DDC (xxxx) K

NPN PRE-BIASED SMALL SIGNAL SOT-26 DUAL SURFACE MOUNT TRANSISTOR

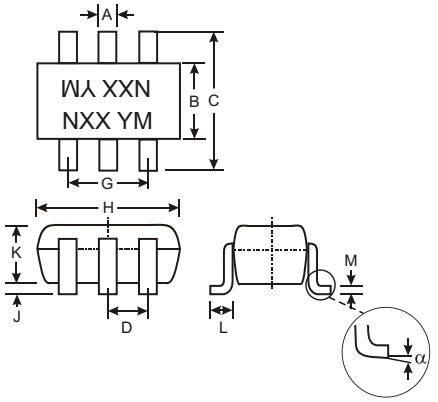
NEW PRODUCT

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDA)
- Built-In Biasing Resistors

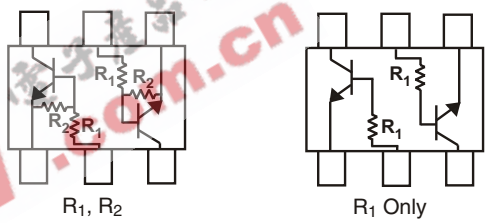
Mechanical Data

- Case: SOT-26, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: Date Code and Marking Code (See Diagrams & Page 3)
- Weight: 0.015 grams (approx.)
- Ordering Information (See Page 3)



SOT-26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D		0.95	
G		1.90	
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			

P/N	R1	R2	MARKING
DDC124EK	22KΩ	22KΩ	N17
DDC144EK	47KΩ	47KΩ	N20
DDC114YK	10KΩ	47KΩ	N14
DDC123JK	2.2KΩ	47KΩ	N06
DDC114EK	10KΩ	10KΩ	N13
DDC143TK	4.7KΩ	-	N07
DDC114TK	10KΩ	-	N12



SCHEMATIC DIAGRAM

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)	DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK DDC143TK DDC114TK	V_{IN}	-10 to +40 -10 to +40 -6 to +40 -5 to +12 -10 to +40 -5 Vmax -5 Vmax	V
Output Current	DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK DDC143TK DDC114TK	I_O	30 30 70 100 50 100 100	mA
Output Current	All	I_C (Max)	100	mA
Power Dissipation (Total)		P_d	300	mW
Thermal Resistance, Junction to Ambient Air (Note 1)		$R_{\theta JA}$	416.7	°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. 200mW per element must not be exceeded.

NEW PRODUCT

Electrical Characteristics @ $T_A = 25°C$ unless otherwise specified

Characteristic (DDC143TK & DDC114TK only)	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	50	—	—	V	$I_C = 50\mu A$
Collector-Emitter Breakdown Voltage	BV_{CEO}	50	—	—	V	$I_C = 1mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	5	—	—	V	$I_E = 50\mu A$
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	$I_C/I_B = 2.5mA / 0.25mA$ DDC143TK $I_C/I_B = 1mA / 0.1mA$ DDC114TK
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	DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK	$V_{I(off)}$	0.5 0.5 0.3 0.5 0.5	1.1 1.1 — — 1.1	—	V	$V_{CC} = 5V, I_O = 100\mu A$
	DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK	$V_{I(on)}$	—	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	DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK	$V_{O(on)}$	—	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	DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK	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	DDC124EK DDC144EK DDC114YK DDC123JK DDC114EK	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

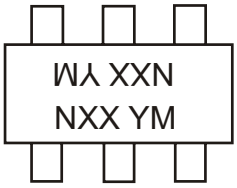
NEW PRODUCT

Ordering Information (Note 3)

Device	Packaging	Shipping
DDC124EK-7	SOT-26	3000/Tape & Reel
DDC144EK-7	SOT-26	3000/Tape & Reel
DDC114YK-7	SOT-26	3000/Tape & Reel
DDC123JK-7	SOT-26	3000/Tape & Reel
DDC114EK-7	SOT-26	3000/Tape & Reel
DDC143TK-7	SOT-26	3000/Tape & Reel
DDC114TK-7	SOT-26	3000/Tape & Reel

Notes: 3. 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: 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

NEW PRODUCT

TYPICAL CURVES - DDC123JK
ONE SECTION

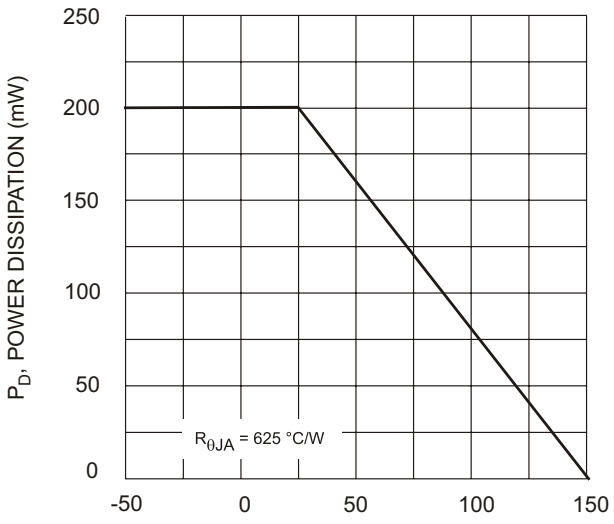


Fig. 1 Derating Curve

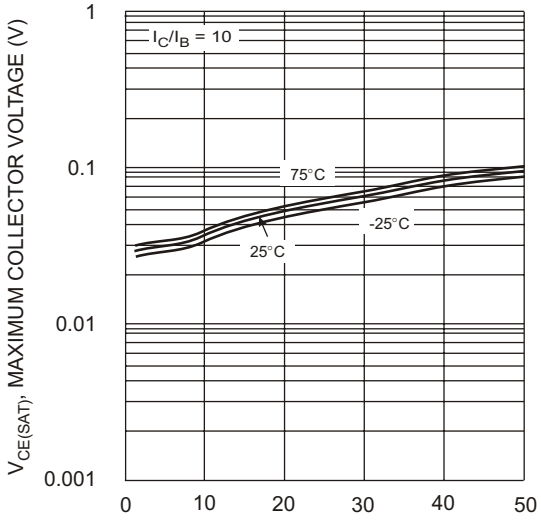


Fig. 2 $V_{CE(SAT)}$ vs. I_C

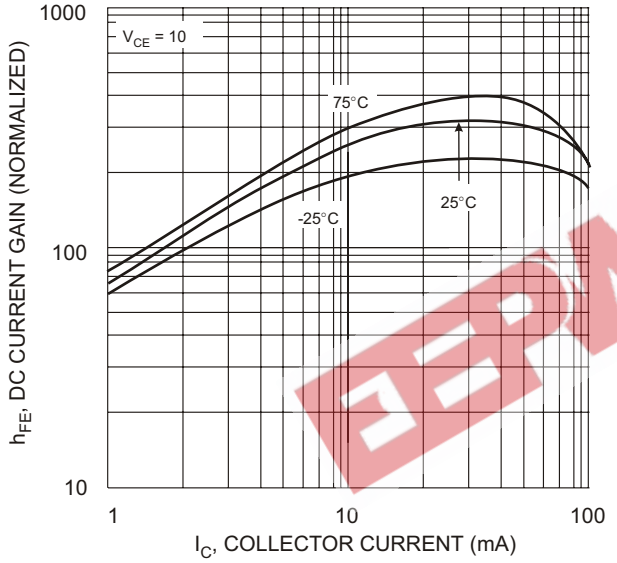


Fig. 3 DC Current Gain

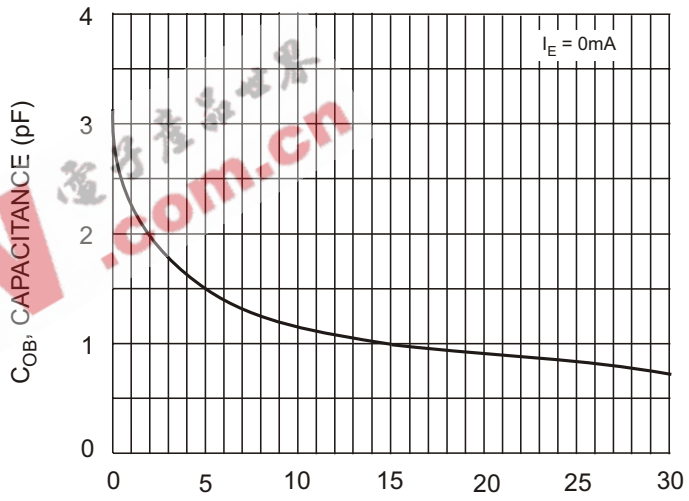


Fig. 4 Output Capacitance

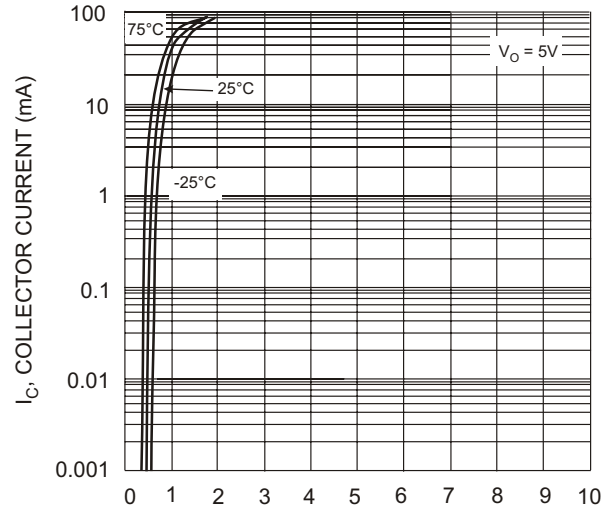


Fig. 5 Collector Current Vs. Input Voltage

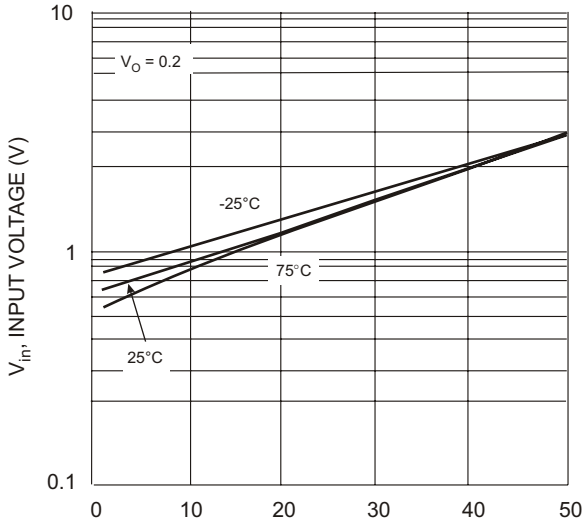


Fig. 6 Input Voltage vs. Collector Current

NEW PRODUCT

TYPICAL CURVES - DDC114TK
ONE SECTION

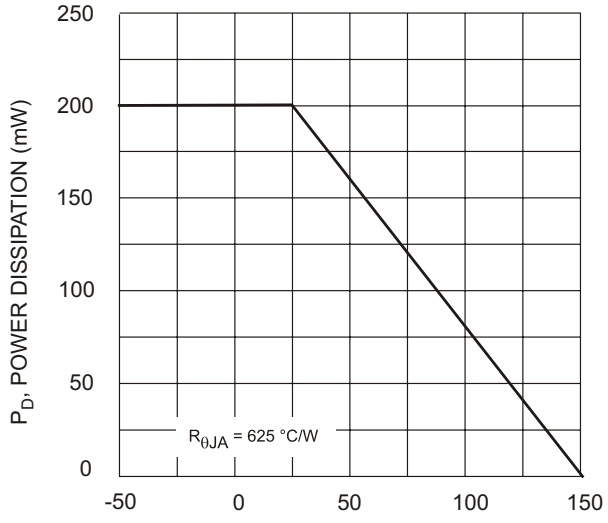


Fig. 1 Derating Curve

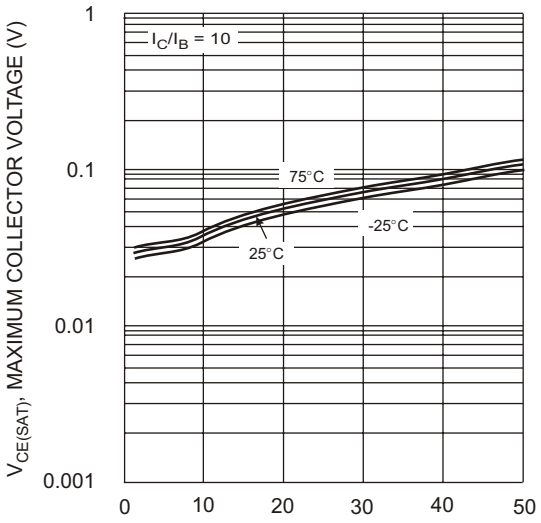


Fig. 2 $V_{CE(SAT)}$ vs. I_C

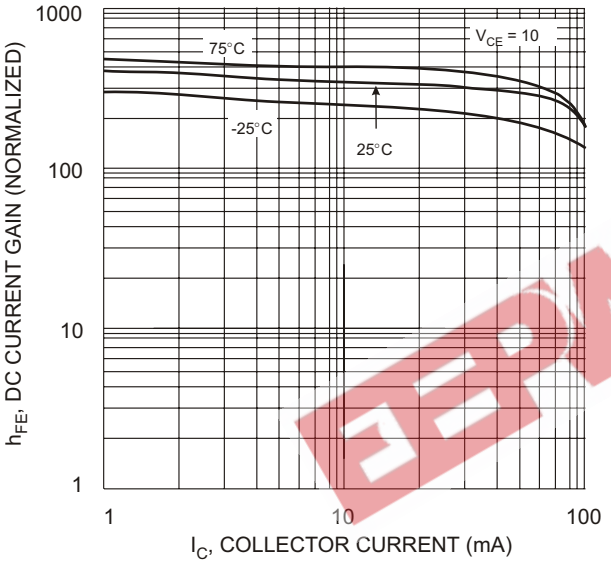


Fig. 3 DC Current Gain

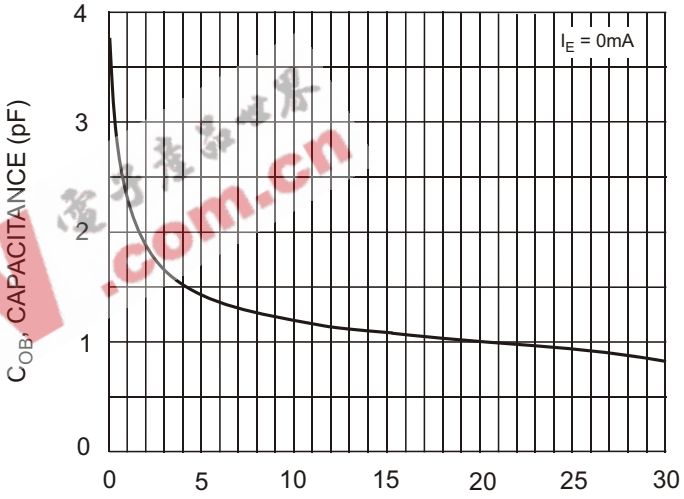


Fig. 4 Output Capacitance

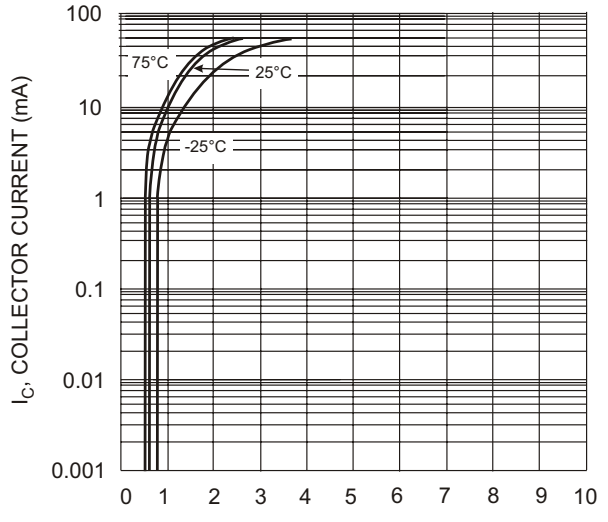


Fig. 5 Collector Current Vs. Input Voltage

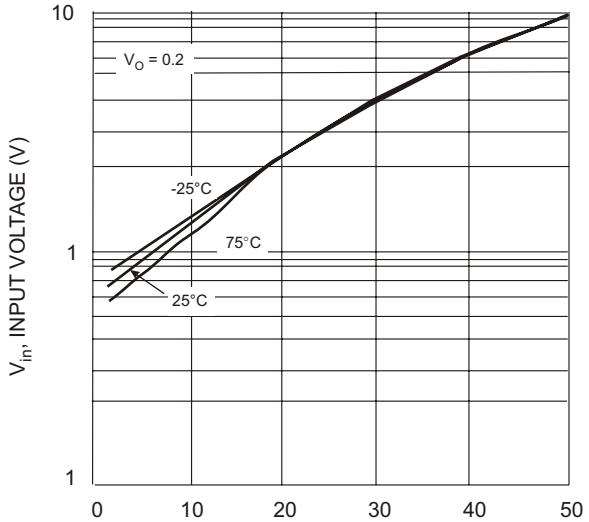


Fig. 6 Input Voltage vs. Collector Current