

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max $T_A = +25^\circ C$
-20V	45m Ω @ $V_{GS} = -4.5V$	-4.7A
	90m Ω @ $V_{GS} = -1.8V$	-3.3A

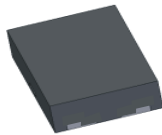
Description and Applications

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.

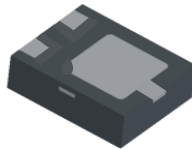
- Backlighting
- Power Management Functions
- DC-DC Converters



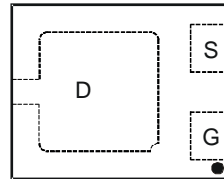
ESD protected Gate



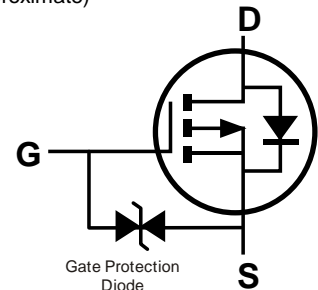
TOP VIEW



BOTTOM VIEW



Internal Schematic
(Top View)



Equivalent Circuit

Features and Benefits

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

Mechanical Data

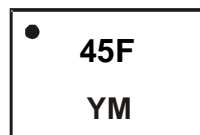
- Case: X2-DFN2015-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (Approximate)

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2045UFY4-7	X2-DFN2015-3	3,000/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 http://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



45F = Marking Code
 YM = Date Code Marking
 Y = Year (ex: F = 2018)
 M = Month (ex: 9 = September)

Date Code Key

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025
Code	E	F	G	H	I	J	K	L	M

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic	Symbol	Value	Unit	
Drain-Source Voltage	V _{DSS}	-20	V	
Gate-Source Voltage	V _{GSS}	±8	V	
Continuous Drain Current (Note 6) V _{GS} = -4.5V	I _D	T _A = +25°C	-4.7	A
		T _A = +70°C	-3.8	A
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	-1	A	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	-25	A	

Thermal Characteristics

Characteristic	Symbol	Value	Unit	
Total Power Dissipation (Note 5)	P _D	0.67	W	
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	Steady State	190	°C/W
Total Power Dissipation (Note 6)		P _D	1.49	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	Steady State	84	°C/W
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	14.5	
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 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	-20	—	—	V	V _{GS} = 0V, I _D = -250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	µA	T _J = +25°C, V _{DS} = -20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	µA	V _{GS} = ±8.0V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-0.3	—	-1.0	V	V _{DS} = V _{GS} , I _D = -250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	34	45	mΩ	V _{GS} = -4.5V, I _D = -4.0A
		—	44	58		V _{GS} = -2.5V, I _D = -3.5A
		—	56	90		V _{GS} = -1.8V, I _D = -0.1A
		—	80	160		V _{GS} = -1.5V, I _D = -0.1A
Diode Forward Voltage	V _{SD}	—	-0.6	-1.2	V	V _{GS} = 0V, I _S = 1.0A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	634	—	pF	V _{DS} = -10V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	81	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	66	—	pF	
Gate Resistance	R _g	—	20	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge	Q _g	—	6.8	—	nC	V _{GS} = -4.5V, V _{DS} = -10V I _D = -4A
Gate-Source Charge	Q _{gs}	—	0.7	—	nC	
Gate-Drain Charge	Q _{gd}	—	1.6	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	4.2	—	ns	V _{DS} = -10V, V _{GS} = -4.5V, R _D = 2.5Ω, R _g = 3.0Ω, I _D = -1A
Turn-On Rise Time	t _r	—	3.4	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	22.7	—	ns	
Turn-Off Fall Time	t _f	—	9.6	—	ns	
Reverse Recovery Time	t _{RR}	—	1.8	—	ns	I _F = -1.0A, di/dt = 100A/µs
Reverse Recovery Charge	Q _{RR}	—	9.4	—	nC	I _F = -1.0A, 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. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

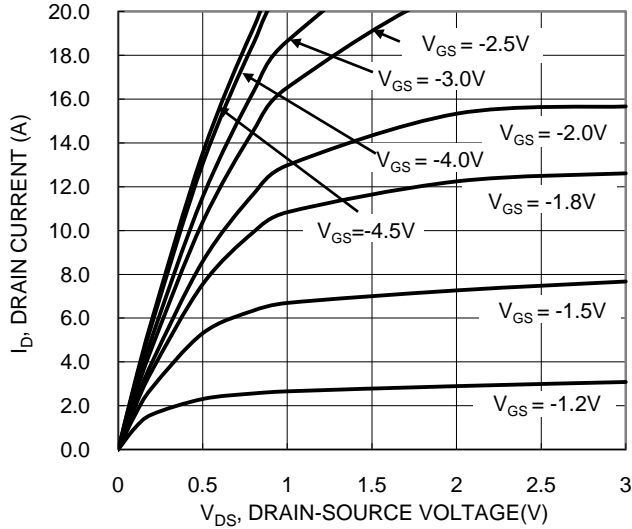


Figure 1. Typical Output Characteristic

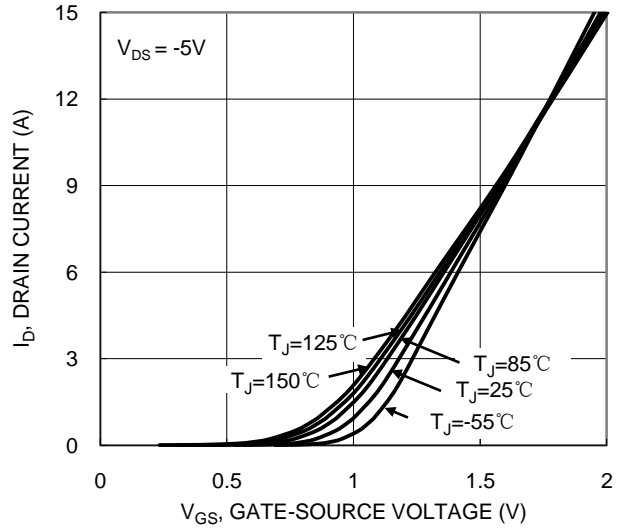


Figure 2. Typical Transfer Characteristic

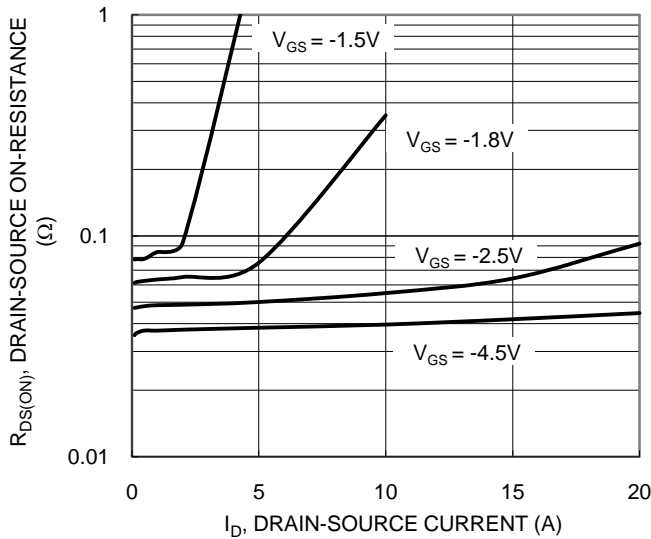


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

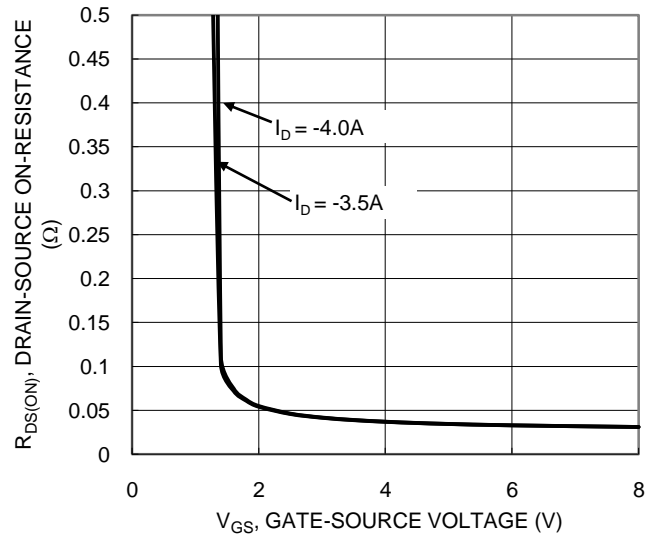


Figure 4. Typical Transfer Characteristic

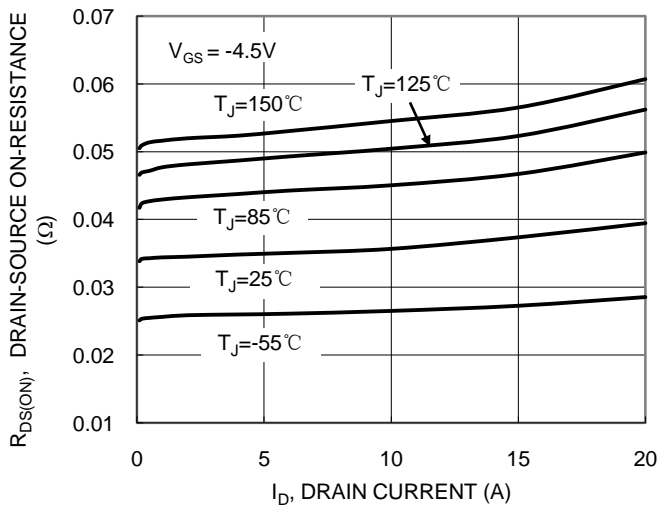


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

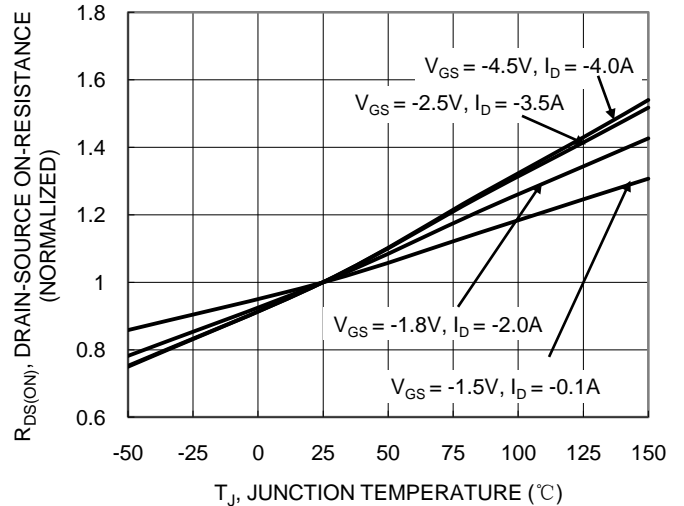
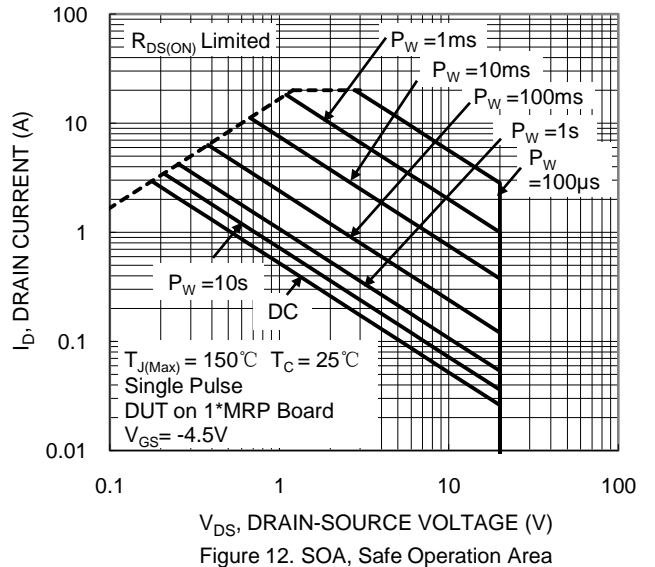
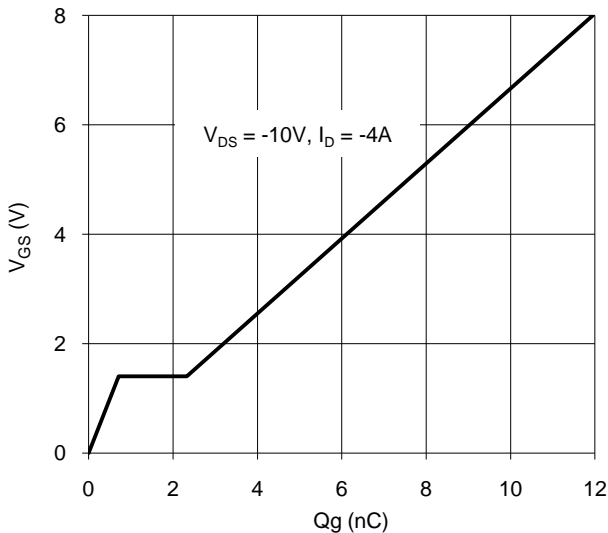
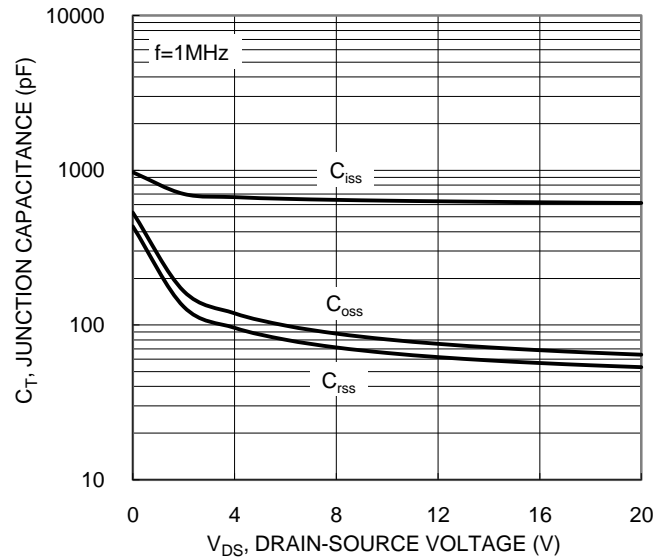
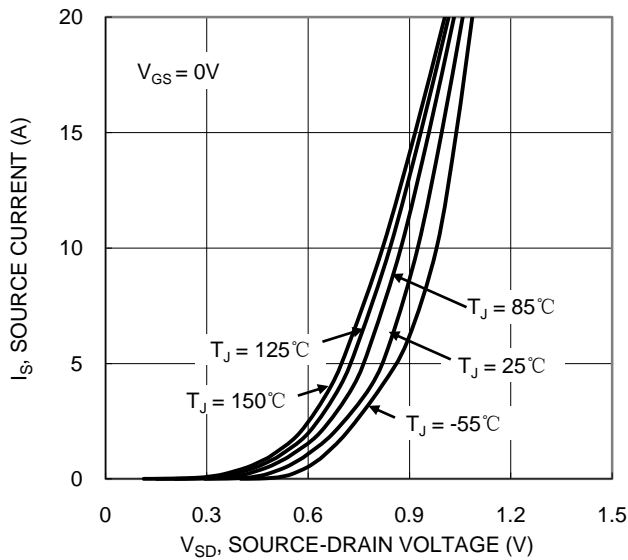
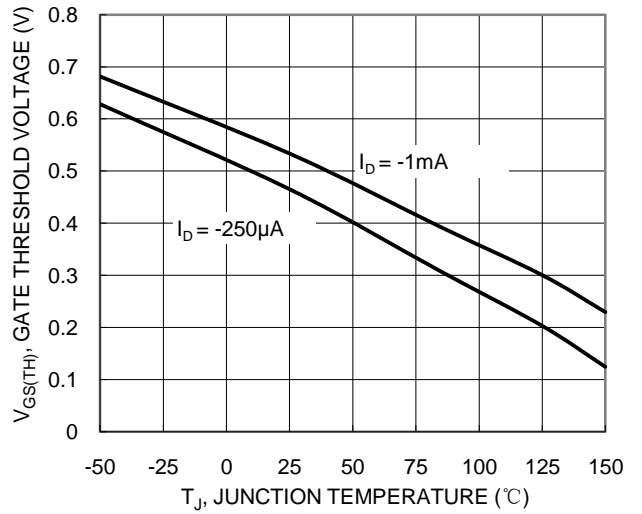
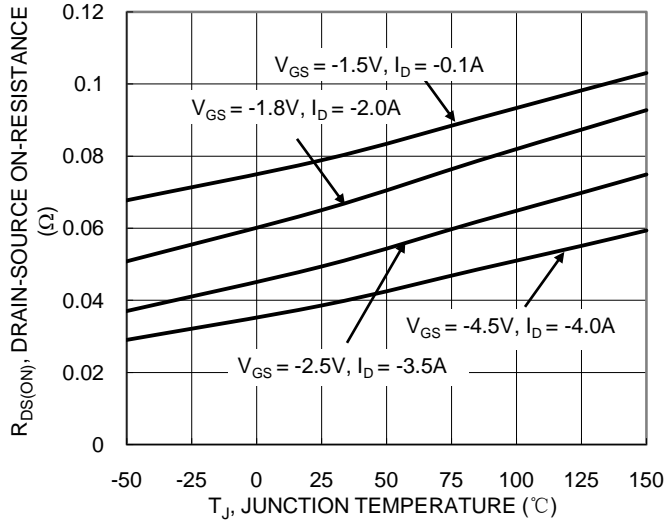


Fig.5 On-Resistance Variation with Junction Temperature



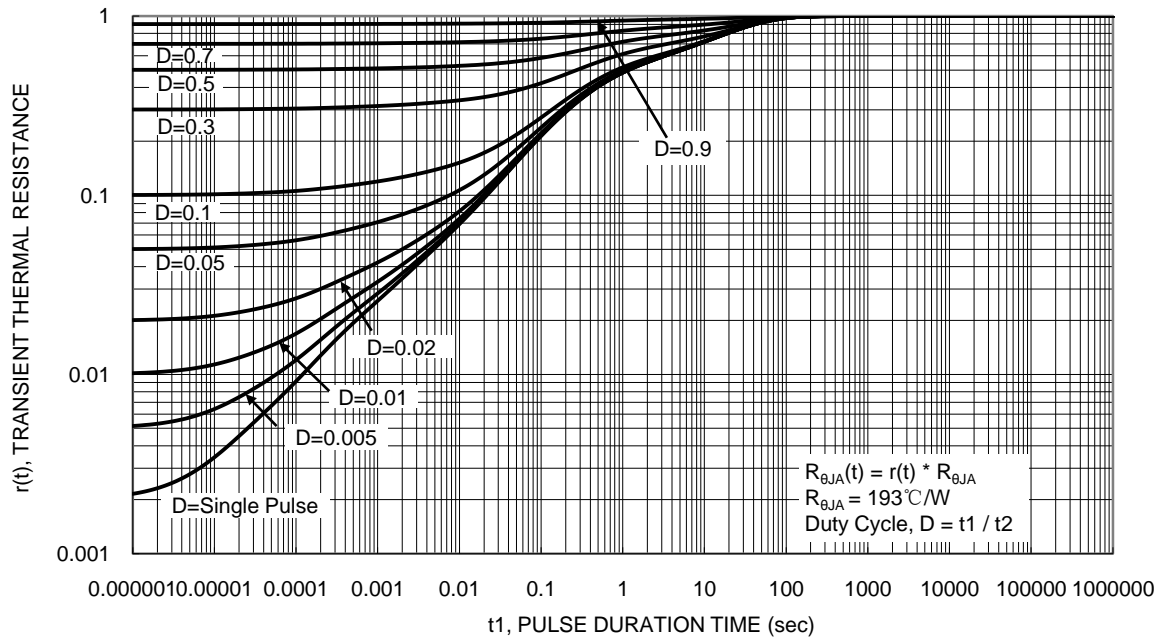
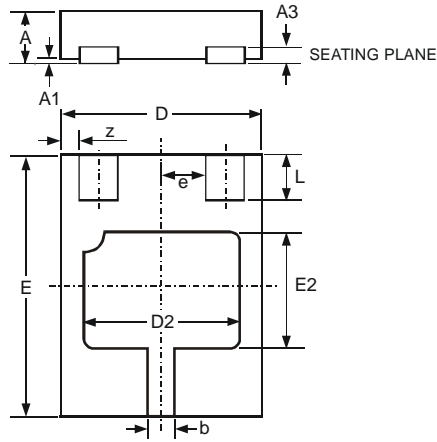


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

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

X2-DFN2015-3

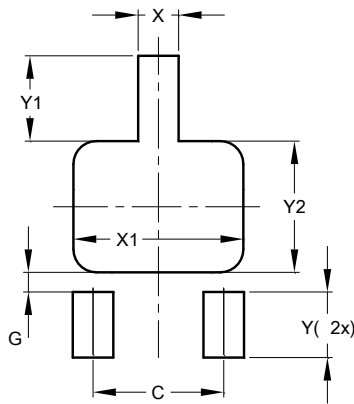


X2-DFN2015-3			
Dim	Min	Max	Typ
A	-	0.40	-
A1	0	0.05	0.02
A3	-	-	0.13
b	0.20	0.30	0.25
D	1.45	1.575	1.5
D2	1.00	1.20	1.10
e	-	-	0.50
E	1.95	2.075	2.00
E2	0.70	0.90	0.80
L	0.25	0.35	0.30
z	-	-	0.125
All Dimensions in mm			

Suggested Pad Layout

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

X2-DFN2015-3



X2-DFN2015-3	
Dimensions	Value (in mm)
C	1.000
G	0.150
X	0.310
X1	1.300
Y	0.500
Y1	0.650
Y2	1.000

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