NPN PRE-BIASED SMALL SIGNAL DUAL SURFACE MOUNT TRANSISTOR

Features

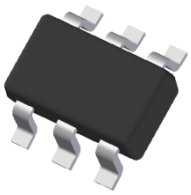
- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

R1 (NOM)	R2 (NOM)
4.7kΩ	47kΩ

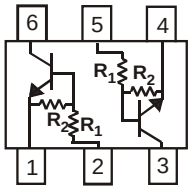
Mechanical Data

- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.006 grams (Approximate)

SOT363



Top View



Device Schematic

Ordering Information (Note 5)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
ADC143ZUQ-7	Automotive	1Y9	7	8	3,000
ADC143ZUQ-13	Automotive	1Y9	13	8	10,000

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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to https://www.diodes.com/quality/product-compliance-definitions/.
5. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

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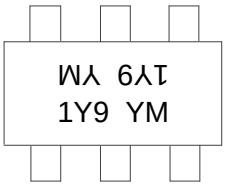


1Y9 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: E = 2017)
M = Month (ex: 9 = September)

Date Code Key

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Code	E	F	G	H	I	J	K	L	M	N	O

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

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

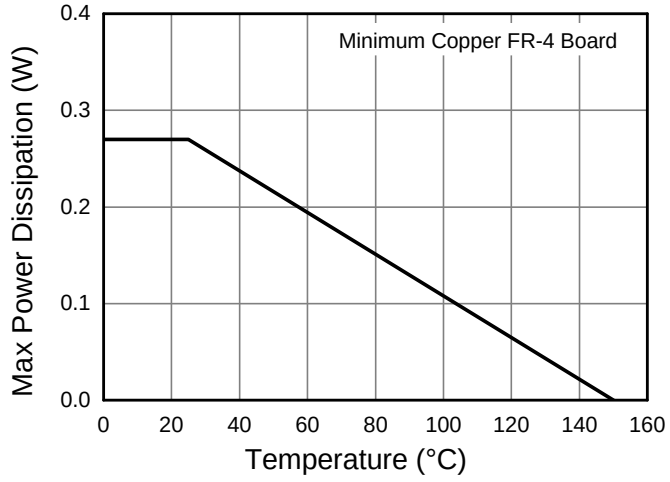
Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	50	V
Input Voltage	V_{IN}	-5 to +30	V
Output Current	$I_{C(MAX)}$	100	mA

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

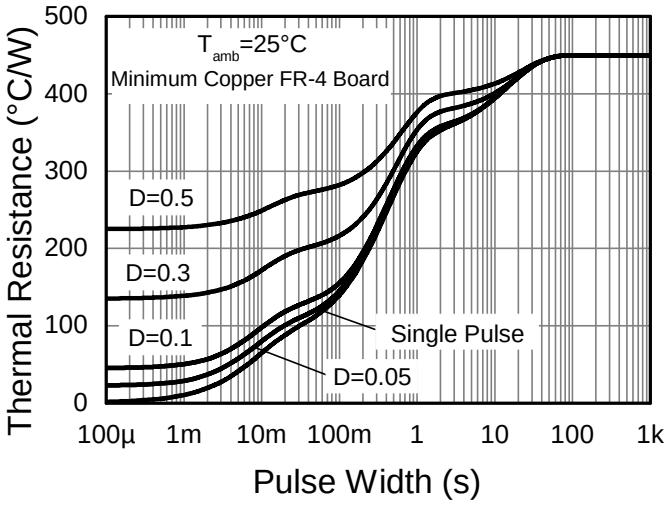
Characteristic	Symbol	Value	Unit
Power Dissipation (Notes 6 & 7)	P_D	270	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	450	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 6. Mounted on FR-4 PC Board with minimum recommended pad layout.
7. 150mW per element must not be exceeded.

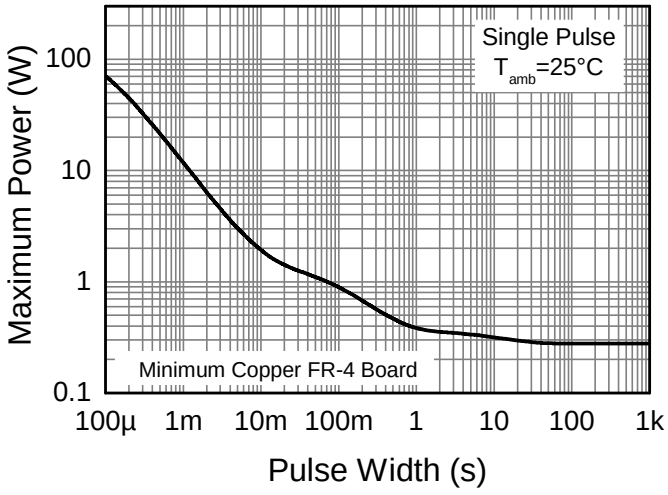
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



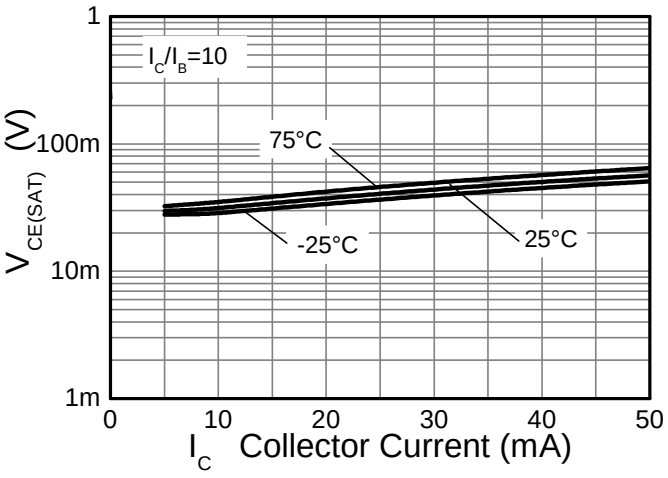
Pulse Power Dissipation

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

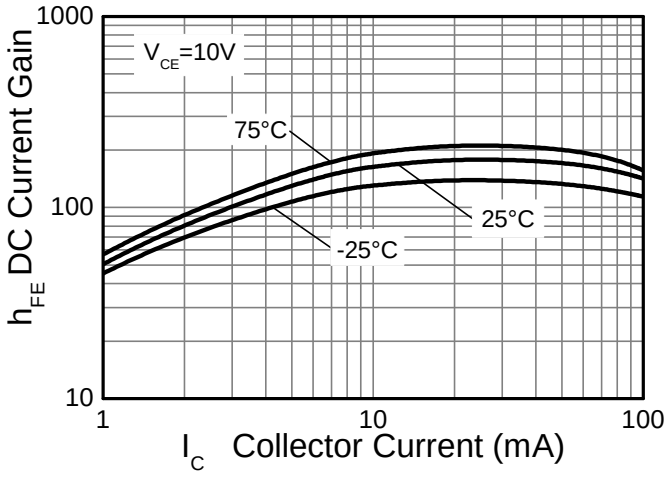
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	$V_{I(OFF)}$ (Note 8)	0.5	—	—	V	V_{CC} = 5V, I_O = 100µA
	$V_{I(ON)}$ (Note 9)	—	—	1.3		V_O = 0.3V, I_O = 5mA
Output Voltage	$V_{O(ON)}$	—	0.1	0.3	V	I_O/I_I = 5mA / 0.25mA
Input Current	I_I	—	—	1.8	mA	V_I = 5V
Output Current	$I_{O(OFF)}$	—	—	0.5	µA	V_{CC} = 50V, V_I = 0V
DC Current Gain	G_I	80	—	—	—	V_O = 5V, I_O = 10mA
Input Resistor (R_1) Tolerance	ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance	$\Delta(R_2/R_1)$	-20	—	+20	%	—
Gain-Bandwidth Product (Note 10)	f_T	—	250	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

Notes: 8. Guarantees that the device will be switched OFF if the Input Voltage is less than 0.5V.
9. Guarantees that the device will be switched ON if the Input Voltage is more than 1.3V.
10. Transistor - For Reference Only.

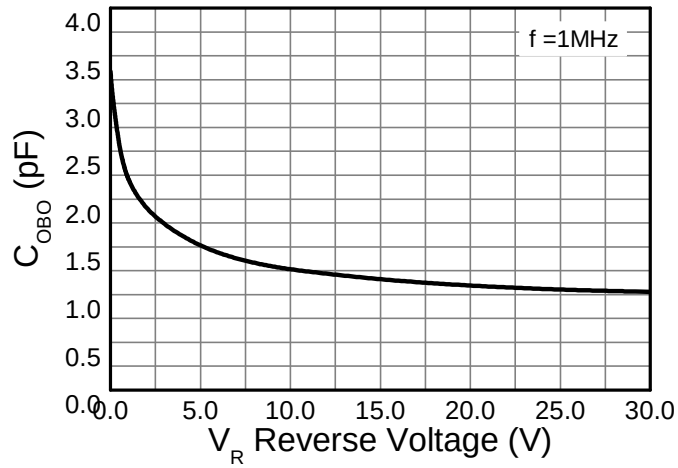
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



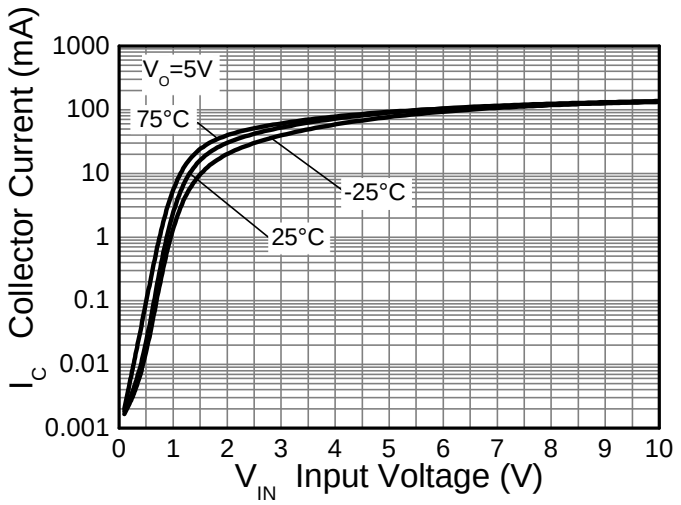
$V_{CE(SAT)}$ v Collector Current



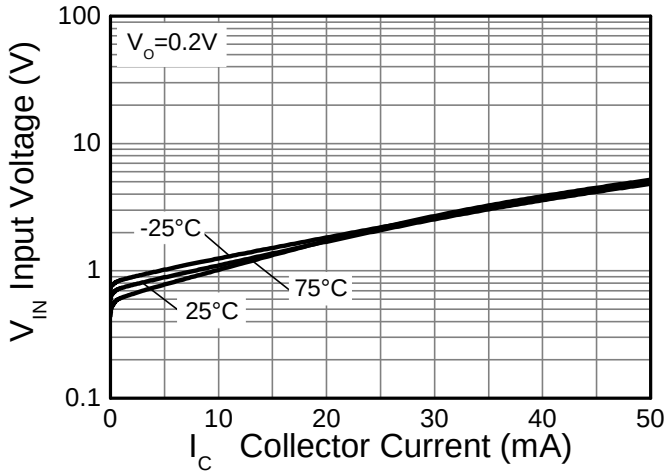
h_{FE} v Collector Current



Output Capacitance



Collector Current v Input Voltage



Input Voltage v Collector Current

Package Outline Dimensions

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

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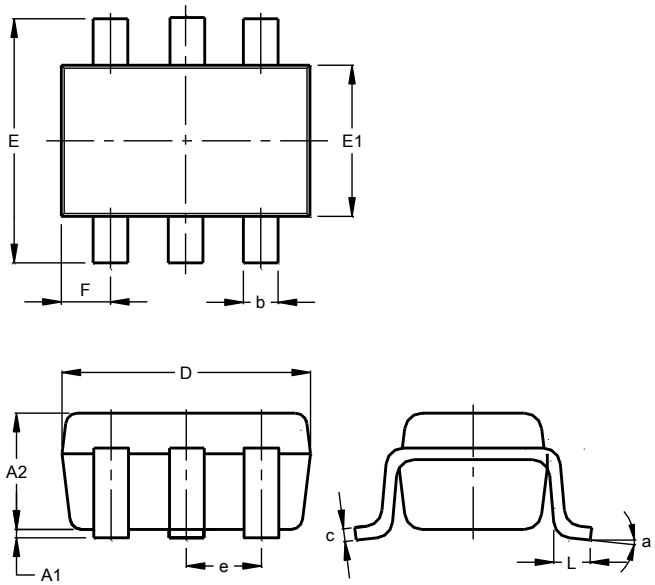

SOT363			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	1.00
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

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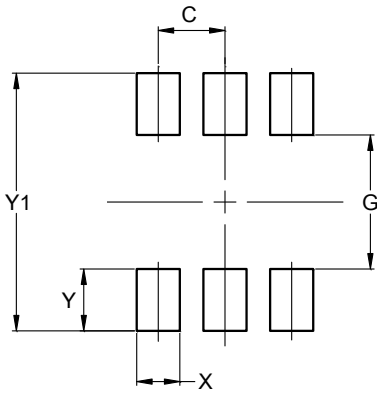

Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500

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