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

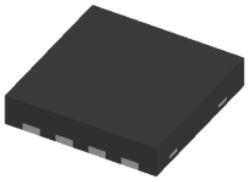
Features and Benefits

- 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)**

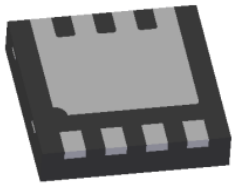
Mechanical Data

- 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)

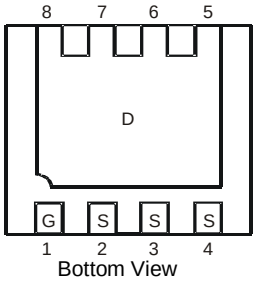
V-DFN3030-8 (Type Q)



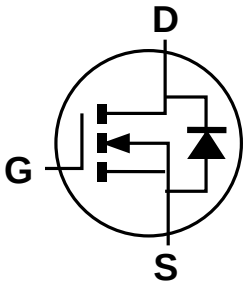
Top View



Bottom View



Bottom View
Pin Configuration



Equivalent Circuit

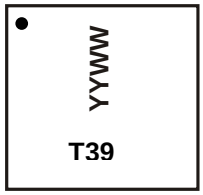
Ordering Information (Note 4)

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)

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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)	I_D	17.1 13.7	A
	T_C = +25°C T_C = +70°C	I_D	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	$R_{\theta JA}$	116	°C/W
Total Power Dissipation (Note 6)		P_D	2.8	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	44	°C/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	6	
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:
5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
6. 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.
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.

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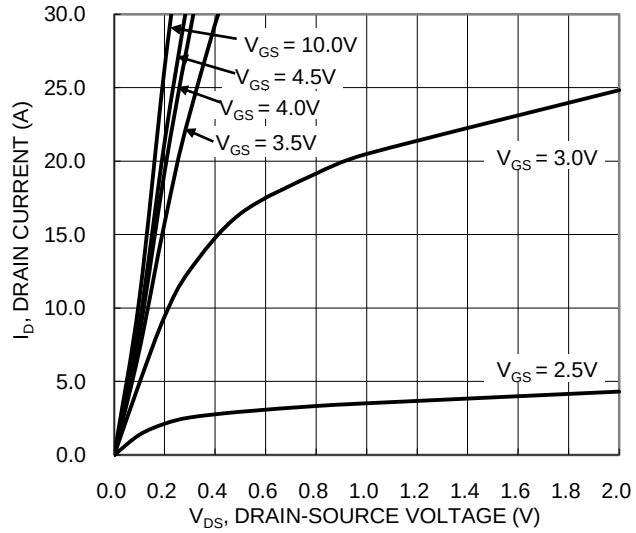

Figure 1. Typical Output Characteristic

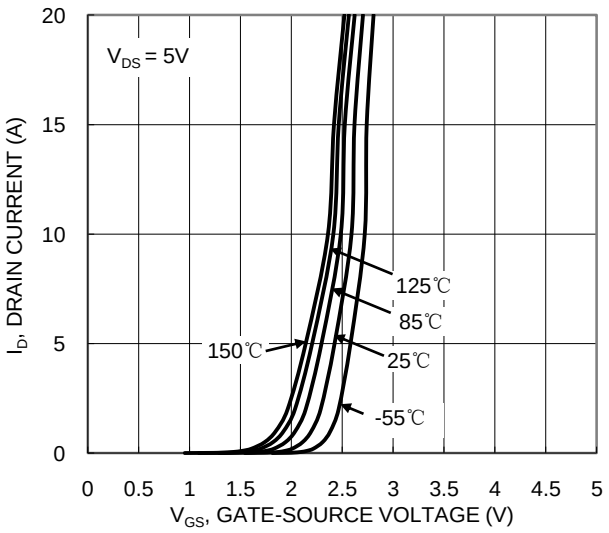

Figure 2. Typical Transfer Characteristic

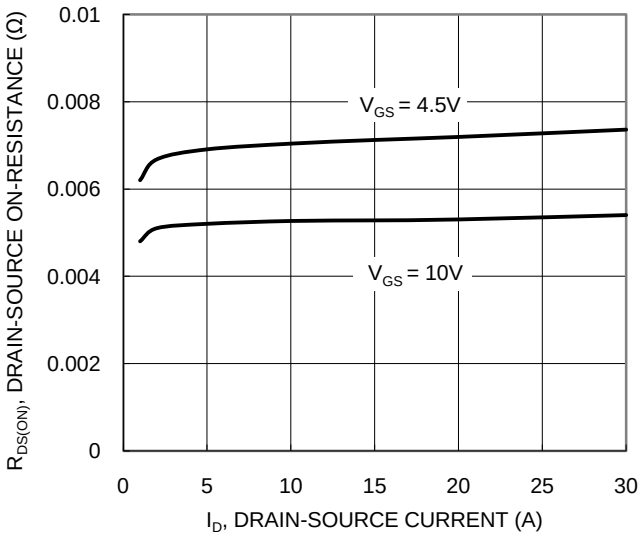

Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

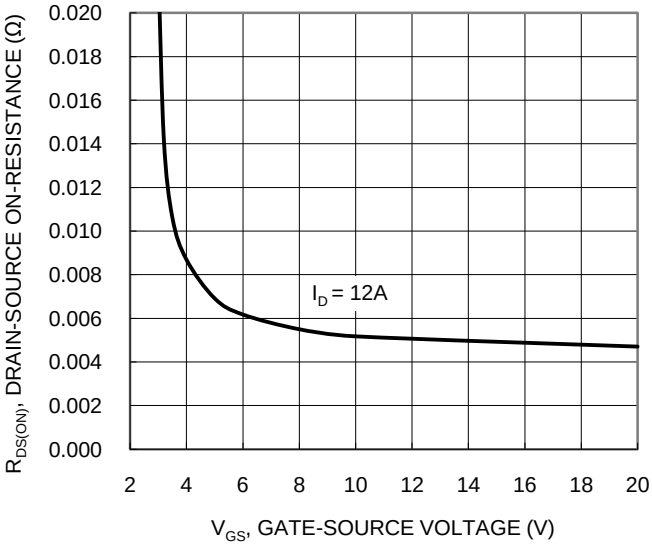

Figure 4. Typical Transfer Characteristic

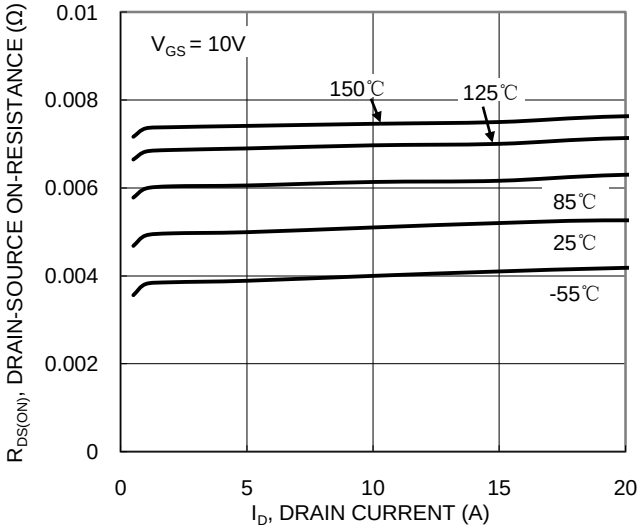

Figure 5. Typical On-Resistance vs. Drain Current and Temperature

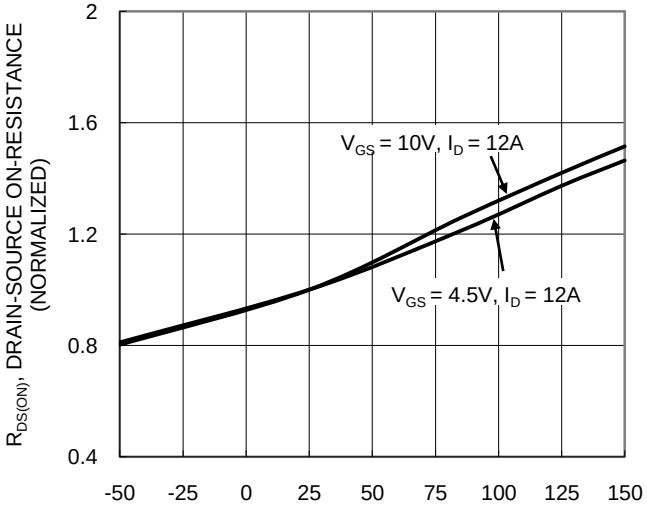

Figure 6. On-Resistance Variation with Temperature

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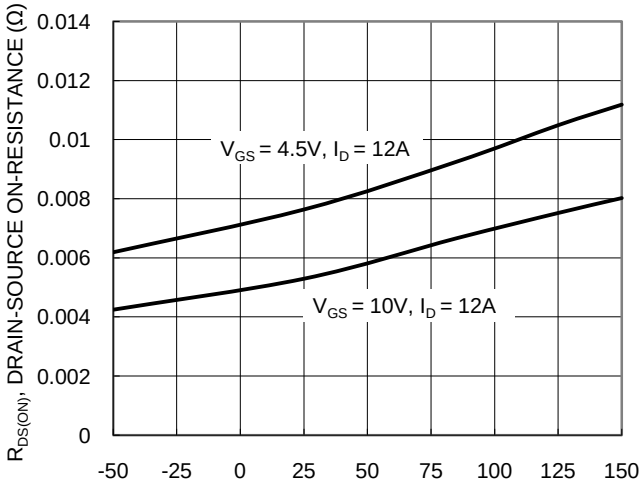

Figure 7. On-Resistance Variation with Temperature

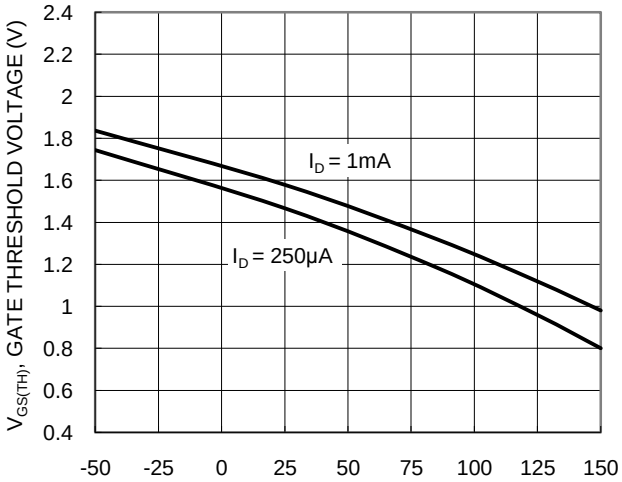

Figure 8. Gate Threshold Variation vs. Junction Temperature

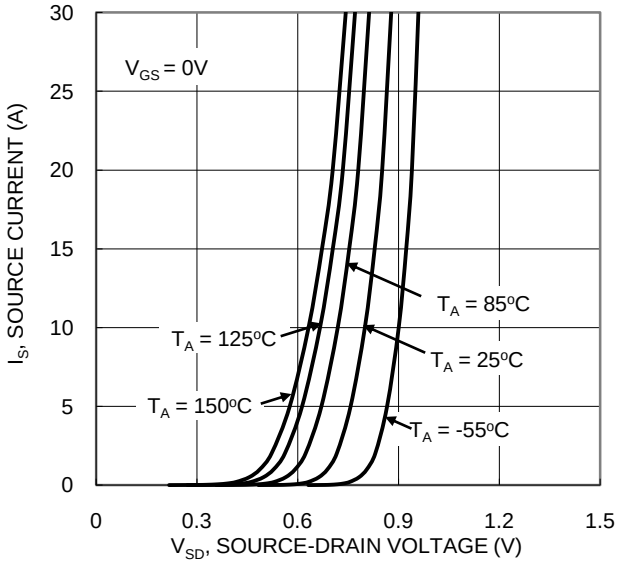

Figure 9. Diode Forward Voltage vs. Current

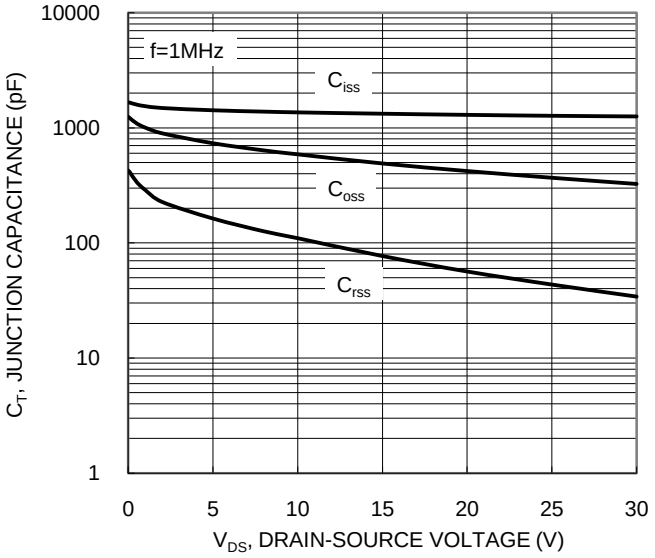

Figure 10. Typical Junction Capacitance

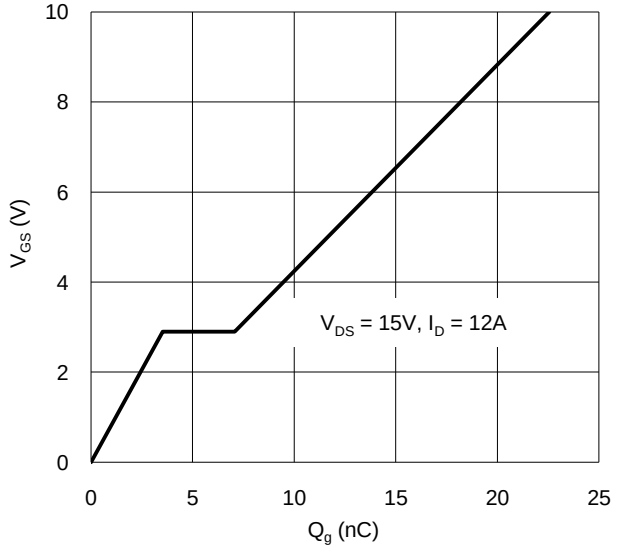

Figure 11. Gate Charge

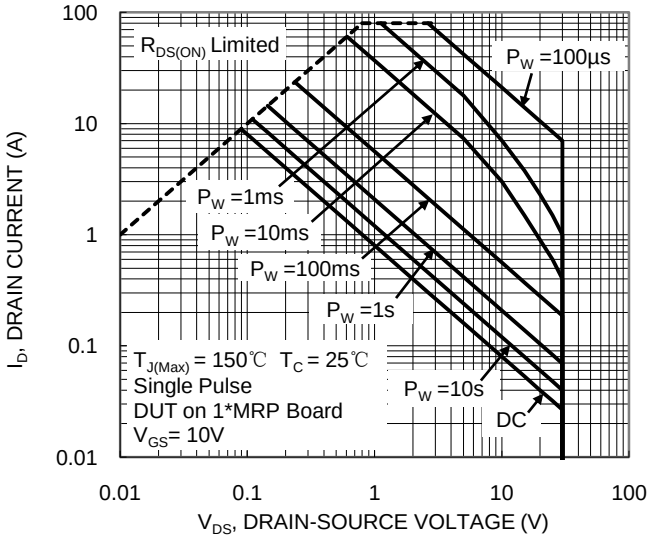

Figure 12. SOA, Safe Operation Area

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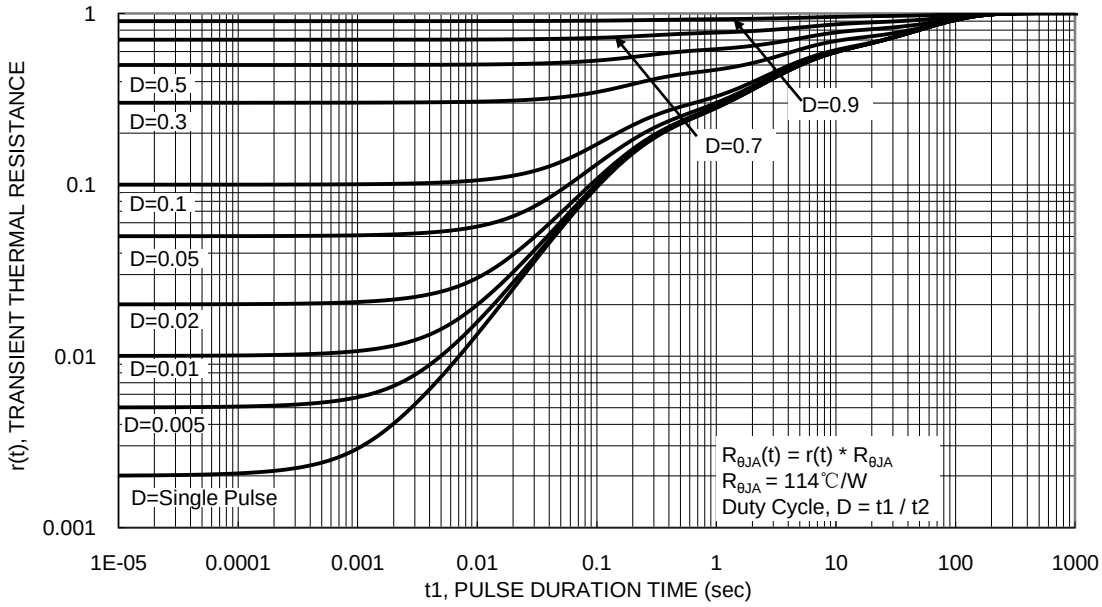

Figure 13. Transient Thermal Resistance

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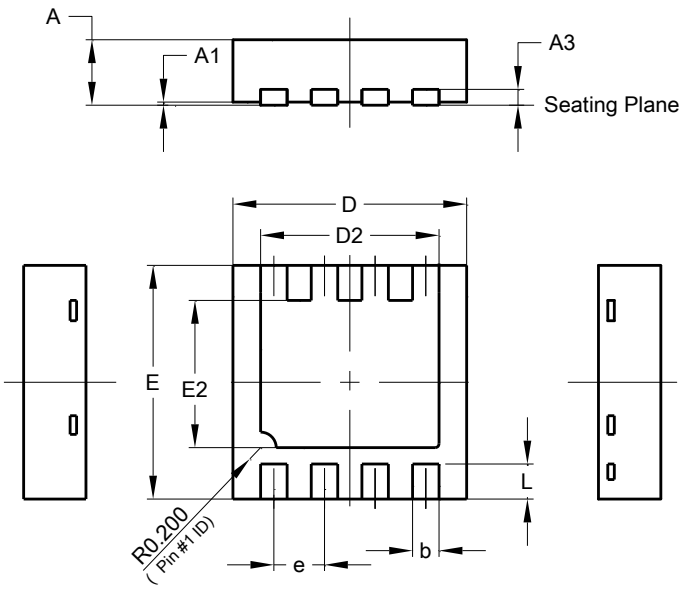
Package Outline Dimensions

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

V-DFN3030-8 (Type Q)

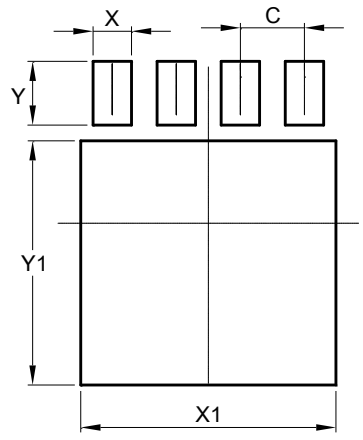


V-DFN3030-8 (Type Q)			
Dim	**Min**	**Max**	**Typ**
A	0.77	0.83	0.80
A1	0.00	0.05	0.02
A3	--	--	0.203
b	0.29	0.39	0.34
D	2.95	3.05	3.00
D2	2.19	2.39	2.29
E	2.95	3.05	3.00
E2	1.64	1.84	1.74
e	--	--	0.65
L	0.40	0.50	0.45
All Dimensions in mm			

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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