

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max $T_C = +25^\circ C$
100V	9.5mΩ @ $V_{GS} = 10V$	100A

Features

- Rated to +175°C—Ideal for High Ambient Temperature Environments
- 100% Unclamped Inductive Switching—Ensures More Reliable and Robust End Application
- Low $R_{DS(ON)}$ —Minimizes Power Losses
- Low Q_g —Minimizes Switching Losses
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**

Description and Applications

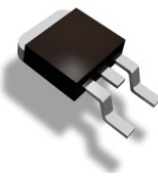
This new generation N-channel enhancement mode MOSFET is designed to minimize $R_{DS(ON)}$ yet maintain superior switching performance. This device is ideal for high-efficiency power management applications.

- Synchronous Rectification
- Inverter
- DC-DC Converters

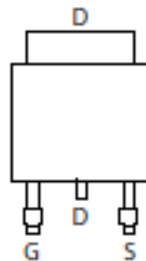
Mechanical Data

- Case: TO263AB (D2PAK)
- 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 Below
- Weight: 1.7 grams (Approximate)

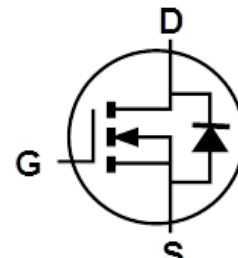
TO263AB (D2PAK)



Top View



Pin Out Top View



Internal Schematic

Ordering Information (Note 4)

Part Number	Case	Packaging
DMTH10H010LCTB-13	TO263AB (D2PAK)	800 / Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



$\text{D} \parallel \parallel$ = Manufacturer's Marking
 T1H10LCTB = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 18 = 2018)
 WW = Week (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	100	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current	I _D	100 71	A
		T _C = +25°C T _C = +100°C	
Maximum Continuous Body Diode Forward Current	I _S	110	A
		T _C = +25°C	
Pulsed Drain Current (10µs Pulse, T _C =+25°C, Package Limited)	I _{DM}	400	A
Pulsed Body Diode Forward Current (10µs Pulse, T _C =+25°C, Package Limited)	I _{SM}	400	A
Avalanche Current, L=0.3mH (Note 7)	I _{AS}	35	A
Avalanche Energy, L=0.3mH (Note 7)	E _{AS}	187	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	3.9	W
		T _A = +25°C	
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	32	°C/W
Total Power Dissipation	P _D	125	W
		T _C = +25°C	
Thermal Resistance, Junction to Case	R _{θJC}	1.0	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 6)						
Drain-Source Breakdown Voltage	BV _{DSS}	100	—	—	V	V _{GS} = 0V, I _D = 1mA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 80V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 6)						
Gate Threshold Voltage	V _{GS(TH)}	1.4	2.0	3.5	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	8.7	9.5	mΩ	V _{GS} = 10V, I _D = 13A
		—	13.2	17		V _{GS} = 4.5V, I _D = 13A
Diode Forward Voltage	V _{SD}	—	0.8	1.3	V	V _{GS} = 0V, I _S = 13A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{ISS}	—	2592	—	pF	V _{DS} = 50V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{OSS}	—	792	—		
Reverse Transfer Capacitance	C _{RSS}	—	45	—		
Gate Resistance	R _g	—	2	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _g	—	53.7	—	nC	V _{DD} = 50V, I _D = 13A, V _{GS} = 10V
Gate-Source Charge	Q _{gs}	—	10.6	—		
Gate-Drain Charge	Q _{gd}	—	8.2	—		
Turn-On Delay Time	t _{D(ON)}	—	11.6	—	ns	V _{DD} = 50V, V _{GS} = 10V, I _D = 13A, R _g = 6Ω
Turn-On Rise Time	t _R	—	14.1	—		
Turn-Off Delay Time	t _{D(OFF)}	—	42.9	—		
Turn-Off Fall Time	t _F	—	22	—		
Reverse Recovery Time	t _{RR}	—	49.8	—	ns	I _F = 13A, di/dt = 100A/µs
Reverse Recovery Charge	Q _{RR}	—	85.1	—	nC	

- Notes:
- Device mounted on FR-4 substrate PCB, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

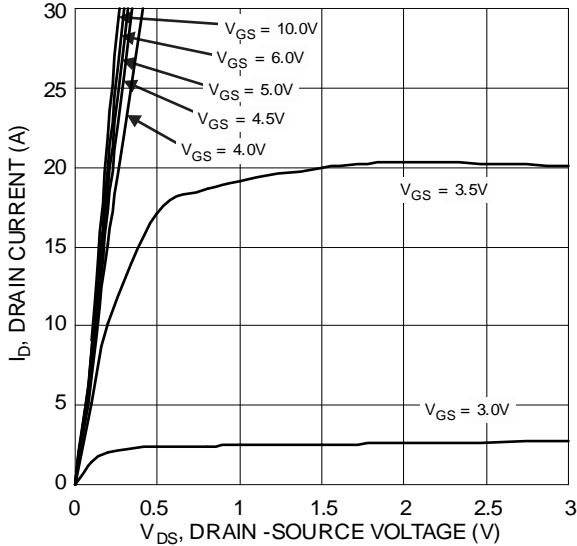


Figure 1 Typical Output Characteristics

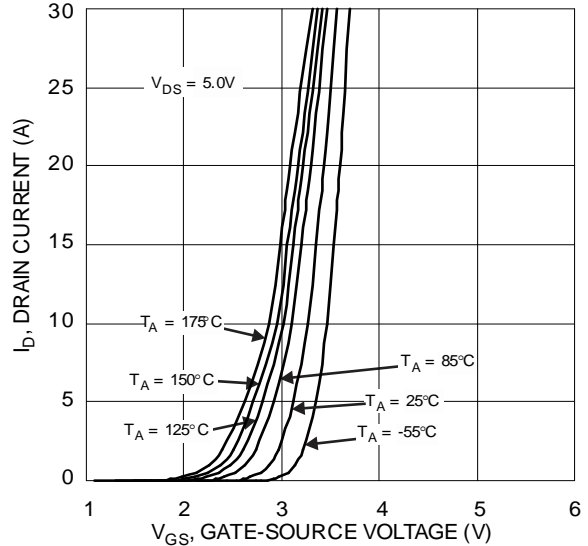


Figure 2 Typical Transfer Characteristics

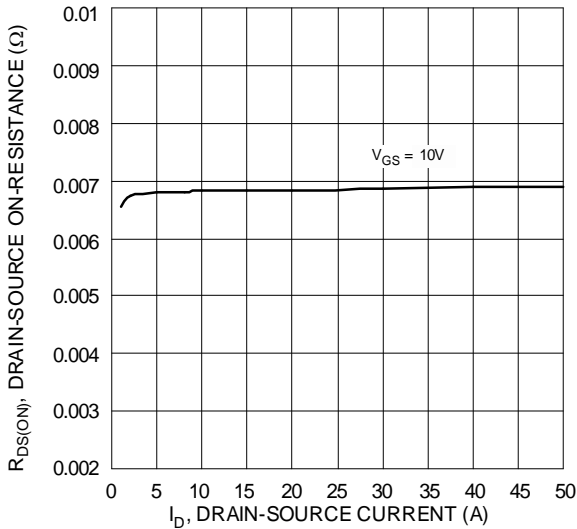


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

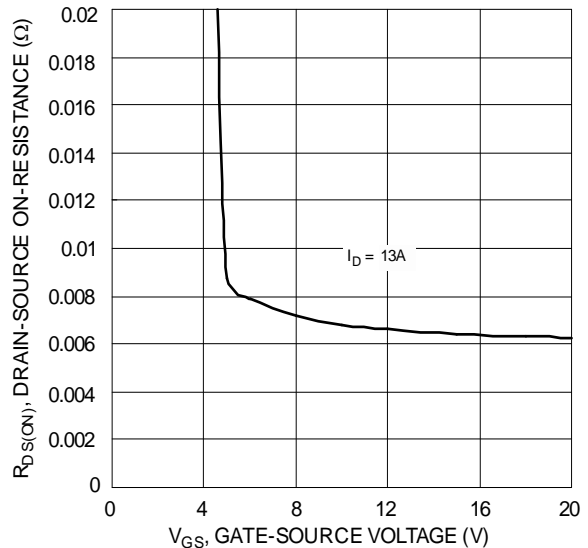


Figure 4 Typical Transfer Characteristics

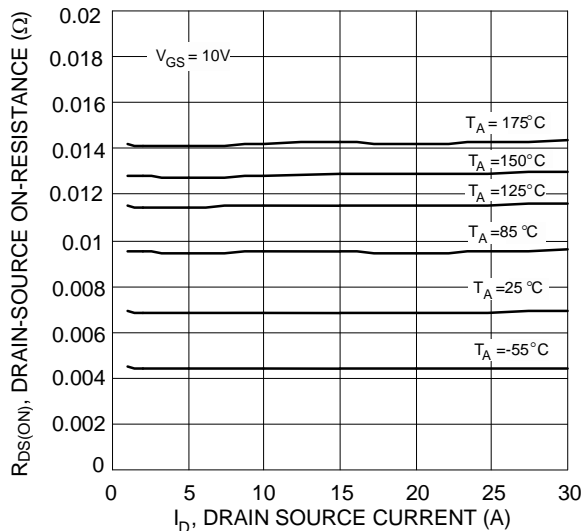


Figure 5 Typical On-Resistance vs. Drain Current and Junction Temperature

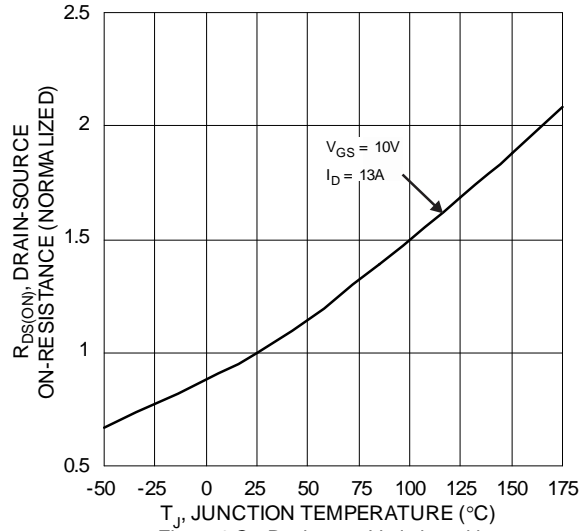


Figure 6 On-Resistance Variation with Junction Temperature

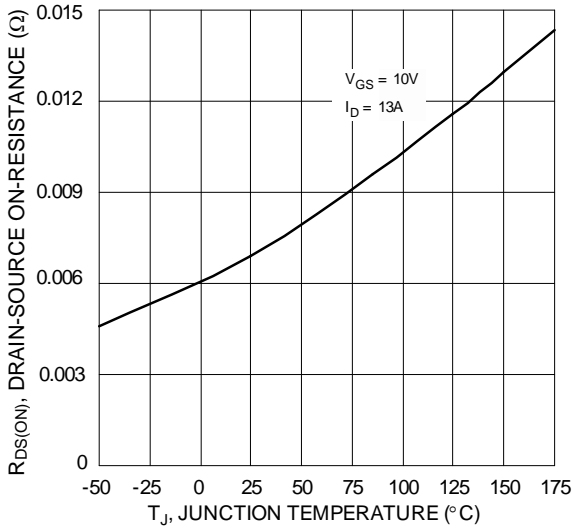


Figure 7 On-Resistance Variation with Junction Temperature

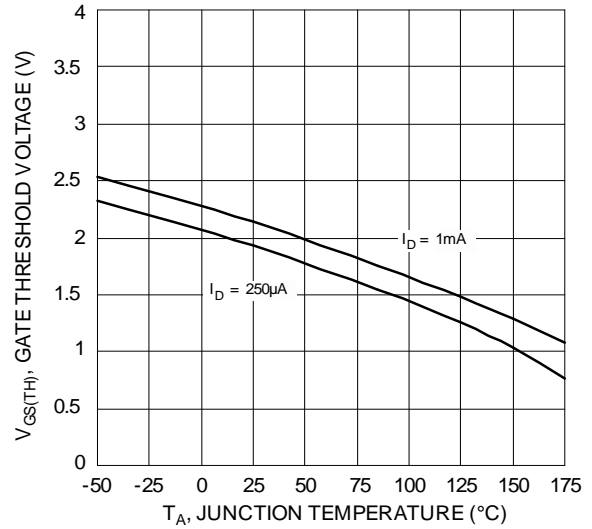


Figure 8 Gate Threshold Variation vs. Junction Temperature

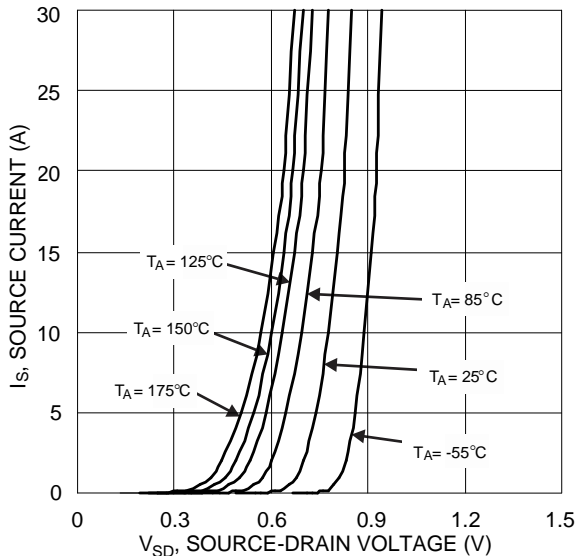


Figure 9 Diode Forward Voltage vs. Current

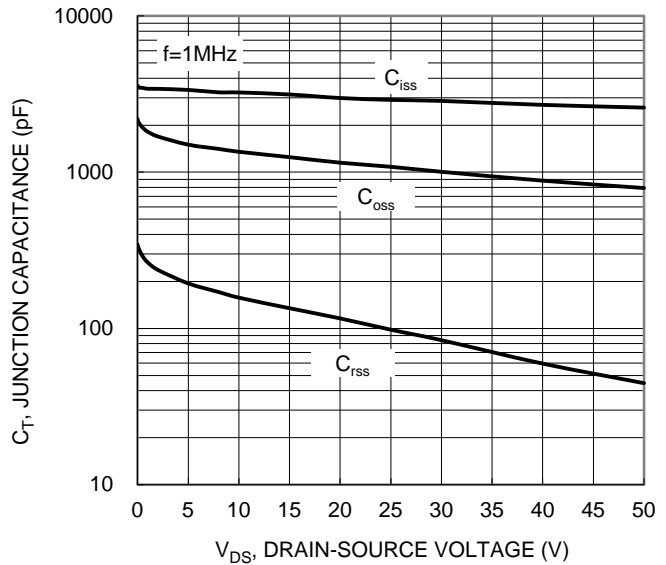


Figure 10. Typical Junction Capacitance

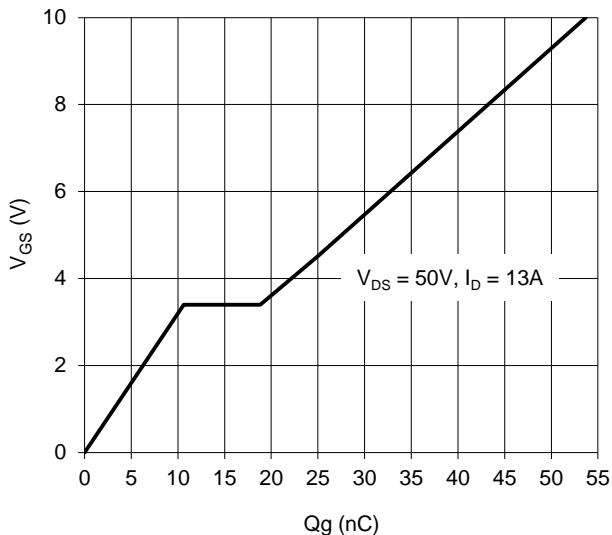


Figure 11. Gate Charge

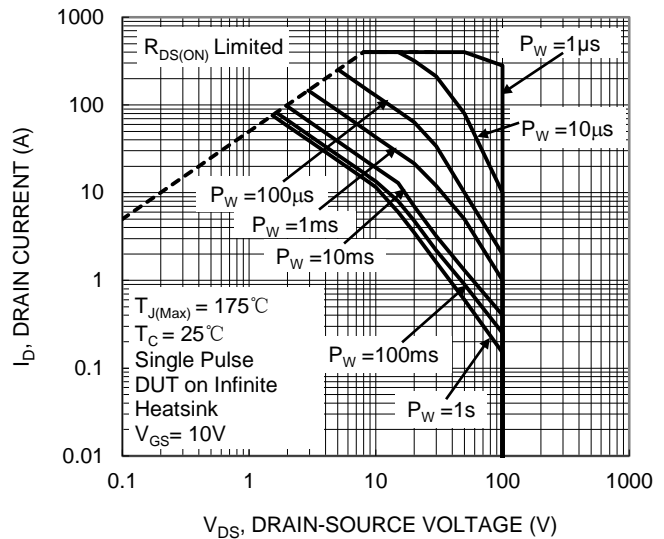
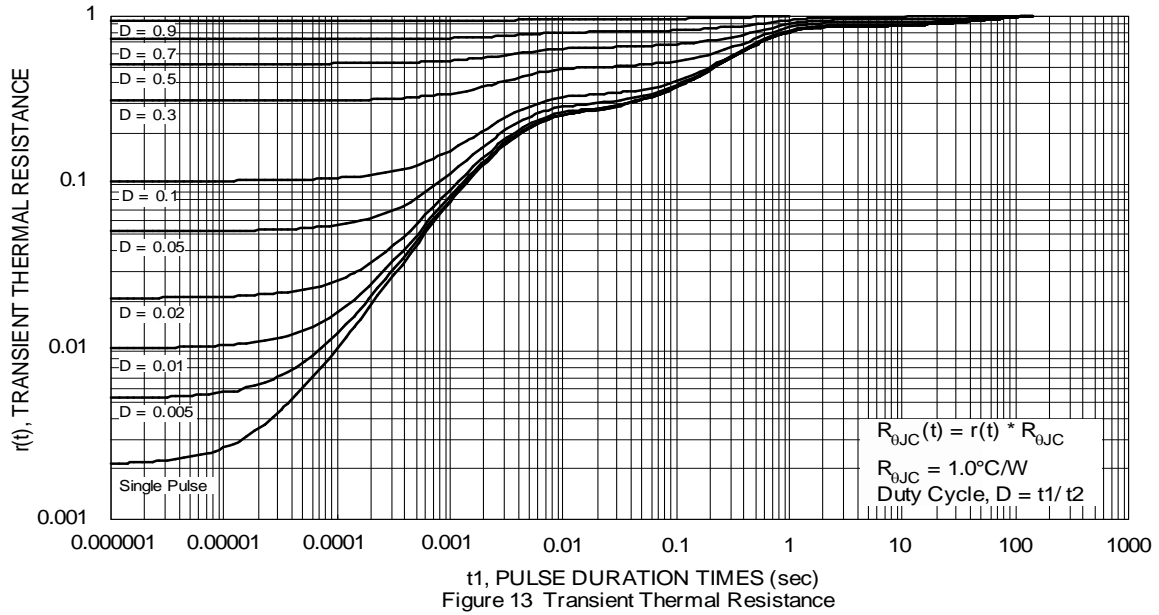


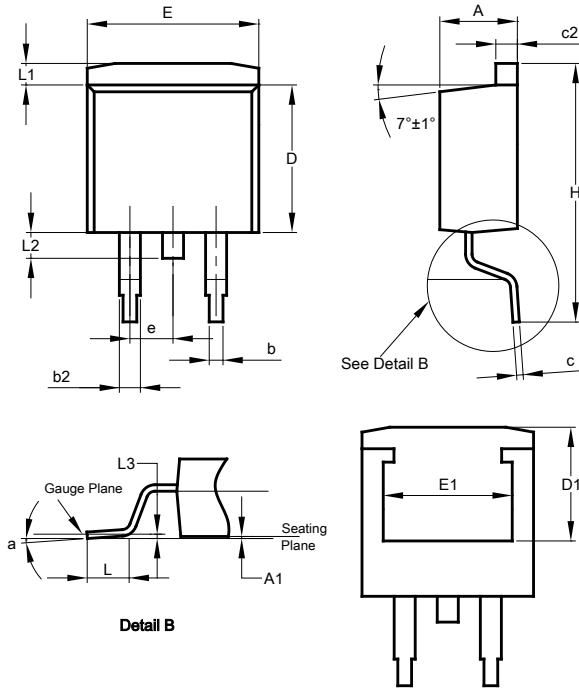
Figure 12. SOA, Safe Operation Area



Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

TO263AB (D2PAK)

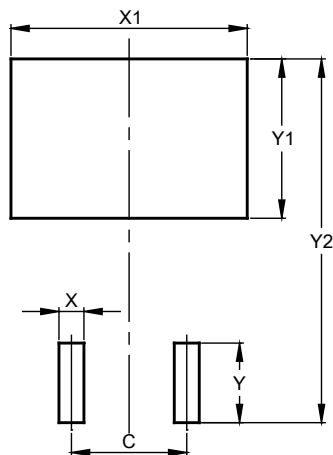


TO263AB (D2PAK)			
Dim	Min	Max	Typ
A	4.07	4.82	-
A1	0.00	0.25	-
b	0.51	0.99	-
b2	1.15	1.77	-
c	0.356	0.73	-
c2	1.143	1.65	-
D	8.39	9.65	-
D1	6.55	6.95	-
e	2.54 TYP		
E	9.66	10.66	-
E1	6.23	8.23	-
H	14.61	15.87	-
L	1.78	2.79	-
L1	-	1.67	-
L2	-	1.77	-
L3	-	-	0.254
a	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

TO263AB (D2PAK)



Dimensions	Value (in mm)
C	5.08
X	1.10
X1	10.41
Y	3.50
Y1	7.01
Y2	15.99

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