

To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

Cautions

Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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BRC144ETP Series

NPN Built-in Resistor Transistor TO-92 Series
Inverter, Driver, Switching

RENESAS

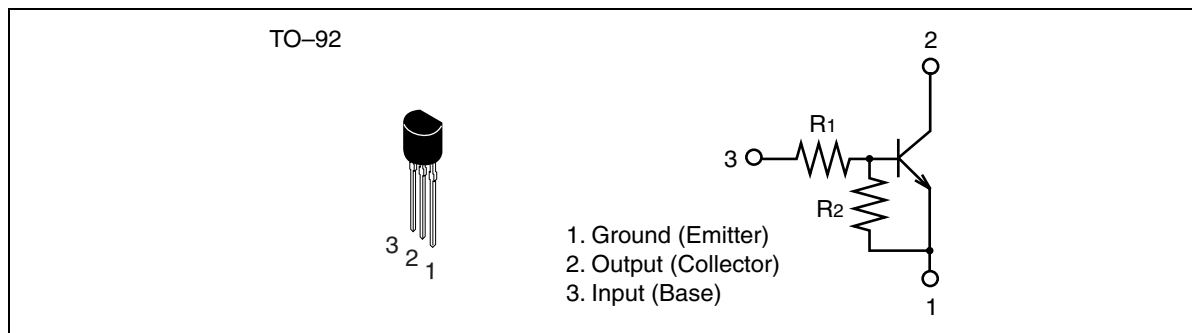
ADE-208-1447B (Z)

Rev.2
Sep. 2001

Features

- Built-in Resistor Type
- Simplifies Circuit Design
- Reduces Board Space
- Complementary pair with BRA144ETP series

Outline



Note: Input resistance is shown in below.

Device	R1 (k Ω)	R2 (k Ω)
BRC144ETP	47	47
BRC124ETP	22	22
BRC114ETP	10	10
BRC143ETP	4.7	4.7
BRC123ETP	2.2	2.2

Absolute Maximum Ratings

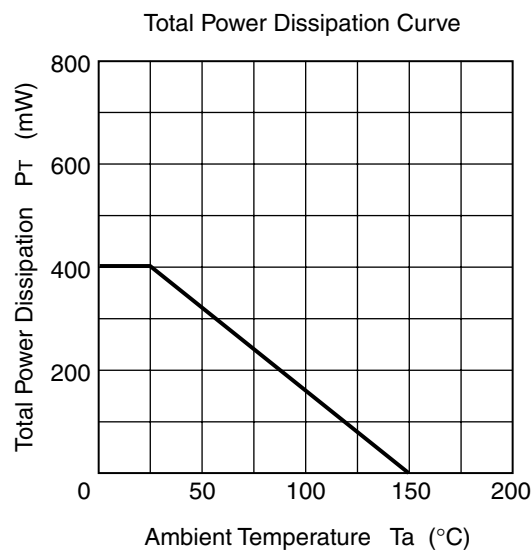
(Ta = 25°C)

Item		Symbol	Ratings	Unit
Supply voltage		V_{CC}	50	V
Input voltage	BRC144ETP	V_I	−10 to +40	V
	BRC124ETP		−10 to +30	
	BRC114ETP		−10 to +20	
	BRC143ETP		−10 to +15	
	BRC123ETP		−10 to +12	
Output current		I_O	100	mA
Total power dissipation		P_T	400	mW
Junction temperature		T_J	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

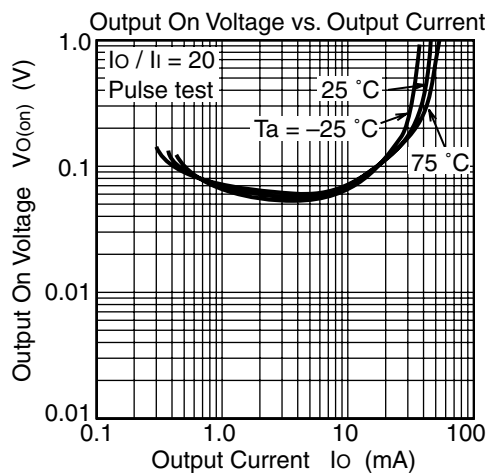
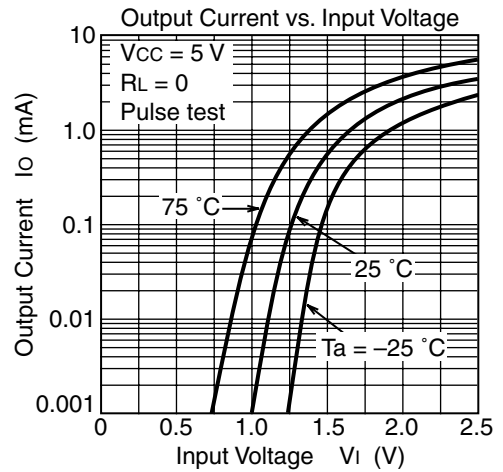
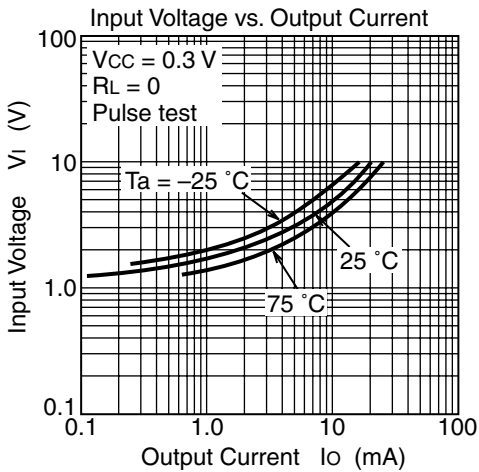
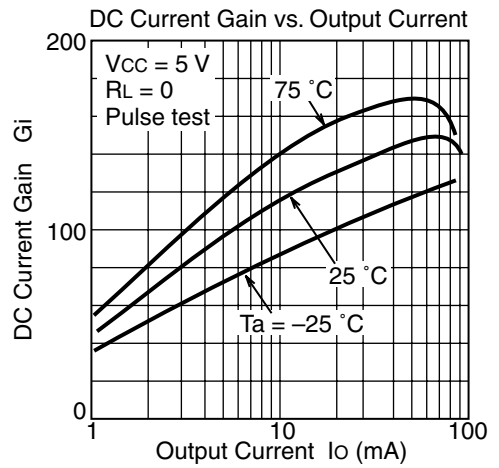
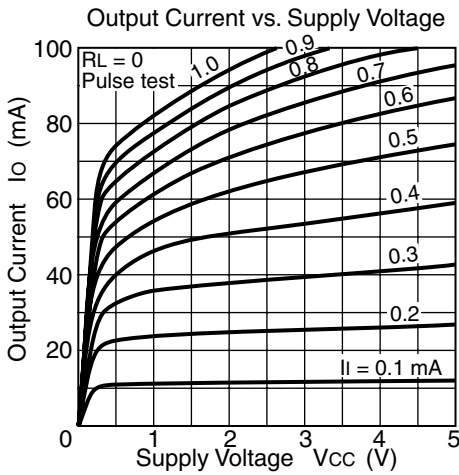
Electrical Characteristics

(Ta = 25°C)

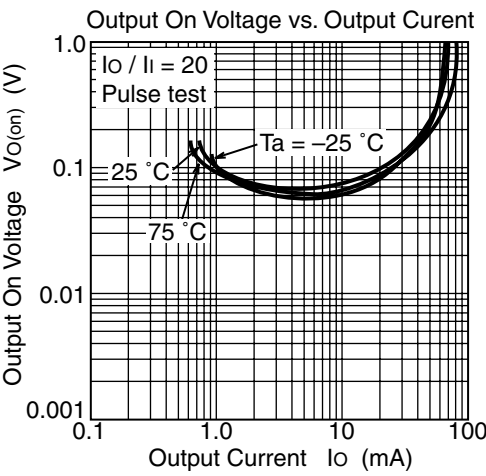
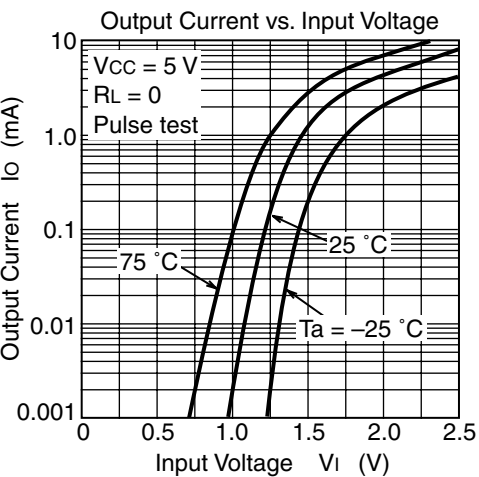
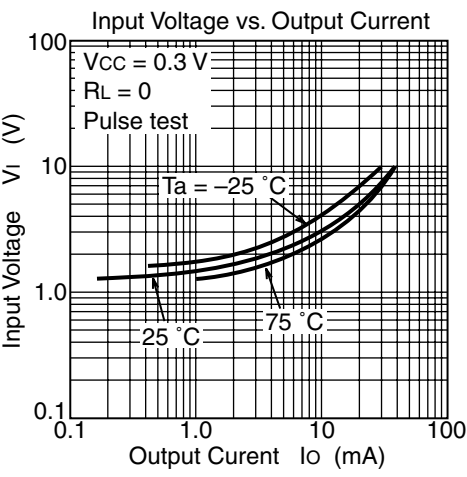
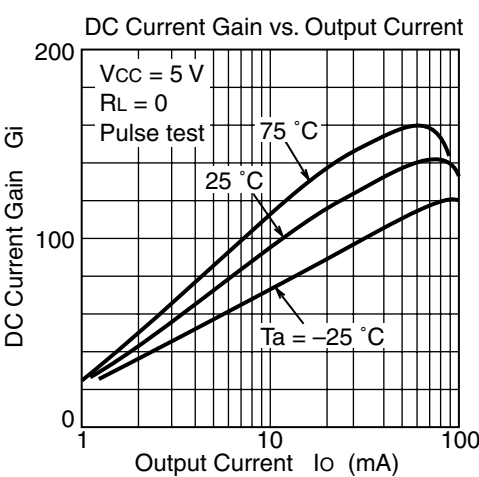
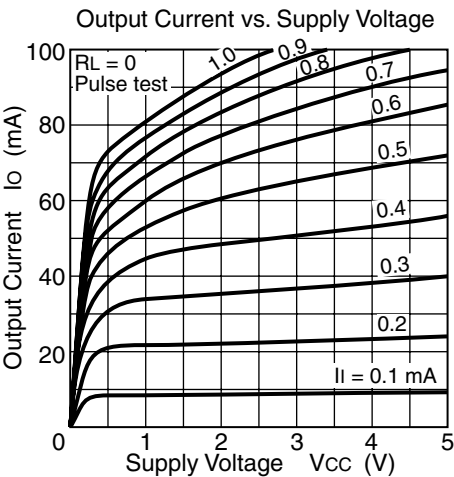
Item		Symbol	Min	Typ	Max	Unit	Test conditions
Input on voltage	BRC144ETP	$V_{I(on)}$	1.5	—	4.5	V	$V_{CC} = 0.3 \text{ V}, I_o = 5 \text{ mA}$
	BRC124ETP		1.3	—	3.0		
	BRC114ETP		1.2	—	2.4		
	BRC143ETP		1.1	—	2.0		
	BRC123ETP		1.1	—	1.8		
Input off voltage	BRC144ETP	$V_{I(off)}$	1.0	—	1.5	V	$V_{CC} = 5 \text{ V}, I_o = 100 \mu\text{A}$
	BRC124ETP		1.0	—	1.5		
	BRC114ETP		1.0	—	1.5		
	BRC143ETP		1.0	—	1.5		
	BRC123ETP		1.0	—	1.5		
Output saturation voltage		$V_{O(on)}$	—	—	0.3	V	$I_o = 10 \text{ mA}, I_i = 0.5 \text{ mA}$
Output cutoff current		$I_{O(off)}$	—	—	0.5	μA	$V_{CC} = 50 \text{ V}, I_i = 0$
DC current transfer ratio	BRC144ETP	G_i	70	—	—		$V_{CC} = 5 \text{ V}, I_o = 5 \text{ mA}$
	BRC124ETP		56	—	—		
	BRC114ETP		30	—	—		
	BRC143ETP		20	—	—		$V_{CC} = 5 \text{ V}, I_o = 10 \text{ mA}$
	BRC123ETP		20	—	—		$V_{CC} = 5 \text{ V}, I_o = 20 \text{ mA}$
Input resistance	BRC144ETP	R_i	33	47	61	$\text{k}\Omega$	
	BRC124ETP		15	22	28		
	BRC114ETP		7	10	13		
	BRC143ETP		3.3	4.7	6.1		
	BRC123ETP		1.5	2.2	2.8		
Resistance ratio		R_1/R_2	0.8	1.0	1.2		



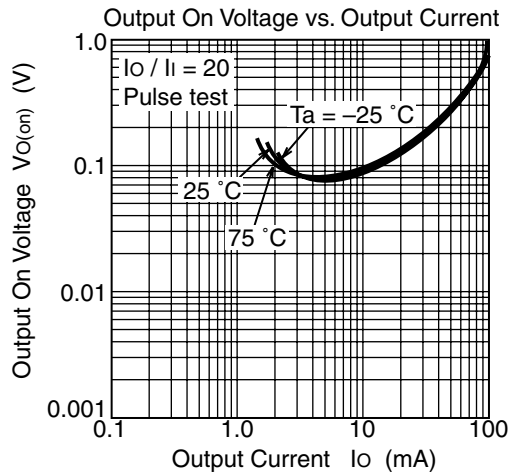
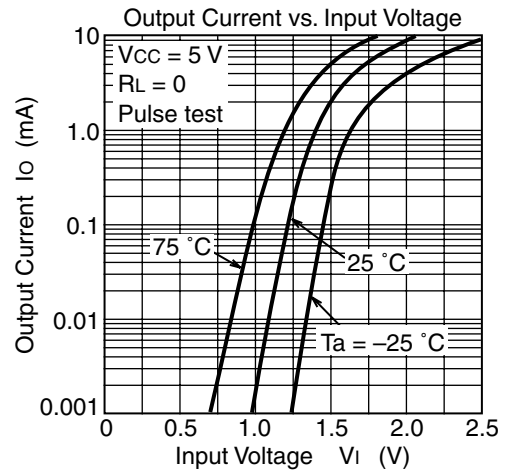
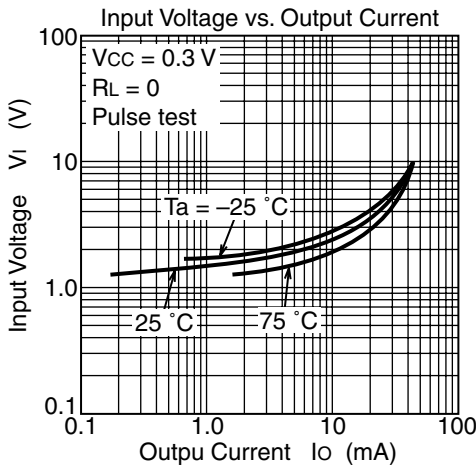
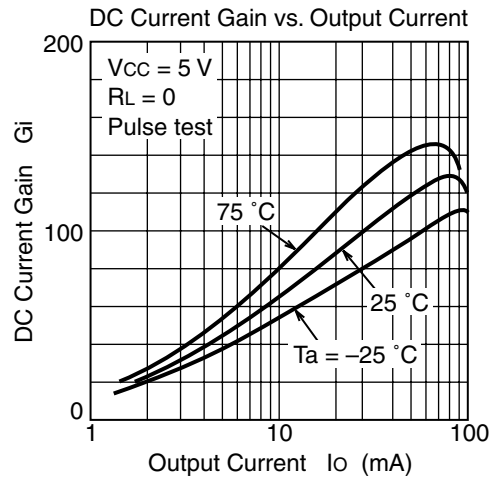
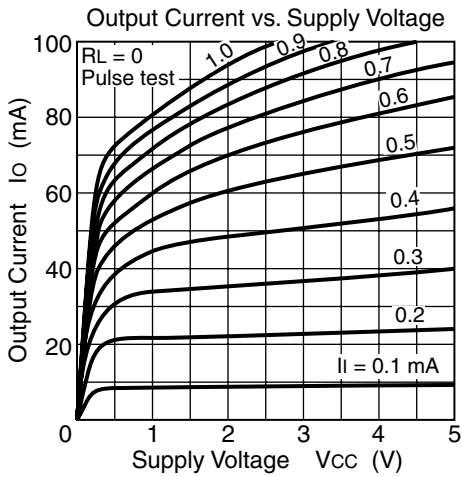
Main Characteristics (BRC144ETP)



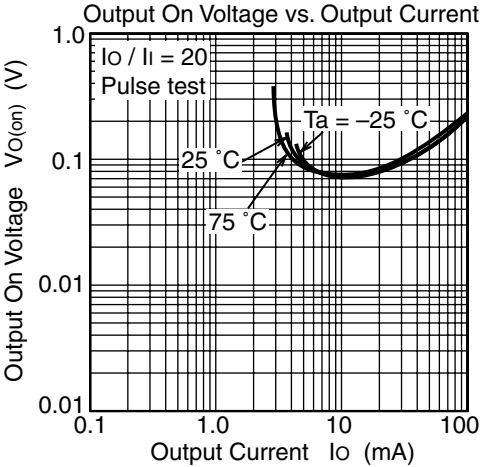
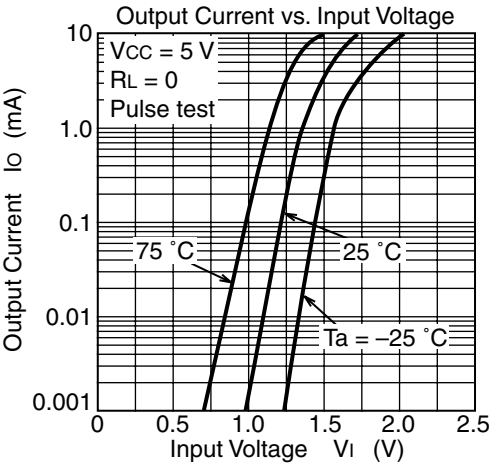
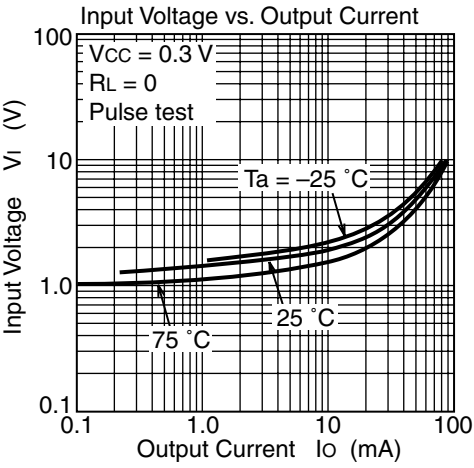
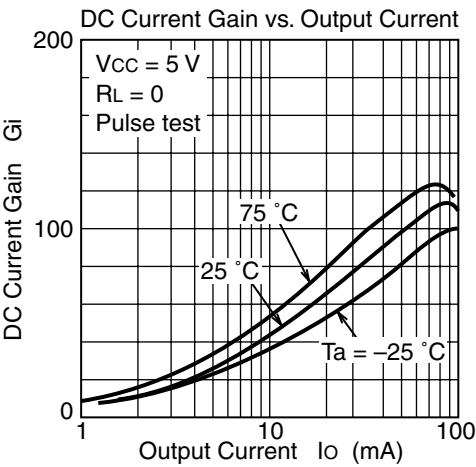
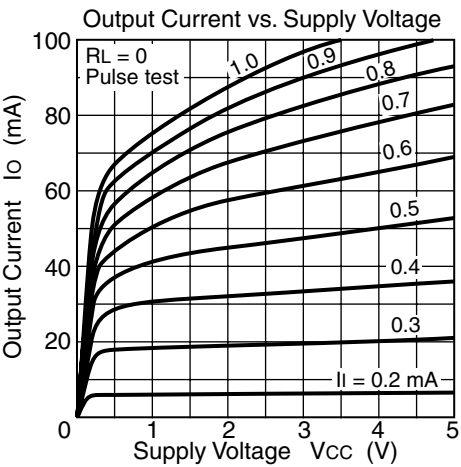
Main Characteristics (BRC124ETP)



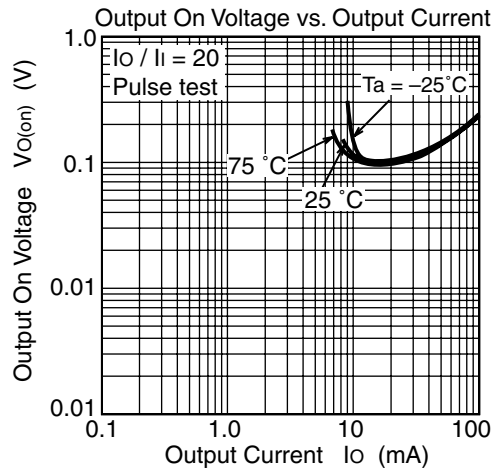
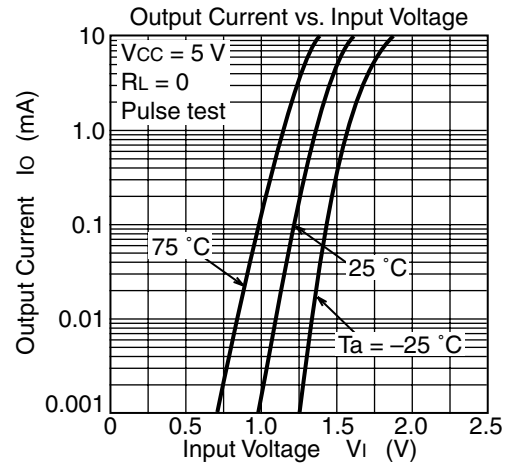
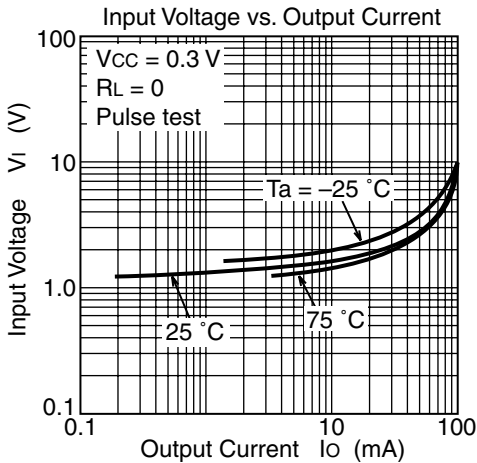
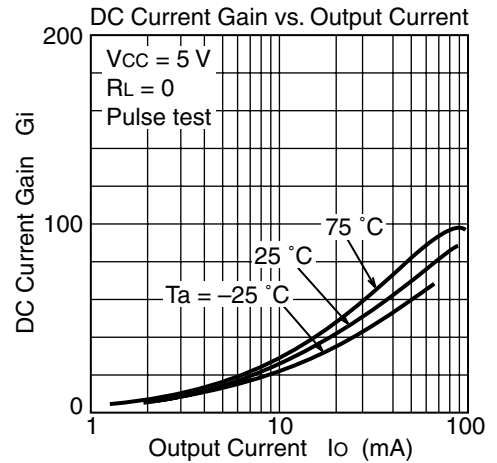
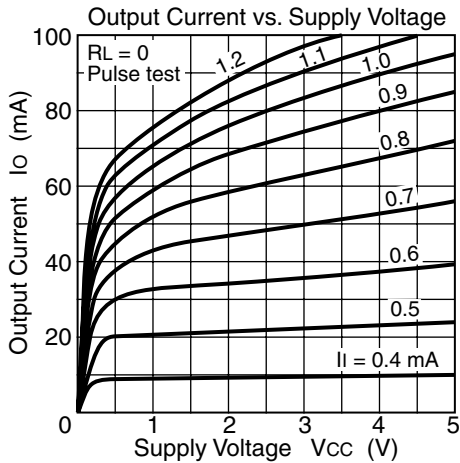
Main Characteristics (BRC114ETP)



Main Characteristics (BRC143ETP)



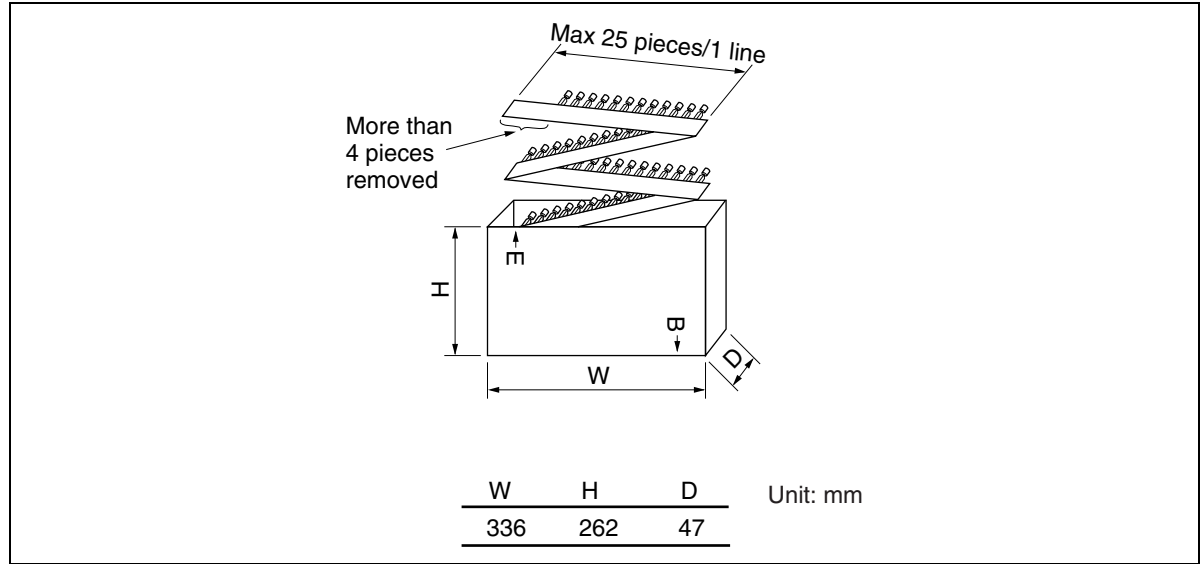
Main Characteristics (BRC123ETP)



Taping Specification

Purchasing Identification Code: Type No + **TZ**

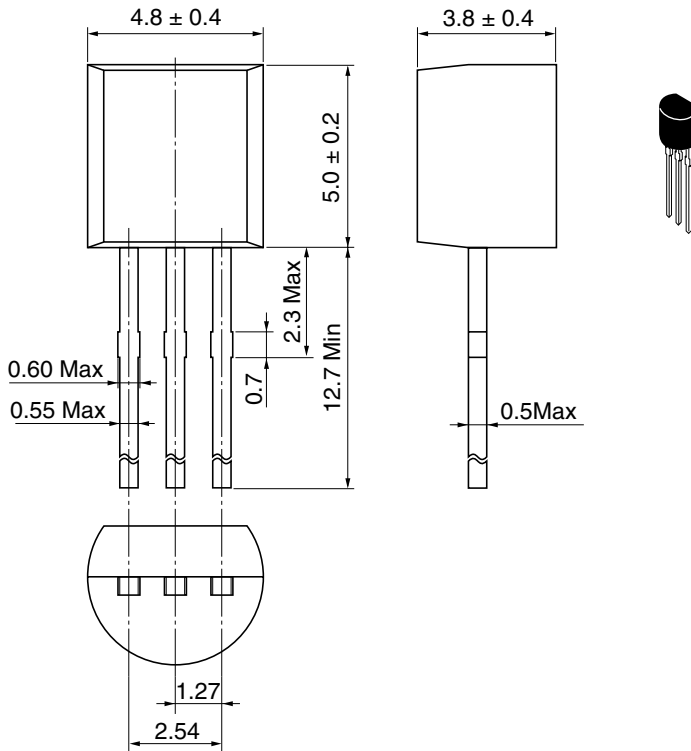
The tape is held in every 25 pitches to a hold box.
Packing quantity is 2500 pieces.



Package Dimensions

As of January, 2001

Unit: mm



Hitachi Code	TO-92 (1)
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.25 g

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