



**THE DATASHEET OF  
DDA124EH-7**



**PNP PRE-BIASED SMALL SIGNAL DUAL SURFACE MOUNT TRANSISTOR**
**Features**

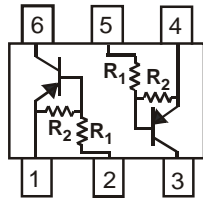
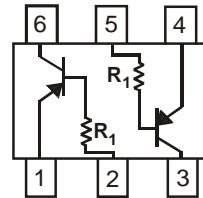
- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDC)
- Built-In Biasing Resistors
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

P/N	R1 (NOM)	R2 (NOM)
DDA124EH	22kΩ	22kΩ
DDA144EH	47kΩ	47kΩ
DDA143EH	4.7kΩ	4.7kΩ
DDA114YH	10kΩ	47kΩ
DDA123JH	2.2kΩ	47kΩ
DDA114EH	10kΩ	10kΩ
DDA143TH	4.7kΩ	—
DDA114TH	10kΩ	—

**Mechanical Data**

- Case: SOT563
- Case Material: Molded Plastic UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Terminal Connections: See Diagram
- Weight: 0.005 grams (Approximate)

SCHEMATIC DIAGRAM, TOP VIEW


 R<sub>1</sub>, R<sub>2</sub> Device Schematic

 R<sub>1</sub> Only Device Schematic

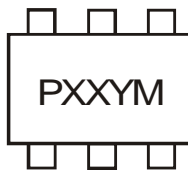
**Ordering Information** (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DDA124EH-7	AEC-Q101	P17	7	8	3,000
DDA144EH-7	AEC-Q101	P20	7	8	3,000
DDA143EH-7	AEC-Q101	P08	7	8	3,000
DDA114YH-7	AEC-Q101	P14	7	8	3,000
DDA123JH-7	AEC-Q101	P06	7	8	3,000
DDA114EH-7	AEC-Q101	P13	7	8	3,000
DDA143TH-7	AEC-Q101	P07	7	8	3,000
DDA114TH-7	AEC-Q101	P12	7	8	3,000

- 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](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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

**Marking Information**

SOT563



PXX = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: C = 2015  
 M = Month ex: 9 = September

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Code	C	D	E	F	G	H	I	J	K	L

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

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

Characteristic	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	-50	V
Input Voltage	V <sub>IN</sub>	+10 to -40 +10 to -40 +10 to -30 +6 to -40 +5 to -12 +10 to -40 +5V Max +5V Max	V
Output Current	I <sub>O</sub>	-30 -30 -100 -70 -100 -50 -100 -100	mA
Output Current	I <sub>C</sub> (Max)	-100	mA
Power Dissipation	P <sub>D</sub>	150	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	833	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Note: 5. Mounted on FR4 Board with recommended pad layout at <http://www.diodes.com/package-outlines.html>.

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$  unless otherwise specified.)

Characteristic (DDA143TH & DDA114TH only)	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	-50	—	—	V	$I_C = -50\mu\text{A}$
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	-50	—	—	V	$I_C = -1\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-5	—	—	V	$I_E = -50\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$	—	—	-0.5	$\mu\text{A}$	$V_{CB} = -50\text{V}$
Emitter Cut-Off Current	$I_{EBO}$	—	—	-0.5	$\mu\text{A}$	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	-0.3	V	$I_C/I_B = -2.5\text{mA} / -0.25\text{mA}$ DDA143TH $I_C/I_B = -1\text{mA} / -0.1\text{mA}$ DDA114TH
DC Current Transfer Ratio	$h_{FE}$	100	250	600	—	$I_C = -1\text{mA}$ , $V_{CE} = -5\text{V}$
Gain-Bandwidth Product*	$f_T$	—	250	—	MHz	$V_{CE} = -10\text{V}$ , $I_E = 5\text{mA}$ , $f = 100\text{MHz}$

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDA124EH DDA144EH DDA143EH DDA114YH DDA123JH DDA114EH	$V_{L(OFF)}$	-0.5 -0.5 -0.5 -0.3 -0.5 -0.5	-1.1 -1.1 -1.1 — — -1.1	—	V	$V_{CC} = -5\text{V}$ , $I_O = -100\mu\text{A}$
	DDA124EH DDA144EH DDA143EH DDA114YH DDA123JH DDA114EH	$V_{L(ON)}$	—	— — — — -1.9	-1.9 -1.9 -1.9 -1.4 -1.1 -3.0	V	$V_O = -0.3\text{V}$ , $I_O = -5\text{mA}$ $V_O = -0.3\text{V}$ , $I_O = -2\text{mA}$ $V_O = -0.3\text{V}$ , $I_O = -20\text{mA}$ $V_O = -0.3\text{V}$ , $I_O = -1\text{mA}$ $V_O = -0.3\text{V}$ , $I_O = -5\text{mA}$ $V_O = -0.3\text{V}$ , $I_O = -10\text{mA}$
Output Voltage	DDA124EH DDA144EH DDA143EH DDA114YH DDA123JH DDA114EH	$V_{O(ON)}$	—	-0.1	-0.3	V	$I_O/I_L = -10\text{mA} / -0.5\text{mA}$ $I_O/I_L = -10\text{mA} / -0.5\text{mA}$ $I_O/I_L = -10\text{mA} / -0.5\text{mA}$ $I_O/I_L = -5\text{mA} / -0.25\text{mA}$ $I_O/I_L = -5\text{mA} / -0.25\text{mA}$ $I_O/I_L = -10\text{mA} / -0.5\text{mA}$
Input Current	DDA124EH DDA144EH DDA143EH DDA114YH DDA123JH DDA114EH	$I_L$	—	—	-0.36 -0.18 -1.8 -0.88 -3.6 -0.88	mA	$V_I = -5\text{V}$
Output Current		$I_{O(OFF)}$	—	—	-0.5	$\mu\text{A}$	$V_{CC} = -50\text{V}$ , $V_I = -0\text{V}$
DC Current Gain	DDA124EH DDA144EH DDA143EH DDA114YH DDA123JH DDA114EH	$G_L$	56 68 20 68 80 30	—	—	—	$V_O = -5\text{V}$ , $I_O = -5\text{mA}$ $V_O = -5\text{V}$ , $I_O = -5\text{mA}$ $V_O = -5\text{V}$ , $I_O = -10\text{mA}$ $V_O = -5\text{V}$ , $I_O = -10\text{mA}$ $V_O = -5\text{V}$ , $I_O = -10\text{mA}$ $V_O = -5\text{V}$ , $I_O = -5\text{mA}$
Gain-Bandwidth Product*		$f_T$	—	250	—	MHz	$V_{CE} = -10\text{V}$ , $I_E = -5\text{mA}$ , $f = 100\text{MHz}$

\* Transistor - For Reference Only

**Typical Curves - DDA143EH**

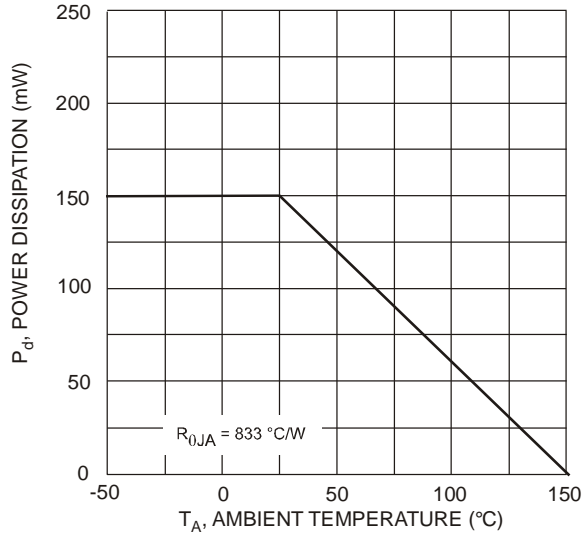


Fig. 1 Derating Curve

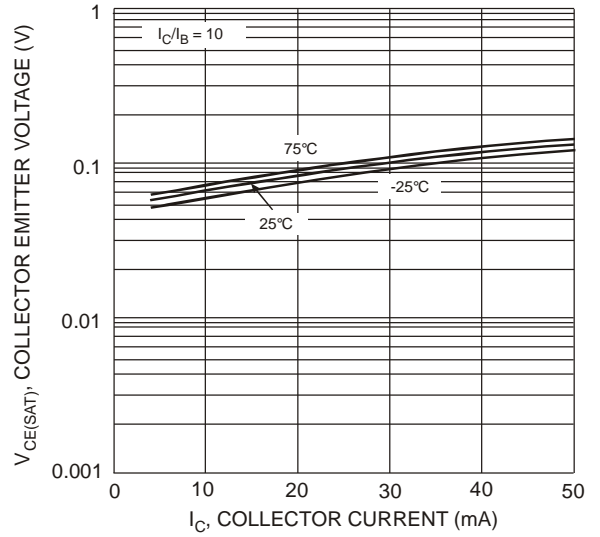


Fig. 2 V<sub>CE(SAT)</sub> vs. I<sub>C</sub>

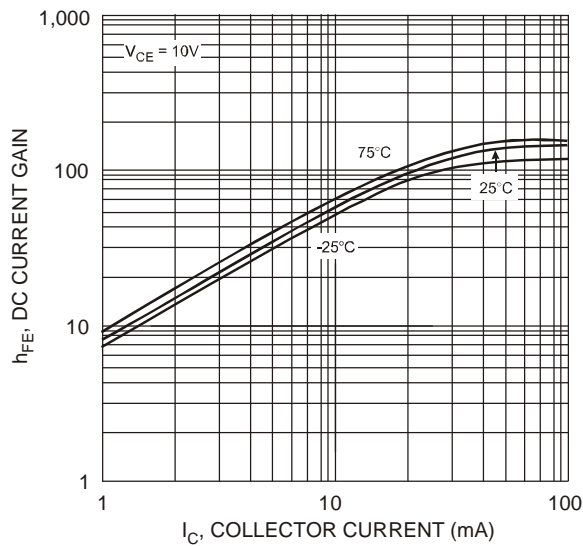


Fig. 3 DC Current Gain

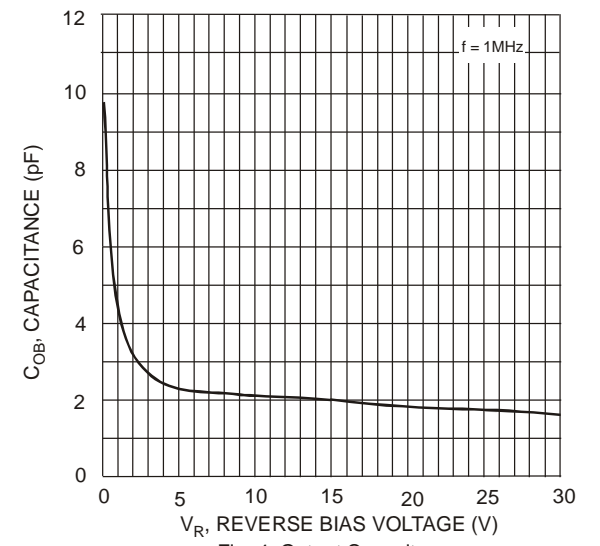


Fig. 4 Output Capacitance

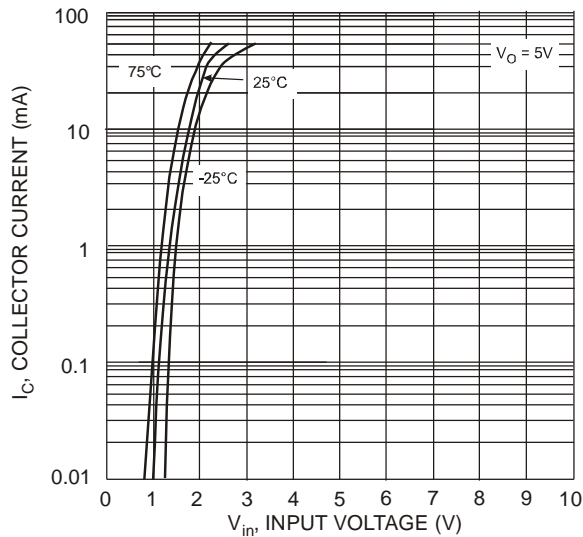


Fig. 5 Collector Current vs. Input Voltage

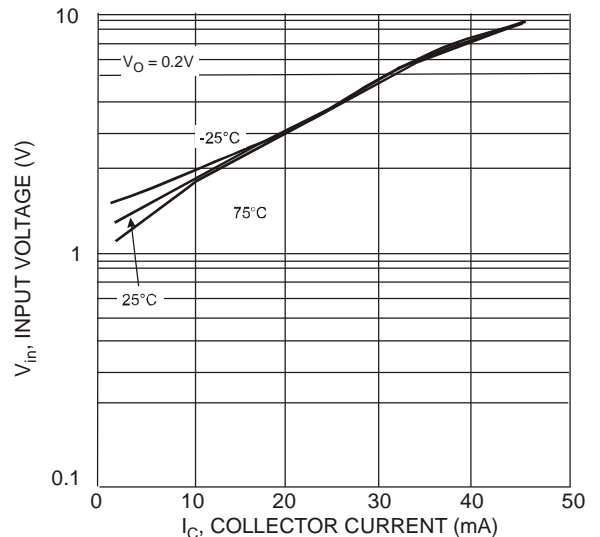
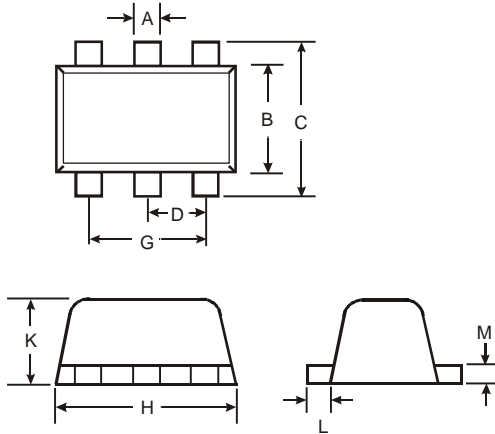


Fig. 6 Input Voltage vs. Collector Current

## Package Outline Dimensions

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

SOT563

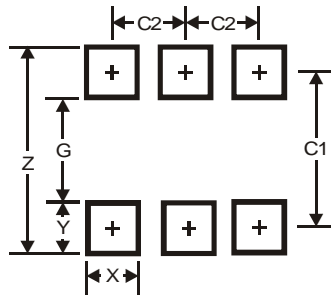


SOT563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

## Suggested Pad Layout

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

SOT563



Dimensions	Value (in mm)
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

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