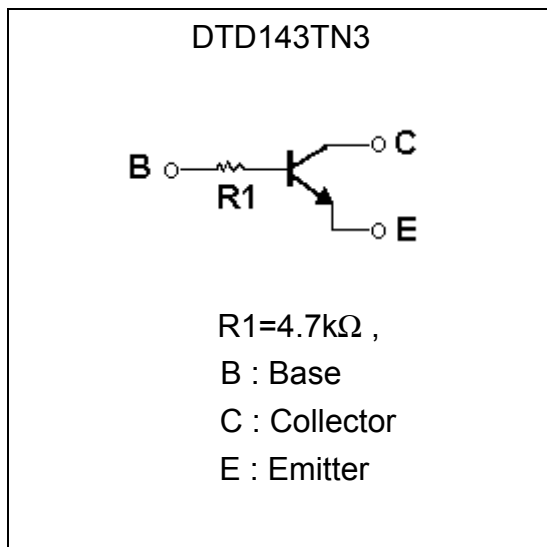
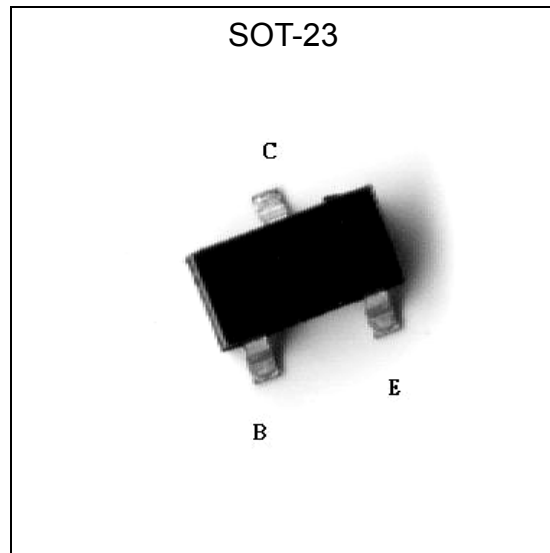


**NPN Digital Transistors (Built-in Resistors)**

# DTD143TN3

**Features**

- Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of almost completely eliminating parasitic effects.
- Only the on/off conditions need to be set for operation, making device design easy.
- Complements the DTB143TN3
- Pb-free package

**Equivalent Circuit**

**Outline**

**Absolute Maximum Ratings (Ta=25°C)**

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V <sub>CBO</sub>	50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	40	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Collector Current	I <sub>C</sub>	600	mA
Power Dissipation	P <sub>d</sub>	200	mW
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 ~ +150	°C



**Characteristics (Ta=25°C)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Collector-Base Breakdown Voltage	V <sub>CB0</sub>	50	-	-	V	I <sub>C</sub> =50μA
Collector-Emitter Breakdown Voltage	V <sub>CEO</sub>	40	-	-	V	I <sub>C</sub> =1mA
Emitter-Base Breakdown Voltage	V <sub>EB0</sub>	5	-	-	V	I <sub>E</sub> =50μA
Collector-Base Cutoff Current	I <sub>CB0</sub>	-	-	0.5	μA	V <sub>CB</sub> =50V
Emitter-Base Cutoff Current	I <sub>EB0</sub>	-	-	0.5	μA	V <sub>EB</sub> =4V
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	-	40	60	mV	I <sub>C</sub> =50mA, I <sub>B</sub> =2.5mA
DC Current Gain	h <sub>FE</sub>	100	-	600	-	V <sub>CE</sub> =5V, I <sub>C</sub> =50mA
Input Resistance	R <sub>i</sub>	3.29	4.7	6.11	kΩ	-
Transition Frequency	f <sub>T</sub>	-	200	-	MHz	V <sub>CE</sub> =10V, I <sub>C</sub> =50mA, f=100MHz *

\* Transition frequency of the device

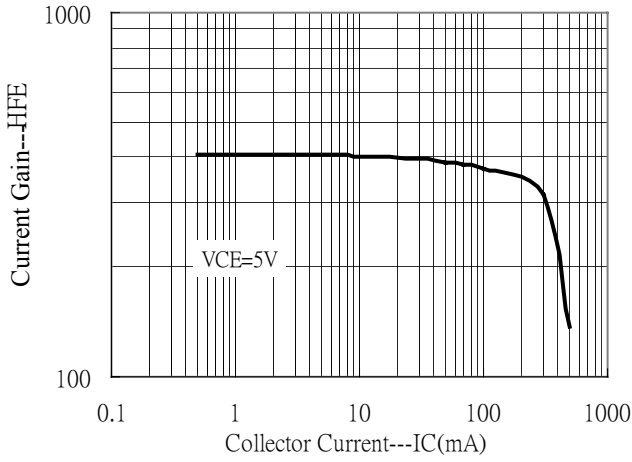
**Ordering Information**

Device	Package	Shipping	Marking
DTD143TN3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	F03

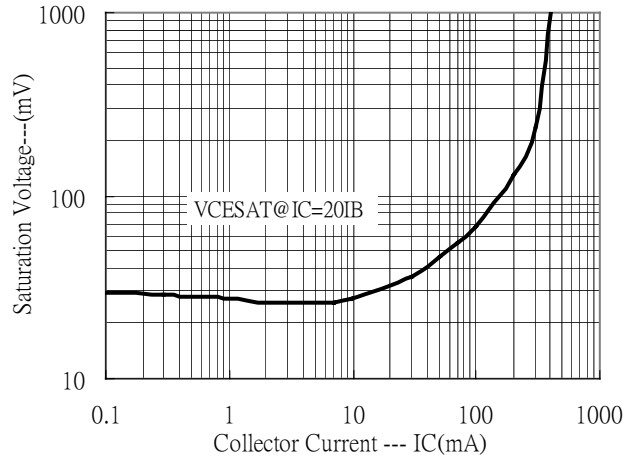


### Characteristic Curves

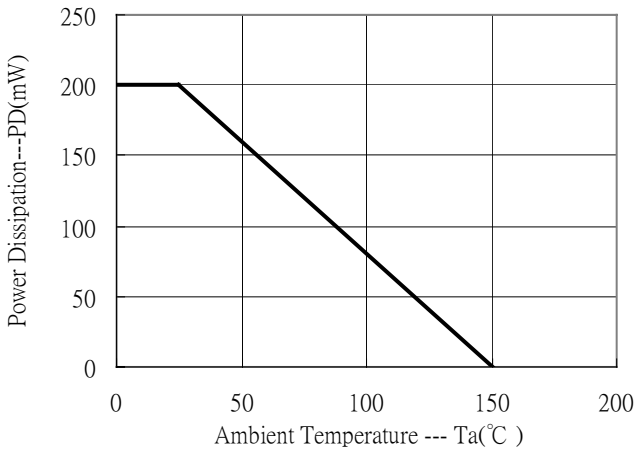
Current Gain vs Collector Current



Saturation Voltage vs Collector Current



Power Derating Curve





Product Designation

<u><b>DT</b></u>	<u><b>X</b></u>	<u><b>X</b></u>	<u><b>X</b></u>	<u><b>X</b></u>	<u><b>X</b></u>	<u><b>XX</b></u>
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) Indicates that transistor is digital

(2) Indicates polarity

A, B . . . . PNP  
C, D . . . . NPN

(3) Indicates device specification

(4) Indicates the basis of the R<sub>1</sub> resistance value

1 . . . . 1.0  
2 . . . . 2.2  
3 . . . . 3.3  
4 . . . . 4.7  
6 . . . . 6.8

(5) Indicates power-of-ten of R<sub>1</sub> value

3 . . . . 10<sup>3</sup>  
4 . . . . 10<sup>4</sup>

The value of R<sub>1</sub> is indicates by combining (4) and (5)

24 . . . . 2.2×10<sup>4</sup> =22kΩ  
43 . . . . 4.7×10<sup>3</sup> =22kΩ

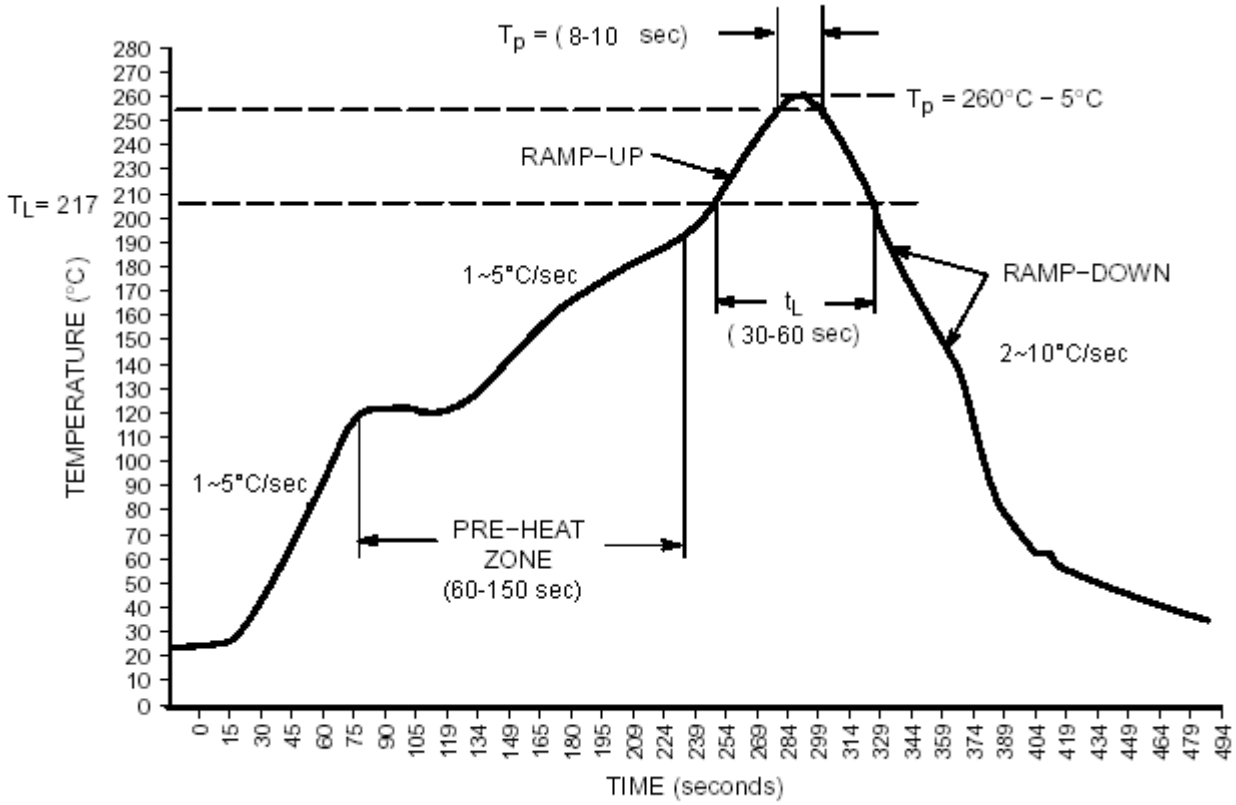
(6) Indicates resistance ratio R<sub>1</sub>/R<sub>2</sub>

E . . . . R<sub>1</sub>/R<sub>2</sub>=1/1  
X . . . . R<sub>1</sub>/R<sub>2</sub>=2/1  
Y . . . . R<sub>1</sub>/R<sub>2</sub>=5/1  
Z . . . . R<sub>1</sub>/R<sub>2</sub>=10/1  
J . . . . R<sub>1</sub>/R<sub>2</sub>=20/1  
W . . . . R<sub>1</sub>/R<sub>2</sub>=1/2  
U . . . . R<sub>1</sub>/R<sub>2</sub>=1/5  
V . . . . R<sub>1</sub>/R<sub>2</sub>=1/10  
T . . . . R<sub>1</sub> only  
G . . . . T<sub>2</sub> only

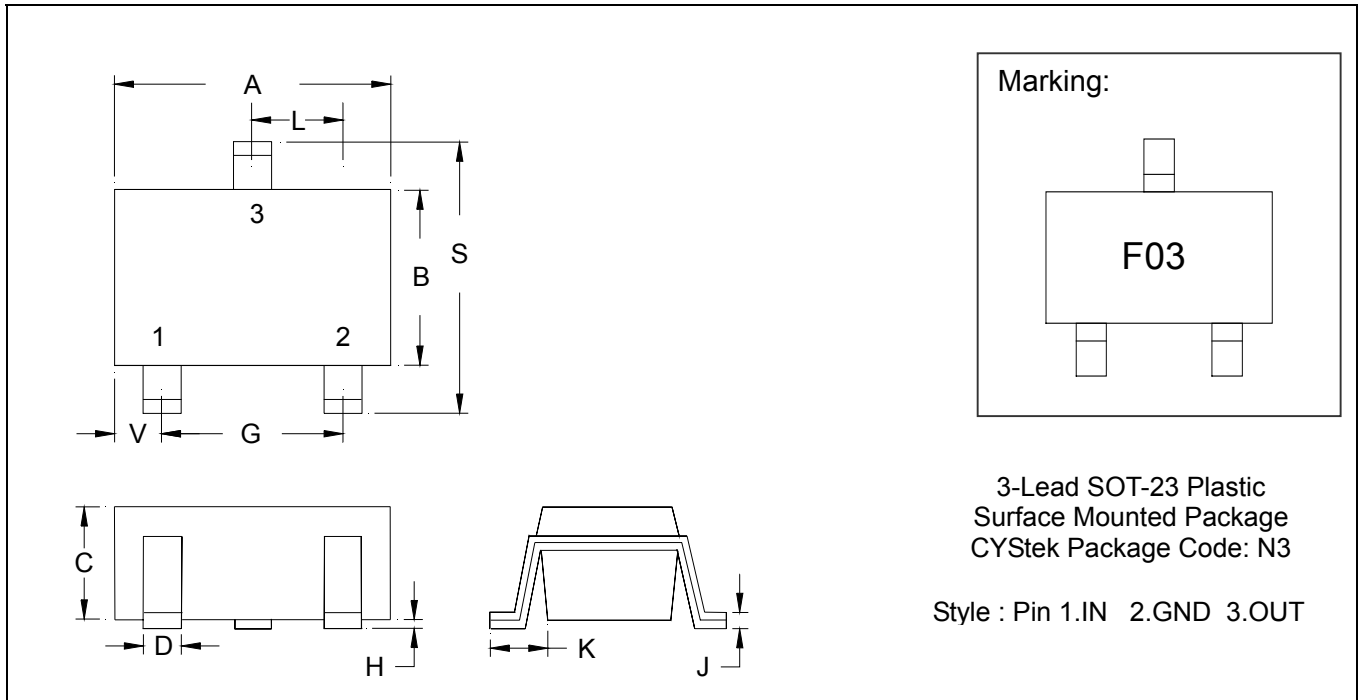
(7) Indicates package shape

N3 . . . . SOT-23  
A3 . . . . TO-92

**Recommended IR reflow profile**



**SOT-23 Dimension**



\*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0034	0.0070	0.085	0.177
B	0.0472	0.0630	1.20	1.60	K	0.0128	0.0266	0.32	0.67
C	0.0335	0.0512	0.89	1.30	L	0.0335	0.0453	0.85	1.15
D	0.0118	0.0197	0.30	0.50	S	0.0830	0.1083	2.10	2.75
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0005	0.0040	0.013	0.10					

- Notes :**
- 1.Controlling dimension : millimeters.
  - 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
  - 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material :**

- Lead : 42 Alloy ; solder plating
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0

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