

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

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

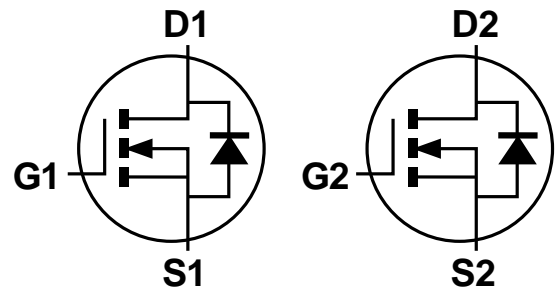
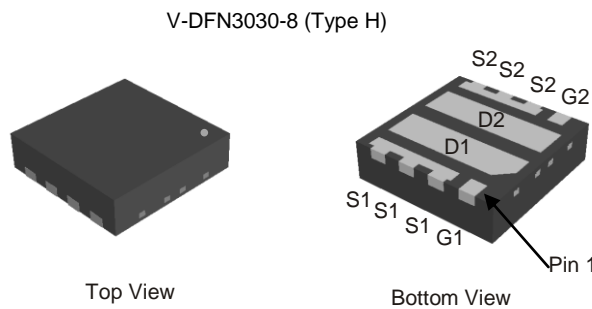
- Power Management Functions
- Analog Switch

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)**

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)



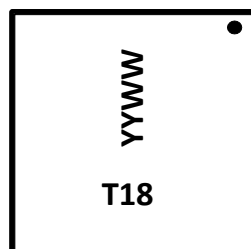
Equivalent Circuit

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	I _D	8.8 7.1	A
	t < 10s	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 _{θJA}	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 _{θJA}	66	°C/W
	t < 10s		40	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	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	17	mΩ	V _{GS} = 10V, I _D = 8.2A
		-	20	26		
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	
Reverse Recovery Charge	Q _{RR}	-	11.4	-	nC	I _F = 8.2A, di/dt = 100A/µs

- 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_{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.

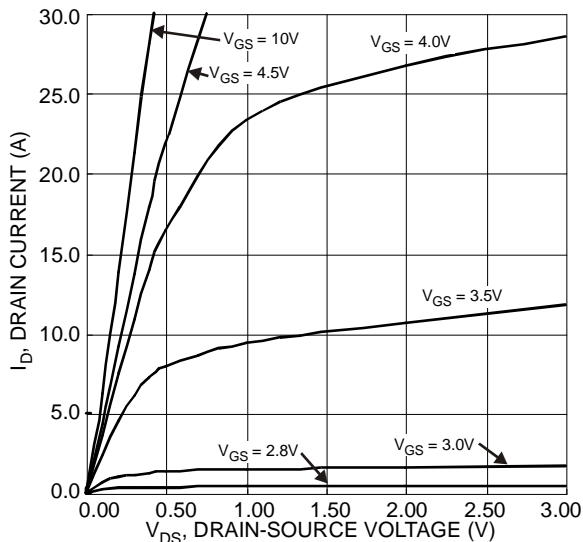


Figure 1 Typical Output Characteristics

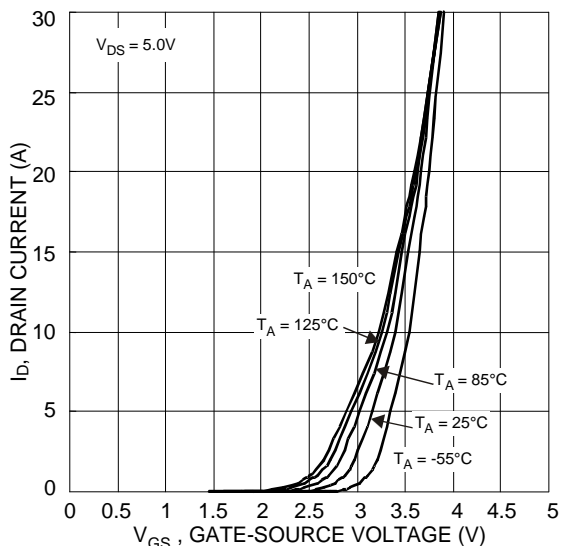


Figure 2 Typical Transfer Characteristics

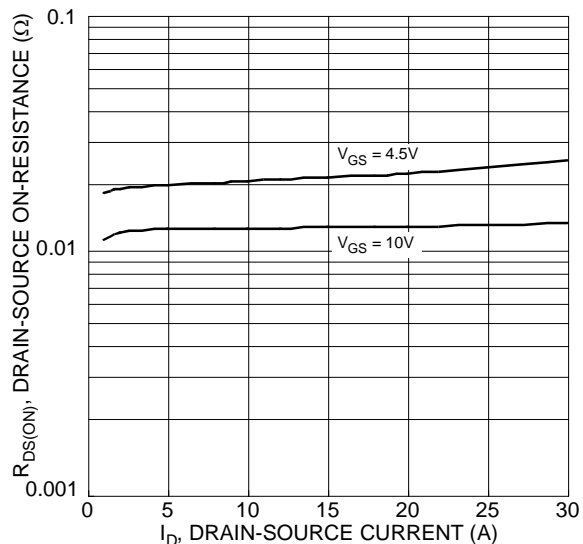


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

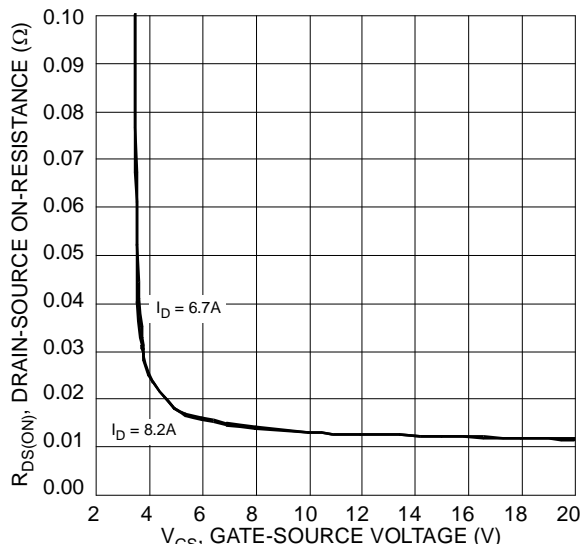


Figure 4 Typical Transfer Characteristics

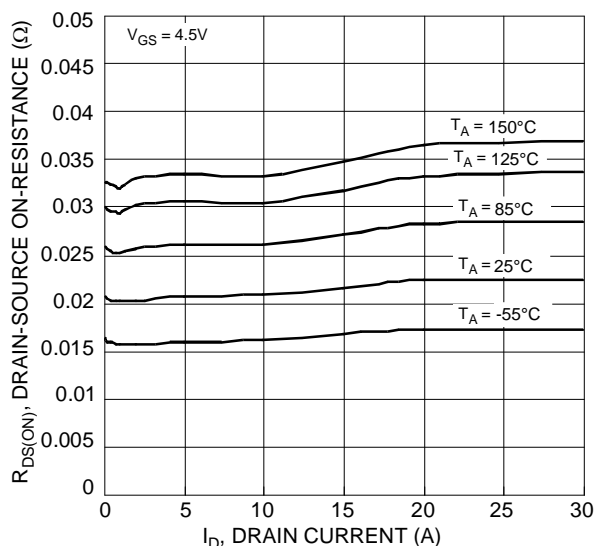


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

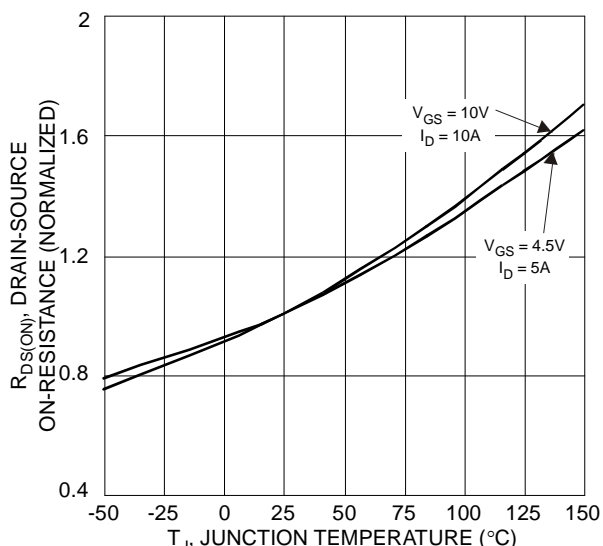


Figure 6 On-Resistance Variation with Temperature

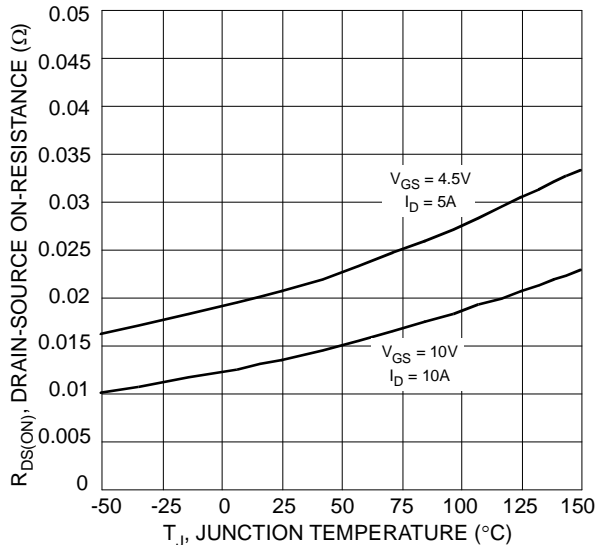


Figure 7 On-Resistance Variation with Temperature

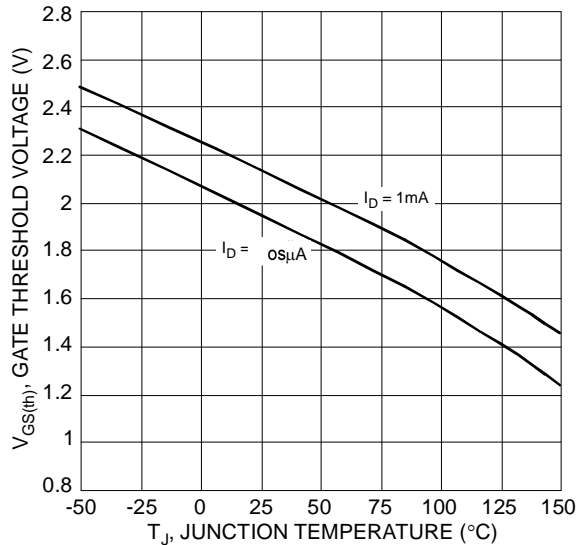


Figure 8 Gate Threshold Variation vs. Junction Temperature

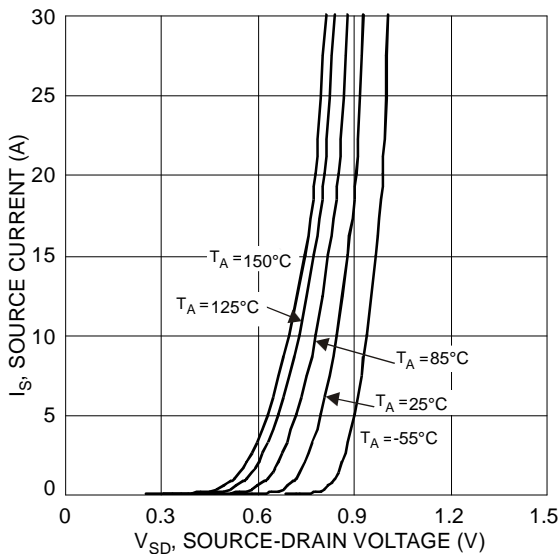


Figure 9 Diode Forward Voltage vs. Current

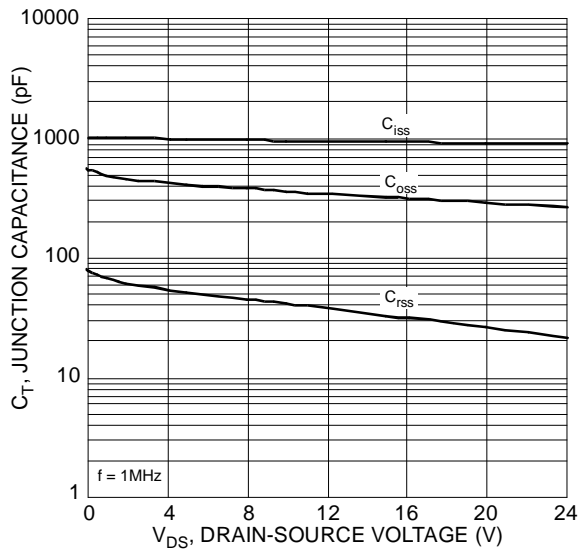


Figure 10 Typical Junction Capacitance

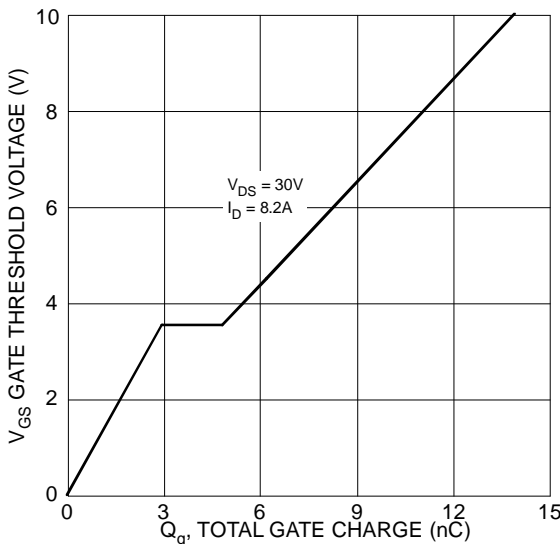


Figure 11 Gate Charge

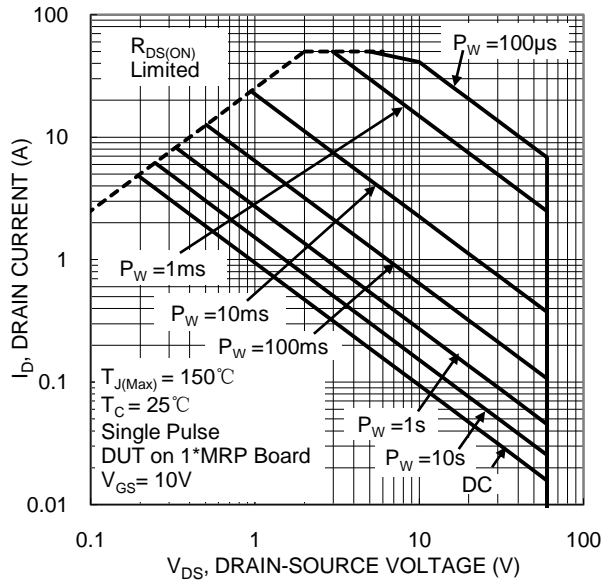
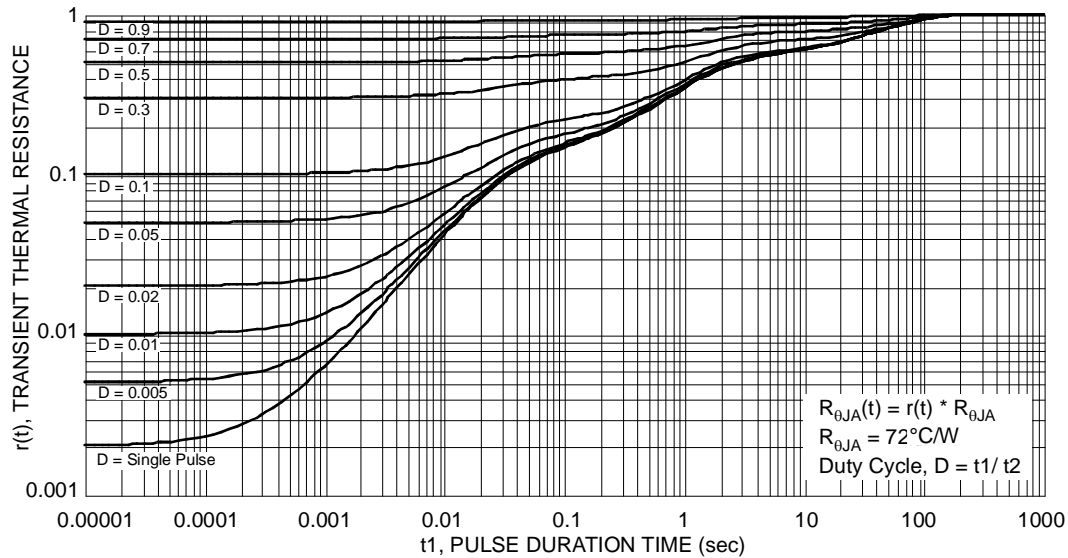


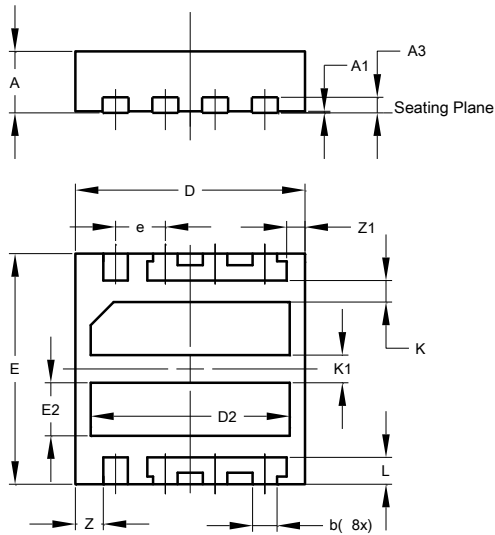
Figure 12. SOA, Safe Operation Area



Package Outline Dimensions

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

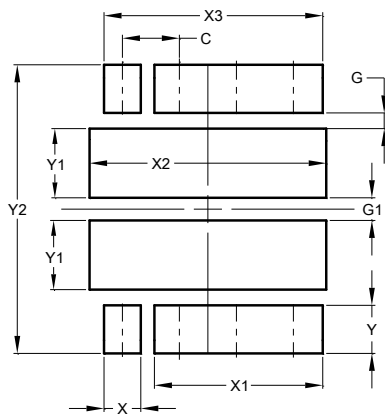
V-DFN3030-8 (Type H)



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

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