

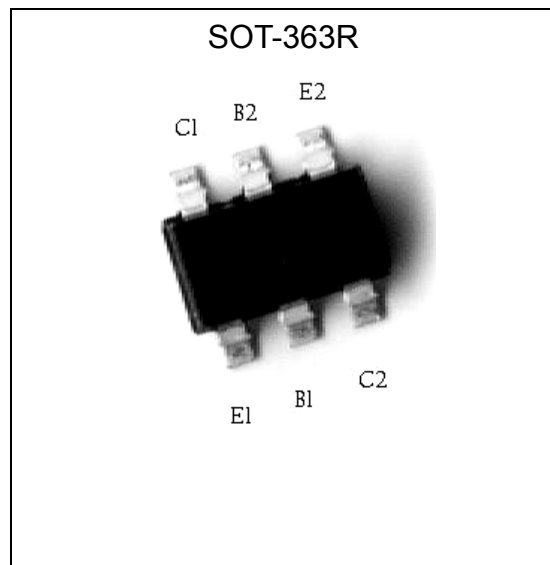
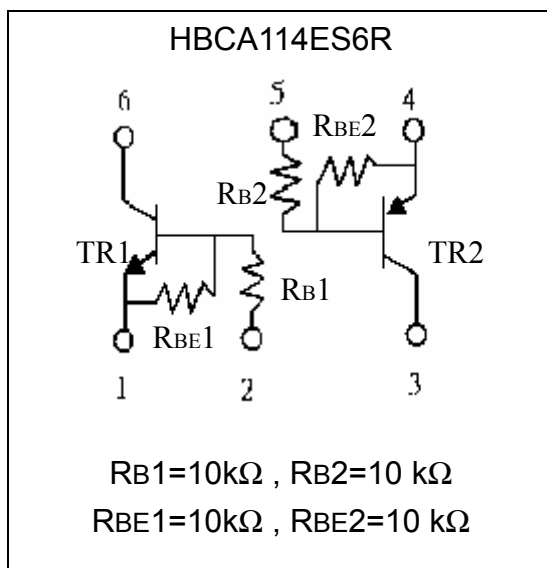
PNP and NPN Dual Digital Transistors

HBCA114ES6R

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 for PNP transistor, and negative biasing of the input for NPN transistor. 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.
- One DTA114E chip and one DTC114E chip in a SOT-363 package.
- Mounting by SOT-323 automatic mounting machines is possible.
- Mounting cost and area can be cut in half.
- Transistor elements are independent, eliminating interference

Equivalent Circuit



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

Parameter	Symbol	Limits		Unit
		Tr1(NPN)	Tr2(PNP)	
Supply Voltage	V _{CC}	50	-50	V
Input Voltage	V _{IN}	-10~+40	-40~+10	V
Output Current	I _O	50	-50	mA
	I _{O(max.)}	100	-100	mA
Total Power Dissipation	P _d	200 (Note)		mW
Junction Temperature	T _j	150		°C
Storage Temperature	T _{stg}	-55~+150		°C

Note : 150mW per element must not be exceeded.

Characteristics (Ta=25°C)**•Tr1(NPN)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input Voltage	V _{I(off)}	-	-	0.5	V	V _{CC} =5V, I _O =100μA
	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	kΩ	-
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

•Tr2(PNP)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Input Voltage	V _{I(off)}	-	-	-0.5	V	V _{CC} =-5V, I _O =-100μA
	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	kΩ	-
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 *

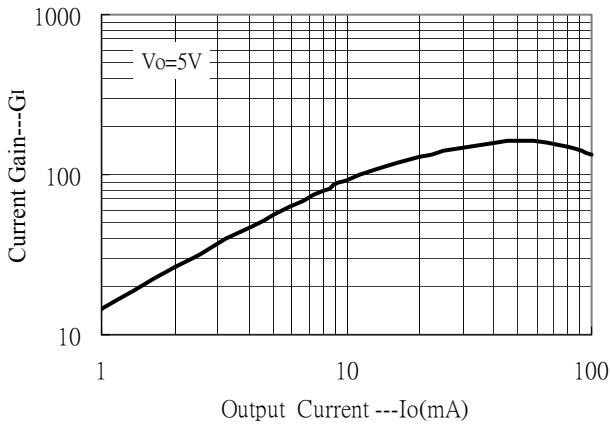
* Transition frequency of the device



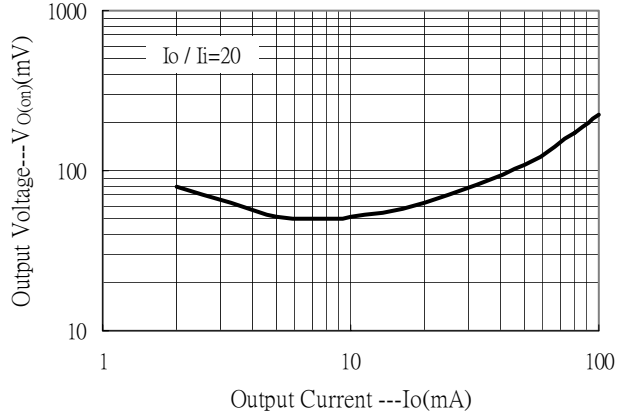
Characteristic Curves

•Tr1(NPN)

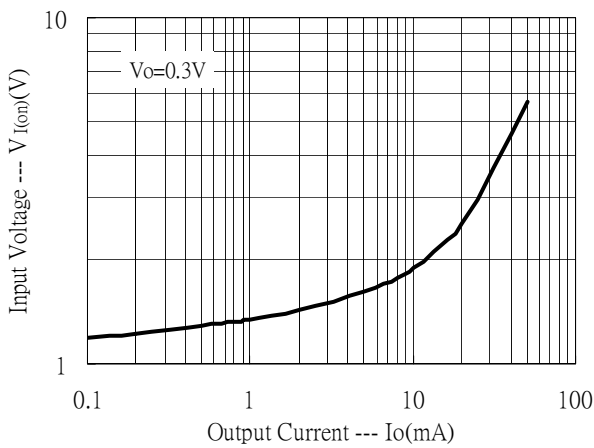
Current Gain vs Output Current



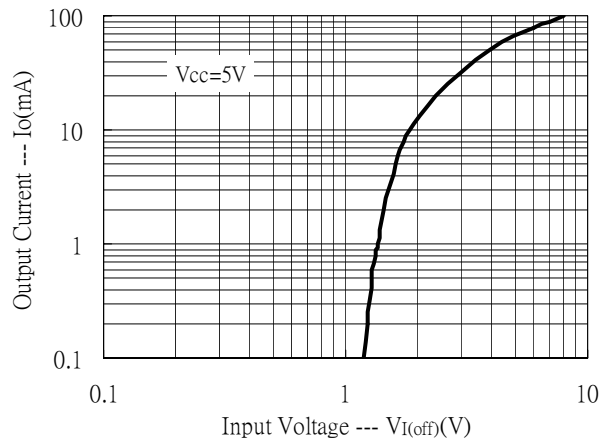
Output Voltage vs Output Current



Input Voltage vs Output Current (ON characteristics)



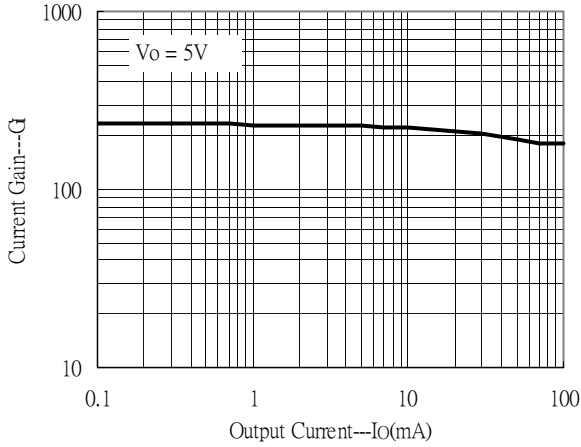
Output Current vs Input Voltage (OFF characteristics)



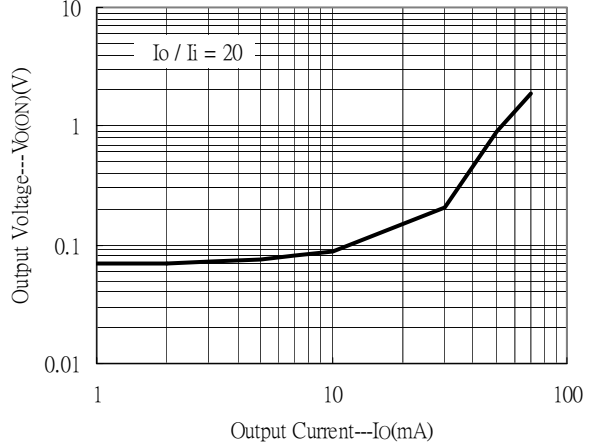


•Tr2(PNP)

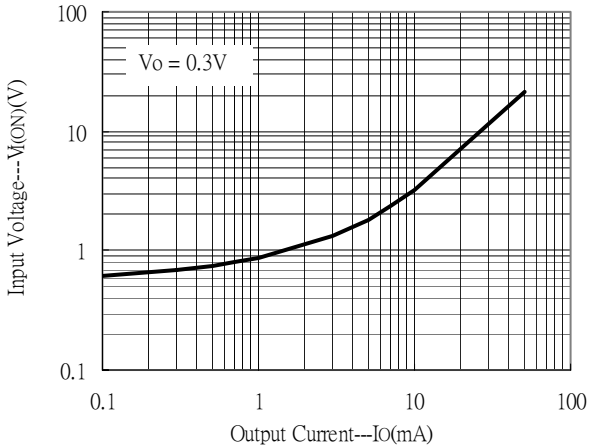
Current Gain vs Output Current



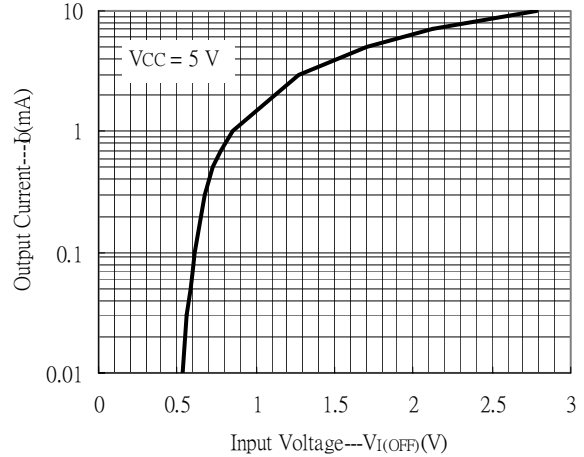
Output Voltage vs Output Current



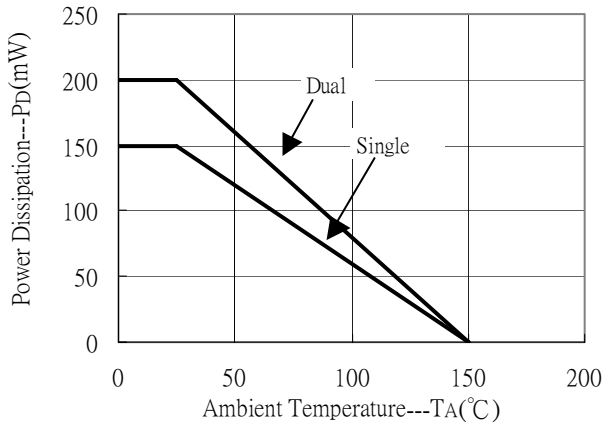
Input Voltage vs Output Current(ON characteristics)



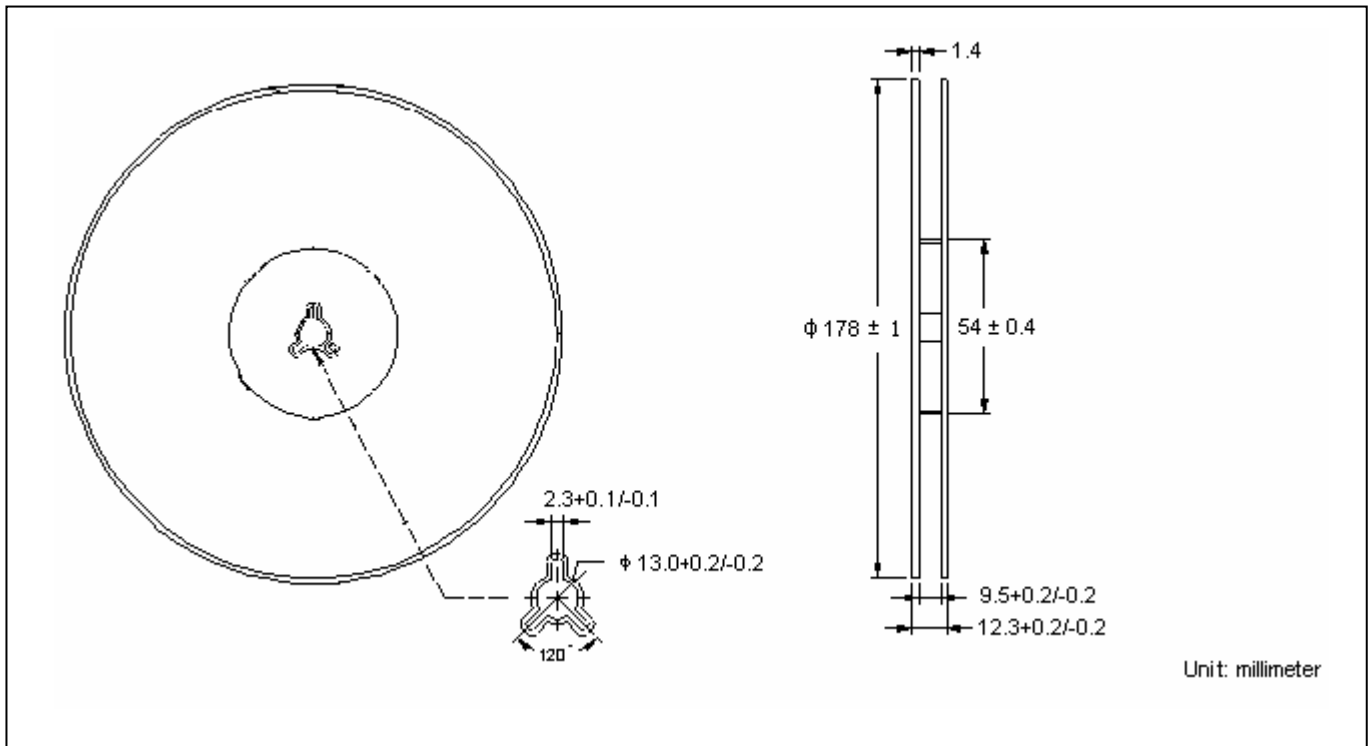
Output Current vs Input Voltage(OFF characteristics)



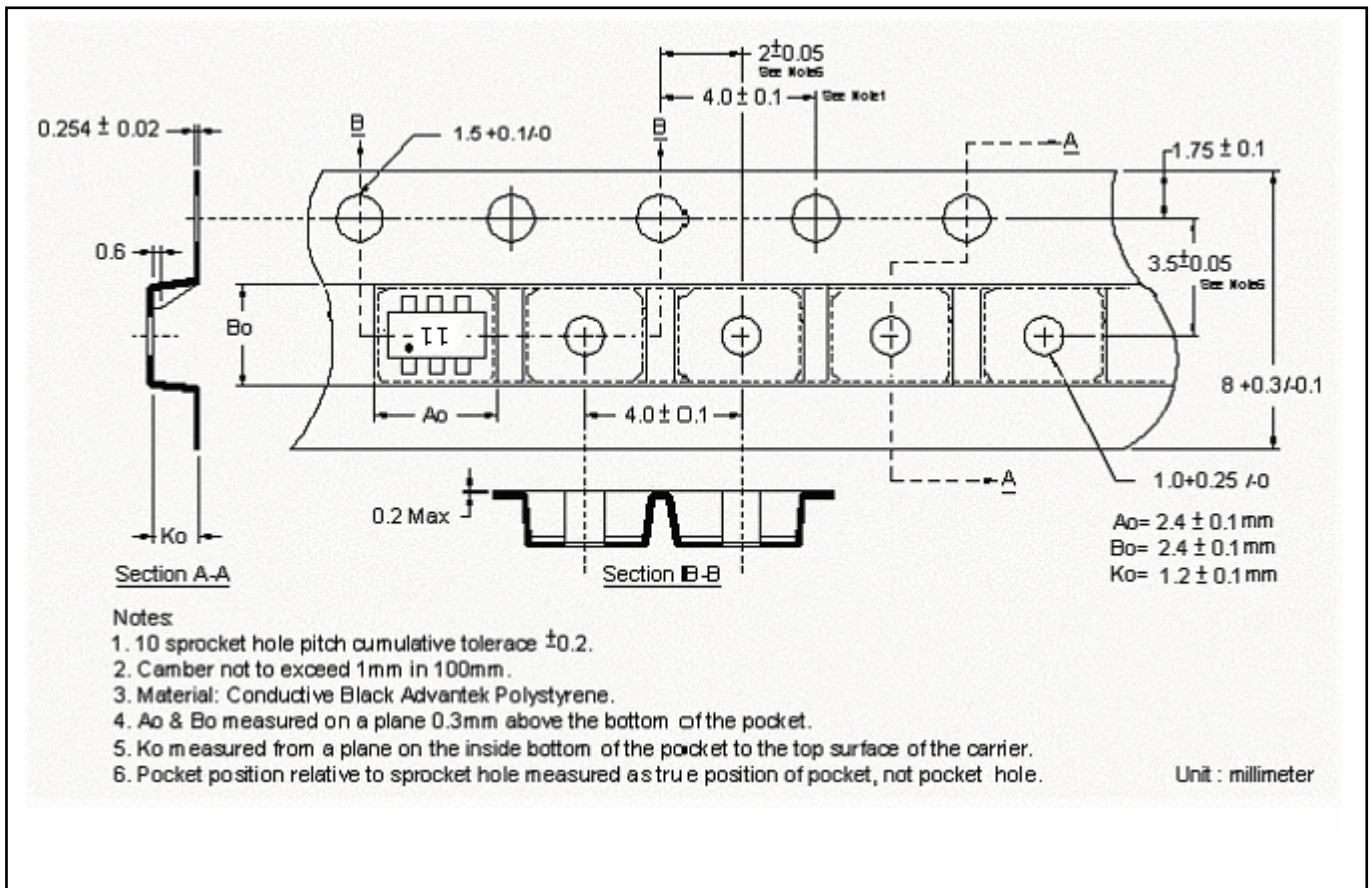
Power Derating Curves



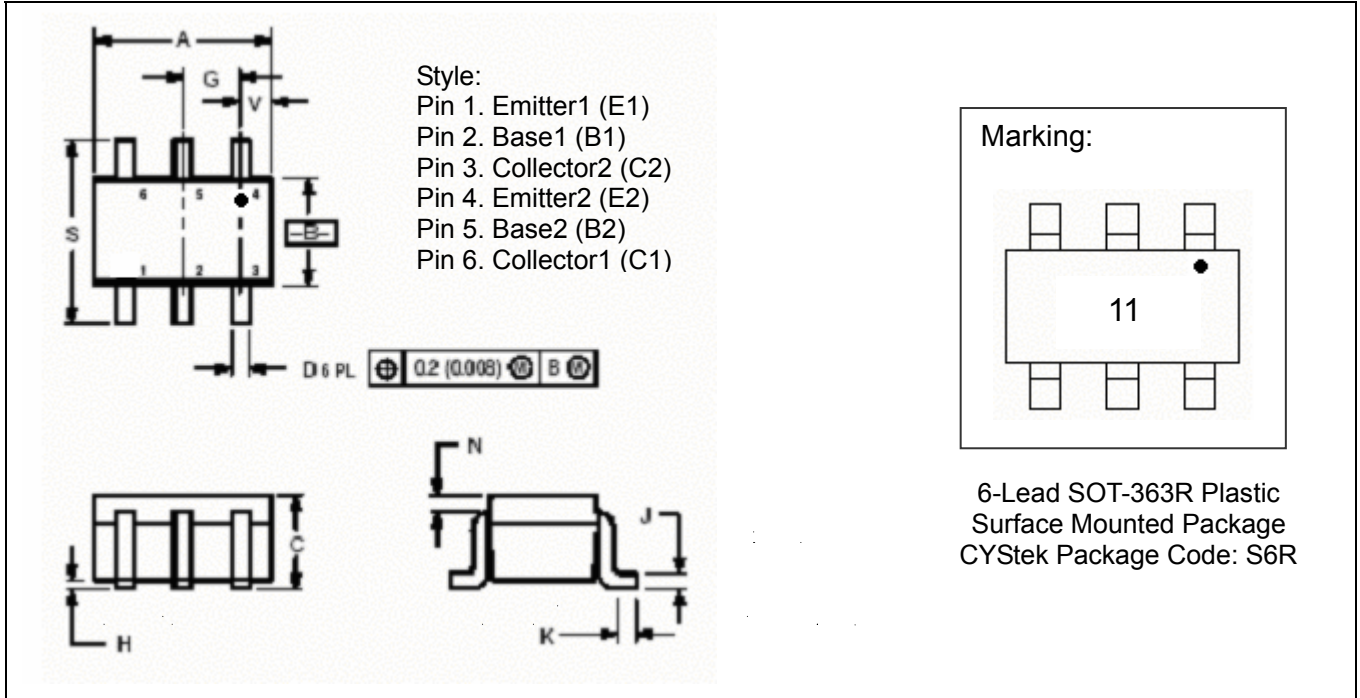
Reel Dimension



Carrier Tape Dimension



SOT-363R Dimension



*:Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.071	0.087	1.8	2.2	J	0.004	0.010	0.1	0.25
B	0.045	0.053	1.15	1.35	K	0.004	0.012	0.1	0.30
C	0.031	0.043	0.8	1.1	N	0.008 REF		0.20 REF	
D	0.004	0.012	0.1	0.3	S	0.079	0.087	2.00	2.20
G	0.026BSC		0.65BSC		Y	0.012	0.016	0.30	0.40
H	-	0.004	-	0.1					

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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