PNP Digital Transistors (Built-in Resistors)

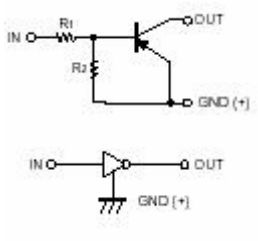
DTA144WA3

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 positive 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 DTC144WA3
- Pb-free lead plating and Halogen-free package

Equivalent Circuit

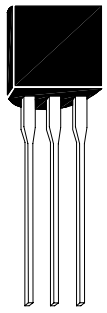
DTA144WA3



R1=47kΩ , R2=22 kΩ
IN(B) : Base
OUT(C) : Collector
GND(E) : Emitter

Outline

TO-92



E C B

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply Voltage	V_{CC}	-50	V
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-50	V
Emitter-Base Voltage	V_{EBO}	-10	V
Input Voltage	V_I	-40~+10	V
Output Current	I_O	-100	mA
	$I_{O(max.)}$	-100	mA
Power Dissipation @ T_A=25°C	P_D	500	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	250	°C/W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-65~+150	°C
Operating Ambient Temperature	Tamb	-65~+150	°C

Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input Voltage	$V_{I(off)}$	-	-1.7	-1.2	V	V_{CC}=-5V, I_O=-100μA
	$V_{I(on)}$	-4	-2.4	-	V	V_O=-0.3V, I_O=-2mA
Output Voltage	$V_{O(on)}$	-	-90	-150	mV	I_O=-10mA, I_I=-0.5mA
Input Current	I_I	-	-	-0.16	mA	V_I=-5V
Output Current	$I_{O(off)}$	-	-	-100	nA	V_{CC}=-50V, V_I=0V
Collector Base Cutoff Current	I_{CBO}	-	-	-100	nA	V_{CB}=-50V, I_E=0A
Collector Emitter Cutoff Current	I_{CEO}	-	-	-500	nA	V_{CE}=-50V, I_B=0A
DC Current Gain	G_I	60	-	-	-	V_O=-5V, I_O=-5mA
Input Resistance	R_1	32.9	47	61.1	kΩ	-
Resistance Ratio	R_2/R_1	0.37	0.47	0.57	-	-
Transition Frequency	f_T	-	250	-	MHz	V_{CE}=-10V, I_C=-5mA, f=100MHz *

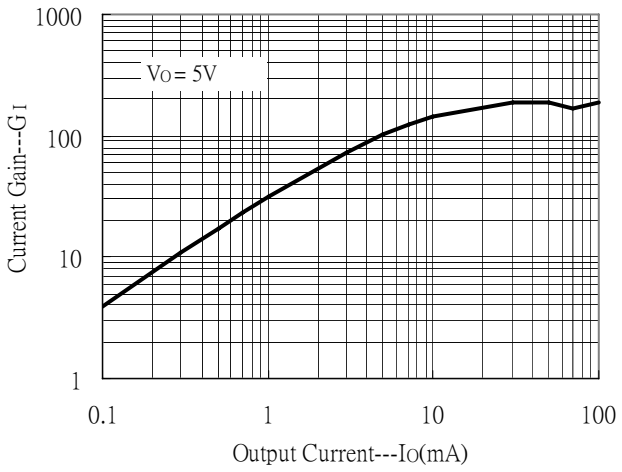
* Transition frequency of the device

Ordering Information

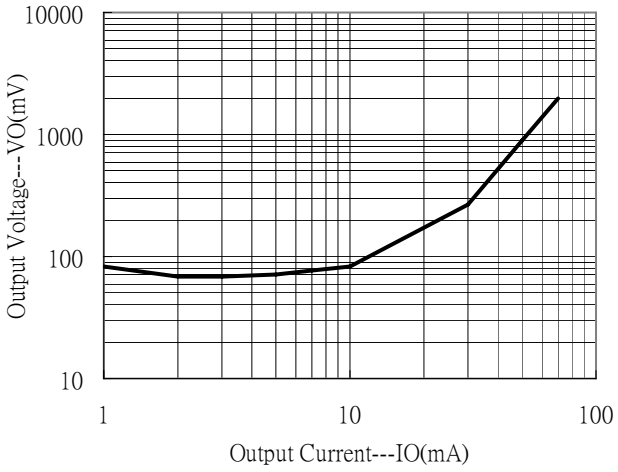
Device	Package	Shipping	Marking
DTA144WA3	TO-92 (Pb-free lead plating and Halogen-free package)	2000 pcs / tape & box	A144W

Characteristic Curves

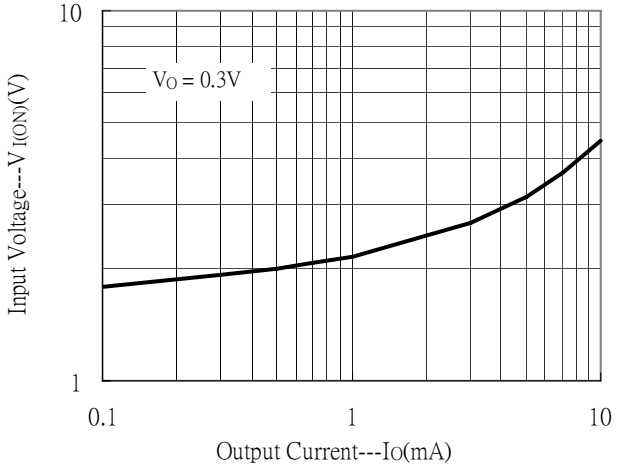
Current Gain vs Output Current



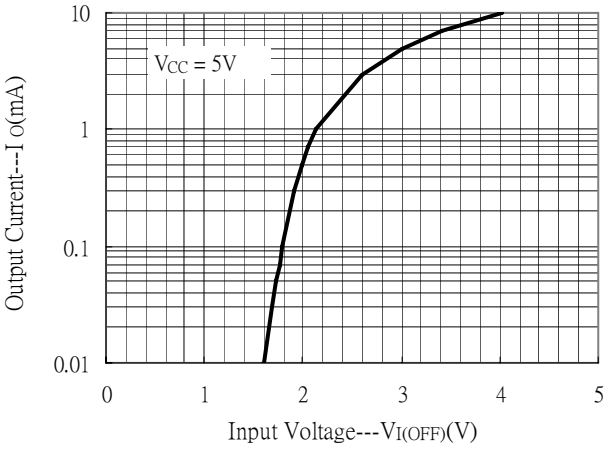
Output Voltage vs Output Current



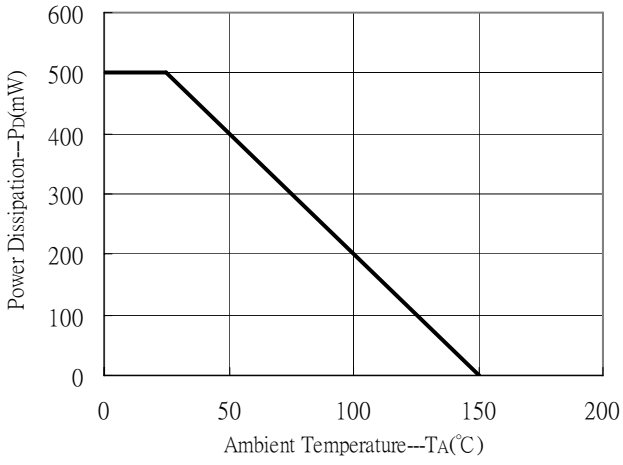
Input Voltage vs Output Current(ON characteristics)



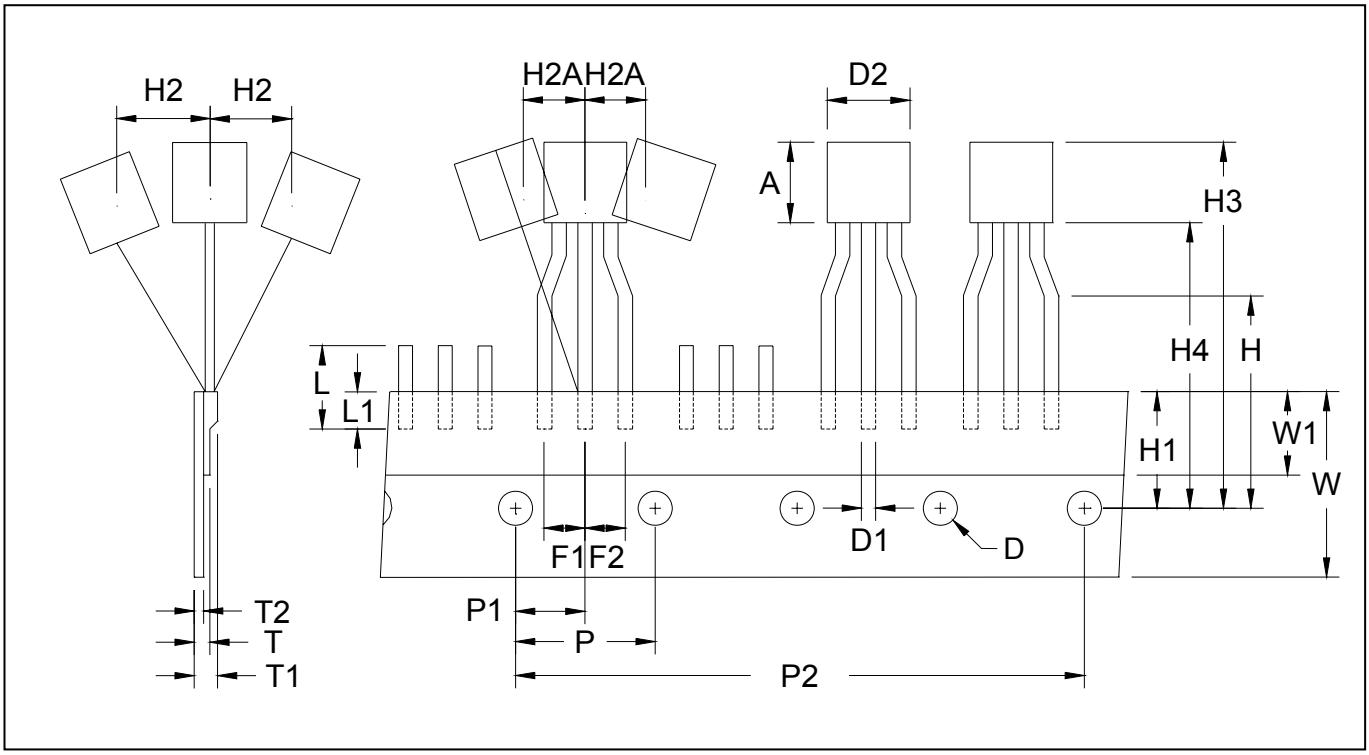
Output Current vs Input Voltage(OFF characteristics)



Power Derating Curve



TO-92 Taping Outline

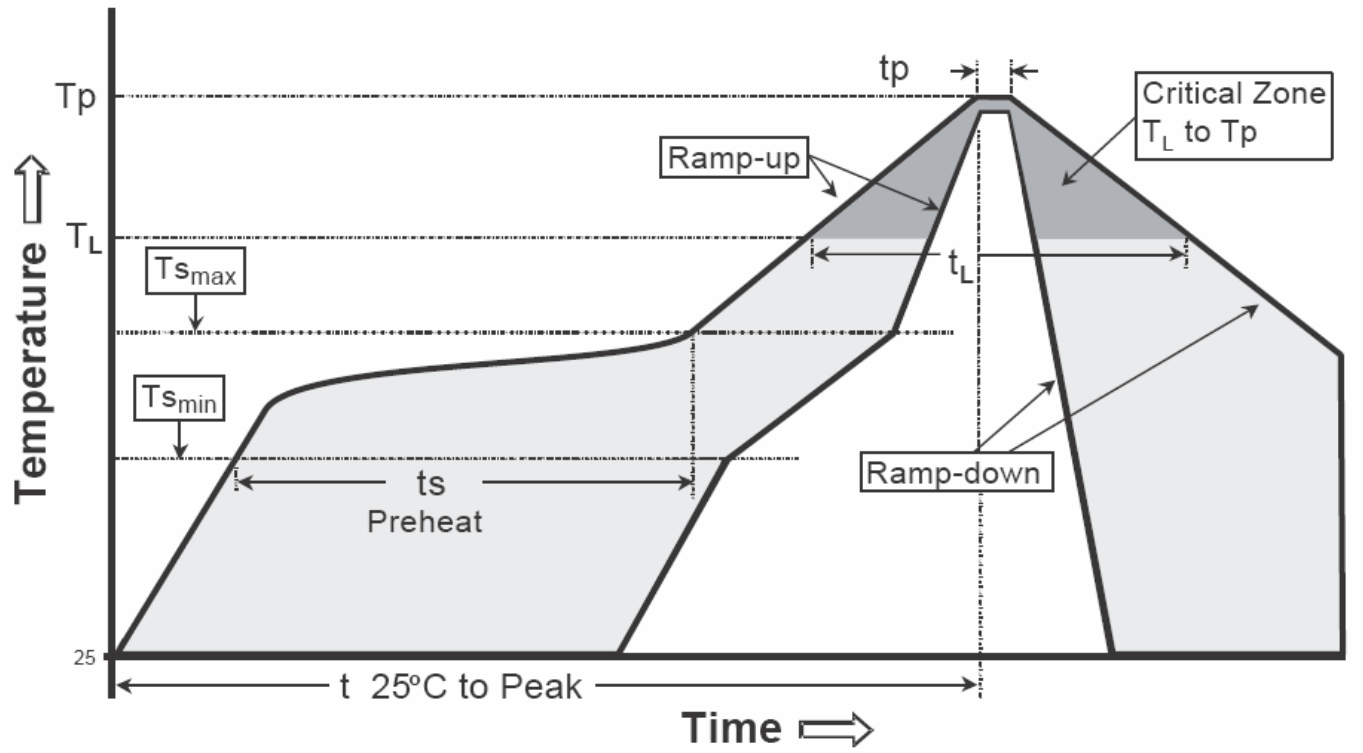


DIM	Item	Millimeters	
		Min.	Max.
A	Component body height	4.33	4.83
D	Tape Feed Diameter	3.80	4.20
D1	Lead Diameter	0.36	0.53
D2	Component Body Diameter	4.33	4.83
F1,F2	Component Lead Pitch	2.40	2.90
F1,F2	F1-F2	-	±0.3
H	Height Of Seating Plane	15.50	16.50
H1	Feed Hole Location	8.50	9.50
H2	Front To Rear Deflection	-	1
H2A	Deflection Left Or Right	-	1
H3	Component Height	-	27
H4	Feed Hole To Bottom Of Component	-	21
L	Lead Length After Component Removal	-	11
L1	Lead Wire Enclosure	2.50	-
P	Feed Hole Pitch	12.50	12.90
P1	Center Of Seating Plane Location	5.95	6.75
P2	4 Feed Hole Pitch	50.30	51.30
T	Over All Tape Thickness	-	0.55
T1	Total Taped Package Thickness	-	1.42
T2	Carrier Tape Thickness	0.36	0.68
W	Tape Width	17.50	19.00
W1	Adhesive Tape Width	5.00	7.00
-	20 pcs Pitch	253	255

Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	265 +0/-5 °C	5 +1/-1 seconds

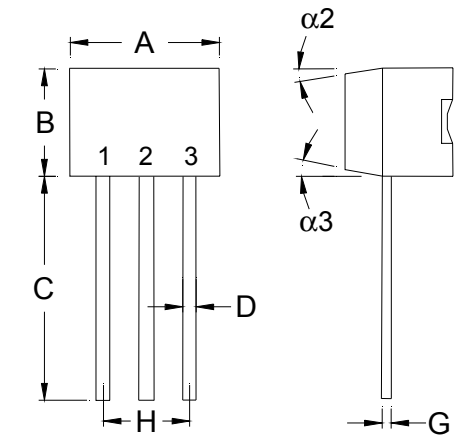
Recommended temperature profile for IR reflow

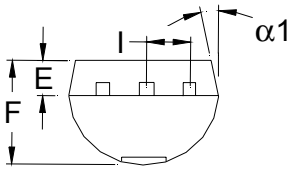


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(T_P)	240 +0/-5 °C	265 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

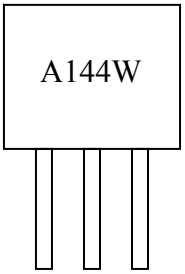
Note : All temperatures refer to topside of the package, measured on the package body surface.

TO-92 Dimension





Marking:



Style: Pin 1.Emitter 2.Collector 3.Base

3-Lead TO-92 Plastic Package
CYStek Package Code: A3

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1704	0.1902	4.33	4.83	G	0.0142	0.0220	0.36	0.56
B	0.1704	0.1902	4.33	4.83	H	-	*0.1000	-	*2.54
C	0.5000	-	12.70	-	I	-	*0.0500	-	*1.27
D	0.0142	0.0220	0.36	0.56	α1	-	*5°	-	*5°
E	-	*0.0500	-	*1.27	α2	-	*2°	-	*2°
F	0.1323	0.1480	3.36	3.76	α3	-	*2°	-	*2°

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: Pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0