

## Product Summary

Device	$BV_{DSS}$	$R_{DS(ON)}$ Max	$I_D$ Max $T_C = +25^\circ C$
Q1 & Q2	30V	20m $\Omega$ @ $V_{GS} = 10V$	8.5A
		32m $\Omega$ @ $V_{GS} = 4.5V$	5.5A

## 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.

## Applications

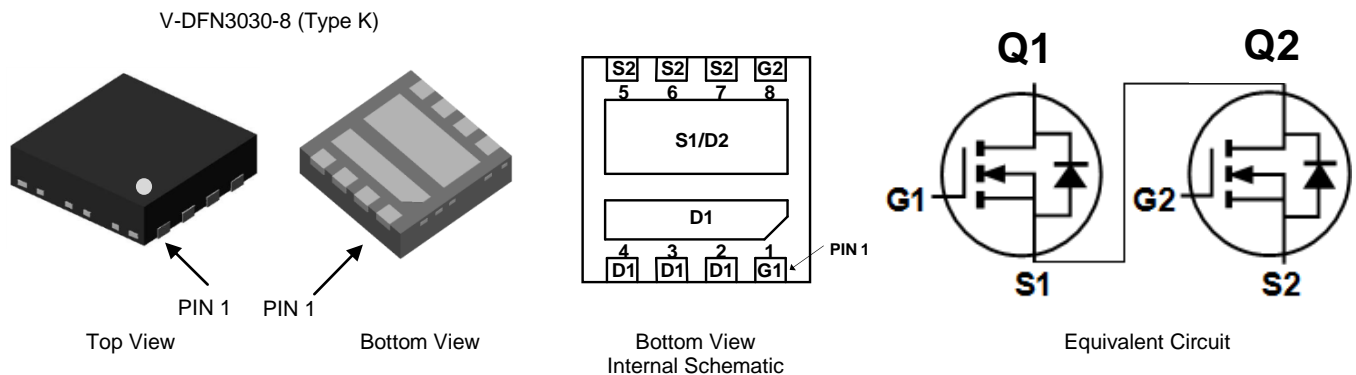
- General Purpose Interfacing Switch
- Power Management Functions

## 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
- Weight: 0.02 grams (Approximate)

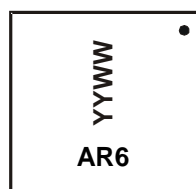


## Ordering Information (Note 4)

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Q1&Q2	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	I <sub>D</sub>	T <sub>C</sub> = +25°C	8.5
Steady State		T <sub>C</sub> = +70°C	7.0
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	55	A
Maximum Body Diode Forward Current (Note 6)	I <sub>S</sub>	2.5	A
Pulsed Body Diode Forward Current (10µs Pulse, Duty Cycle = 1%)	I <sub>SM</sub>	55	A
Avalanche Current (Note 7) L = 0.1mH	I <sub>AS</sub>	11.4	A
Avalanche Energy (Note 7) L = 0.1mH	E <sub>AS</sub>	6.5	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	0.67	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	119	°C/W
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.95	W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	64	°C/W
Thermal Resistance, Junction to Case (Note 6)	R <sub>θJC</sub>	13.5	
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 (Note 8)</b>						
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>	—	—	1	µA	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	—	2.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250µA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	20	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 6A
		—	—	32		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5A
Diode Forward Voltage	V <sub>SD</sub>	—	—	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 2A
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	—	393	—	pF	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	173	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	27	—		
Gate Resistance	R <sub>G</sub>	—	1.1	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge (V <sub>GS</sub> = 10V)	Q <sub>g</sub>	—	7.0	—	nC	V <sub>DD</sub> = 15V, I <sub>D</sub> = 9A
Total Gate Charge (V <sub>GS</sub> = 4.5V)	Q <sub>g</sub>	—	3.6	—		
Gate-Source Charge	Q <sub>gs</sub>	—	0.9	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	1.5	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	1.8	—	ns	V <sub>DD</sub> = 15V, V <sub>GS</sub> = 10V, R <sub>G</sub> = 6Ω, I <sub>D</sub> = 9A
Turn-On Rise Time	t <sub>R</sub>	—	1.9	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	7.5	—		
Turn-Off Fall Time	t <sub>F</sub>	—	2.4	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	10	—	ns	I <sub>F</sub> = 9A, dI/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	2.6	—	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.
  - I<sub>AS</sub> and E<sub>AS</sub> ratings are based on low frequency and duty cycles to keep T<sub>J</sub> = +25°C.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to product testing.

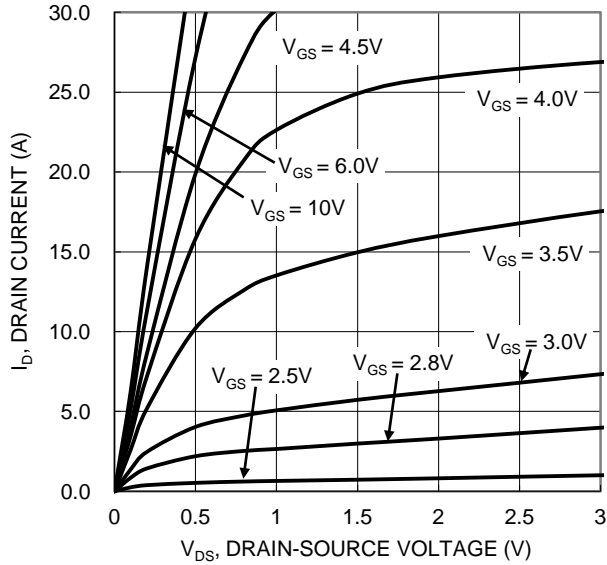


Figure 1. Typical Output Characteristic

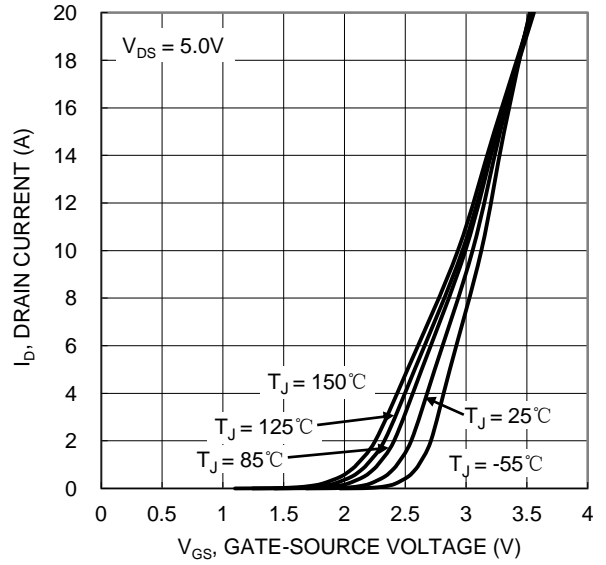


Figure 2. Typical Transfer Characteristic

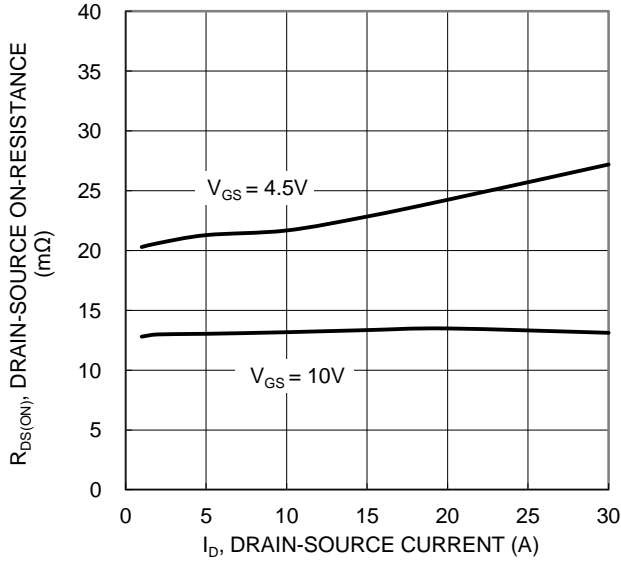


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

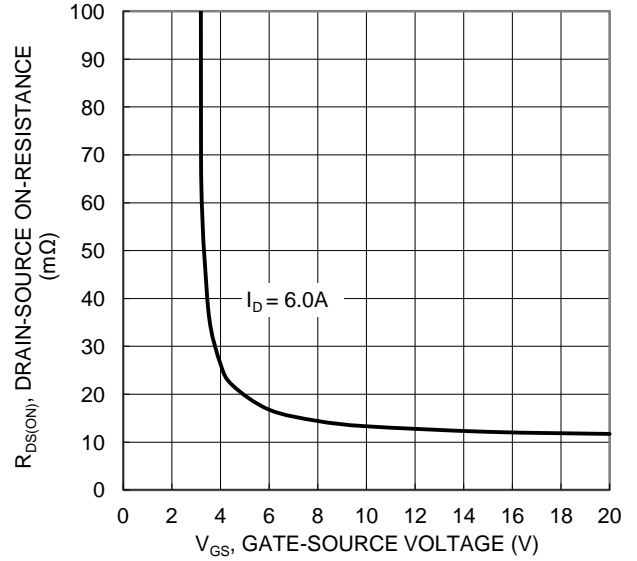


Figure 4. Typical Transfer Characteristic

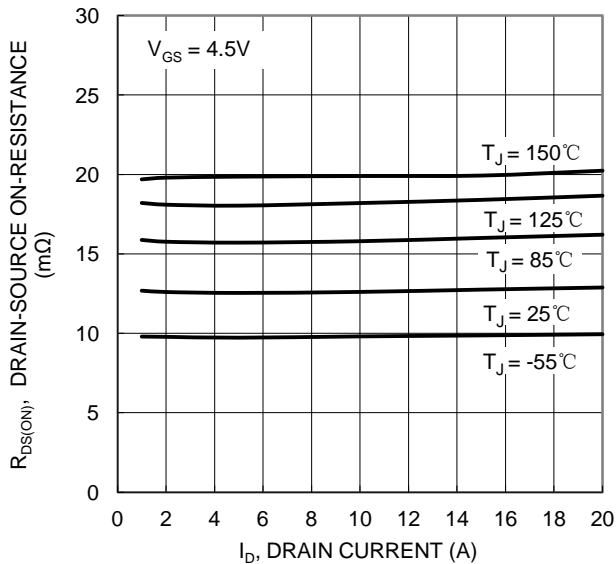


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

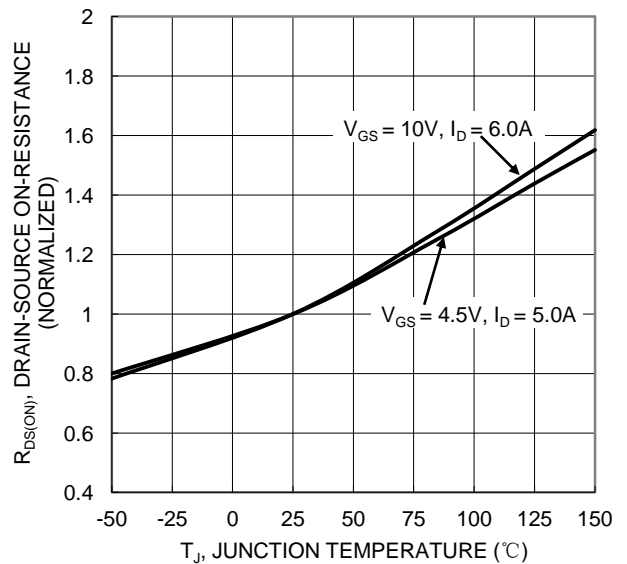


Figure 6. On-Resistance Variation with Temperature

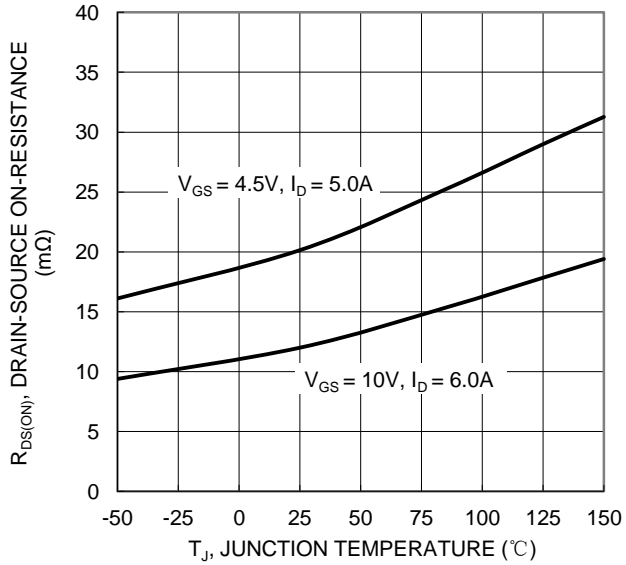


Figure 7. On-Resistance Variation with Temperature

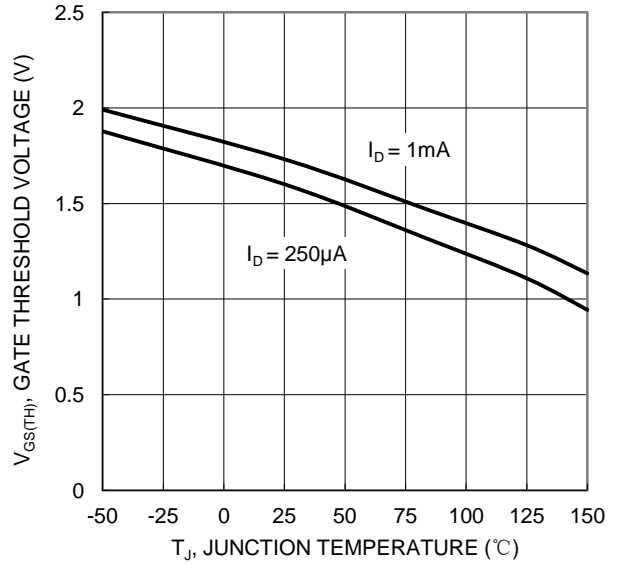


Figure 8. Gate Threshold Variation vs. Junction Temperature

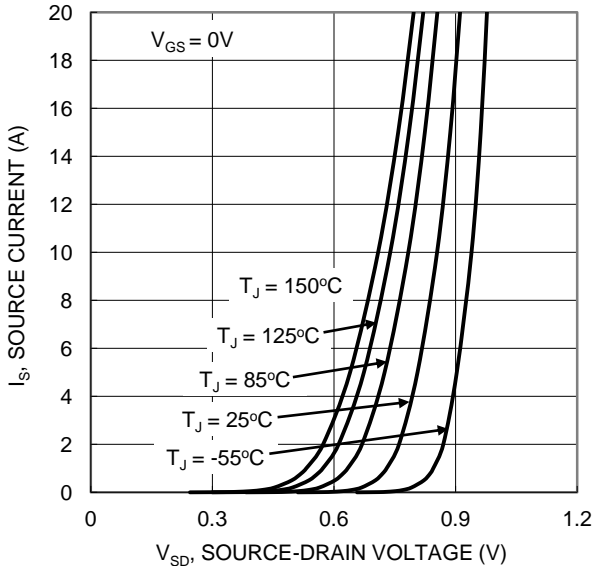


Figure 9. Diode Forward Voltage vs. Current

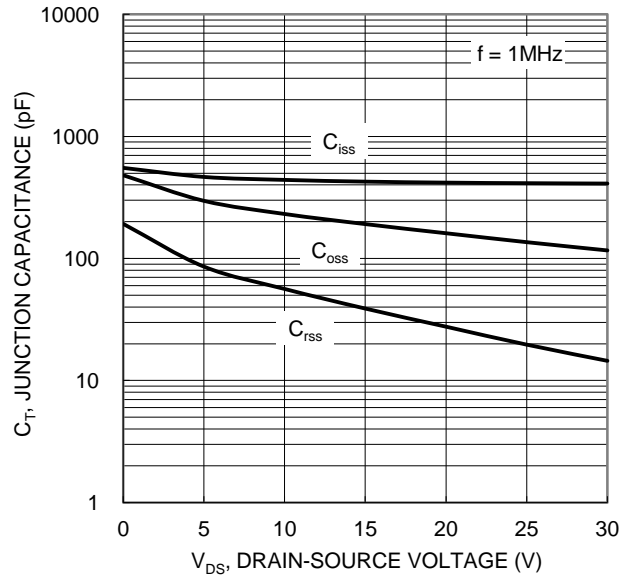


Figure 10. Typical Junction Capacitance

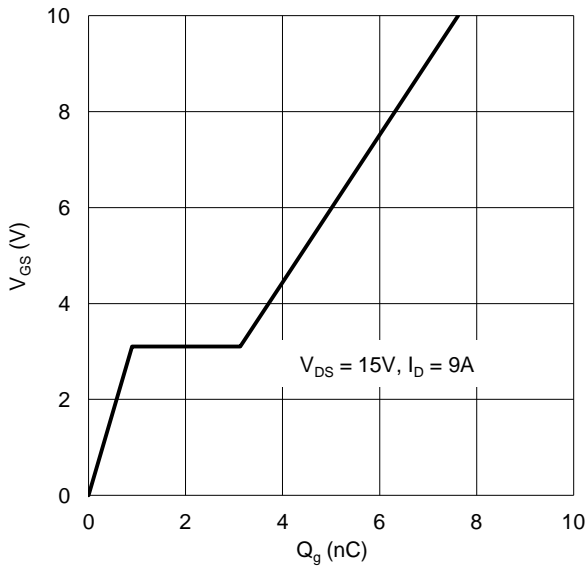


Figure 11. Gate Charge

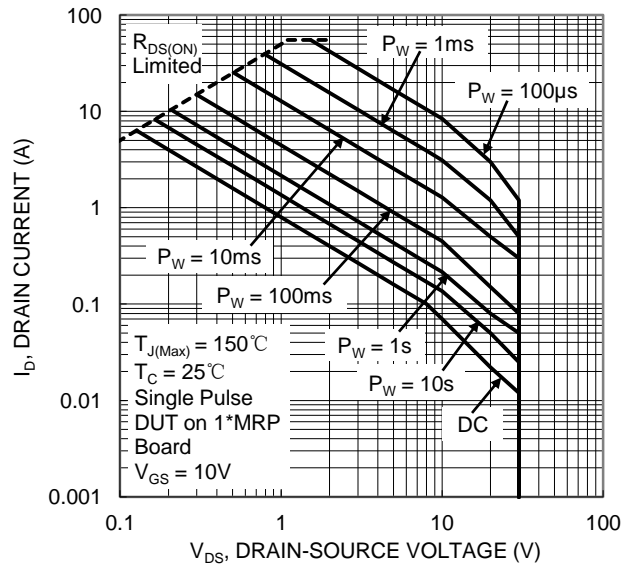


Figure 12. SOA, Safe Operation Area

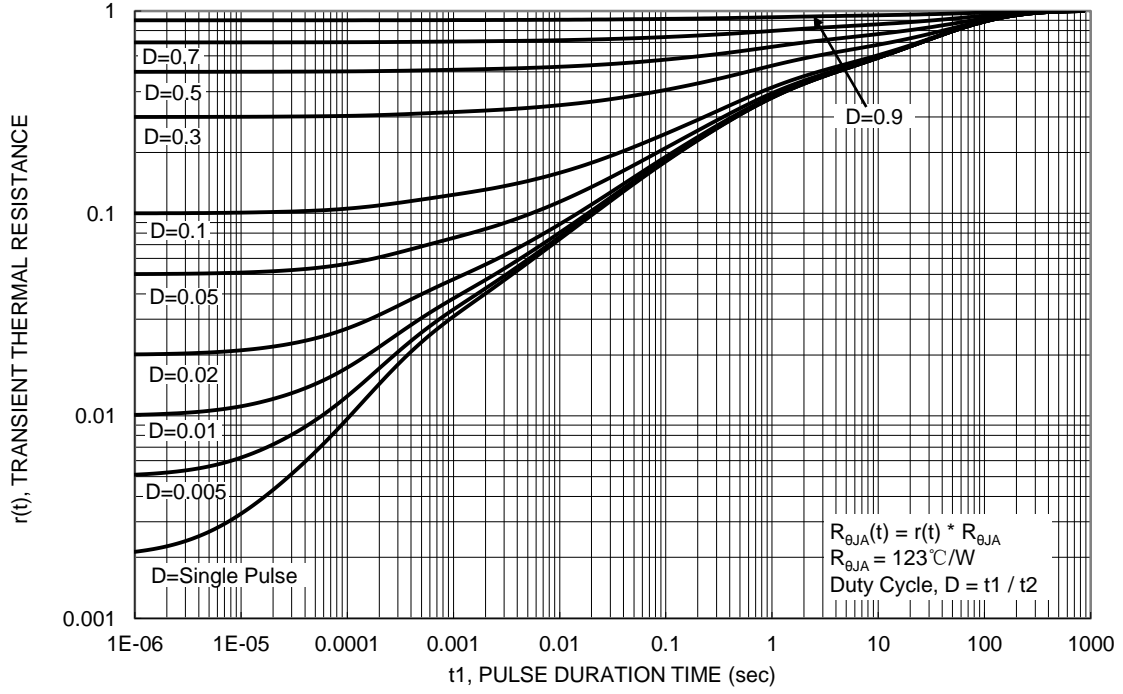
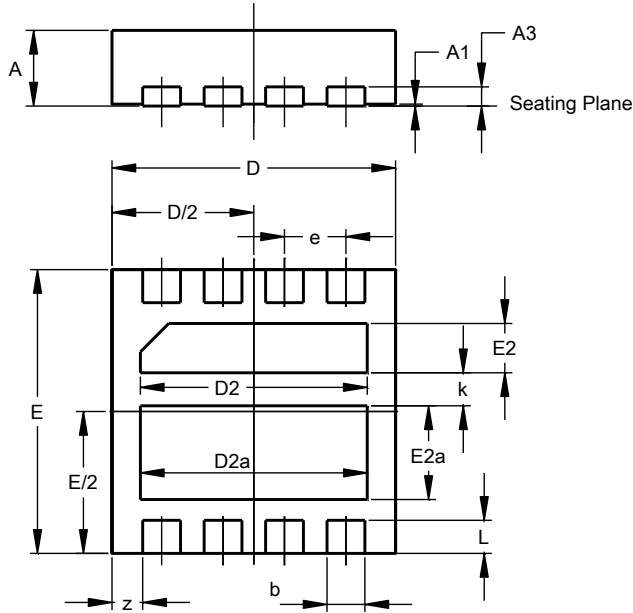


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

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

**V-DFN3030-8 (Type K)**

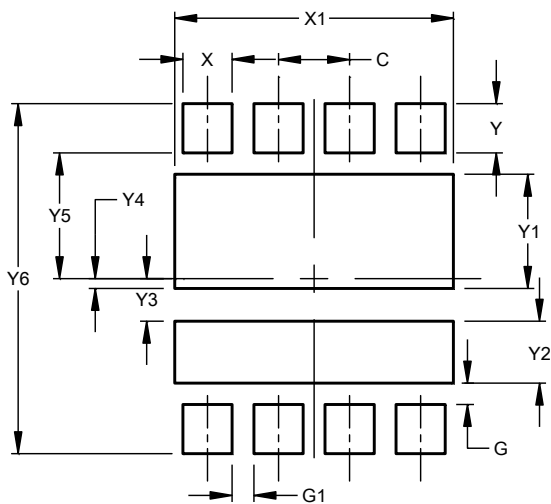


V-DFN3030-8 (Type K)			
Dim	Min	Max	Typ
A	0.77	0.85	0.80
A1	0.00	0.05	0.02
A3	0.20BSC		
b	0.35	0.45	0.40
D	2.95	3.050	3.00
D2	2.30	2.50	2.40
D2a	2.30	2.50	2.40
E	2.95	3.050	3.00
E2	0.42	0.62	0.52
E2a	0.89	1.09	0.99
e	0.65BSC		
k	-	-	0.35
L	0.30	0.40	0.35
z	0.325BSC		
All Dimensions in mm			

**Suggested Pad Layout**

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

**V-DFN3030-8 (Type K)**



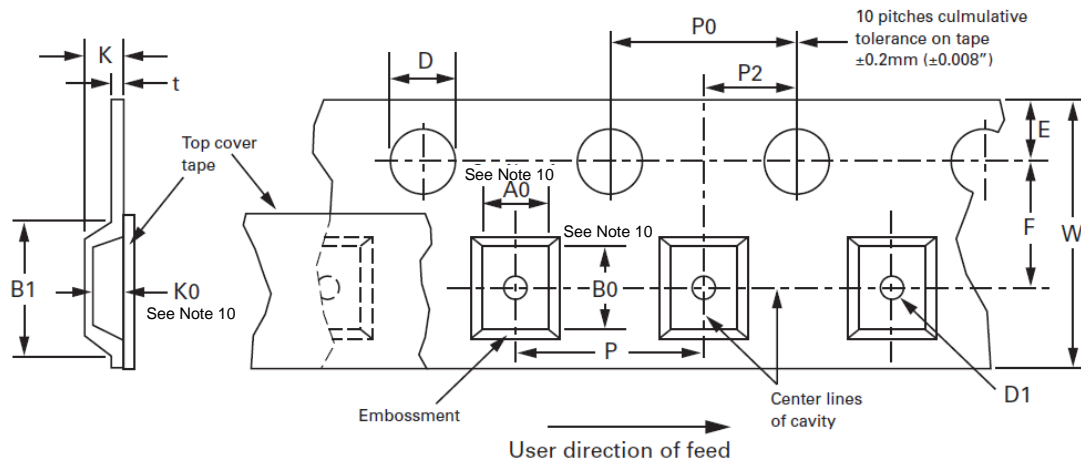
Dimensions	Value (in mm)
C	0.650
G	0.195
G1	0.200
X	0.450
X1	2.550
Y	0.450
Y1	1.044
Y2	0.566
Y3	0.389
Y4	0.089
Y5	1.150
Y6	3.200

## Tape and Reel Information

Please see [http://www.diodes.com/\\_files/datasheets/ap02007.pdf](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	—
<b>12mm</b>	1.50 +0.10 -0.0	1.75 ± 0.10	4.0 ± 0.10	0.400	See Note 10	<b>Constant Dimensions</b>

Tape Size	B1 Max	D1 Min	F	K Max	P2	R Min	W	Package Type
<b>12mm</b>	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
<b>12mm</b>	—	—	V-DFN3030-8 (Type K)	—	—

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

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