BRC144EMP Series

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

HITACHI

ADE-208-1443B (Z)

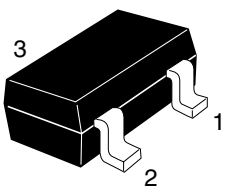
Rev.2
Sep. 2001

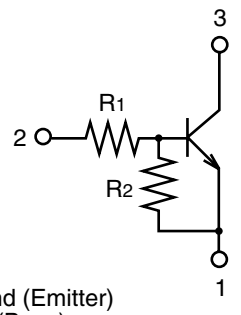
Features

- Built–in Resistor Type
- Simplifies Circuit Design
- Reduces Board Space
- Complementary pair with BRA144EMP series

Outline

MPAK





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

Note: Marking is shown in below.

Device	Marking	R1 (kΩ)	R2 (kΩ)
BRC144EMP	BG	47	47
BRC124EMP	DG	22	22
BRC114EMP	FG	10	10
BRC143EMP	HG	4.7	4.7
BRC123EMP	KG	2.2	2.2

Hitachi semiconductor

Absolute Maximum Ratings

(Ta = 25°C)

Item		Symbol	Ratings	Unit
Supply voltage		V_{CC}	50	V
Input voltage	BRC144EMP	V_I	−10 to +50	V
	BRC124EMP		−10 to +50	
	BRC114EMP		−10 to +35	
	BRC143EMP		−10 to +25	
	BRC123EMP		−10 to +15	
Output current		I_O	100	mA
Total power dissipation		P_T*1	200	mW
Junction temperature		Tj	150	°C
Storage temperature		Tstg	−55 to +150	°C

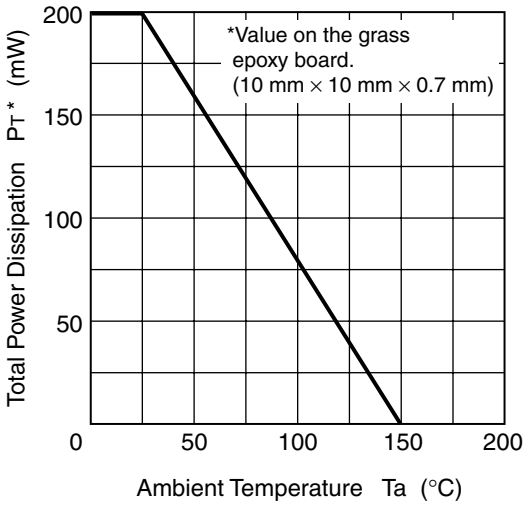
*Value on the glass epoxy board. (10 mm × 10 mm × 0.7 mm)

Electrical Characteristics

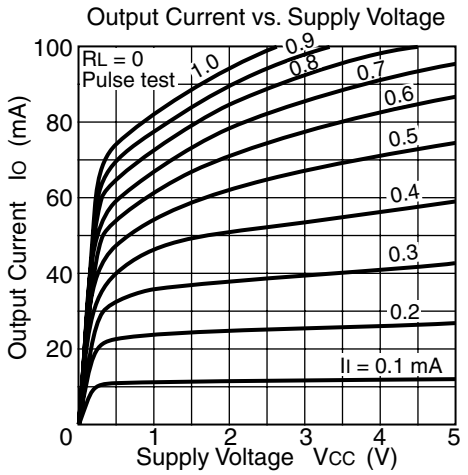
(Ta = 25°C)

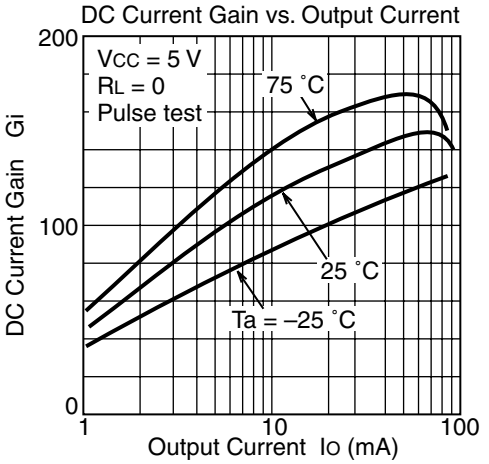
Item		Symbol	Min	Typ	Max	Unit	Test conditions
Input on voltage	BRC144EMP	$V_{I(on)}$	1.5	—	4.5	V	V_{CC} = 0.3 V, I_O = 5 mA
	BRC124EMP		1.3	—	3.0		
	BRC114EMP		1.2	—	2.4		
	BRC143EMP		1.1	—	2.0		
	BRC123EMP		1.1	—	1.8		
Input off voltage	BRC144EMP	$V_{I(off)}$	1.0	—	1.5	V	V_{CC} = 5 V, I_O = 100 µA
	BRC124EMP		1.0	—	1.5		
	BRC114EMP		1.0	—	1.5		
	BRC143EMP		1.0	—	1.5		
	BRC123EMP		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	µA	V_{CC} = 50 V, I_I = 0
DC current transfer ratio	BRC144EMP	Gi	70	—	—		V_{CC} = 5 V, I_O = 5 mA
	BRC124EMP		56	—	—		
	BRC114EMP		30	—	—		
	BRC143EMP		20	—	—		V_{CC} = 5 V, I_O = 10 mA
	BRC123EMP		20	—	—		V_{CC} = 5 V, I_O = 20 mA
Input resistance	BRC144EMP	R_1	33	47	61	kΩ	
	BRC124EMP		15	22	28		
	BRC114EMP		7	10	13		
	BRC143EMP		3.3	4.7	6.1		
	BRC123EMP		1.5	2.2	2.8		
Resistance ratio		R_1/R_2	0.8	1.0	1.2		

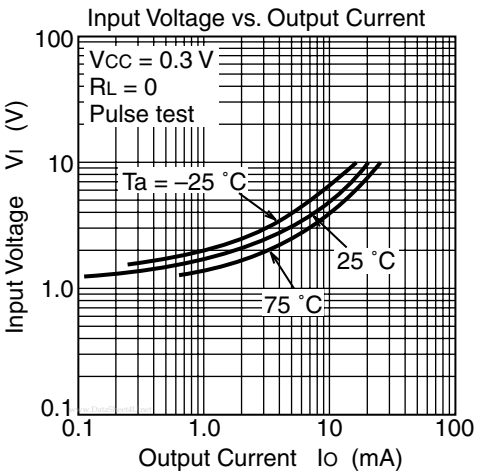
Total Power Dissipation Curve

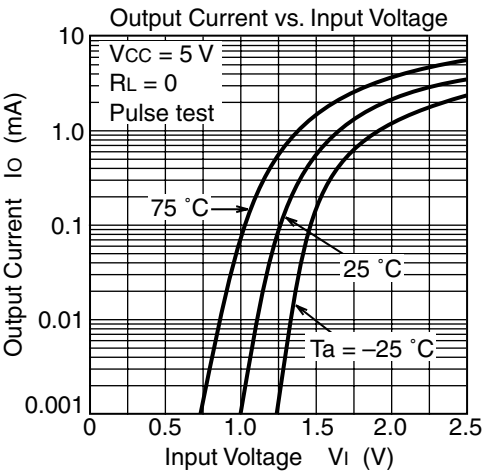


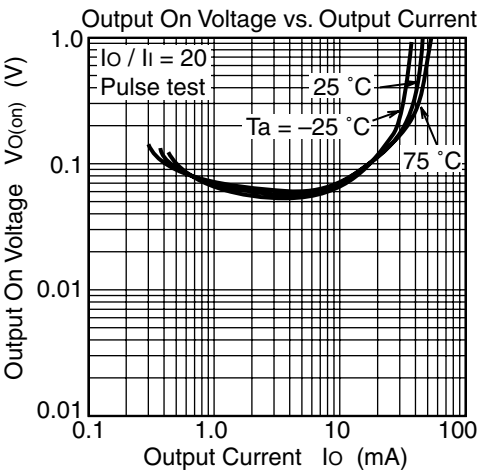
Main Characteristics (BRC144EMP)





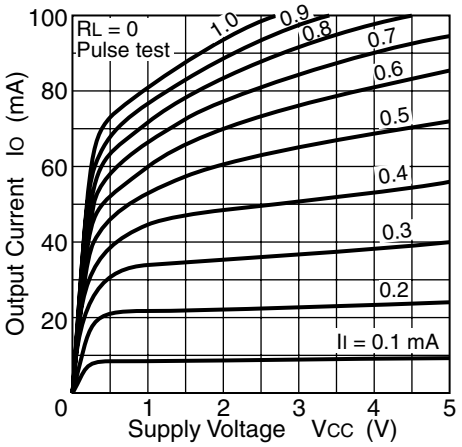




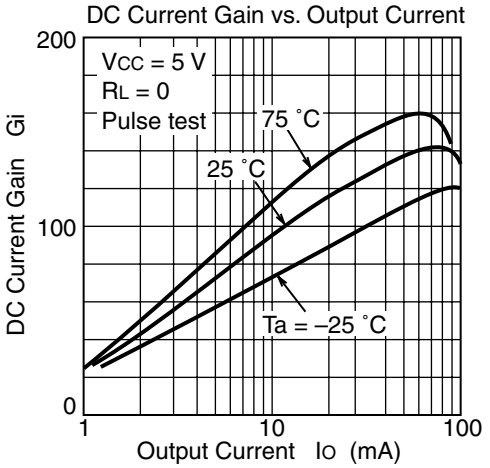


Main Characteristics (BRC124EMP)

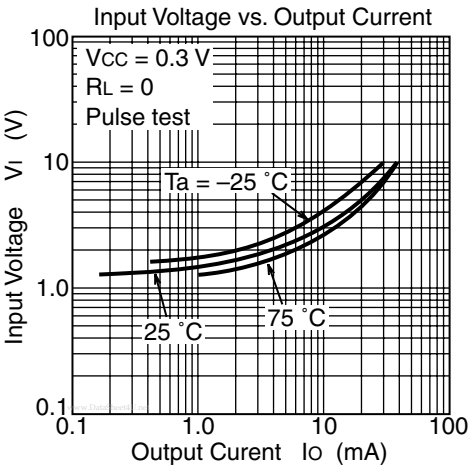
Output Current vs. Supply Voltage



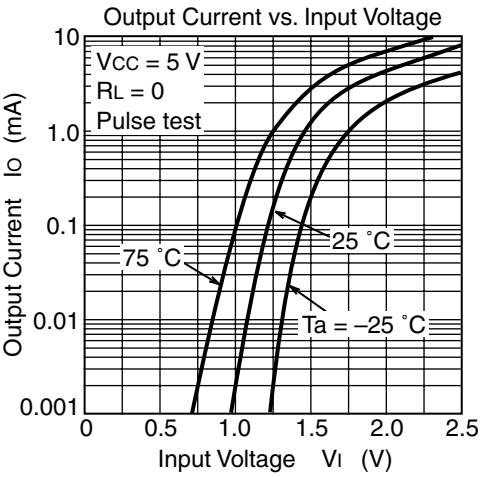
DC Current Gain vs. Output Current



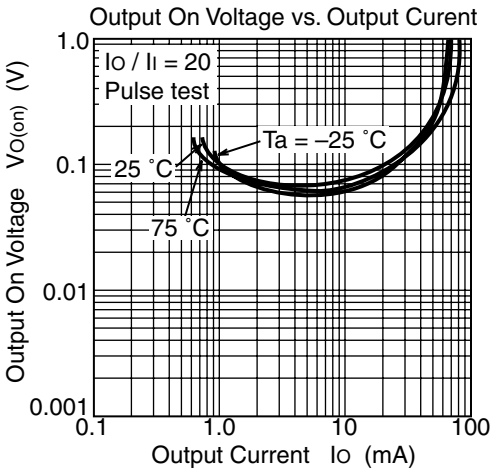
Input Voltage vs. Output Current



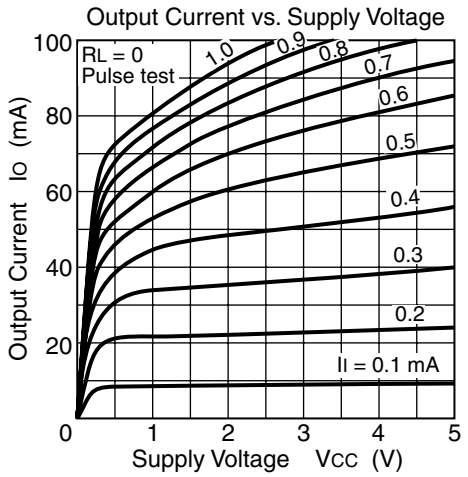
Output Current vs. Input Voltage

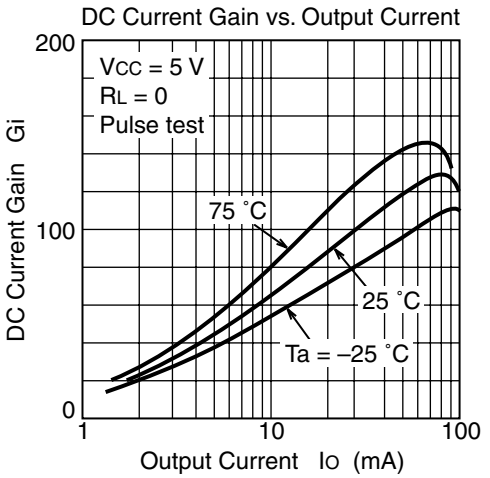


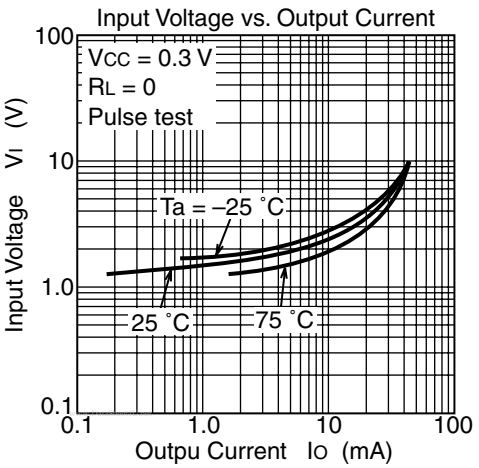
Output On Voltage vs. Output Curent

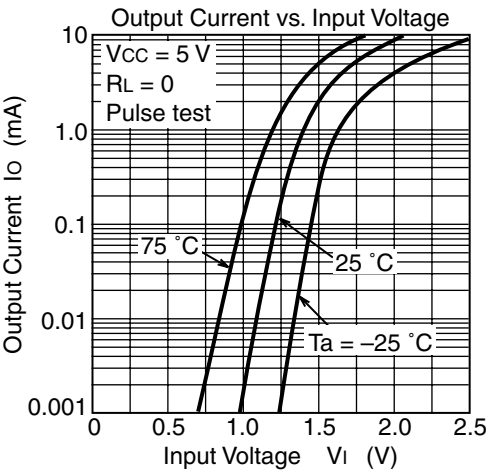


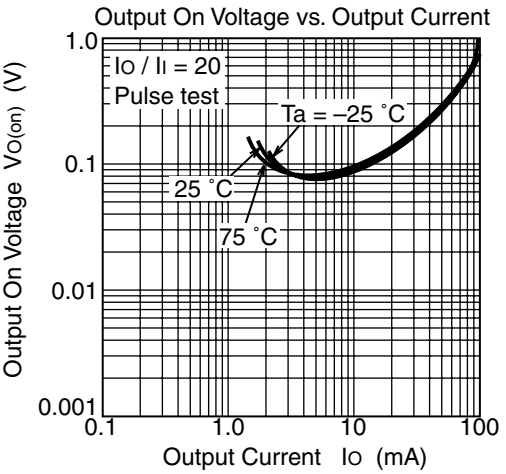
Main Characteristics (BRC114EMP)



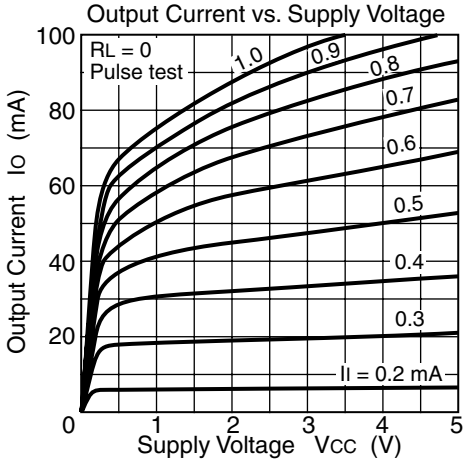


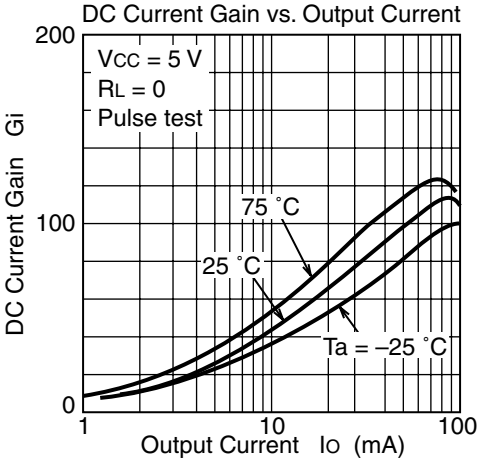


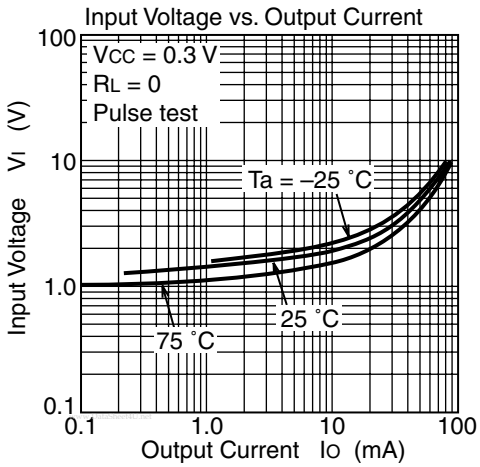


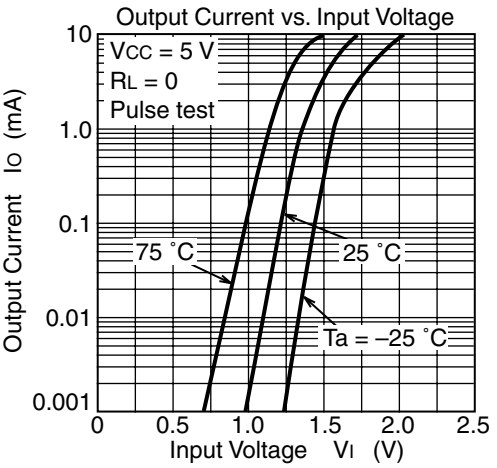


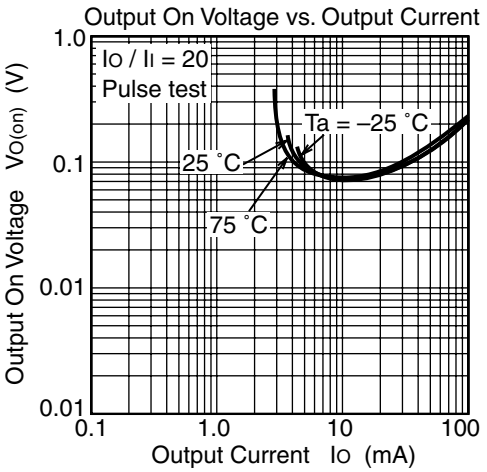
Main Characteristics (BRC143EMP)



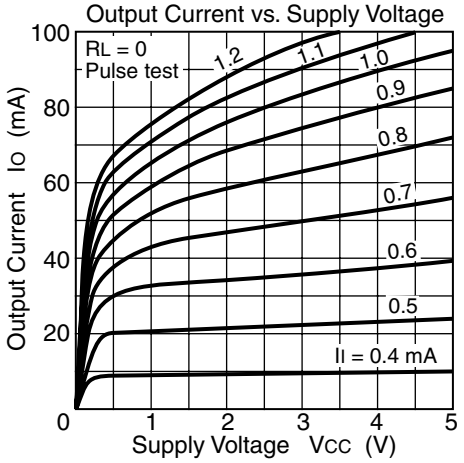


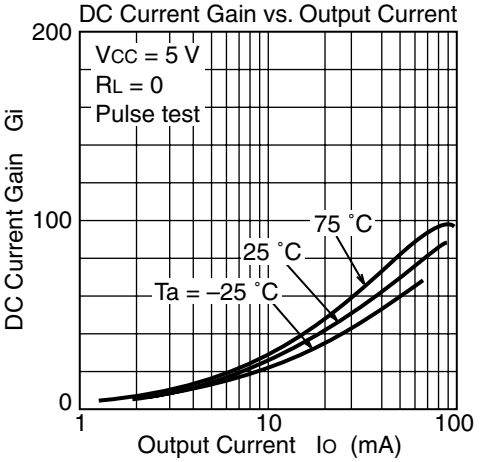


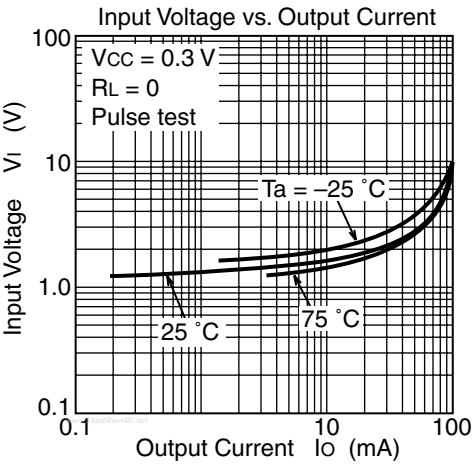


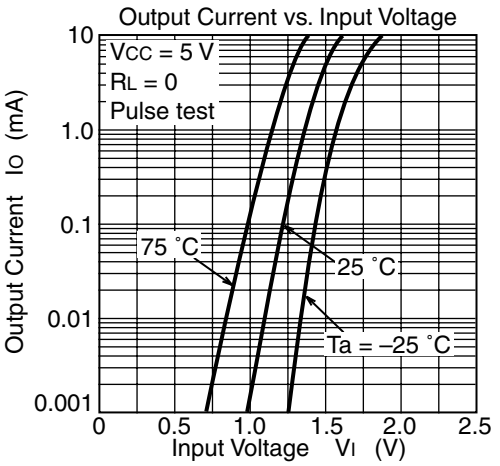


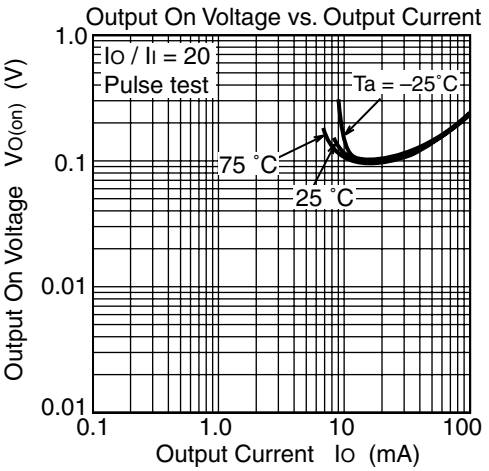
Main Characteristics (BRC123EMP)











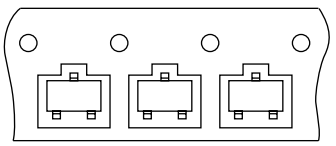
Taping Specification

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**

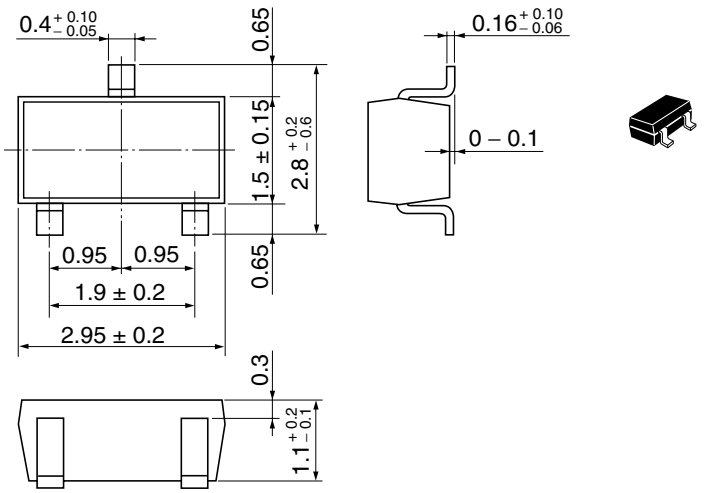


Marking face is up.
Center lead goes to left.

Direction of feed

Package Dimensions

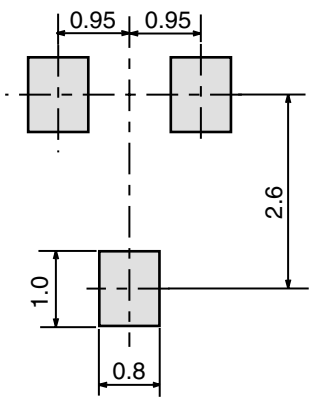
Unit: mm



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

Footprint

MPAK



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