

PNP PRE-BIASED SMALL SIGNAL DUAL SURFACE MOUNT TRANSISTOR

Features

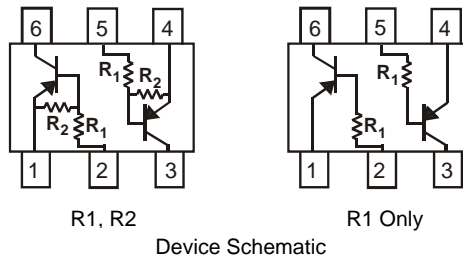
- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDC)
- Built-In Biasing Resistors
- "Lead Free", RoHS Compliant (Note 1)
- Halogen and Antimony Free "Green" Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

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

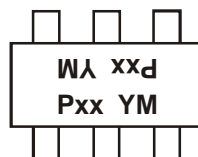


Ordering Information (Notes 3 & 4)

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_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Supply Voltage (1) to (6) and (4) to (3)		V _{CC}	-50	V
Input Voltage (1) to (2) and (4) to (5)	DDA124EU	V _{IN}	+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 _O	-30	mA
	DDA144EU		-30	
	DDA114YU		-70	
	DDA123JU		-100	
	DDA114EU		-50	
	DDA113TU		-100	
	DDA143TU		-100	
DDA114TU	-100			
Output Current		I _{C(MAX)}	-100	mA

Thermal Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	200	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R _{θJA}	625	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic (DDA113TU & DDA143TU & DDA114TU 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 Cutoff Current	I_{CBO}	---	---	-0.5	μA	$V_{CB} = -50\text{V}$
Emitter Cutoff Current	I_{EBO}	---	---	-0.5	μA	$V_{EB} = -4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	---	---	-0.3	V	$I_C/I_B = -2.5\text{mA} / -0.25\text{mA}$ DDA143TU $I_C/I_B = -1\text{mA} / -0.1\text{mA}$ DDA114TU $I_C/I_B = -10\text{mA} / -1\text{mA}$ DDA113TU
DC Current Transfer Ratio	h_{FE}	100 160	250 -	600 -	---	$I_C = -1\text{mA}, V_{CE} = -5\text{V}$ $I_C = -1\text{mA}, V_{CE} = -5\text{V}$ DDA143TUQ
Input Resistor (R_1) Tolerance	ΔR_1	-30	---	+30	%	---
Gain-Bandwidth Product (Note 6)	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	$V_{I(off)}$	DDA124EU	-0.5	-1.1	---	V	$V_{CC} = -5\text{V}, I_O = -100\mu\text{A}$
		DDA144EU	-0.5	-1.1			
DDA114YU		-0.3	---				
DDA123JU		-0.5	---				
DDA114EU		-0.5	-1.1				
Input Voltage	$V_{I(on)}$	DDA124EU	---	-1.9	-3.0	$V_O = -0.3, I_O = -5\text{mA}$	
		DDA144EU	---	-1.9	-3.0	$V_O = -0.3, I_O = -2\text{mA}$	
		DDA114YU	---	---	-1.4	$V_O = -0.3, I_O = -1\text{mA}$	
		DDA123JU	---	---	-1.1	$V_O = -0.3, I_O = -5\text{mA}$	
		DDA114EU	---	-1.9	-3.0	$V_O = -0.3, I_O = -10\text{mA}$	
Output Voltage	$V_{O(on)}$	---	-0.1	-0.3	V	$I_O/I_I = -10\text{mA} / -0.5\text{mA}$ $I_O/I_I = -10\text{mA} / -0.5\text{mA}$ $I_O/I_I = -5\text{mA} / -0.25\text{mA}$ $I_O/I_I = -5\text{mA} / -0.25\text{mA}$ $I_O/I_I = -10\text{mA} / -0.5\text{mA}$	
Input Current	I_I	---	---	-0.36 -0.18 -0.88 -3.6 -0.88	mA	$V_I = -5\text{V}$	
Output Current	$I_{O(off)}$	---	---	-0.5	μA	$V_{CC} = -50\text{V}, V_I = -0\text{V}$	
DC Current Gain	G_I	56 60 68 68 80 30	---	---	---	$V_O = -5\text{V}, I_O = -5\text{mA}$ $V_O = -5\text{V}, I_O = -5\text{mA}$ $V_O = -5\text{V}, I_O = -5\text{mA}$ $V_O = -5\text{V}, I_O = -10\text{mA}$ $V_O = -5\text{V}, I_O = -10\text{mA}$ $V_O = -5\text{V}, I_O = -5\text{mA}$	
Input Resistor (R_1) Tolerance	ΔR_1	-30	---	+30	%	---	
Resistance Ratio Tolerance	R_2/R_1	-20	---	+20	%	---	
Gain-Bandwidth Product	f_T	---	250	---	MHZ	$V_{CE} = -10\text{V}, I_E = -5\text{mA}, f = 100\text{MHZ}$	

Notes: 6. Transistor - For Reference Only

Typical Curves – DDA123JU

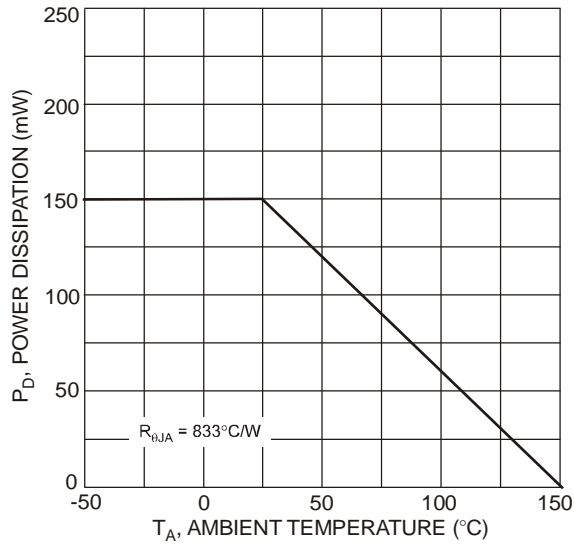


Fig. 1 Power Dissipation vs. Ambient Temperature

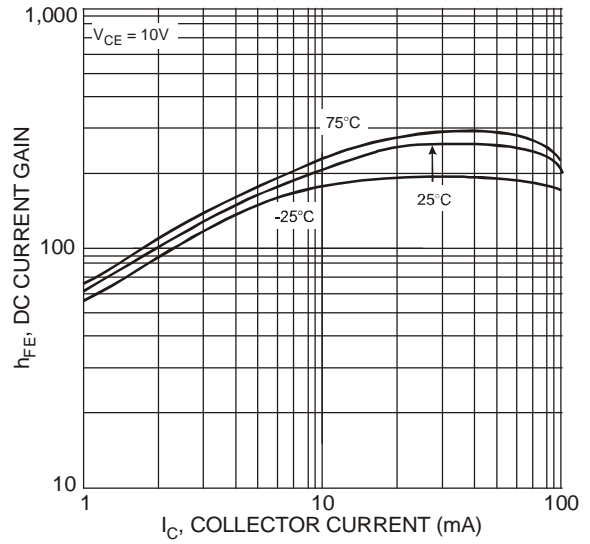


Fig. 2 Typical DC Current Gain vs. Collector Current

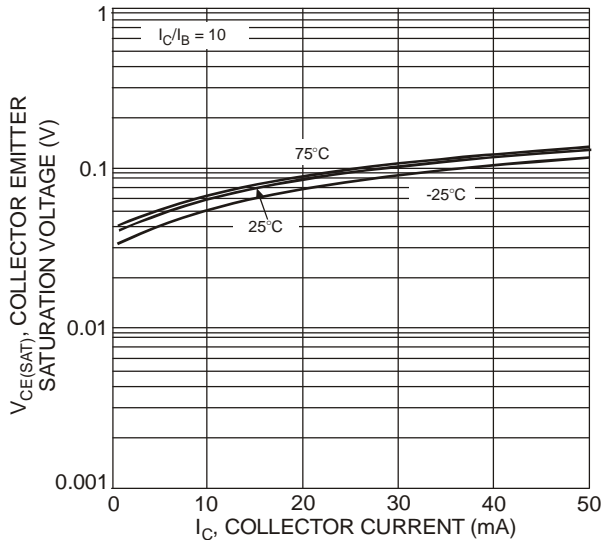


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

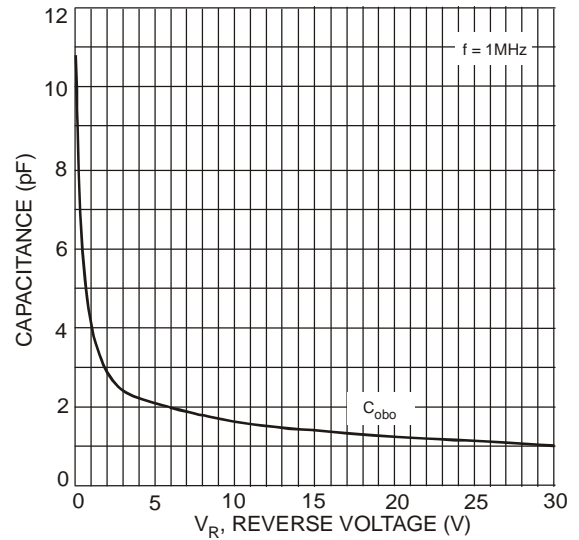


Fig. 4 Typical Capacitance Characteristics

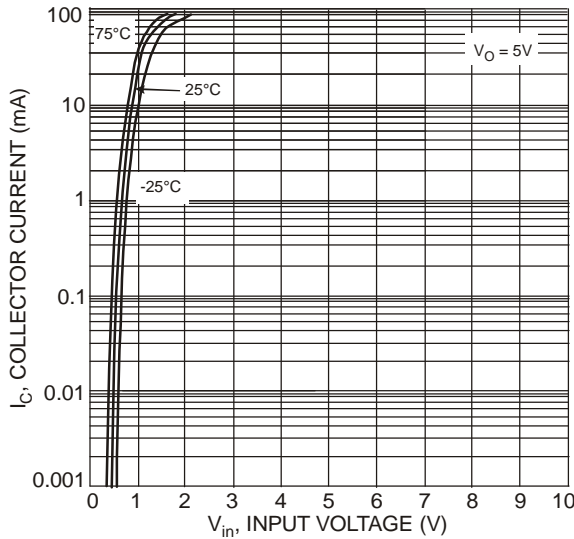


Fig. 5 Collector Current vs. Input Voltage

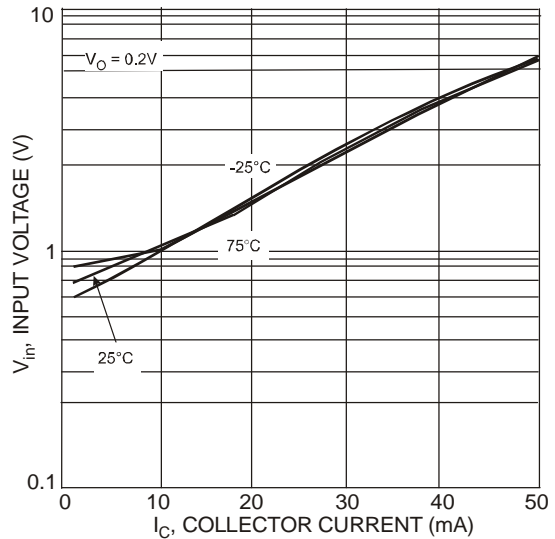


Fig. 6 Input Voltage vs. Collector Current

Typical Curves – DDA114TU

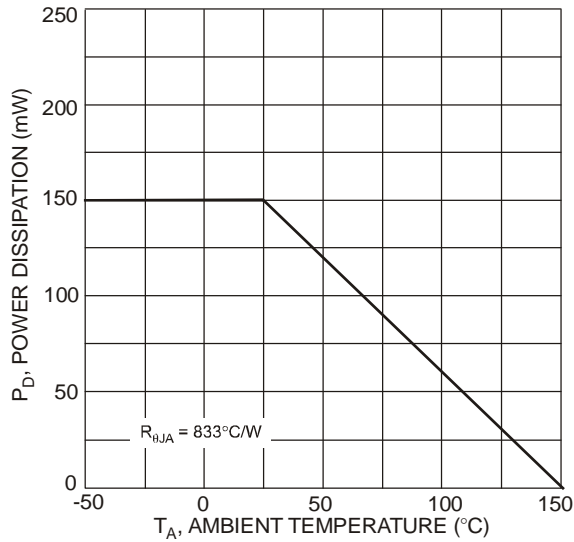


Fig. 1 Power Dissipation vs. Ambient Temperature

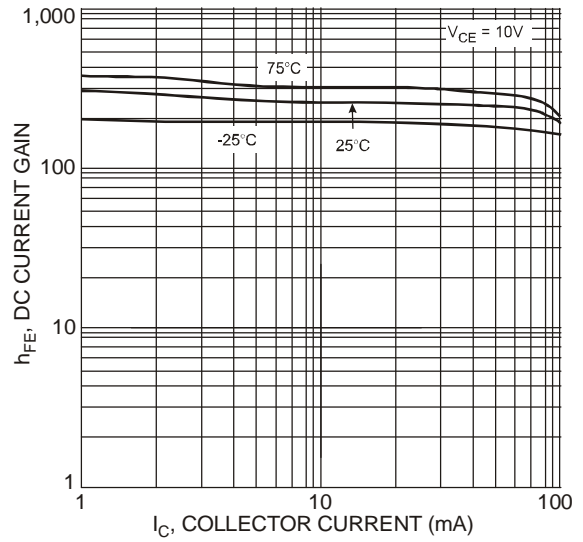


Fig. 2 Typical DC Current Gain vs. Collector Current

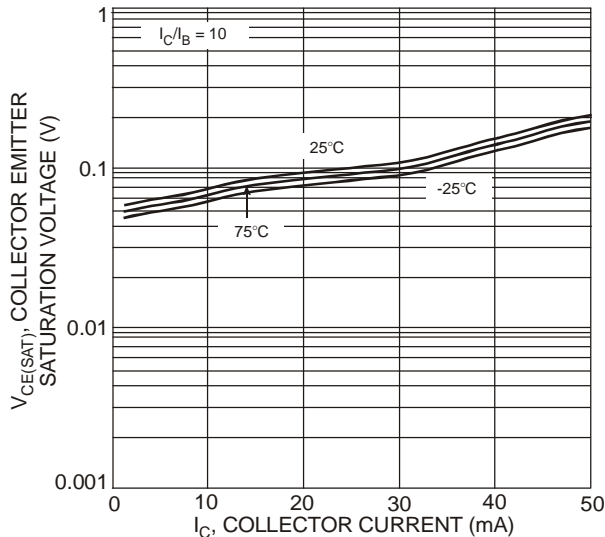


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

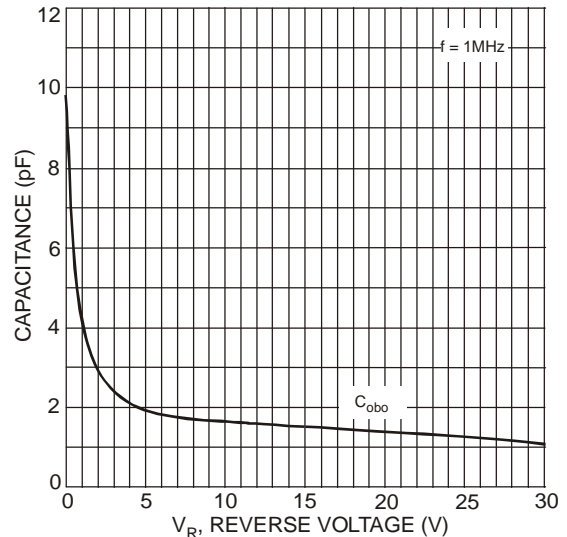


Fig. 4 Typical Capacitance Characteristics

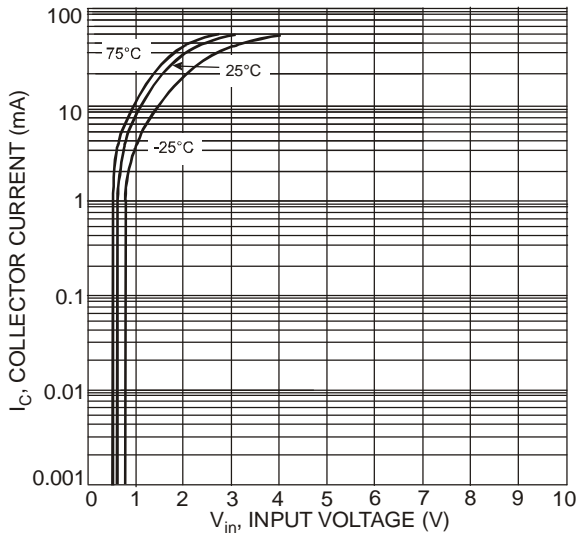


Fig. 5 Collector Current vs. Input Voltage

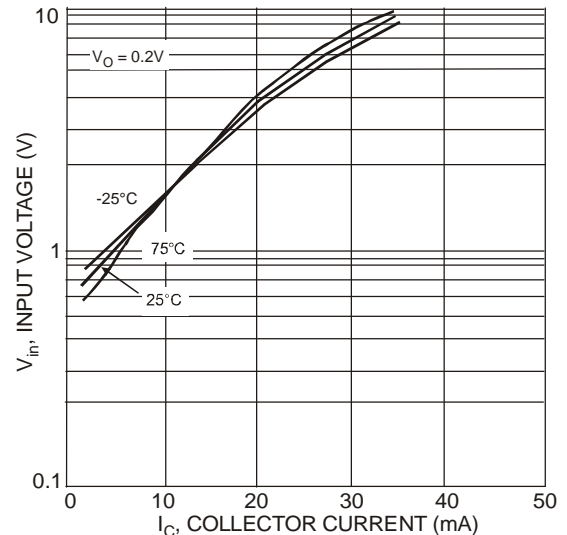
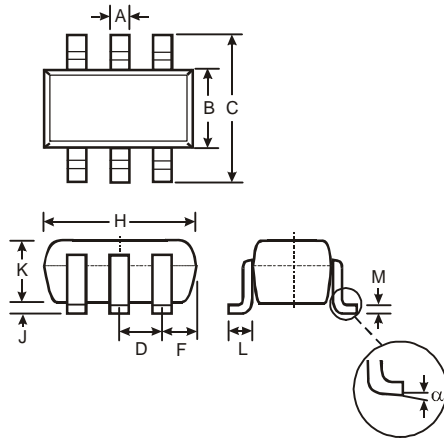


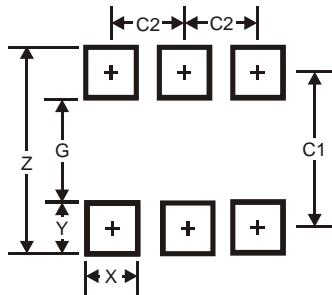
Fig. 6 Input Voltage vs. Collector Current

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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