DDC (xxxx) U

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

SPICE MODELS: DDC124EU DDC144EU DDC114YU DDC123JU DDC114EU DDC143TU DDC114TU

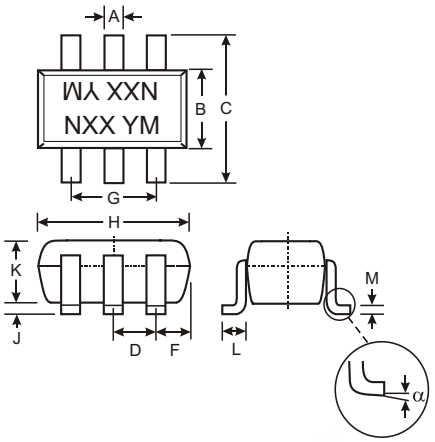
NEW PRODUCT

Features

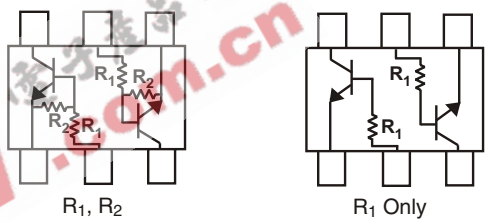
- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDA)
- Built-In Biasing Resistors
- Also Available in Lead Free Version

Mechanical Data

- Case: SOT-363, Molded Plastic
- Moisture sensitivity: Level 1 per J-STD-020A
- Case material - UL Flammability Rating 94V-0
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 4, on Page 3
- Terminal Connections: See Diagram
- Marking: Date Code and Marking Code (See Diagrams & Page 3)
- Weight: 0.006 grams (approx.)
- Ordering Information (See Page 3)



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		



SCHEMATIC DIAGRAM

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
DDC143TU	4.7KΩ	-	N07
DDC114TU	10KΩ	-	N12

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Supply Voltage, (3) to (1)		V_{CC}	50	V
Input Voltage, (2) to (1)	DDC124EU DDC144EU DDC114YU DDC123JU DDC114EU DDC143TU DDC114TU	V_{IN}	-10 to +40 -10 to +40 -6 to +40 -5 to +12 -10 to +40 -5 Vmax -5 Vmax	V
Output Current	DDC124EU DDC144EU DDC114YU DDC123JU DDC114EU DDC143TU DDC114TU	I_O	30 30 70 100 50 100 100	mA
Output Current	All	I_C (Max)	100	mA
Power Dissipation (Total)		P_d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1)		$R_{\theta JA}$	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.

Electrical Characteristics @ T_A = 25°C unless otherwise specified

Characteristic (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
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	DDC124EU DDC144EU DDC114YU DDC123JU DDC114EU	$V_{I(off)}$	0.5 0.5 0.3 0.5 0.5	1.1 1.1 — — 1.1	—	V	V_{CC} = 5V, I_O = 100μA
	DDC124EU DDC144EU DDC114YU DDC123JU DDC114EU	$V_{I(on)}$	—	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	DDC124EU DDC144EU DDC114YU DDC123JU DDC114EU	$V_{O(on)}$	—	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	DDC124EU DDC144EU DDC114YU DDC123JU DDC114EU	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	DDC124EU DDC144EU DDC114YU DDC123JU DDC114EU	G_I	56 68 68 80 30	—	—	—	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

* Transistor - For Reference Only

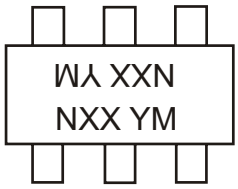
NEW PRODUCT

Ordering Information (Note 3)

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

Notes: 3. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.
4. For Lead Free version (with Lead Free terminal finish) part number, please add "-F" suffix to part number above. Example: DDC114TU-7-F.

Marking Information



NXX = Product Type Marking Code
See Sheet 1 Diagrams
YM = Date Code Marking
Y = Year ex: N = 2002
M = Month ex: 9 = September

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009
Code	N	P	R	S	T	U	V	W

Month	Jan	Feb	March	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

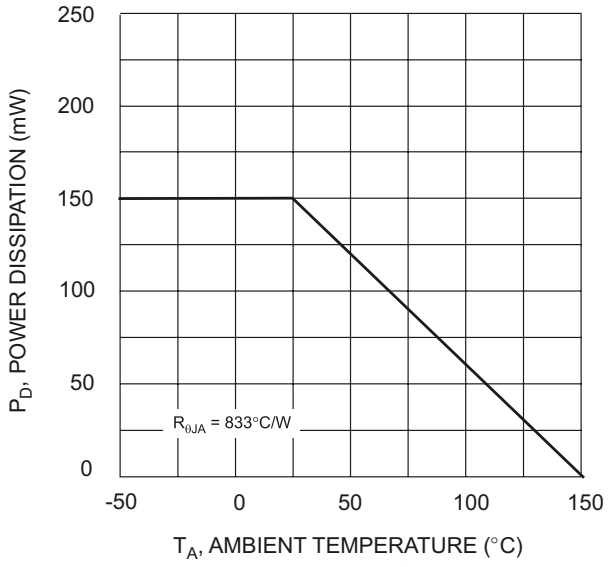


Fig. 1 Derating Curve

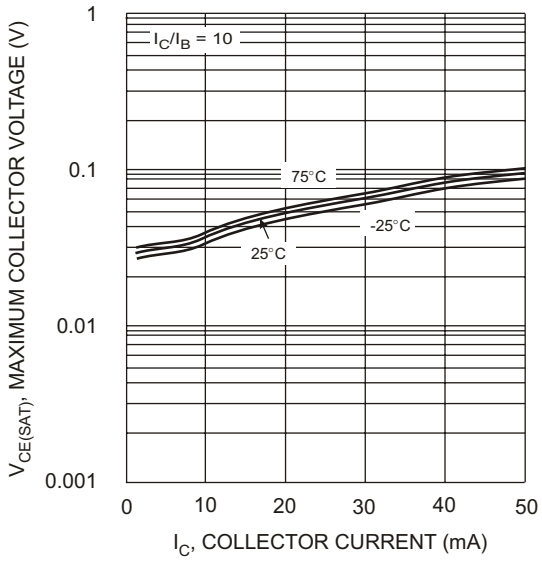


Fig. 2 $V_{CE(SAT)}$ vs. I_C

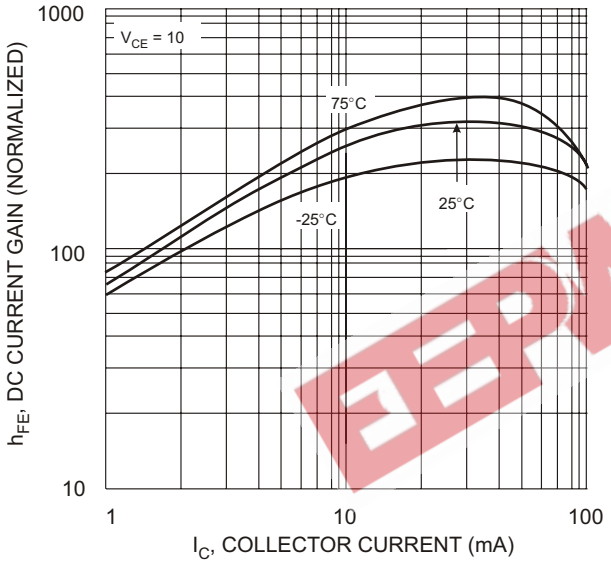


Fig. 3 DC Current Gain

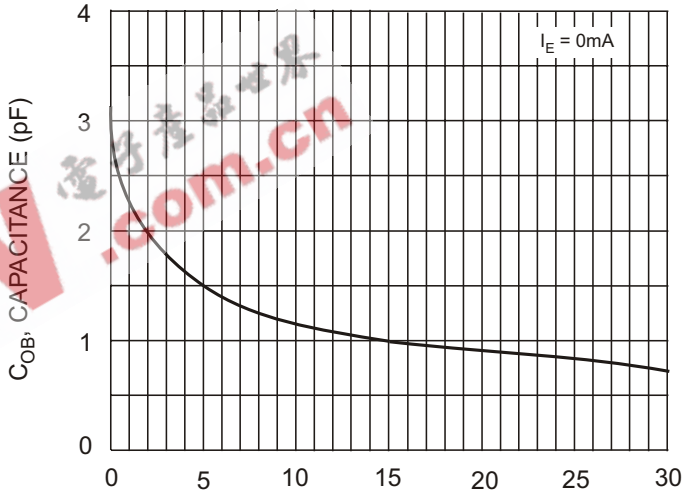


Fig. 4 Output Capacitance

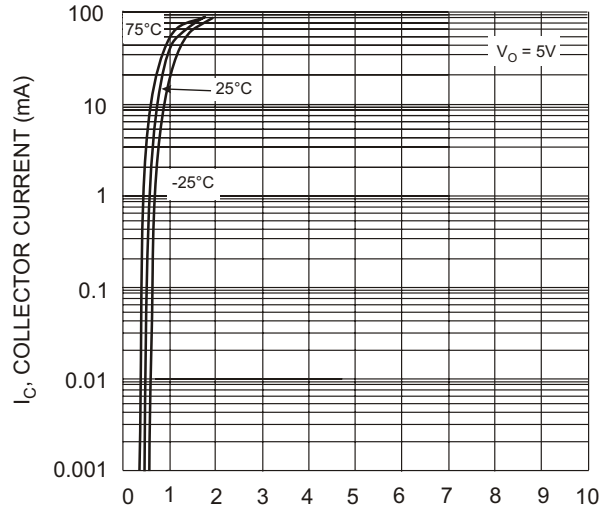


Fig. 5 Collector Current Vs. Input Voltage

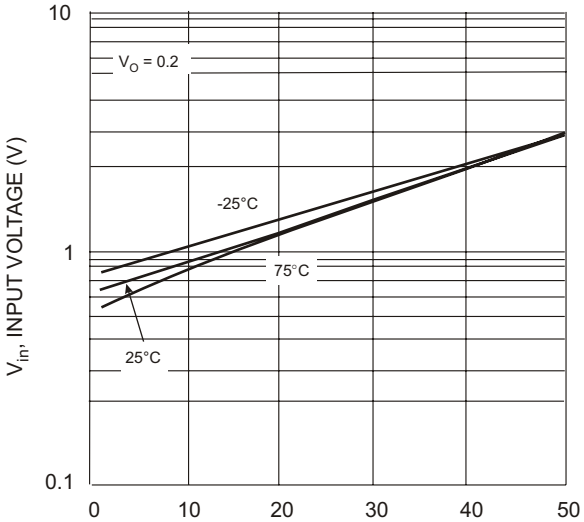


Fig. 6 Input Voltage vs. Collector Current

TYPICAL CURVES - DDC114TK
ONE SECTION

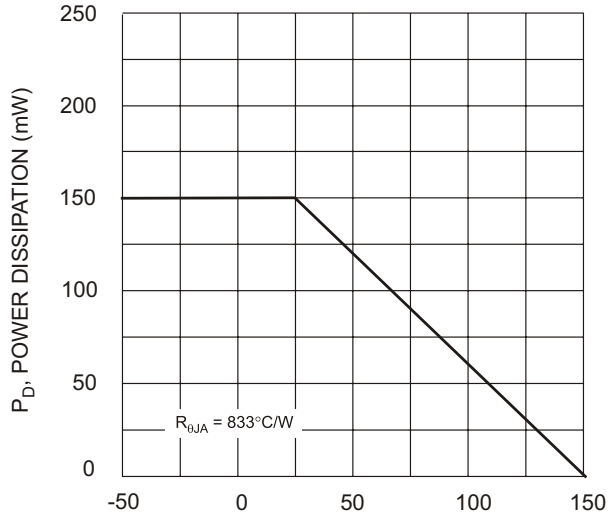


Fig. 1 Derating Curve

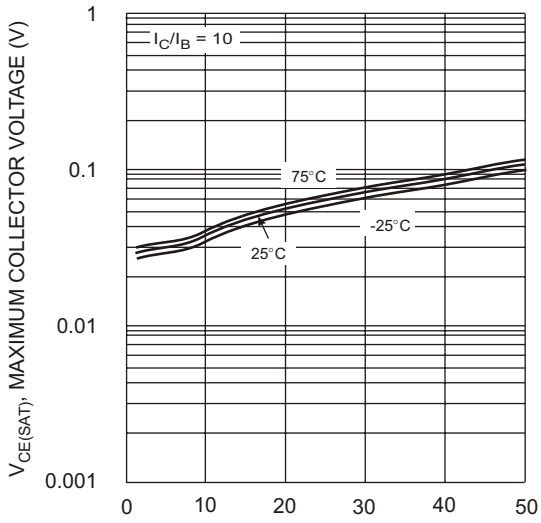


Fig. 2 $V_{CE(SAT)}$ vs. I_C

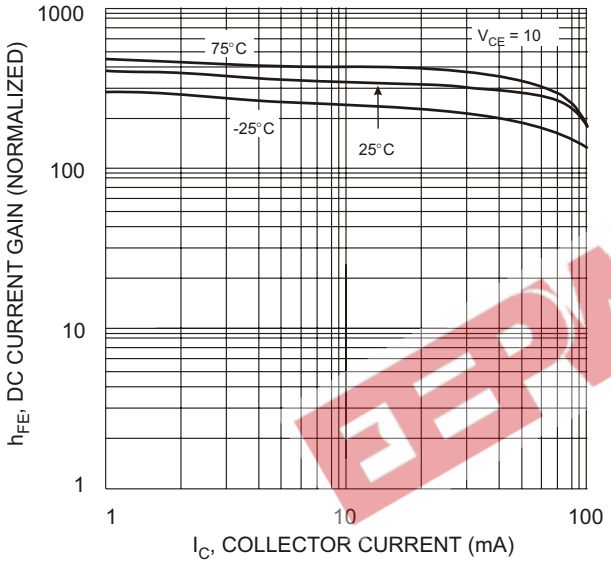


Fig. 3 DC Current Gain

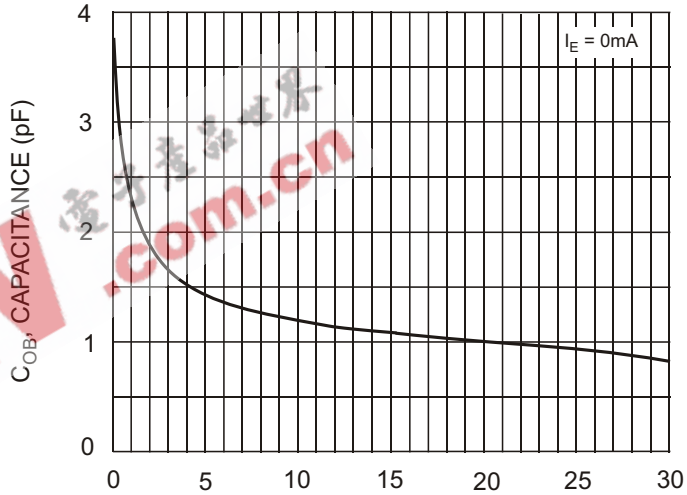


Fig. 4 Output Capacitance

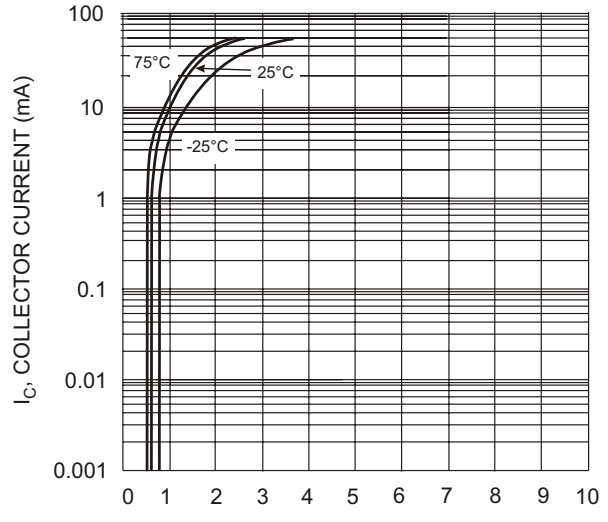


Fig. 5 Collector Current Vs. Input Voltage

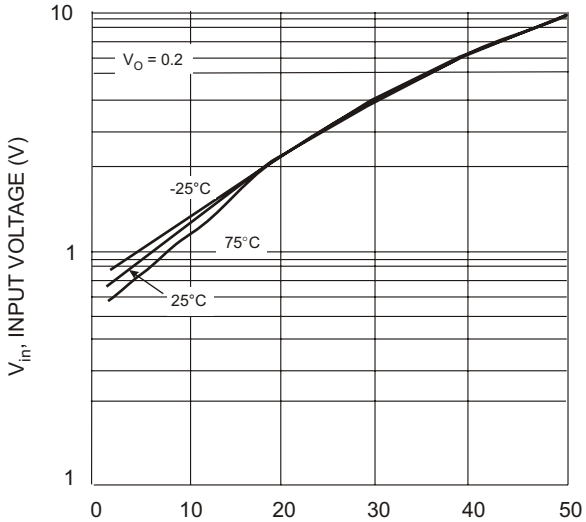


Fig. 6 Input Voltage vs. Collector Current