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**

Mechanical Data

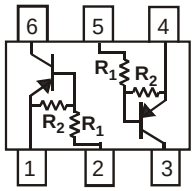
- Case: SOT363
- Case material: Molded Plastic. "Green" Molding Compound.
- Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.006 grams (approximate)

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

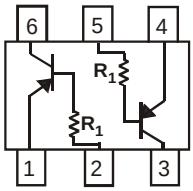
Part Number	R1 Only
DDA113TU	1KΩ
DDA143TU	4.7KΩ
DDA114TU	10KΩ

SOT363

Top View



R1, R2



R1 Only

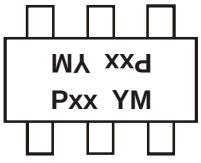
Device Schematic

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_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	
	DDA114TU		+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)	$R_{\theta JA}$	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°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 = -50μA
Collector-Emitter Breakdown Voltage	BV_{CEO}	-50	—	—	V	I_C = -1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	I_E = -50μA
Collector Cutoff Current	I_{CBO}	—	—	-0.5	μA	V_{CB} = -50V
Emitter Cutoff Current	I_{EBO}	—	—	-0.5	μA	V_{EB} = -4V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-0.3	V	I_C/I_B = -2.5mA / -0.25mA DDA143TU I_C/I_B = -1mA / -0.1mA DDA114TU I_C/I_B = -10mA / -1mA DDA113TU
DC Current Transfer Ratio	h_{FE}	100 160	250 -	600 -	—	I_C = -1mA, V_{CE} = -5V I_C = -1mA, V_{CE} = -5V DDA143TUQ
Input Resistor (R_1) Tolerance	ΔR_1	-30	—	+30	%	—
Gain-Bandwidth Product (Note 6)	f_T	—	250	—	MHz	V_{CE} = -10V, I_E = 5mA, f = 100MHz

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDA124EU DDA144EU DDA114YU DDA123JU DDA114EU	$V_{I(off)}$	-0.5 -0.5 -0.3 -0.5 -0.5	-1.1 -1.1 — — -1.1	—	V	V_{CC} = -5V, I_O = -100μA
	DDA124EU DDA144EU DDA114YU DDA123JU DDA114EU	$V_{I(on)}$	—	-1.9 -1.9 — — –1.9	-3.0 -3.0 -1.4 -1.1 -3.0		V_O = -0.3, I_O = -5mA V_O = -0.3, I_O = -2mA V_O = -0.3, I_O = -1mA V_O = -0.3, I_O = -5mA V_O = -0.3, I_O = -10mA
Output Voltage	DDA124EU DDA144EU DDA114YU DDA123JU DDA114EU	$V_{O(on)}$	—	-0.1	-0.3	V	I_O/I_I = -10mA / -0.5mA I_O/I_I = -10mA / -0.5mA I_O/I_I = -5mA / -0.25mA I_O/I_I = -5mA / -0.25mA I_O/I_I = -10mA / -0.5mA
Input Current	DDA124EU DDA144EU DDA114YU DDA123JU DDA114EU	I_I	—	—	-0.36 -0.18 -0.88 -3.6 -0.88	mA	V_I = -5V
Output Current		$I_{O(off)}$	—	—	-0.5	μA	V_{CC} = -50V, V_I = -0V
DC Current Gain	DDA124EU DDA124EUQ DDA144EU DDA114YU DDA123JU DDA114EU	G_I	56 60 68 68 80 30	—	—	—	V_O = -5V, I_O = -5mA V_O = -5V, I_O = -5mA V_O = -5V, I_O = -5mA V_O = -5V, I_O = -10mA V_O = -5V, I_O = -10mA V_O = -5V, I_O = -5mA
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} = -10V, I_E = -5mA, f = 100MHz

Notes: 6. Transistor - For Reference Only

Typical Curves – DDA123JU

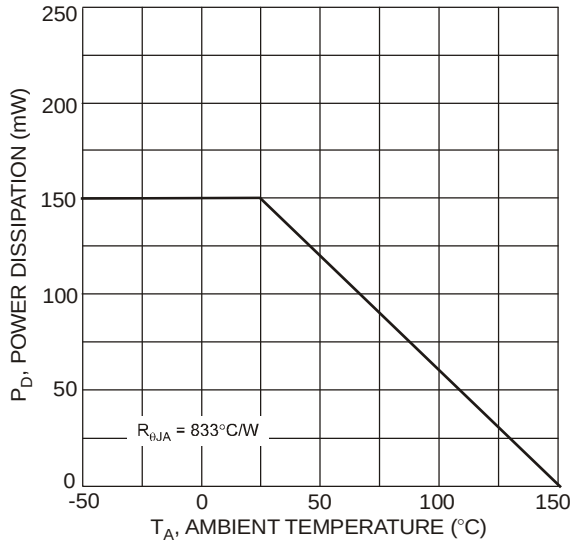


Fig. 1 Power Dissipation vs. Ambient Temperature

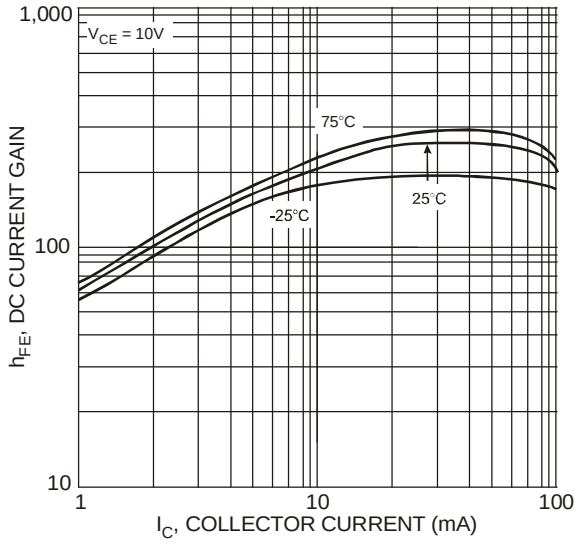


Fig. 2 Typical DC Current Gain vs. Collector Current

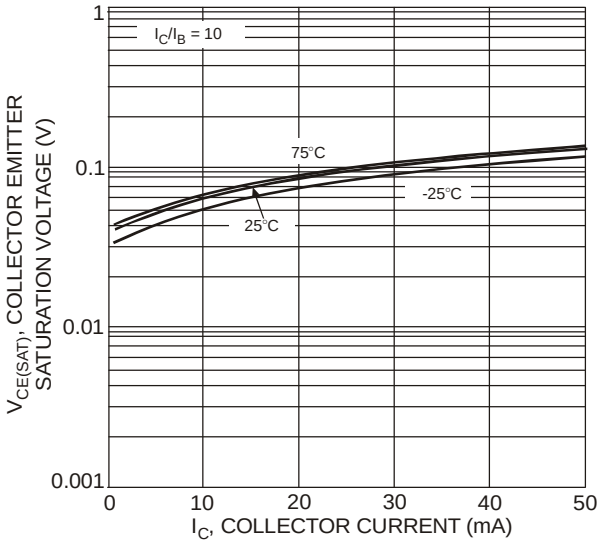


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

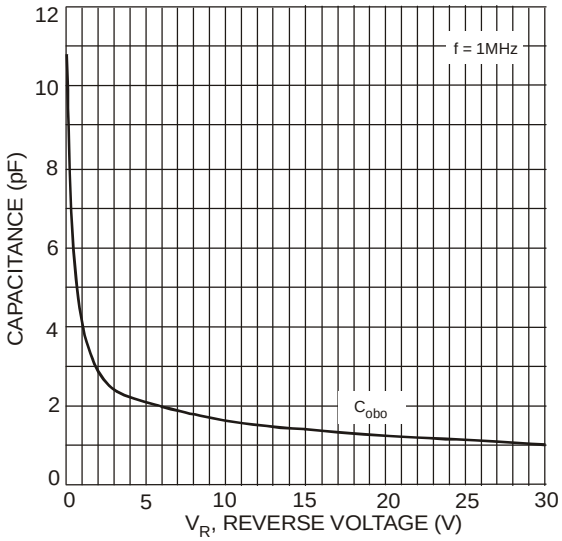


Fig. 4 Typical Capacitance Characteristics

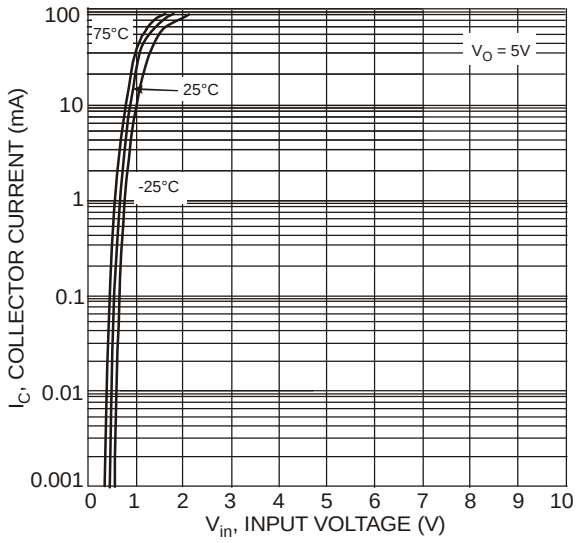


Fig. 5 Collector Current vs. Input Voltage

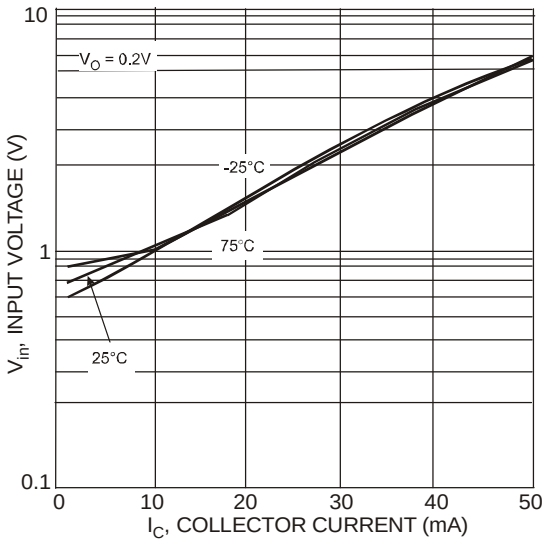


Fig. 6 Input Voltage vs. Collector Current

Typical Curves – DDA114TU

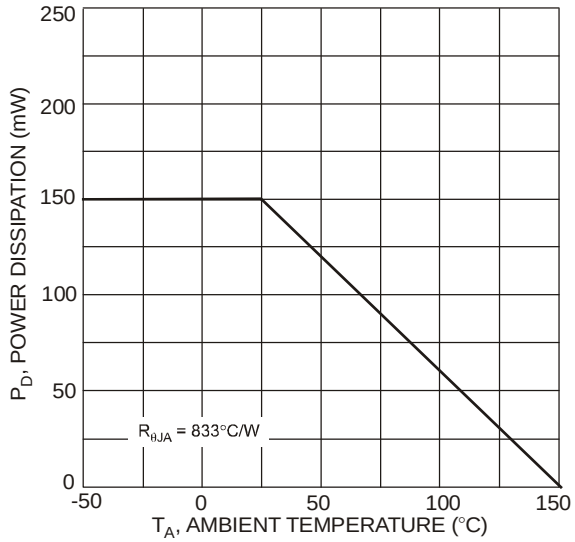


Fig. 1 Power Dissipation vs. Ambient Temperature

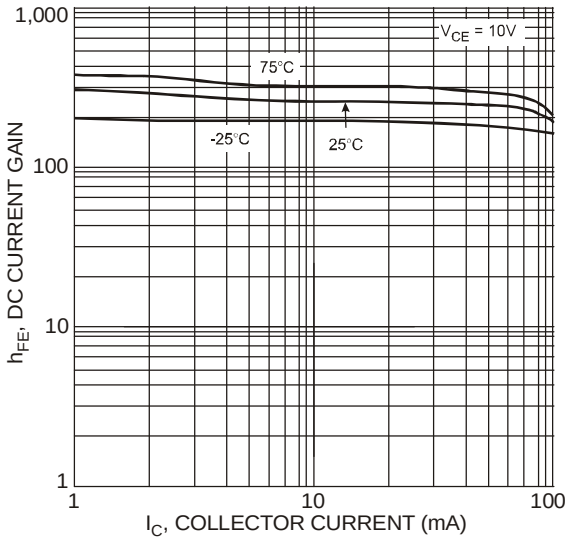


Fig. 2 Typical DC Current Gain vs. Collector Current

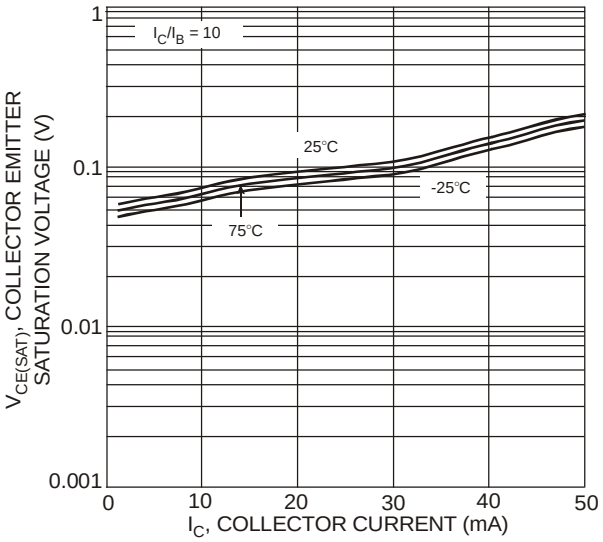


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

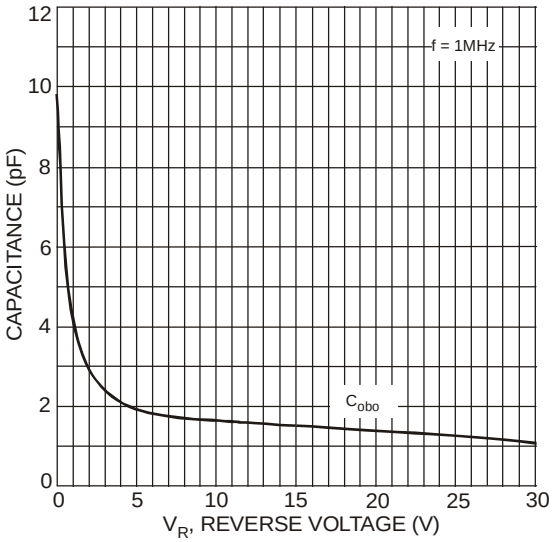


Fig. 4 Typical Capacitance Characteristics

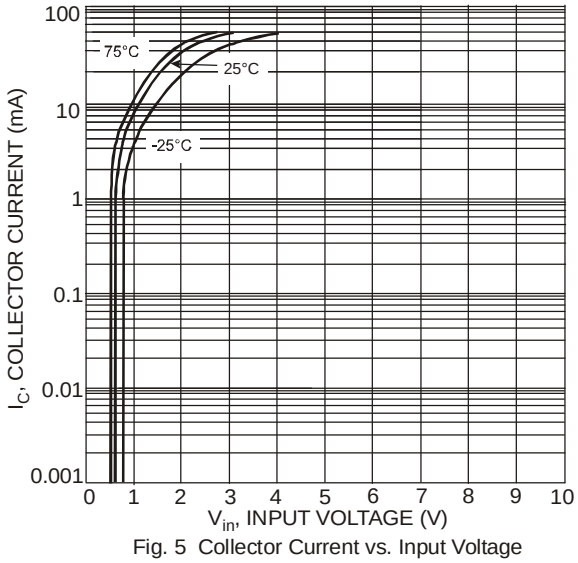


Fig. 5 Collector Current vs. Input Voltage

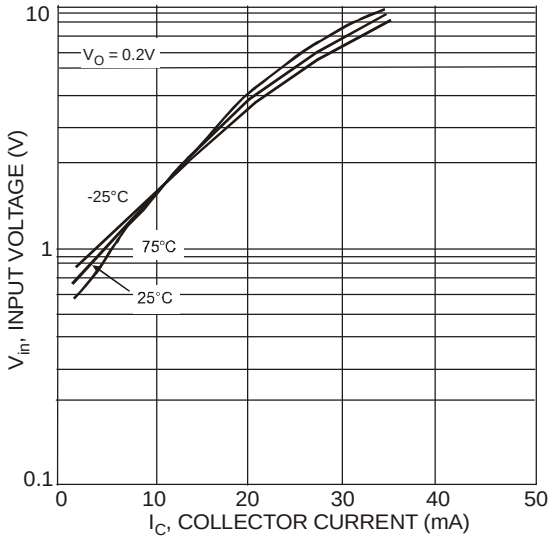
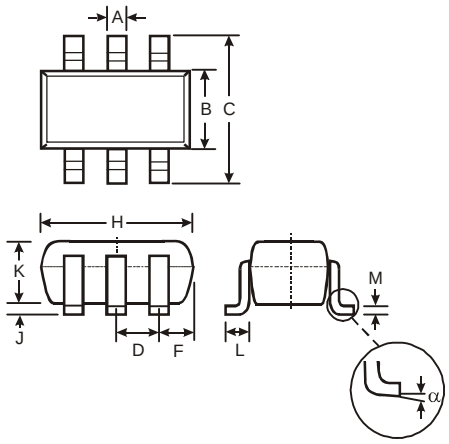


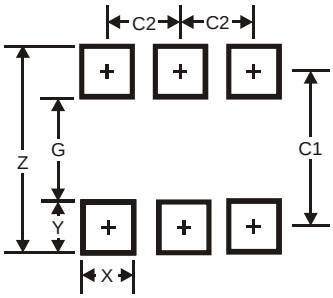
Fig. 6 Input Voltage vs. Collector Current

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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