

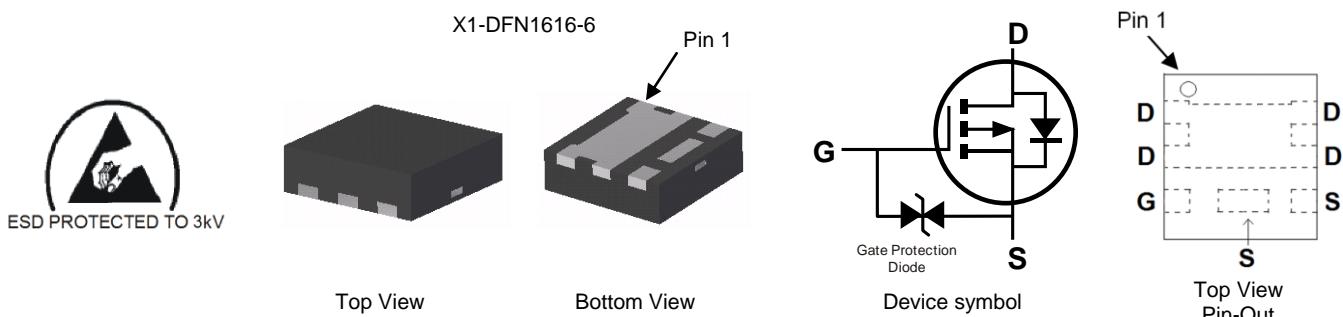
Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ max	I_D max
-12V	29m Ω @ $V_{GS} = -4.5V$	-6.6 A
	45m Ω @ $V_{GS} = -2.5V$	-5.3 A
	60m Ω @ $V_{GS} = -1.8V$	-4.6 A
	100m Ω @ $V_{GS} = -1.5V$	-3.5 A

Applications

This device provides high performance, low $R_{DS(ON)}$ P Channel MOSFETs in the thermally and space efficient X1-DFN1616-6 package. The low $R_{DS(ON)}$ of this MOSFET ensures conduction losses are kept making it ideal for use as a:

- Battery Disconnect Switch
- Load Switch for Power Management Functions



Ordering Information (Note 4)

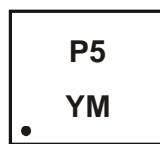
Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMP1245UFCL-7	P5	7	8	3,000

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

X1-DFN1616-6



P5 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: Y = 2011)
 M = Month (ex: 9 = September)

Date Code Key

Year	2011	2014	2015	2016	2017	2018	2019	2020	2021		
Code	Y	B	C	D	E	F	G	H	I		
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 (@ $T_A = +25^\circ\text{C}$ unless otherwise specified.)

Characteristic	Symbol	Value	Units	
Drain-Source Voltage	V_{DSS}	-12	V	
Gate-Source Voltage	V_{GSS}	± 8	V	
Continuous Drain Current (Note 6)	I_D	-6.6	A	
		-5.25	A	
Pulsed Drain Current	$T_P = 10\mu\text{s}$	I_{DM}	-16.67	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$ unless otherwise specified.)

Characteristic	Symbol	Value	Units
Total Power Dissipation	P_D	613	mW
		1.7	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	204	°C/W
		74	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:

5. For a device surface mounted on minimum recommended pad layout, in still air conditions; the device is measured when operating in a steady state condition.
6. For a device surface mounted on 25mm by 25mm by 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady state condition.

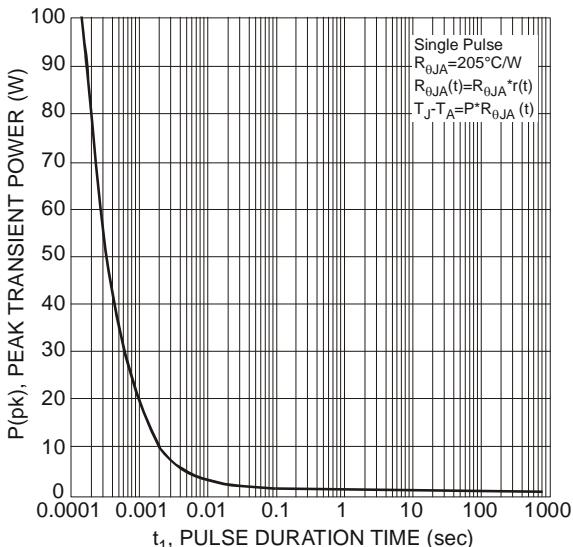


Fig. 1 Single Pulse Maximum Power Dissipation

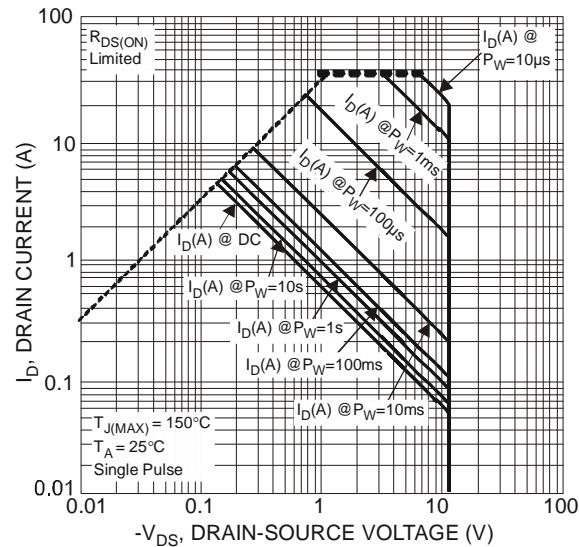


Fig. 2 SOA, Safe Operation Area

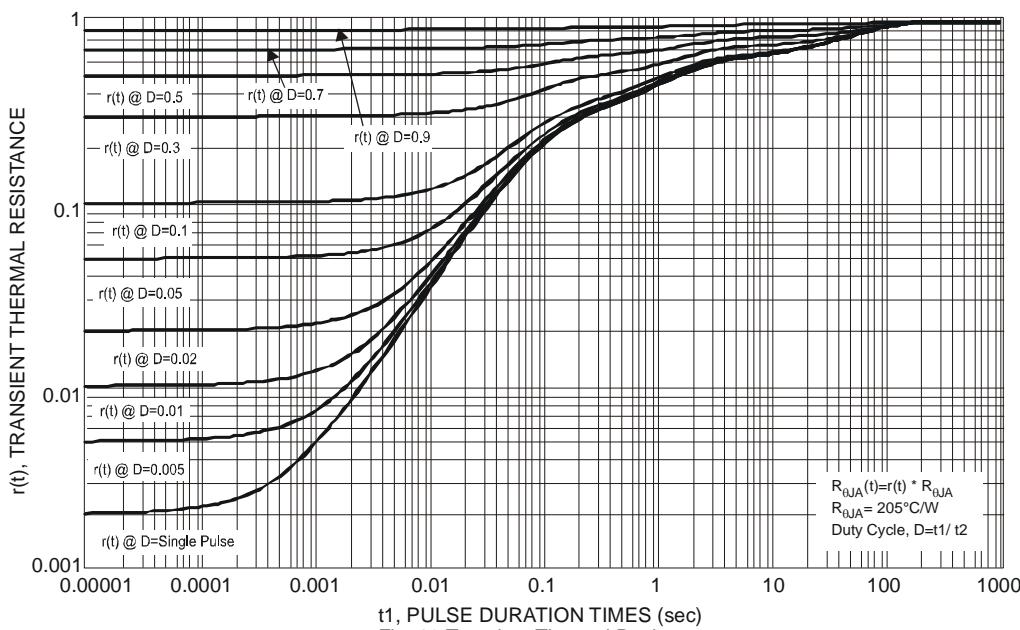
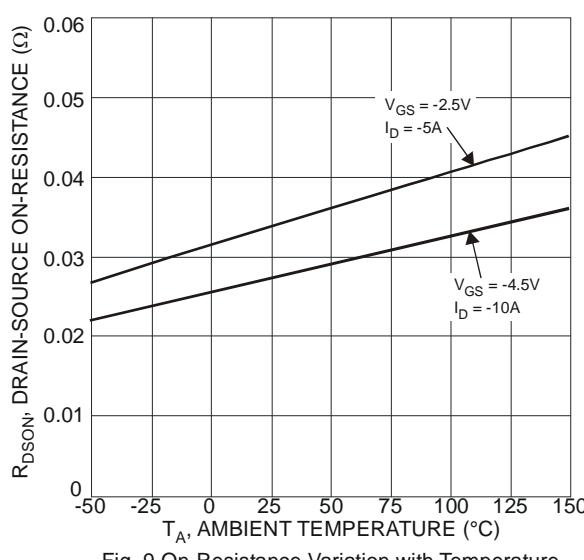
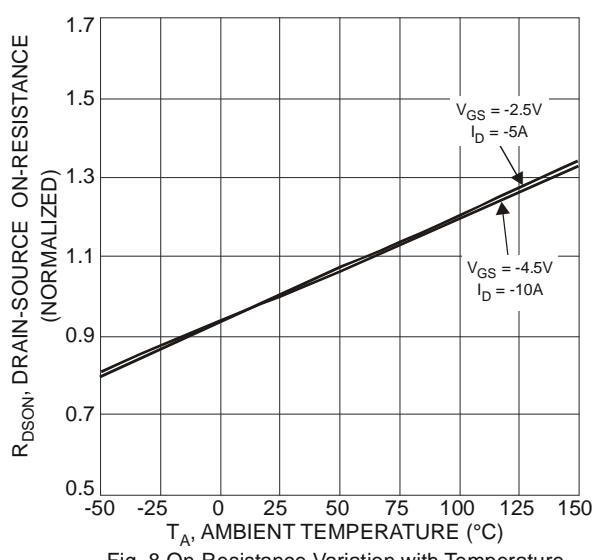
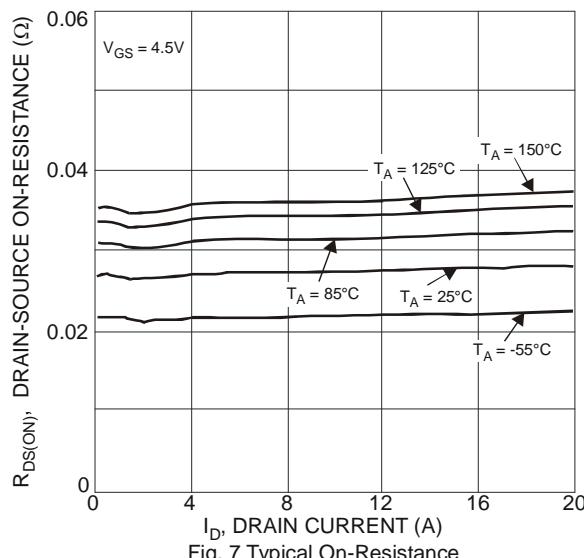
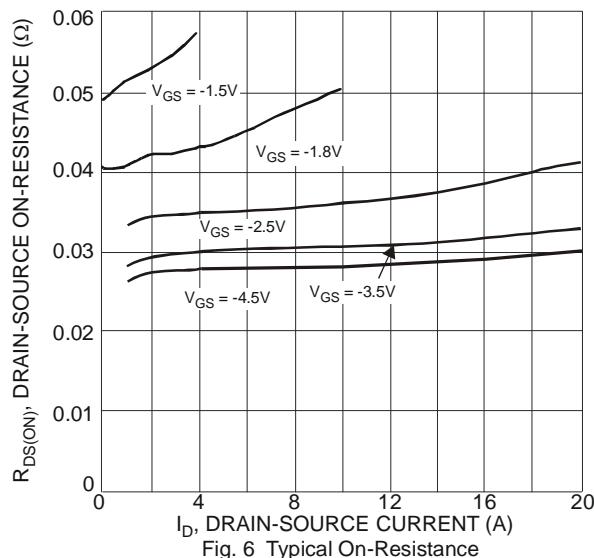
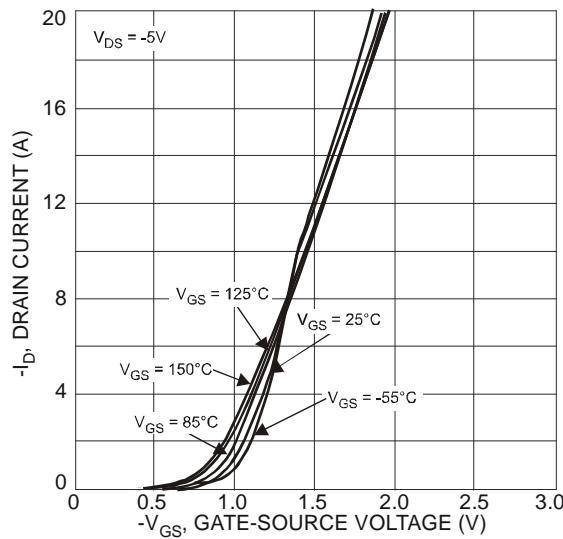
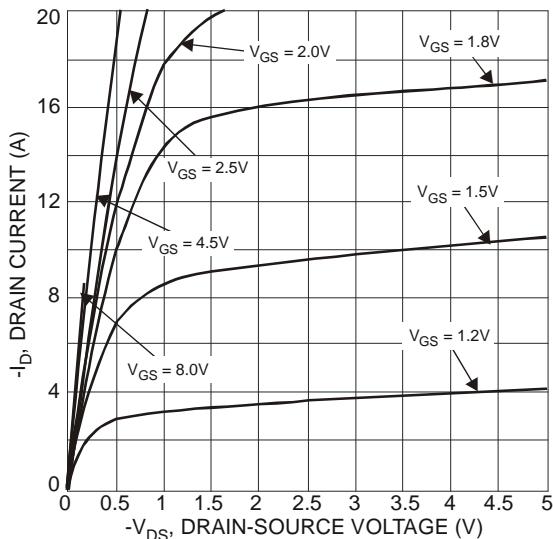


Fig. 03 Transient Thermal Resistance

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$ unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-12	—	—	V	$\text{V}_{\text{GS}} = 0\text{V}, \text{I}_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current $\text{T}_J = +25^\circ\text{C}$	I_{DSS}	—	—	-1	μA	$\text{V}_{\text{DS}} = -12.0\text{V}, \text{V}_{\text{GS}} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 10	μA	$\text{V}_{\text{GS}} = \pm 8.0\text{V}, \text{V}_{\text{DS}} = 0\text{V}$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$\text{V}_{\text{GS(th)}}$	-0.3	-0.6	-0.95	V	$\text{V}_{\text{DS}} = \text{V}_{\text{GS}}, \text{I}_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$\text{R}_{\text{DS(ON)}}$	—	25	29	$\text{m}\Omega$	$\text{V}_{\text{GS}} = -4.5\text{V}, \text{I}_D = -4\text{A}$
		—	31	45		$\text{V}_{\text{GS}} = -2.5\text{V}, \text{I}_D = -3.5\text{A}$
		—	40	60		$\text{V}_{\text{GS}} = -1.8\text{V}, \text{I}_D = -1\text{A}$
		—	60	100		$\text{V}_{\text{GS}} = -1.5\text{V}, \text{I}_D = -0.5\text{A}$
Forward Transfer Admittance	$ \text{Y}_{\text{fs}} $	0.4	3	-	S	$\text{V}_{\text{DS}} = -5\text{V}, \text{I}_D = -2\text{A}$
Diode Forward Voltage	V_{SD}	-	-	-1.0	V	$\text{V}_{\text{GS}} = 0\text{V}, \text{I}_D = -2\text{A}$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	-	1357.4	-	pF	$\text{V}_{\text{DS}} = -10\text{V}, \text{V}_{\text{GS}} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	-	499	-	pF	
Reverse Transfer Capacitance	C_{rss}	-	273.6	-	pF	
Gate Resistance	R_{g}	-	14.26	-	Ω	$\text{V}_{\text{DS}} = 0\text{V}, \text{V}_{\text{GS}} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge	Q_{g}	-	16.1	-	nC	$\text{V}_{\text{GS}} = -4.5\text{V}$
		-	26.1	-	nC	$\text{I}_D = -1\text{A}, \text{V}_{\text{DS}} = -10\text{V}$
Gate-Source Charge	Q_{gs}	-	1.71	-	nC	$\text{V}_{\text{GS}} = -8\text{V}$
Gate-Drain Charge	Q_{gd}	-	20.48	-	nC	
Turn-On Delay Time	$\text{t}_{\text{D(on)}}$	-	15.2	-	ns	$\text{V}_{\text{GS}} = -2.5\text{V}, \text{V}_{\text{DS}} = -10\text{V}$ $\text{I}_D = -180\text{mA}, \text{R}_{\text{G}} = 2.0\Omega$
Turn-On Rise Time	t_{r}	-	33.11	-	ns	
Turn-Off Delay Time	$\text{t}_{\text{D(off)}}$	-	219.4	-	ns	
Turn-Off Fall Time	t_{f}	-	217.64	-	ns	

Notes: 7. Short duration pulse test used to minimize self-heating effect.
 8. Guaranteed by design. Not subject to production testing.



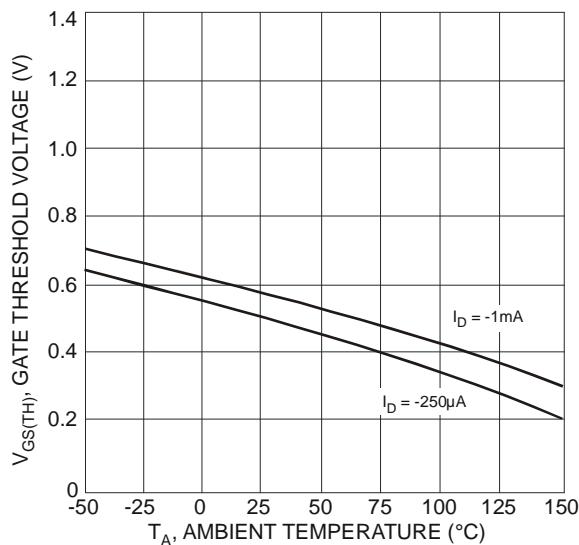


Fig. 10 Gate Threshold Variation vs. Ambient Temperature

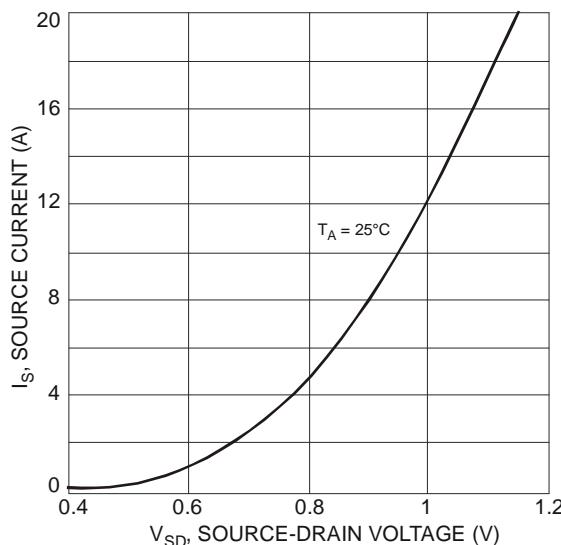


Fig. 11 Diode Forward Voltage vs. Current

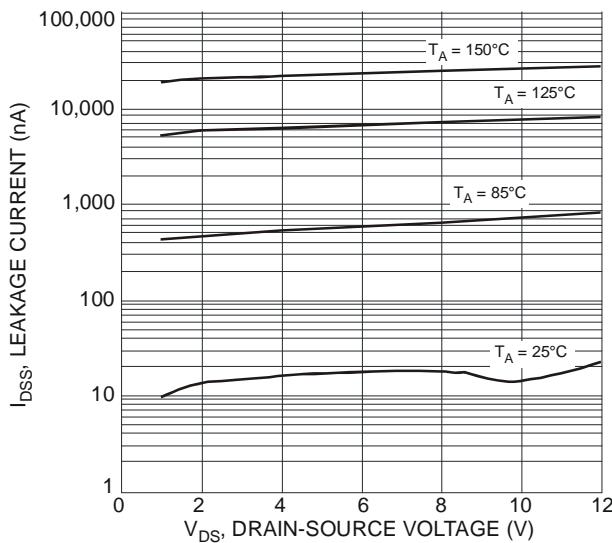


Fig. 12 Typical Drain-Source Leakage Current vs. Voltage

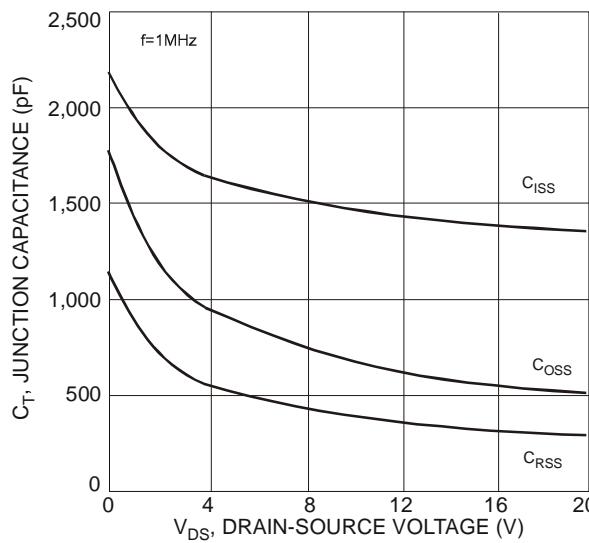


Fig. 13 Typical Junction Capacitance

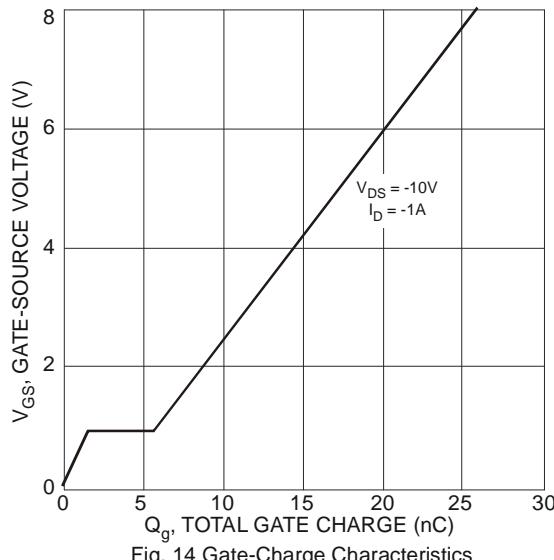
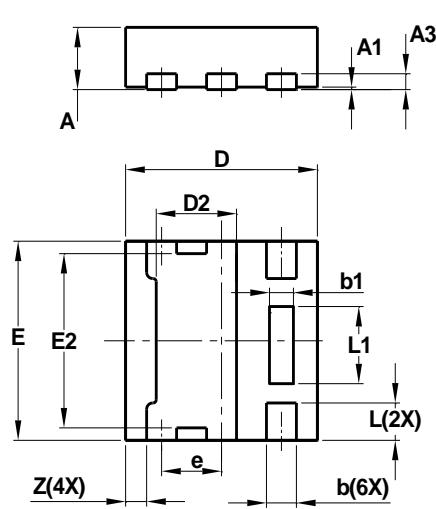


Fig. 14 Gate-Charge Characteristics

Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

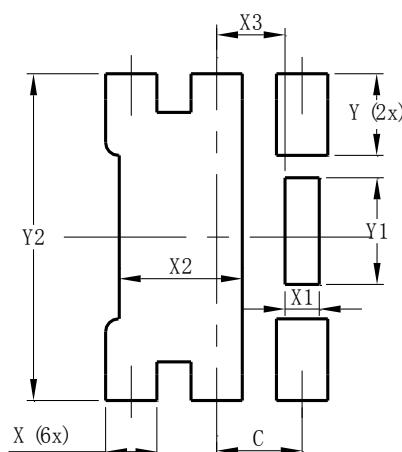


X1-DFN1616-6 Type E			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0	0.05	0.02
A3	—	—	0.13
b	0.20	0.30	0.25
b1	0.10	0.30	0.20
D	1.55	1.65	1.60
D2	0.57	0.77	0.67
E	1.55	1.65	1.60
E2	1.30	1.50	1.40
e	—	—	0.50
L	0.25	0.35	0.30
L1	0.52	0.72	0.62
Z	—	—	0.175

All Dimensions in mm

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.



Dimensions	Value (in mm)
C	0.500
X	0.300
X1	0.200
X2	0.720
X3	0.400
Y	0.475
Y1	0.620
Y2	1.900

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