



DDTC (R1 = R2 SERIES) KA

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

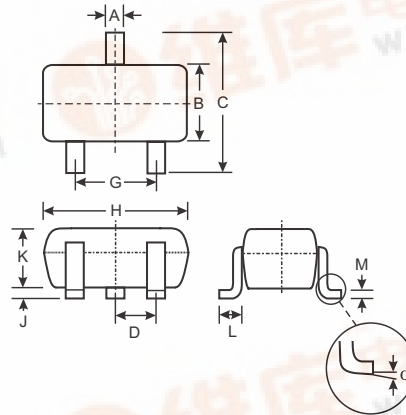
Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 = R2
- **Lead Free/RoHS Compliant (Note 2)**
- "Green" Device, Note 3 and 4

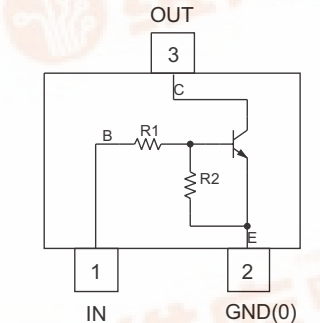
Mechanical Data

- 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 Table Below & Page 2)
- Ordering Information (See Page 2)
- Weight: 0.008 grams (approximate)

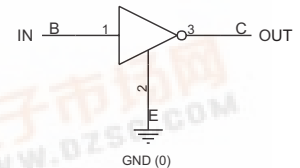
P/N	R1, R2 (NOM)	Type Code
DDTC123EKA	2.2K Ω	N04
DDTC143EKA	4.7K Ω	N08
DDTC114EKA	10K Ω	N13
DDTC124EKA	22K Ω	N17
DDTC144EKA	47K Ω	N20
DDTC115EKA	100K Ω	N24



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		



Schematic and Pin Configuration



Equivalent Inverter Circuit

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage, (3) to (2)	V _{CC}	50	V
Input Voltage, (1) to (2)	V _{IN}	-10 to +12 -10 to +30 -10 to +40 -10 to +40 -10 to +40 -10 to +40	V
Output Current	I _O	100 100 50 30 100 20	mA
Output Current All	I _C (Max)	100	mA
Power Dissipation	P _d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1)	R _{θJA}	625	°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. 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.

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

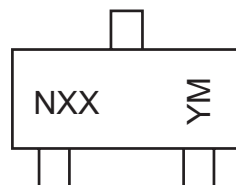
Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage		$V_{I(off)}$	0.5	1.1	—		$V_{CC} = 5V, I_O = 100\mu A$
		$V_{I(on)}$	—	1.9	3	V	$V_O = 0.3V, I_O = 20mA$, DDTC123EKA $V_O = 0.3V, I_O = 20mA$, DDTC143EKA $V_O = 0.3V, I_O = 10mA$, DDTC114EKA $V_O = 0.3V, I_O = 5mA$, DDTC124EKA $V_O = 0.3V, I_O = 2mA$, DDTC144EKA $V_O = 0.3V, I_O = 1mA$, DDTC115EKA
Output Voltage		$V_{O(on)}$	—	0.1	0.3	V	$I_O/I_I = 10mA/0.5mA$, DDTC123EKA $I_O/I_I = 10mA/0.5mA$, DDTC143EKA $I_O/I_I = 10mA/0.5mA$, DDTC114EKA $I_O/I_I = 10mA/0.5mA$, DDTC124EKA $I_O/I_I = 10mA/0.5mA$, DDTC144EKA $I_O/I_I = 5mA/0.25mA$, DDTC115EKA
Input Current	DDTC123EKA DDTC143EKA DDTC114EKA DDTC124EKA DDTC144EKA DDTC115EKA	I_I	—	—	3.8 1.8 0.88 0.36 0.18 0.15	mA	$V_I = 5V$
Output Current		$I_{O(off)}$	—	—	0.5	μA	$V_{CC} = 50V, V_I = 0V$
DC Current Gain	DDTC123EKA DDTC143EKA DDTC114EKA DDTC124EKA DDTC144EKA DDTC115EKA	G_I	20 20 30 56 68 82	—	—	—	$V_O = 5V, I_O = 20mA$ $V_O = 5V, I_O = 10mA$ $V_O = 5V, I_O = 5mA$ $V_O = 5V, I_O = 5mA$ $V_O = 5V, I_O = 5mA$ $V_O = 5V, I_O = 5mA$
Input Resistor (R_1) Tolerance		ΔR_1	-30	—	+30	%	—
Resistance Ratio		R_2/R_1	0.8	1	1.2	—	—
Gain-Bandwidth Product*		f_T	—	250	—	MHz	$V_{CE} = 10V, I_E = 5mA$, $f = 100MHz$

* Transistor - For Reference Only

Ordering Information (Note 4 & 5)

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


NXX = 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

TYPICAL CURVES - DDTC143EKA

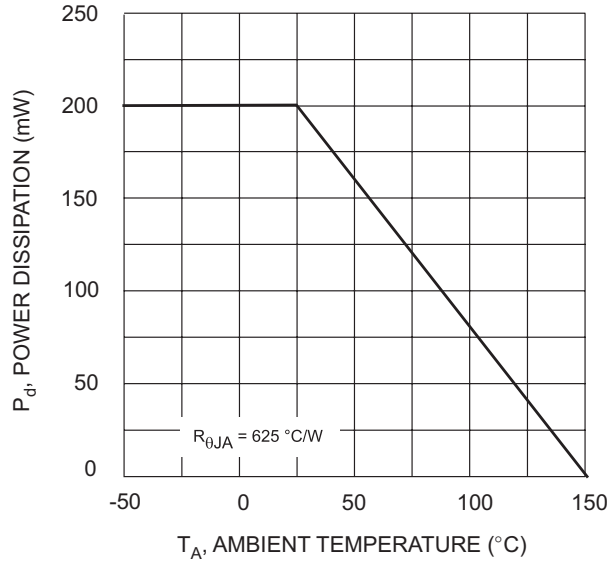


Fig. 1 Derating Curve

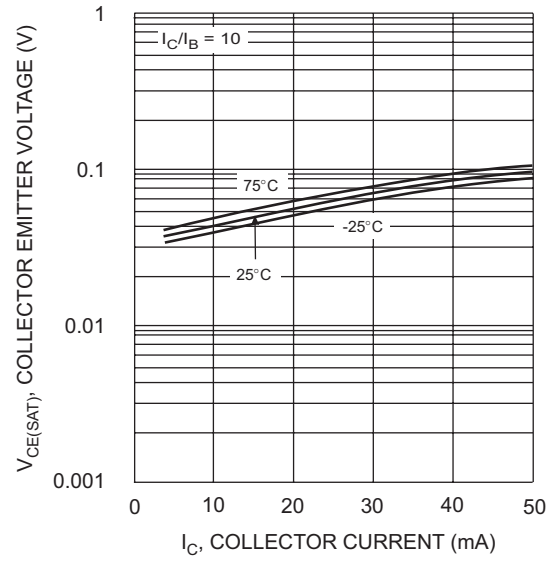


Fig. 2 $V_{CE(SAT)}$ vs. I_C

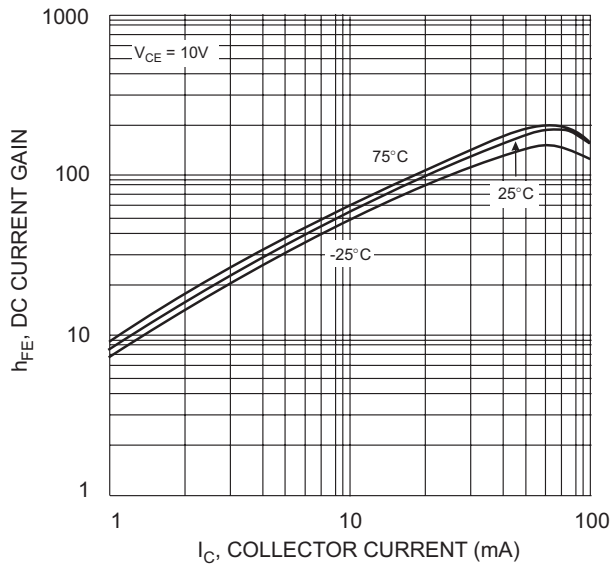


Fig. 3 DC Current Gain

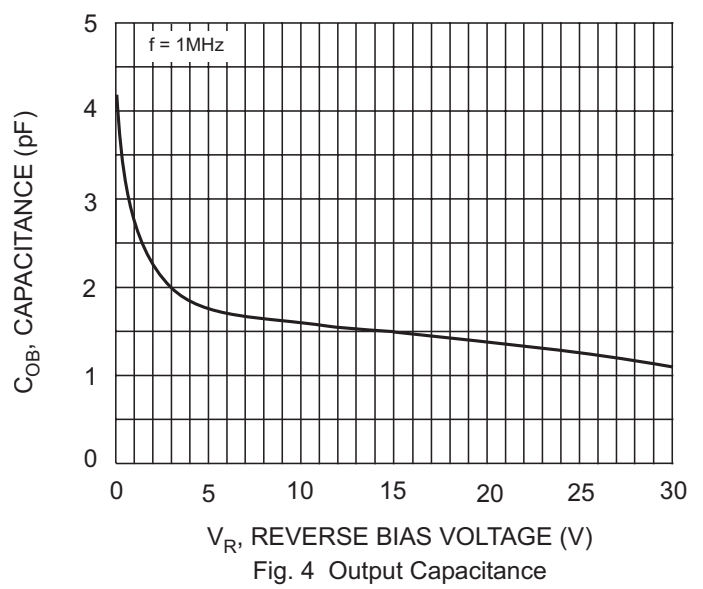


Fig. 4 Output Capacitance

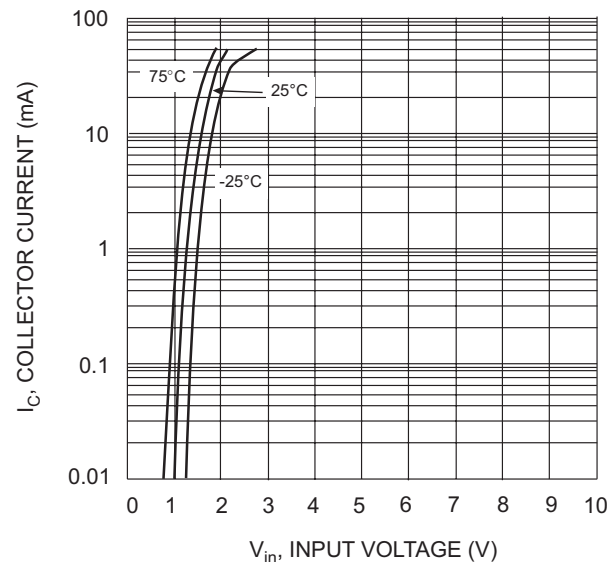


Fig. 5 Collector Current Vs. Input Voltage

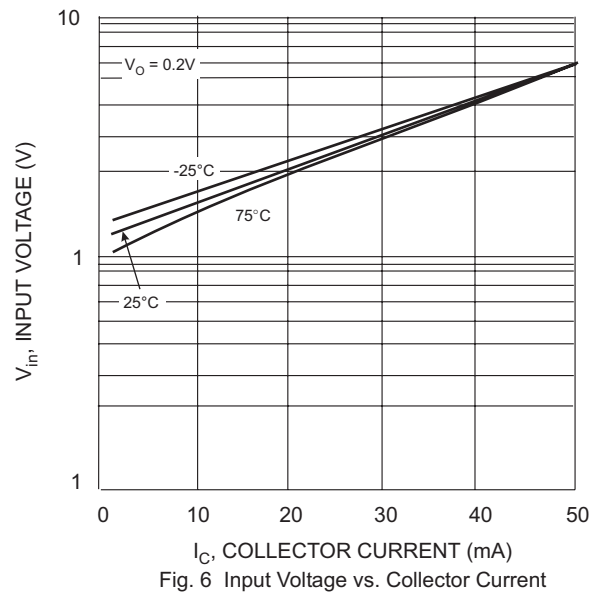


Fig. 6 Input Voltage vs. Collector Current



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