

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ Max}$	$I_D \text{ Max}$ @ $T_A = +25^\circ\text{C}$
-30V	2.4Ω @ $V_{GS} = -10V$	-400mA
	4Ω @ $V_{GS} = -4.5V$	-300mA

Description

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.

Applications

- Load Switch
- Portable Applications
- Power Management Functions

Features

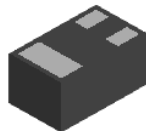
- Low On-Resistance
- Ultra-Small Surface Mount Package
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

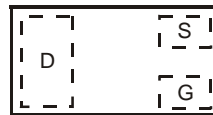
- Case: X1-DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – NiPdAu over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 ^(e4)
- Weight: 0.001 grams (Approximate)



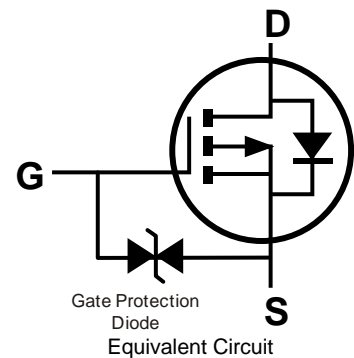
X1-DFN1006-3



Bottom View



Top View



Ordering Information (Note 4)

Part Number	Reel Size (inches)	Quantity per Reel
DMP32D5SFB-7B	7	10,000

- 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



Top View
Bar Denotes Gate and Source Side

XH = Product Type Marking Code

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-30	V
Gate-Source Voltage			V _{GSS}	±25	V
Continuous Drain Current (Note 5)	V _{GS} = -10V	T _A = +25°C T _A = +70°C	I _D	-400 -300	mA
Continuous Drain Current (Note 6)	V _{GS} = -10V	T _A = +25°C T _A = +70°C	I _D	-500 -400	mA
Pulsed Drain Current (Note 5)			I _{DM}	-1	A
Maximum Body Diode Continuous Current (Note 6)			I _S	-800	mA

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation	(Note 5)	P _D	0.5	W
	(Note 6)		1.2	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	255	°C/W
	(Note 6)		108	
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}	-30	-	-	V	V _{GS} = 0V, I _D = -1mA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	-	-	-1	μA	V _{DS} = -30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±10	μA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-1.3	-	-2.3	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	-	-	2.4	Ω	V _{GS} = -10V, I _D = -200mA
				4		V _{GS} = -4.5V, I _D = -200mA
Diode Forward Voltage	V _{SD}	-	0.8	1.2	V	V _{GS} = 0V, I _S = -300mA
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	-	51	100	pF	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	-	11	20	pF	
Reverse Transfer Capacitance	C _{rss}	-	9	20	pF	
Total Gate Charge	Q _g	-	0.62	2	nC	V _{GS} = -4.5V
Total Gate Charge	Q _g	-	1.25	4	nC	V _{DS} = -10V, I _D = -200mA
Gate-Source Charge	Q _{gs}	-	0.16	0.5	nC	
Gate-Drain Charge	Q _{gd}	-	0.21	0.5	nC	
Turn-On Delay Time	t _{D(ON)}	-	4.3	10	ns	V _{DS} = -15V, I _D = -500mA V _{GS} = -10V, R _G = 1Ω
Turn-On Rise Time	t _r	-	7.7	15	ns	
Turn-Off Delay Time	t _{D(OFF)}	-	31.9	60	ns	
Turn-Off Fall Time	t _f	-	17.8	40	ns	

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

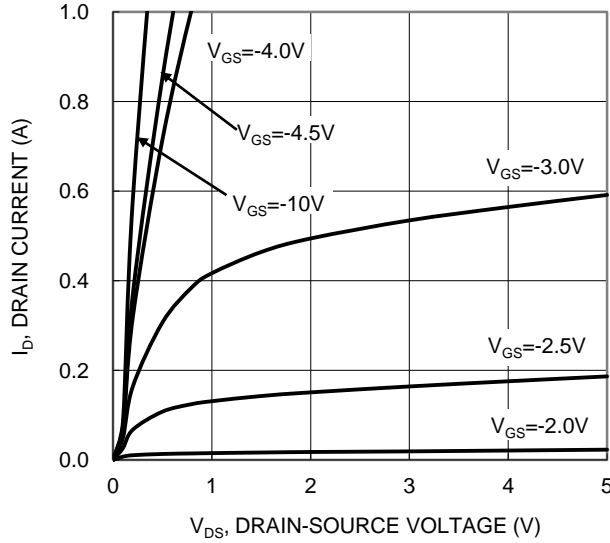


Figure 1. Typical Output Characteristic

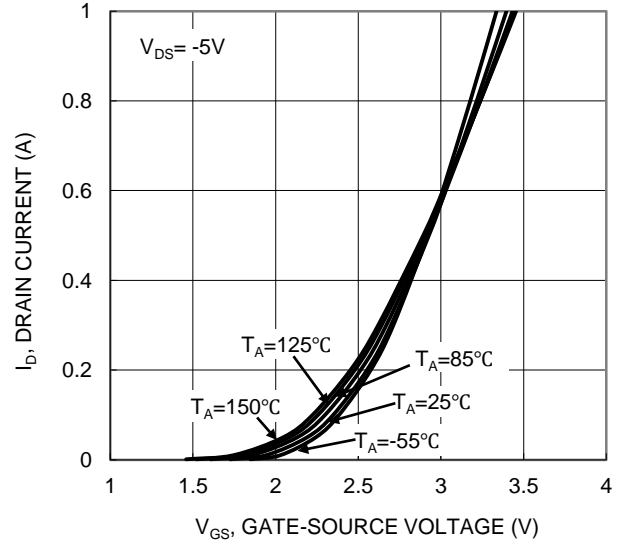


Figure 2. Typical Transfer Characteristic

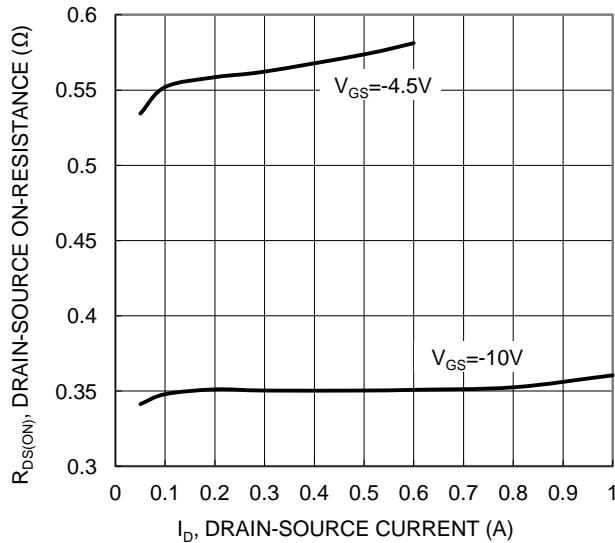


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

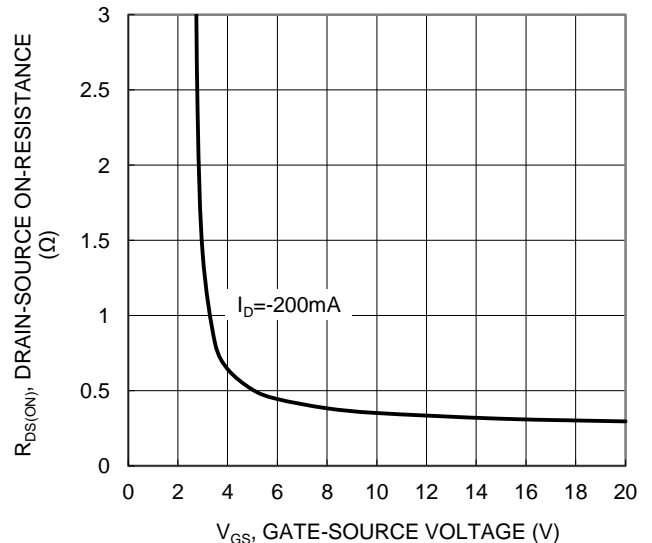


Figure 4. Typical Transfer Characteristic

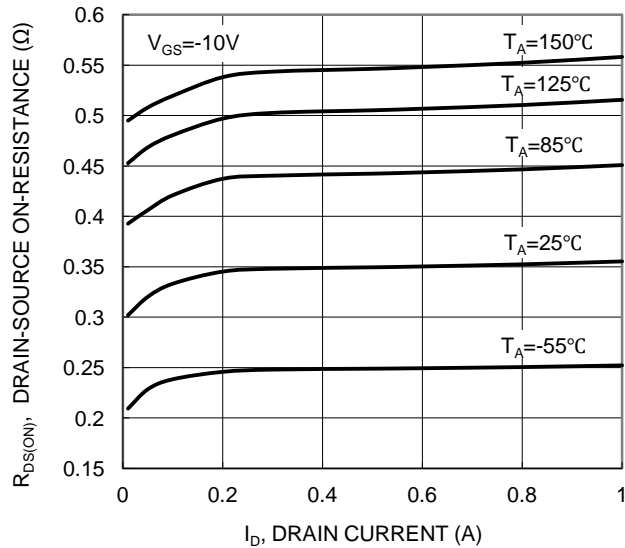


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

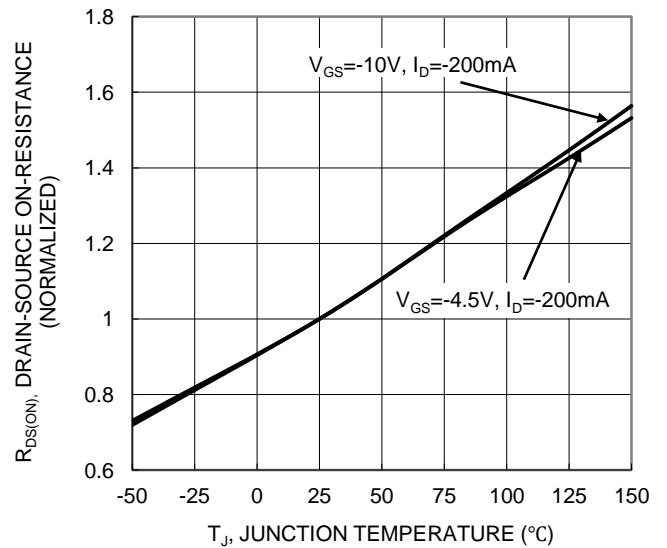


Figure 6. On-Resistance Variation with Temperature

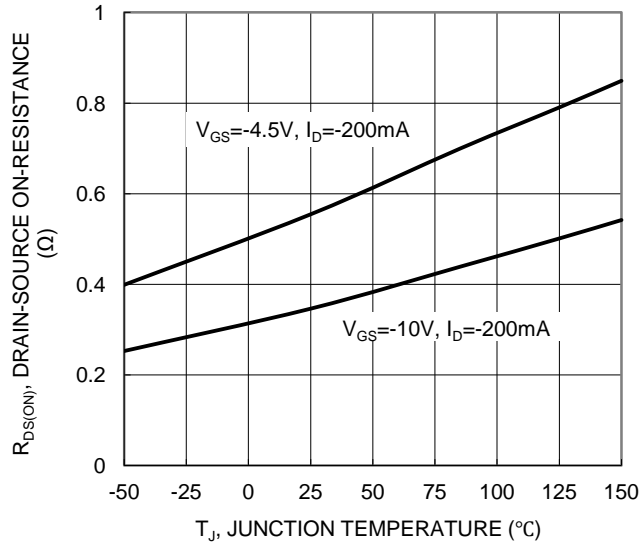


Figure 7. On-Resistance Variation with Temperature

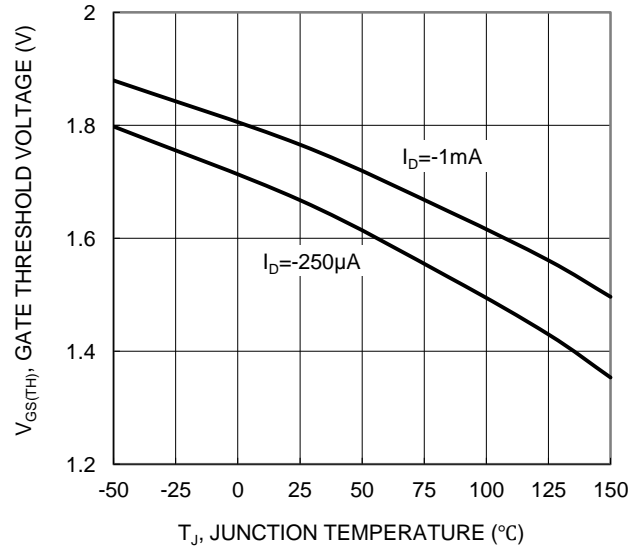


Figure 8. Gate Threshold Variation vs. Temperature

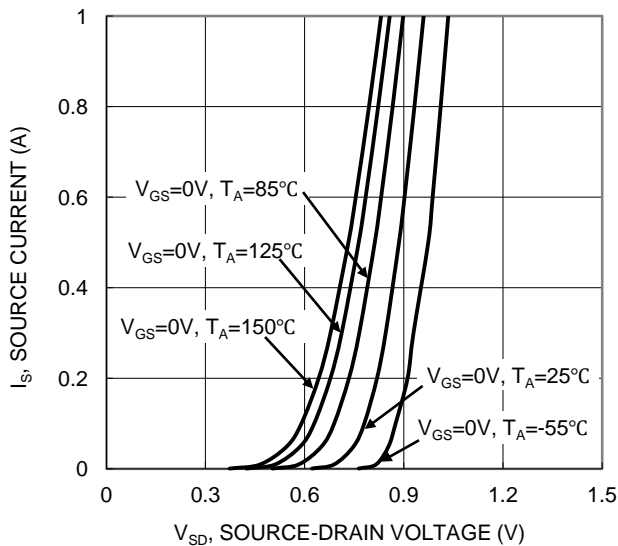


Figure 9. Diode Forward Voltage vs. Current

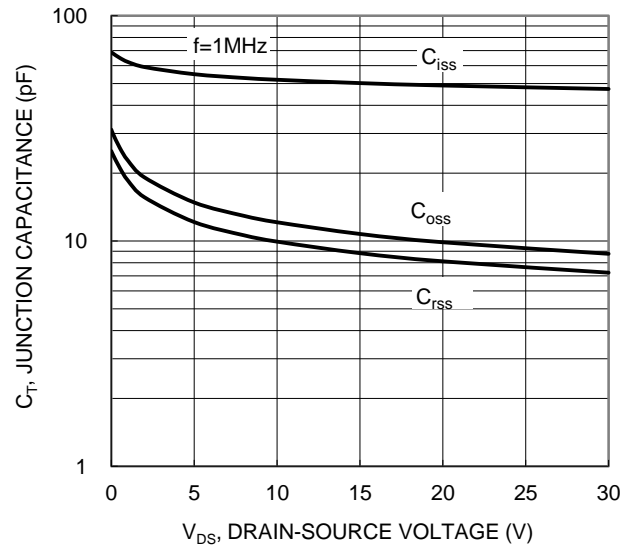


Figure 10. Typical Junction Capacitance

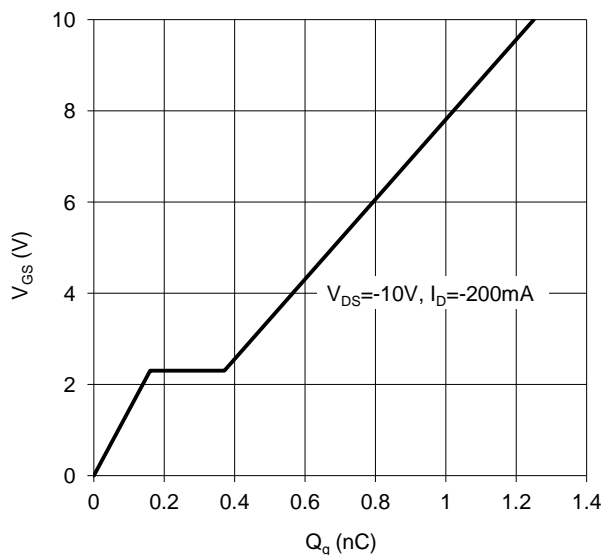


Figure 11. Gate Charge

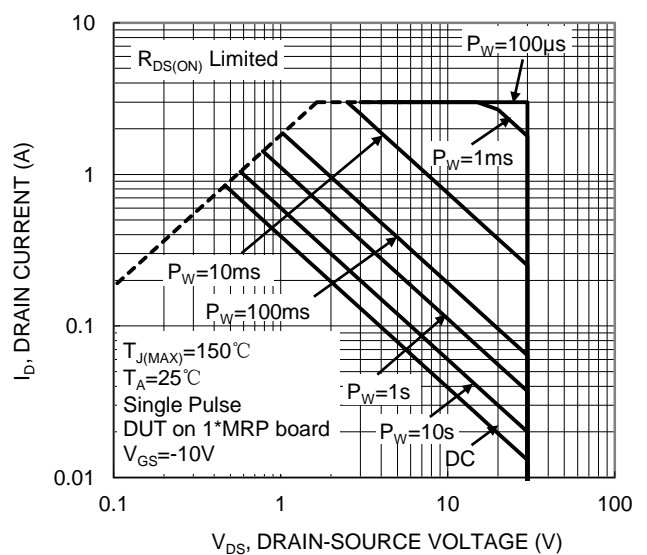
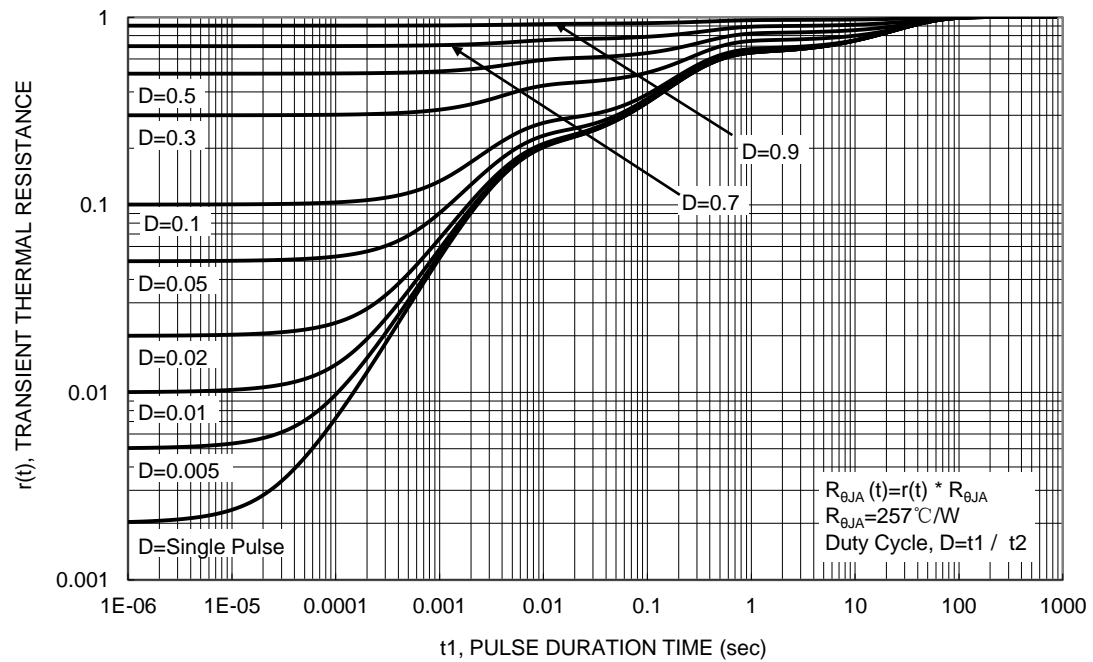
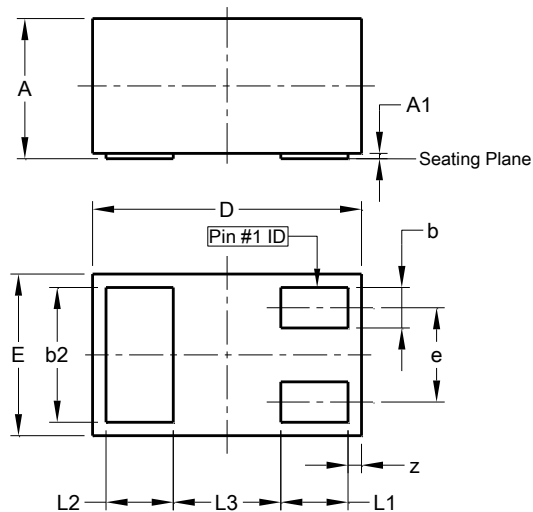


Figure 12. SOA, Safe Operation Area



Package Outline Dimensions

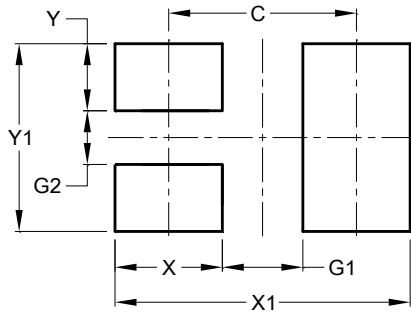
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



X1-DFN1006-3			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0.00	0.05	0.03
b	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	0.60
e	-	-	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
L3	-	-	0.40
z	0.02	0.08	0.05
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	0.70
G1	0.30
G2	0.20
X	0.40
X1	1.10
Y	0.25
Y1	0.70

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