

Features

- Epitaxial Planar Die Construction
- Complementary PNP Types Available (DDTA)
- Built-In Biasing Resistors, R1 = R2
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

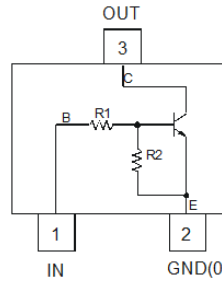
Mechanical Data

- Case: SOT-523
- Case Material: Molded Plastic, "Green" Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208(63)
- Weight: 0.002 grams (Approximate)

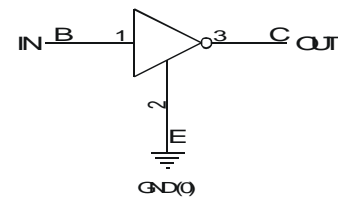
Part Number	R1, R2 (NOM)
DDTC123EE	2.2K Ω
DDTC143EE	4.7K Ω
DDTC114EE	10K Ω
DDTC124EE	22K Ω
DDTC144EE	47K Ω
DDTC115EE	100K Ω



Top View



Device Schematic



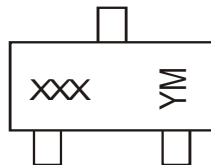
Equivalent Inverter Circuit

Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDTC123EE-7-F	AEC-Q101	N04	7	8	3,000
DDTC143EE-7-F	AEC-Q101	N08	7	8	3,000
DDTC114EE-7-F	AEC-Q101	N13	7	8	3,000
DDTC124EE-7-F	AEC-Q101	N17	7	8	3,000
DDTC144EE-7-F	AEC-Q101	N20	7	8	3,000
DDTC115EE-7-F	AEC-Q101	N24	7	8	3,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-Free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



XXX = Product Type Marking Code, See Table Above
 YM = Date Code Marking
 Y = Year ex: B = 2014
 M = Month ex: 9 = September

Date Code Key

Year	2012	2013	2014	2015	2016	2017	2018	2019
Code	Z	A	B	C	D	E	F	G

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

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Supply Voltage <Pin: (3) to (2)>		V _{CC}	50	V
Input Voltage <Pin: (1) to (2)>	DDTC123EE	V _{IN}	-10 to +12	V
	DDTC143EE		-10 to +30	
	DDTC114EE		-10 to +40	
	DDTC124EE		-10 to +40	
	DDTC144EE		-10 to +40	
	DDTC115EE		-10 to +40	
Output Current	DDTC123EE	I _O	100	mA
	DDTC143EE		100	
	DDTC114EE		50	
	DDTC124EE		30	
	DDTC144EE		100	
	DDTC115EE		20	
Output Current	I _C (Max)	100	mA	

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

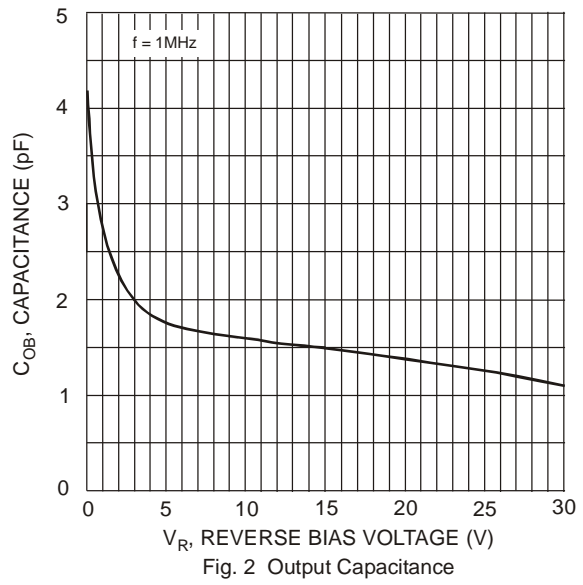
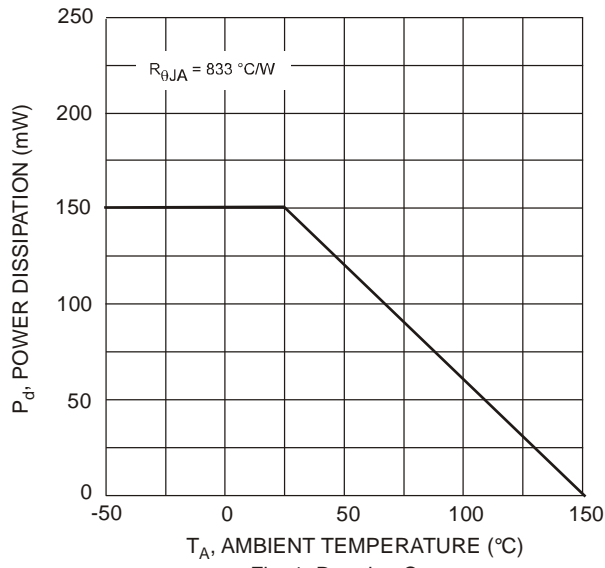
Characteristic	Symbol	Value	Unit
Power Dissipation (Notes 5 & 6)	P _D	150	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	R _{θJA}	833	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°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 = 100μA
	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	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	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 Tolerance	ΔR ₁	-30	—	+30	%	—
Resistance Ratio Tolerance	ΔR ₂ /R ₁	0.8	1	1.2	%	—
Gain-Bandwidth Product (Note 7)	f _T	—	250	—	MHz	V _{CE} = -10V, I _E = 5mA, f = 100MHz

- Notes:
- Mounted on FR4 PC Board with minimum recommended pad layout.
 - 150mW per element must not be exceeded.
 - Transistor only.

Typical Electrical Characteristics



Typical Electrical Characteristics – DDTC123EE

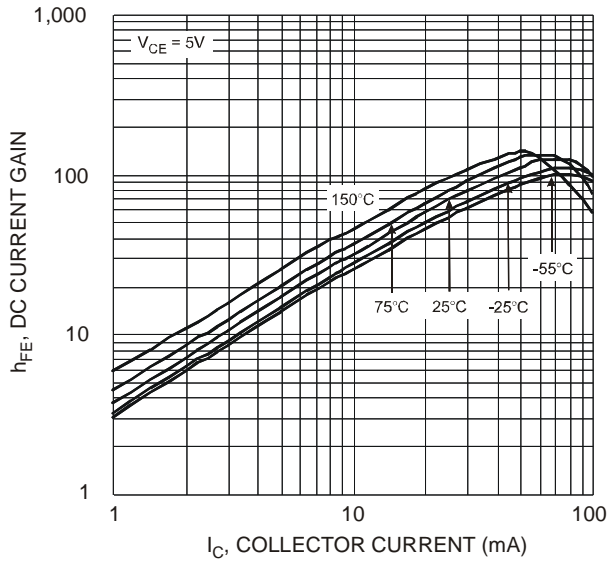


Fig. 3 Typical DC Current Gain vs. Collector Current

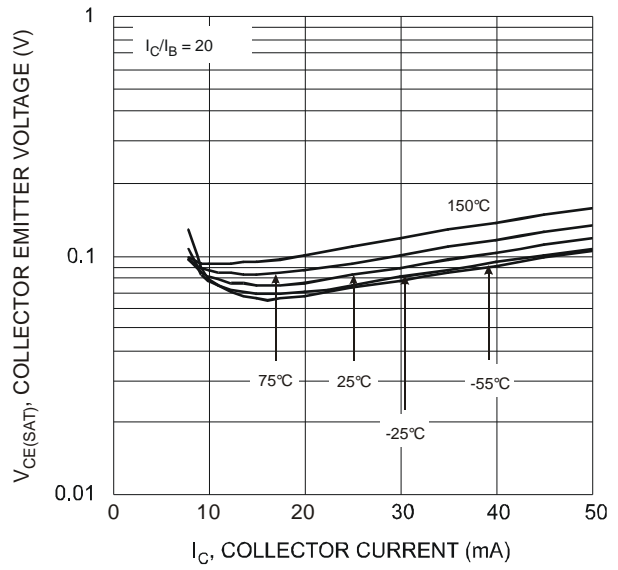


Fig. 4 $V_{CE(SAT)}$ vs. I_C

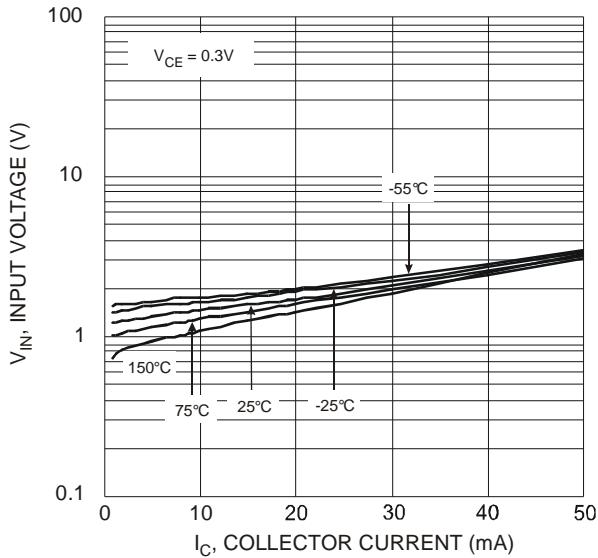


Fig. 5 Input Voltage vs. Collector Current

Typical Electrical Characteristics – DDTC143EE

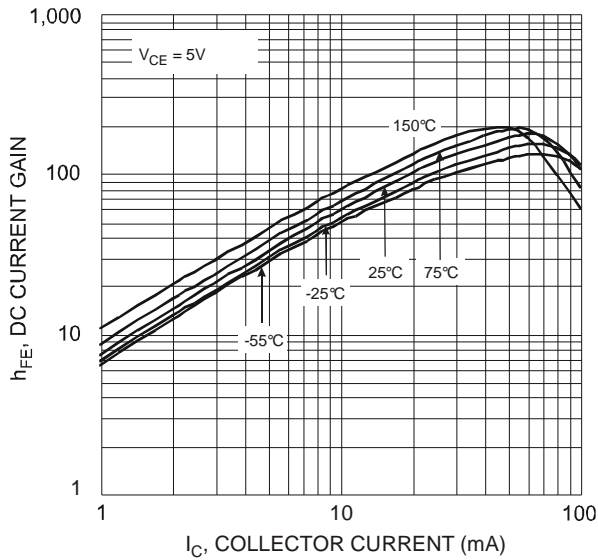


Fig. 6 Typical DC Current Gain vs. Collector Current

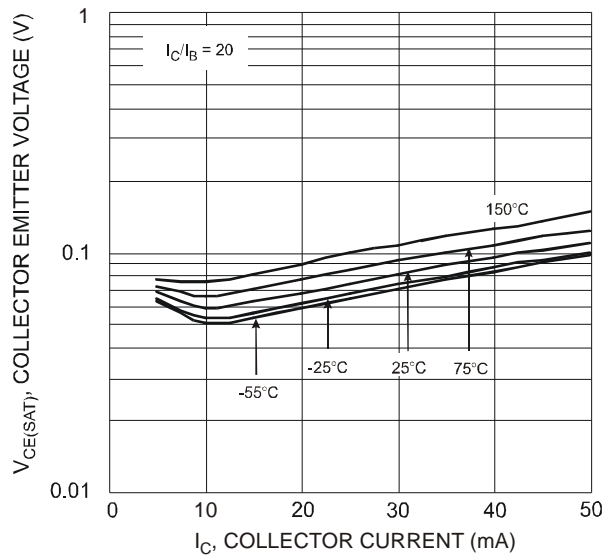


Fig. 7 $V_{CE(SAT)}$ vs. I_C

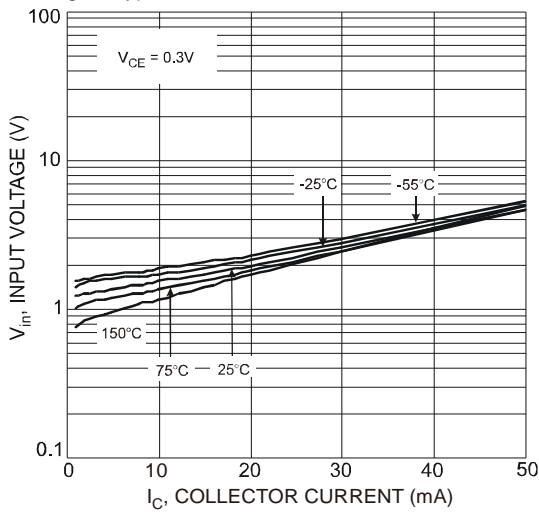


Fig. 8 Input Voltage vs. Collector Current

Typical Electrical Characteristics – DDTC114EE

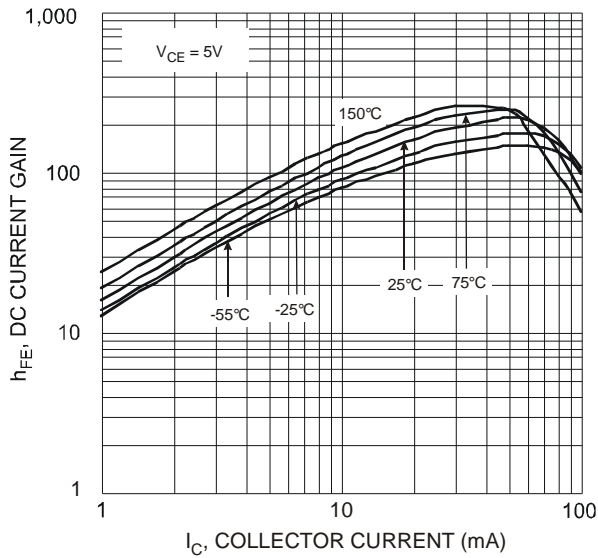


Fig. 9 Typical DC Current Gain vs. Collector Current

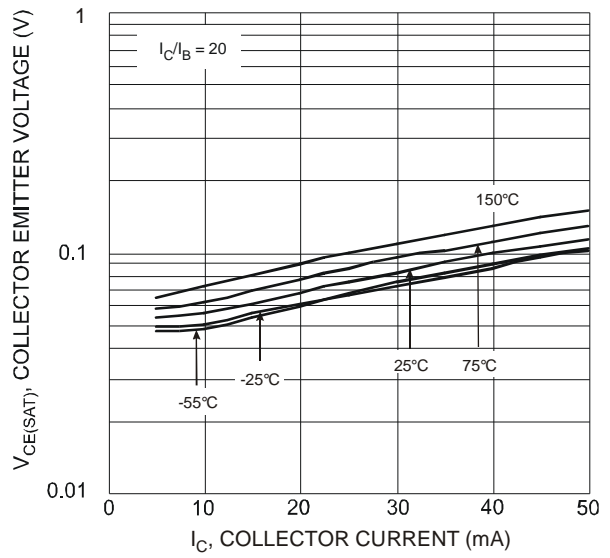


Fig. 10 $V_{CE(SAT)}$ vs. I_C

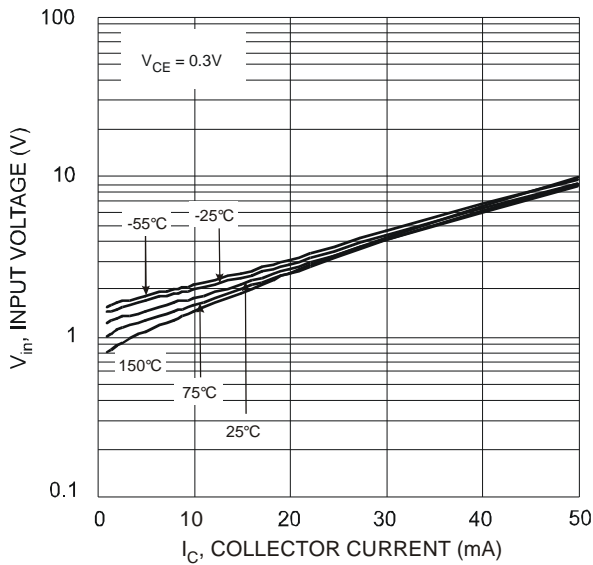


Fig. 11 Input Voltage vs. Collector Current

Typical Electrical Characteristics – DDTC124EE

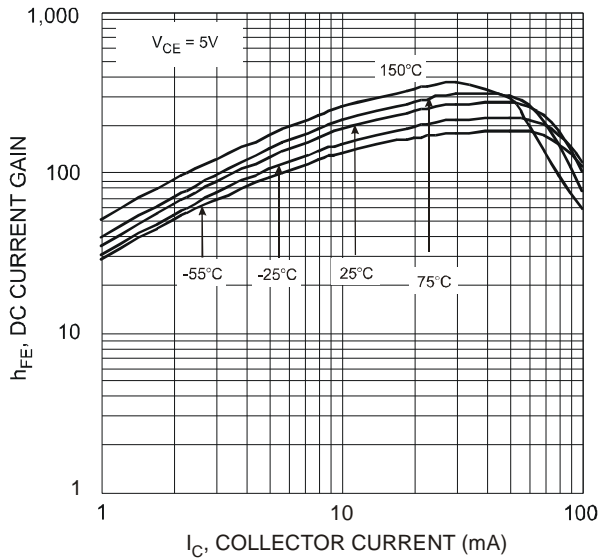


Fig. 12 Typical DC Current Gain vs. Collector Current

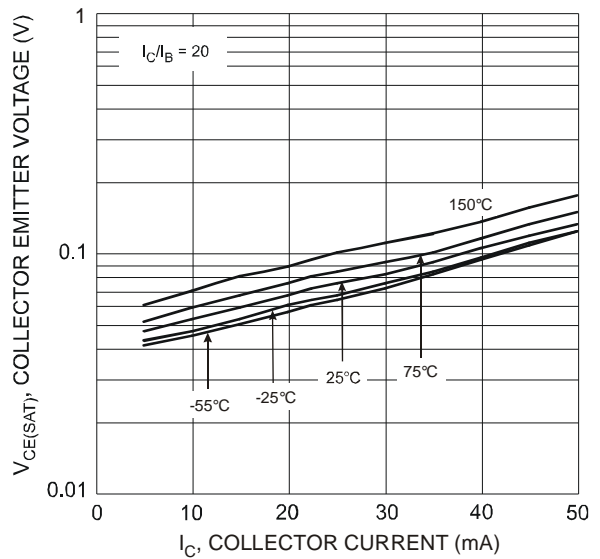


Fig. 13 $V_{CE(SAT)}$ vs. I_C

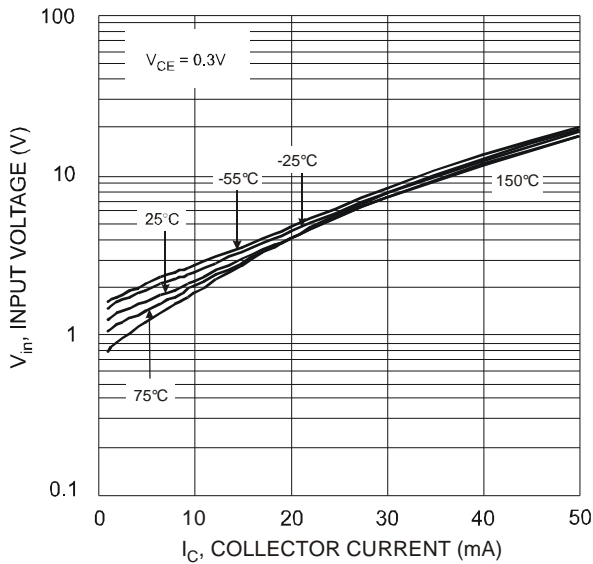


Fig. 14 Input Voltage vs. Collector Current

Typical Electrical Characteristics – DDTC144EE

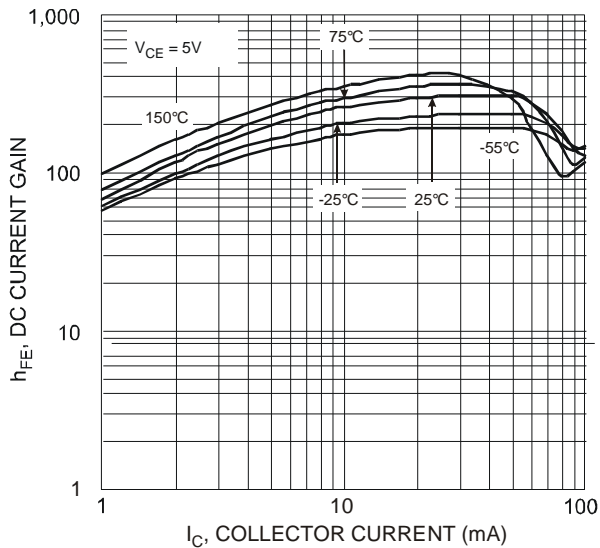


Fig. 15 Typical DC Current Gain vs. Collector Current

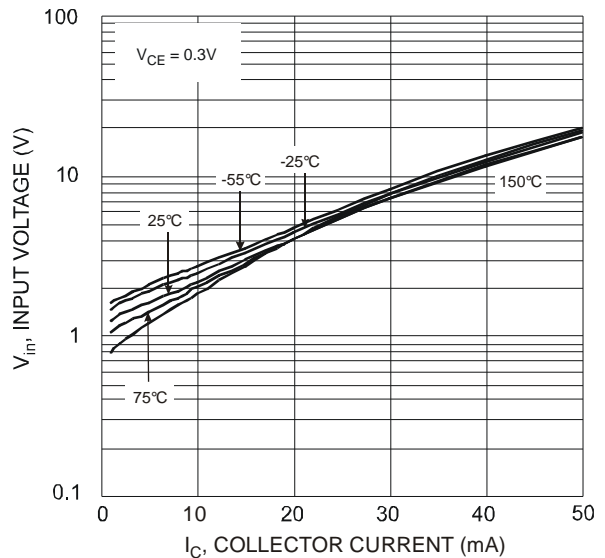


Fig. 16 Input Voltage vs. Collector Current

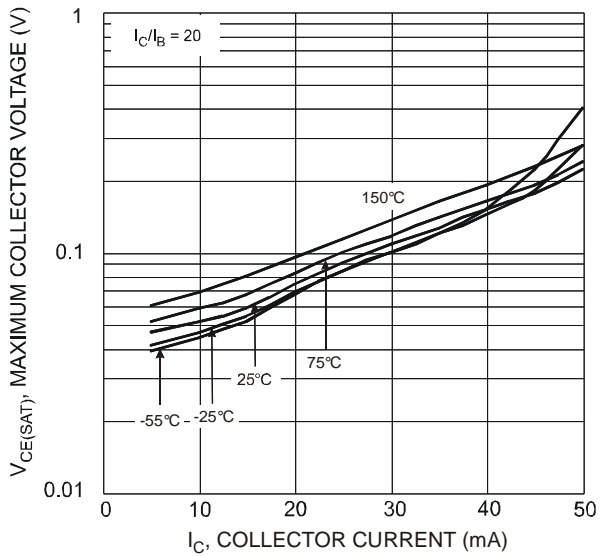
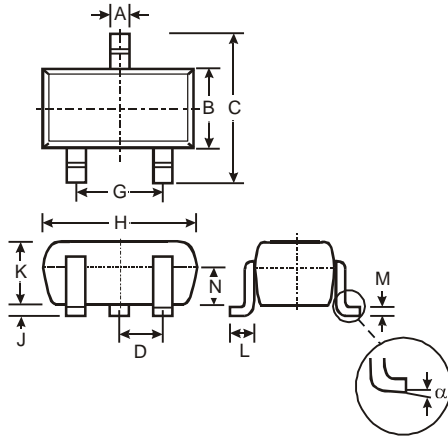


Fig. 17 $V_{CE(SAT)}$ vs. I_C

Package Outline Dimensions

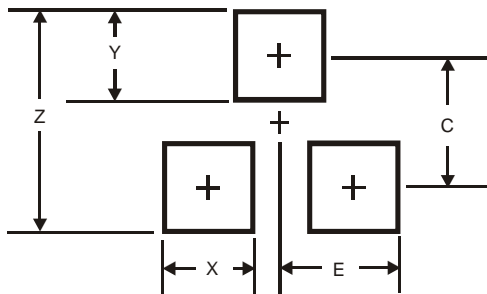
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SOT523			
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			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
Z	1.8
X	0.4
Y	0.51
C	1.3
E	0.7

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