

# BRA144EMP Series

PNP Built-in Resistor Transistor MPAK Series  
Inverter, Driver, Switching

## HITACHI

ADE-208-1442B (Z)

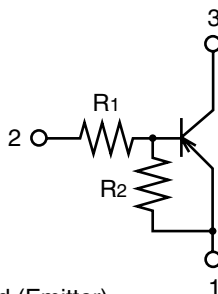
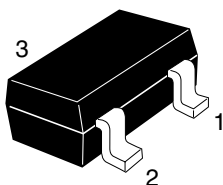
Rev.2  
Sep. 2001

### Features

- Built-in Resistor Type
- Simplifies Circuit Design
- Reduces Board Space
- Complementary pair with BRC144EMP series

### Outline

MPAK



1. Ground (Emitter)
2. Input (Base)
3. Output (Collector)

Note: Marking is shown in below.

Device	Marking	R1 (k $\Omega$ )	R2 (k $\Omega$ )
BRA144EMP	AG	47	47
BRA124EMP	CG	22	22
BRA114EMP	EG	10	10
BRA143EMP	GG	4.7	4.7
BRA123EMP	JG	2.2	2.2

# BRA144EMP Series

## Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

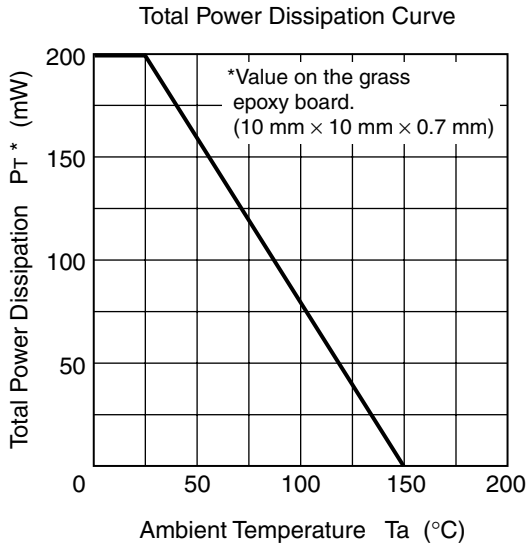
Item		Symbol	Ratings	Unit
Supply voltage		$V_{cc}$	-50	V
Input voltage	BRA144EMP	$V_i$	+10 to -50	V
	BRA124EM		+10 to -50	
	BRA114EMP		+10 to -35	
	BRA143EMP		+10 to -25	
	BRA123EMP		+10 to -15	
Output current		$I_o$	-100	mA
Total power dissipation		$P_T^*$	200	mW
Junction temperature		$T_j$	150	$^\circ\text{C}$
Storage temperature		$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*Value on the glass epoxy board. (10 mm × 10 mm × 0.7 mm)

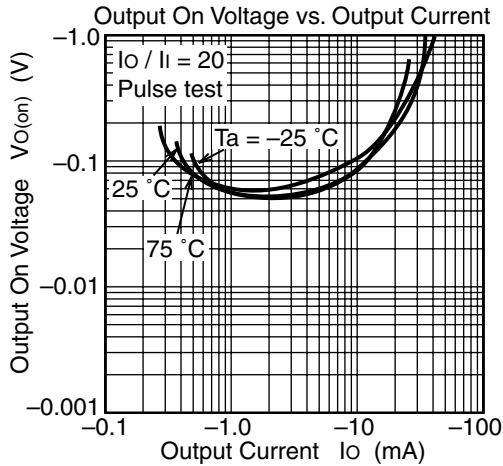
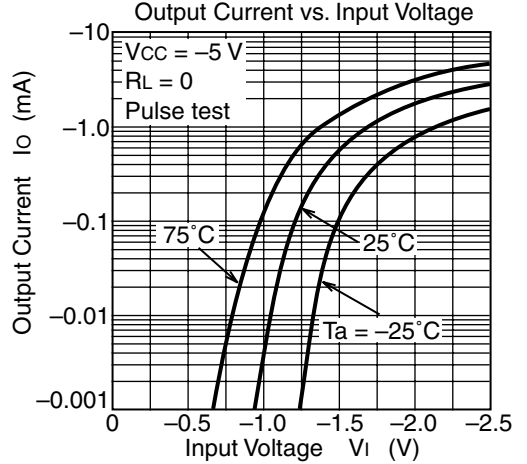
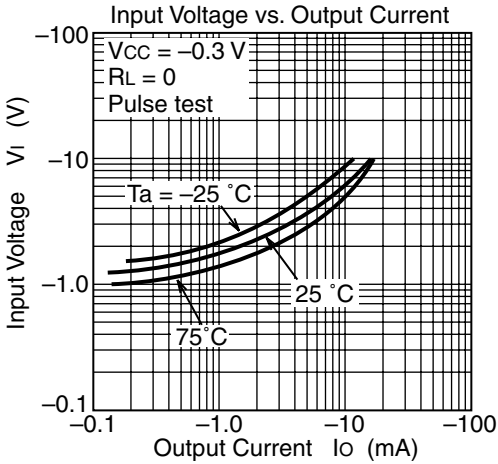
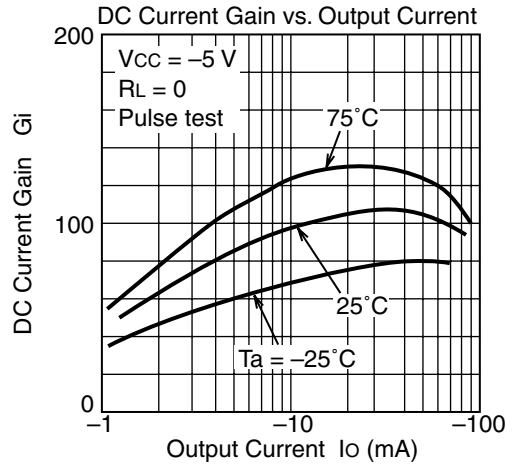
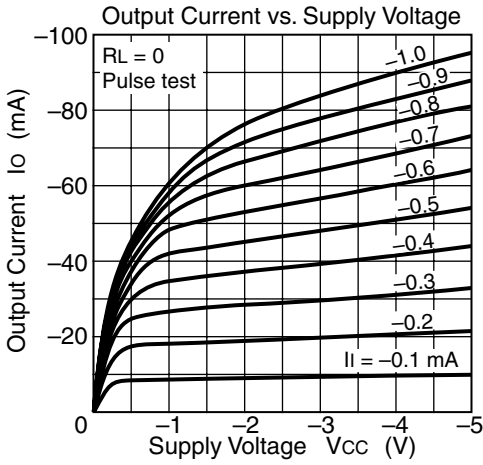
## Electrical Characteristics

(Ta = 25°C)

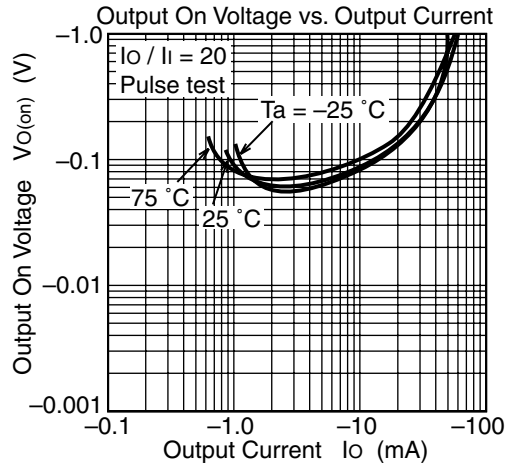
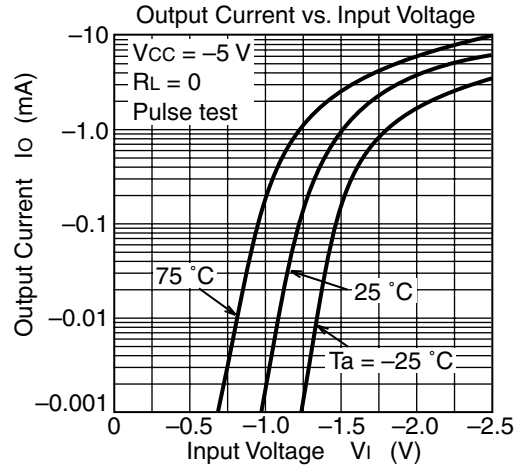
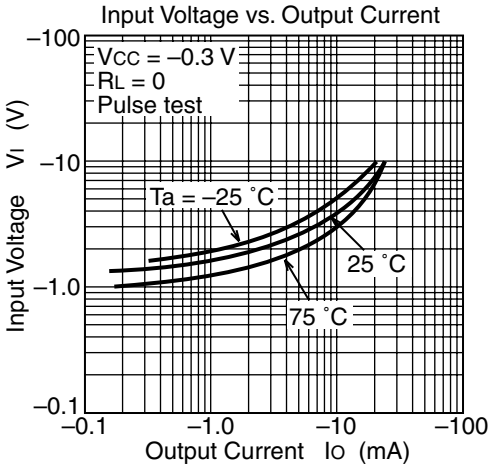
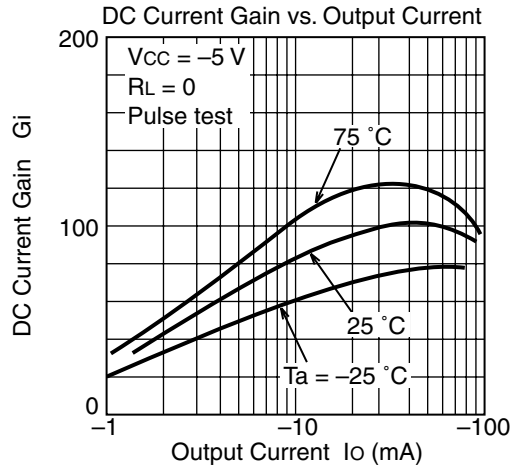
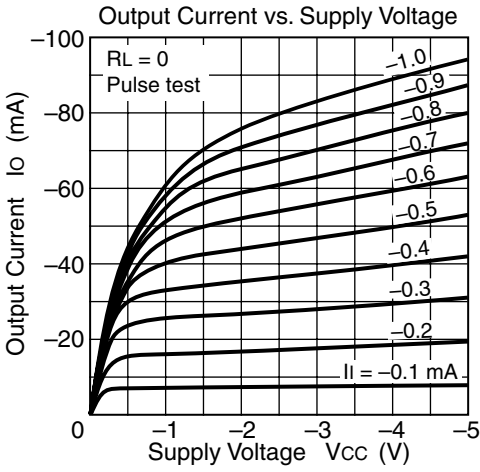
Item		Symbol	Min	Typ	Max	Unit	Test conditions	
Input on voltage	BRA144EMP	$V_{I(on)}$	-1.5	—	-4.5	V	$V_{cc} = -0.3 V,$ $I_o = -5 mA$	
	BRA124EMP		-1.3	—	-3.0			
	BRA114EMP		-1.2	—	-2.4			
	BRA143EMP		-1.1	—	-2.0			
	BRA123EMP		-1.1	—	-1.8			
Input off voltage	BRA144EMP	$V_{I(off)}$	-1.0	—	-1.5	V	$V_{cc} = -5 V,$ $I_o = -100 \mu A$	
	BRA124EMP		-1.0	—	-1.5			
	BRA114EMP		-1.0	—	-1.5			
	BRA143EMP		-1.0	—	-1.5			
	BRA123EMP		-1.0	—	-1.5			
Output saturation voltage		$V_{O(on)}$	—	—	-0.3	V	$I_o = -10 mA,$ $I_i = -0.5 mA$	
Output cutoff current		$I_{O(off)}$	—	—	-0.5	$\mu A$	$V_{cc} = -50 V, I_i = 0$	
DC current transfer ratio	BRA144EMP	$G_i$	70	—	—		$V_{cc} = -5 V, I_o = -5 mA$	
	BRA124EMP		56	—	—			
	BRA114EMP		30	—	—			
	BRA143EMP		20	—	—			$V_{cc} = -5 V, I_o = -10 mA$
	BRA123EMP		20	—	—			$V_{cc} = -5 V, I_o = -20 mA$
Input resistance	BRA144EMP	$R_i$	33	47	61	k $\Omega$		
	BRA124EMP		15	22	28			
	BRA114EMP		7	10	13			
	BRA143EMP		3.3	4.7	6.1			
	BRA123EMP		1.5	2.2	2.8			
Resistance ratio		$R_1/R_2$	0.8	1.0	1.2			



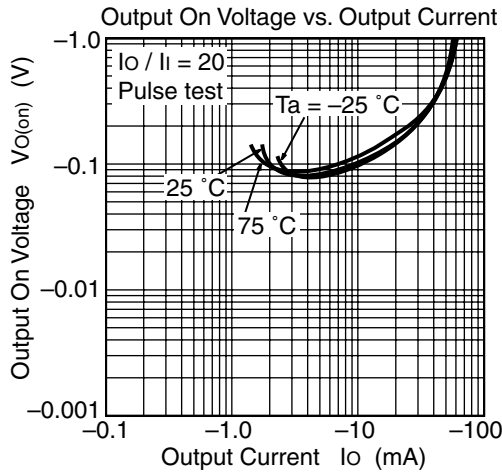
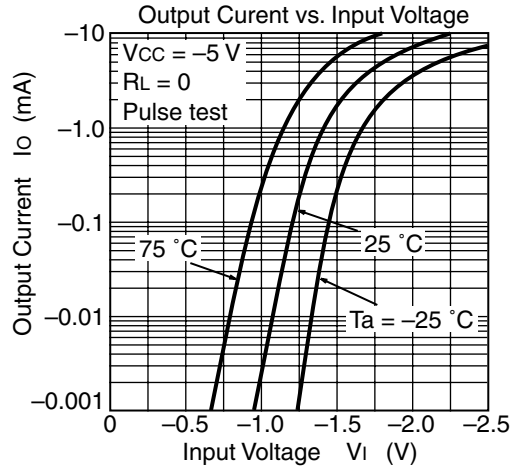
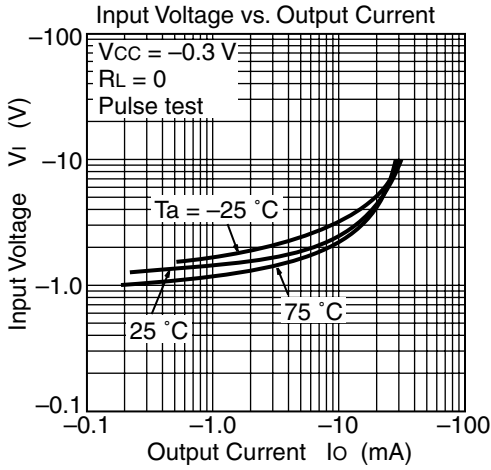
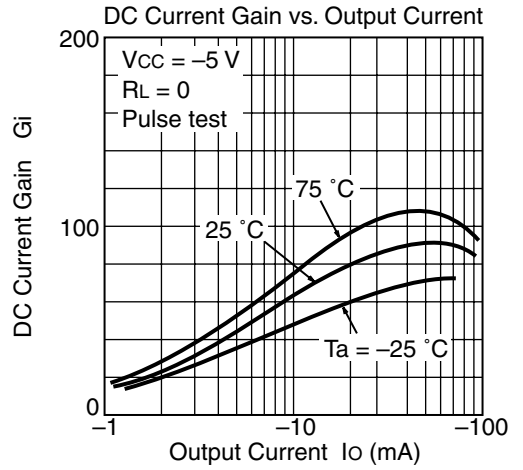
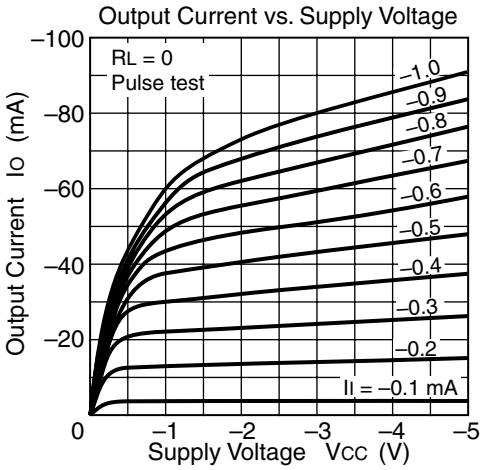
Main Characteristics (BRA144EMP)



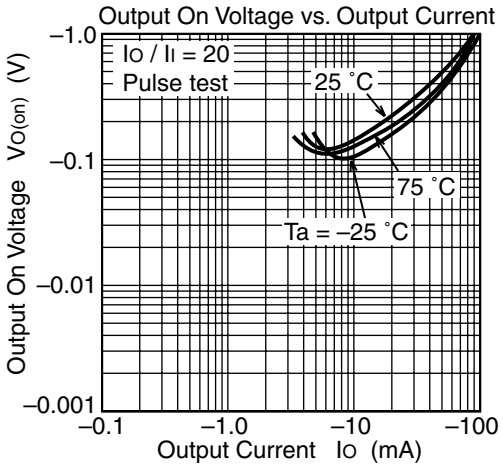
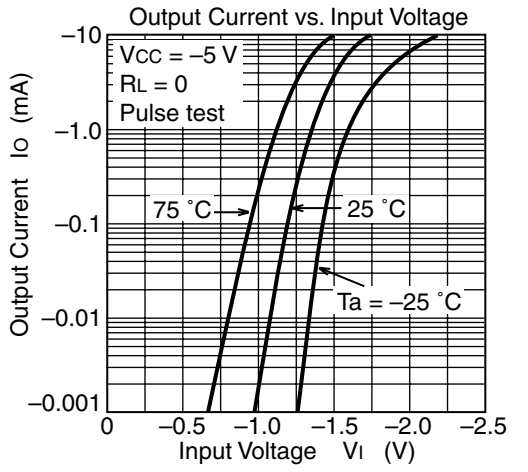
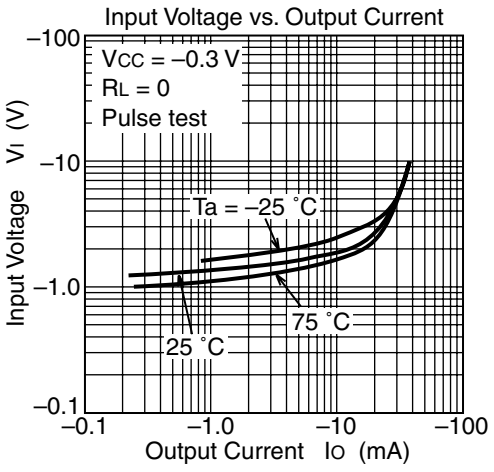
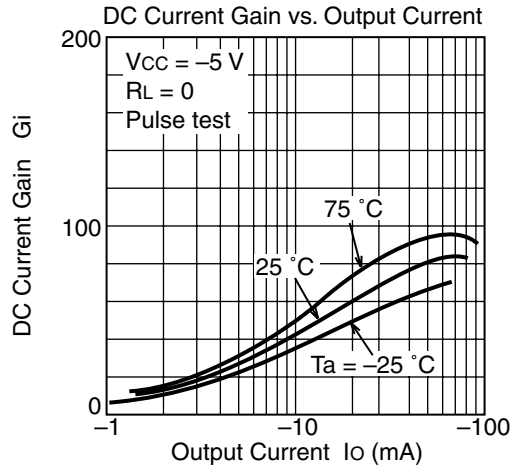
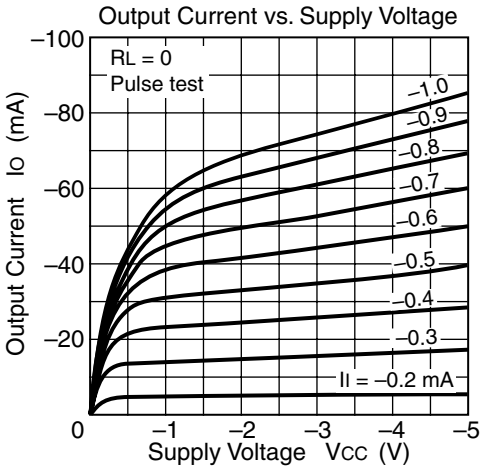
**Main Characteristics (BRA124EMP)**



Main Characteristics (BRA114EMP)

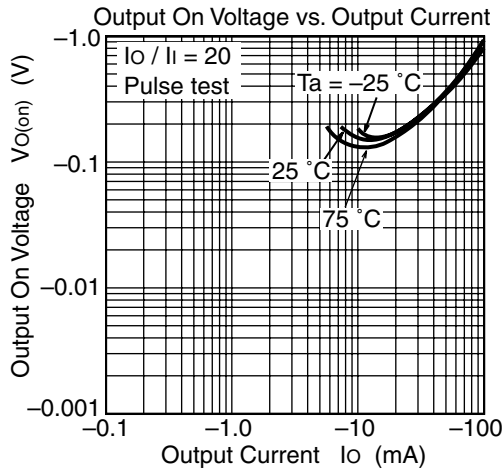
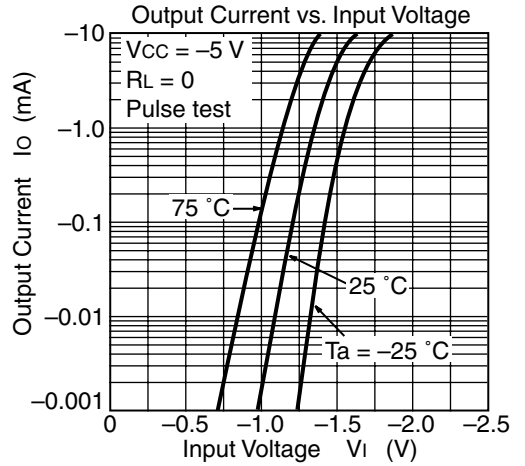
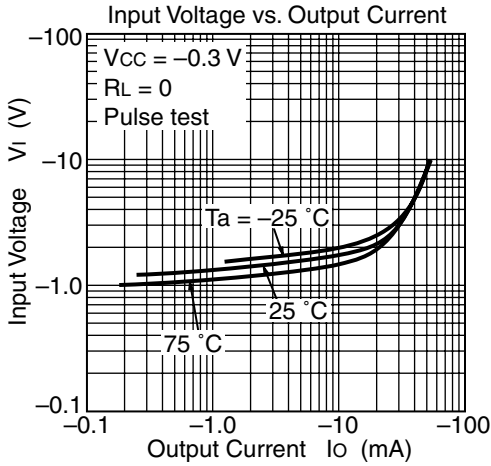
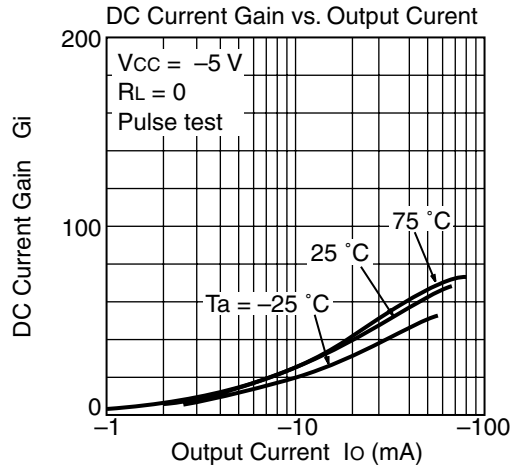
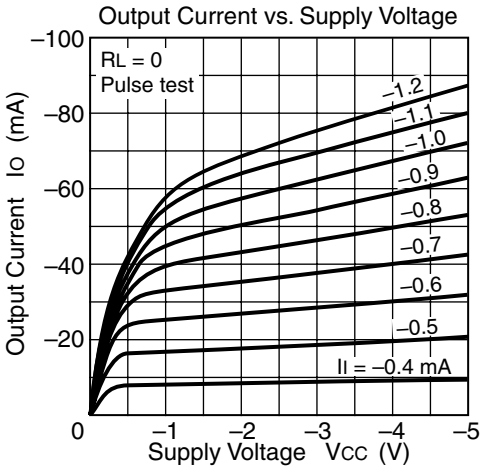


**Main Characteristics (BRA143EMP)**





Main Characteristics (BRA123EMP)



## Taping Specification

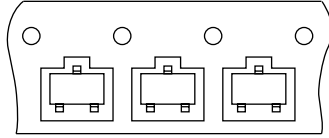
There are two different size reels in MPAK packaging.

Packing to “Left” direction

Purchasing Identification Code

Standard Reel 3000 pcs/reel: Type No. + Mark **TL**

Large Reel 12000 pcs/reel: Type No. + Mark **UL**

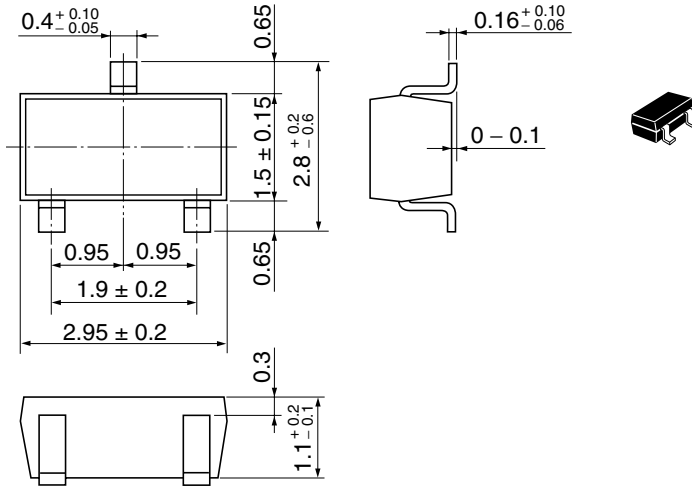


Marking face is up.  
Center lead goes to left.

Direction of feed →

Package Dimensions

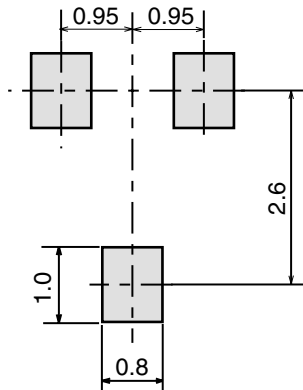
Unit: mm



Hitachi Code	MPAK
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.011 g

Footprint

MPAK



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