Product Summary

$V_{(BR)DSS}$	$R_{DS(on)max}$	I_D T_A = +25°C
-30V	14mΩ @ V_{GS} = -10V	-10.4A
	25mΩ @ V_{GS} = -4.5V	-7.8A

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

- Load Switch
- Power Management Functions
- DC-DC Converters

Features and Benefits

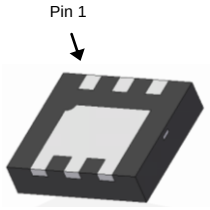
- Low On-Resistance
- Low Input Capacitance
- Low Input/Output Leakage
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: U-DFN2523-6
- 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 e4
- Weight: 0.008 grams (Approximate)

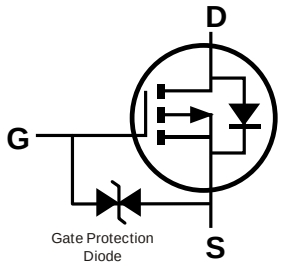


U-DFN2523-6



Pin 1, 2 = Source
Pin 3 = Gate
Pin 4, 5, 6 = Drain

Bottom View



Equivalent Circuit

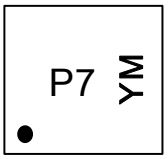
Ordering Information (Note 4)

Part Number	Case	Packaging
DMP3017SFK-7	U-DFN2523-6	3,000 / Tape & Reel
DMP3017SFK-13	U-DFN2523-6	10,000 / 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 http://www.diodes.com/products/packages.html.

Marking Information

U-DFN2523-6



P7 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: B = 2014)
M = Month (ex: 9 = September)

Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020
Code	B	C	D	E	F	G	H

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

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	-30	V
Gate-Source Voltage			V_{GSS}	±25	V
Continuous Drain Current (Note 6) V_{GS} = -10V	Steady State	T_A = +25°C T_A = +70°C	I_D	-10.4 -8.3	A
Continuous Drain Current (Note 6) V_{GS} = -4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	-7.8 -6.2	A
Maximum Continuous Body Diode Forward Current (Note 6)			I_S	-3	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	-80	A
Avalanche Current (Note 7)			I_{AS}	-14	A
Avalanche Energy (Note 7)			E_{AS}	104	mJ

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)		P_D	1	W
Thermal Resistance, Junction to Ambient (Note 5)		$R_{\theta JA}$	123	°C/W
Total Power Dissipation (Note 6)		P_D	2.2	W
Thermal Resistance, Junction to Ambient (Note 6)		$R_{\theta JA}$	55	°C/W
Total Power Dissipation (Note 6)	T_C = +25°C	P_D	17	W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	7.2	°C/W
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 = -10mA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	-1	µA	V_{DS} = -24V, V_{GS} = 0V
Zero Gate Voltage Drain Current T_J = +150°C (Note 9)		—	—	-100		
Gate-Source Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±25V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	-1	-1.6	-2.5	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	9.5	14	mΩ	V_{GS} = -10V, I_D = -9.5A
		—	15	25		V_{GS} = -4.5V, I_D = -6.9A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.2	V	V_{GS} = 0V, I_S = -1A
On State Drain Current (Note 9)	$I_{D(ON)}$	-20	—	—	A	V_{DS} ≦-5V, V_{GS} = -10V
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	2207	4414	pF	V_{DS} = -15V, V_{GS} = 0V, f = 1MHz
Output Capacitance	C_{oss}	—	390	780		
Reverse Transfer Capacitance	C_{rss}	—	343	686		
Gate Resistance	R_g	—	8.4	20	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = -10V)	Q_g	—	42.7	90	nC	V_{DS} = -15V, I_D = -9.5A
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	21.6	45		
Gate-Source Charge	Q_{gs}	—	7.9	16		
Gate-Drain Charge	Q_{gd}	—	10	20		
Turn-On Delay Time	$t_{D(on)}$	—	7.35	15	ns	V_{DD} = -15V, V_{GS} = -10V, R_{GEN} = 6Ω, I_D = -9.5A
Turn-On Rise Time	t_r	—	16.4	30		
Turn-Off Delay Time	$t_{D(off)}$	—	67.2	110		
Turn-Off Fall Time	t_f	—	37.5	60		
Reverse Recovery Time	t_{rr}	—	18.6	35	ns	I_S = -9.5A, di/dt = 100A/µs
Reverse Recovery Charge	Q_{rr}	—	8.6	17.5	nC	

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 thermal vias to bottom layer 1-inch square copper plate.
7. UIS in production with L = 1mH, T_J = +25°C.
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing.

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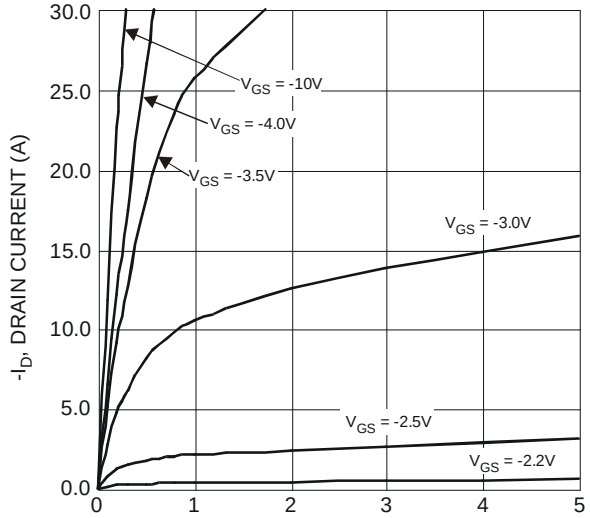


Figure 1 Typical Output Characteristics

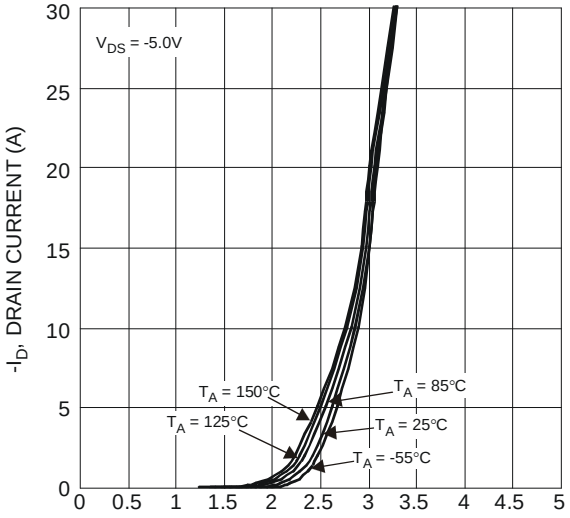


Figure 2 Typical Transfer Characteristics

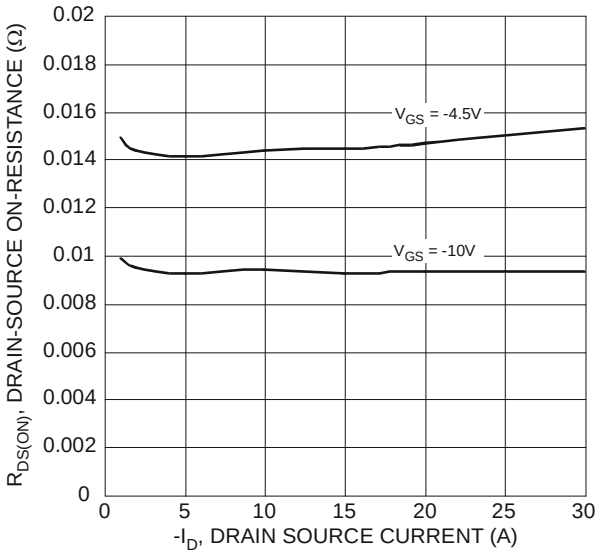


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

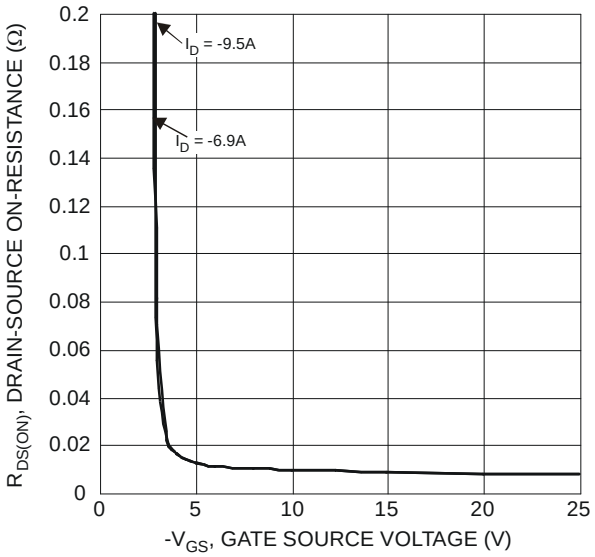


Figure 4 Typical Transfer Characteristics

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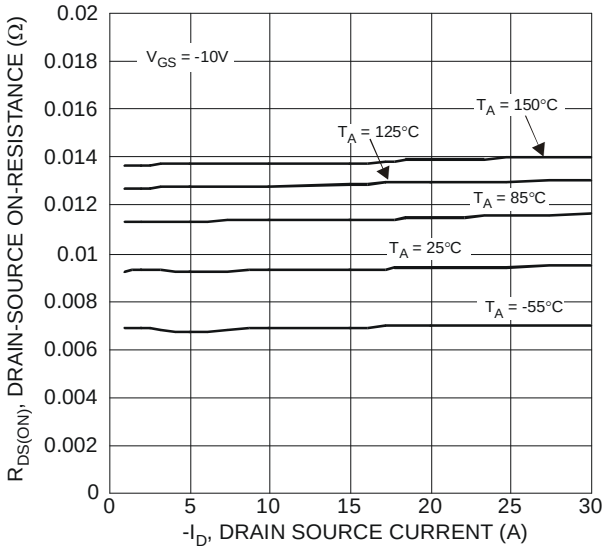


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

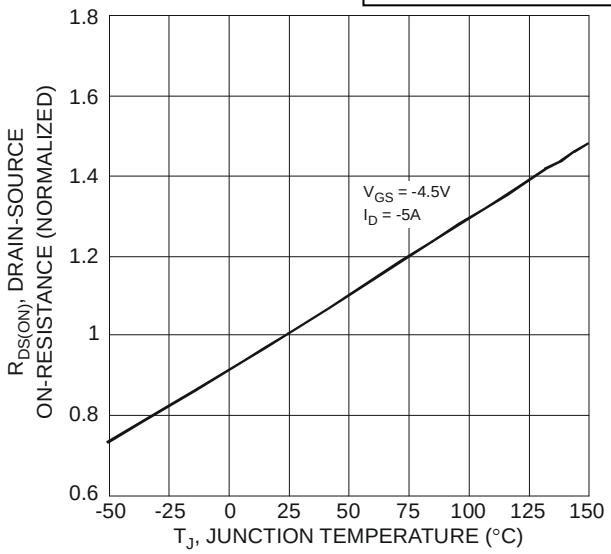


Figure 6 On-Resistance Variation with Temperature

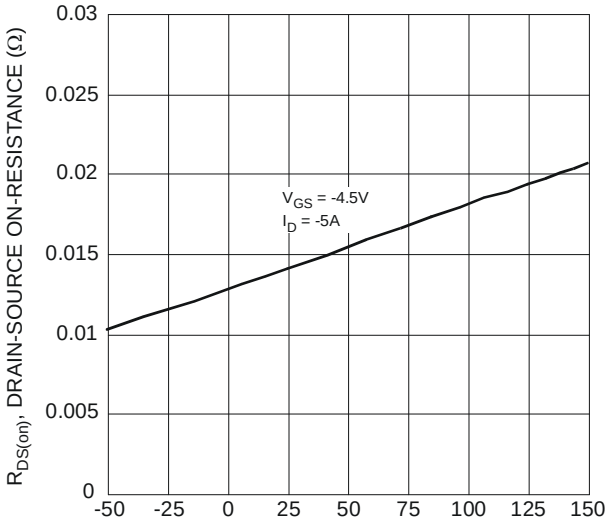


Figure 7 On-Resistance Variation with Temperature

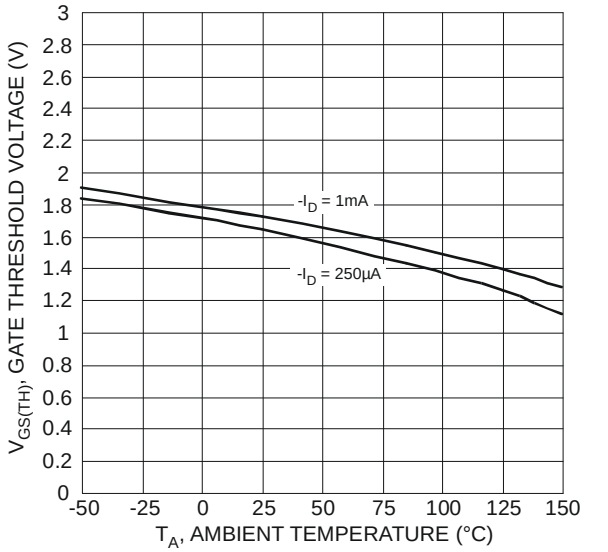


Figure 8 Gate Threshold Variation vs. Ambient Temperature

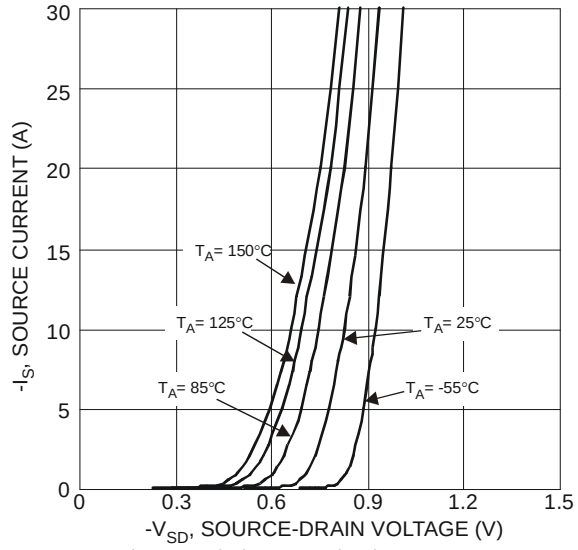


Figure 9 Diode Forward Voltage vs. Current

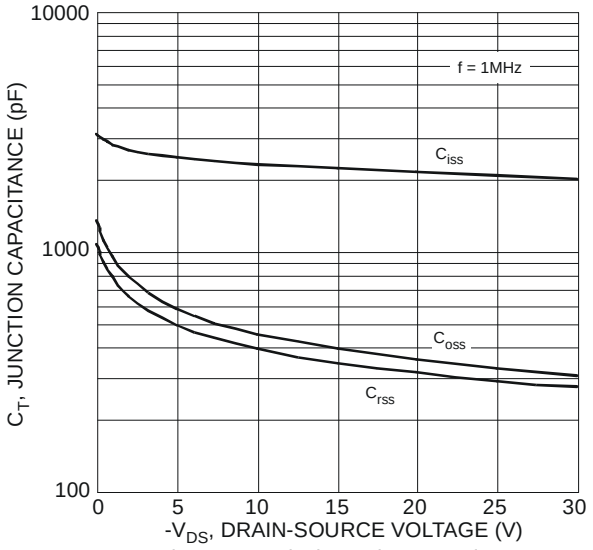


Figure 10 Typical Junction Capacitance

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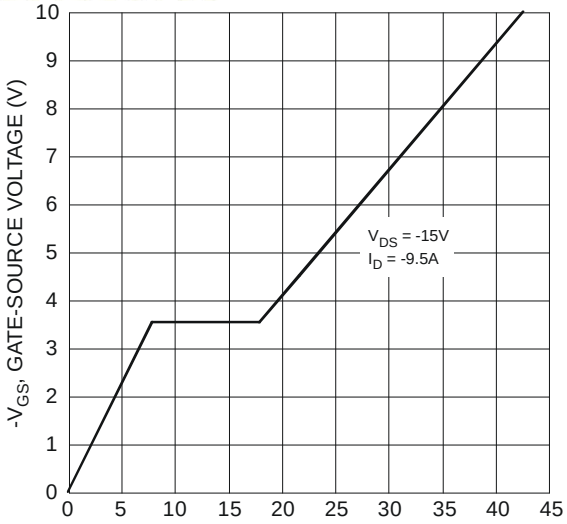


Figure 11 Gate-Charge Characteristics

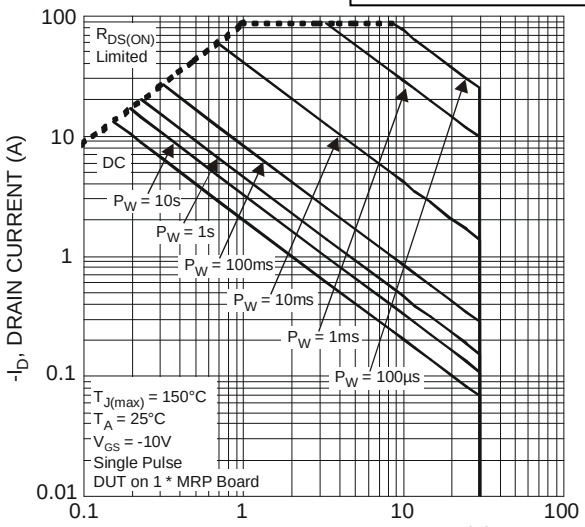


Figure 12 SOA, Safe Operation Area

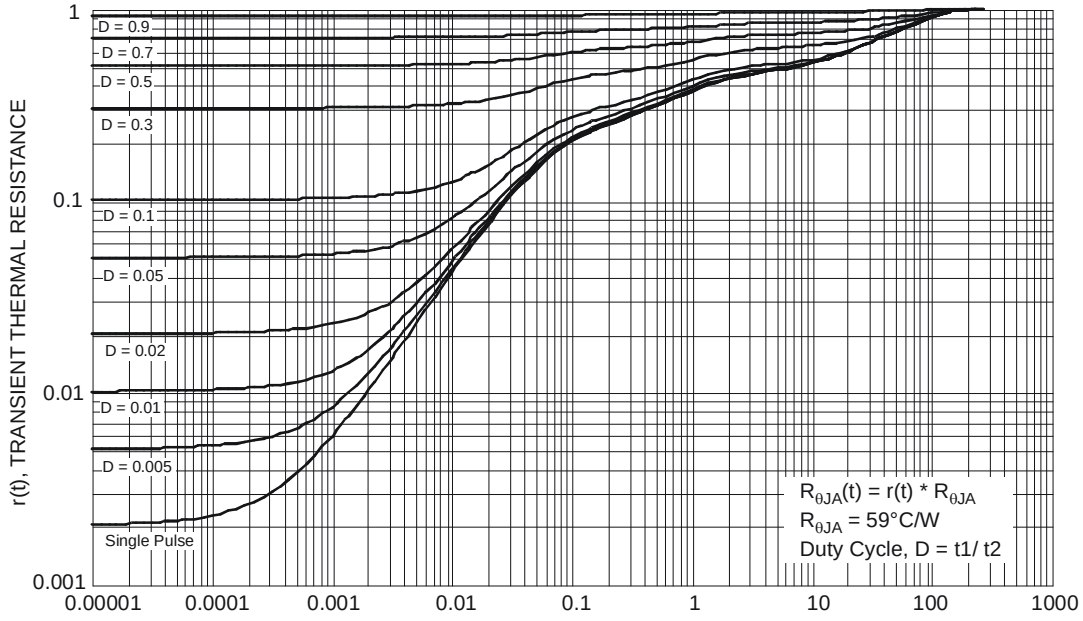
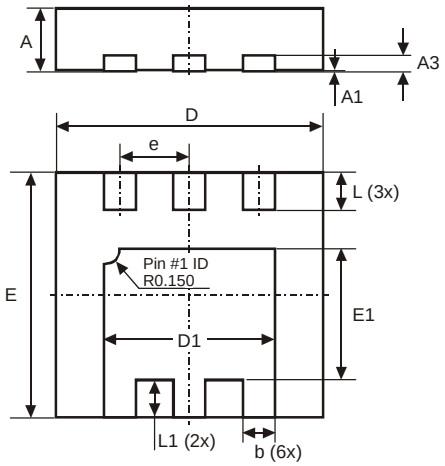


Figure 13 Transient Thermal Resistance

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Package Outline Dimensions

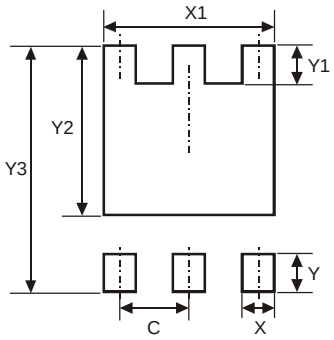
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



U-DFN2523-6			
Dim	**Min**	**Max**	**Typ**
A	0.57	0.63	0.60
A1	0	0.05	0.02
A3	–	–	0.152
b	0.25	0.35	0.30
D	2.45	2.55	2.50
D1	1.55	1.65	1.60
e	–	–	0.65
E	2.25	2.35	2.30
E1	1.18	1.28	1.23
L	0.30	0.40	0.35
L1	0.30	0.40	0.35
All Dimensions in mm			

Suggested Pad Layout

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



Dimensions	Value (in mm)
C	0.650
X	0.400
X1	1.700
Y	0.650
Y1	0.450
Y2	1.830
Y3	2.700

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