



NPN PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (ADTA)
- 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

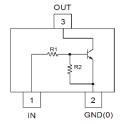
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ³
- Weight: 0.008 grams (Approximate)

R1 (NOM)	R2 (NOM)
47kΩ	22kΩ

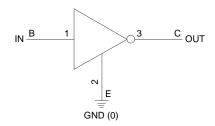




Top View



Device Schematic



Equivalent Inverter Circuit

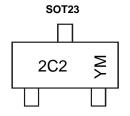
Ordering Information (Note 5)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
ADTC144WCAQ-7	Automotive	2C2	7	8	3,000
ADTC144WCAQ-13	Automotive	2C2	13	8	10,000

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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



2C2 = 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	202	1 20	22	2023	2024	2025	2026	2027
Code	E	F	G	Н	_	,	J	K	Г	M	Ν	0
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



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

Characteristic	Symbol	Value	Unit
Supply Voltage <pin: (2)="" (3)="" to=""></pin:>	Vcc	50	V
Input Voltage <pin: (1)="" (2)="" to=""></pin:>	V _{IN}	-10 to +40	V
Output Current	lo	30	mA
Output Current	I _C (Max)	100	mA

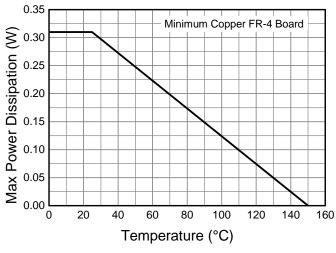
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_{D}	310	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	403	°C/W
Operating and Storage Temperature Range	T_J,T_STG	-55 to +150	°C

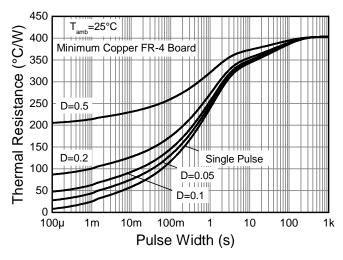
Note: 6. Mounted on FR-4 PC Board with minimum recommended pad layout.



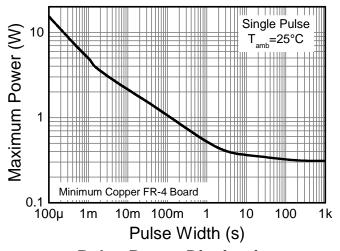
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation



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

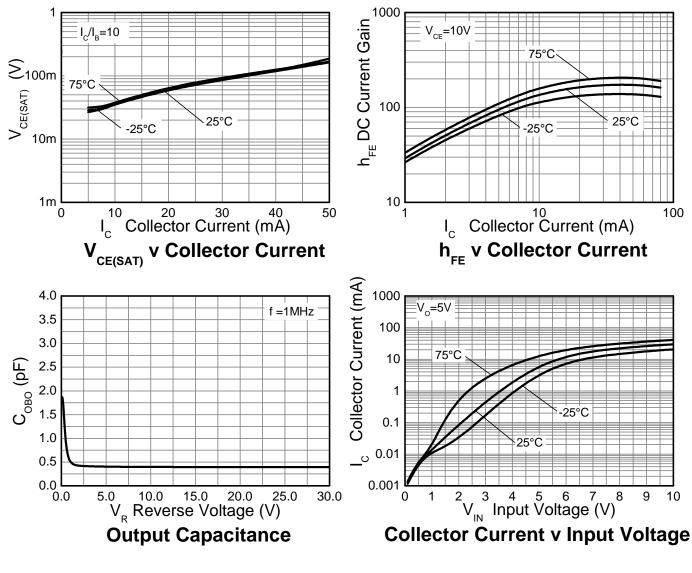
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Input Voltage	V _{I(OFF)} (Note 7)	0.8		_	V	$V_{CC} = 5V, I_{O} = 100\mu A$
Input Voltage	V _{I(ON)} (Note 8)	_		4	V	$V_O = 0.3V$, $I_O = 2mA$
Output Voltage	V _{O(ON)}	_	0.1	0.3	V	$I_0/I_1 = 10 \text{mA}/0.5 \text{mA}$
Input Current	l _l	_	_	0.16	mA	$V_I = 5V$
Output Current	I _{O(OFF)}	_		0.5	μA	$V_{CC} = 50V, V_{I} = 0V$
DC Current Gain	G _I	56	_	_	_	$V_0 = 5V, I_0 = 5mA$
Input Resistor Tolerance	ΔR_1	-30	_	+30	%	_
Resistance Ratio Tolerance	$\Delta R_2/R_1$	-20	_	+20	%	_
Gain-Bandwidth Product (Note 9)	f _T		250	_	MHz	$V_{CE} = 10V$, $I_E = 5mA$, $f = 100MHz$

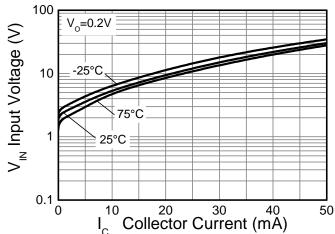
Notes:

- 7. Guarantees that the device will be switched OFF if the Input Voltage is less than 0.8V.8. Guarantees that the device will be switched ON if the Input Voltage is more than 4V.9. Transistor For Reference Only.



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





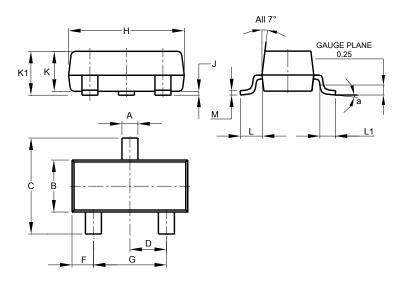
Input Voltage v Collector Current



Package Outline Dimensions

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

SOT23

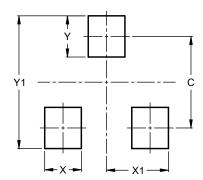


SOT23							
Dim	Min	Max	Тур				
Α	0.37	0.51	0.40				
В	1.20	1.40	1.30				
С	2.30	2.50	2.40				
D	0.89	1.03	0.915				
F	0.45	0.60	0.535				
G	1.78	2.05	1.83				
Н	2.80	3.00	2.90				
7	0.013	0.10	0.05				
K	0.890	1.00	0.975				
K1	0.903	1.10	1.025				
L	0.45	0.61	0.55				
L1	0.25	0.55	0.40				
М	0.085	0.150	0.110				
а	0°	8°					
All Dimensions in mm							

Suggested Pad Layout

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

SOT23



Dimensions	Value (in mm)
С	2.0
Х	0.8
X1	1.35
Y	0.9
V1	2.0



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