DUAL N CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

Device	BV_{DSS}	$R_{DS(ON)\ MAX}$	$I_{D\ MAX}$ T_A = +25°C
N-Channel	60V	17mΩ @ V_{GS} = 10V	8.8A
		26mΩ @ V_{GS} = 4.5V	6.9A

Features

- 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)**

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.

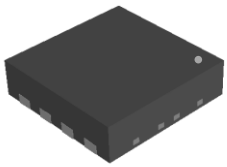
Mechanical Data

- Case: V-DFN3030-8 (Type H)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – NiPdAu Over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.02 grams (Approximate)

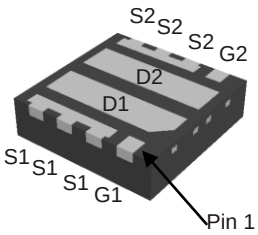
Applications

- Power Management Functions
- Analog Switch

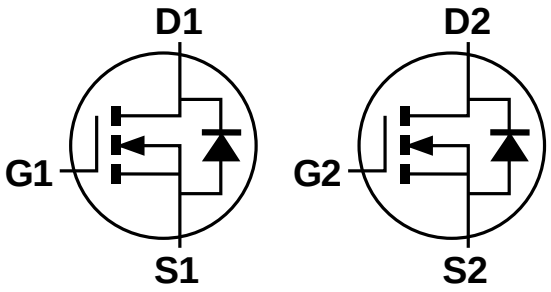
V-DFN3030-8 (Type H)



Top View



Bottom View



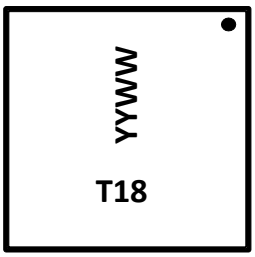
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMT6018LDR-7	V-DFN3030-8 (Type H)	3000/Tape & Reel
DMT6018LDR-13	V-DFN3030-8 (Type H)	10000/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 http://www.diodes.com/products/packages.html.

Marking Information



T18 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 16 for 2016)
WW = Week Code (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	8.8 7.1	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	11.4 9.1	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	3	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I_{DM}	50	A
Avalanche Current (Note 7) L = 1mH			I_{AS}	8	A
Avalanche Energy (Note 7) L = 1mH			E_{AS}	32	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	1.1	W
	T_A = +70°C		0.7	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	108	°C/W
	t<10s		65	
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.9	W
	T_A = +70°C		1.2	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	66	°C/W
	t<10s		40	
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	11.4	
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}	60	-	-	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	-	-	1.0	µA	V_{DS} = 48V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	-	-	±100	nA	V_{GS} = ±20V, 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	$R_{DS(ON)}$	-	13 20	17 26	mΩ	V_{GS} = 10V, I_D = 8.2A V_{GS} = 4.5V, I_D = 6.7A
Diode Forward Voltage	V_{SD}	-	0.75	-	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	-	869	-	pF	V_{DS} = 30V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	226	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	15	-	pF	
Gate Resistance	R_g	-	1.1	-	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	-	6.2	-	nC	V_{DS} = 30V, I_D = 8.2A
Total Gate Charge (V_{GS} = 10V)	Q_g	-	13.9	-	nC	
Gate-Source Charge	Q_{gs}	-	3.0	-	nC	
Gate-Drain Charge	Q_{gd}	-	1.9	-	nC	
Turn-On Delay Time	$t_{D(ON)}$	-	3.5	-	ns	V_{DD} = 30V, V_{GS} = 10V, I_D = 8.2A, R_g = 6Ω
Turn-On Rise Time	t_R	-	4.6	-	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	-	10.8	-	ns	
Turn-Off Fall Time	t_F	-	3.5	-	ns	
Reverse Recovery Time	t_{RR}	-	20.3	-	ns	I_F = 8.2A, di/dt = 100A/µs
Reverse Recovery Charge	Q_{RR}	-	11.4	-	nC	I_F = 8.2A, di/dt = 100A/µs

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.

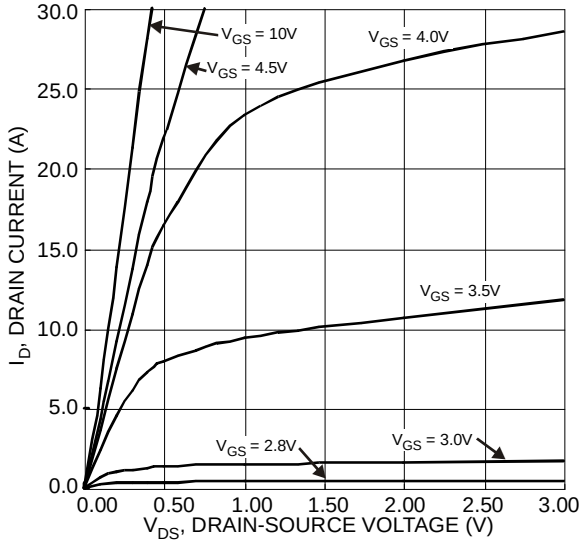


Figure 1 Typical Output Characteristics

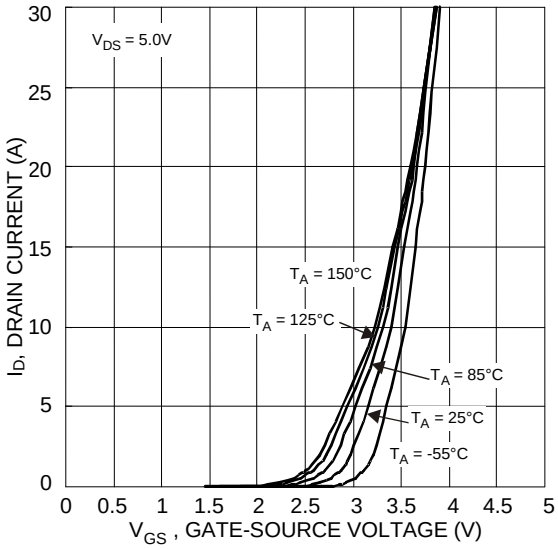


Figure 2 Typical Transfer Characteristics

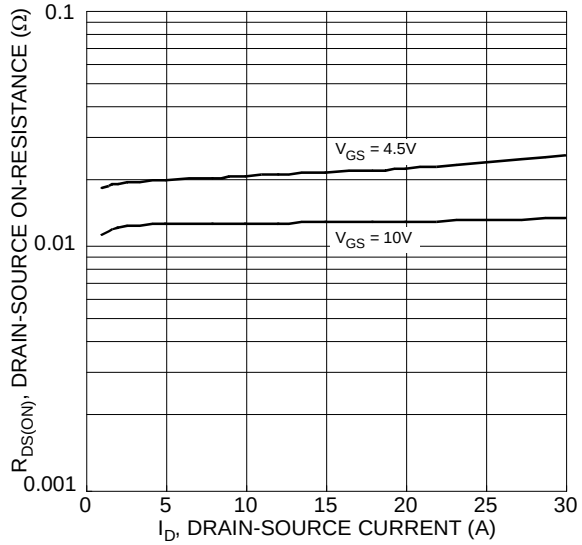


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

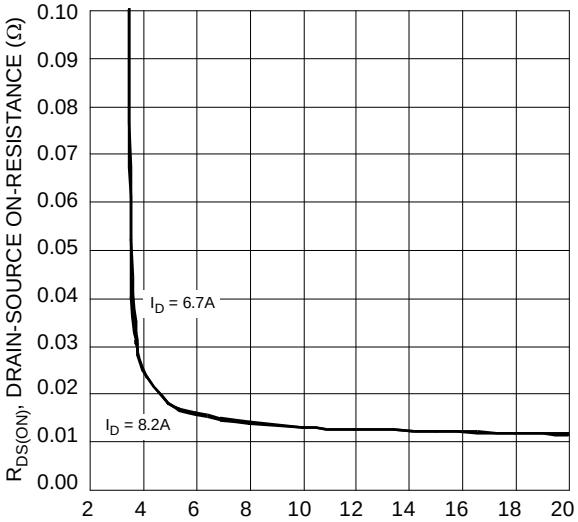


Figure 4 Typical Transfer Characteristics

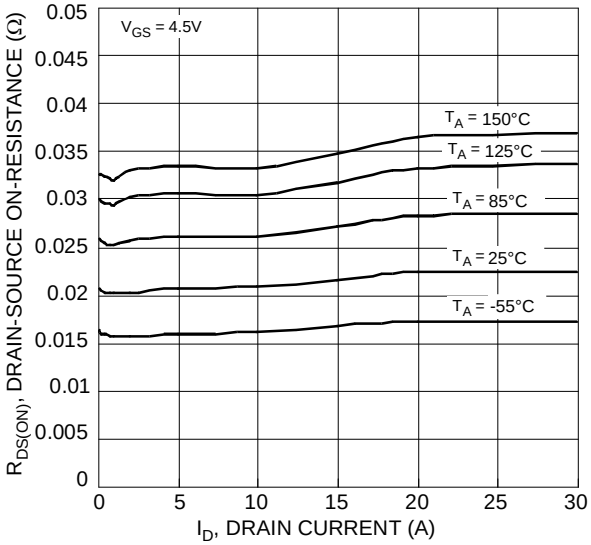


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

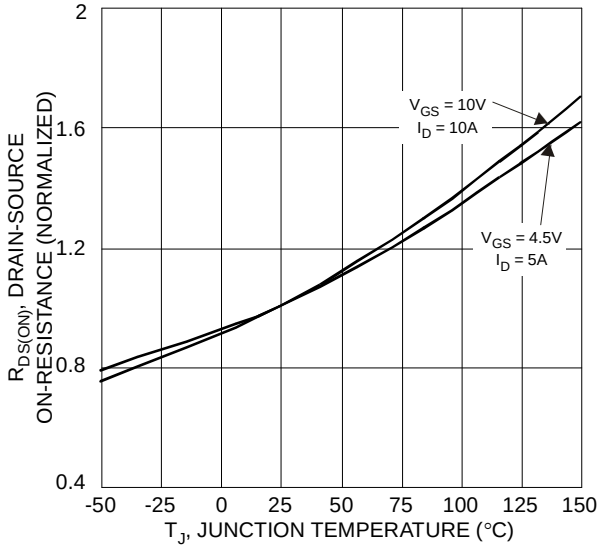


Figure 6 On-Resistance Variation with Temperature

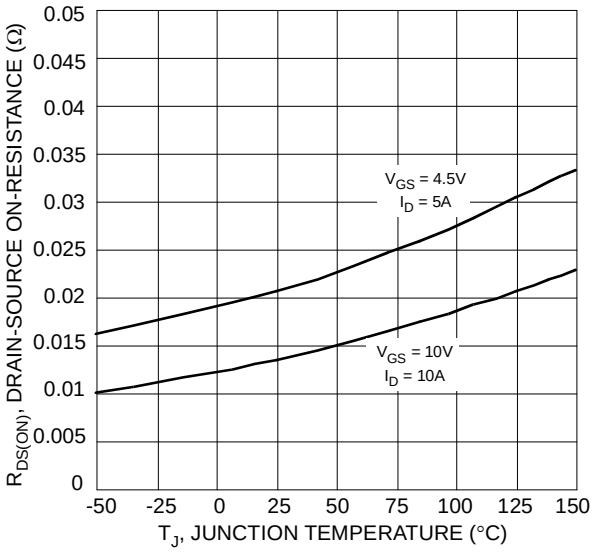


Figure 7 On-Resistance Variation with Temperature

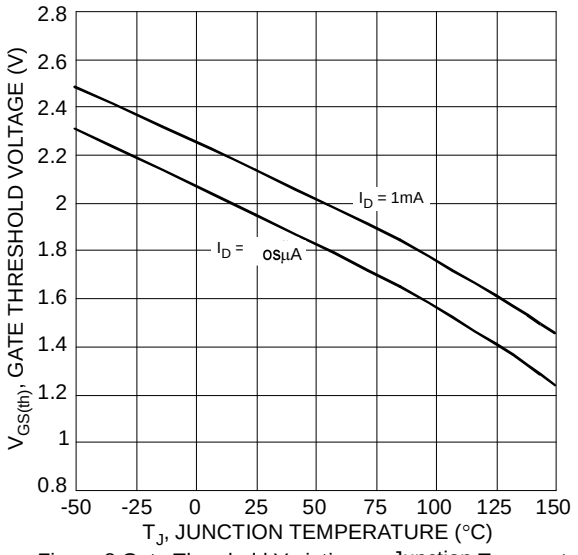


Figure 8 Gate Threshold Variation vs. Junction Temperature

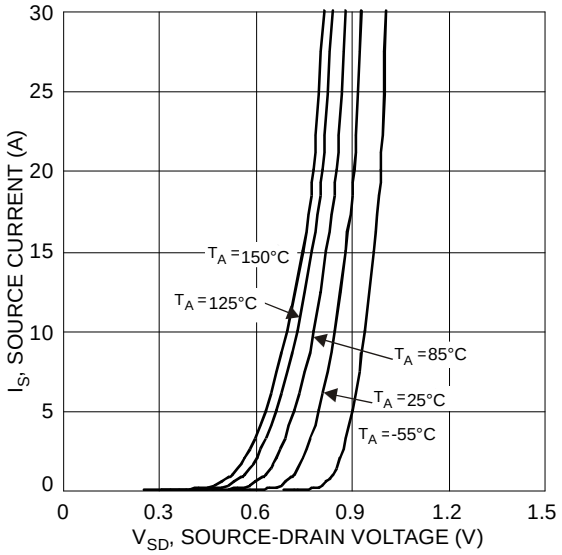


Figure 9 Diode Forward Voltage vs. Current

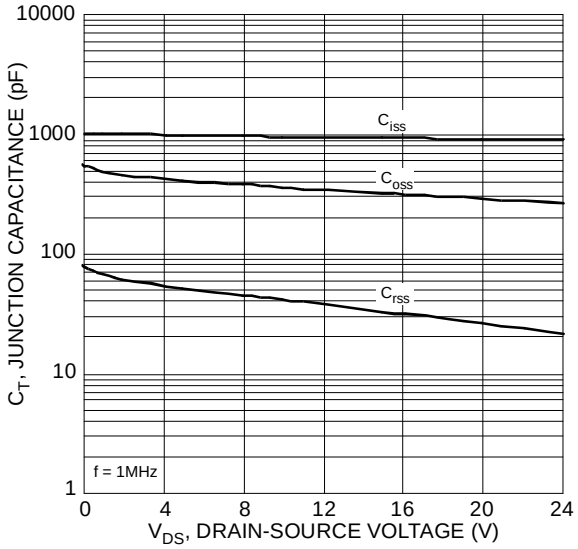


Figure 10 Typical Junction Capacitance

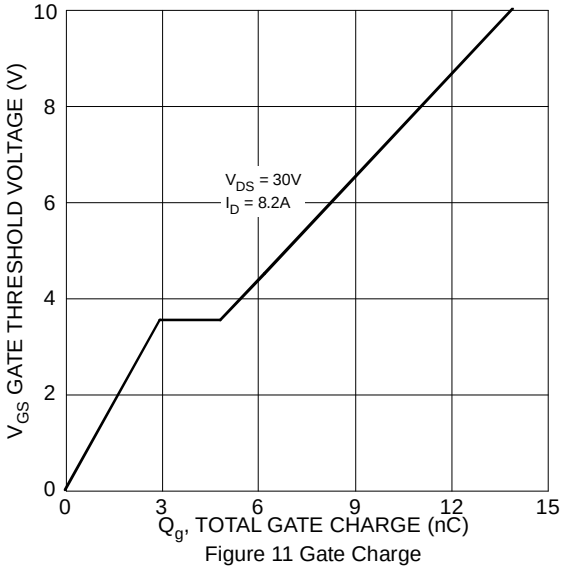


Figure 11 Gate Charge

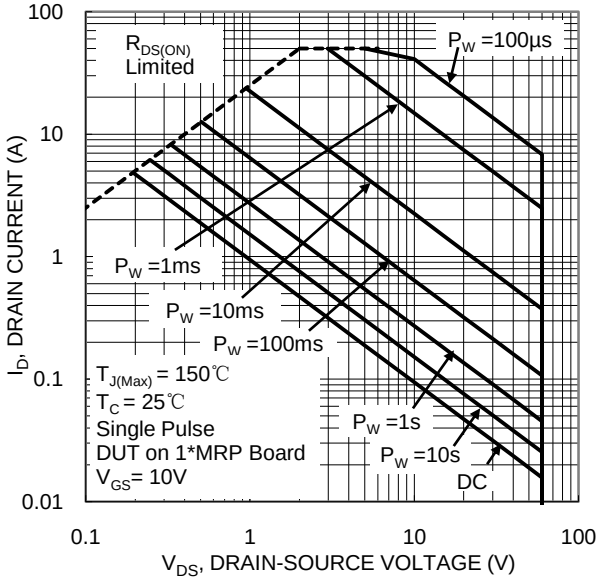


Figure 12. SOA, Safe Operation Area

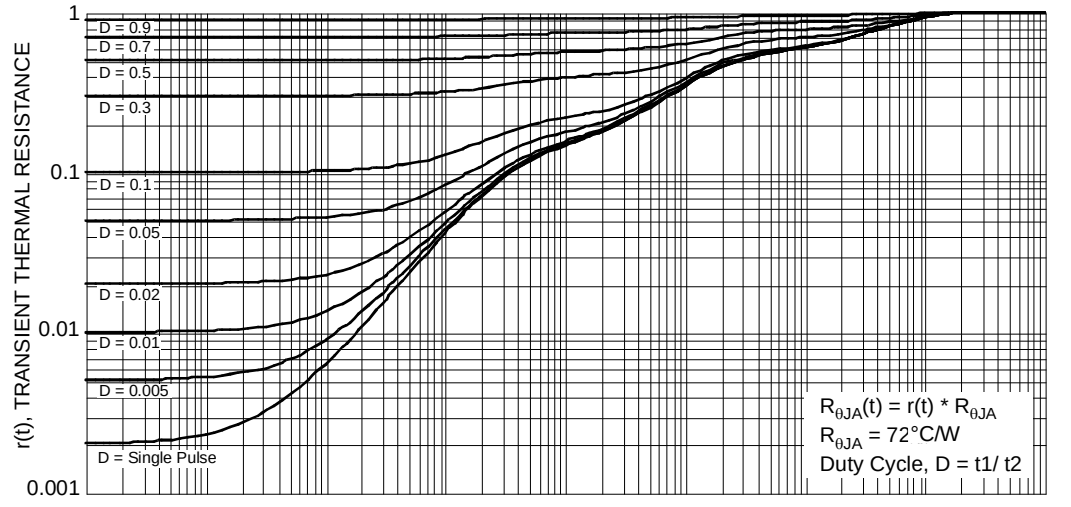
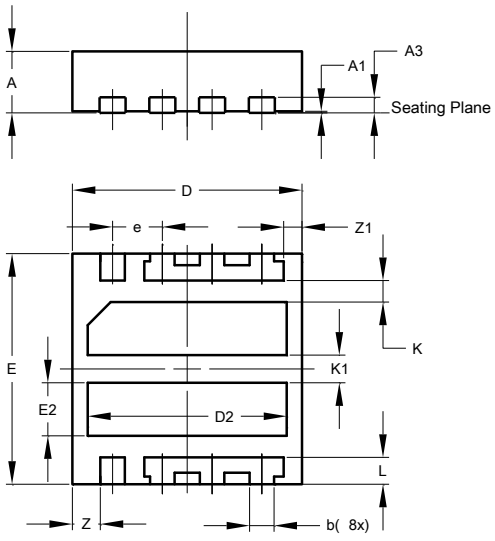


Figure 12 Transient Thermal Resistance

Package Outline Dimensions

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

V-DFN3030-8 (Type H)

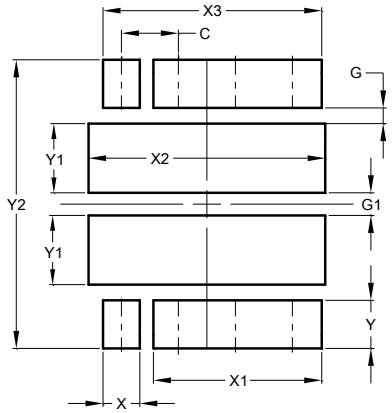


V-DFN3030-8 (Type H)			
Dim	**Min**	**Max**	**Typ**
A	0.75	0.85	0.80
A1	0	0.05	0.02
A3	0.203 BSC		
b	0.27	0.37	0.32
D	2.95	3.05	3.00
D2	2.50	2.70	2.60
e	0.65 BSC		
E	2.95	3.05	3.00
E2	0.59	0.79	0.69
L	0.30	0.40	0.35
K	0.28 BSC		
K1	0.36 BSC		
Z	0.365 BSC		
Z1	0.24 BSC		
All Dimensions in mm			

Suggested Pad Layout

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

V-DFN3030-8 (Type H)



Dimensions	Value (in mm)
C	0.650
G	0.180
G1	0.260
X	0.420
X1	1.920
X2	2.700
X3	2.495
Y	0.550
Y1	0.790
Y2	3.300