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[Diodes Incorporated](#)
[DMP1045U-7](#)

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DMP1045U

P-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on) max}$	I_D $T_A = +25^\circ C$
-12V	31mΩ @ $V_{GS} = -4.5V$	5.2A
	45mΩ @ $V_{GS} = -2.5V$	4.3A

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

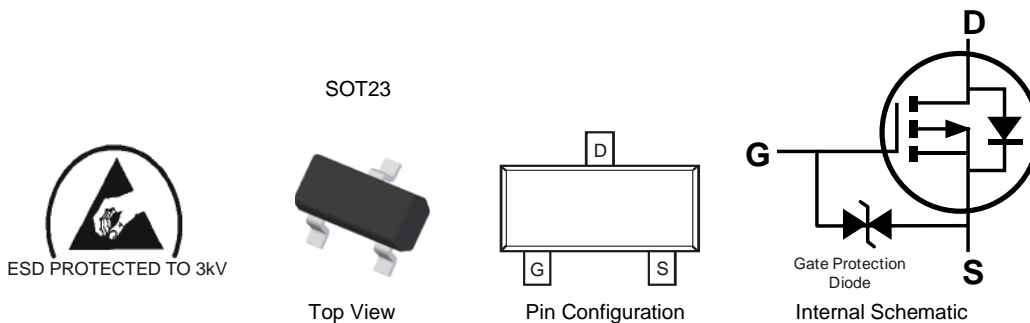
- DC-DC Converters
- Power Management Functions
- Analog Switch

Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Up To 3kV
- 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: SOT23
- 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 – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.0072 grams (Approximate)

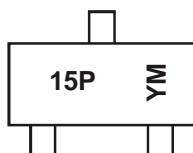


Ordering Information (Note 4)

Part Number	Case	Packaging
DMP1045U-7	SOT-23	3,000/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



15P = Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: A = 2013)
 M = Month (ex: 9 = September)

Date Code Key

Year	2010	2011	2012	2013	2014	2015
Code	X	Y	Z	A	B	C

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°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 5) V _{GS} = -4.5V	I _D	T _A = +25°C T _A = +70°C	4.0 3.1	A
Continuous Drain Current (Note 5) V _{GS} = -2.5V		T _A = +25°C T _A = +70°C	3.3 2.6	A
Continuous Drain Current (Note 6) V _{GS} = -4.5V	I _D	T _A = +25°C T _A = +70°C	5.2 4.2	A
Continuous Drain Current (Note 6) V _{GS} = -2.5V		T _A = +25°C T _A = +70°C	4.3 3.4	A
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	2	A	
Pulsed Drain Current (10μs pulse, duty cycle=1%) (Note 5)	I _{DM}	40	A	

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P _D	0.8	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	168	°C/W
Total Power Dissipation (Note 6)	P _D	1.3	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	99	°C/W
Thermal Resistance, Junction to Case (Note 6)	R _{θJc}	14.8	°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 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	-12	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1.0	μA	T _J = +25°C V _{DS} = -12V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	μA	V _{GS} = ±8V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(th)}	-0.3	-0.55	-1.0	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	26	31	mΩ	V _{GS} = -4.5V, I _D = -4.0A
			31	45		V _{GS} = -2.5V, I _D = -3.5A
			45	75		V _{GS} = -1.8V, I _D = -2.7A
Forward Transfer Admittance	Y _{fs}	—	12	—	S	V _{DS} = -5V, I _D = -4A
Diode Forward Voltage	V _{SD}	—	-0.6	—	V	V _{GS} = 0V, I _S = -1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{iss}	—	1,357	—	pF	V _{DS} = -10V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{oss}	—	504	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	235	—	pF	
Gate Resistance	R _g	—	14.1	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
SWITCHING CHARACTERISTICS (Note 8)						
Total Gate Charge	Q _g	—	15.8	—	nC	V _{GS} = -4.5V, V _{DS} = -10V, I _D = -4A
Gate-Source Charge	Q _{gs}	—	2.0	—	nC	
Gate-Drain Charge	Q _{gd}	—	3.9	—	nC	
Turn-On Delay Time	t _{D(on)}	—	15.7	—	ns	V _{DS} = -10V, V _{GS} = -4.5V, R _L = 2.5Ω, R _G = 3.0Ω
Turn-On Rise Time	t _r	—	23.3	—	ns	
Turn-Off Delay Time	t _{D(off)}	—	91.2	—	ns	
Turn-Off Fall Time	t _f	—	106.9	—	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 thermal vias to bottom layer 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.



DMP1045U

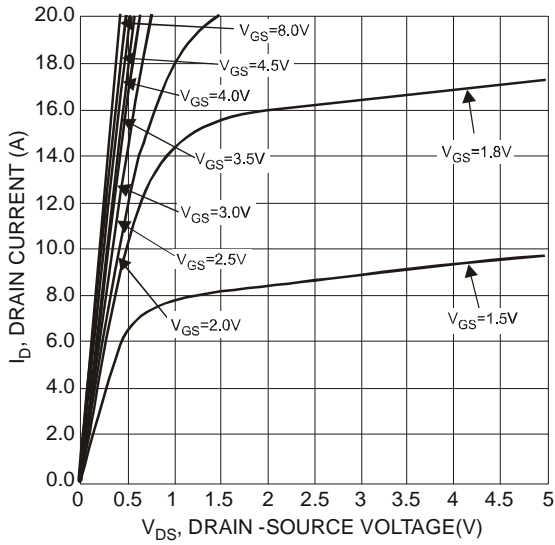


Fig. 1 Typical Output Characteristics

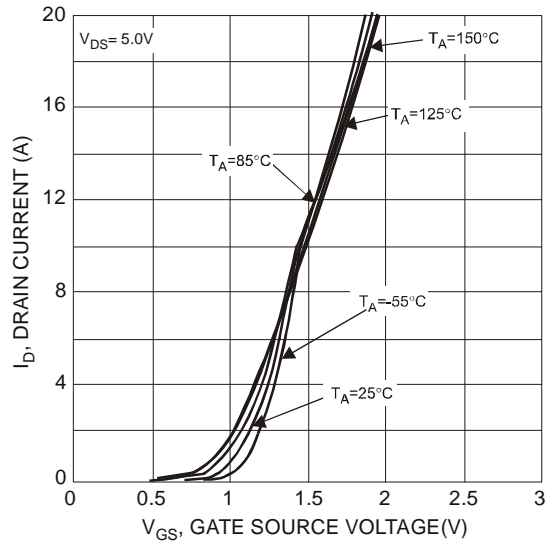


Fig. 2 Typical Transfer Characteristics

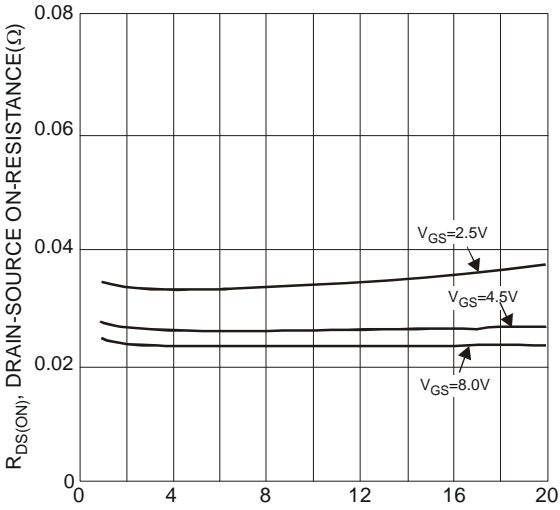


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

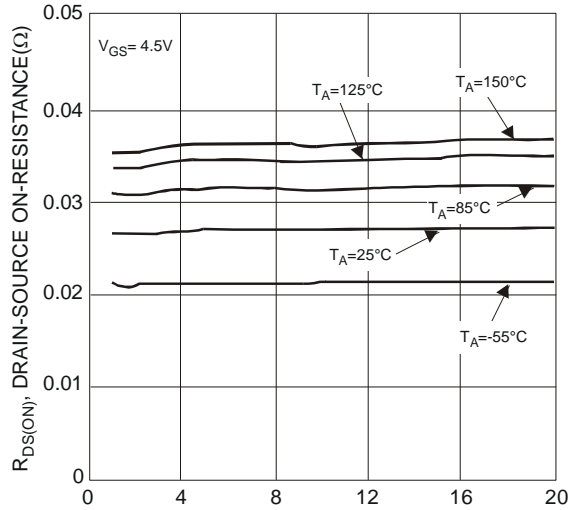


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

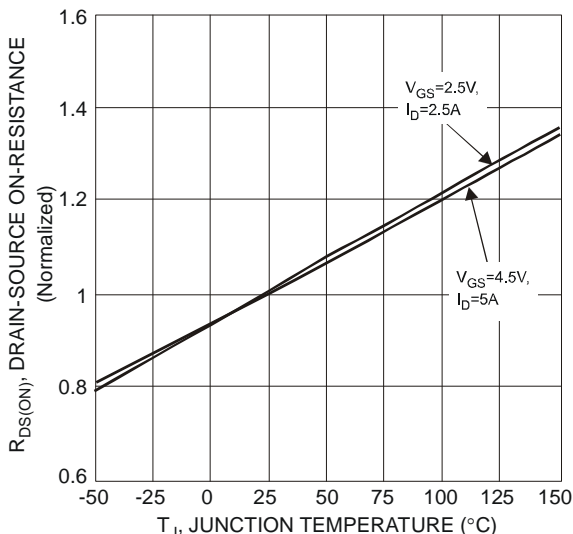


Fig. 5 On-Resistance Variation with Temperature

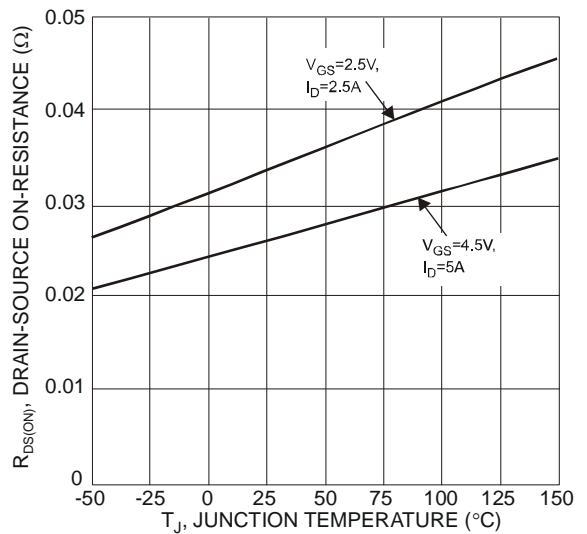


Fig. 6 On-Resistance Variation with Temperature



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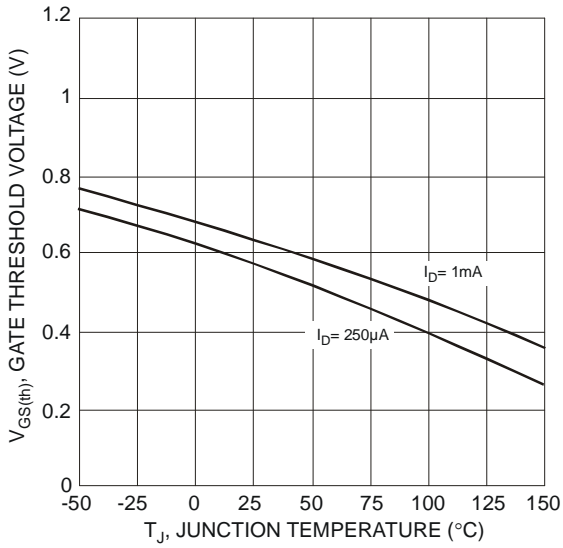


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

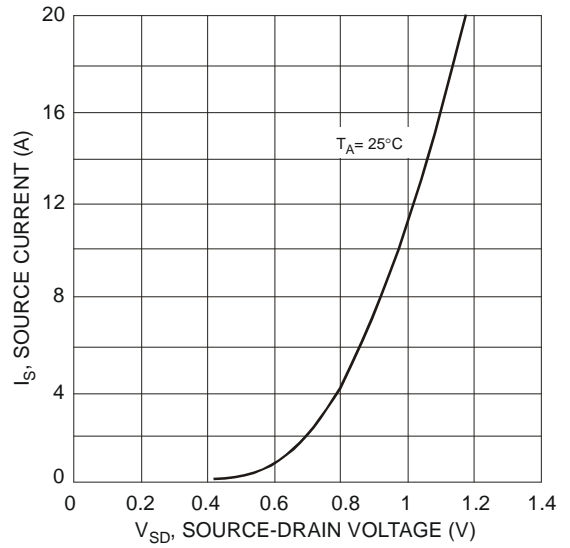


Fig. 8 Diode Forward Voltage vs. Current

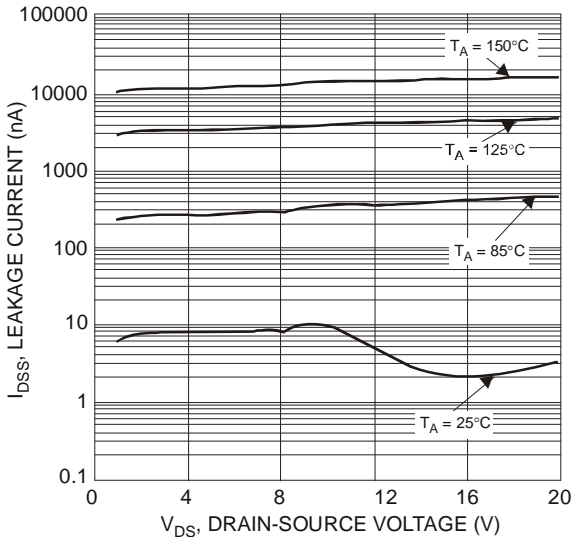


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

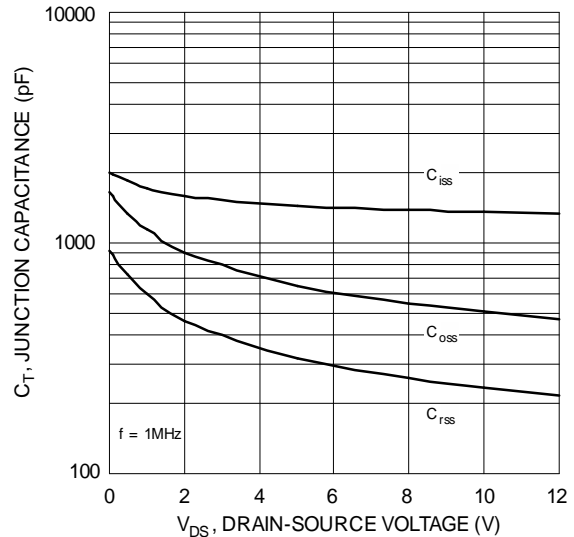


Fig. 10 Typical Junction Capacitance

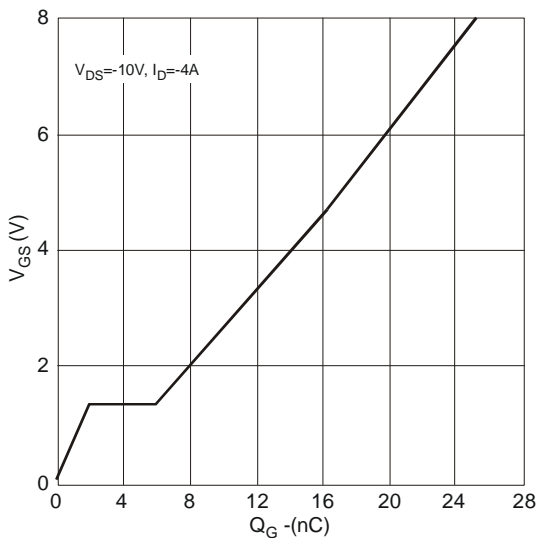
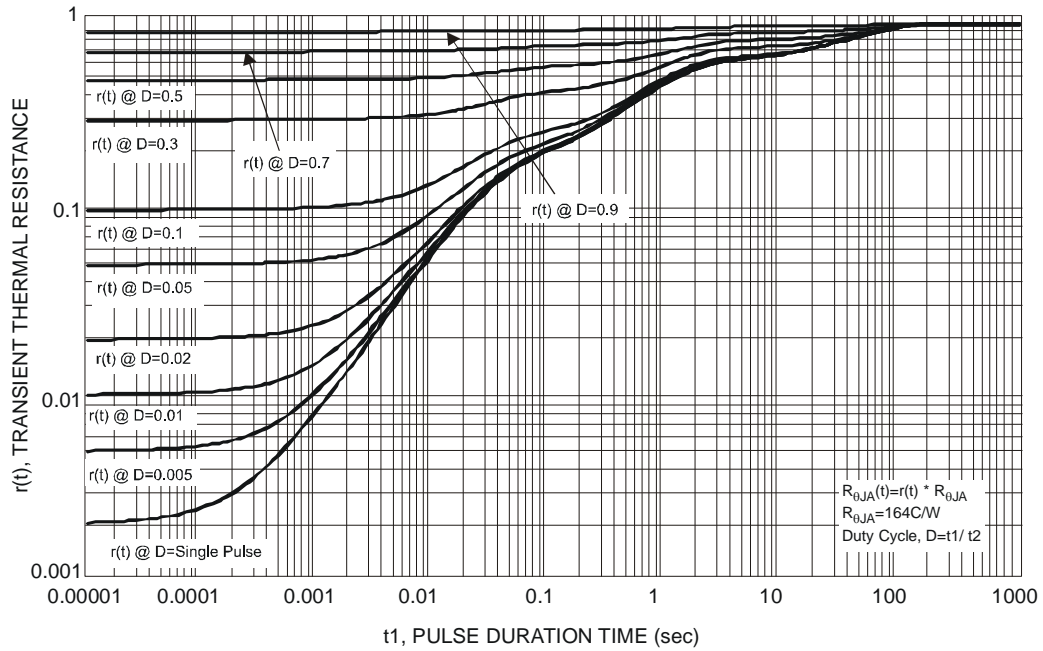


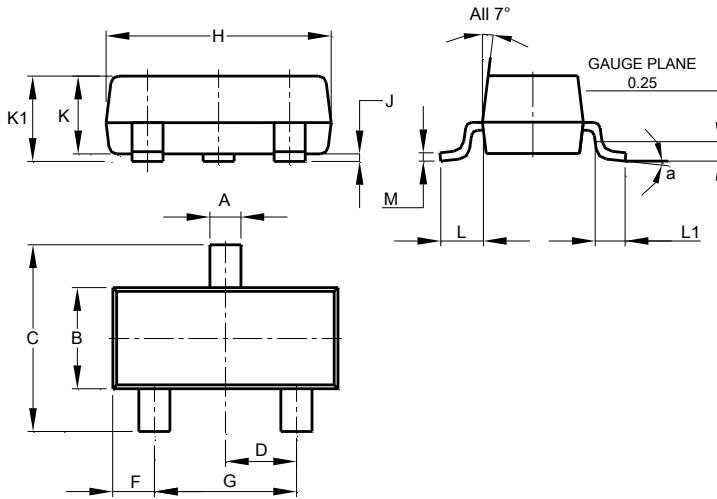
Fig. 11 Gate Charge Characteristics



t1, PULSE DURATION TIME (sec)
 Fig. 12 Transient Thermal Resistance

Package Outline Dimensions

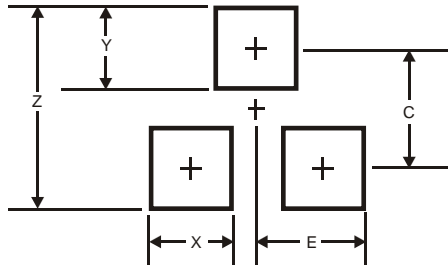
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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