



DDC (xxxx) U

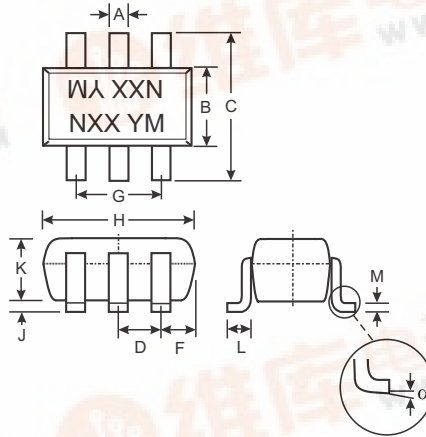
NPN PRE-BIASED SMALL SIGNAL SOT-363 DUAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDA)
- Built-In Biasing Resistors
- Lead Free/RoHS Compliant (Note 3)

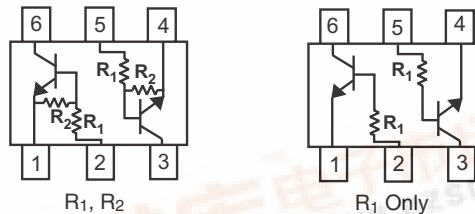
Mechanical Data

- Case: SOT-363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking: Date Code and Marking Code (See Diagrams & Page 3)
- Ordering Information (See Page 3)
- Weight: 0.006 grams (approximate)



SOT-363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
F	0.30	0.40
H	1.80	2.20
J	—	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
α	0°	8°
All Dimensions in mm		

P/N	R1	R2	MARKING
DDC124EU	22KΩ	22KΩ	N17
DDC144EU	47KΩ	47KΩ	N20
DDC114YU	10KΩ	47KΩ	N14
DDC123JU	2.2KΩ	47KΩ	N06
DDC114EU	10KΩ	10KΩ	N13
DDC113TU	1KΩ	—	N01
DDC143TU	4.7KΩ	—	N07
DDC114TU	10KΩ	—	N12



SCHEMATIC DIAGRAM

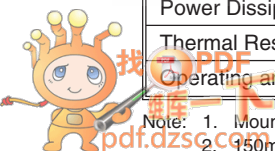
Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage, (6) to (1) and (3) to (4)	V _{CC}	50	V
Input Voltage, (2) to (1) and (5) to (4)	V _{IN}	-10 to +40 -10 to +40 -6 to +40 -5 to +12 -10 to +40 -5 V _{max} -5 V _{max} -5 V _{max}	V
Output Current	I _O	30 30 70 100 50 100 100 100	mA
Output Current	I _C (Max)	100	mA
Power Dissipation (Total)	P _d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	R _{θJA}	625	°C/W
Operating and Storage and Temperature Range	T _J , T _{STG}	-55 to +150	°C

Note: 1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.

2. 150mW per element must not be exceeded.

3. No purposefully added lead.





Electrical Characteristics @ T_A = 25°C unless otherwise specified

Characteristic (DDC113TU & DDC143TU & DDC114TU 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 DDC143TU I _C /I _B = 1mA / 0.1mA DDC114TU I _C /I _B = 10mA / 1mA DDC113TU
DC Current Transfer Ratio	h _{FE}	100	250	600	—	I _C = 1mA, V _{CE} = 5V
Input Resistor (R ₁) Tolerance	ΔR ₁	-30	—	+30	%	—
Gain-Bandwidth Product*	f _T	—	250	—	MHz	V _{CE} = 10V, I _E = -5mA, f = 100MHz

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	V _{I(off)}	0.5	1.1	—	V	V _{CC} = 5V, I _O = 100μA
		0.5	1.1	—		
Input Voltage	V _{I(on)}	0.3	—	—	V	V _O = 0.3, I _O = 5mA
		0.5	—	—		
Input Voltage	V _{I(on)}	0.5	—	—	V	V _O = 0.3, I _O = 2mA
		0.5	—	—		
Output Voltage	V _{O(on)}	—	0.1	0.3	V	I _O /I _I = 10mA / 0.5mA
		—	0.1	0.3		
Output Voltage	V _{O(on)}	—	0.1	0.3	V	I _O /I _I = 10mA / 0.5mA
		—	0.1	0.3		
Input Current	I _I	—	—	0.36	mA	V _I = 5V
		—	—	0.18		
Input Current	I _I	—	—	0.88	mA	V _I = 5V
		—	—	3.6		
Input Current	I _I	—	—	0.88	mA	V _I = 5V
		—	—	0.88		
Output Current	I _{O(off)}	—	—	0.5	μA	V _{CC} = 50V, V _I = 0V
DC Current Gain	G _I	56	—	—	—	V _O = 5V, I _O = 5mA
		68	—	—		
DC Current Gain	G _I	68	—	—	—	V _O = 5V, I _O = 5mA
		80	—	—		
DC Current Gain	G _I	80	—	—	—	V _O = 5V, I _O = 10mA
		30	—	—		
DC Current Gain	G _I	80	—	—	—	V _O = 5V, I _O = 10mA
		30	—	—		
DC Current Gain	G _I	30	—	—	—	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

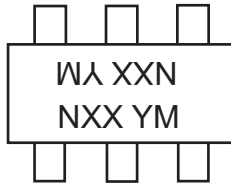
* Transistor - For Reference Only

Ordering Information (Note 4)

Device	Packaging	Shipping
DDC124EU-7-F	SOT-363	3000/Tape & Reel
DDC144EU-7-F	SOT-363	3000/Tape & Reel
DDC114YU-7-F	SOT-363	3000/Tape & Reel
DDC123JU-7-F	SOT-363	3000/Tape & Reel
DDC114EU-7-F	SOT-363	3000/Tape & Reel
DDC113TU-7-F	SOT-363	3000/Tape & Reel
DDC143TU-7-F	SOT-363	3000/Tape & Reel
DDC114TU-7-F	SOT-363	3000/Tape & Reel

Notes: 4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



NXX = Product Type Marking Code
 See Sheet 1 Diagrams
 YM = Date Code Marking
 Y = Year ex: T = 2006
 M = Month ex: 9 = September

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	N	P	R	S	T	U	V	W	X	Y	Z

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

TYPICAL CURVES - DDC123JK
ONE SECTION

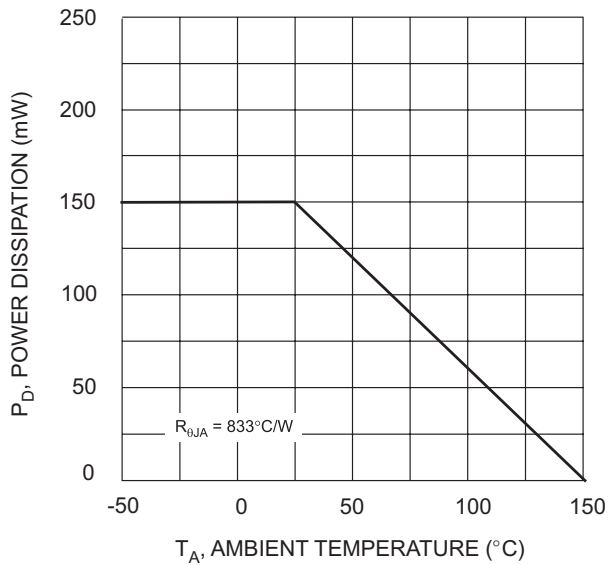


Fig. 1 Derating Curve

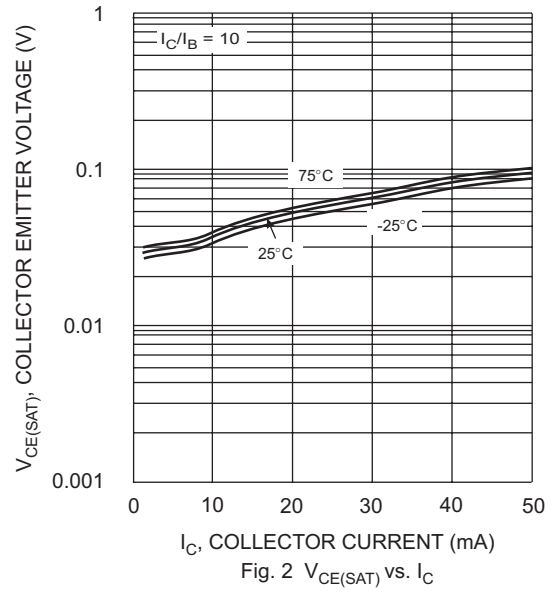


Fig. 2 $V_{CE(SAT)}$ vs. I_C

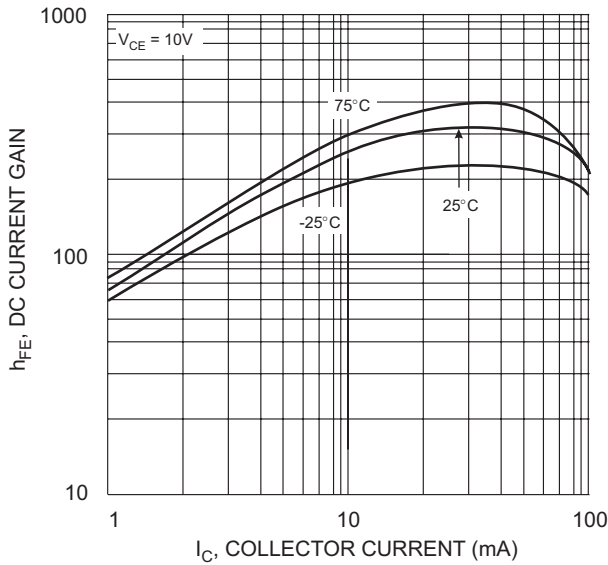


Fig. 3 DC Current Gain

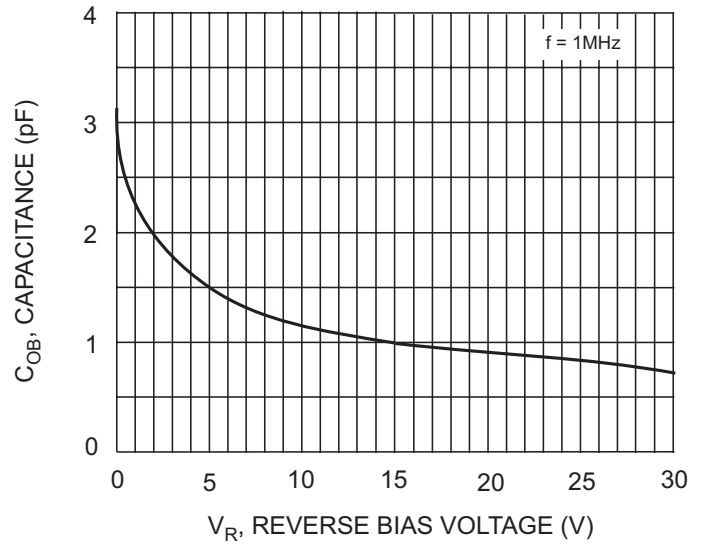


Fig. 4 Output Capacitance

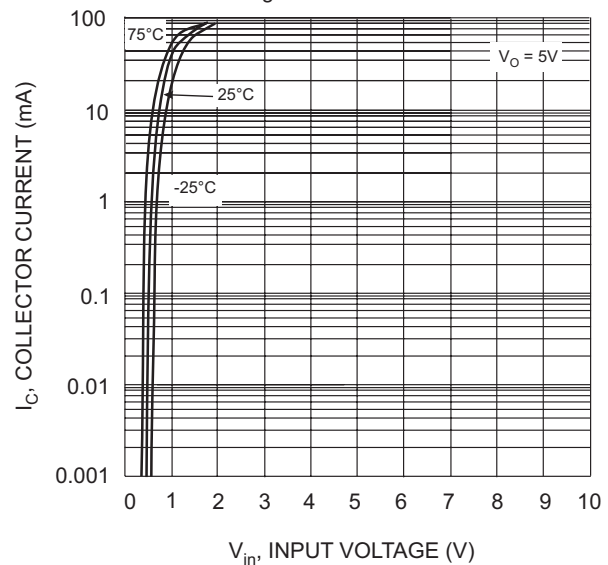


Fig. 5 Collector Current vs. Input Voltage

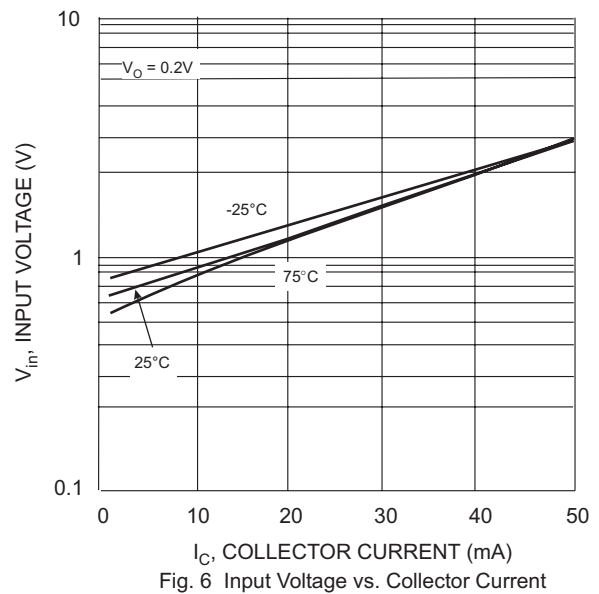


Fig. 6 Input Voltage vs. Collector Current

TYPICAL CURVES - DDC114TK
ONE SECTION

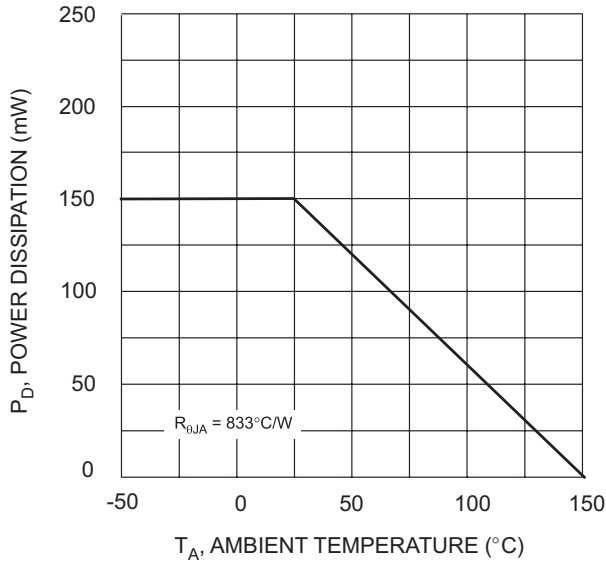


Fig. 1 Derating Curve

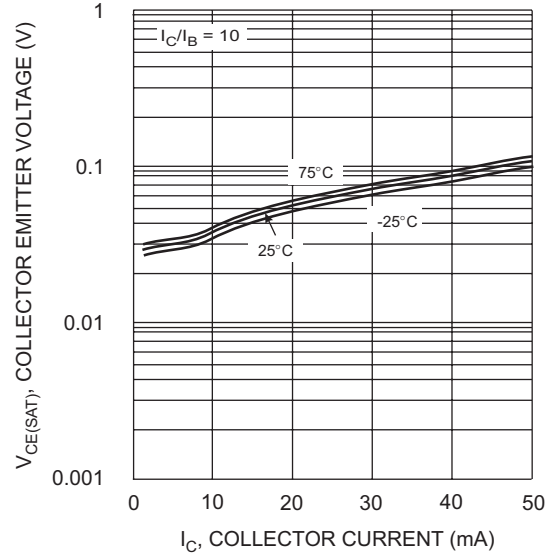


Fig. 2 $V_{CE(SAT)}$ vs. I_C

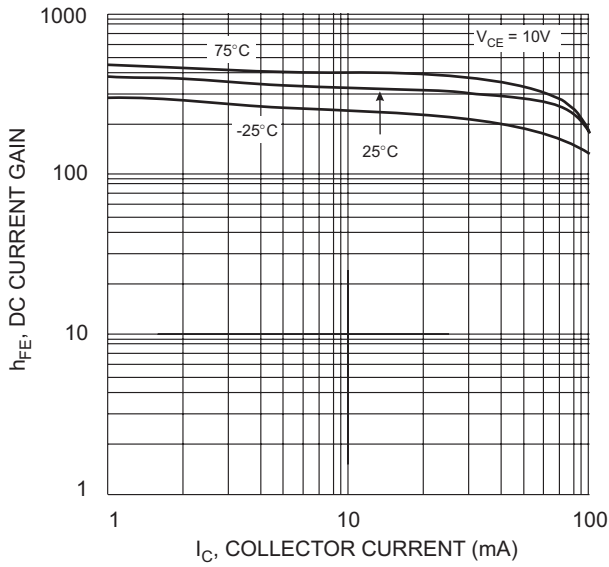


Fig. 3 DC Current Gain

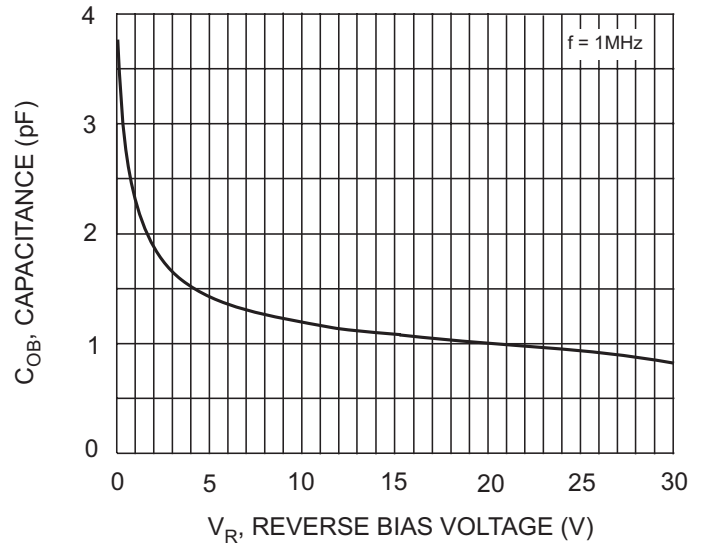


Fig. 4 Output Capacitance

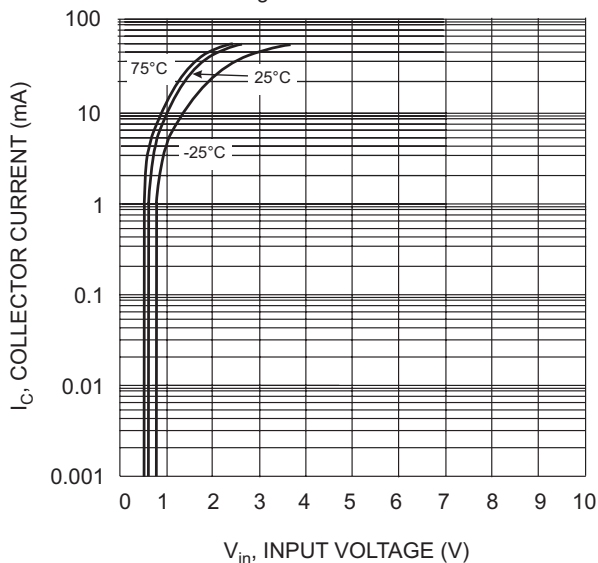


Fig. 7 Collector Current Vs. Input Voltage

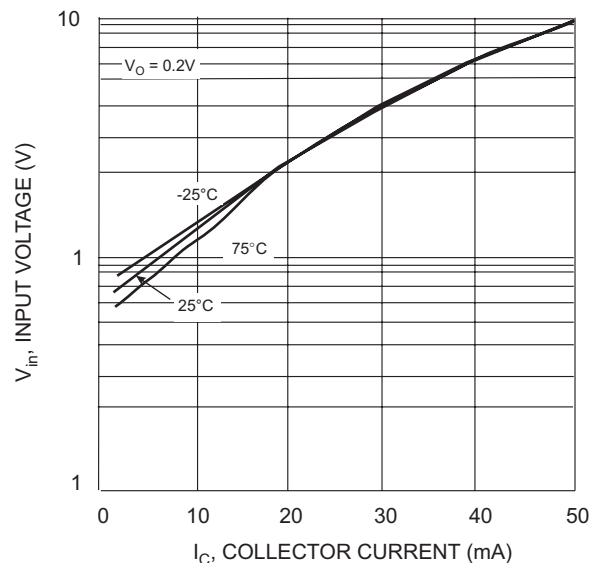


Fig. 6 Input Voltage vs. Collector Current



IMPORTANT NOTICE

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

LIFE SUPPORT

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.