

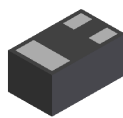
PRE-BIASED SMALL SIGNAL SURFACE MOUNT 100mA NPN TRANSISTOR
Features

- Epitaxial Planar Die Construction
- Ultra-Small Leadless Surface Mount Package
- Ideally Suited for Automated Assembly Processes
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

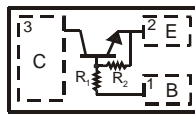
Part Number	R1 (NOM)	R2 (NOM)
DDTC123JLP	2.2K	47K
DDTC143ZLP	4.7K	47K
DDTC114YLP	10K	47K

Mechanical Data

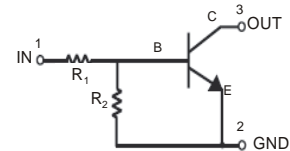
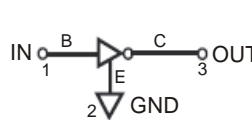
- Case: DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminal Connections: Collector Dot (See Diagram and Marking Information)
- Terminals: Finish — NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 6
- Ordering Information: See Page 6
- Weight: 0.0009 grams (approximate)



Bottom View



Package Pin Out Configuration



Device Schematics

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

Characteristic	P/N	Symbol	Value	Unit
Supply Voltage		V_{CC}	50	V
Input Voltage	DDTC123JLP	V_{IN}	-5 to +12	V
	DDTC143ZLP		-5 to +30	
	DDTC114YLP		-5 to +40	
Output Voltage	DDTC123JLP	I_O	100	mA
	DDTC143ZLP		100	
	DDTC114YLP		70	
Maximum Collector Current		$I_{C(MAX)}$	100	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	P_D	250	mW
Power Deration above 25 °C	P_{der}	2	mW/°C
Thermal Resistance, Junction to Ambient Air (Note 3) (Equivalent to one heated junction of NPN)	$R_{\theta JA}$	500	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

- Notes:
1. No purposefully added lead.
 2. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
 3. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on page 6 or our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	P/N	Symbol	Min	Typ	Max	Unit	Test Condition
Off Characteristics (Note 4)							
Collector-Base Breakdown Voltage		V _{(BR)CBO}	50	—	—	V	I _C = 10μA, I _E = 0
Collector-Emitter Breakdown Voltage *		V _{(BR)CEO}	50	—	—	V	I _C = 2mA, I _B = 0
Emitter-Base Breakdown Voltage *		V _{(BR)EBO}	4.5	—	—	V	I _E = 50μA, I _C = 0
Collector Cutoff Current *		I _{CEX}	—	—	0.5	μA	V _{CE} = 50V, V _{EB(OFF)} = 3.0V
Base Cutoff Current (I _{BEX})		I _{BL}	—	—	0.5	μA	V _{CE} = 50V, V _{EB(OFF)} = 3.0V
Collector-Base Cut Off Current		I _{CBO}	—	—	0.5	μA	V _{CB} = 50V, I _E = 0
Collector-Emitter Cut Off Current, I _{O(OFF)}		I _{CEO}	—	—	0.5	μA	V _{CE} = 50V, I _B = 0
Emitter-Base Cut Off Current		I _{EBO}	—	—	0.5	mA	V _{EB} = 5V, I _C = 0
Input-Off Voltage		V _{I(OFF)}	—	—	0.5	V	V _{CE} = 5V, I _C = 100μA
On Characteristics (Note 4)							
Base-Emitter Turn-On Voltage*	DDTC123JLP	V _{BE(ON)}	—	—	0.85	V	V _{CE} = 5V, I _C = 2mA
	DDTC143ZLP		—	—	0.85		
	DDTC114YLP		—	—	0.95		
Base-Emitter Saturation Voltage*	DDTC123JLP	V _{BE(SAT)}	—	—	0.98	V	I _C = 10mA, I _B = 1mA, V _{CE} =5V
	DDTC143ZLP		—	—	0.998		
	DDTC114YLP		—	—	0.98		
Input-On Voltage		V _{I(ON)}	1.1	—	—	V	V _O = 0.3V, I _C = 5mA
Input Current	DDTC123JLP	I _I	—	—	7.2	mA	V _I = 5V
	DDTC143ZLP		—	—	1.5		
	DDTC114YLP		—	—	7.2		
DC Current Gain		h _{FE}	50	—	—	—	V _{CE} = 5V, I _C = 1mA
			70	—	—	—	V _{CE} = 5V, I _C = 2mA
			125	—	—	—	V _{CE} = 5V, I _C = 5mA
			150	—	—	—	V _{CE} = 5V, I _C = 10mA
			180	—	—	—	V _{CE} = 5V, I _C = 50mA
Collector-Emitter Saturation Voltage		V _{CE(SAT)}	—	—	0.15	V	I _C = 10mA, I _B = 1mA
			—	—	0.2	V	I _C = 50mA, I _B = 5mA
Output On Voltage (Same as V _{CE(SAT)})		V _{O(ON)}	—	—	0.3		I _J = 2.5mA, I _O = 50mA
Input Resistor +/-30%		ΔR1	-30	—	30	%	—
Resistor Ratio		Δ (R2/R1)	-20	—	-20	%	—
Small Signal Characteristics							
Transition Frequency (gain bandwidth product)		f _T	—	250	—	MHz	V _{CE} = 10V, I _E = 5mA, f = 100MHz

*Guaranteed by design

Notes: 4. Short duration pulse test used to minimize self-heating effect.
Pulse Test: Pulse width, tp<300 uS, Duty Cycle, d<=0.02

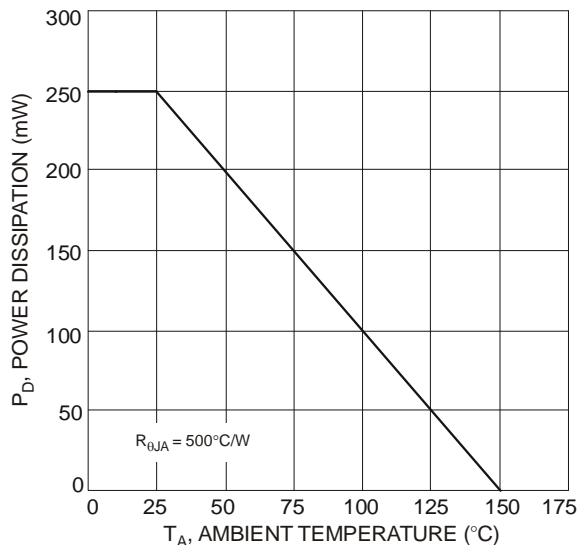
Typical Characteristics Curves @T_A = 25°C unless otherwise specified


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

Characteristics Curves of DDTC123JLP

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

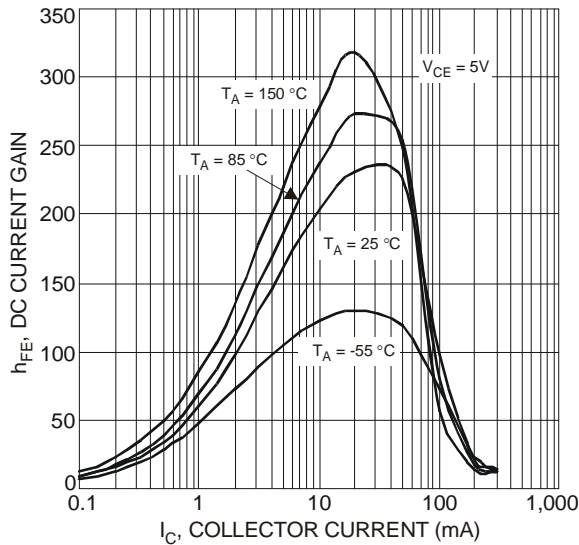


Fig. 2 Typical DC Current Gain vs. Collector Current

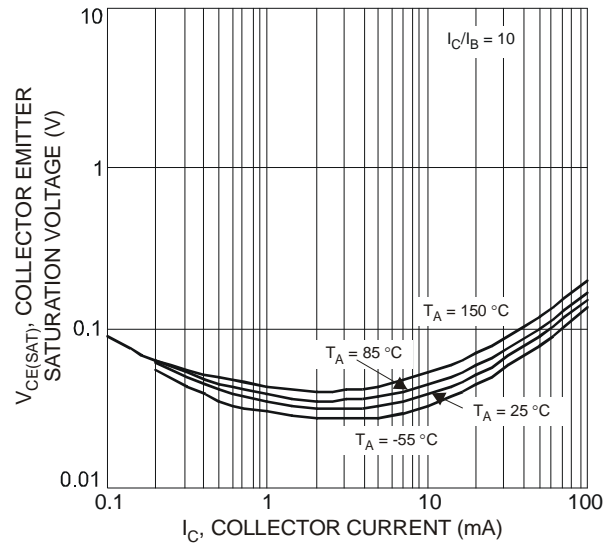


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

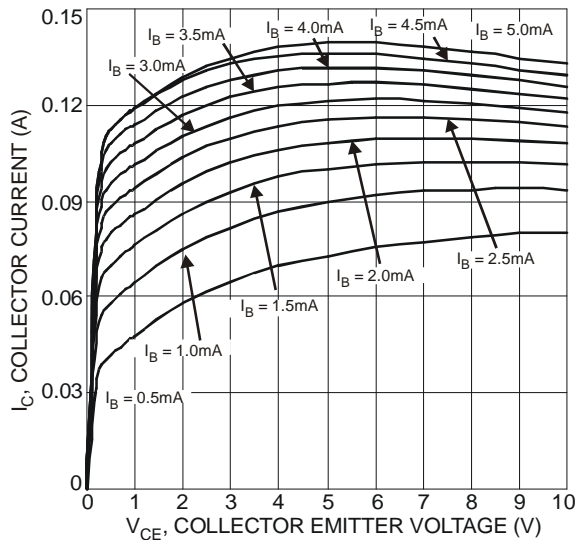


Fig. 4 Typical Collector Current vs. Collector Emitter Voltage

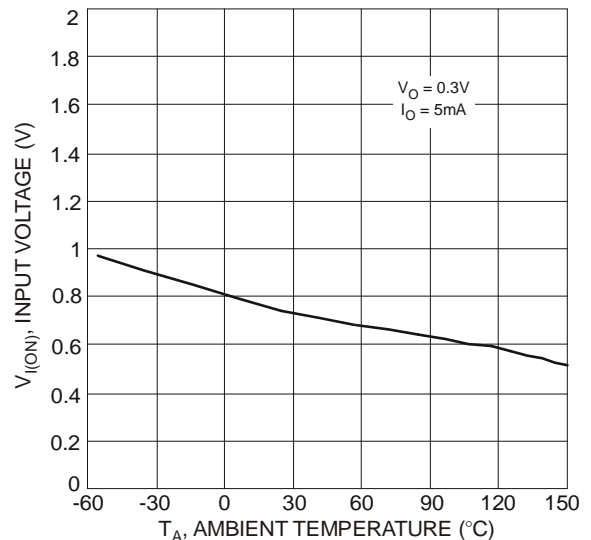


Fig. 5 Typical Input Voltage vs. Ambient Temperature

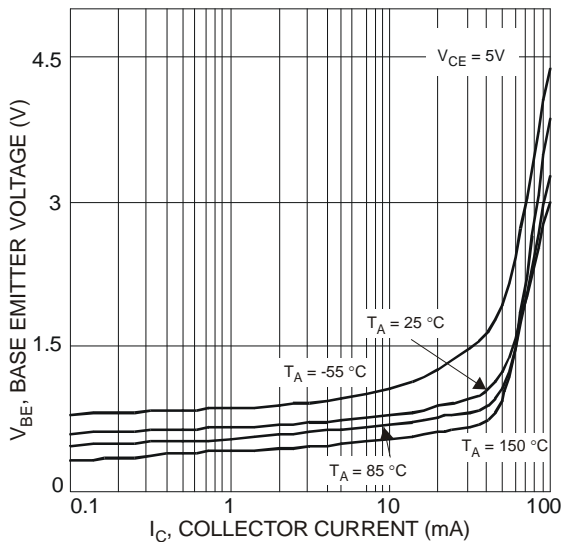


Fig. 6 Typical Base Emitter Voltage vs. Collector Current

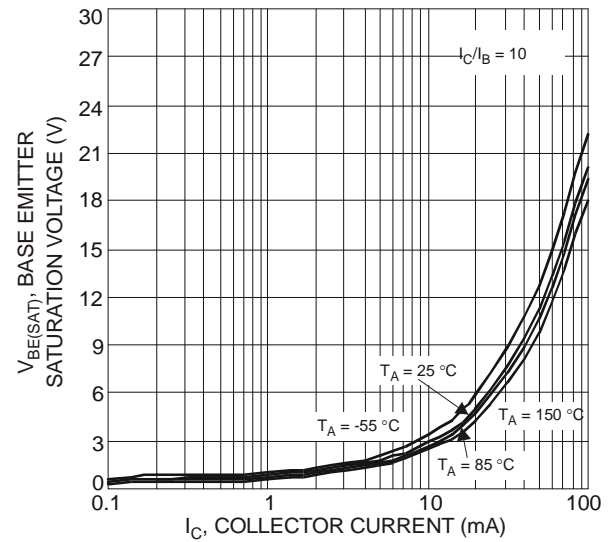


Fig. 7 Typical Base Emitter Saturation Voltage vs. Collector Current

Characteristics Curves of DDTC143ZLP @ $T_A = 25^\circ\text{C}$ unless otherwise specified

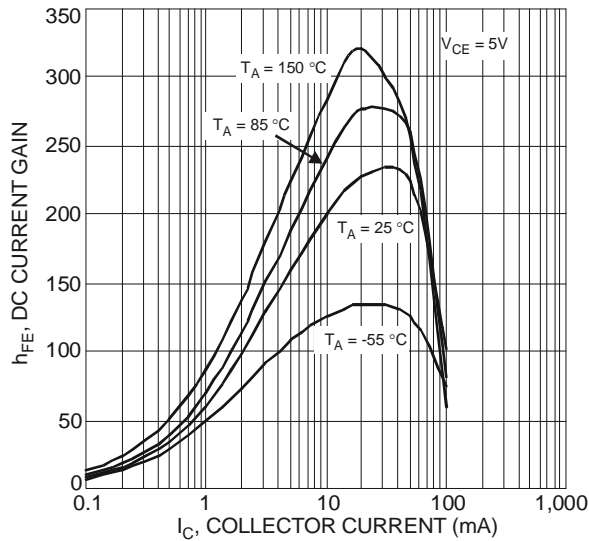


Fig. 8 Typical DC Current Gain vs. Collector Current

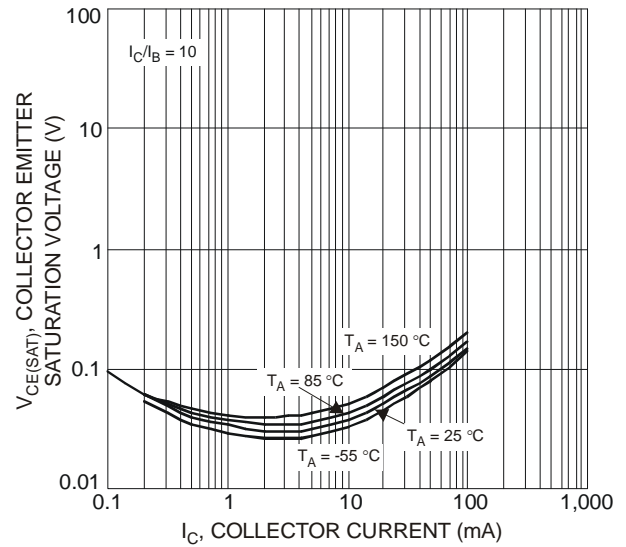


Fig. 9 Typical Collector Emitter Saturation Voltage vs. Collector Current

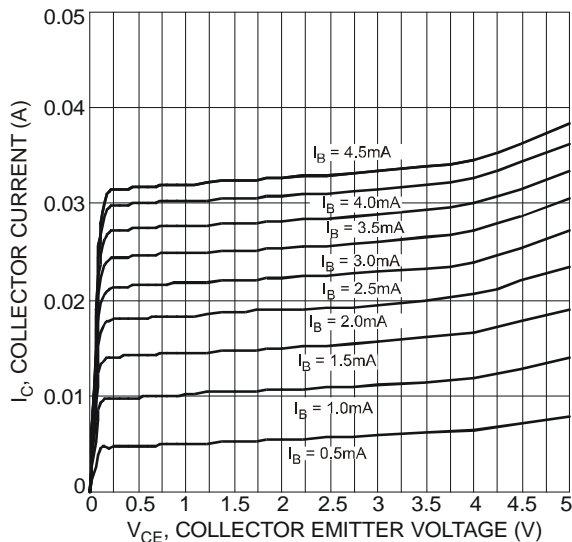


Fig. 10 Typical Collector Current vs. Collector Emitter Voltage

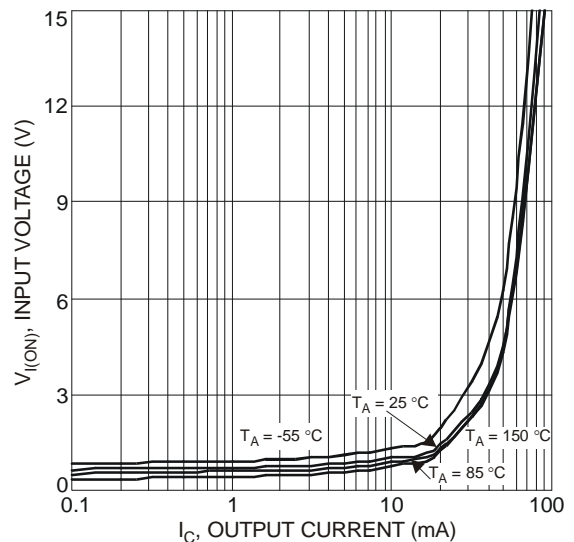


Fig. 11 Typical Input Voltage vs. Output Current

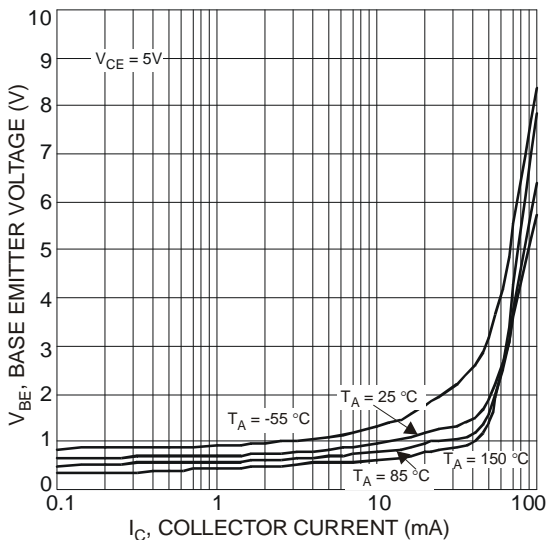


Fig. 12 Typical Base Emitter Voltage vs. Collector Current

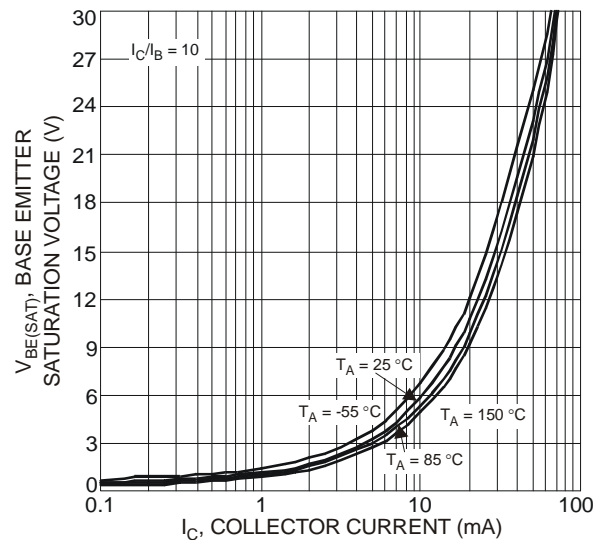


Fig. 13 Typical Base Emitter Saturation Voltage vs. Collector Current

Characteristics Curves of DDTC114YLP @ $T_A = 25^\circ\text{C}$ unless otherwise specified

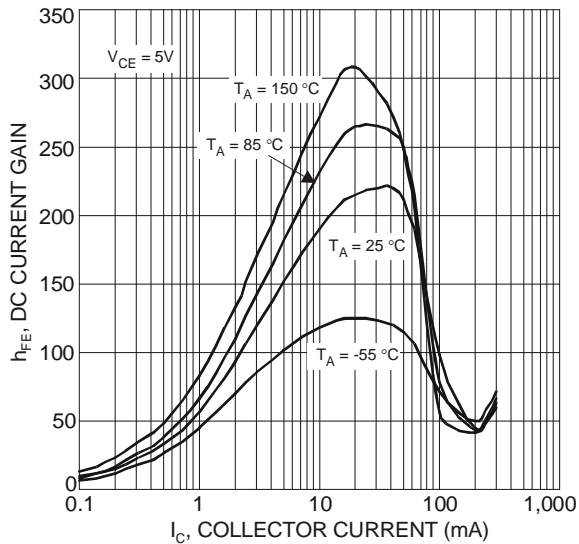


Fig. 14 Typical DC Current Gain vs. Collector Current

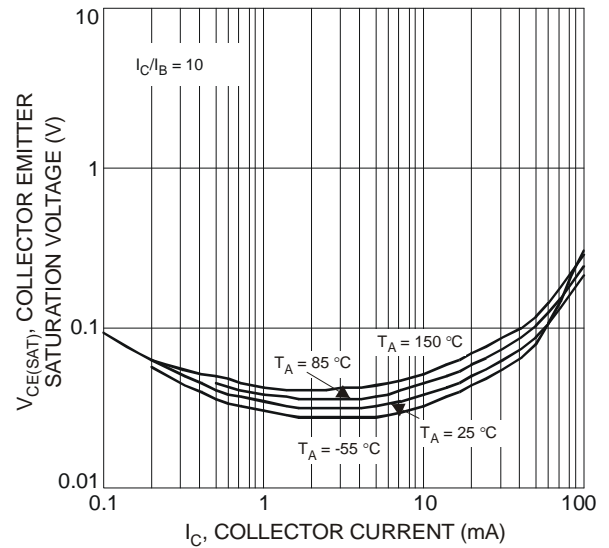


Fig. 15 Typical Collector Emitter Saturation Voltage vs. Collector Current

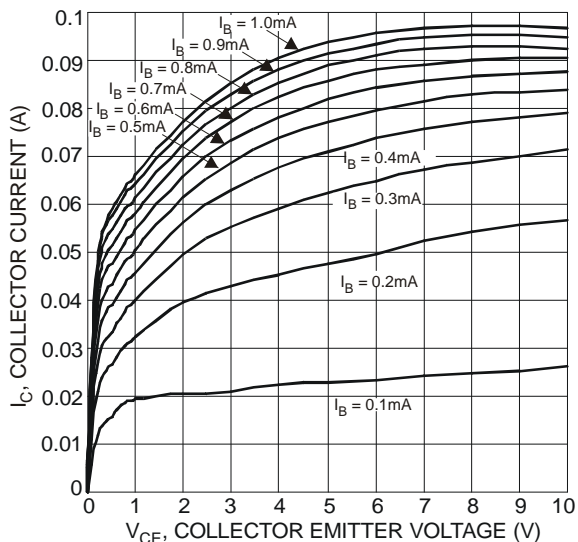


Fig. 16 Typical Collector Current vs. Collector Emitter Voltage

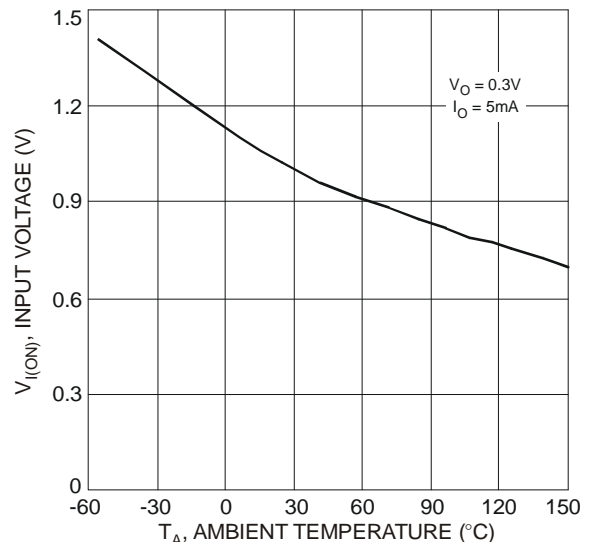


Fig. 17 Typical Input Voltage vs. Ambient Temperature

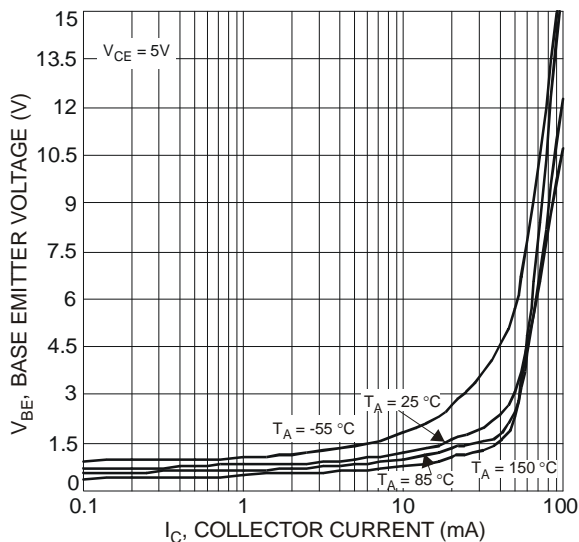


Fig. 18 Typical Base Emitter Voltage vs. Collector Current

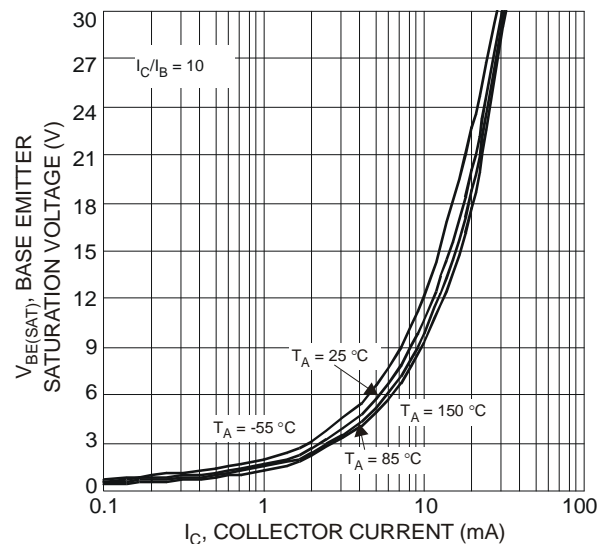
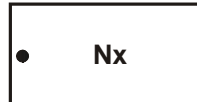


Fig. 19 Typical Base Emitter Saturation Voltage vs. Collector Current

Ordering Information (Note 5)

Part Number	Case	Packaging
DDTC123JLP-7	DFN1006-3	3000/Tape & Reel
DDTC143ZLP-7	DFN1006-3	3000/Tape & Reel
DDTC114YLP-7	DFN1006-3	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information


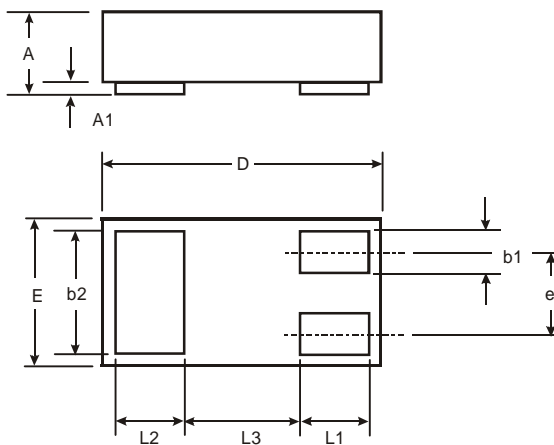
Nx = Product Type Marking Code:

DDTC123JLP = N0

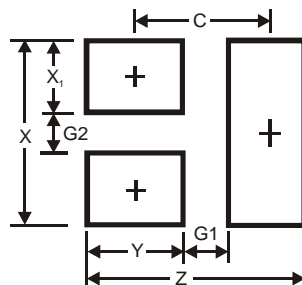
DDTC143ZLP = N1

DDTC114YLP = N2

Dot Denotes Collector, Pin 3

Package Outline Dimensions


DFN1006-3			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0	0.05	0.03
b1	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	0.60
e	—	—	0.35
L1	0.20	0.30	0.25
L2	0.20	0.30	0.25
L3	—	—	0.40
All Dimensions in mm			

Suggested Pad Layout


Dimensions	Value (in mm)
Z	1.1
G1	0.3
G2	0.2
X	0.7
X1	0.25
Y	0.4
C	0.7

IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2009, Diodes Incorporated

www.diodes.com



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.