

# DDTC (R1 = R2 SERIES) KA

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

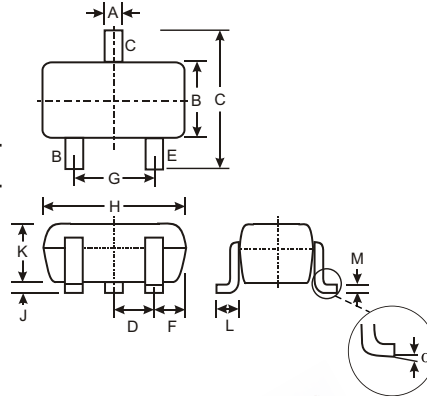
NEW PRODUCT

## Features

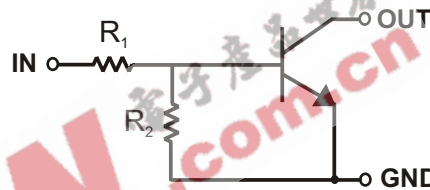
- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 = R2

## Mechanical Data

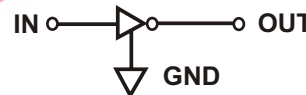
- Case: SC-59, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking: Date Code and Marking Code (See Diagrams & Page 2)
- Weight: 0.008 grams (approx.)
- Ordering Information (See Page 2)



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



P/N	R1, R2 (NOM)	MARKING
DDTC123EKA	2.2K $\Omega$	N04
DDTC143EKA	4.7K $\Omega$	N08
DDTC114EKA	10K $\Omega$	N13
DDTC124EKA	22K $\Omega$	N17
DDTC144EKA	47K $\Omega$	N20
DDTC115EKA	100K $\Omega$	N24



SCHEMATIC DIAGRAM

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

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

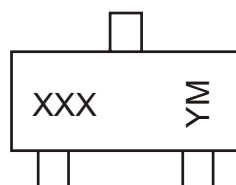
**Electrical Characteristics** @ T<sub>A</sub> = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage		V <sub>I(off)</sub>	0.5	1.1	—	V	V <sub>CC</sub> = 5V, I <sub>O</sub> = 100μA
		V <sub>I(on)</sub>	—	1.9	3		V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA, DDTC123EKA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 20mA, DDTC143EKA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 10mA, DDTC114EKA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 5mA, DDTC124EKA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 2mA, DDTC144EKA V <sub>O</sub> = 0.3V, I <sub>O</sub> = 1mA, DDTC115EKA
Output Voltage		V <sub>O(on)</sub>	—	0.1	0.3	V	I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTC123EKA I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTC143EKA I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTC114EKA I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTC124EKA I <sub>O</sub> /I <sub>I</sub> = 10mA/0.5mA, DDTC144EKA I <sub>O</sub> /I <sub>I</sub> = 5mA/0.25mA, DDTC115EKA
Input Current	DDTC123EKA DDTC143EKA DDTC114EKA DDTC124EKA DDTC144EKA DDTC115EKA	I <sub>I</sub>	—	—	3.8 1.8 0.88 0.36 0.18 0.15	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	DDTC123EKA DDTC143EKA DDTC114EKA DDTC124EKA DDTC144EKA DDTC115EKA	G <sub>I</sub>	20 20 30 56 68 82	—	—	—	V <sub>O</sub> = 5V, I <sub>O</sub> = 20mA V <sub>O</sub> = 5V, I <sub>O</sub> = 10mA 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> = 5mA V <sub>O</sub> = 5V, I <sub>O</sub> = 5mA
Input Resistor (R <sub>1</sub> ) Tolerance		DR <sub>1</sub>	-30	—	+30	%	—
Resistance Ratio		R <sub>2</sub> /R <sub>1</sub>	0.8	1	1.2	—	—
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 2)

Device	Packaging	Shipping
DDTC123EKA-7	SC-59	3000/Tape & Reel
DDTC143EKA-7	SC-59	3000/Tape & Reel
DDTC114EKA-7	SC-59	3000/Tape & Reel
DDTC124EKA-7	SC-59	3000/Tape & Reel
DDTC144EKA-7	SC-59	3000/Tape & Reel
DDTC115EKA-7	SC-59	3000/Tape & Reel

Notes: 2. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.**Marking Information**

XXX = 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 - DDTC143EKA

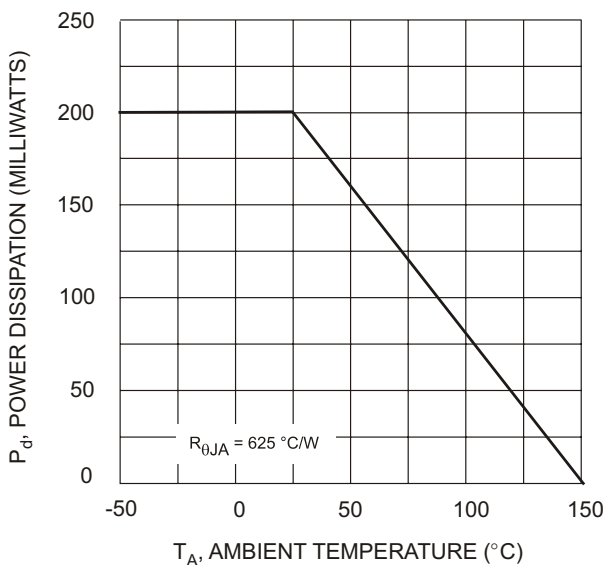


Fig. 1 Derating Curve

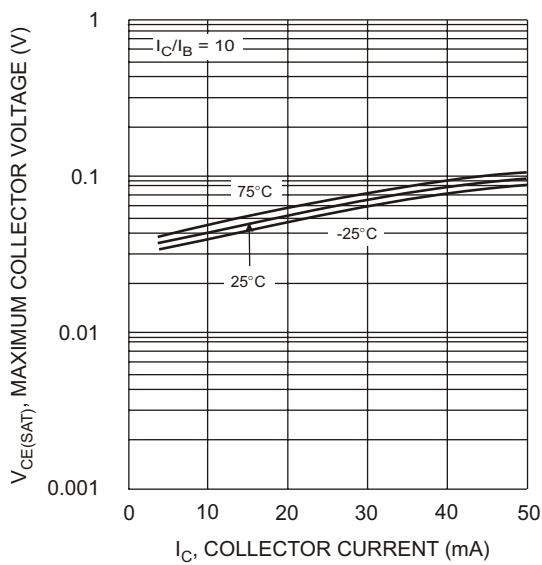


Fig. 2  $V_{CE(SAT)}$  vs.  $I_C$

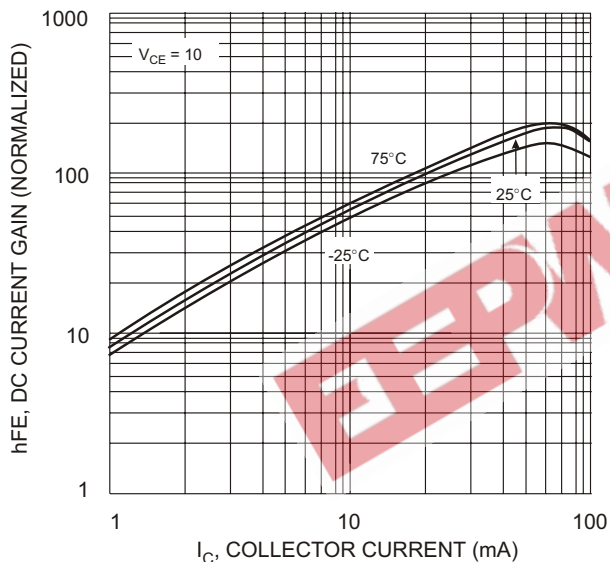


Fig. 3 DC CURRENT GAIN

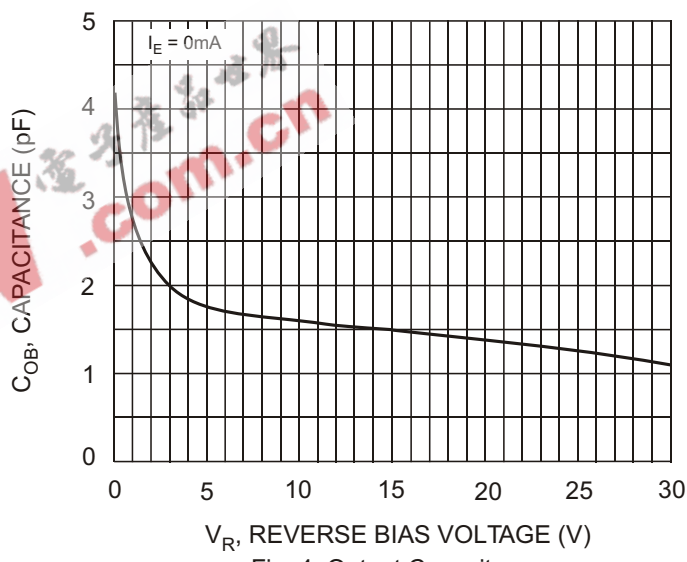


Fig. 4 Output Capacitance

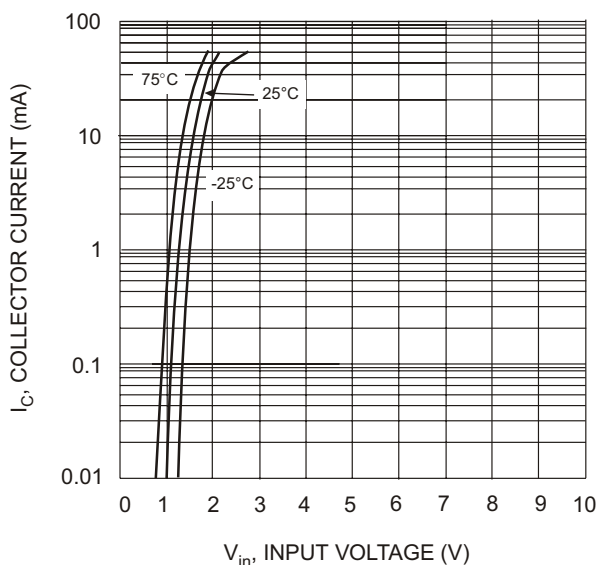


Fig. 5 Collector Current Vs. Input Voltage

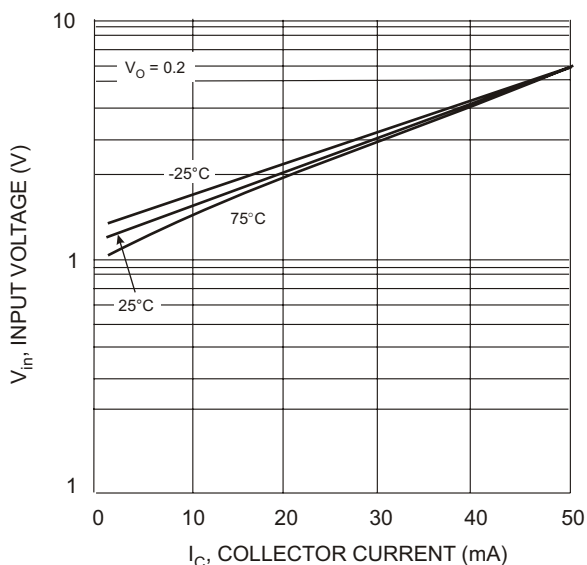


Fig. 6 Input Voltage vs. Collector Current