

Product Summary

BV _{DSS}	R _{DS(on)} max	I _D T _A = +25°C
60V	50mΩ @ V _{GS} = 10V	6.7A
	70mΩ @ V _{GS} = 4.5V	5.7A

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

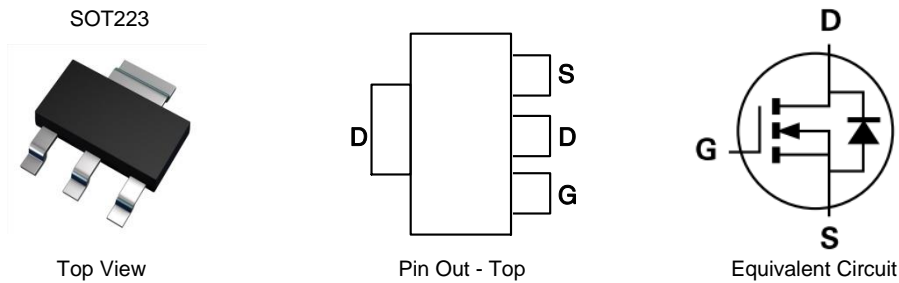
- DC-DC Converters
- Power Management Functions
- Backlighting

Features and Benefits

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish(3)
- Weight: 0.112 grams (Approximate)

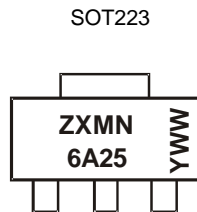


Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN6A25GTA	ZXMN6A25	7	12	1,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 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



ZXMN6A25 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5= 2015)
 WW or $\bar{W}W$ = Week Code (01~53)

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

Characteristic		Symbol	Value	Units	
Drain-Source Voltage		V _{DSS}	60	V	
Gate-Source Voltage		V _{GSS}	±20	V	
Continuous Drain Current, V _{GS} = 10V	Steady State	I _D	T _A = +25°C (Note 6)	6.7	A
			T _A = +70°C (Note 6)	5.4	
			T _A = +25°C (Note 5)	4.8	
Maximum Body Diode Forward Current (Note 6)		I _S	5.7	A	
Pulsed Drain Current (Note 7)		I _{DM}	28.5	A	
Pulsed Source Current (Note 7)		I _{SM}	28.5	A	

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

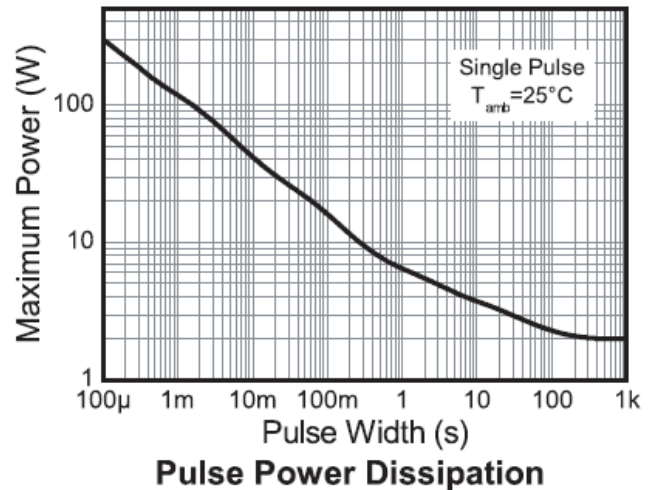
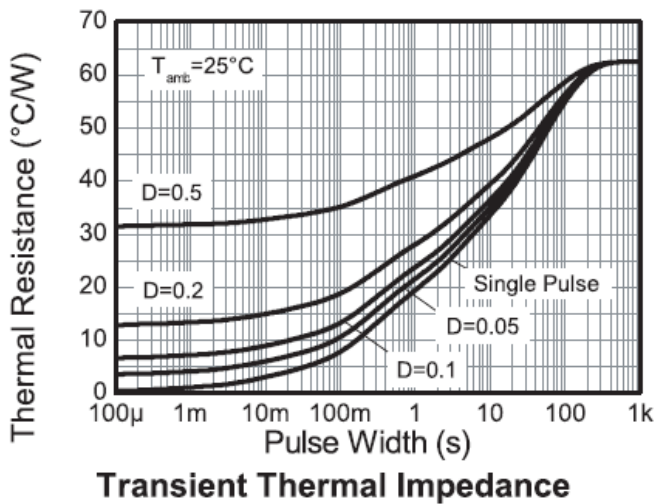
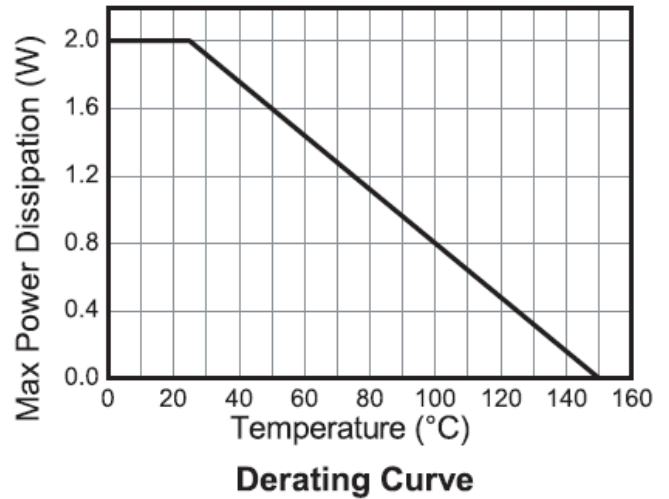
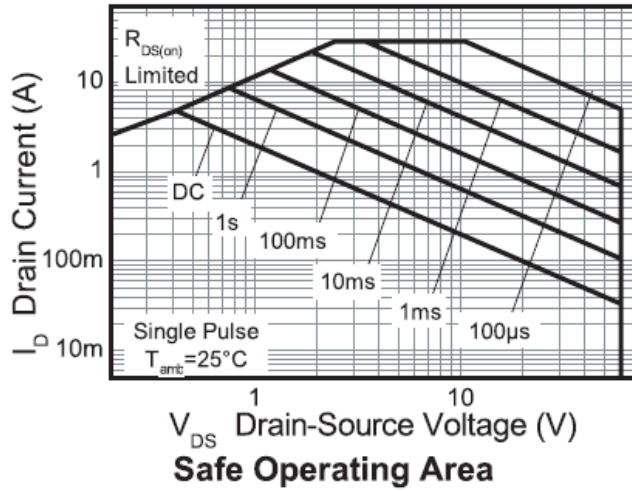
Characteristic		Symbol	Value	Units
Total Power Dissipation	T _A = +25°C (Note 5)	P _D	2	W
Linear Derating Factor			16	mW/°C
Total Power Dissipation	T _A = +25°C (Note 6)	P _D	3.9	W
Linear Derating Factor			31	mW/°C
Thermal Resistance, Junction to Ambient	Steady state (Note 5)	R _{θJA}	62.5	°C/W
	Steady state (Note 6)		32	°C/W
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

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

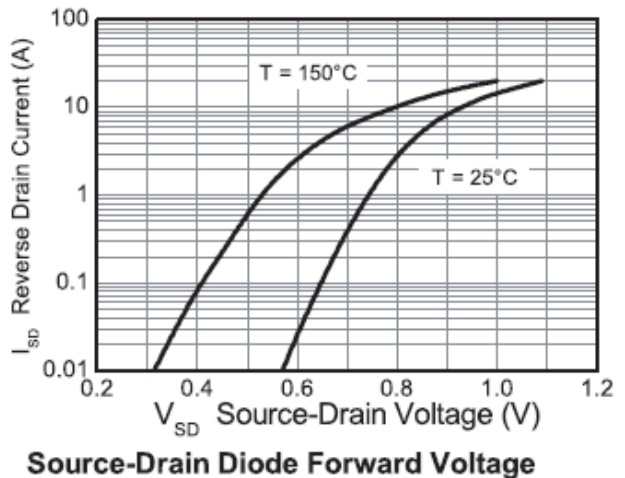
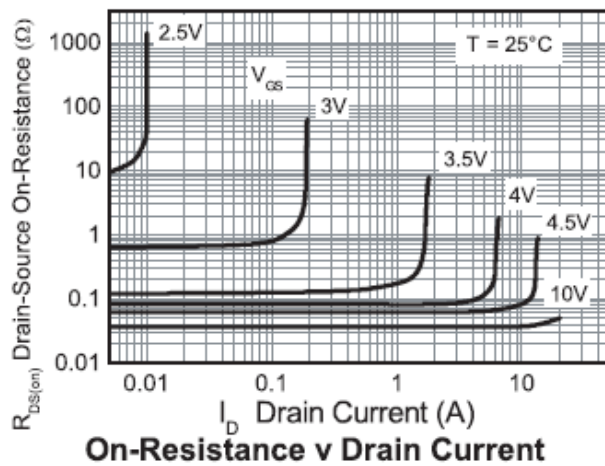
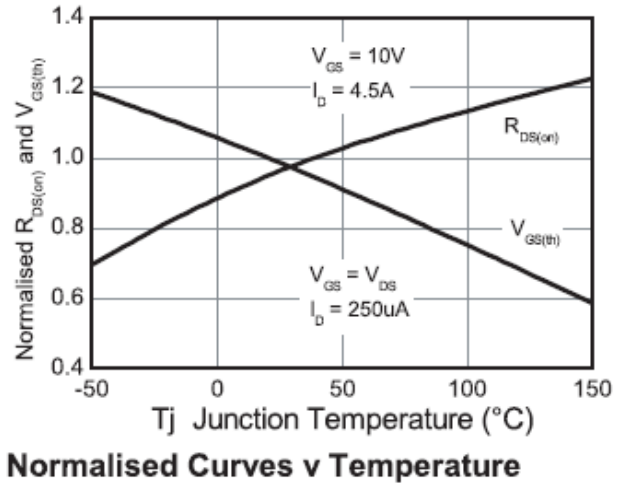
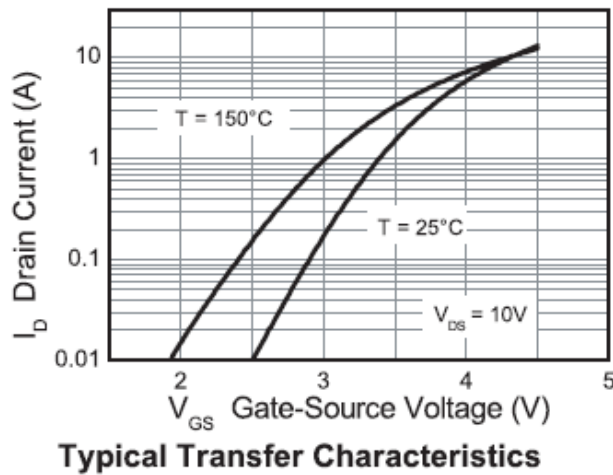
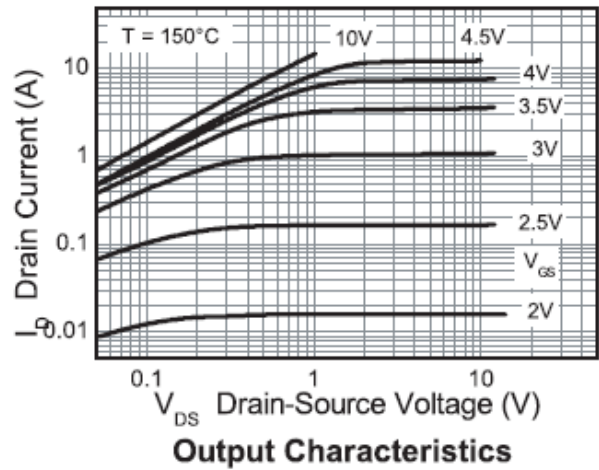
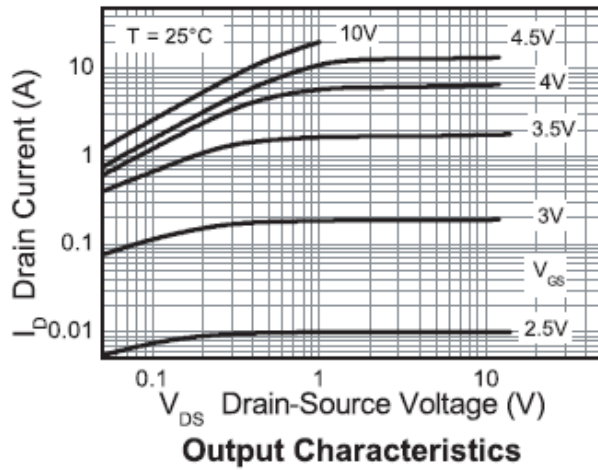
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 9)						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1.0	μA	V _{DS} = 60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	V _{GS(th)}	1.0	—	—	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance (Note 8)	R _{DS(ON)}	—	—	50	mΩ	V _{GS} = 10V, I _D = 3.6A
		—	—	70		V _{GS} = 4.5V, I _D = 3.0A
Diode Forward Voltage (Note 8)	V _{SD}	—	0.85	0.95	V	V _{GS} = 0V, I _S = 5.5A
Forward Transconductance (Note 8 & 10)	g _{fs}	—	10.2	—	S	V _{DS} = 15V, I _D = 4.5A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{ISS}	—	1,063	—	pF	V _{DS} = 30V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{OSS}	—	104	—		
Reverse Transfer Capacitance	C _{RSS}	—	64	—		
Total Gate Charge (V _{GS} = 5.0V)	Q _g	—	11	—	nC	V _{DS} = 30V, I _D = 1.4A,
Total Gate Charge (V _{GS} = 10V)	Q _g	—	20.4	—		
Gate-Source Charge	Q _{gs}	—	4.1	—		
Gate-Drain Charge	Q _{gd}	—	5.1	—		
Turn-On Delay Time	t _{D(on)}	—	3.8	—	nS	V _{GS} = 10V, V _{DD} = 30V, R _G = 6.0Ω, I _D = 1.0A
Turn-On Rise Time	t _r	—	4.0	—		
Turn-Off Delay Time	t _{D(off)}	—	26.2	—		
Turn-Off Fall Time	t _f	—	10.6	—		
Body Diode Reverse Recovery Time	t _{rr}	—	22	—	nS	I _F = 2.2A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{rr}	—	21.4	—	nC	

- 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 ≤ 10 secs.
 7. Repetitive rating 25mm x 25mm FR4 PCB, D = 0.02, pulse width 300μs - pulse width limited by maximum junction temperature.
 8. Measured under pulsed conditions. Width=300μs. Duty cycle ≤ 2%.
 9. Short duration pulse test used to minimize self-heating effect.
 10. Guaranteed by design. Not subject to product testing.

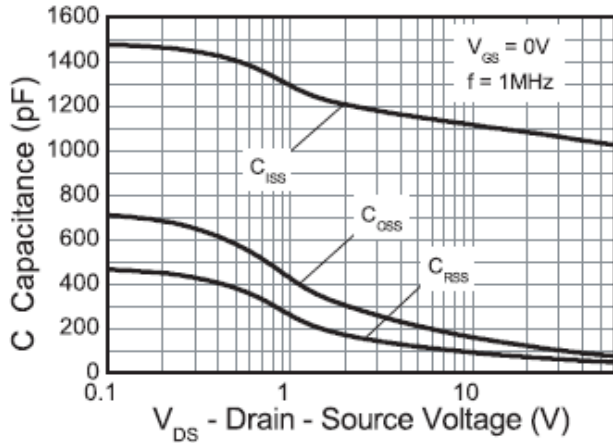
Typical Characteristics



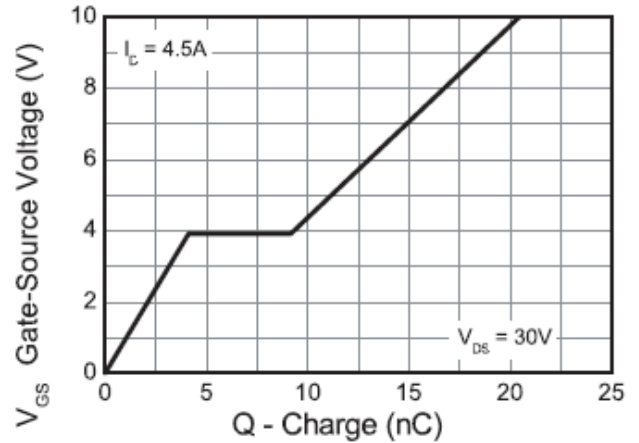
Typical Characteristics (continued)



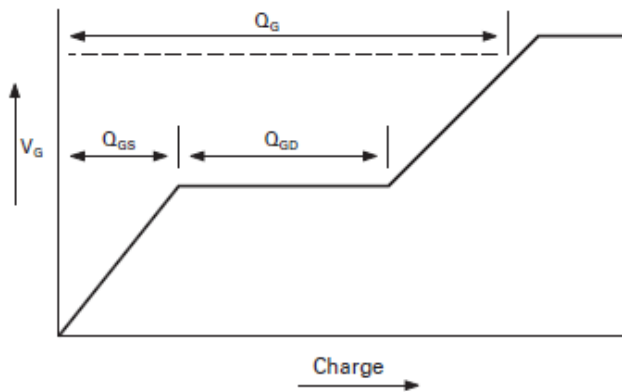
Typical Characteristics (cont.)



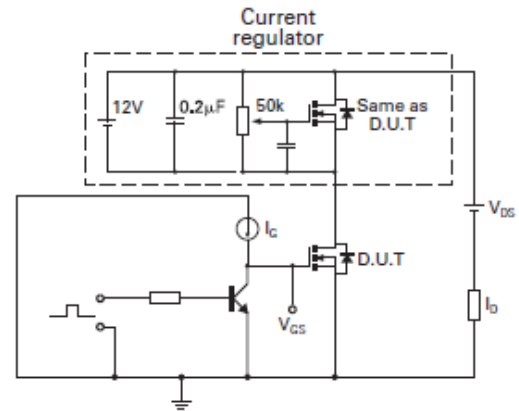
Capacitance v Drain-Source Voltage



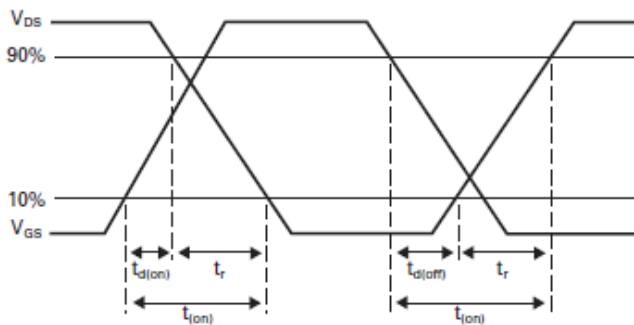
Gate-Source Voltage v Gate Charge



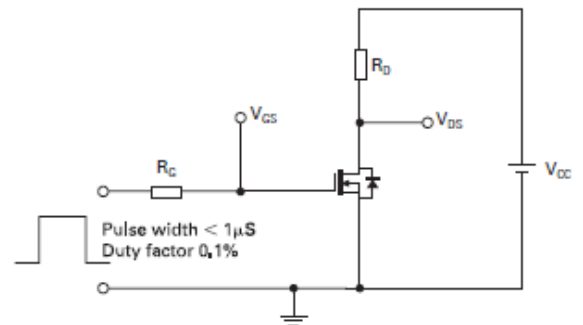
Basic gate charge waveform



Gate charge test circuit



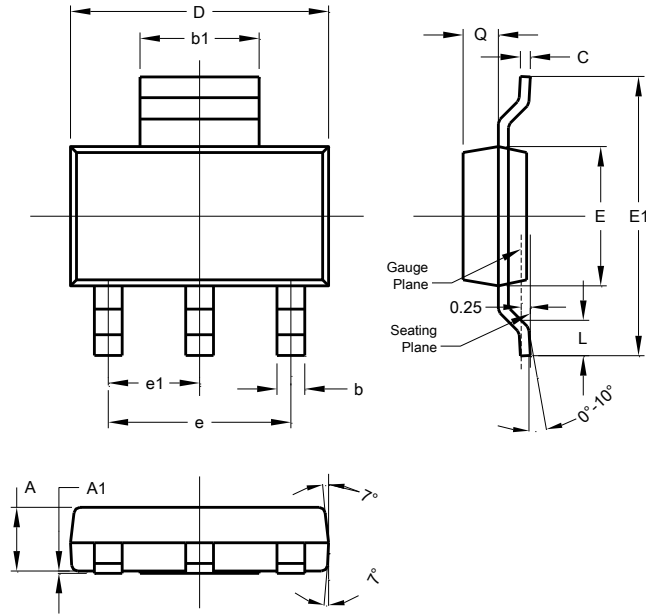
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

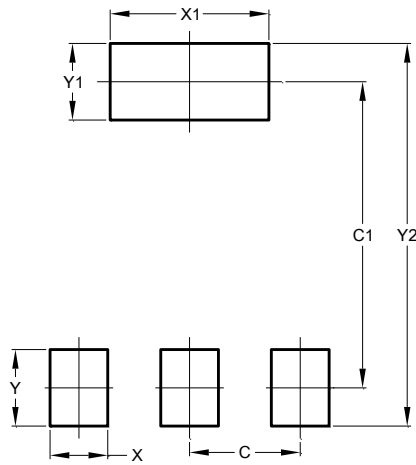
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
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	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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