30V 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	20mΩ @ V_{GS} = 10V	8.5A
		32mΩ @ V_{GS} = 4.5V	5.5A

Features and Benefits

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

Description

This new generation MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

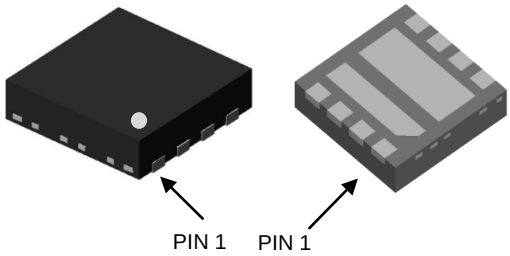
Mechanical Data

- 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)

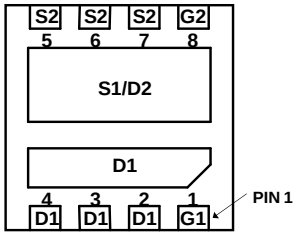
Applications

- General Purpose Interfacing Switch
- Power Management Functions

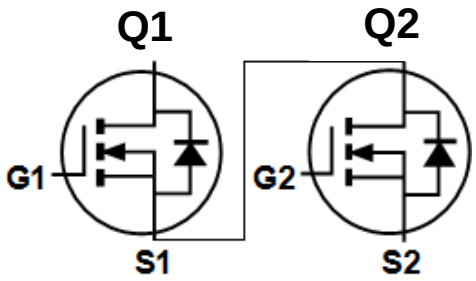
V-DFN3030-8 (Type K)



Top View Bottom View



Bottom View
Internal Schematic



Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Tape Width	Tape Pitch	Packaging
DMT3020LDT-7	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 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

AR6 = 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°C, unless otherwise specified.)

Characteristic			Symbol	Q1&Q2	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_C = +25°C T_C = +70°C	I_D	8.5 7.0	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	55	A
Maximum Body Diode Forward Current (Note 6)			I_S	2.5	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)			I_{SM}	55	A
Avalanche Current (Note 7) L = 0.1mH			I_{AS}	11.4	A
Avalanche Energy (Note 7) L = 0.1mH			E_{AS}	6.5	mJ

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	0.67	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	119	°C/W
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.95	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	64	°C/W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	13.5	
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 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
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±12V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	1.0	—	2.5	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	—	20	mΩ	V_{GS} = 10V, I_D = 6A
		—	—	32		V_{GS} = 4.5V, I_D = 5A
Diode Forward Voltage	V_{SD}	—	—	1.2	V	V_{GS} = 0V, I_S = 2A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	393	—	pF	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	173	—		
Reverse Transfer Capacitance	C_{rss}	—	27	—		
Gate Resistance	R_G	—	1.1	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = 10V)	Q_g	—	7.0	—	nC	V_{DD} = 15V, I_D = 9A
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	3.6	—		
Gate-Source Charge	Q_{gs}	—	0.9	—		
Gate-Drain Charge	Q_{gd}	—	1.5	—		
Turn-On Delay Time	$t_{D(ON)}$	—	1.8	—	ns	V_{DD} = 15V, V_{GS} = 10V, R_G = 6Ω, I_D = 9A
Turn-On Rise Time	t_R	—	1.9	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	7.5	—		
Turn-Off Fall Time	t_F	—	2.4	—		
Body Diode Reverse Recovery Time	t_{RR}	—	10	—	ns	I_F = 9A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q_{RR}	—	2.6	—	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. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

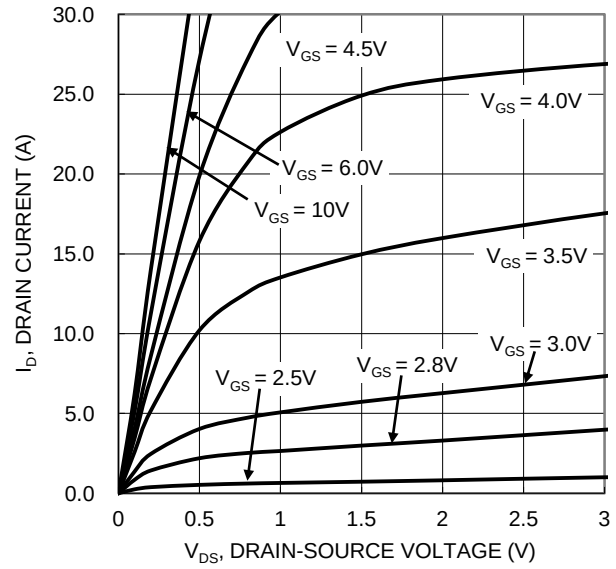


Figure 1. Typical Output Characteristic

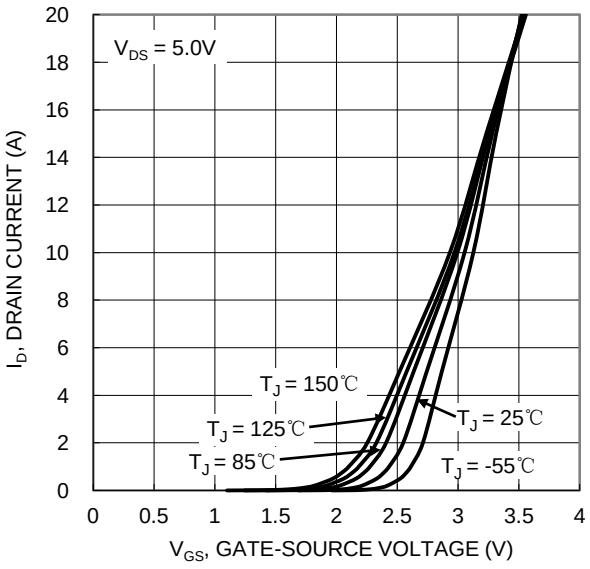


Figure 2. Typical Transfer Characteristic

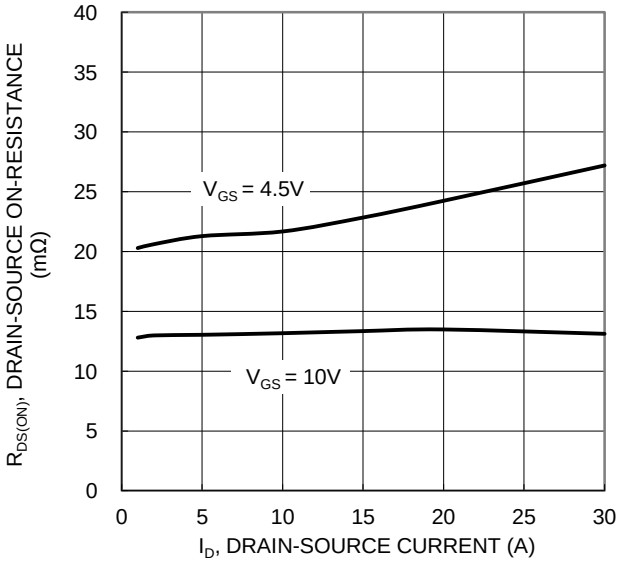


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

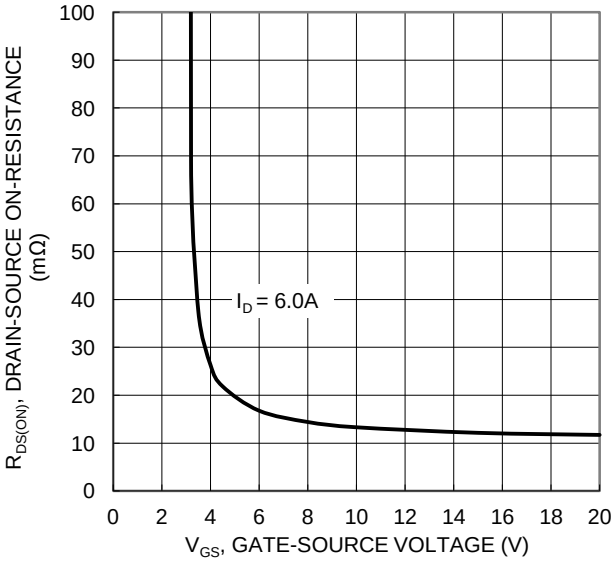


Figure 4. Typical Transfer Characteristic

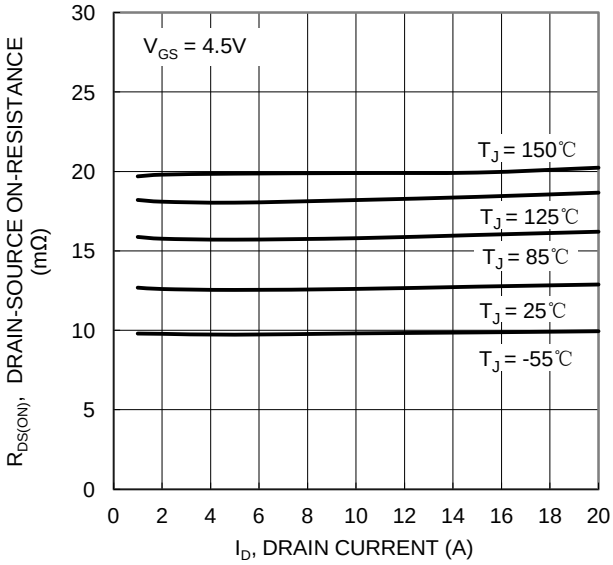


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

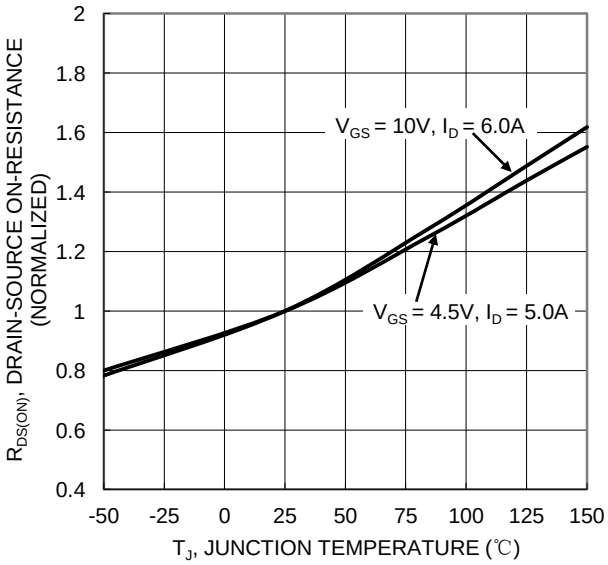


Figure 6. On-Resistance Variation with Temperature

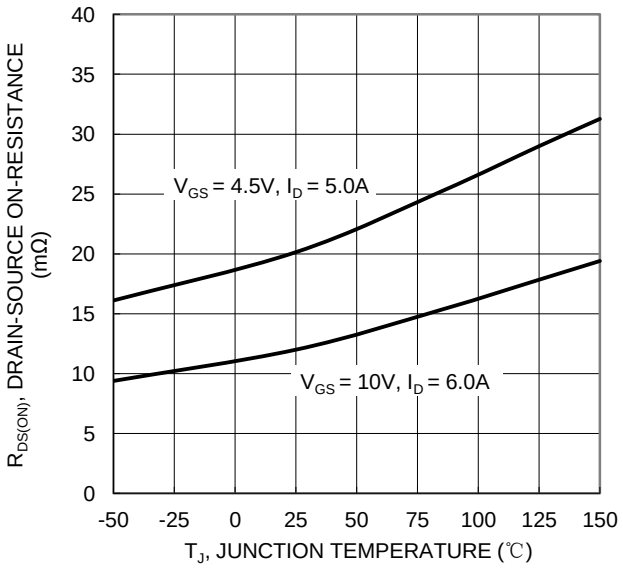


Figure 7. On-Resistance Variation with Temperature

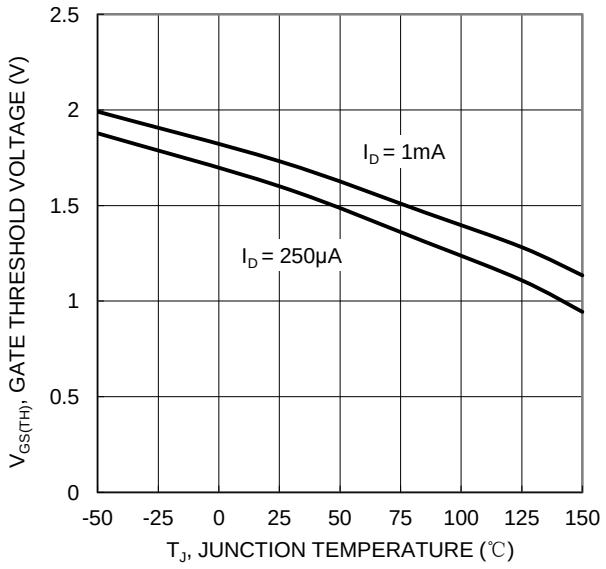


Figure 8. Gate Threshold Variation vs. Junction Temperature

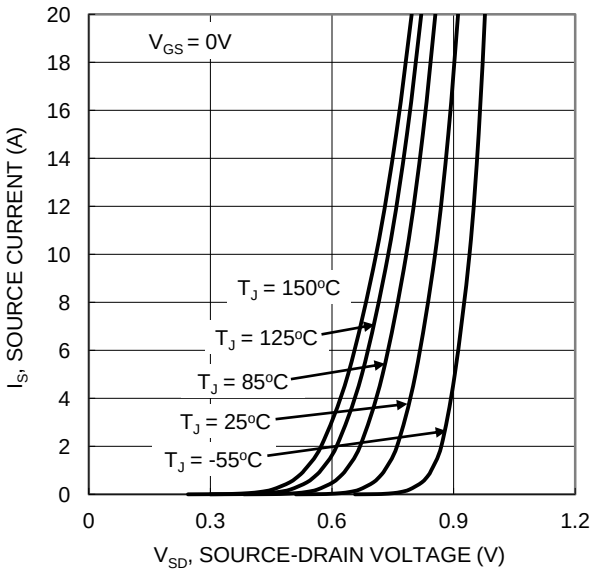


Figure 9. Diode Forward Voltage vs. Current

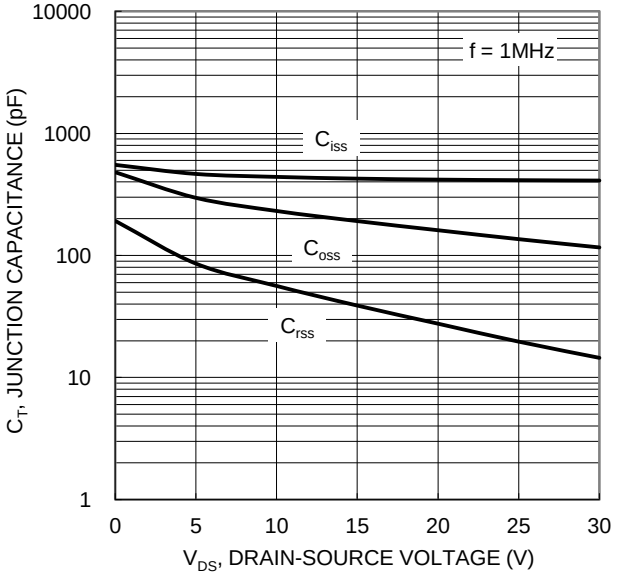


Figure 10. Typical Junction Capacitance

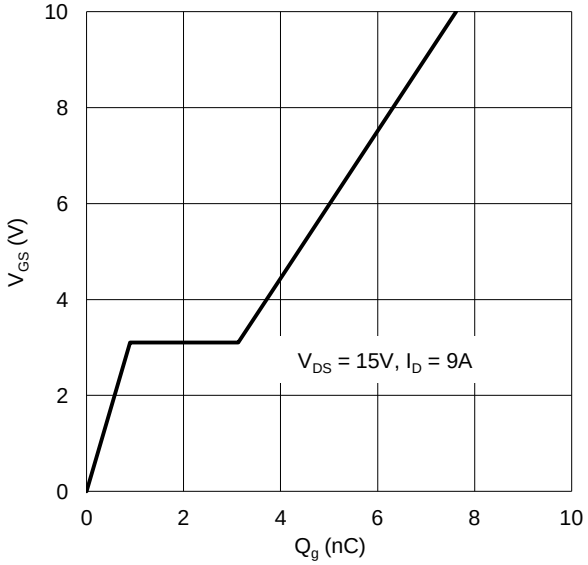


Figure 11. Gate Charge

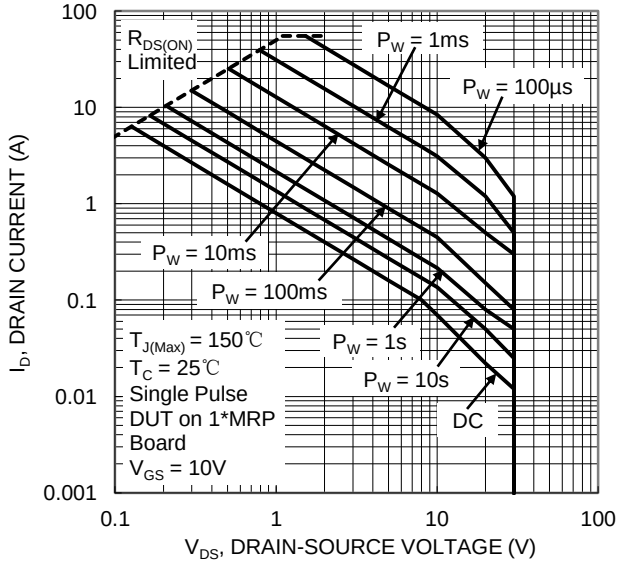


Figure 12. SOA, Safe Operation Area

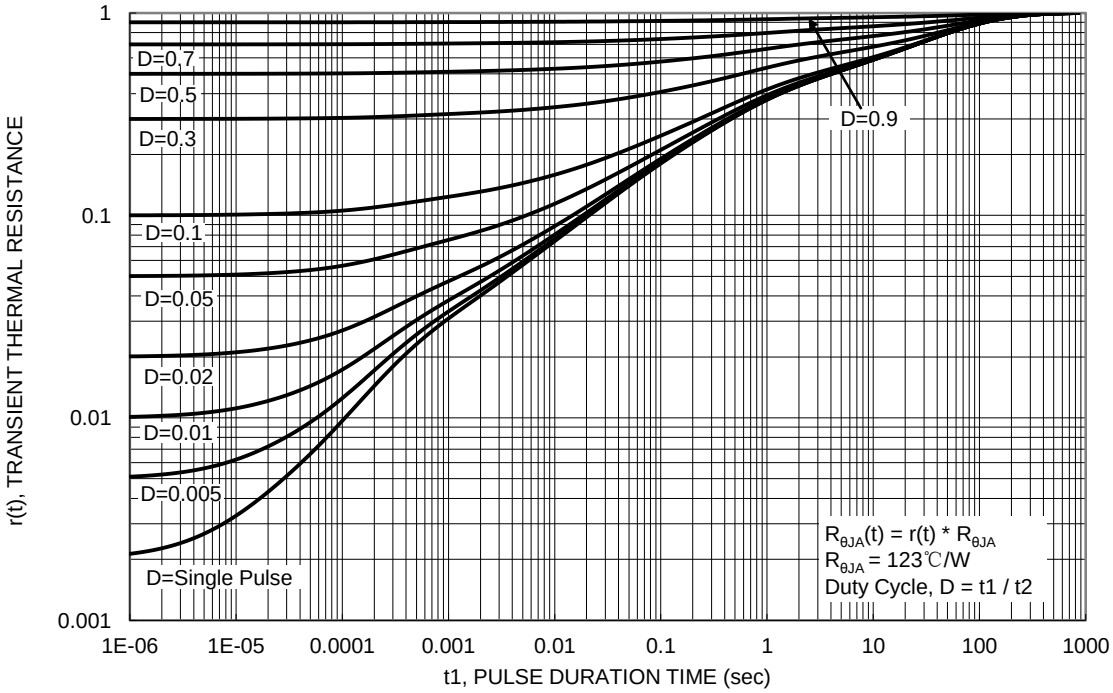
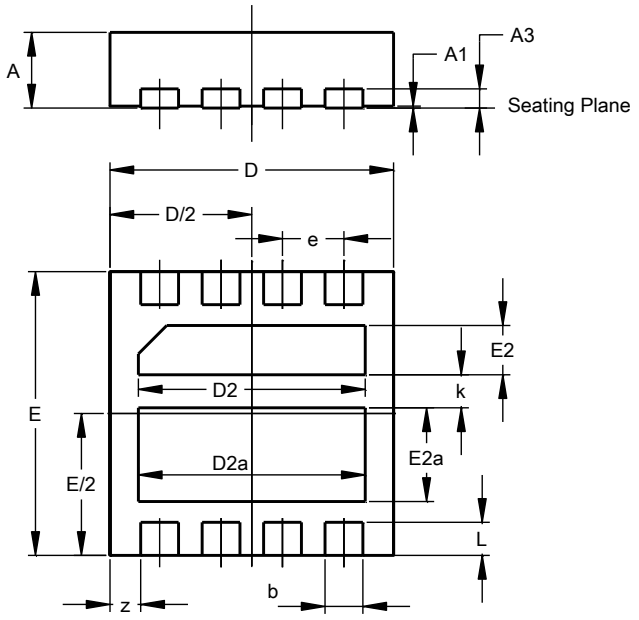


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

V-DFN3030-8 (Type K)

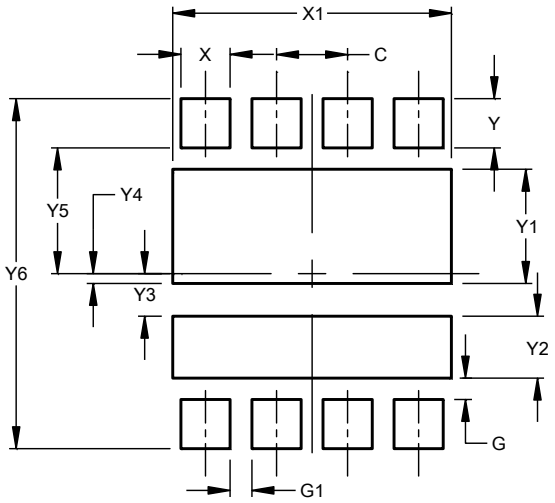


V-DFN3030-8 (Type K)			
Dim	**Min**	**Max**	**Typ**
A	0.77	0.85	0.80
A1	0.00	0.05	0.02
A3	0.20BSC		
b	0.35	0.45	0.40
D	2.95	3.050	3.00
D2	2.30	2.50	2.40
D2a	2.30	2.50	2.40
E	2.95	3.050	3.00
E2	0.42	0.62	0.52
E2a	0.89	1.09	0.99
e	0.65BSC		
k	-	-	0.35
L	0.30	0.40	0.35
z	0.325BSC		
All Dimensions in mm			

Suggested Pad Layout

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

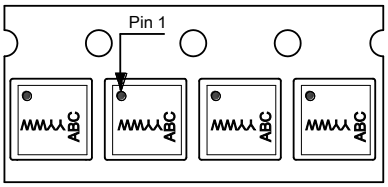
V-DFN3030-8 (Type K)



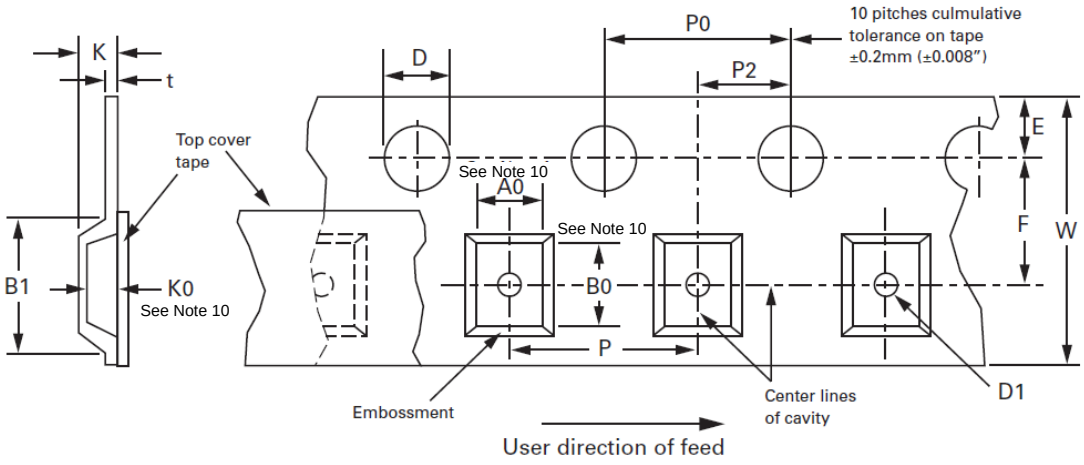
Dimensions	Value (in mm)
C	0.650
G	0.195
G1	0.200
X	0.450
X1	2.550
Y	0.450
Y1	1.044
Y2	0.566
Y3	0.389
Y4	0.089
Y5	1.150
Y6	3.200

Tape and Reel Information

Please see http://www.diodes.com/_files/datasheets/ap02007.pdf for the latest version.

12mm		
Package	**Suffix**	**Tape Orientation**
V-DFN3030-8 (Type K)	-7	

Embossed Carrier Tape Specifications



8, 12, 16, 24mm EMBOSSED TAPE DIMENSIONS IN mm						
Tape Size	**D**	**E**	**P0**	**t_Max**	**A0 B0 K0**	—
12mm	1.50 +0.10 -0.0	1.75 ± 0.10	4.0 ± 0.10	0.400	See Note 10	**Constant Dimensions**

Tape Size	B1 Max	D1 Min	F	K Max	P2	R Min	W	Package Type
12mm	8.2	1.5	5.5 ± 0.05	4.5	2.0 ± 0.05	30	12.0 ± 0.30	V-DFN3030-8 (Type K)

P					
Tape Size	**2.0 ± 0.05**	**4.0 ± 0.10**	**8.0 ± 0.10**	**12.0 ± 0.10**	**16.0 ± 0.10**
12mm	—	—	V-DFN3030-8 (Type K)	—	—

Note: 10. A0 B0 K0 are determined by component size.

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