

OBSOLETE - PART DISCONTINUED

### Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDC)
- Built-In Biasing Resistors
- Available in Lead Free/RoHS Compliant Version (Note 3)

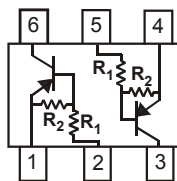
Part Number	R1	R2	Marking
DDA124EK	22K $\Omega$	22K $\Omega$	P17
DDA144EK	47K $\Omega$	47K $\Omega$	P20
DDA114YK	10K $\Omega$	47K $\Omega$	P14
DDA123JK	2.2K $\Omega$	47K $\Omega$	P06
DDA114EK	10K $\Omega$	10K $\Omega$	P13
DDA143TK	4.7K $\Omega$	-	P07
DDA114TK	10K $\Omega$	-	P12

### Mechanical Data

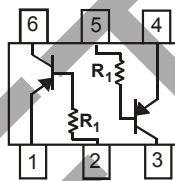
- Case: SOT-26
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminal Connections: See Diagram
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish annealed over Copper leadframe). Please see Ordering Information, Note 5, on Page 5
- Marking Information: See Table and Page 5
- Ordering Information See Page 5
- Weight: 0.015 grams (approximate)



Top View



R1, R2 Device Schematic



R1 only Device Schematic

### Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage, (1) to (6) and (4) to (3)	$V_{CC}$	50	V
Input Voltage, (2) to (1) and (5) to (4)	$V_{IN}$	DDA124EK +10 to -40 DDA144EK +10 to -40 DDA114YK +6 to -40 DDA123JK +5 to -12 DDA114EK +10 to -40 DDA143TK +5V max DDA114TK +5V max	V
Output Current	$I_O$	DDA124EK -30 DDA144EK -30 DDA114YK -70 DDA123JK -100 DDA114EK -50 DDA143TK -100 DDA114TK -100	mA
Output Current	$I_{C(MAX)}$	-100	mA

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Total)	$P_D$	300	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	$R_{\theta JA}$	416.7	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
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.
  3. No purposefully added lead.

**Electrical Characteristics** @<sub>T<sub>A</sub></sub> = 25°C unless otherwise specified

Characteristic (DDA143TK & DDA114TK only)	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	-50	—	—	V	I <sub>C</sub> = -50μA
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	-50	—	—	V	I <sub>C</sub> = -1mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5	—	—	V	I <sub>E</sub> = -50μA
Collector Cutoff Current	I <sub>CB0</sub>	—	—	-0.5	μA	V <sub>CB</sub> = -50V
Emitter Cutoff Current	I <sub>EBO</sub>	—	—	-0.5	μA	V <sub>EB</sub> = -4V
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	—	-0.3	V	I <sub>C</sub> /I <sub>B</sub> = -2.5mA / -0.25mA DDA143TK I <sub>C</sub> /I <sub>B</sub> = -1mA / -0.1mA DDA114TK
DC Current Transfer Ratio	h <sub>FE</sub>	100	250	600	—	I <sub>C</sub> = -1mA, V <sub>CE</sub> = -5V
Input Resistor (R <sub>1</sub> ) Tolerance	ΔR <sub>1</sub>	-30	—	+30	%	—
Gain-Bandwidth Product*	f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> = -10V, I <sub>E</sub> = 5mA, f = 100MHz

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DDA124EK DDA144EK DDA114YK DDA123JK DDA114EK	-0.5 -0.5 -0.3 -0.5 -0.5	-1.1 -1.1 — — -1.1	—	V	V <sub>CC</sub> = -5V, I <sub>O</sub> = -100μA
	DDA124EK DDA144EK DDA114YK DDA123JK DDA114EK	—	-1.9 -1.9 — — -1.9	-3.0 -3.0 -1.4 -1.1 -3.0		
Output Voltage	DDA124EK DDA144EK DDA114YK DDA123JK DDA114EK	—	-0.1	-0.3	V	I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA I <sub>O</sub> /I <sub>I</sub> = -5mA / -0.25mA I <sub>O</sub> /I <sub>I</sub> = -5mA / -0.25mA I <sub>O</sub> /I <sub>I</sub> = -10mA / -0.5mA
Input Current	DDA124EK DDA144EK DDA114YK DDA123JK DDA114EK	—	—	-0.36 -0.18 -0.88 -3.6 -0.88	mA	V <sub>I</sub> = -5V
Output Current	I <sub>O(OFF)</sub>	—	—	-0.5	μA	V <sub>CC</sub> = 50V, V <sub>I</sub> = 0V
DC Current Gain	DDA124EK DDA144EK DDA114YK DDA123JK DDA114EK	56 68 68 80 30	—	—	—	V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA V <sub>O</sub> = -5V, I <sub>O</sub> = -5mA
Input Resistor (R <sub>1</sub> ) Tolerance	ΔR <sub>1</sub>	-30	—	+30	%	—
Resistance Ratio Tolerance	R <sub>2</sub> /R <sub>1</sub>	-20	—	+20	%	—
Gain-Bandwidth Product*	f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> = -10V, I <sub>E</sub> = -5mA, f = 100MHz

\* Transistor - For Reference Only

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Typical Curves – DDA123JK One Section

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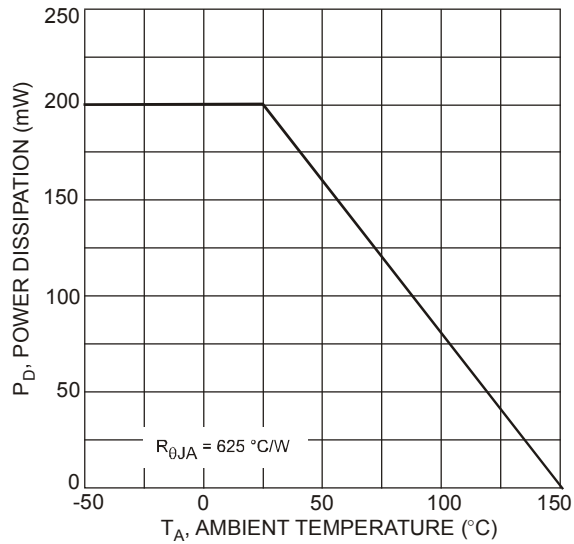


Fig. 1 Power Dissipation vs. Ambient Temperature

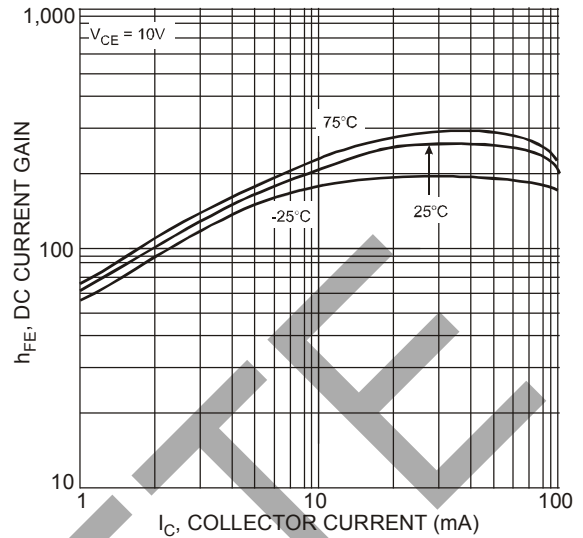


Fig. 2 Typical DC Current Gain vs. Collector Current

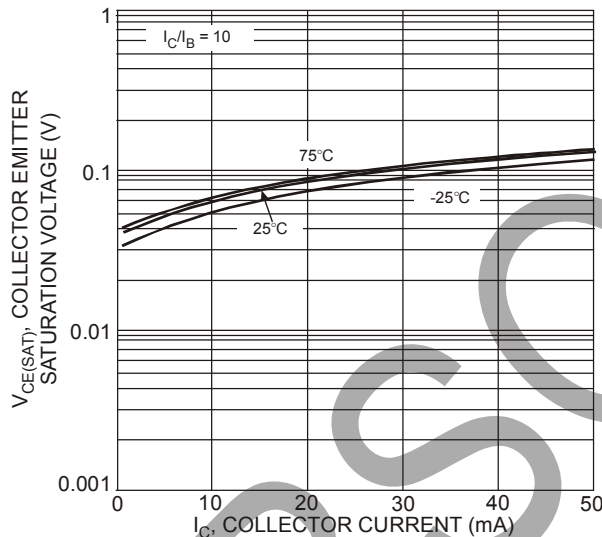


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

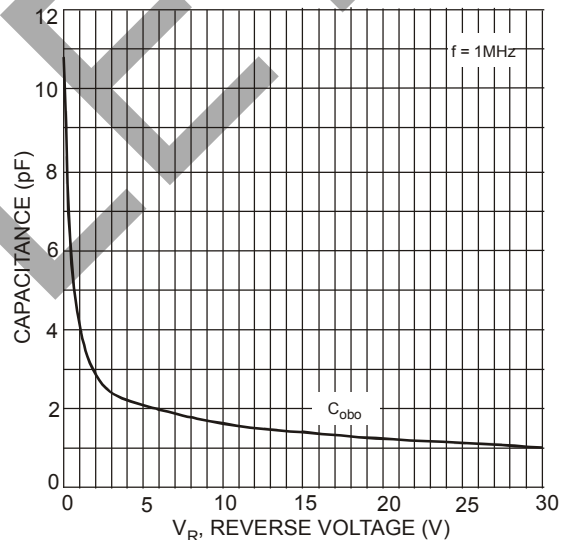


Fig. 4 Typical Capacitance Characteristics

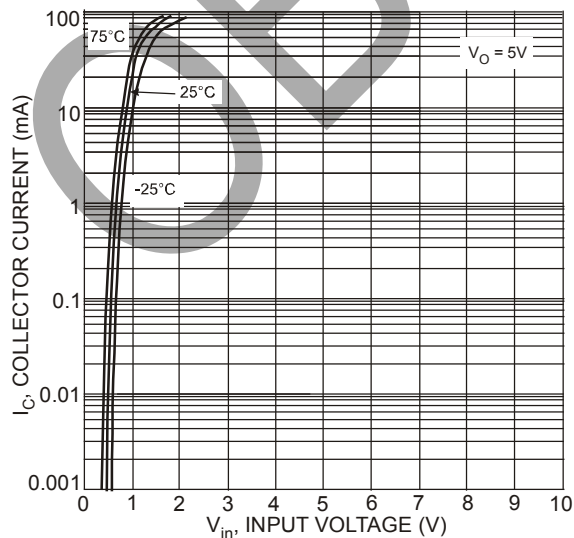


Fig. 5 Collector Current vs. Input Voltage

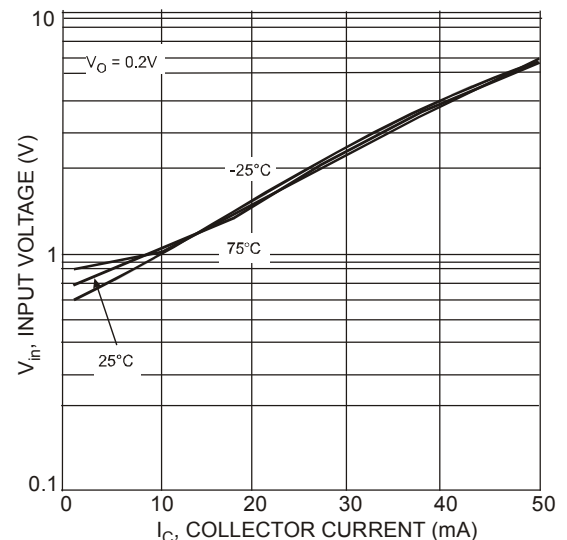


Fig. 6 Input Voltage vs. Collector Current

**Typical Curves – DDA1414TK One Section**

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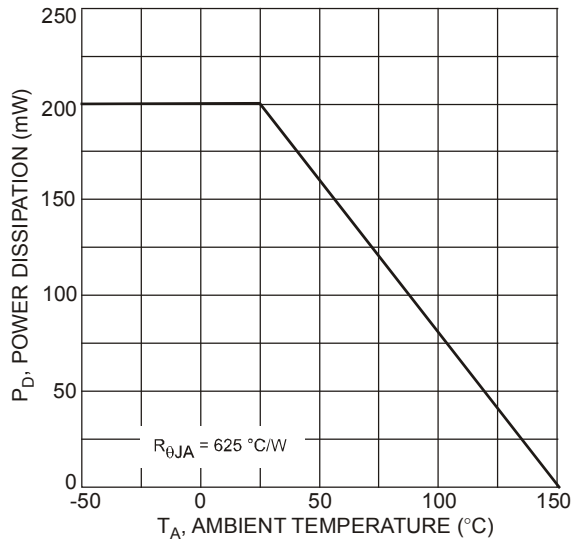


Fig. 1 Power Dissipation vs. Ambient Temperature

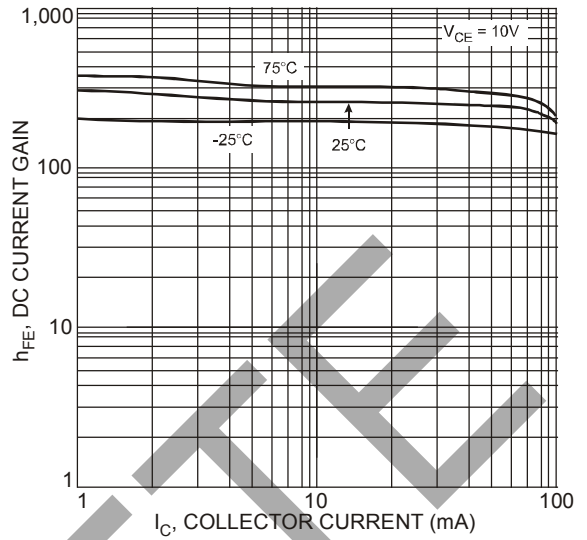


Fig. 2 Typical DC Current Gain vs. Collector Current

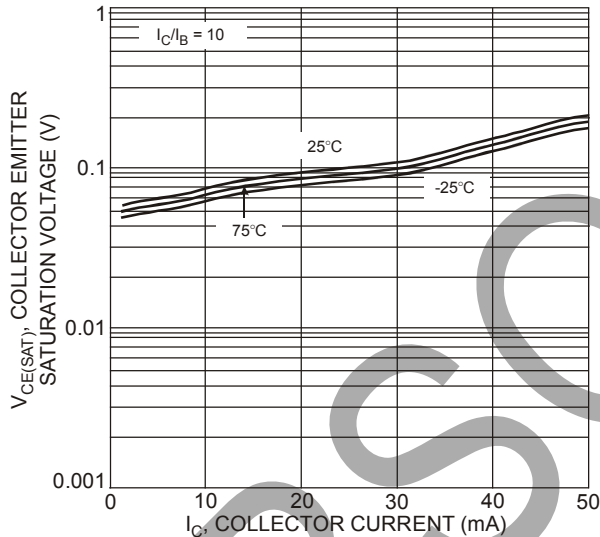


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

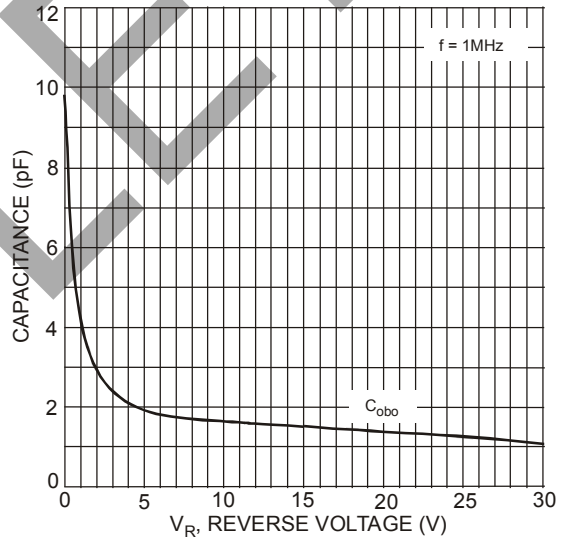


Fig. 4 Typical Capacitance Characteristics

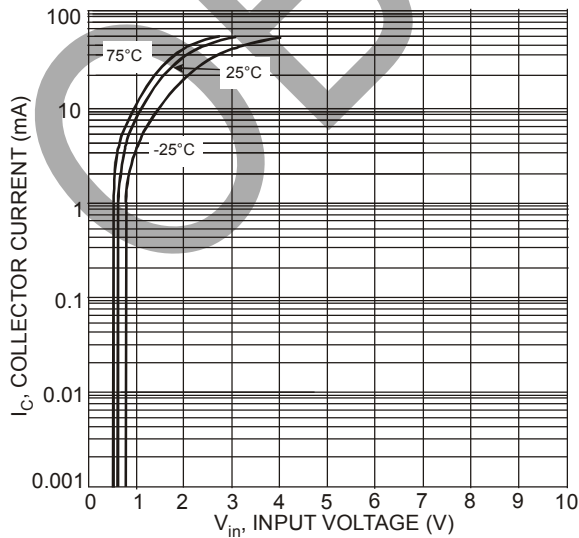


Fig. 5 Collector Current vs. Input Voltage

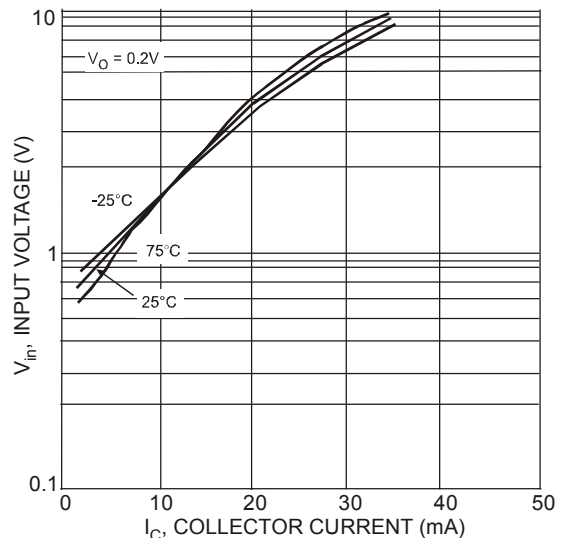


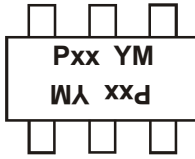
Fig. 6 Input Voltage vs. Collector Current

**Ordering Information** (Notes 4 & 5)

Part Number	Case	Packaging
DDA124EK-7	SOT-26	3000/Tape & Reel
DDA144EK-7	SOT-26	3000/Tape & Reel
DDA114YK-7	SOT-26	3000/Tape & Reel
DDA123JK-7	SOT-26	3000/Tape & Reel
DDA114EK-7	SOT-26	3000/Tape & Reel
DDA143TK-7	SOT-26	3000/Tape & Reel
DDA114TK-7	SOT-26	3000/Tape & Reel

- Notes:
- For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
  - For Lead Free/ROHS Compliant version part numbers, please add "-F" suffix to the part numbers above. Example: DDA114TK-7-F.

**Marking Information**



Pxx = Product Type Marking Code (See Page 1)  
 YM = Date Code Marking  
 Y = Year (ex: T = 2006)  
 M = Month (ex: 9 = September)

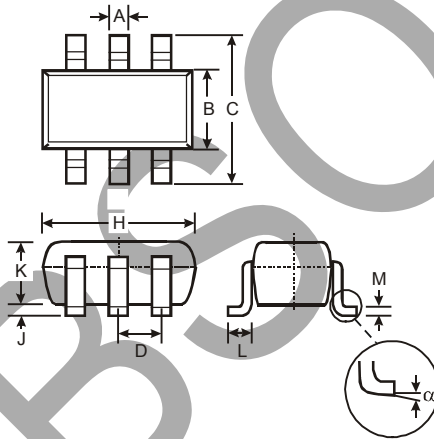
Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Code	T	U	V	W	X	Y	Z	A	B	C

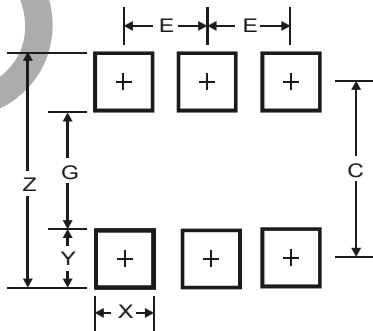
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

**Package Outline Dimensions**



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
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
$\alpha$	0°	8°	—
All Dimensions in mm			

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C	2.40
E	0.95

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