

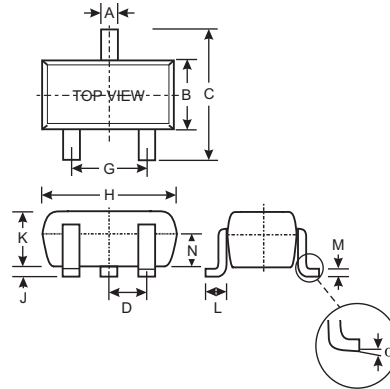
Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 = R2
- Lead Free/RoHS Compliant (Note 1)

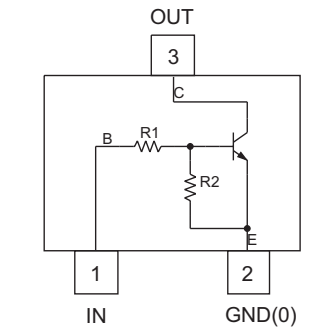
Mechanical Data

- Case: SOT-523
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Diagram
- Terminals: Finish - Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Marking & Type Code Information: See Table Below and Last Page
- Ordering Information: See Last Page
- Weight: 0.002 grams (approximate)

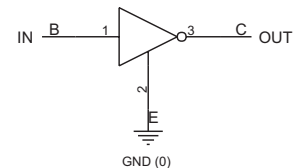
P/N	R1, R2 (NOM)	MARKING
DDTC123EE	2.2K Ω	N04
DDTC143EE	4.7K Ω	N08
DDTC114EE	10K Ω	N13
DDTC124EE	22K Ω	N17
DDTC144EE	47K Ω	N20
DDTC115EE	100K Ω	N24



SOT-523			
Dim	Min	Max	Typ
A	0.15	0.30	0.22
B	0.75	0.85	0.80
C	1.45	1.75	1.60
D	—	—	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
J	0.00	0.10	0.05
K	0.60	0.80	0.75
L	0.10	0.30	0.22
M	0.10	0.20	0.12
N	0.45	0.65	0.50
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 -10 to +40	V
Output Current	I _O	100 100 50 30 100 20	mA
Power Dissipation	P _d	150	mW
Thermal Resistance, Junction to Ambient Air (Note 2)	R _{θJA}	833	°C/W
Operating and Storage and Temperature Range	T _j , T _{STG}	-55 to +150	°C

- Note:
1. No purposefully added lead.
 2. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.

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	$V_{CC} = 5V, I_O = 100\mu A$
		$V_{I(on)}$	—	1.9	3		$V_O = 0.3V, I_O = 20mA$, DDTC123EE $V_O = 0.3V, I_O = 20mA$, DDTC143EE $V_O = 0.3V, I_O = 10mA$, DDTC114EE $V_O = 0.3V, I_O = 5mA$, DDTC124EE $V_O = 0.3V, I_O = 2mA$, DDTC144EE $V_O = 0.3V, I_O = 1mA$, DDTC115EE
Output Voltage		$V_{O(on)}$	—	0.1	0.3	V	$I_O/I_I = 10mA/0.5mA$, DDTC123EE $I_O/I_I = 10mA/0.5mA$, DDTC143EE $I_O/I_I = 10mA/0.5mA$, DDTC114EE $I_O/I_I = 10mA/0.5mA$, DDTC124EE $I_O/I_I = 10mA/0.5mA$, DDTC144EE $I_O/I_I = 5mA/0.25mA$, DDTC115EE
Input Current	DDTC123EE DDTC143EE DDTC114EE DDTC124EE DDTC144EE DDTC115EE	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	DDTC123EE DDTC143EE DDTC114EE DDTC124EE DDTC144EE DDTC115EE	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

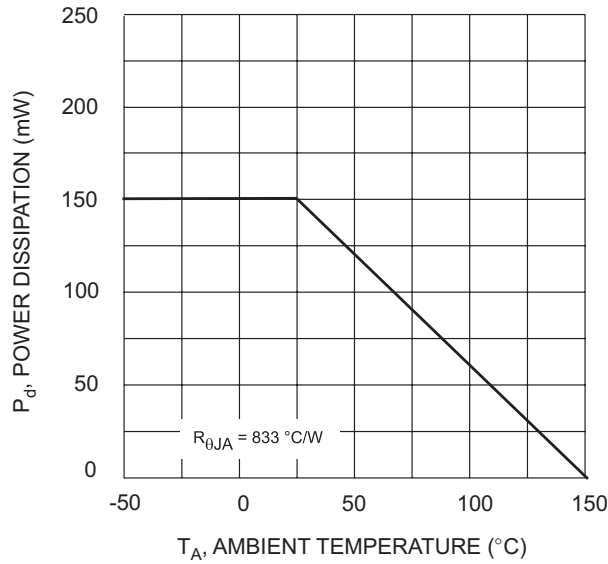


Fig. 1 Derating Curve

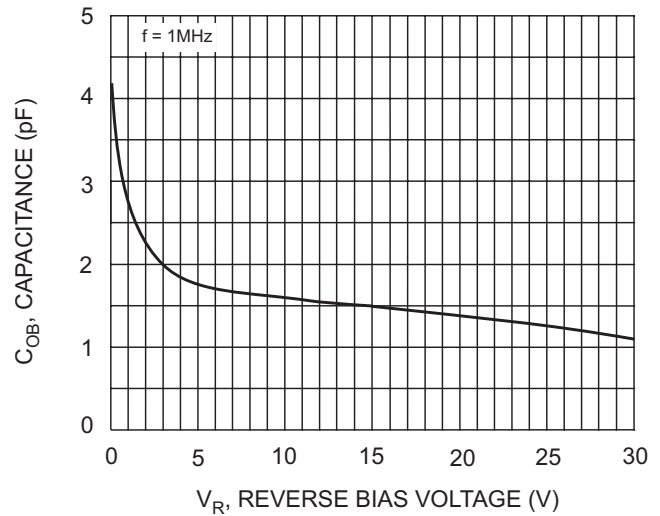


Fig. 2 Output Capacitance

Typical Curves - DDTC123EE

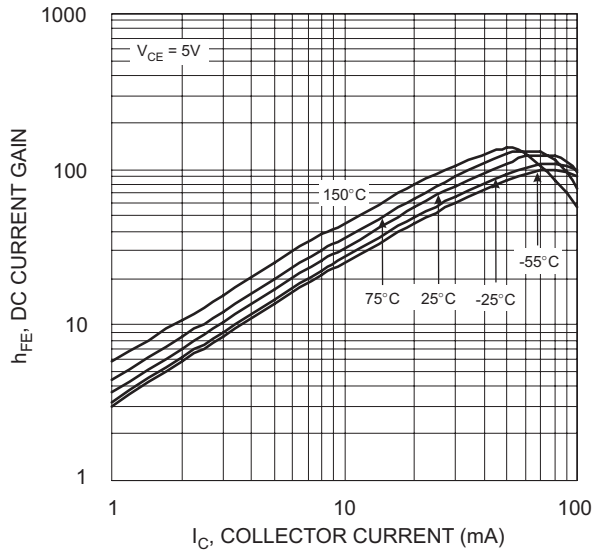


Fig. 3 Typical DC Current Gain vs. Collector Current

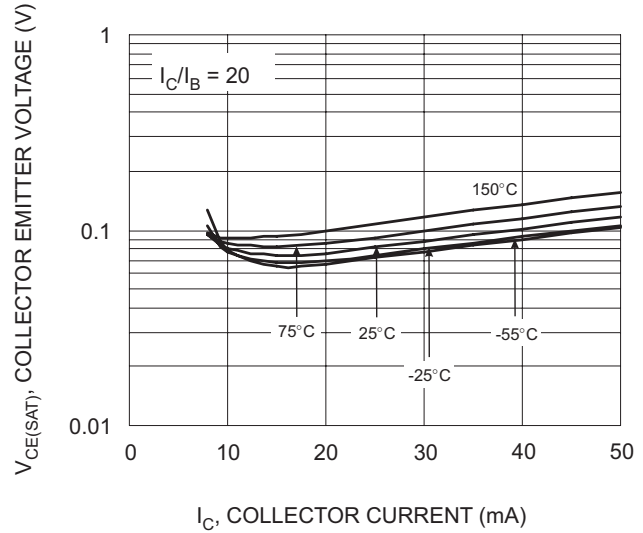


Fig. 4 $V_{CE(SAT)}$ vs. I_C

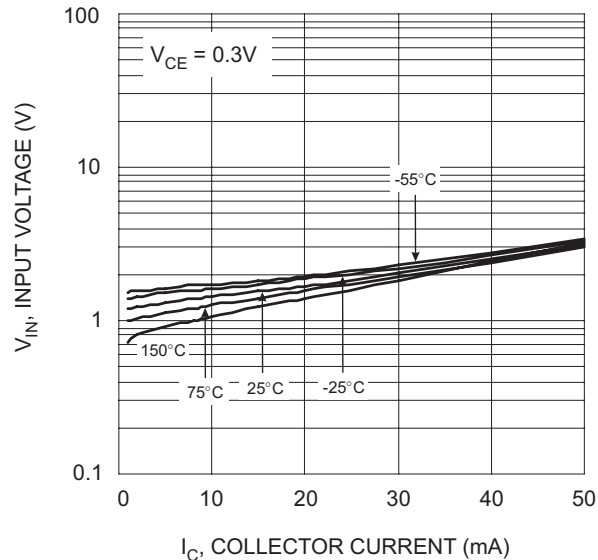


Fig. 5 Input Voltage vs. Collector Current

Typical Curves - DDTC143EE

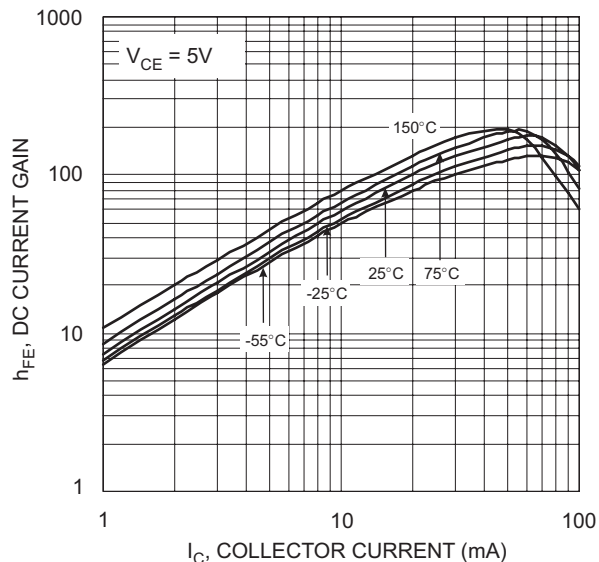


Fig. 6 Typical DC Current Gain vs Collector Current

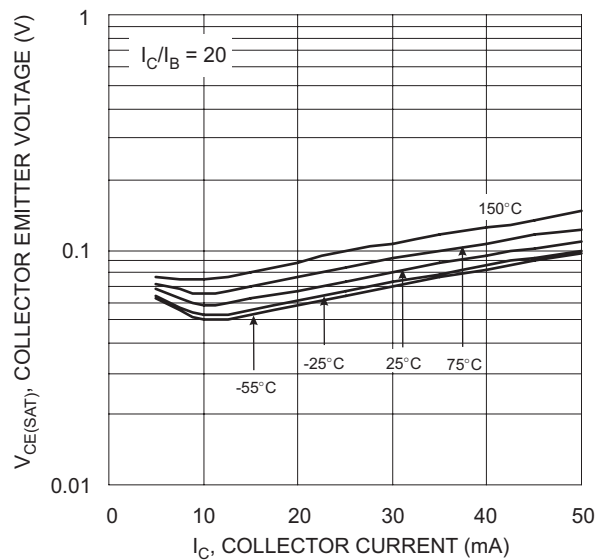


Fig. 7 $V_{CE(SAT)}$ vs. I_C

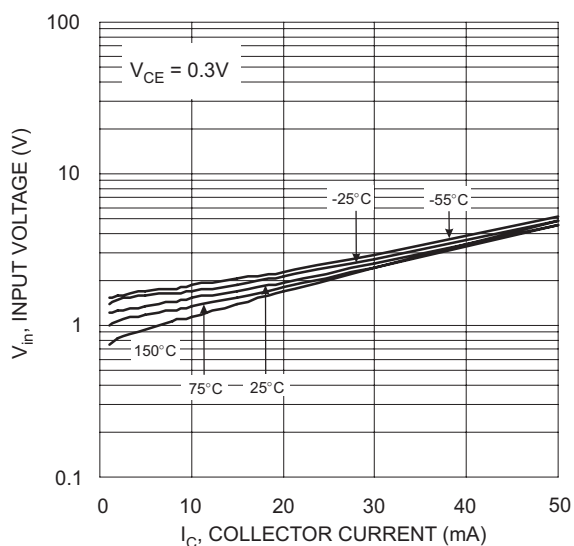


Fig. 8 Input Voltage vs. Collector Current

Typical Curves - DDTC114EE

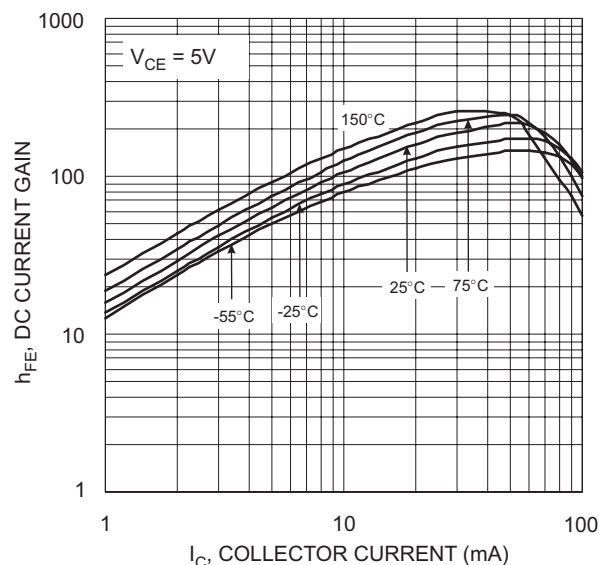


Fig. 9 Typical DC Current Gain vs Collector Current

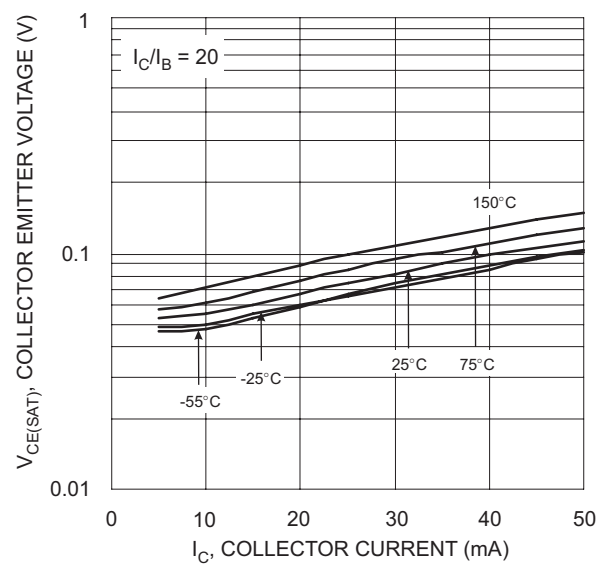
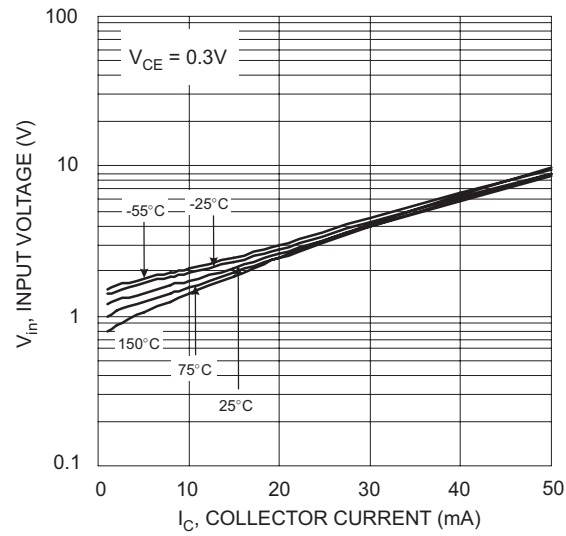
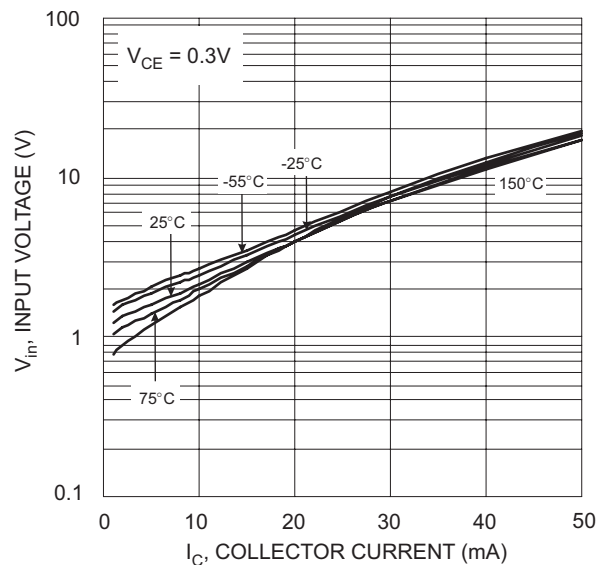
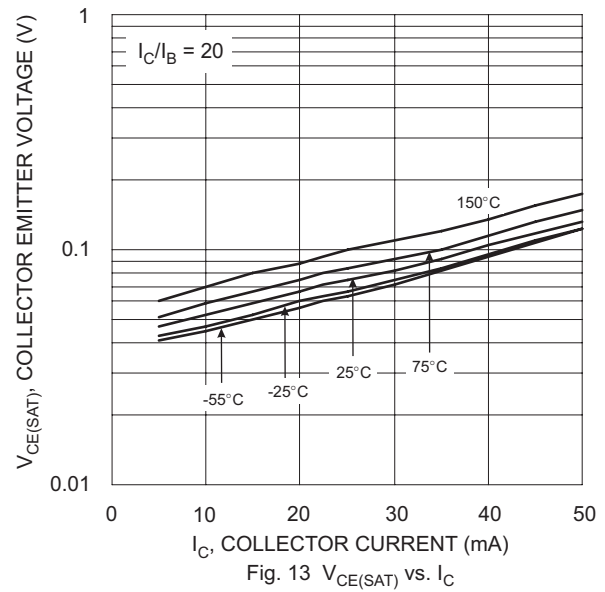
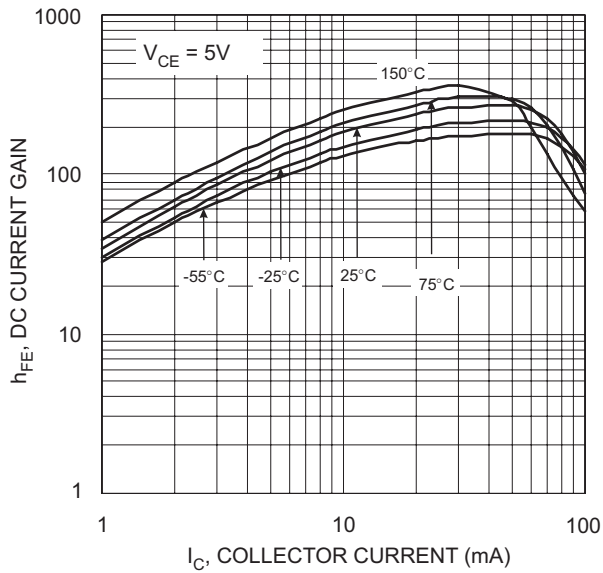


Fig. 10 $V_{CE(SAT)}$ vs. I_C



Typical Curves - DDTC124EE



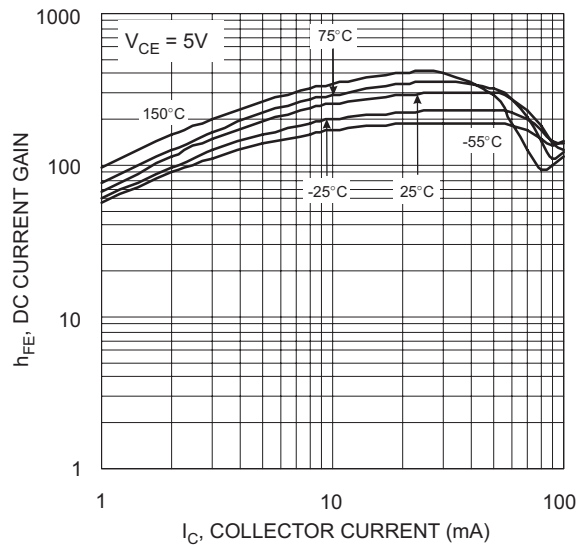


Fig. 15 Typical DC Current Gain vs Collector Current

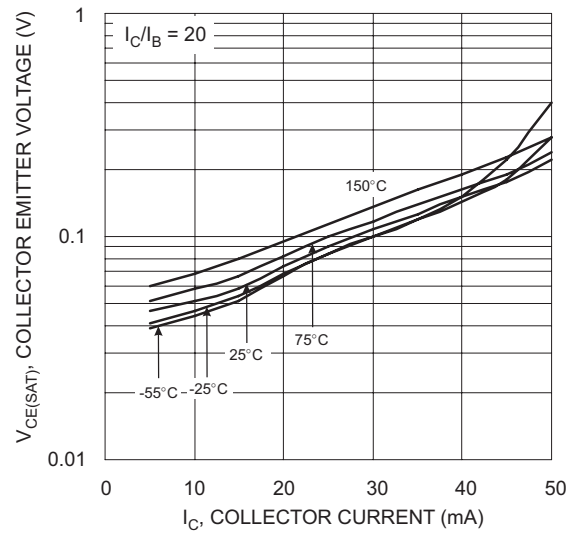
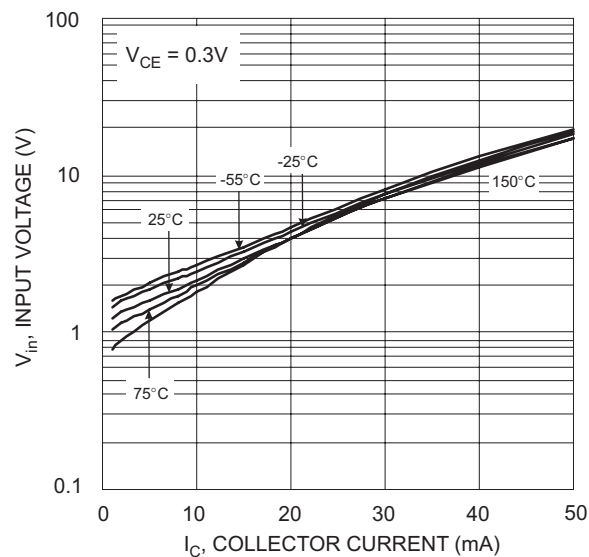

 Fig. 16 $V_{CE(SAT)}$ vs. I_C


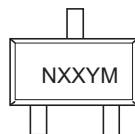
Fig. 16 Input Voltage vs. Collector Current

Ordering Information (Note 3)

Device	Packaging	Shipping
DDTC123EE-7-F	SOT-523	3000/Tape & Reel
DDTC143EE-7-F	SOT-523	3000/Tape & Reel
DDTC114EE-7-F	SOT-523	3000/Tape & Reel
DDTC124EE-7-F	SOT-523	3000/Tape & Reel
DDTC144EE-7-F	SOT-523	3000/Tape & Reel
DDTC115EE-7-F	SOT-523	3000/Tape & Reel

 Notes: 3. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



NXX = 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	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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