

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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BRA144ETP Series

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

RENESAS

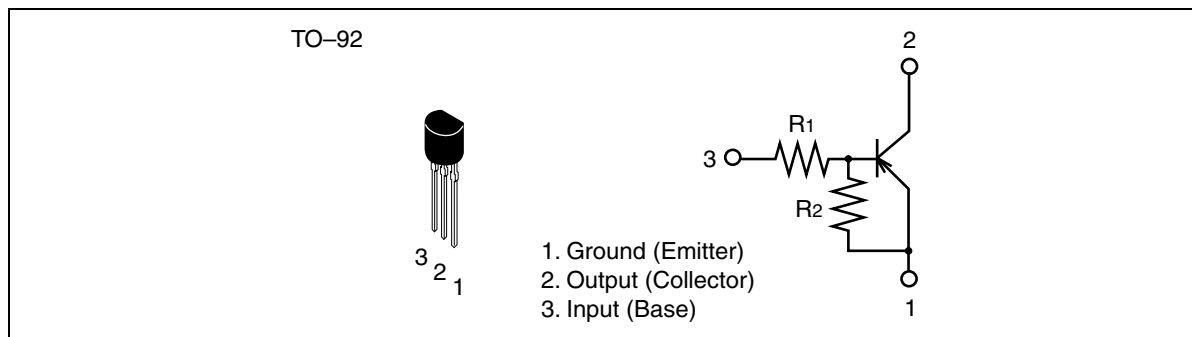
ADE-208-1446B (Z)

Rev.2
Sep. 2001

Features

- Built-in Resistor Type
- Simplifies Circuit Design
- Reduces Board Space
- Complementary pair with BRC144ETP series

Outline



Note: Input resistance is shown in below

Device	R1 (k Ω)	R2 (k Ω)
BRA144ETP	47	47
BRA124ETP	22	22
BRA114ETP	10	10
BRA143ETP	4.7	4.7
BRA123ETP	2.2	2.2

Absolute Maximum Ratings

(Ta = 25°C)

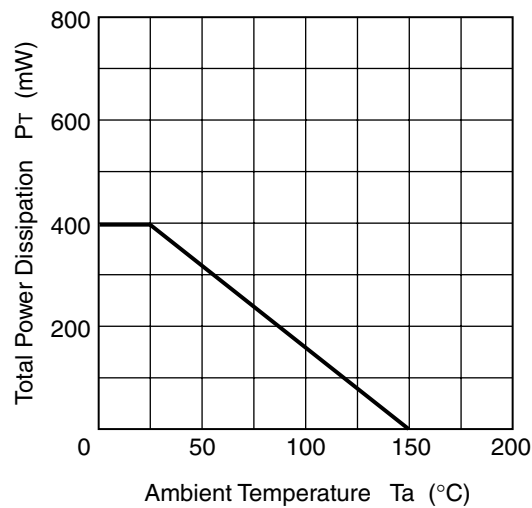
Item		Symbol	Ratings	Unit
Supply voltage		V_{CC}	−50	V
Input voltage	BRA144ETP	V_I	+10 to −40	V
	BRA124ETP		+10 to −30	
	BRA114ETP		+10 to −20	
	BRA143ETP		+10 to −15	
	BRA123ETP		+10 to −12	
Output current		I_O	−100	mA
Total power dissipation		P_T	400	mW
Storage temperature		Tstg	−55 to +150	°C

Electrical Characteristics

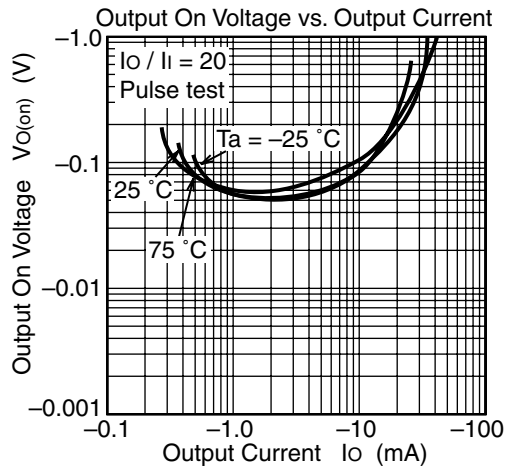
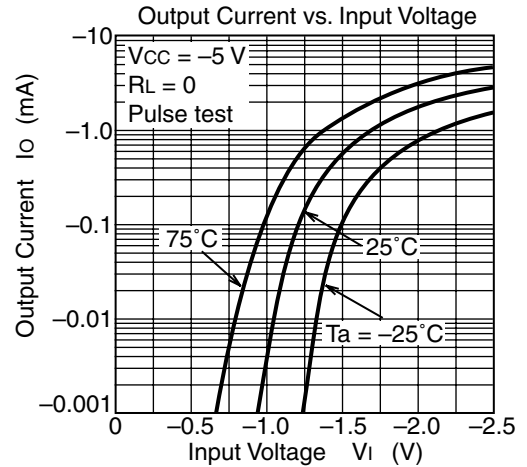
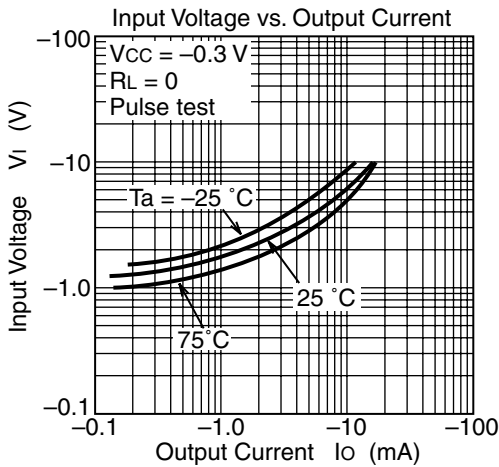
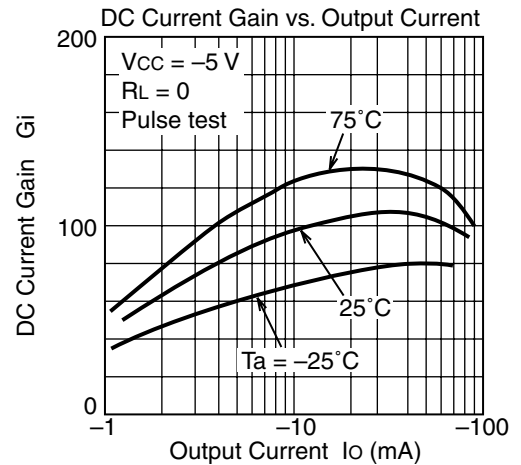
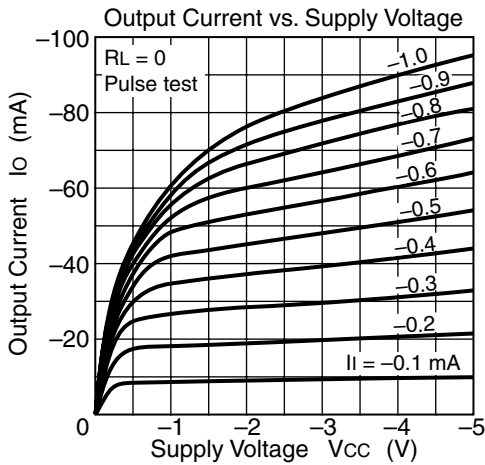
(Ta = 25°C)

Item		Symbol	Min	Typ	Max	Unit	Test conditions
Input on voltage	BRA144ETP	$V_{I(on)}$	-1.5	—	-4.5	V	$V_{CC} = -0.3 \text{ V}$, $I_o = -5 \text{ mA}$
	BRA124ETP		-1.3	—	-3.0		
	BRA114ETP		-1.2	—	-2.4		
	BRA143ETP		-1.1	—	-2.0		
	BRA123ETP		-1.1	—	-1.8		
Input off voltage	BRA144ETP	$V_{I(off)}$	-1.0	—	-1.5	V	$V_{CC} = -5 \text{ V}$, $I_o = -100 \mu\text{A}$
	BRA124ETP		-1.0	—	-1.5		
	BRA114ETP		-1.0	—	-1.5		
	BRA143ETP		-1.0	—	-1.5		
	BRA123ETP		-1.0	—	-1.5		
Output saturation current		$V_{O(on)}$	—	—	-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	BRA144ETP	G_i	70	—	—		$V_{CC} = -5 \text{ V}$, $I_o = -5 \text{ mA}$
	BRA124ETP		56	—	—		
	BRA114ETP		30	—	—		
	BRA143ETP		20	—	—		$V_{CC} = -5 \text{ V}$, $I_o = -10 \text{ mA}$
	BRA123ETP		20	—	—		$V_{CC} = -5 \text{ V}$, $I_o = -20 \text{ mA}$
Input resistance	BRA144ETP	R_i	33	47	61	k Ω	
	BRA124ETP		15	22	28		
	BRA114ETP		7	10	13		
	BRA143ETP		3.3	4.7	6.1		
	BRA123ETP		1.5	2.2	2.8		
Resistance ratio		R_i/R_2	0.8	1.0	1.2		

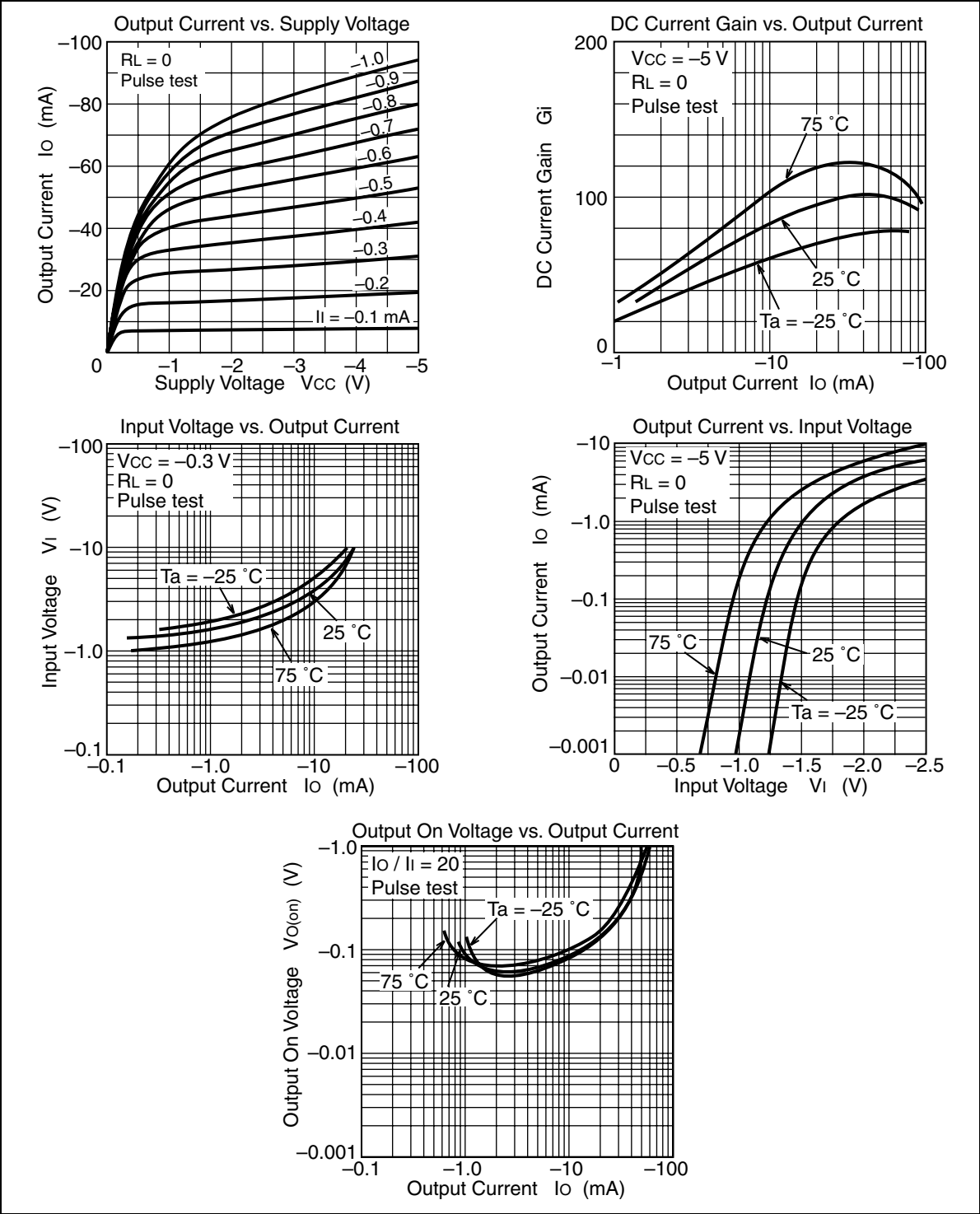
Total Power Dissipation Curve



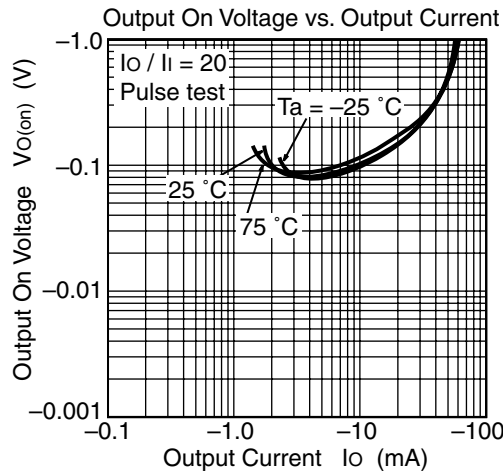
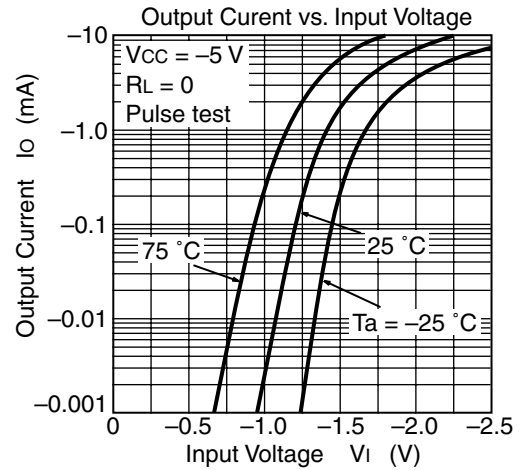
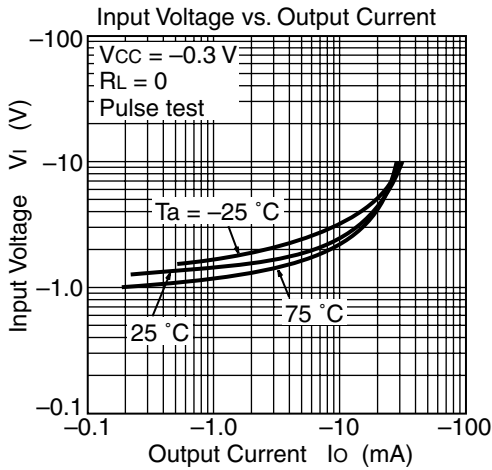
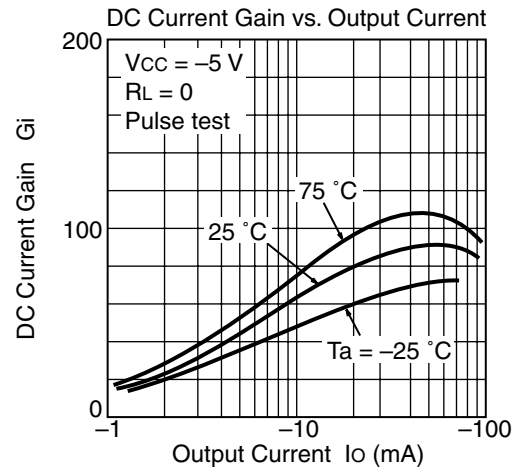
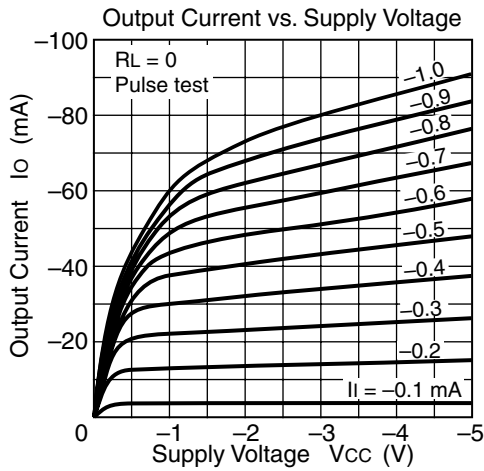
Main Characteristics (BRA144ETP)



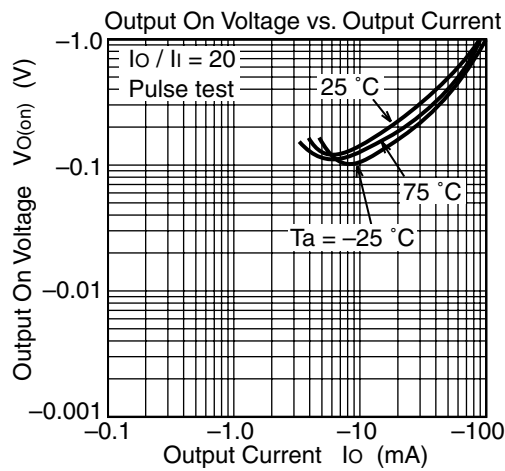
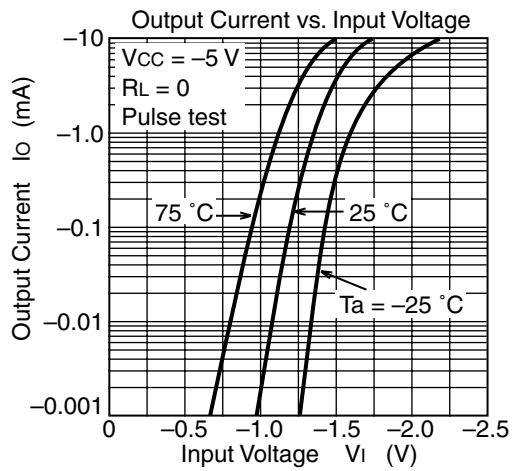
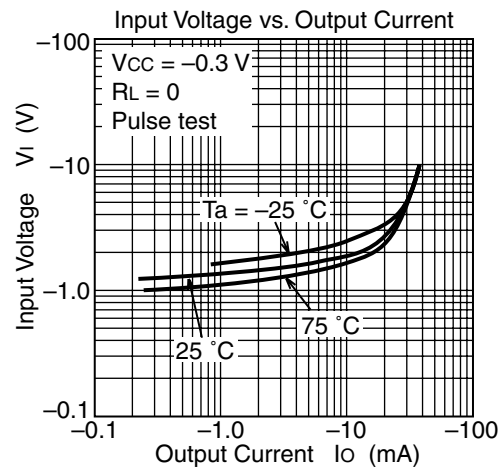
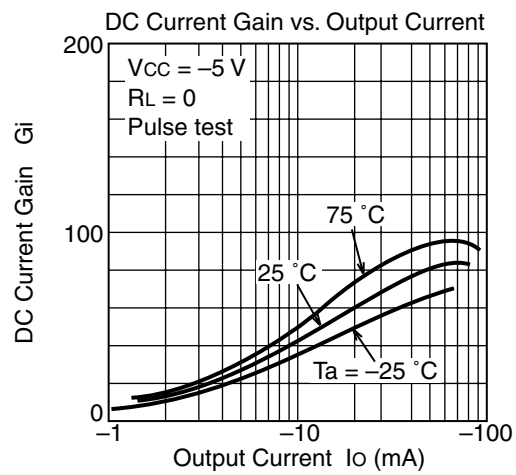
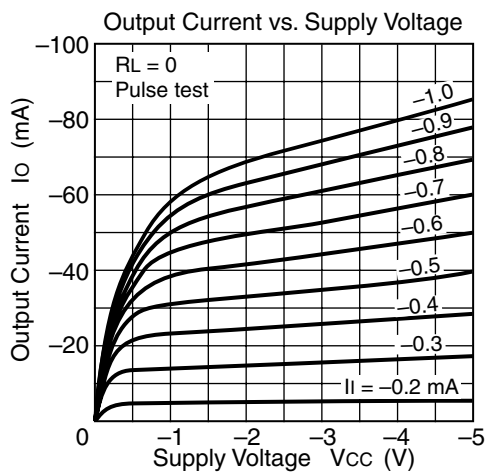
Main Characteristics (BRA124ETP)



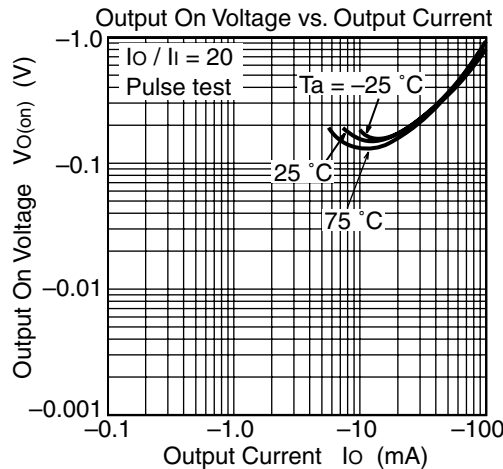
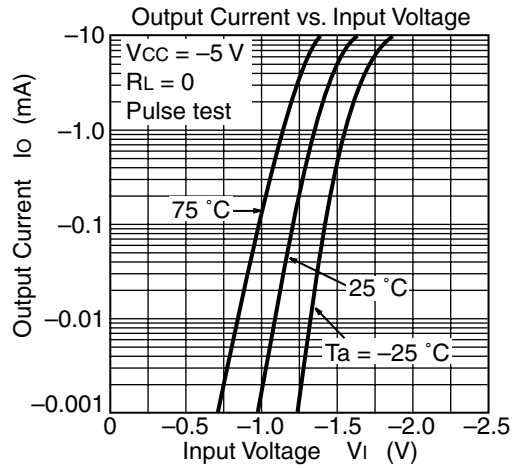
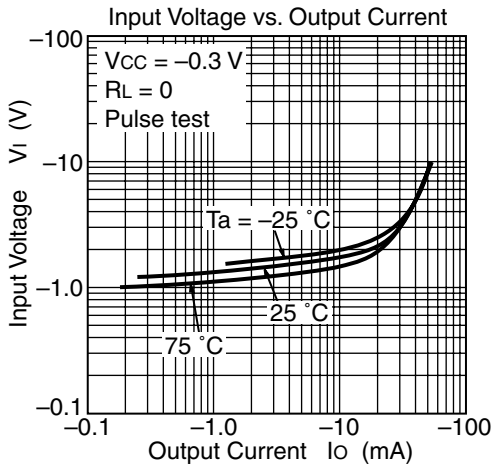
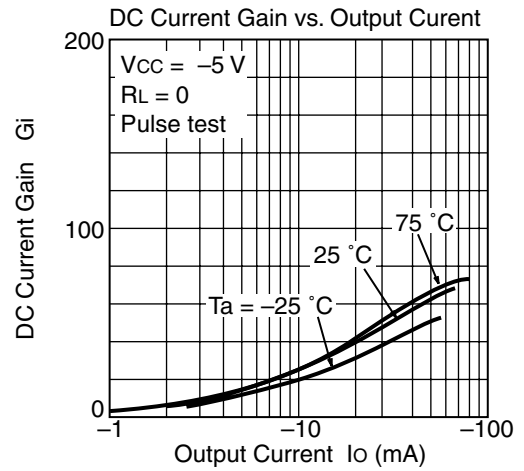
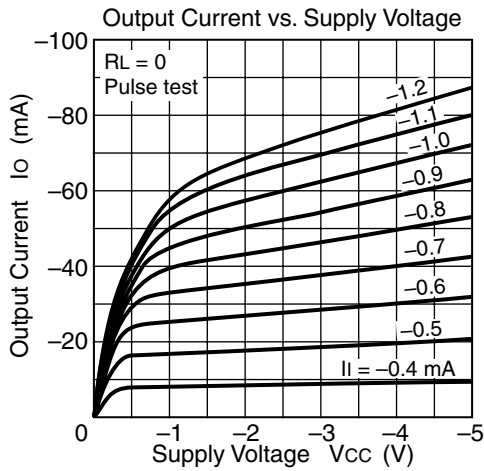
Main Characteristics (BRA114ETP)



Main Characteristics (BRA143ETP)



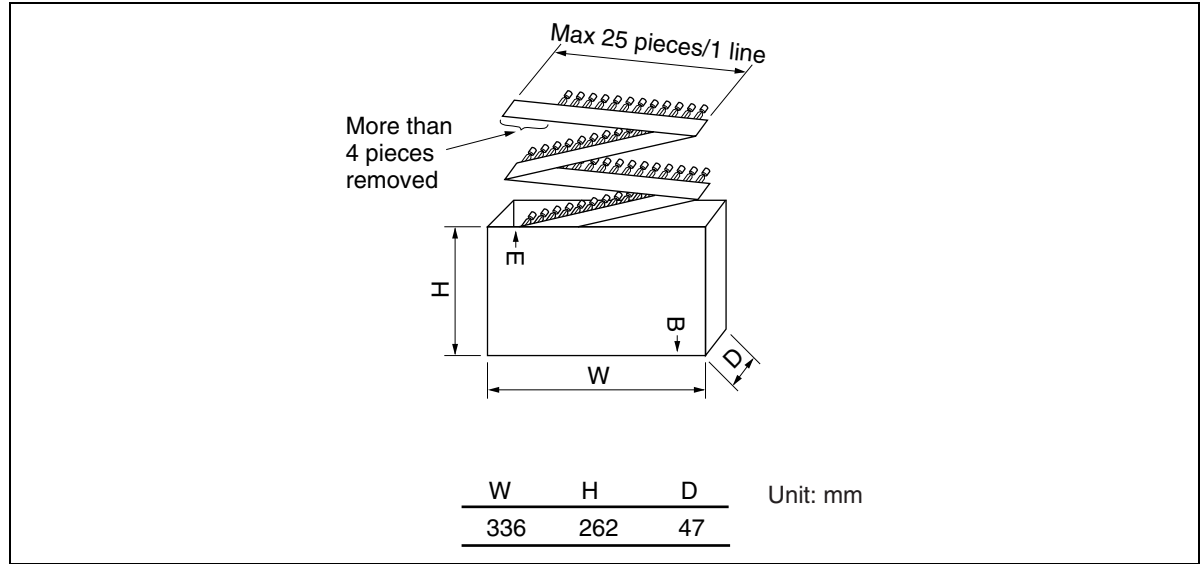
Main Characteristics (BRA123ETP)



Taping Specification

Purchasing Identification Code: Type No. + Grade + TZ

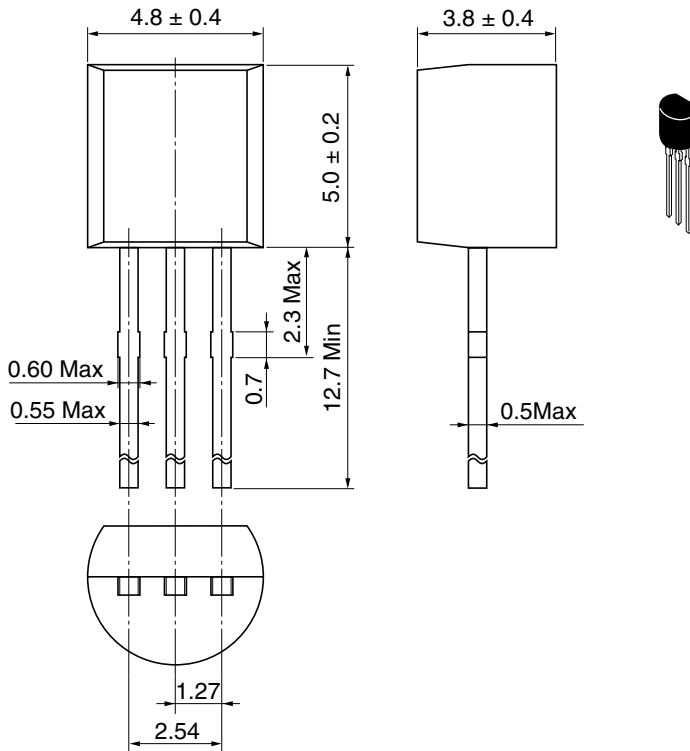
The tape is held in every 25 pitches to a hold box.
Packing quantity is 2500 pieces.



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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