NEW PRODUCT

Description

The AZ2185 series is low dropout positive voltage regulators with a maximum dropout of 1.5V at 3A of load current.

The device features low quiescent current, low adjustable current and improved load transient performance. This device built in band-gap reference circuit, on-chip thermal shutdown and current limit function.

The AZ2185 is available in adjustable version. The adjustable version can set the output voltage with two external resistors.

The AZ2185 series is available in standard packages of TO252 (Standard).

Features

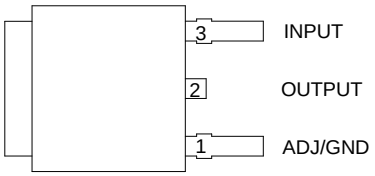
- Low Dropout Voltage: Typical 1.3V at 3A
- Current Limiting and Thermal Protection
- Output Current: 3A
- Current Limit: 4.5A
- Operating Junction Temperature: -40 to +125°C
- Line Regulation: 0.015%/V (Typ)
- Load Regulation: 0.1%/A (Typ)
- Adjust Pin Current: 6μA (Typ)
- Minimum Load Current: 0.3mA (Typ)
- Compatible with Low ESR Ceramic Capacitor
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Applications

- High Efficiency Linear Regulators
- Battery Charger
- Digital Video/Camcorder
- Post Regulation for Switching Supplies
- Microprocessor Supply
- Mother Board Power Supplies
- DVD-video Player
- Telecom Equipment
- Set Top Boxes and Web Boxes Modules' Supply

Features

(Top View)



TO252 (Standard)

Applications

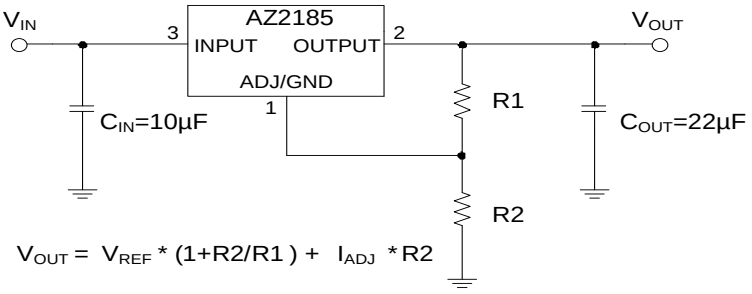
- High Efficiency Linear Regulators
- Battery Charger
- Digital Video/Camcorder
- Post Regulation for Switching Supplies
- Microprocessor Supply
- Mother Board Power Supplies
- DVD-video Player
- Telecom Equipment
- Set Top Boxes and Web Boxes Modules' Supply

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.

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Typical Applications Circuit (Note 4)

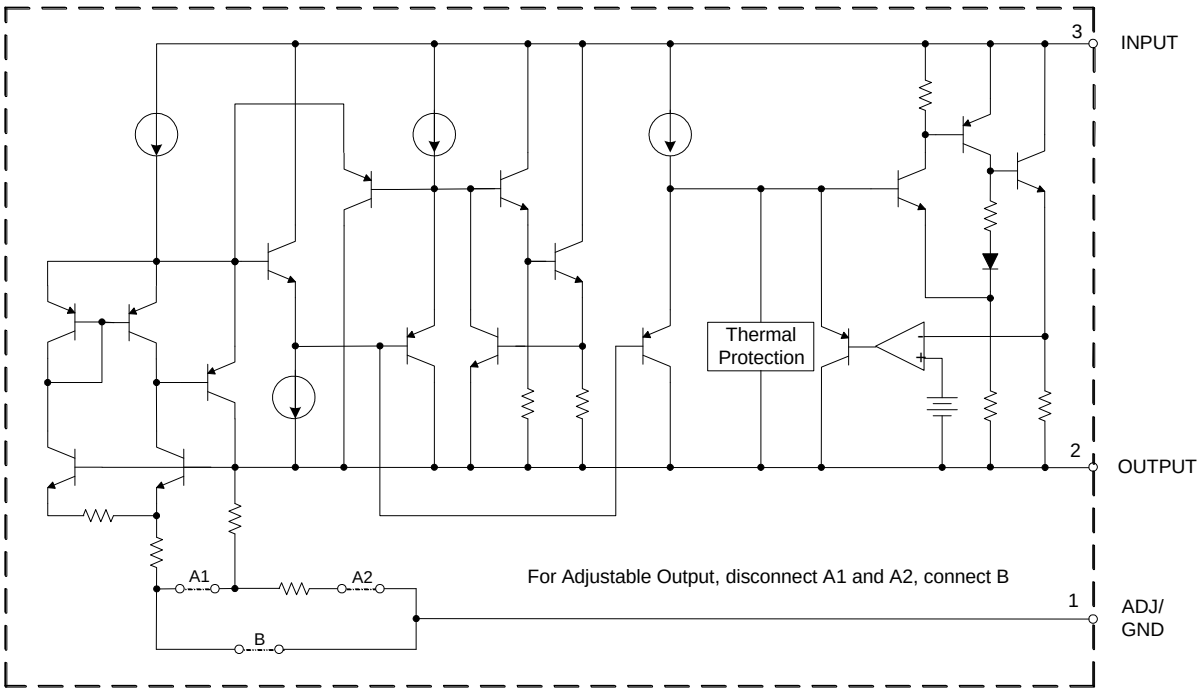


Note 4: The AZ2185 is compatible with low ESR ceramic capacitor.
The ESR of the output capacitors must be less than 0.4Ω.
A minimum of 10µF output capacitor is required.

Pin Descriptions

Pin Number	Pin Name	Function
1	ADJ/GND	Adjust pin/Ground
2	OUTPUT	Output voltage
3	INPUT	Input voltage

Functional Block Diagram



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Absolute Maximum Ratings (Note 5)

Symbol	Parameter	Rating	Unit
V_{IN}	Input Voltage	18	V
T_J	Operating Junction Temperature	+150	°C
T_{STG}	Storage Temperature Range	-65 to +150	°C
T_{LEAD}	Lead Temperature (Soldering, 10sec)	+260	°C
θ_{JA}	Thermal Resistance (Junction to Ambient)	75	°C/W
—	ESD (Human Body Model)	5000	V
—	ESD (Charge Device Model)	2000	V

Note 5: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

Symbol	Parameter	Min	Max	Unit
V_{IN}	Input Voltage	—	12	V
T_J	Operating Junction Temperature	-40	+125	°C

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Electrical Characteristics (Typicals and limits appearing in normal type apply for T_J = +25ºC. Limits appearing in **Boldface** type apply over the entire operating junction temperature range -40 to +125ºC.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{REF}	Reference Voltage	I_{OUT} = 10mA, V_{IN}-V_{OUT} = 3V, T_J = +25°C, 10mA ≤ I_{OUT} ≤ 3A, 1.5V ≤ V_{IN}-V_{OUT} ≤ 5V	1.238 **1.225**	1.250 **1.250**	1.262 **1.275**	V
V_{RLOAD}	Load Regulation	10mA ≤ I_{OUT} ≤ 3A, V_{IN}-V_{OUT} = 3V	—	0.1 **0.2**	0.4 **0.5**	%/A
V_{RLINE}	Line Regulation	I_{OUT} = 10mA, 2.85V ≤ V_{IN} ≤ 10V	—	0.015 **0.035**	0.2 **0.2**	%/V
V_{DROP}	Dropout Voltage	I_{OUT} = 3A, ΔV_{REF}, ΔV_{OUT} = 1%	—	**1.3**	**1.5**	V
I_{LIMIT} (Note 6)	Current Limit	V_{IN}-V_{OUT} = 3V	3.2	4.5	4.95	A
I_{LOAD}	Minimum Load Current	V_{IN} = 10V	—	0.3	1	mA
I_{ADJ}	Adjust Pin Current	V_{IN} = 4.25V, I_{OUT} = 10mA	—	6	10	µA
ΔI_{ADJ}	Adjust Pin Current Change	10mA ≤ I_{OUT} ≤ 3A, 1.5V ≤ V_{IN}-V_{OUT} ≤ 6V	—	0.3	2	µA
PSRR	Ripple Rejection	f_{RIPPLE} = 120Hz, C_{OUT} = 22µF, I_{OUT} = 3A, V_{IN}-V_{OUT} = 3V	—	50	—	dB
—	Long Term Stability	T_A = +125°C, 1000Hrs	—	0.5	—	%
—	Temperature Stability	I_{OUT} = 10mA, V_{IN}-V_{OUT} = 1.5V	—	50	—	PPM%
—	RMS Noise (% of V_{OUT})	T_A = +125°C, 10Hz ≤ f ≤ 10kHz	—	0.003	—	%
—	OTSD	—	—	+150	—	°C
—	OTSD Hysteresis	—	—	+20	—	°C
θ_{JC}	Thermal Resistance (Junction to Case)	—	—	10	—	°C/W

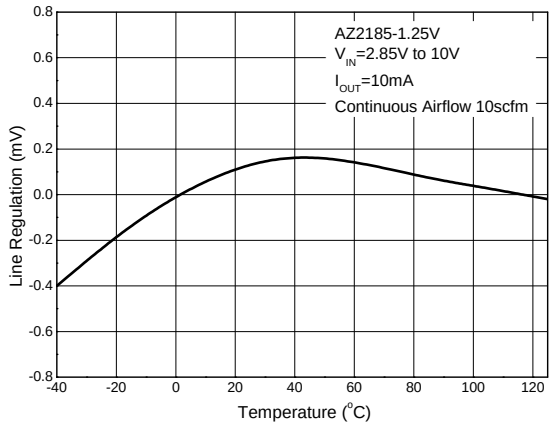
Note 6: Make the V_{OUT} down to about 98% of the test values, I_{OUT} value is set to I_{LIMIT} at this time.

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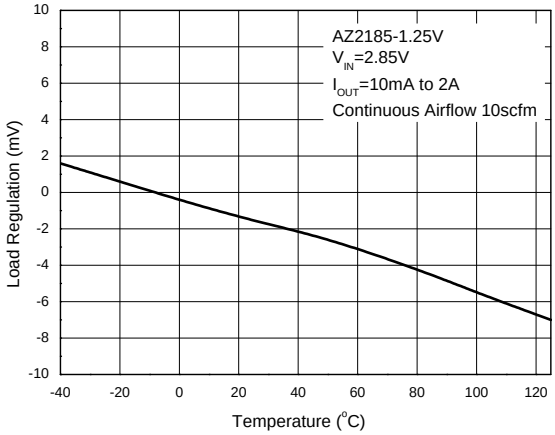
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Performance Characteristics

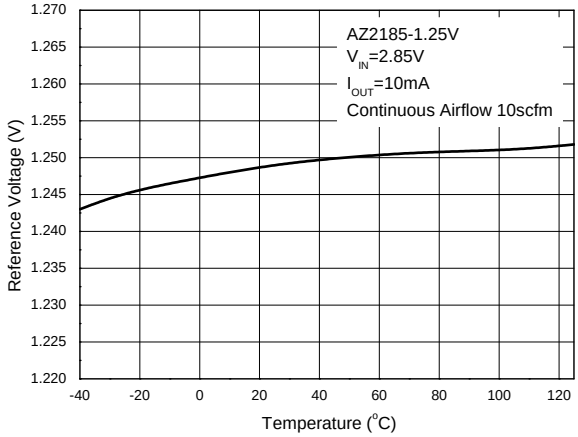
Line Regulation vs. Temperature



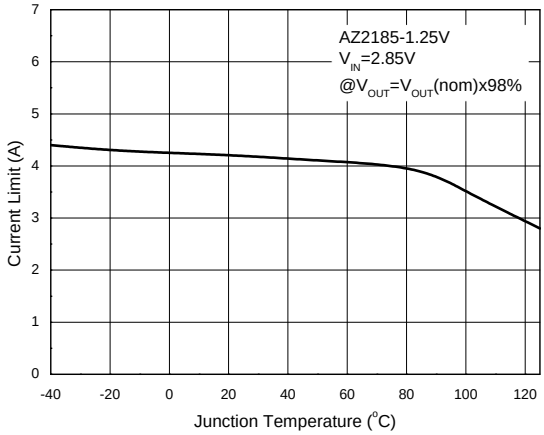
Load Regulation vs. Temperature



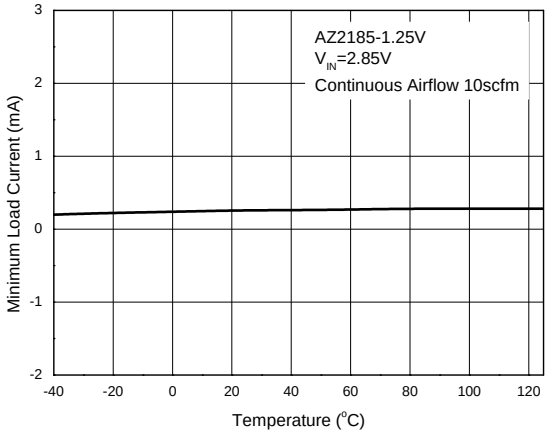
Reference Voltage vs. Temperature



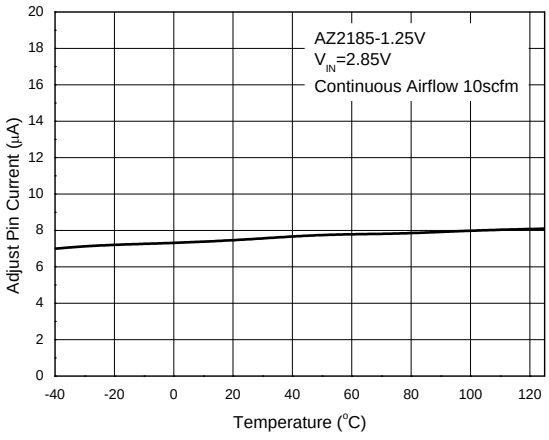
Current Limit vs. Temperature



Minimum Load Current vs. Temperature



Adjust Pin Current vs. Temperature

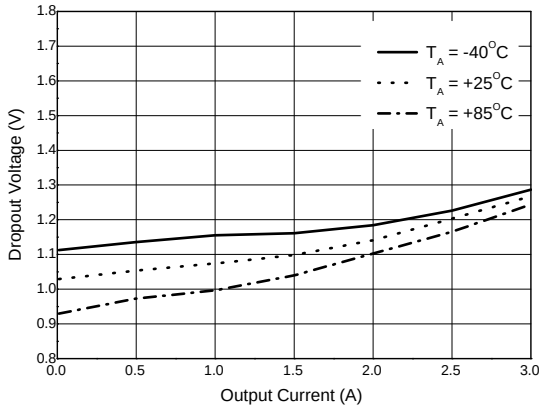


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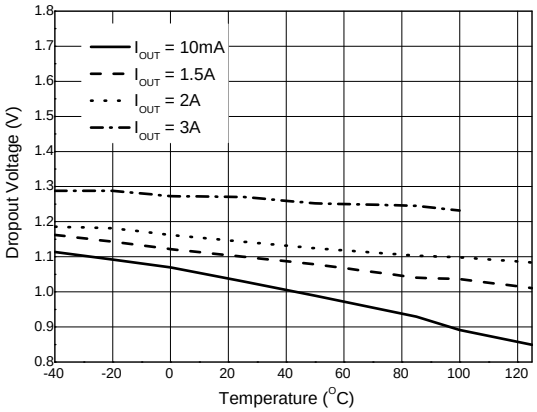
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Performance Characteristics (Cont.)

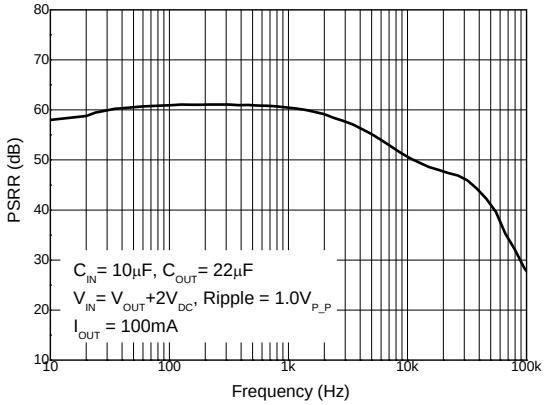
Dropout Voltage vs. Output Current



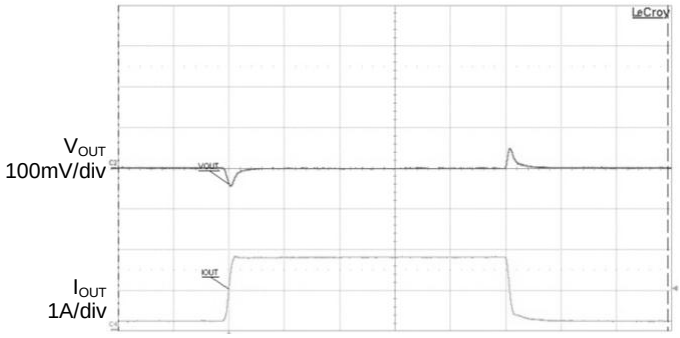
Dropout Voltage vs. Temperature



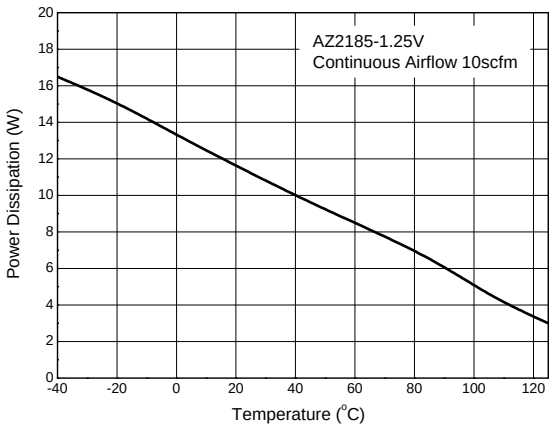
PSRR vs. Frequency



Load Transient Response



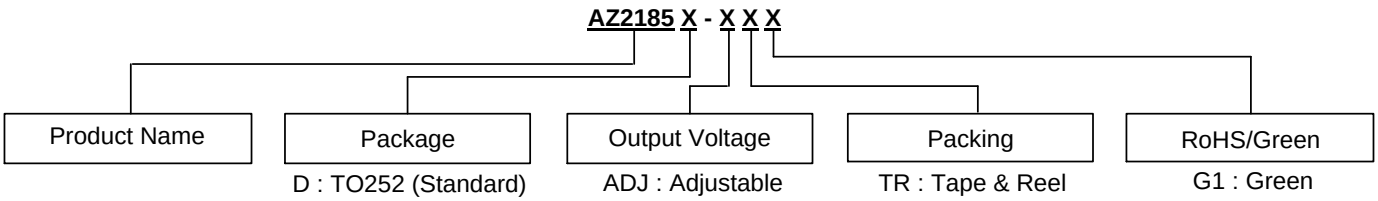
Power Dissipation vs. Temperature



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Ordering Information

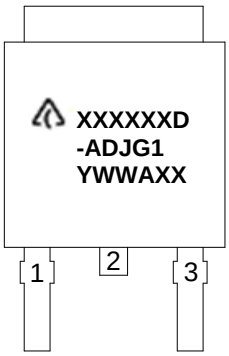


Package	Temperature Range	Part Number	Marking ID	Packing
TO252 (Standard)	-40 to +125°C	AZ2185D-ADJTRG1	AZ2185D-ADJG1	2500/Tape & Reel

Marking Information

(1) TO252 (Standard)

(Top View)



First and Second Lines: Logo and Marking ID (See Ordering Information)
Third Line: Date Code
Y: Year
WW: Work Week of Molding
A: Assembly House Code
XX: 7th and 8th Digits of Batch Number

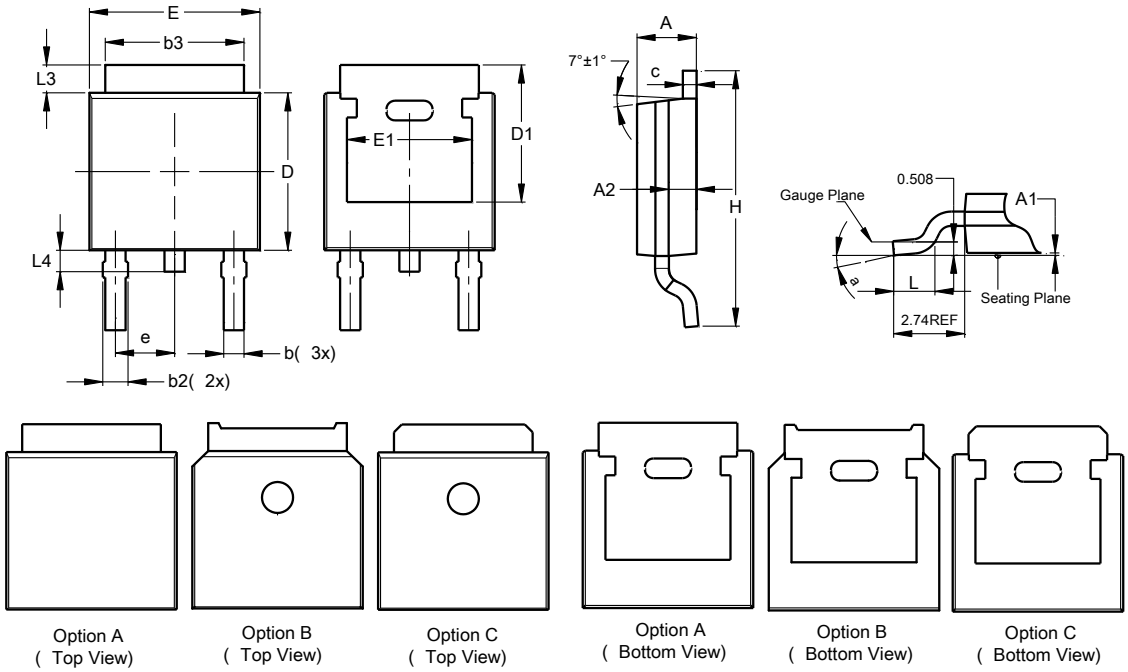
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Package Outline Dimensions

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

(1) Package Type: TO252 (Standard)

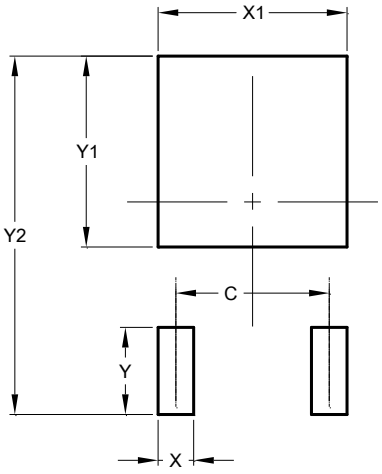


TO252 (Standard)			
Dim	**Min**	**Max**	**Typ**
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.60	1.02	0.83
a	0°	10°	-
All Dimensions in mm			

Suggested Pad Layout

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

(1) Package Type: TO252 (Standard)



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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