

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

**Features**

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

Part Number	R1 (NOM)	R2 (NOM)
DDA124EU	22KΩ	22KΩ
DDA144EU	47KΩ	47KΩ
DDA114YU	10KΩ	47KΩ
DDA123JU	2.2KΩ	47KΩ
DDA114EU	10KΩ	10KΩ

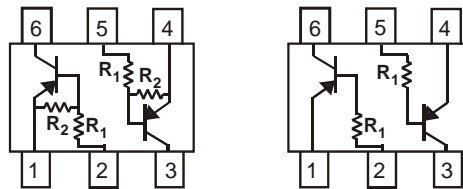
**Mechanical Data**

- Case: SOT363
- Case material: Molded Plastic. "Green" Molding Compound.
- Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.006 grams (approximate)

Part Number	R1 Only
DDA113TU	1KΩ
DDA143TU	4.7KΩ
DDA114TU	10KΩ



Top View



R1, R2

R1 Only

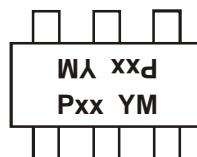
Device Schematic

**Ordering Information** (Notes 3 & 4)

Product	Grade	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDA124EU-7-F	Commercial	P17	7	8	3,000
DDA124EUQ-7-F	Automotive	P17	7	8	3,000
DDA124EUQ-13-F	Automotive	P17	13	8	10,000
DDA144EU-7-F	Commercial	P20	7	8	3,000
DDA144EUQ-7-F	Automotive	P20	7	8	3,000
DDA114YU-7-F	Commercial	P14	7	8	3,000
DDA114YUQ-7-F	Automotive	P14	7	8	3,000
DDA123JU-7-F	Commercial	P06	7	8	3,000
DDA114EU-7-F	Commercial	P13	7	8	3,000
DDA114EUQ-7-F	Automotive	P13	7	8	3,000
DDA113TU-7-F	Commercial	P01	7	8	3,000
DDA143TU-7-F	Commercial	P07	7	8	3,000
DDA143TUQ-7-F	Automotive	P07	7	8	3,000
DDA143TUQ-13-F	Automotive	P07	13	8	10,000
DDA114TU-7-F	Commercial	P12	7	8	3,000
DDA114TUQ-7-F	Automotive	P12	7	8	3,000
DDA114TUQ-13-F	Automotive	P12	13	8	10,000

- Notes:
1. No purposefully added lead.
  2. Diodes Inc's "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.
  4. Products with Q-suffix are automotive grade. Automotive products are electrical and thermal the same as the commercial, except where specified.

**Marking Information**



Pxx = Product Type Marking Code (See Ordering Information)  
 YM = Date Code Marking  
 Y = Year (ex: T = 2006)  
 M = Month (ex: 9 = September)

Date Code Key

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E

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 (1) to (6) and (4) to (3)		V <sub>CC</sub>	-50	V
Input Voltage (1) to (2) and (4) to (5)	DDA124EU	V <sub>IN</sub>	+10 to -40	V
	DDA144EU		+10 to -40	
	DDA114YU		+6 to -40	
	DDA123JU		+5 to -12	
	DDA114EU		+10 to -40	
	DDA113TU		+5V max	
	DDA143TU		+5V max	
Output Current	DDA124EU	I <sub>O</sub>	-30	mA
	DDA144EU		-30	
	DDA114YU		-70	
	DDA123JU		-100	
	DDA114EU		-50	
	DDA113TU		-100	
	DDA143TU		-100	
DDA114TU	-100			
Output Current		I <sub>C(MAX)</sub>	-100	mA

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	200	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Notes: 5. Mounted on FR4 PC Board with minimum recommended pad layout

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic (DDA113TU & DDA143TU & DDA114TU only)	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-50	---	---	V	I <sub>C</sub> = -50μA
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	-50	---	---	V	I <sub>C</sub> = -1mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5	---	---	V	I <sub>E</sub> = -50μA
Collector Cutoff Current	I <sub>CBO</sub>	---	---	-0.5	μA	V <sub>CB</sub> = -50V
Emitter Cutoff Current	I <sub>EBO</sub>	---	---	-0.5	μA	V <sub>EB</sub> = -4V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	---	---	-0.3	V	I <sub>C</sub> /I <sub>B</sub> = -2.5mA / -0.25mA DDA143TU I <sub>C</sub> /I <sub>B</sub> = -1mA / -0.1mA DDA114TU I <sub>C</sub> /I <sub>B</sub> = -10mA / -1mA DDA113TU
DC Current Transfer Ratio	h <sub>FE</sub>	100 160	250 -	600 -	---	I <sub>C</sub> = -1mA, V <sub>CE</sub> = -5V I <sub>C</sub> = -1mA, V <sub>CE</sub> = -5V DDA143TUQ
Input Resistor (R <sub>1</sub> ) Tolerance	ΔR <sub>1</sub>	-30	---	+30	%	---
Gain-Bandwidth Product (Note 6)	f <sub>T</sub>	---	250	---	MHZ	V <sub>CE</sub> = -10V, I <sub>E</sub> = 5mA, f = 100MHZ

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
Input Voltage	V <sub>I(off)</sub>	DDA124EU	-0.5	-1.1	---	V	V <sub>CC</sub> = -5V, I <sub>O</sub> = -100μA
		DDA144EU	-0.5	-1.1			
DDA114YU		-0.3	---				
DDA123JU		-0.5	---				
DDA114EU		-0.5	-1.1				
Input Voltage	V <sub>I(on)</sub>	DDA124EU	---	-1.9	-3.0	V	V <sub>O</sub> = -0.3, I <sub>O</sub> = -5mA V <sub>O</sub> = -0.3, I <sub>O</sub> = -2mA V <sub>O</sub> = -0.3, I <sub>O</sub> = -1mA V <sub>O</sub> = -0.3, I <sub>O</sub> = -5mA V <sub>O</sub> = -0.3, I <sub>O</sub> = -10mA
		DDA144EU	---	-1.9	-3.0		
		DDA114YU	---	---	-1.4		
		DDA123JU	---	---	-1.1		
		DDA114EU	---	-1.9	-3.0		
Output Voltage	V <sub>O(on)</sub>	---	-0.1	-0.3	V	I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA I <sub>O</sub> /I <sub>I</sub> = -5mA / -0.25mA I <sub>O</sub> /I <sub>I</sub> = -5mA / -0.25mA I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA	
Input Current	I <sub>I</sub>	---	---	-0.36 -0.18 -0.88 -3.6 -0.88	mA	V <sub>I</sub> = -5V	
Output Current	I <sub>O(off)</sub>	---	---	-0.5	μA	V <sub>CC</sub> = -50V, V <sub>I</sub> = -0V	
DC Current Gain	G <sub>I</sub>	56 60 68 68 80 30	---	---	---	V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA	
Input Resistor (R <sub>1</sub> ) Tolerance	ΔR <sub>1</sub>	-30	---	+30	%	---	
Resistance Ratio Tolerance	R <sub>2</sub> /R <sub>1</sub>	-20	---	+20	%	---	
Gain-Bandwidth Product	f <sub>T</sub>	---	250	---	MHZ	V <sub>CE</sub> = -10V, I <sub>E</sub> = -5mA, f = 100MHZ	

Notes: 6. Transistor - For Reference Only

**Typical Curves – DDA123JU**

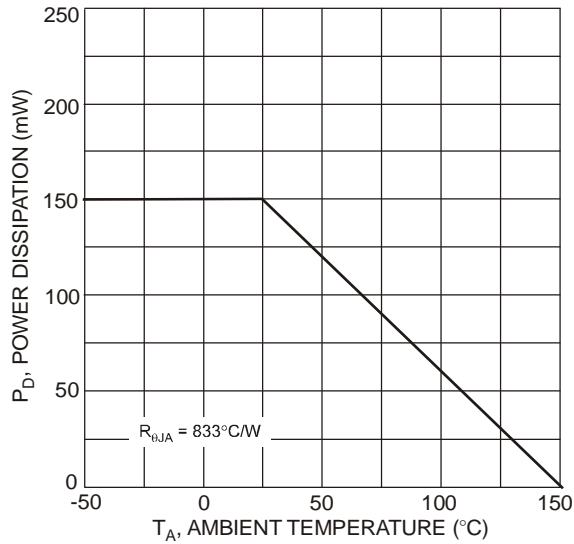


Fig. 1 Power Dissipation vs. Ambient Temperature

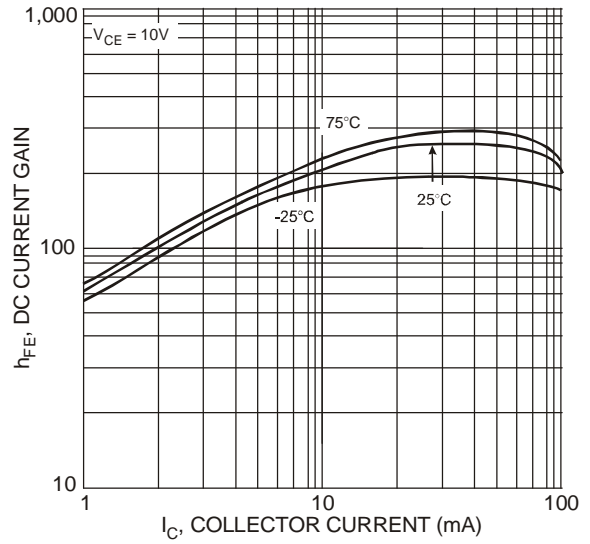


Fig. 2 Typical DC Current Gain vs. Collector Current

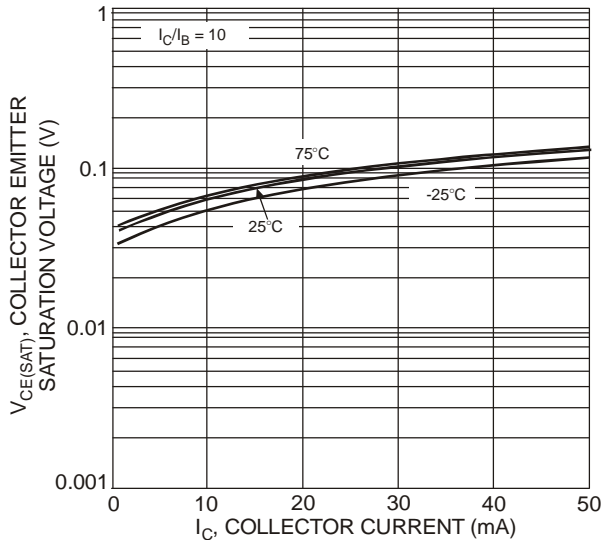


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

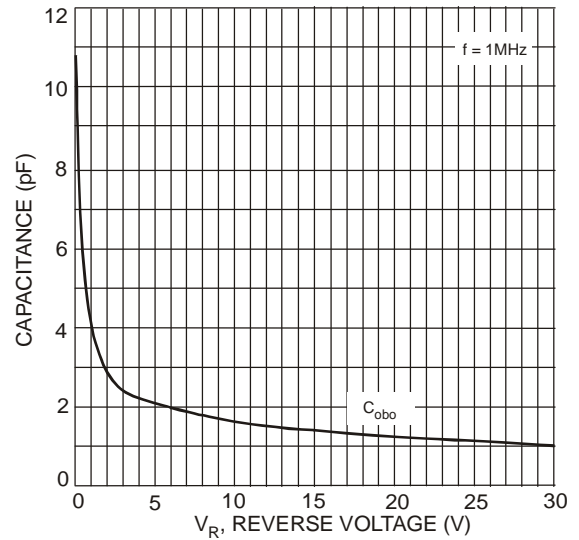


Fig. 4 Typical Capacitance Characteristics

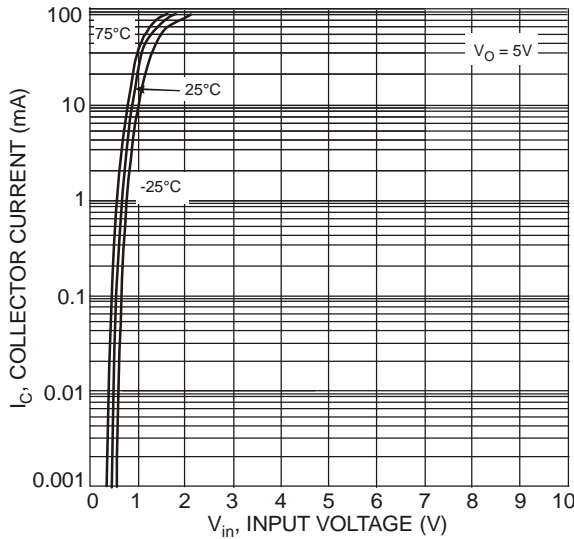


Fig. 5 Collector Current vs. Input Voltage

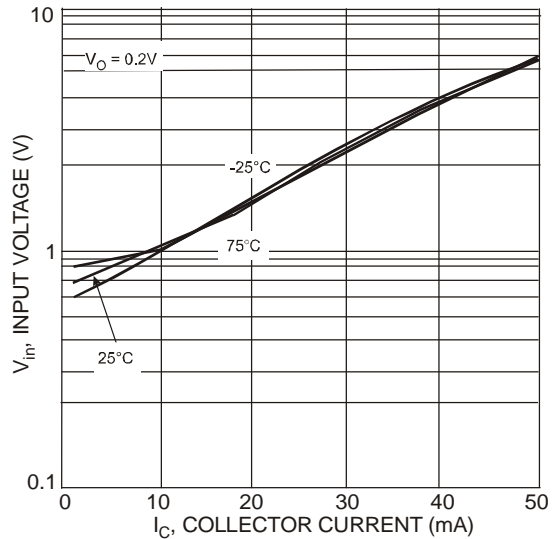


Fig. 6 Input Voltage vs. Collector Current

**Typical Curves – DDA114TU**

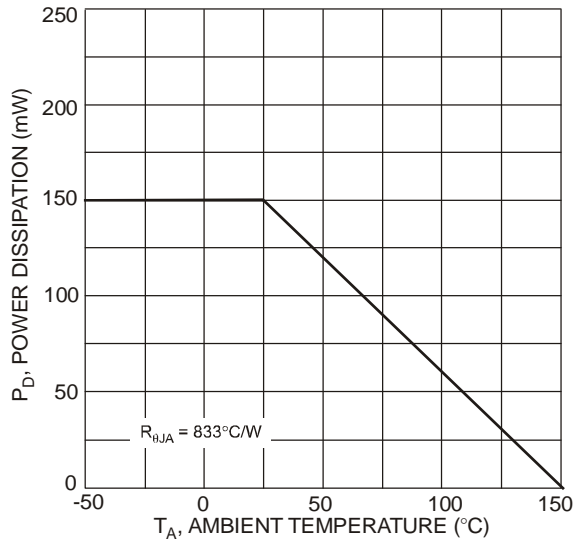


Fig. 1 Power Dissipation vs. Ambient Temperature

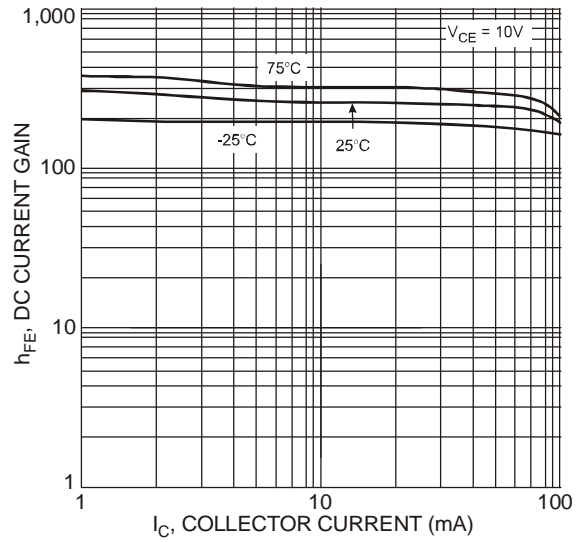


Fig. 2 Typical DC Current Gain vs. Collector Current

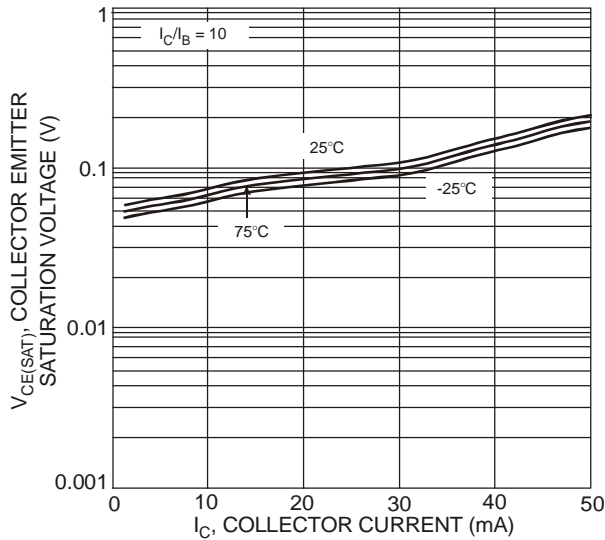


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

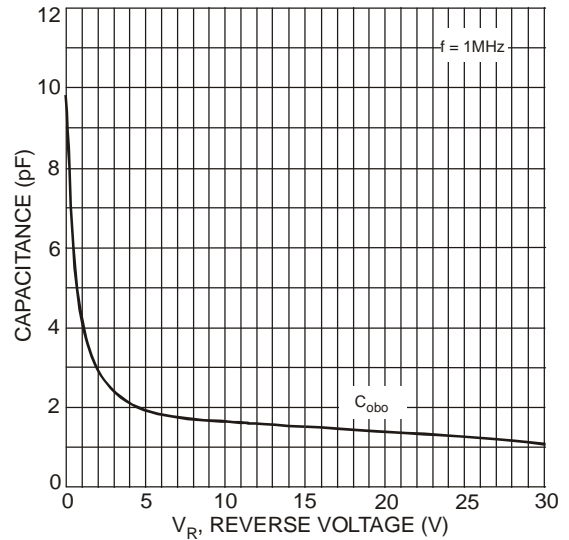


Fig. 4 Typical Capacitance Characteristics

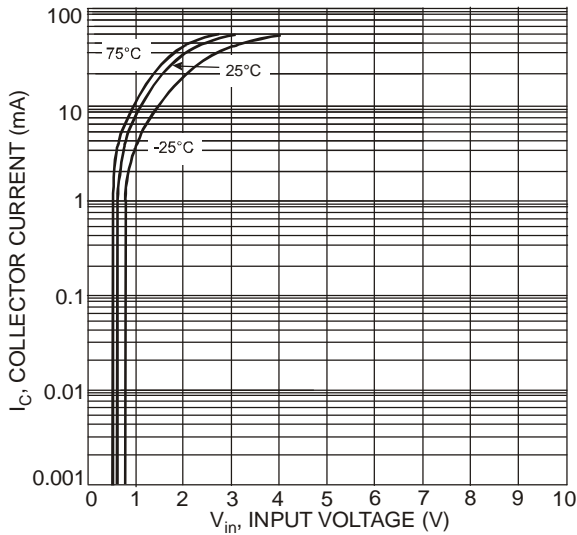


Fig. 5 Collector Current vs. Input Voltage

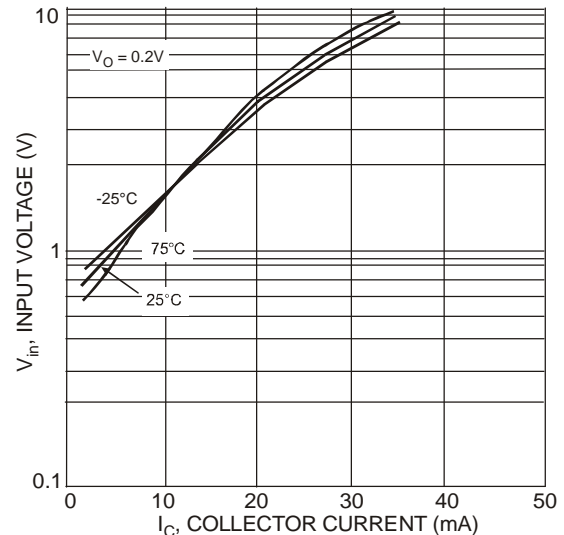
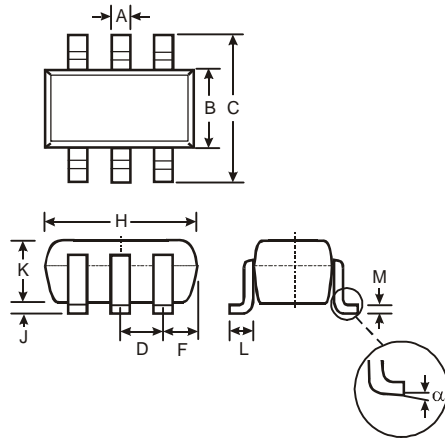


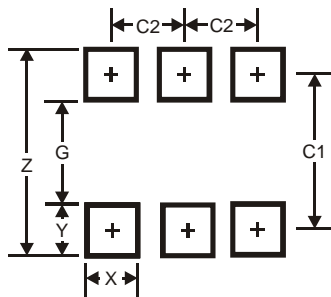
Fig. 6 Input Voltage vs. Collector Current

**Package Outline Dimensions**



SOT363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Typ	
F	0.40	0.45
H	1.80	2.20
J	0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.22
α	0°	8°
All Dimensions in mm		

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

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