

## Product Summary

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

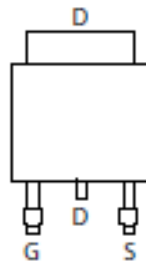
## Mechanical Data

- 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)

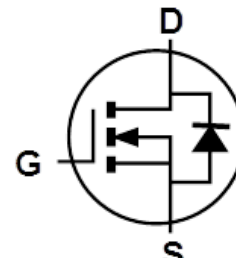
TO263AB (D2PAK)



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<sub>A</sub> = +25°C, unless otherwise specified.)

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

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P <sub>D</sub>	3.9	W
		T <sub>A</sub> = +25°C	
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	32	°C/W
Total Power Dissipation	P <sub>D</sub>	125	W
		T <sub>C</sub> = +25°C	
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	1.0	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

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

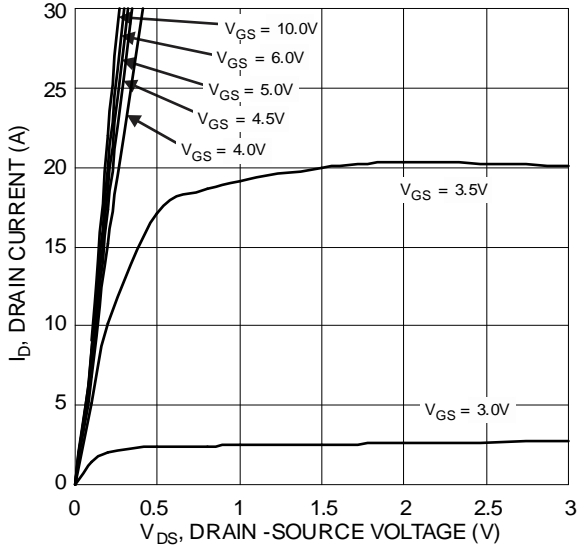


Figure 1 Typical Output Characteristics

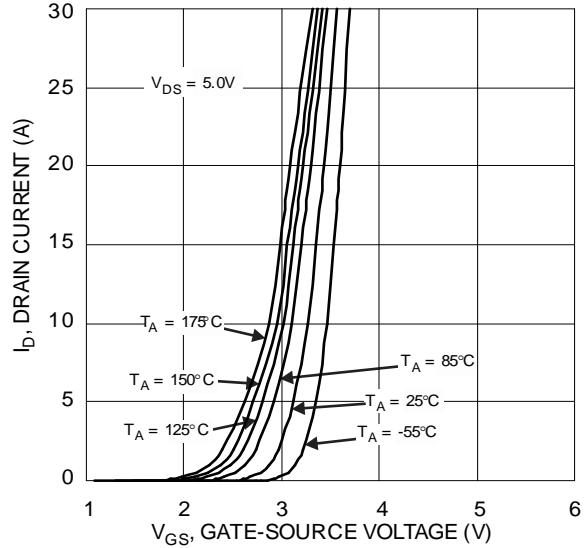


Figure 2 Typical Transfer Characteristics

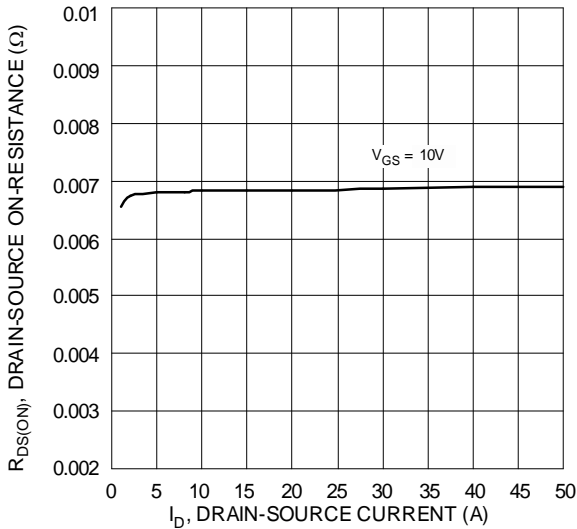


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

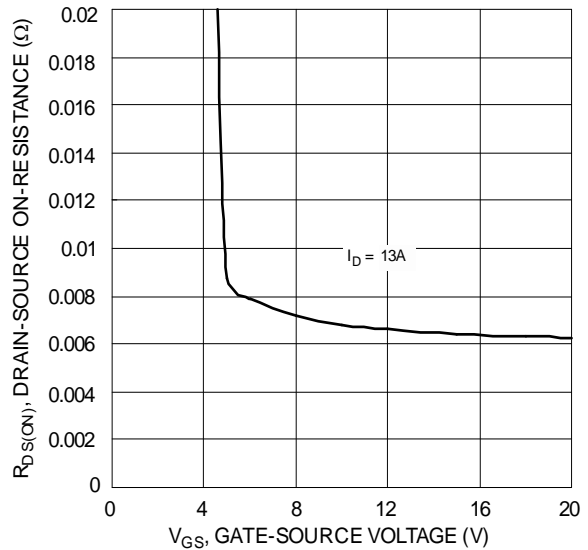


Figure 4 Typical Transfer Characteristics

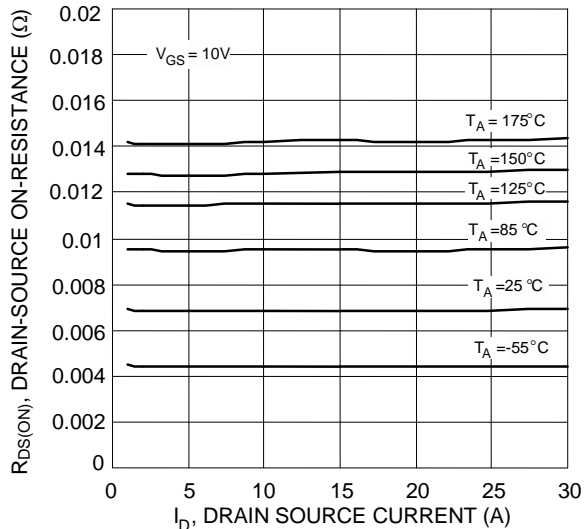


Figure 5 Typical On-Resistance vs. Drain Current and Junction Temperature

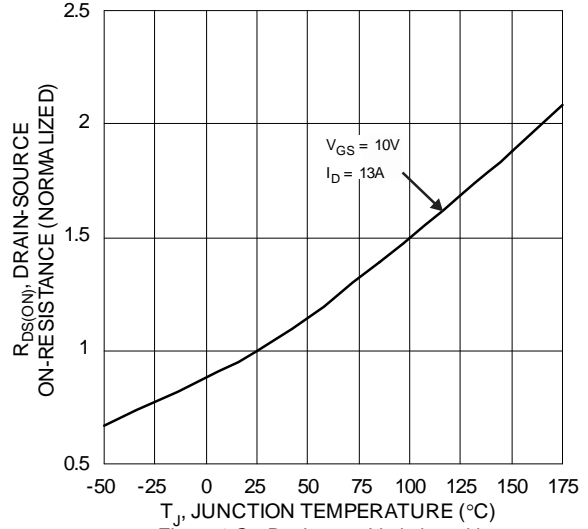


Figure 6 On-Resistance Variation with Junction Temperature

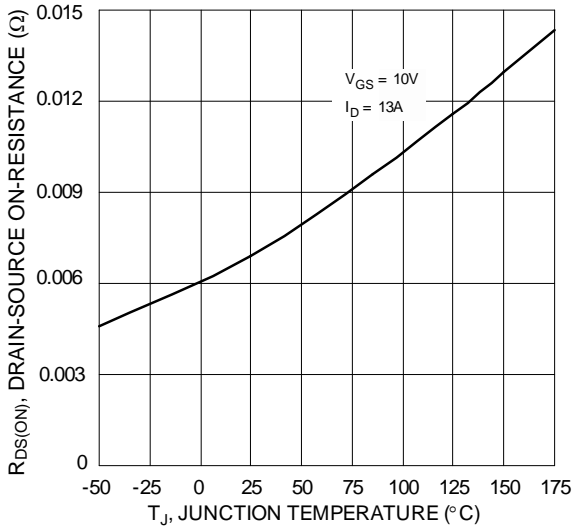


Figure 7 On-Resistance Variation with Junction Temperature

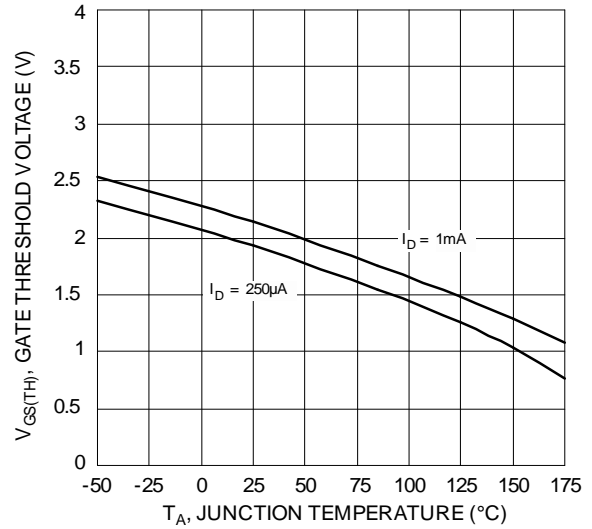


Figure 8 Gate Threshold Variation vs. Junction Temperature

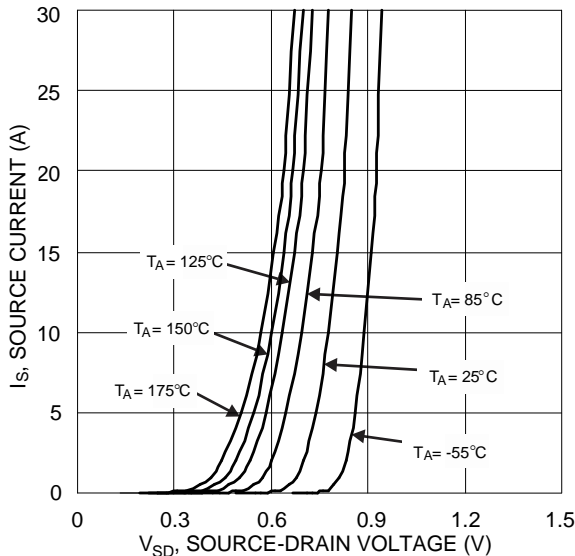


Figure 9 Diode Forward Voltage vs. Current

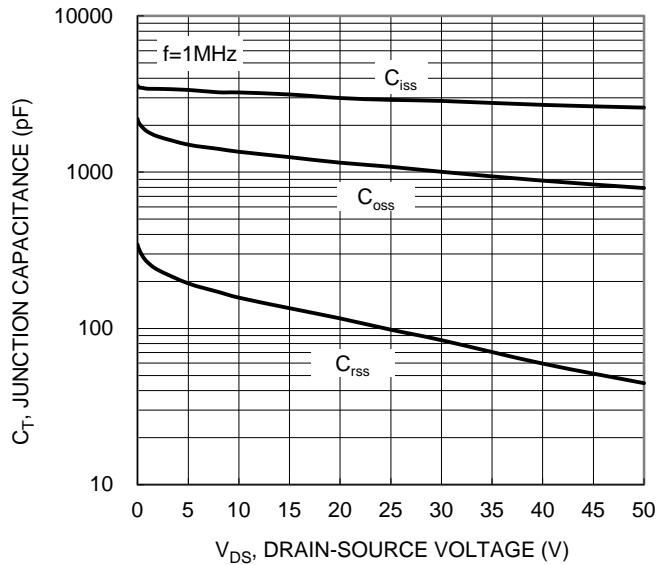


Figure 10. Typical Junction Capacitance

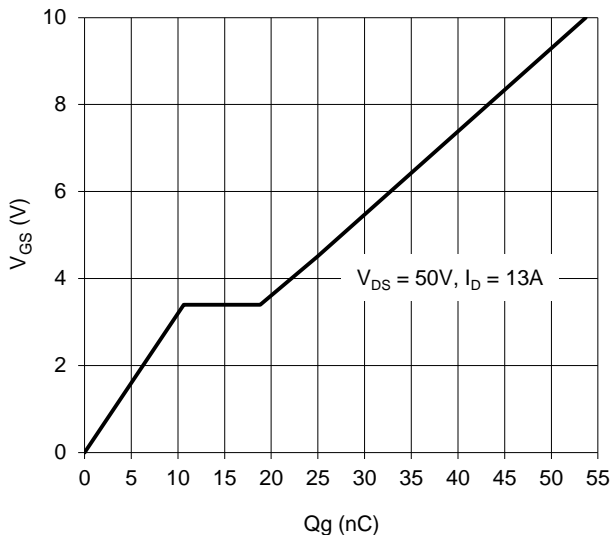


Figure 11. Gate Charge

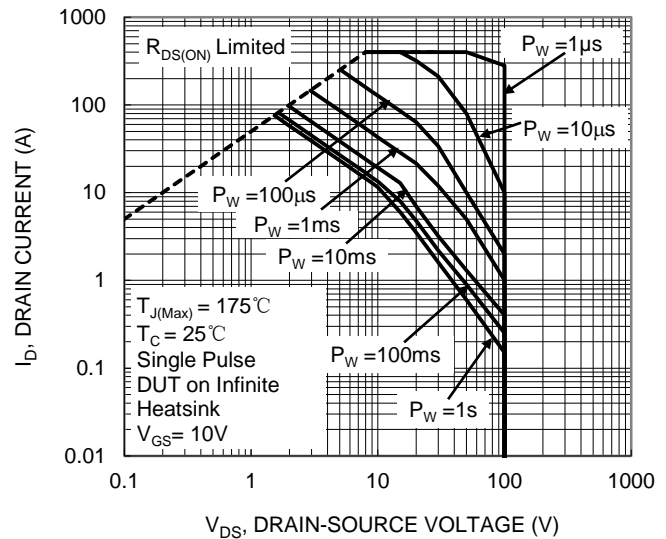
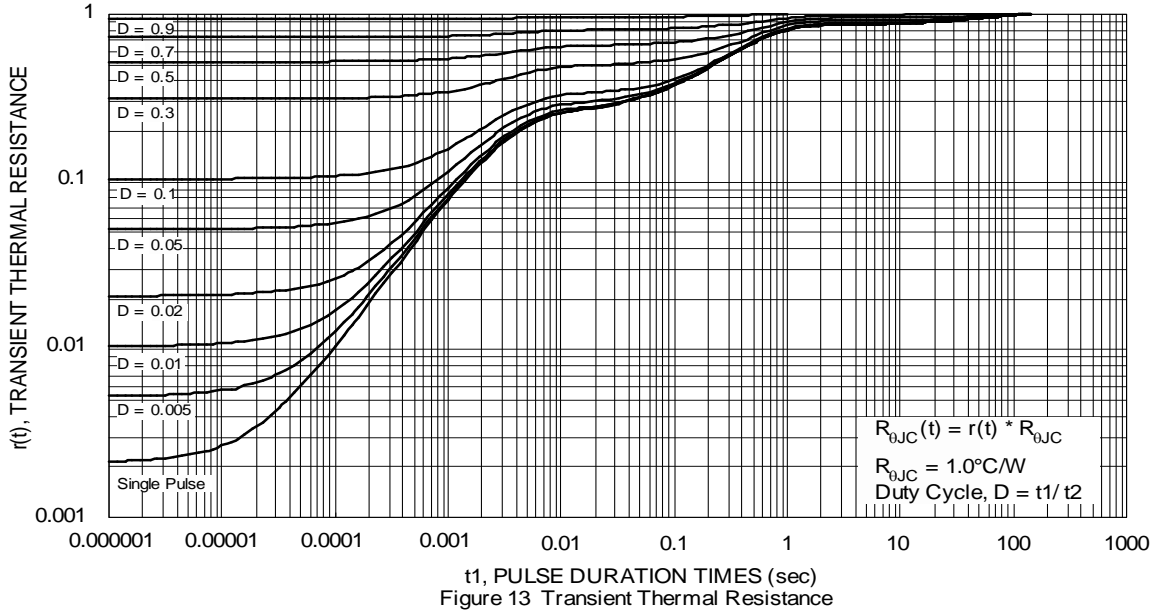


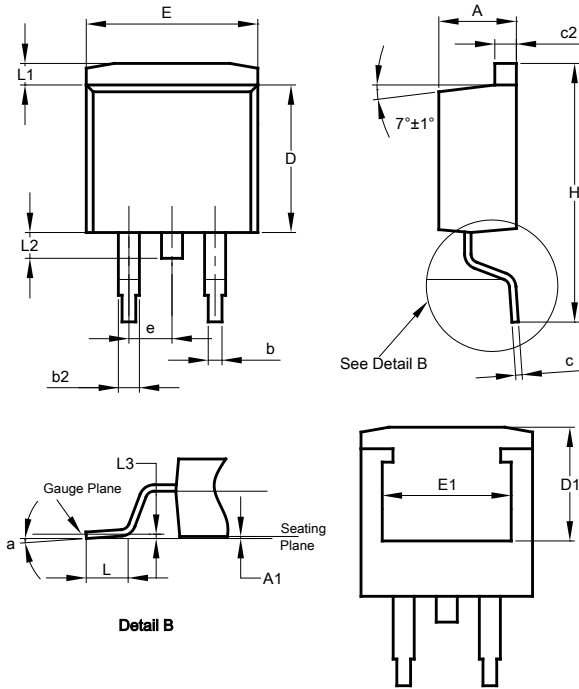
Figure 12. SOA, Safe Operation Area



**Package Outline Dimensions**

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

**TO263AB (D2PAK)**

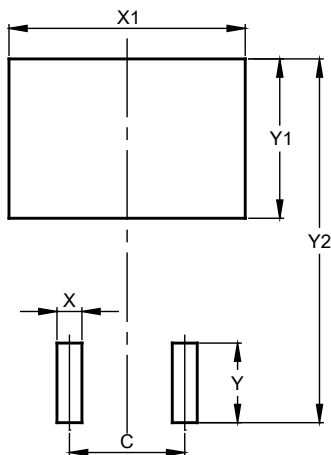


TO263AB (D2PAK)			
Dim	Min	Max	Typ
A	4.07	4.82	-
A1	0.00	0.25	-
b	0.51	0.99	-
b2	1.15	1.77	-
c	0.356	0.73	-
c2	1.143	1.65	-
D	8.39	9.65	-
D1	6.55	6.95	-
e	2.54 TYP		
E	9.66	10.66	-
E1	6.23	8.23	-
H	14.61	15.87	-
L	1.78	2.79	-
L1	-	1.67	-
L2	-	1.77	-
L3	-	-	0.254
a	0°	8°	-
All Dimensions in mm			

**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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