30V P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D T_A = +25°C
-30V	0.15Ω @ V_{GS} = -10V	-2.6A
	0.23Ω @ V_{GS} = -4.5V	-1.5A

Description

This MOSFET utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed, making it ideal for high-efficiency power management applications.

Applications

- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

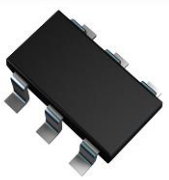
Features and Benefits

- Fast Switching Speed
- Low On-Resistance
- Low Threshold
- Low Gate Drive
- **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**

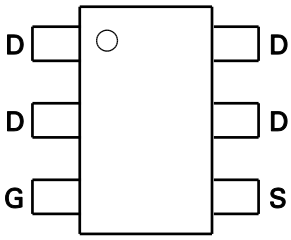
Mechanical Data

- Case: SOT-26
- Case Material: Molded Plastic; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.015 grams (Approximate)

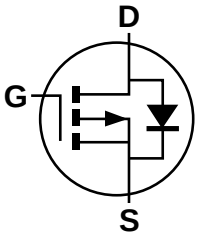
SOT-26



Top View



Pin Out - Top



Equivalent Circuit

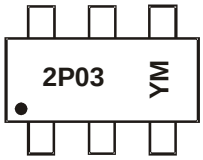
Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXM62P03E6TA	2P03	7	8	3,000 Units
ZXM62P03E6TC	2P03	13	8	10,000 Units

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

SOT-26



2P03 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: C = 2015)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022
Code	C	D	E	F	G	H	I	J

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_{GS}	±20	V
Continuous Drain Current	V_{GS} = -4.5V	T_A = +25°C (Note 5) T_A = +70°C (Note 5)	I_D	-1.5 -1.2	A
Pulsed Drain Current (Note 7)			I_{DM}	-7.4	A
Continuous Source Current (Body Diode)			I_S	-0.54	A
Pulsed Source Current (Body Diode)			I_{SM}	-7.4	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear Derating Factor	P_D	625 5	mW mW/°C
Power Dissipation (Note 6) Linear Derating Factor	P_D	806 6.4	mW mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	113	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	73	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:
5. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions
6. For a device surface mounted on FR4 PCB measured at t ≤5 seconds.
7. Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

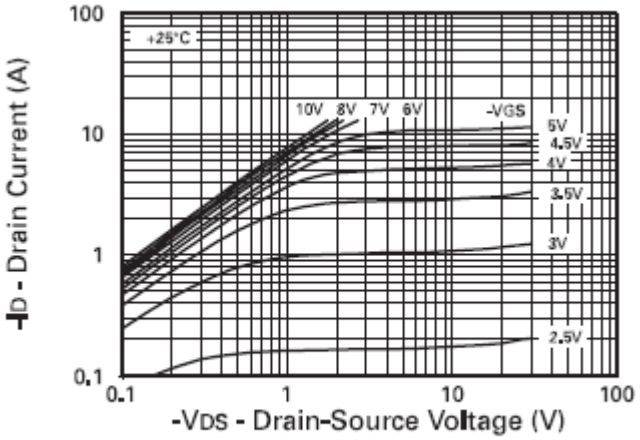
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	I_D = -250µA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	-1	—	—	V	I_D = -250µA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 8)	$R_{DS\ (ON)}$	—	—	0.15	Ω	V_{GS} = -10V, I_D = -1.6A
				0.23		V_{GS} = -4.5V, I_D = -0.8A
Forward Transconductance (Notes 8 & 10)	g_{fs}	1.1	—	—	S	V_{DS} = -10V, I_D = -0.8A
Diode Forward Voltage (Note 8)	V_{SD}	—	—	-0.95	V	T_J = +25°C, I_S = -1.6A, V_{GS} = 0V
Reverse Recovery Time (Note 10)	t_{rr}	—	19.9	—	ns	T_J = +25°C, I_F = -1.6A, di/dt = 100A/µs
Reverse Recovery Charge (Note 10)	Q_{rr}	—	13	—	nC	
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	330	—	pF	V_{DS} = -25V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	120	—		
Reverse Transfer Capacitance	C_{rss}	—	45	—		
Turn-On Delay Time (Note 9)	$t_{d(on)}$	—	2.8	—	ns	V_{DD} = -15V, I_D = -1.6A, $R_G \cong 6.2\Omega$, $R_D \cong 25\Omega$,
Turn-On Rise Time (Note 9)	t_r	—	6.4	—		
Turn-Off Delay Time (Note 9)	$t_{d(off)}$	—	13.9	—		
Turn-Off Fall Time (Note 9)	t_f	—	10.3	—		
Total Gate Charge (Note 9)	Q_g	—	—	10.2	nC	V_{DS} = -24V, V_{GS} = -10V, I_D = -1.6A
Gate-Source Charge (Note 9)	Q_{gs}	—	—	1.5		
Gate-Drain Charge (Note 9)	Q_{gd}	—	—	3		

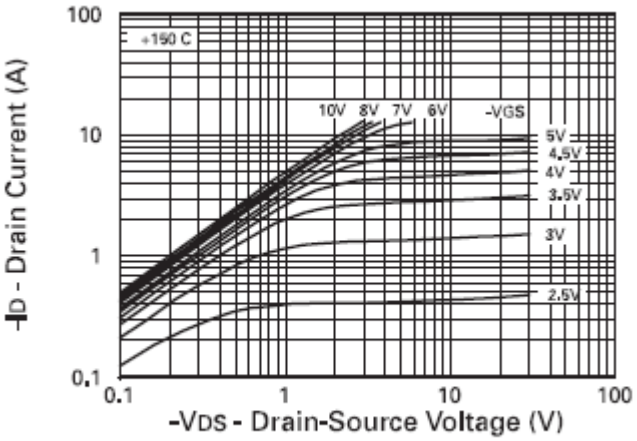
Notes:
8. Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤ 2%.
9. Switching characteristics are independent of operating junction temperature.
10. For design aid only, not subject to production testing.

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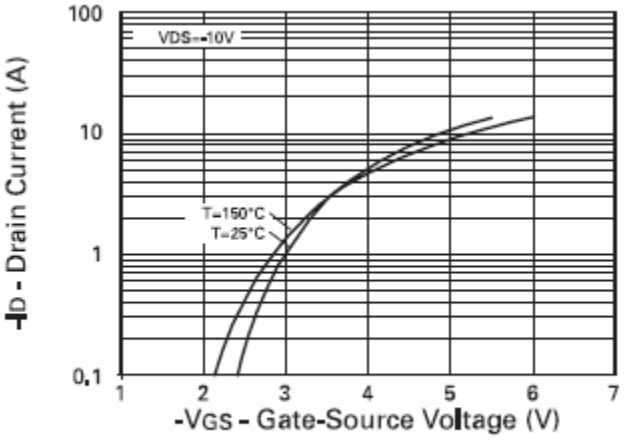
Typical Characteristics



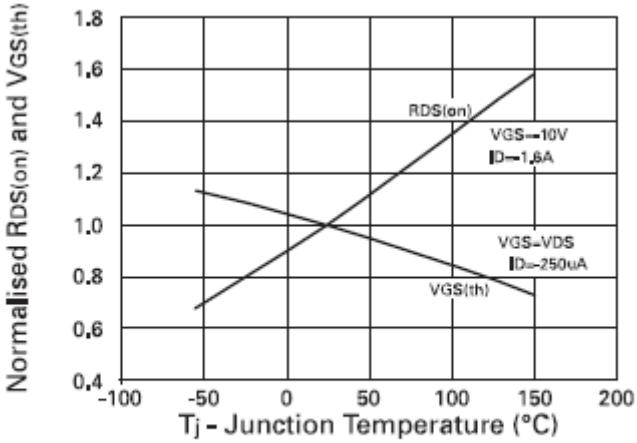
Output Characteristics



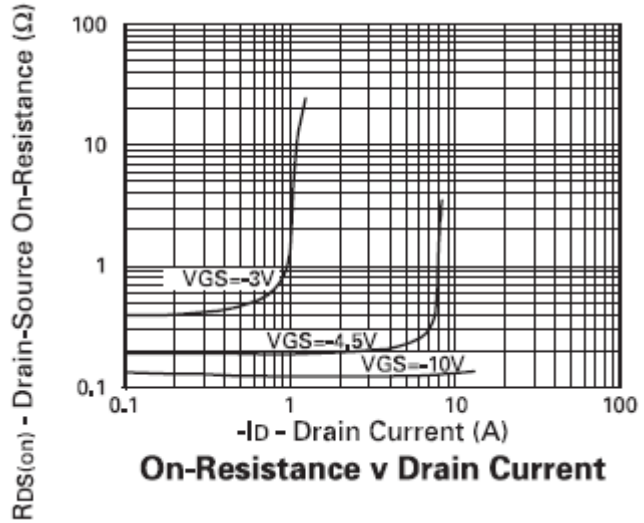
Output Characteristics



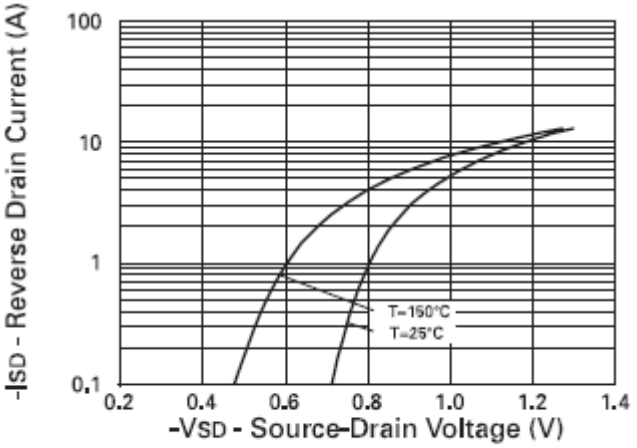
Typical Transfer Characteristics



Normalised RDS(on) and VGS(th) v Temperature



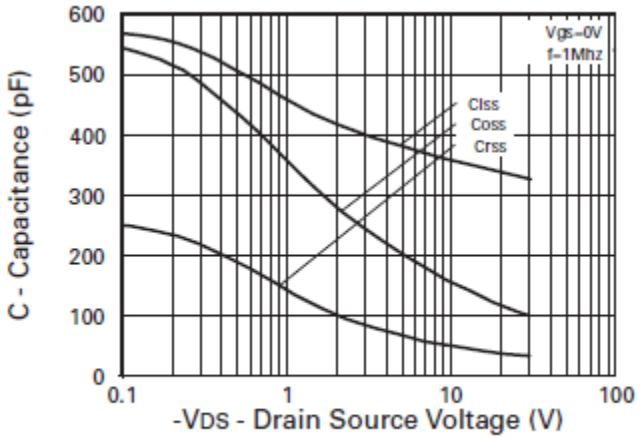
On-Resistance v Drain Current



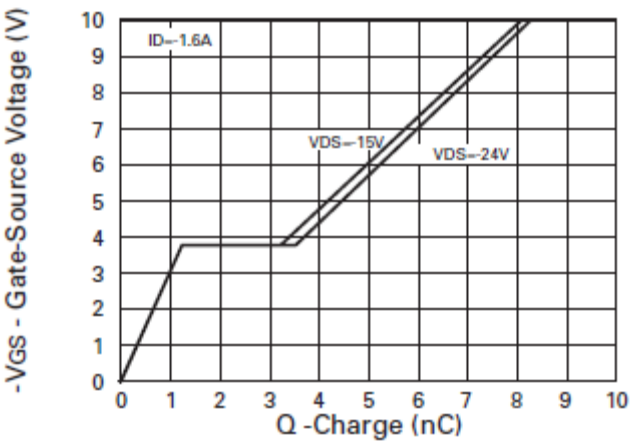
Source-Drain Diode Forward Voltage

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Typical Characteristics (cont.)

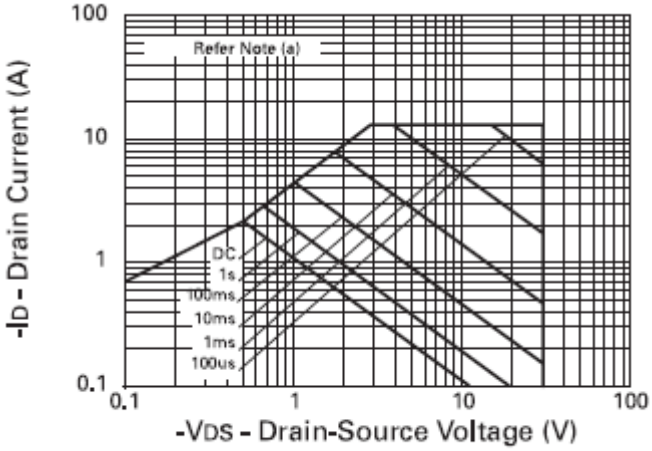


Capacitance v Drain-Source Voltage

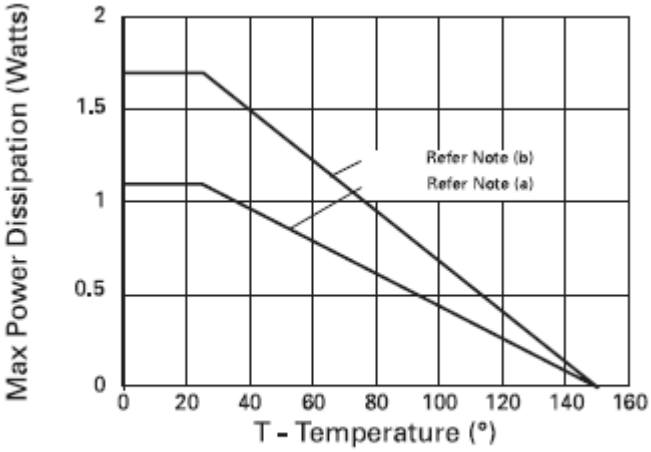


Gate-Source Voltage v Gate Charge

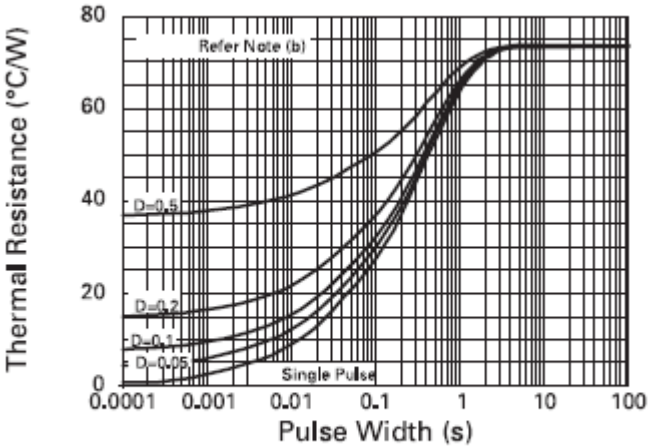
Thermal Characteristics



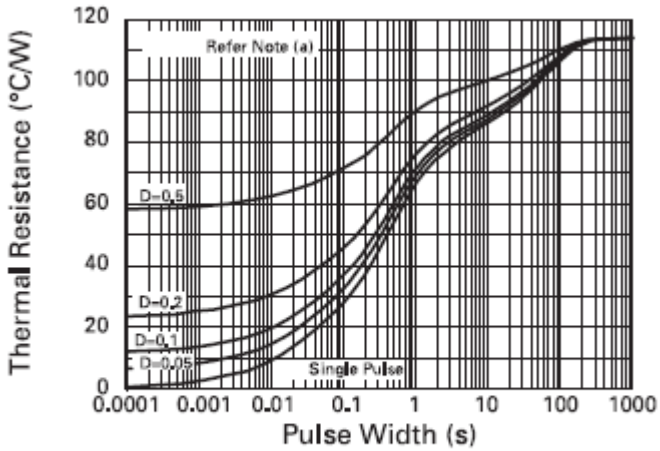
Safe Operating Area



Derating Curve



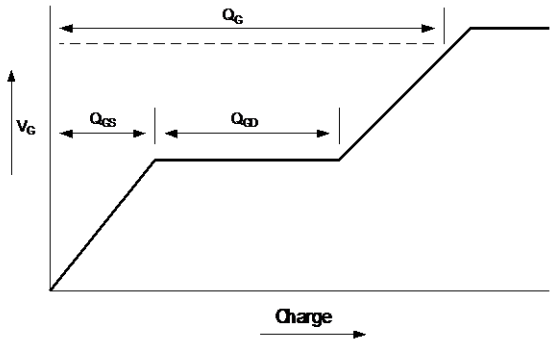
Transient Thermal Impedance



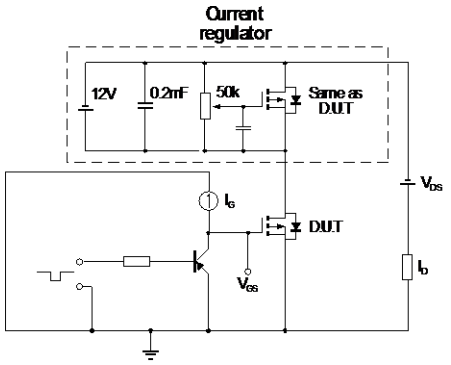
Transient Thermal Impedance

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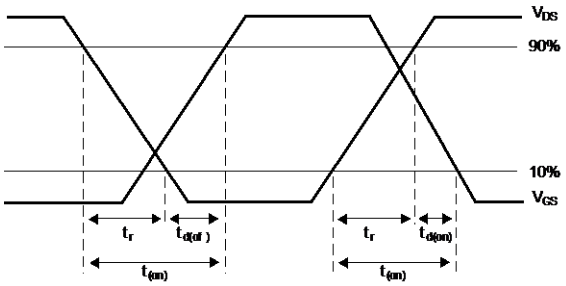
Test Circuits



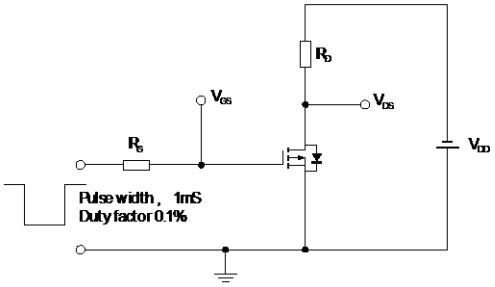
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

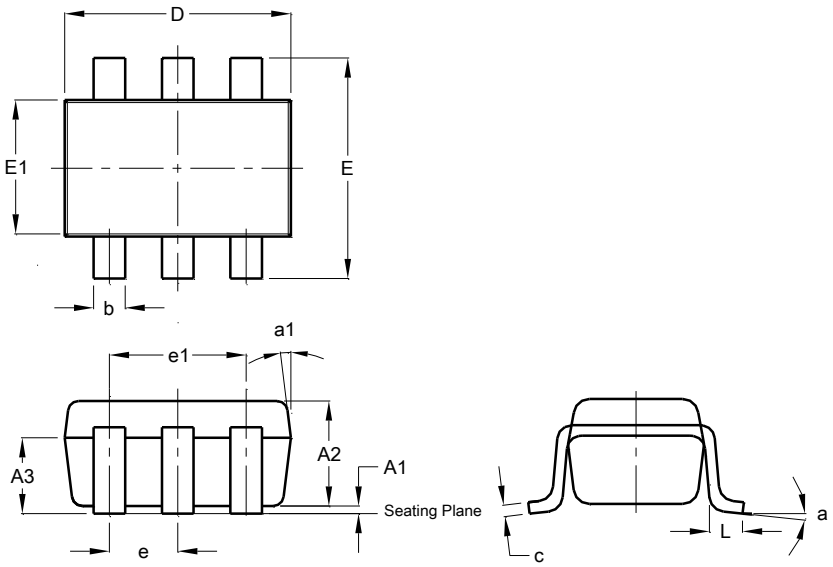


Switching time test circuit

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Package Outline Dimensions

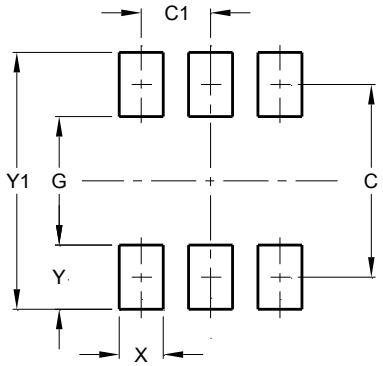
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT26			
Dim	**Min**	**Max**	**Typ**
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

Suggested Pad Layout

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



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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