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

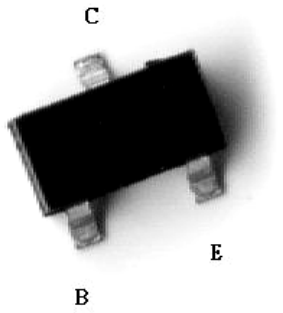
Equivalent Circuit

DTD143TN3

R1=4.7kΩ ,
B : Base
C : Collector
E : Emitter

Outline

SOT-23



Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	I_C	600	mA
Power Dissipation	Pd	200	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55 ~ +150	°C

Characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Collector-Base Breakdown Voltage	V_{CBO}	50	-	-	V	I_C=50μA
Collector-Emitter Breakdown Voltage	V_{CEO}	40	-	-	V	I_C=1mA
Emitter-Base Breakdown Voltage	V_{EBO}	5	-	-	V	I_E=50μA
Collector-Base Cutoff Current	I_{CBO}	-	-	0.5	μA	V_{CB}=50V
Emitter-Base Cutoff Current	I_{EBO}	-	-	0.5	μA	V_{EB}=4V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	40	60	mV	I_C=50mA, I_B=2.5mA
DC Current Gain	h_{FE}	100	-	600	-	V_{CE}=5V, I_C=50mA
Input Resistance	R_1	3.29	4.7	6.11	kΩ	-
Transition Frequency	f_T	-	200	-	MHz	V_{CE}=10V, I_C=50mA, f=100MHz *

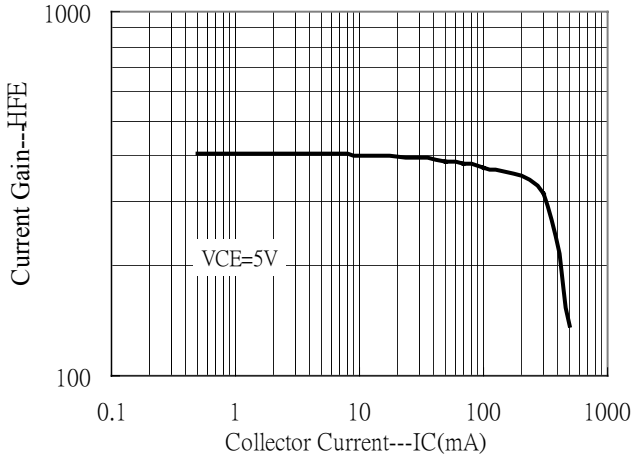
* Transition frequency of the device

Ordering Information

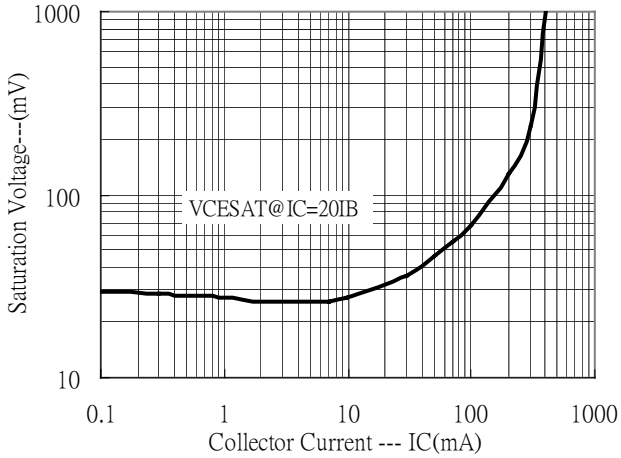
Device	Package	Shipping	Marking
DTD143TN3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	F03

Characteristic Curves

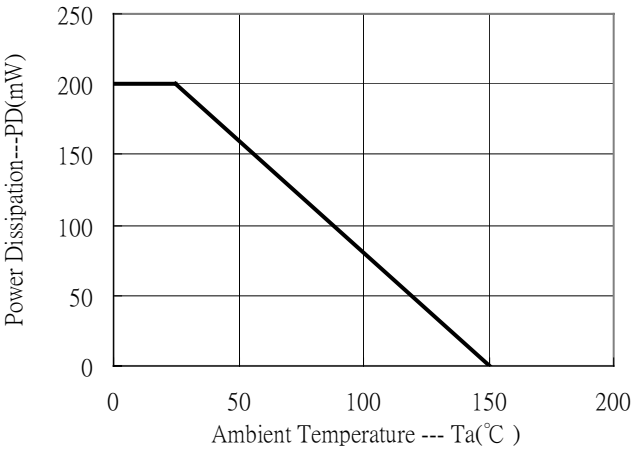
Current Gain vs Collector Current



Saturation Voltage vs Collector Current



Power Derating Curve



Product Designation

DT X X X X X XX

(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_1 resistance value
- 1・・・1.0
- 2・・・2.2
- 3・・・3.3
- 4・・・4.7
- 6・・・6.8

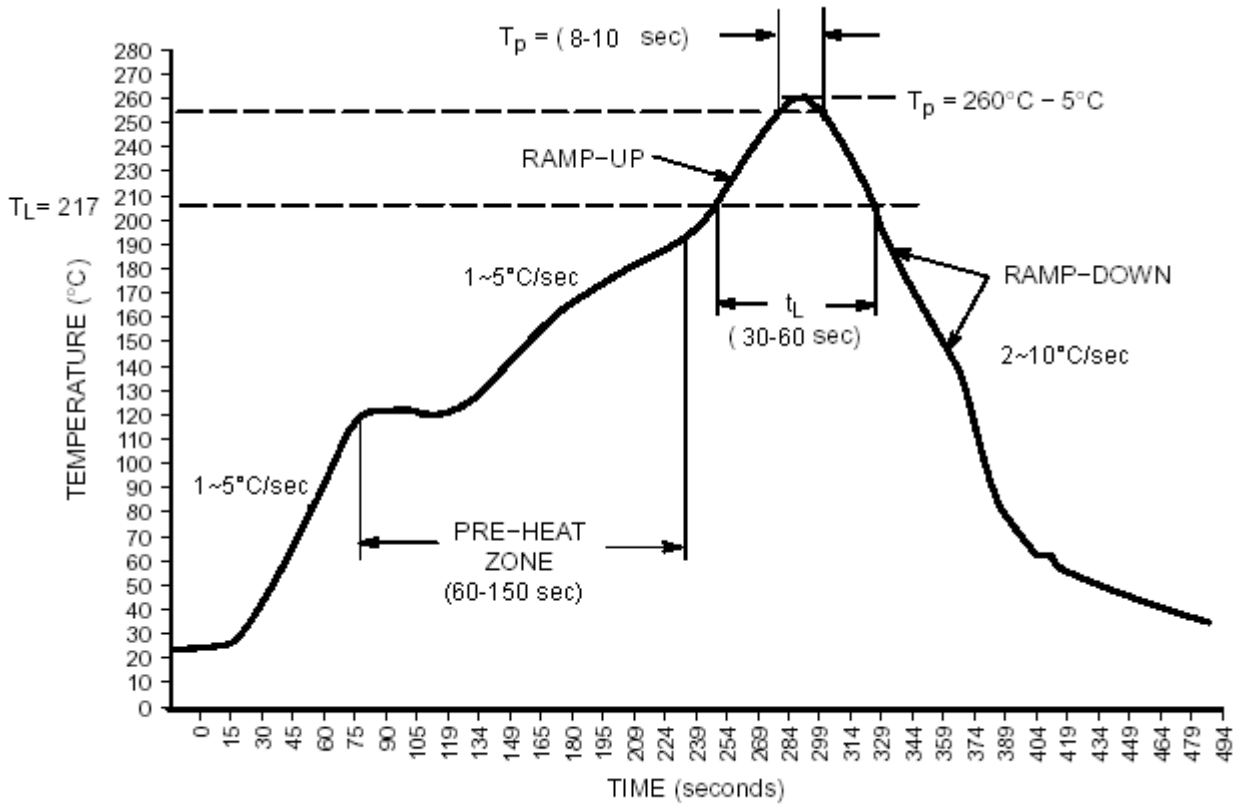
(5) Indicates power-of-ten of R_1 value
- 3・・・10^3
- 4・・・10^4

The value of R1 is indicates by combining (4) and (5)
- 24・・・2.2×10^4 =22kΩ
- 43・・・4.7×10^3 =22kΩ

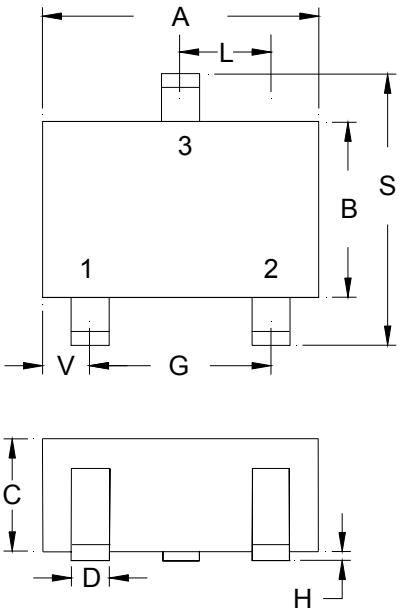
(6) Indicates resistance ratio R_1/R_2
- E・・・R_1/R_2=1/1
- X・・・R_1/R_2=2/1
- Y・・・R_1/R_2=5/1
- Z・・・R_1/R_2=10/1
- J・・・R_1/R_2=20/1
- W・・・R_1/R_2=1/2
- U・・・R_1/R_2=1/5
- V・・・R_1/R_2=1/10
- T・・・R_1 only
- G・・・T_2 only

(7) Indicates package shape
- N3・・・SOT-23
- A3・・・TO-92

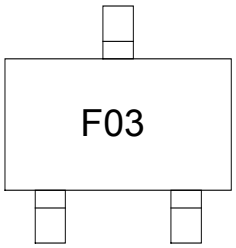
Recommended IR reflow profile



SOT-23 Dimension



Marking:



3-Lead SOT-23 Plastic
Surface Mounted Package
CYStek Package Code: N3

Style : Pin 1.IN 2.GND 3.OUT

*: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