
Dim	Min	Max	Typ
A	0.77	0.85	0.80
A1	0.00	0.05	0.02
A3	0.20BSC		
b	0.35	0.45	0.40
D	2.95	3.050	3.00
D2	2.30	2.50	2.40
D2a	2.30	2.50	2.40
E	2.95	3.050	3.00
E2	0.42	0.62	0.52
E2a	0.89	1.09	0.99
e	0.65BSC		
k	-	-	0.35
k1	-	-	0.22
L	0.30	0.40	0.35
z	0.325BSC		
All Dimensions in mm			

Suggested Pad Layout

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

V-DFN3030-8 (Type K)



Dimensions	Value (in mm)
C	0.650
G	0.195
G1	0.200
X	0.450
X1	2.550
Y	0.450
Y1	1.044
Y2	0.566
Y3	0.389
Y4	0.089
Y5	1.150
Y6	3.200

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