

Product Summary

V _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
30V	6.5mΩ @ V _{GS} = 10V	46.2A
	10mΩ @ V _{GS} = 4.5V	37.0A

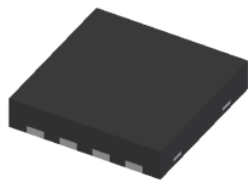
Description

This 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.

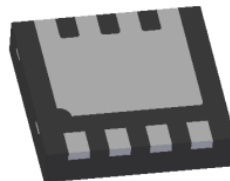
Applications

- Backlighting
- Power Management Functions
- DC-DC Converters

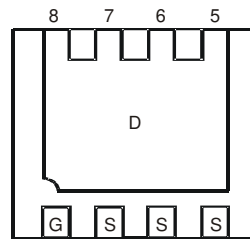
V-DFN3030-8 (Type Q)



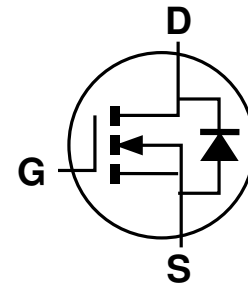
Top View



Bottom View



Bottom View
Pin Configuration



Equivalent Circuit

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: V-DFN3030-8 (Type Q)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See Diagram
- Terminals: Finish - NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 **(e4)**
- Weight: 0.0172 grams (Approximate)

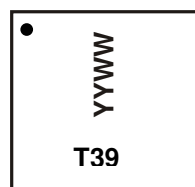
Ordering Information (Note 4)

Part Number	Case	Packaging
DMT3006LDK-7	V-DFN3030-8 (Type Q)	3,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html 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 Q)



T39 = Product Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 17 for 2017)
 WW = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	30	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current V _{GS} = 10V	T _A = +25°C T _A = +70°C (Note 6)	17.1 13.7	A
	T _C = +25°C T _C = +70°C	46.2 37.0	A
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	2	A
Pulsed Drain Current (10μS Pulse, Duty Cycle = 1%)	I _{DM}	80	A
Avalanche Current (Note 7) L = 0.1mH	I _{AS}	25	A
Avalanche Energy (Note 7) L = 0.1mH	E _{AS}	31	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.1	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State R _{θJA}	116	°C/W
Total Power Dissipation (Note 6)	P _D	2.8	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State R _{θJA}	44	°C/W
Thermal Resistance, Junction to Case	R _{θJC}	6	°C/W
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 T _J = +25°C	I _{DSS}	—	—	1	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)}	1.0	—	3.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	5.5	6.5	mΩ	V _{GS} = 10V, I _D = 12A
		—	7.5	10		V _{GS} = 4.5V, I _D = 12A
Diode Forward Voltage	V _{SD}	—	—	1.0	V	V _{GS} = 0V, I _S = 2A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iSS}	—	1,155	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	456	—		
Reverse Transfer Capacitance	C _{rSS}	—	72	—		
Gate Resistance	R _g	—	1.6	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = 10V)	Q _g	—	16.7	—	nC	V _{DD} = 15V, I _D = 9A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	8.4	—		
Gate-Source Charge	Q _{gs}	—	2.2	—		
Gate-Drain Charge	Q _{gd}	—	3.5	—		
Turn-On Delay Time	t _{D(ON)}	—	3.5	—	ns	V _{DD} = 15V, V _{GS} = 10V, R _g = 3Ω, I _D = 9A
Turn-On Rise Time	t _R	—	5.5	—		
Turn-Off Delay Time	t _{D(OFF)}	—	13.5	—		
Turn-Off Fall Time	t _F	—	4.6	—		
Body Diode Reverse Recovery Time	t _{RR}	—	19.3	—	ns	I _F = 1.5A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	8.6	—	nC	

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on 4.75 inches by 4.5 inches FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1-inch square copper plate.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

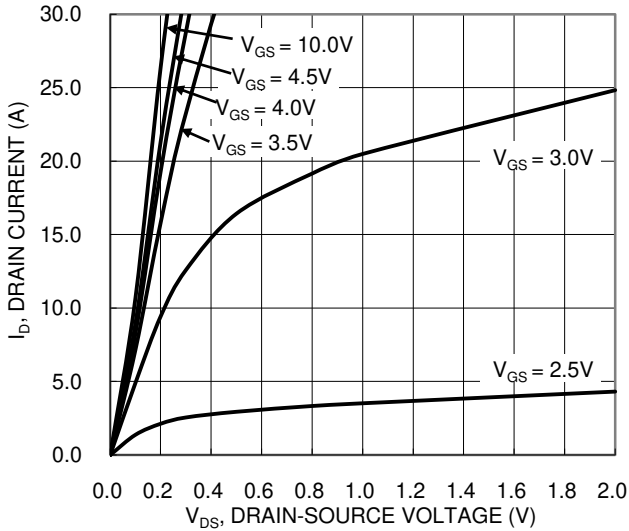


Figure 1. Typical Output Characteristic

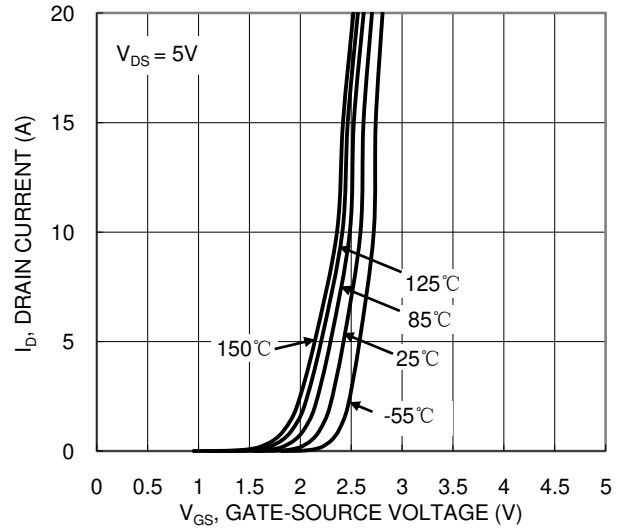


Figure 2. Typical Transfer Characteristic

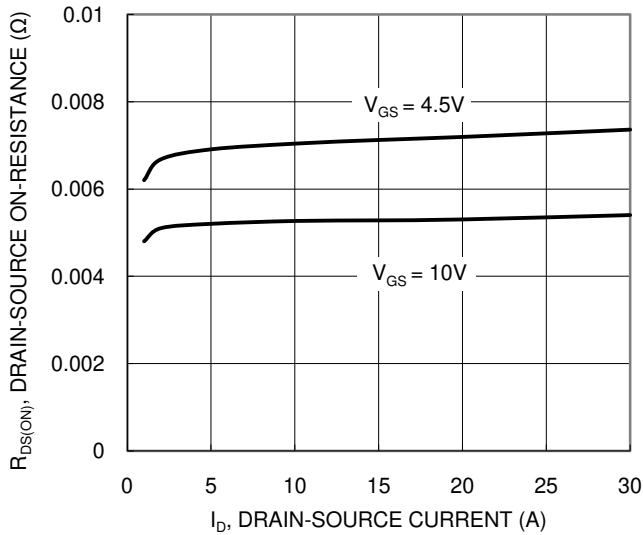


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

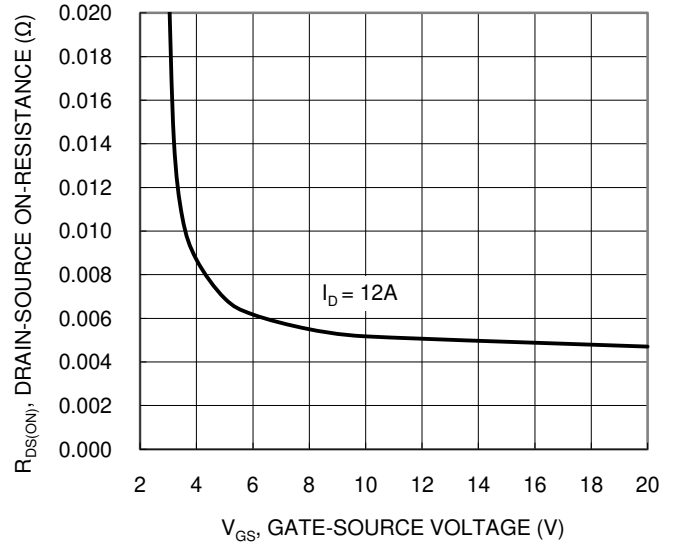


Figure 4. Typical Transfer Characteristic

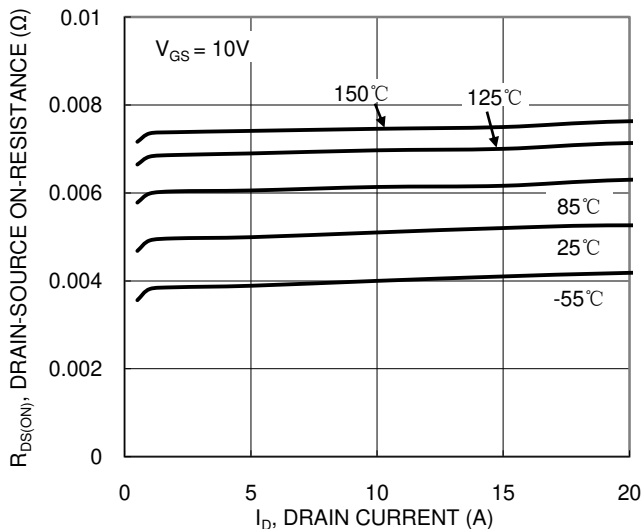


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

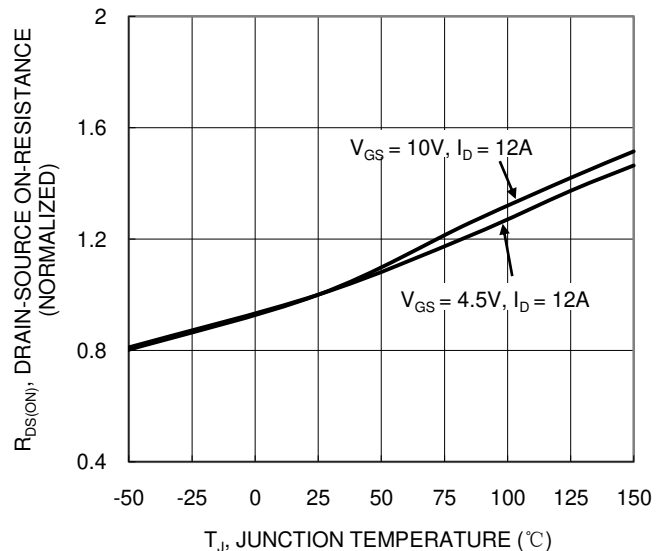
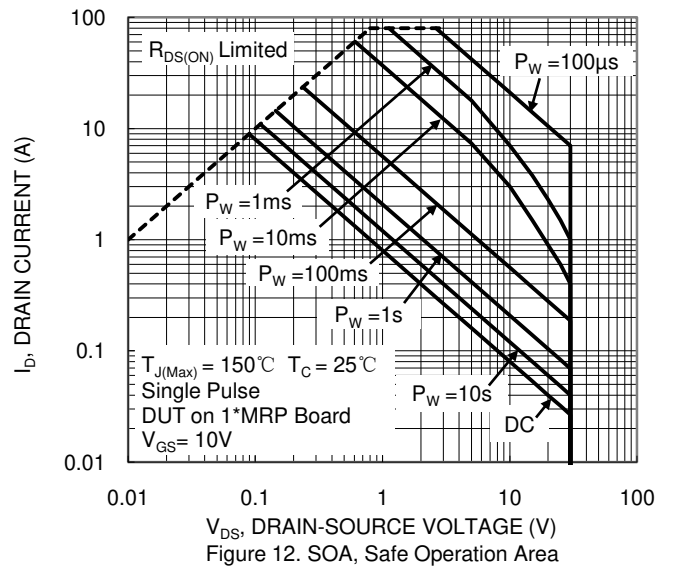
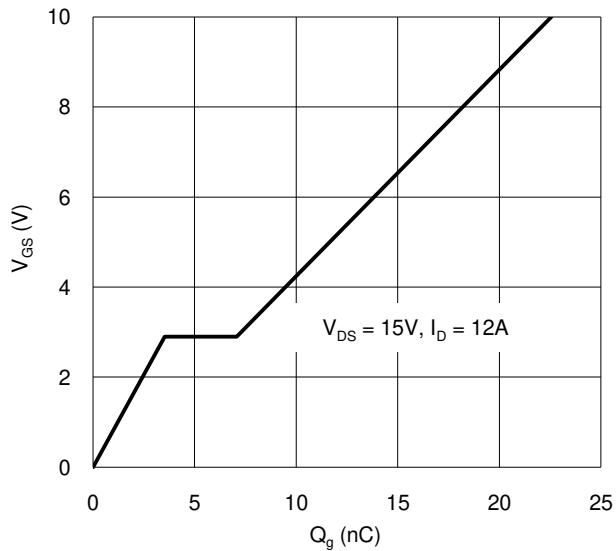
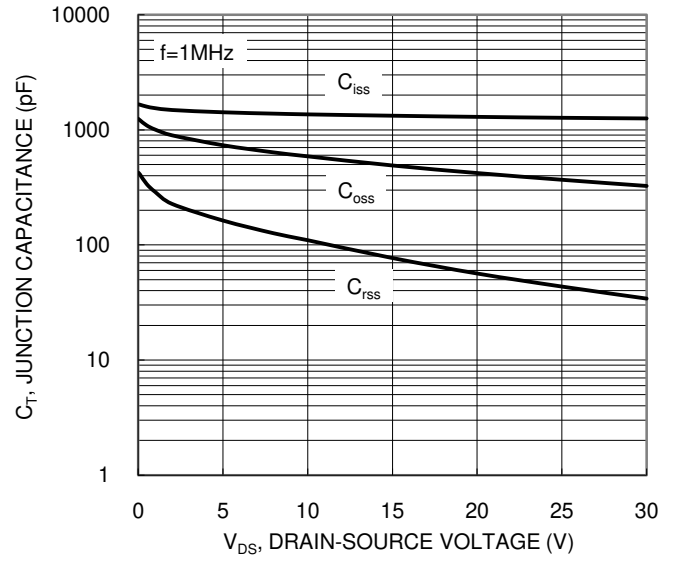
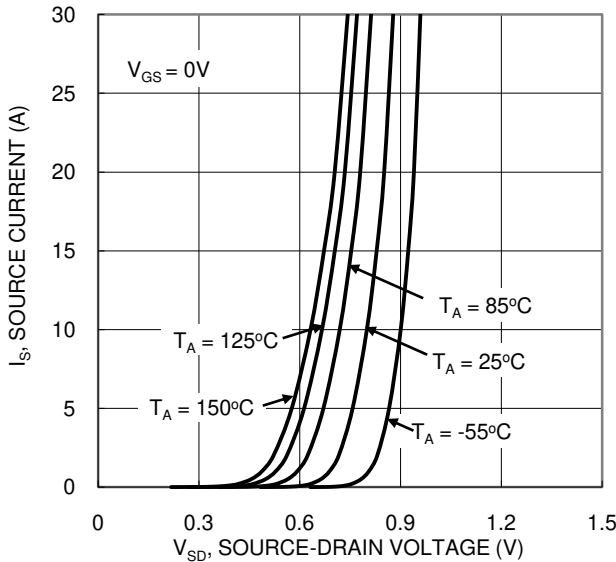
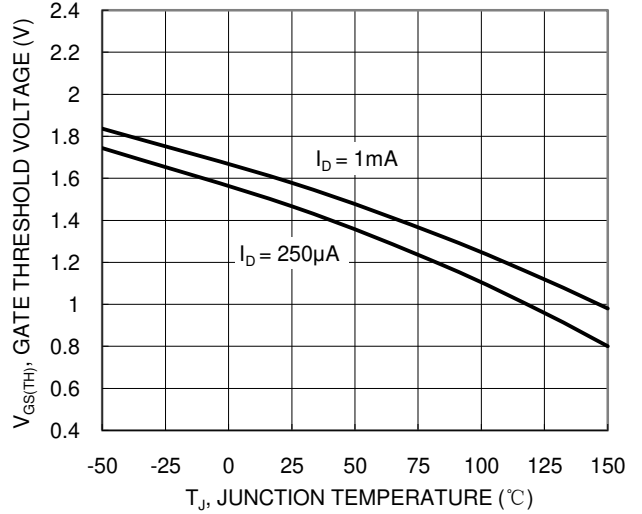
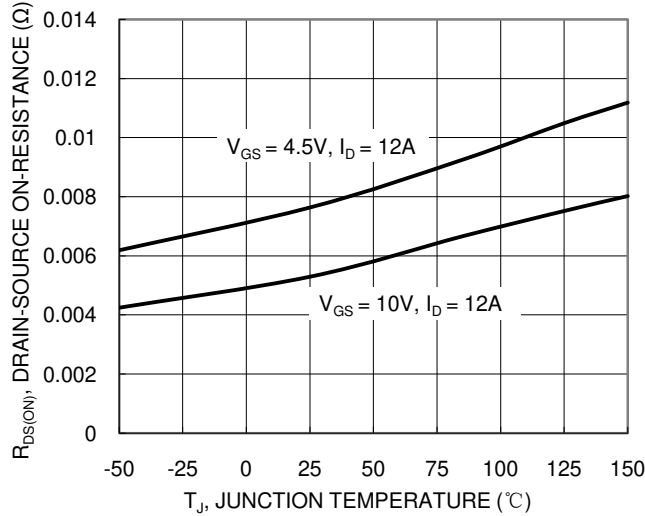


Figure 6. On-Resistance Variation with Temperature



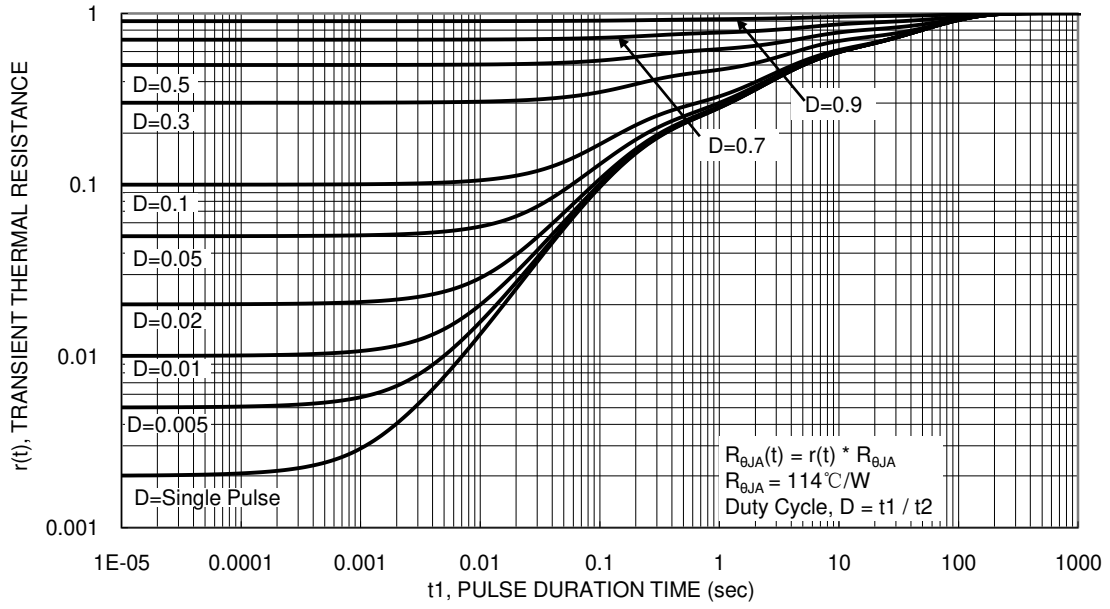
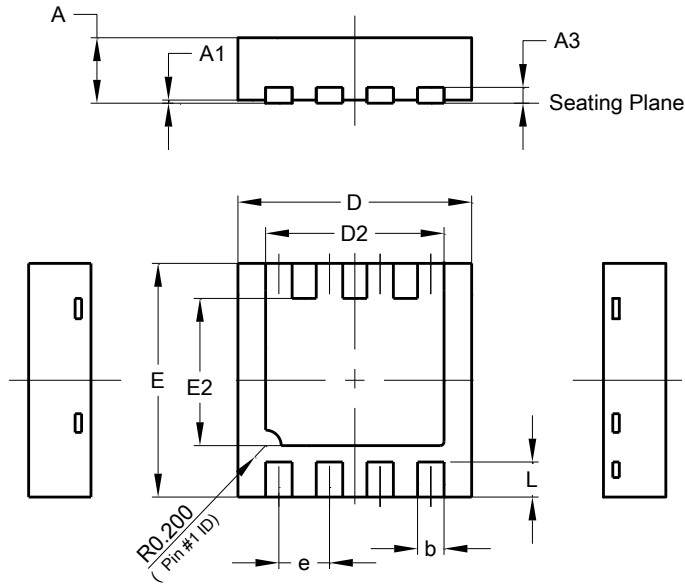


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

V-DFN3030-8 (Type Q)

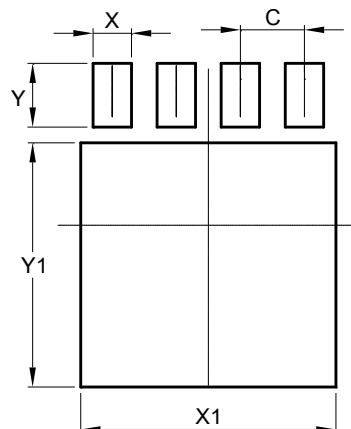


V-DFN3030-8 (Type Q)			
Dim	Min	Max	Typ
A	0.77	0.83	0.80
A1	0.00	0.05	0.02
A3	--	--	0.203
b	0.29	0.39	0.34
D	2.95	3.05	3.00
D2	2.19	2.39	2.29
E	2.95	3.05	3.00
E2	1.64	1.84	1.74
e	--	--	0.65
L	0.40	0.50	0.45
All Dimensions in mm			

Suggested Pad Layout

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

V-DFN3030-8 (Type Q)



Dimensions	Value (in mm)
C	0.650
X	0.390
X1	2.590
Y	0.650
Y1	2.490

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