

#### PNP PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

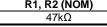
#### **Features**

- **Epitaxial Planar Die Construction**
- 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)

#### R1, R2 (NOM) 47kΩ

### **Mechanical Data**

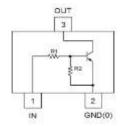
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 👀
- Weight: 0.008 grams (Approximate)



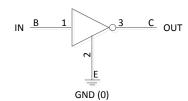




Top View



**Device Schematic** 



**Equivalent Inverter Circuit** 

#### Ordering Information (Notes 4 & 5)

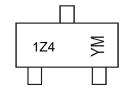
Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ADTA144ECAQ-7	Automotive	1Z4	7	8	3,000
ADTA144ECAQ-13	Automotive	1Z4	13	8	10,000

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"
- 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 http://www.diodes.com/product\_compliance\_definitions.html.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

### **Marking Information**





1Z4 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: D = 2016)

M = Month (ex: 9 = September)

Date Code Key

Date Oode	itcy															
Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	D	Е	F	G	Н		J	K	L	М	N	0	Р	Q	R	S
Month	Jan	F	eb	Mar	Apr	M	lay	Jun	Jul	A	ug	Sep	Oct	N	ov	Dec
Code	1		2	3	4		5	6	7	3	3	9	0	1	V	D



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

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

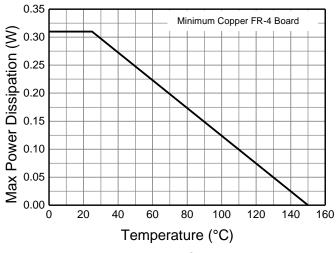
## Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	$P_{D}$	310	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{ heta JA}$	403	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

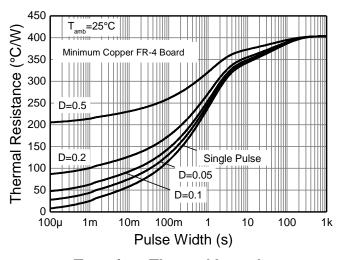
Note: 6. Mounted on FR-4 PC Board with minimum recommended pad layout.



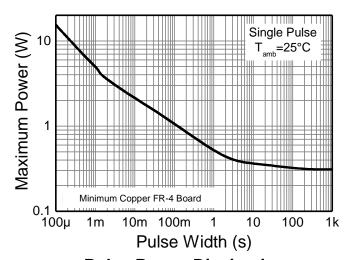
## **Thermal Characteristics and Derating Information**



# **Derating Curve**



**Transient Thermal Impedance** 



**Pulse Power Dissipation** 



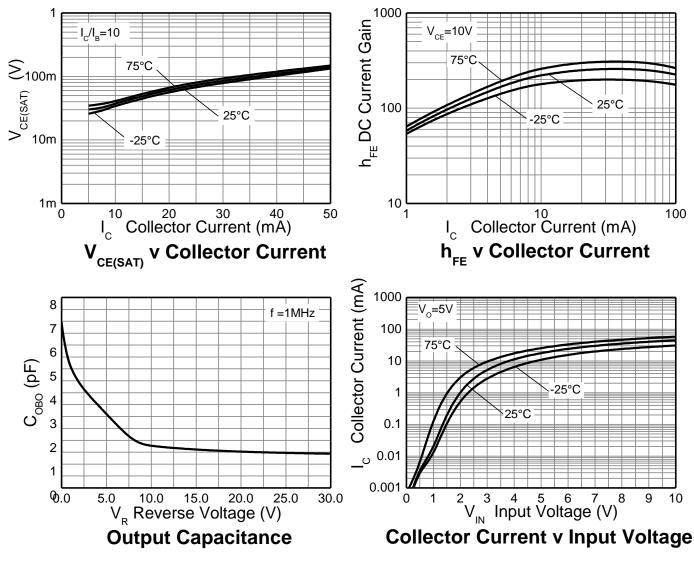
## **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

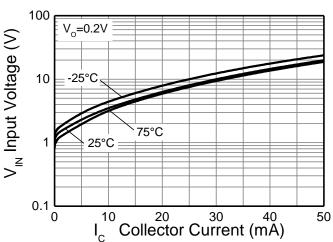
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Input Voltage	$V_{I(OFF)}$	-0.5	-1.1	_	<b>V</b>	$V_{CC} = -5V, I_{O} = -100\mu A$
Imput voltage	$V_{I(ON)}$	_	-1.9	-3	V	$V_O = -0.3V$ , $I_O = -2mA$
Output Voltage	V <sub>O(ON)</sub>	_	-0.1	-0.3	V	$I_{O}/I_{I} = -10 \text{mA}/-0.5 \text{mA}$
Input Current	l <sub>1</sub>	_		-0.18	mA	$V_I = -5V$
Output Current	I <sub>O(OFF)</sub>	_	_	-0.5	μΑ	$V_{CC} = -50V, V_{I} = 0V$
DC Current Gain	Gı	68	_	_	_	$V_0 = -5V, I_0 = -5mA$
Input Resistor Tolerance	$\Delta R_1$	-30	_	+30	%	_
Resistance Ratio Tolerance	$\Delta R_2/R_1$	-20	_	+20	%	_
Gain-Bandwidth Product (Note 7)	f <sub>T</sub>	_	250	_	MHz	$V_{CE} = -10V$ , $I_{E} = -5mA$ , $f = 100MHz$

Note: 7. Transistor - For Reference Only.



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





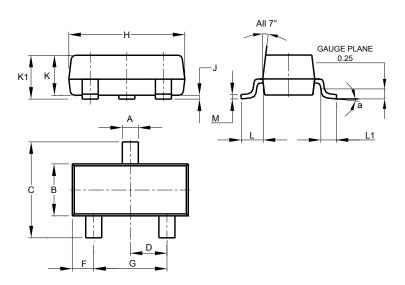
**Input Voltage v Collector Current** 



# **Package Outline Dimensions**

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

#### SOT23

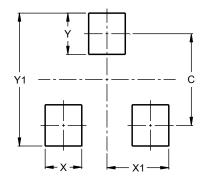


SOT23							
Dim	Min	Max	Тур				
Α	0.37	0.51	0.40				
В	1.20	1.40	1.30				
С	2.30	2.50	2.40				
D	0.89	1.03	0.915				
F	0.45	0.60	0.535				
G	1.78	2.05	1.83				
H	2.80	3.00	2.90				
7	0.013	0.10	0.05				
K	0.890	1.00	0.975				
K1	0.903	1.10	1.025				
L	0.45	0.61	0.55				
L1	0.25	0.55	0.40				
М	0.085	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			
Υ	0.9			
Y1	2.9			



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