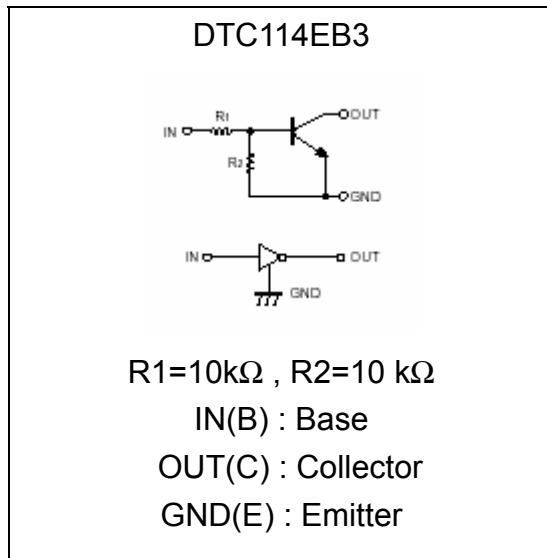


NPN Digital Transistors (Built-in Resistors)

DTC114EB3

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 DTA114EB3
- Pb-free package

Equivalent Circuit

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply Voltage	V _{CC}	50	V
Input Voltage	V _I	-10~+40	V
Output Current	I _O	50	mA
	I _{O(max.)}	100	mA
Power Dissipation	P _d	300	mW
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55~+150	°C



Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input Voltage	$V_{I(off)}$	-	-	0.5	V	$V_{CC}=5V, I_o=100\mu A$
	$V_{I(on)}$	3	-	-	V	$V_o=0.3V, I_o=10mA$
Output Voltage	$V_{O(on)}$	-	-	0.3	V	$I_o/I_i=10mA/0.5mA$
Input Current	I_i	-	-	0.88	mA	$V_i=5V$
Output Current	$I_{O(off)}$	-	-	0.5	μA	$V_{CC}=50V, V_i=0V$
DC Current Gain	G_i	30	-	-	-	$V_o=5V, I_o=5mA$
Input Resistance	R_i	7	10	13	k Ω	-
Resistance Ratio	R_2/R_1	0.8	1	1.2	-	-
Transition Frequency	f_T	-	250	-	MHz	$V_{CE}=10V, I_c=5mA, f=100MHz$ *

* Transition frequency of the device

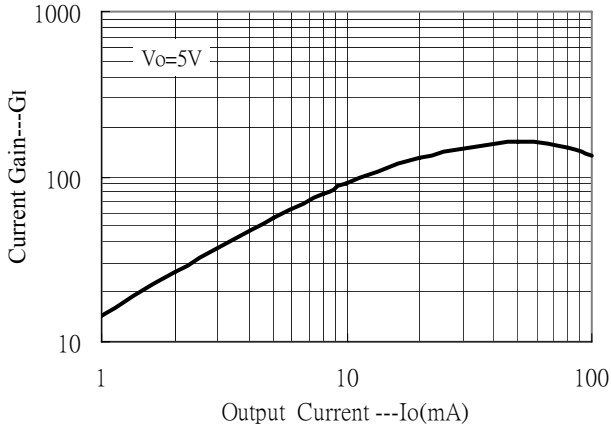
Ordering Information

Device	Package	Shipping	Marking
DTC114EB3	TO-92SP (Pb-free)	3000 pcs / Tape & Box	C114E

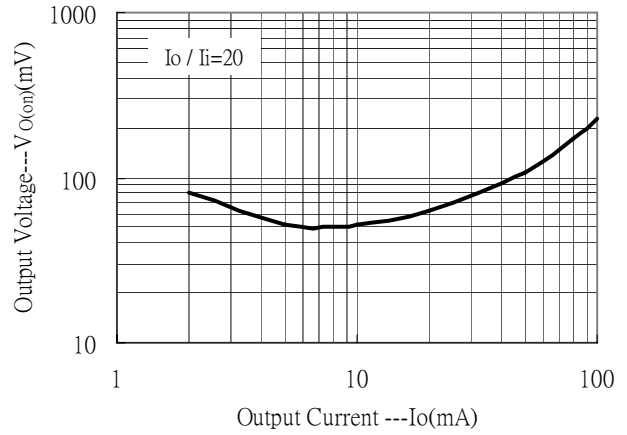


Characteristic Curves

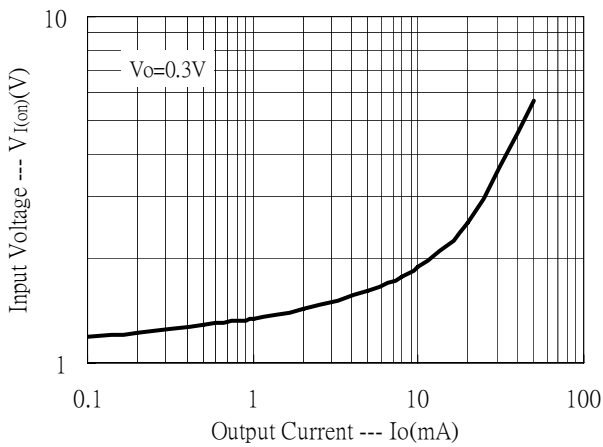
Current Gain vs Output Current



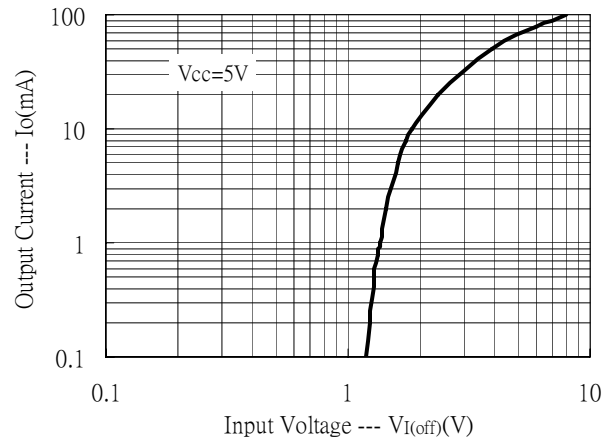
Output Voltage vs Output Current



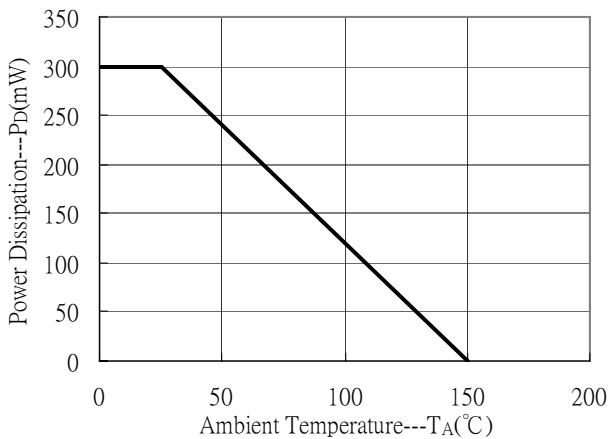
Input Voltage vs Output Current (ON characteristics)



Output Current vs Input Voltage (OFF characteristics)



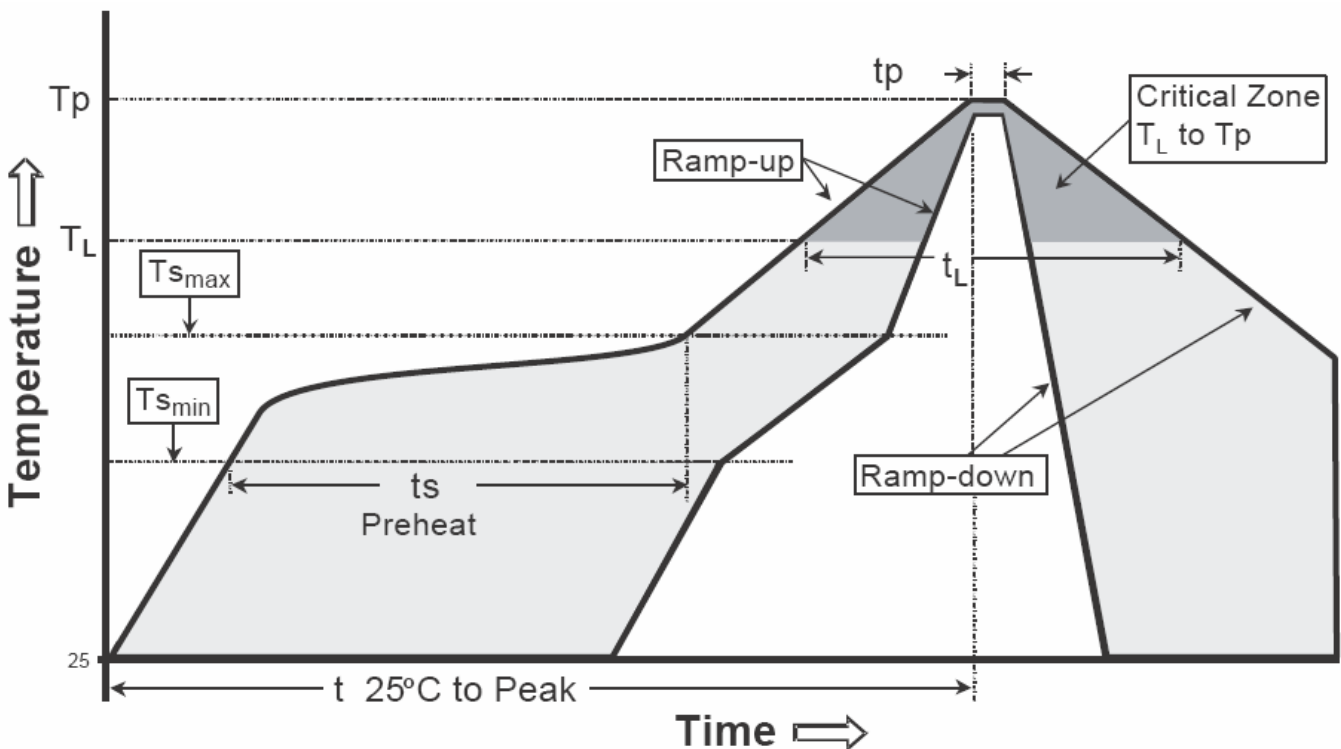
Power Derating Curve



Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

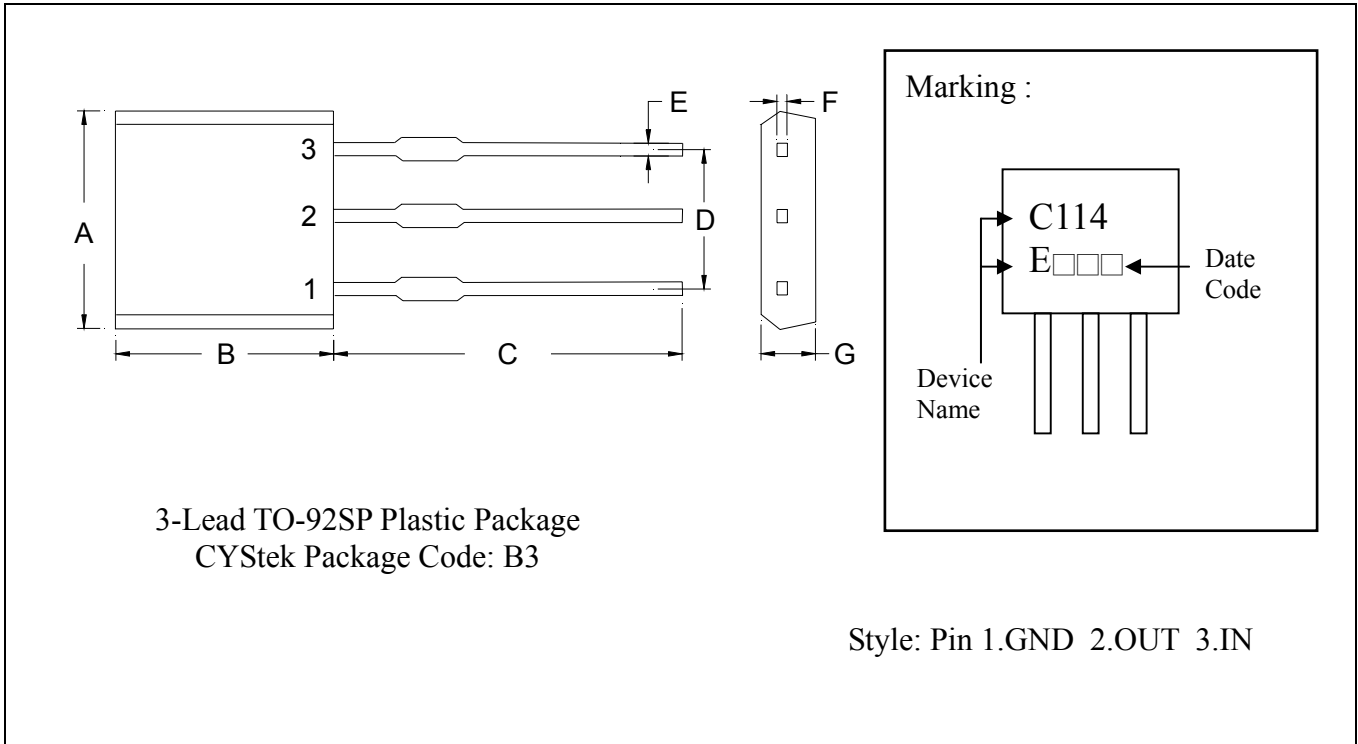
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _s max to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _s min)	100°C	150°C
-Temperature Max(T _s max)	150°C	200°C
-Time(t _s min to t _s max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T _L)	183°C	217°C
- Time (t _L)	60-150 seconds	60-150 seconds
Peak Temperature(T _p)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(t _p)	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-92SP Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1450	0.1650	3.70	4.20	E	0.0160	0.0240	0.41	0.61
B	0.1063	0.1300	2.70	3.30	F	-	*0.0150	-	*0.38
C	0.5000	-	12.7	-	G	0.0800	0.1050	2.03	2.67
D	-	*0.1000	-	*2.54					

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

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