

# DDTC (R1-ONLY SERIES) KA

## NPN PRE-BIASED SMALL SIGNAL SC-59 SURFACE MOUNT TRANSISTOR

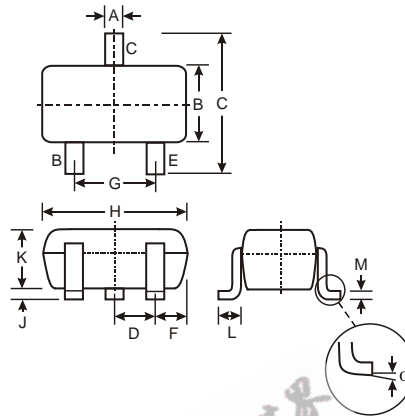
NEW PRODUCT

### Features

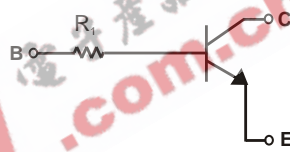
- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistor, R1 only
- **Lead Free/RoHS Compliant (Note 2)**
- "Green" Device, Note 3 and 4

### Mechanical Data

- Case: SC-59
- Case Material: Molded Plastic, "Green" Molding Compound, Note 4. 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: Date Code and Type Code (See Diagrams & Page 2)
- Ordering Information (See Page 2)
- 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
	0°	8°
All Dimensions in mm		



SCHEMATIC DIAGRAM

P/N	R1 (NOM)	Type Code
DDTC113TKA	1K	N01
DDTC123TKA	2.2K	N03
DDTC143TKA	4.7K	N07
DDTC114TKA	10K	N12
DDTC124TKA	22K	N16
DDTC144TKA	47K	N19
DDTC115TKA	100K	N23
DDTC125TKA	200K	N25

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Collector Current	I <sub>C</sub> (Max)	100	mA
Power Dissipation	P <sub>d</sub>	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	R <sub>JA</sub>	625	°C/W
Operating and Storage and Temperature Range	T <sub>j</sub> , T <sub>STG</sub>	-55 to +150	°C

- Note:
1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>
  2. No purposefully added lead.
  3. 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).
  4. Product manufactured with Date Code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</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>CBO</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> = 10mA/1mA DDTC113TKA I <sub>C</sub> /I <sub>B</sub> = 5mA/0.5mA DDTC123TKA I <sub>C</sub> /I <sub>B</sub> = 2.5mA/.25mA DDTC143TKA I <sub>C</sub> /I <sub>B</sub> = 1mA/.1mA DDTC114TKA I <sub>C</sub> /I <sub>B</sub> = 5mA/0.5mA DDTC124TKA I <sub>C</sub> /I <sub>B</sub> = 2.5mA/.25mA DDTC144TKA I <sub>C</sub> /I <sub>B</sub> = 1mA/0.1mA DDTC115TKA I <sub>C</sub> /I <sub>B</sub> = .5mA/.05mA DDTC125TKA
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	R <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

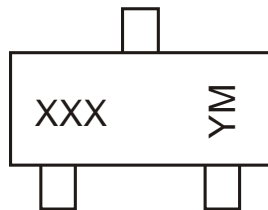
\* Transistor - For Reference Only

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

Device	Packaging	Shipping
DDTC113TKA-7-F	SC-59	3000/Tape & Reel
DDTC123TKA-7-F	SC-59	3000/Tape & Reel
DDTC143TKA-7-F	SC-59	3000/Tape & Reel
DDTC114TKA-7-F	SC-59	3000/Tape & Reel
DDTC124TKA-7-F	SC-59	3000/Tape & Reel
DDTC144TKA-7-F	SC-59	3000/Tape & Reel
DDTC115TKA-7-F	SC-59	3000/Tape & Reel
DDTC125TKA-7-F	SC-59	3000/Tape & Reel

- Notes: 4. Product manufactured with Date Code 0609 (week 9, 2006) and newer are built with Green Molding Compound. Product manufactured prior to Date Code 0609 are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.  
5. For Packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



XXX = Product Type Marking Code, See Table on Page 1  
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 - DDTC114TKA**

NEW PRODUCT

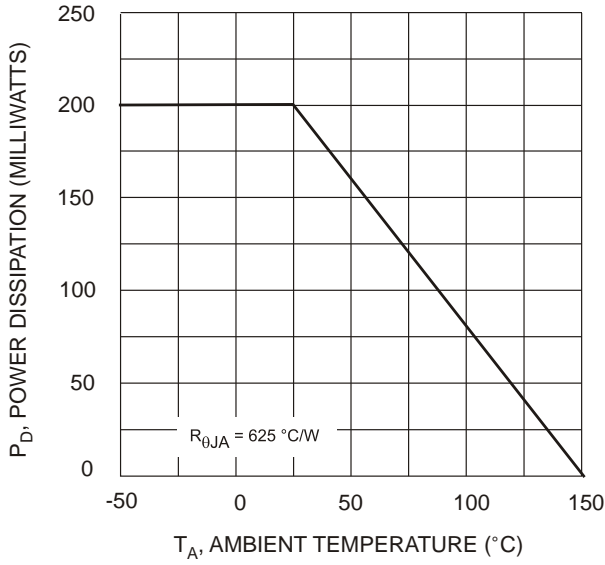


Fig. 1 Derating Curve

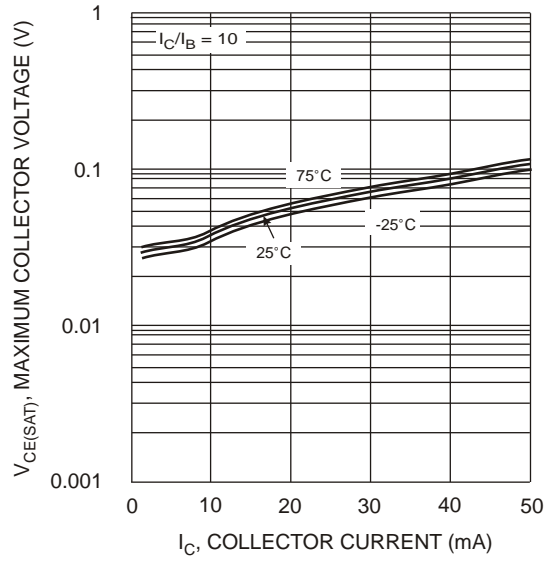


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

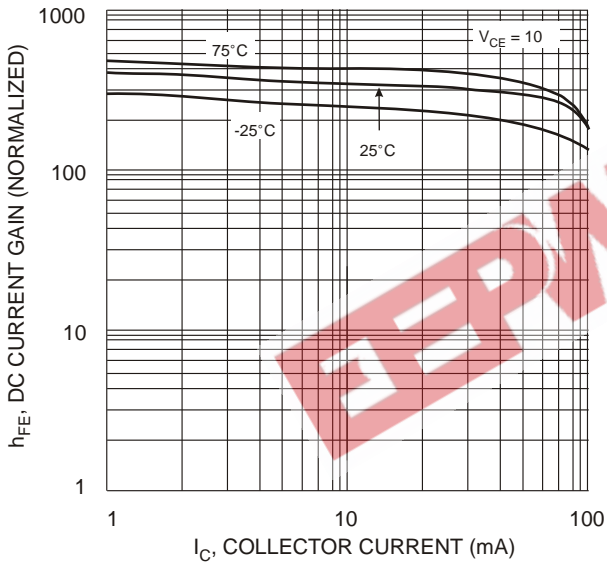


Fig. 3 DC Current Gain

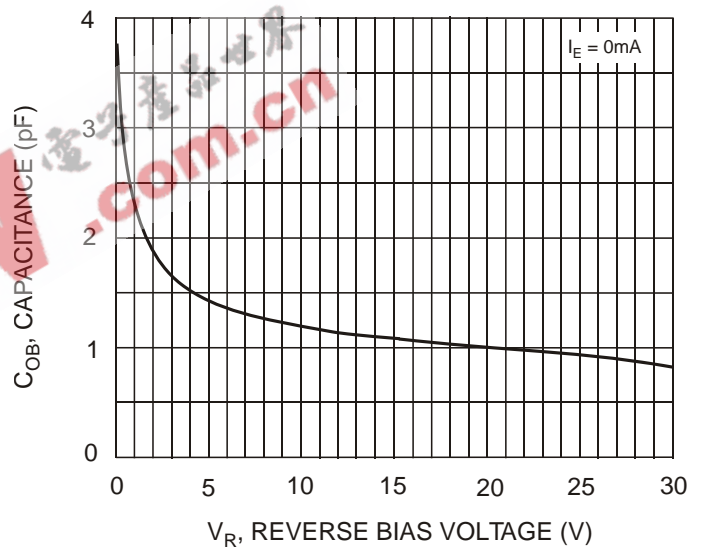


Fig. 4 Output Capacitance

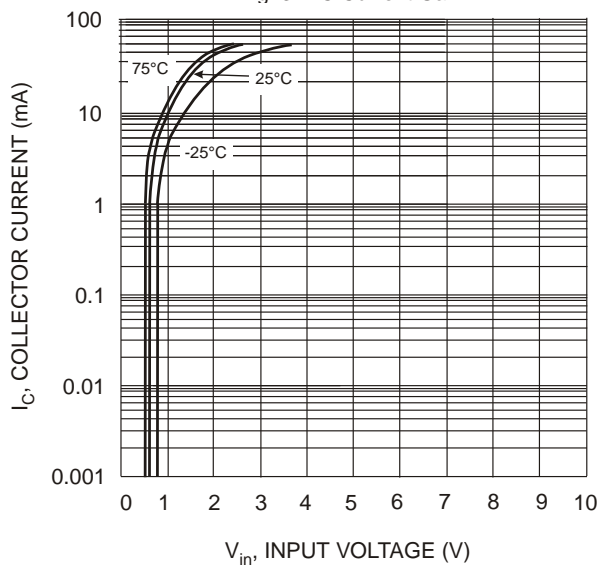


Fig. 5 Collector Current Vs. Input Voltage

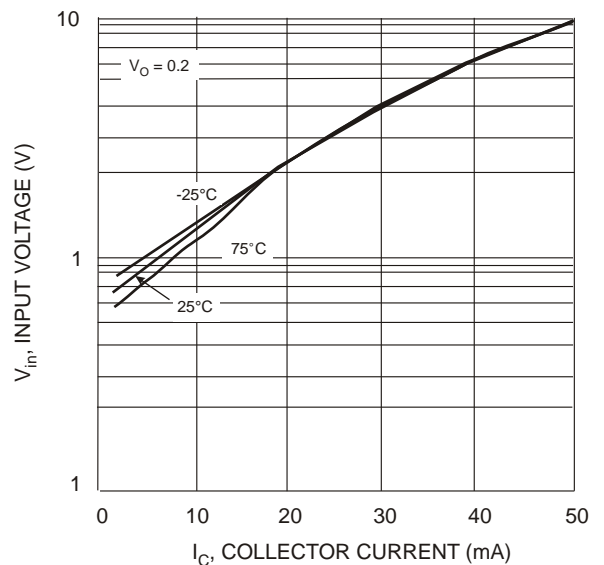


Fig. 6 Input Voltage vs. Collector Current

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