

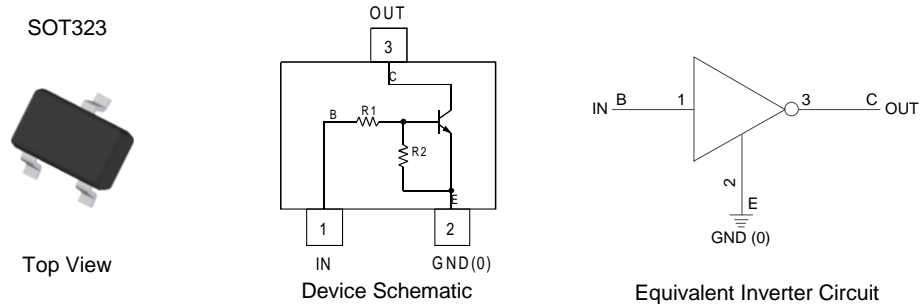
NPN PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR
Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 = R2
- **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)**

Mechanical Data

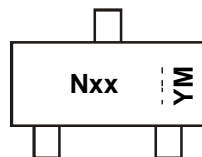
- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.008 grams (Approximate)

Part Number	R1, R2 (NOM)
DDTC123EUA	2.2kΩ
DDTC143EUA	4.7kΩ
DDTC114EUA	10kΩ
DDTC124EUA	22kΩ
DDTC144EUA	47kΩ
DDTC115EUA	100kΩ


Ordering Information (Note 5)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
DDTC123EUA-7-F	AEC-Q101	N04	7	8	3,000
DDTC143EUA-7-F	AEC-Q101	N08	7	8	3,000
DDTC114EUA-7-F	AEC-Q101	N13	7	8	3,000
DDTC114EUAQ-7-F	Automotive	N13	7	8	3,000
DDTC124EUA-7-F	AEC-Q101	N17	7	8	3,000
DDTC124EUAQ-7-F	Automotive	N17	7	8	3,000
DDTC124EUAQ-13-F	Automotive	N17	13	8	10,000
DDTC144EUA-7-F	AEC-Q101	N20	7	8	3,000
DDTC144EUAQ-7-F	Automotive	N20	7	8	3,000
DDTC144EUAQ-13-F	Automotive	N20	13	8	10,000
DDTC115EUA-7-F	AEC-Q101	N24	7	8	3,000
DDTC115EUAQ-7-F	Automotive	N24	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to <https://www.diodes.com/quality/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information


Nxx = Product Type Marking Code (See Table Above)
 YM = Date Code Marking
 Y = Year (ex: F = 2018)
 M = Month (ex: 9 = September)

Date Code Key

Year	2018	2019	2020	2021	2022	2023	2024	2025
Code	F	G	H	I	J	K	L	M

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 <Pin: (3) to (2)>	V _{CC}	50	V
Input Voltage <Pin: (1) to (2)>	V _{IN}	-10 to +12 -10 to +30 -10 to +40 -10 to +40 -10 to +40 -10 to +40	V
Output Current	I _O	100 100 50 30 100 20	mA
Output Current	I _{C(MAX)}	100	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P _D	200	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	R _{θJA}	625	°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
Input Voltage	V _{I(OFF)}	0.5	1.1	—	V	V _{CC} = 5V, I _O = 100µA
	V _{I(ON)}	—	1.9	3	V	V _O = 0.3V, I _O = 20mA, DDTC123EUA V _O = 0.3V, I _O = 20mA, DDTC143EUA V _O = 0.3V, I _O = 10mA, DDTC114EUA V _O = 0.3V, I _O = 5mA, DDTC124EUA V _O = 0.3V, I _O = 1mA, DDTC115EUA V _O = 0.3V, I _O = 2mA, DDTC144EUA
Output Voltage	V _{O(ON)}	—	0.1	0.3	V	I _O /I _I = 10mA/0.5mA, DDTC123EUA I _O /I _I = 10mA/0.5mA, DDTC143EUA I _O /I _I = 10mA/0.5mA, DDTC114EUA I _O /I _I = 10mA/0.5mA, DDTC124EUA I _O /I _I = 10mA/0.5mA, DDTC144EUA I _O /I _I = 5mA/0.25mA, DDTC115EUA
Input Current	I _I	—	—	3.8 1.8 0.88 0.36 0.18 0.15	mA	V _I = 5V
Output Current	I _{O(OFF)}	—	—	0.5	µA	V _{CC} = 50V, V _I = 0V
DC Current Gain	G _I	20 20 30 56 68 80 82	—	—	—	V _O = 5V, I _O = 20mA V _O = 5V, I _O = 10mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA V _O = 5V, I _O = 5mA
Input Resistor (R ₁) Tolerance	ΔR ₁	-30	—	+30	%	—
Resistance Ratio	R ₂ /R ₁	0.8	1	1.2	—	—
Gain-Bandwidth Product (Note 7)	f _T	—	250	—	MHz	V _{CE} = 10V, I _E = 5mA, f = 100MHz

Notes: 6. Mounted on FR-4 PC Board with minimum recommended pad layout.
7. Transistor - For Reference Only.

Typical Curves – DDTC143EUA (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

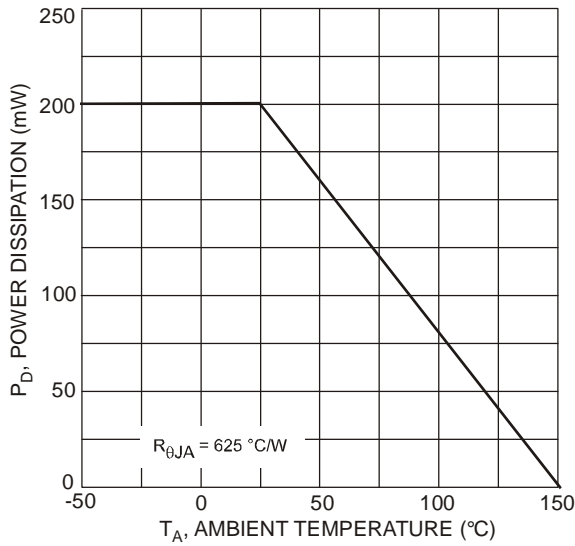


Fig. 1 Power Dissipation vs. Ambient Temperature

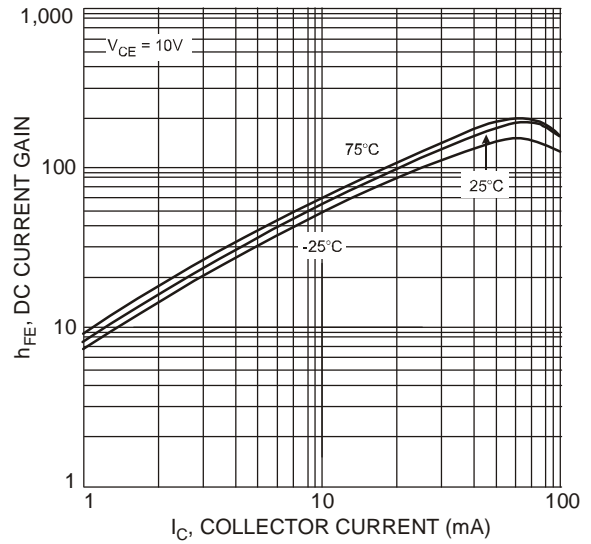


Fig. 2 Typical DC Current Gain vs. Collector Current

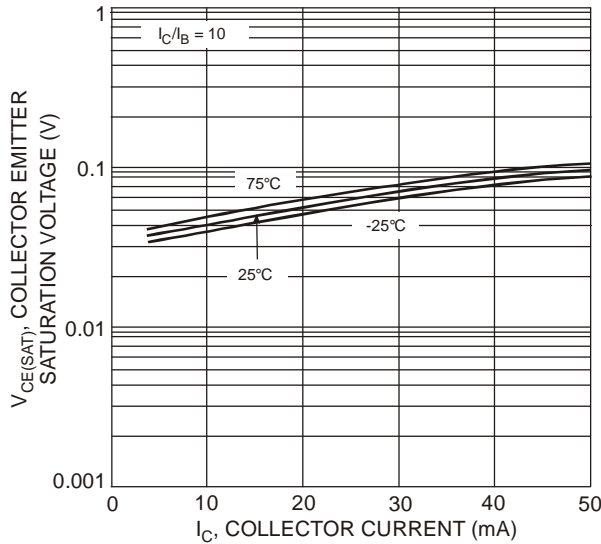


Fig. 3. Collector Emitter Saturation Voltage vs. Collector Current

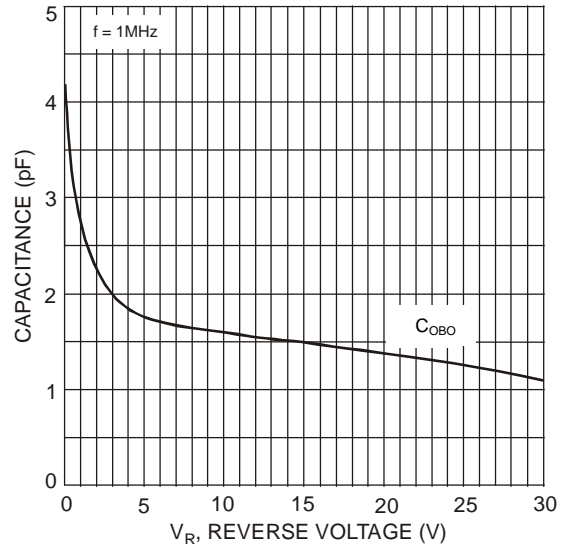


Fig. 4 Typical Capacitance Characteristics

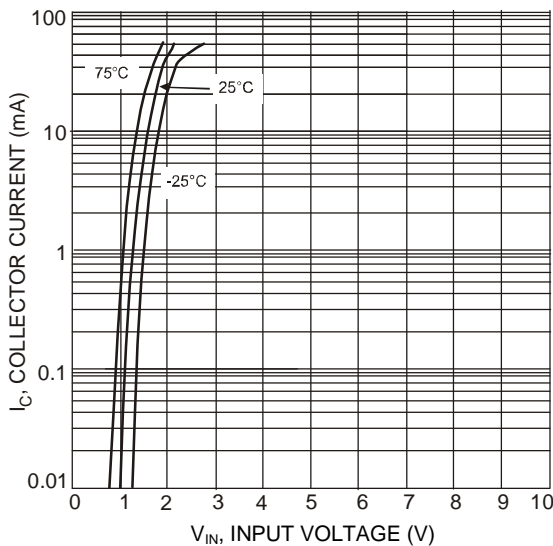


Fig. 5 Collector Current vs. Input Voltage

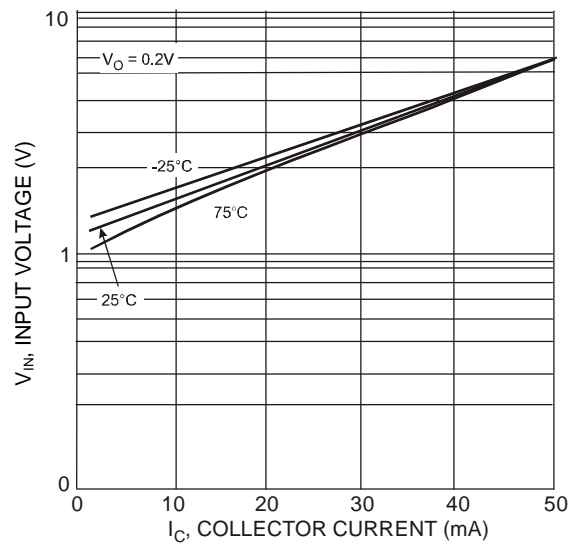
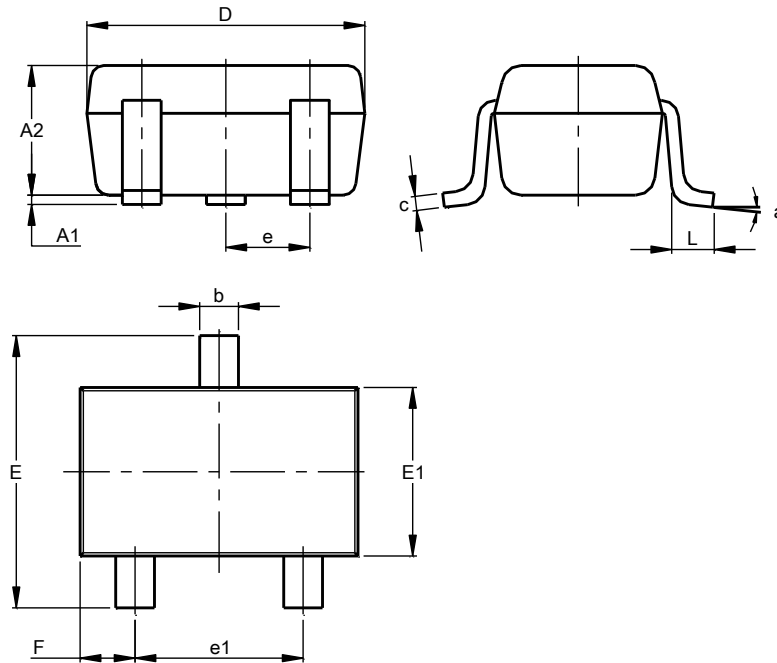


Fig. 6 Input Voltage vs. Collector Current

Package Outline Dimensions

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

SOT323

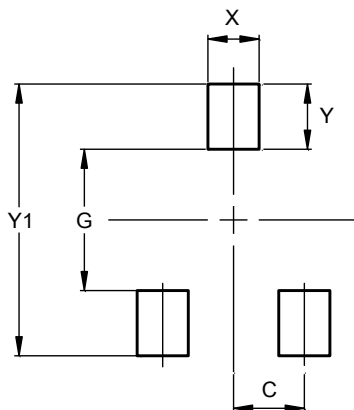


SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT323



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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