

# DDTA (R1≠R2 SERIES) KA

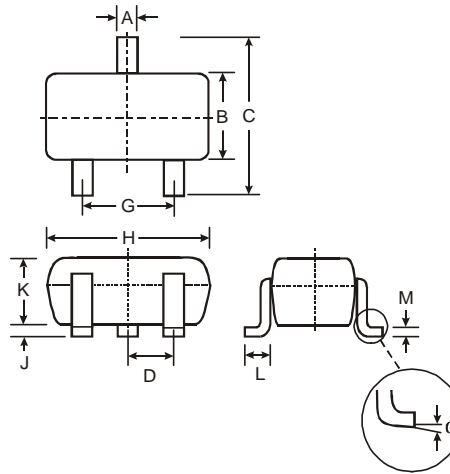
## PNP PRE-BIASED SMALL SIGNAL SURFACE MOUNT TRANSISTOR

### Features

- Epitaxial Planar Die Construction
- Complementary NPN Types Available (DDTC)
- Built-In Biasing Resistors, R1≠R2
- Lead Free/RoHS Compliant (Note 1)
- "Green" Device, Note 2 and 3

### Mechanical Data

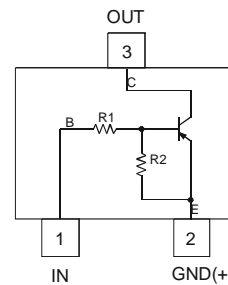
- Case: SC-59
- Case material: Molded Plastic, "Green" Molding Compound, Note 3. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Copper leadframe).
- Terminal Connections: See Diagram
- Marking Information: See Table Below & Page 4
- Ordering Information: See Page 4
- Weight: 0.008 grams (approximate)



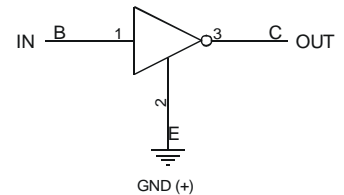
SC-59		
Dim	Min	Max
A	0.35	0.50
B	1.50	1.70
C	2.70	3.00
D	0.95	
G	1.90	
H	2.90	3.10
J	0.013	0.10
K	1.00	1.30
L	0.35	0.55
M	0.10	0.20
α	0°	8°

All Dimensions in mm

P/N	R1 (NOM)	R2 (NOM)	Type Code
DDTA113ZKA	1KΩ	10KΩ	P02
DDTA123YKA	2.2KΩ	10KΩ	P05
DDTA123JKA	2.2KΩ	47KΩ	P06
DDTA143XKA	4.7KΩ	10KΩ	P09
DDTA143FKA	4.7KΩ	22KΩ	P10
DDTA143ZKA	4.7KΩ	47KΩ	P11
DDTA114YKA	10KΩ	47KΩ	P14
DDTA114WKA	10KΩ	4.7KΩ	P15
DDTA124XKA	22KΩ	47KΩ	P18
DDTA144VKA	47KΩ	10KΩ	P21
DDTA144WKA	47KΩ	22KΩ	P22



Schematic and Pin Configuration



Equivalent Inverter Circuit

### Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage, (3) to (2)	V <sub>CC</sub>	-50	V
Input Voltage, (1) to (2)	V <sub>IN</sub>	+5 to -10 +5 to -12 +5 to -12 +7 to -20 +6 to -30 +5 to -30 +6 to -40 +10 to -30 +10 to -40 +15 to -40 +10 to -40	V
Output Current	I <sub>O</sub>	-100 -100 -100 -100 -100 -100 -70 -100 -50 -30 -30	mA

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Product manufactured with Date Code 0627 (week 27, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0627 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

### Maximum Ratings (continued) @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>d</sub>	200	mW
Output Current	I <sub>C</sub> (Max)	-100	mA
Thermal Resistance, Junction to Ambient Air (Note 4)	R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-55 to +150	°C

Notes: 4. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	V <sub>I(off)</sub>	-0.3			V	V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA
		-0.3				
-0.5						
-0.3						
-0.3						
-0.5		—	—			
-0.3						
-0.8						
-0.4						
-1.0						
-0.8						
Input Voltage		V <sub>I(on)</sub>				
				-3.0		
				-1.1		
				-2.5		
				-1.3		
			—	—		
				-1.4		
				-3.0		
				-2.5		
				-5.0		
				-4.0		
	Output Voltage		V <sub>O(on)</sub>	—	-0.1	-0.3
Input Current	I <sub>I</sub>			-7.2	mA	V <sub>I</sub> = -5V
				-3.8		
				-3.6		
				-1.8		
				-1.8		
				-1.8		
				-0.88		
				-0.88		
				-0.36		
				-0.16		
				-0.16		
		Output Current	I <sub>O(off)</sub>	—		
DC Current Gain	G <sub>I</sub>	-33			—	V <sub>O</sub> = -5V, I <sub>O</sub> = -10mA
		-33				
		-80				
		-30				
		-68				
		-80	—	—		
		-68				
		-24				
		-68				
		-33				
		-56				
		Input Resistor Tolerance	ΔR <sub>1</sub>	-30		
Resistance Ratio Tolerance	ΔR <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

## Typical Curves – DDTA123JKA

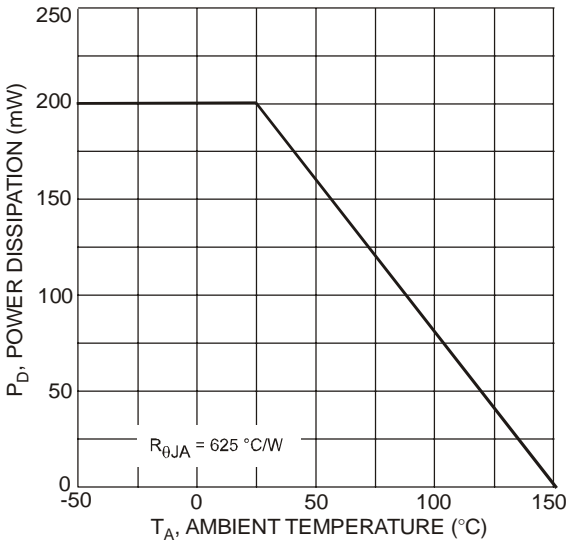


Fig. 1 Derating Curve

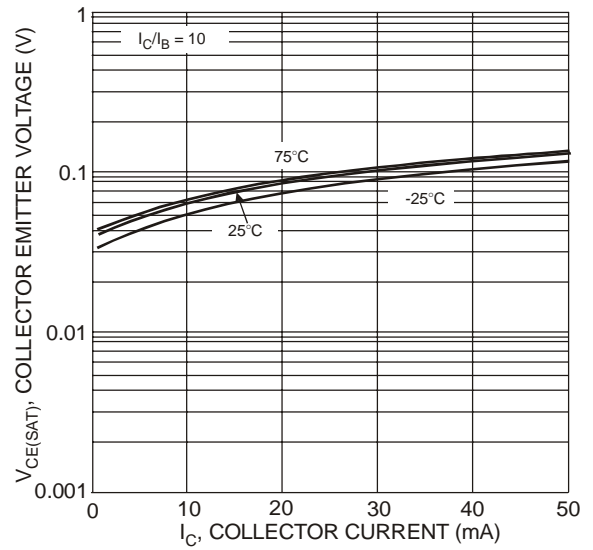


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

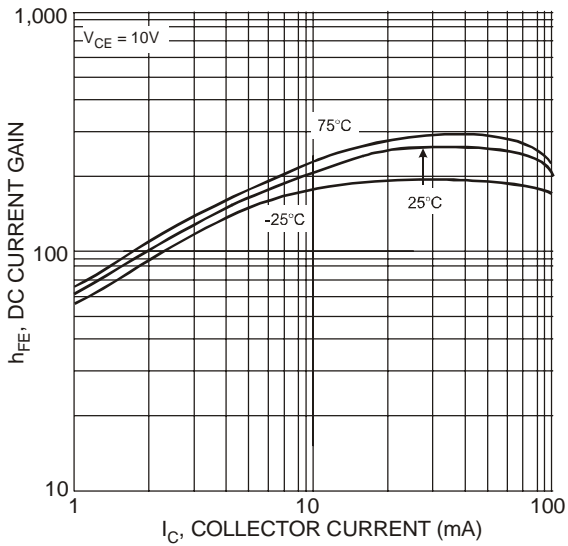


Fig. 3 DC Current Gain

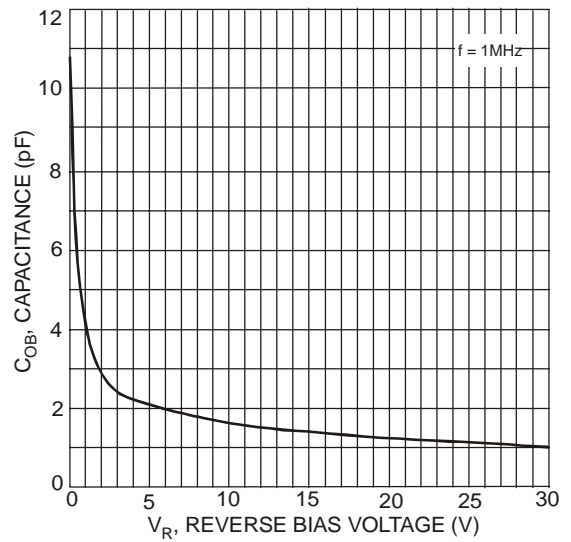


Fig. 4 Output Capacitance

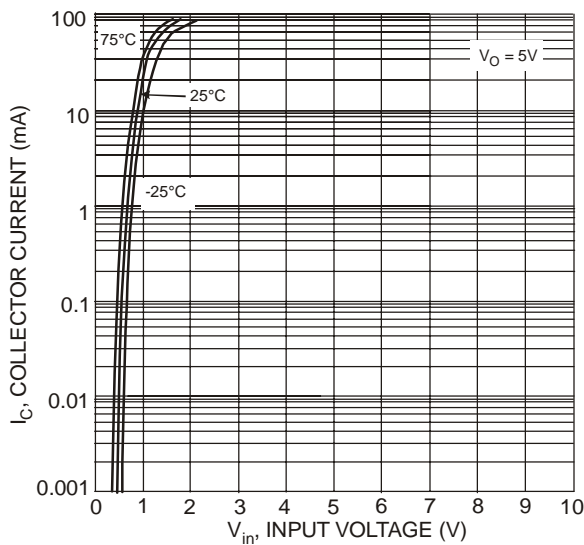


Fig. 5 Collector Current vs. Input Voltage

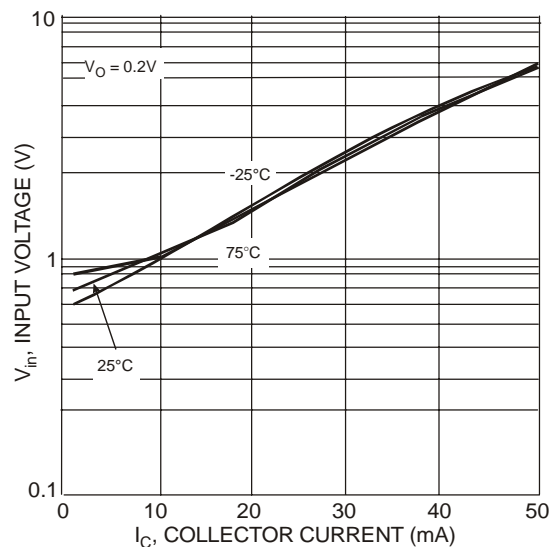


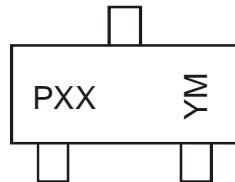
Fig. 6 Input Voltage vs. Collector Current

## Ordering Information (Note 3 & 5)

Device	Packaging	Shipping
DDTA113ZKA-7-F	SC-59	3000/Tape & Reel
DDTA123YKA-7-F	SC-59	3000/Tape & Reel
DDTA123JKA-7-F	SC-59	3000/Tape & Reel
DDTA143XKA-7-F	SC-59	3000/Tape & Reel
DDTA143FKA-7-F	SC-59	3000/Tape & Reel
DDTA143ZKA-7-F	SC-59	3000/Tape & Reel
DDTA114YKA-7-F	SC-59	3000/Tape & Reel
DDTA114WKA-7-F	SC-59	3000/Tape & Reel
DDTA124XKA-7-F	SC-59	3000/Tape & Reel
DDTA144VKA-7-F	SC-59	3000/Tape & Reel
DDTA144WKA-7-F	SC-59	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



PXX = Product Type Marking Code, See Table on Page 1  
 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

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