To all our customers

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Renesas Technology Home Page: http://www.renesas.com

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

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Keep safety first in your circuit designs!

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   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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BRA144EMP Series

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

ADE-208-1442B (Z)

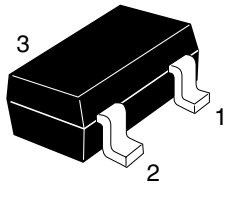
Rev.2
Sep. 2001

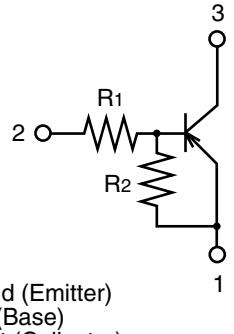
Features

- 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 (kΩ)	R2 (kΩ)
BRA144EMP	AG	47	47
BRA124EMP	CG	22	22
BRA114EMP	EG	10	10
BRA143EMP	GG	4.7	4.7
BRA123EMP	JG	2.2	2.2

Absolute Maximum Ratings

(Ta = 25°C)

Item		Symbol	Ratings	Unit
Supply voltage		V_{CC}	–50	V
Input voltage	BRA144EMP	V_I	+10 to –40	V
	BRA124EM		+10 to –30	
	BRA114EMP		+10 to –20	
	BRA143EMP		+10 to –15	
	BRA123EMP		+10 to –12	
Output current		I_O	–100	mA
Total power dissipation		P_T*	200	mW
Junction temperature		Tj	150	°C
Storage temperature		Tstg	–55 to +150	°C

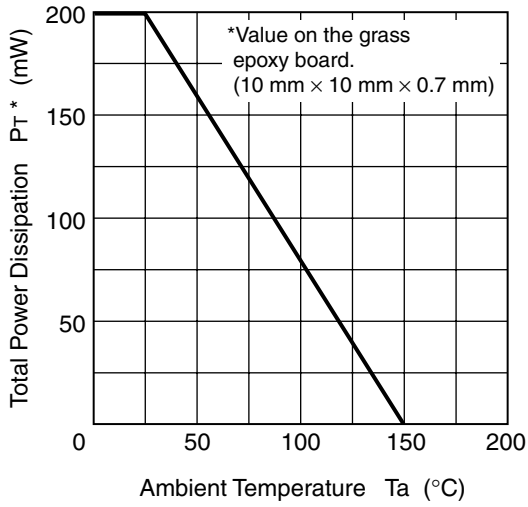
*Value on the glass epoxy board. (10 mm × 10 mm × 0.7 mm)

Electrical Characteristics

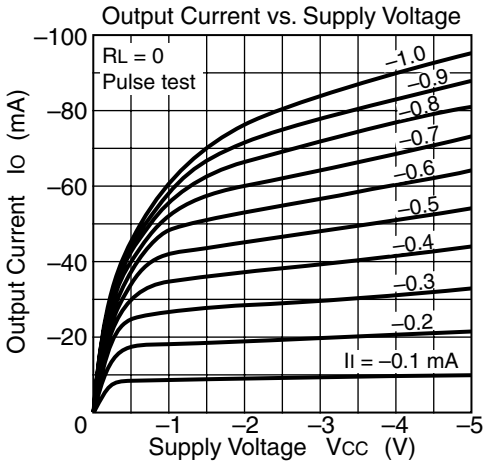
(Ta = 25°C)

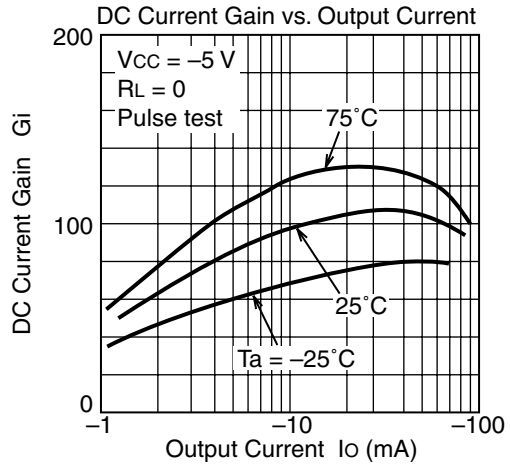
Item		Symbol	Min	Typ	Max	Unit	Test conditions
Input on voltage	BRA144EMP	$V_{I(on)}$	–1.5	—	–4.5	V	V_{CC} = –0.3 V, I_O = –5 mA
	BRA124EMP		–1.3	—	–3.0		
	BRA114EMP		–1.2	—	–2.4		
	BRA143EMP		–1.1	—	–2.0		
	BRA123EMP		–1.1	—	–1.8		
Input off voltage	BRA144EMP	$V_{I(off)}$	–1.0	—	–1.5	V	V_{CC} = –5 V, I_O = –100 µA
	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	µA	V_{CC} = –50 V, I_I = 0
DC current transfer ratio	BRA144EMP	Gi	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_1	33	47	61	kΩ	
	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		

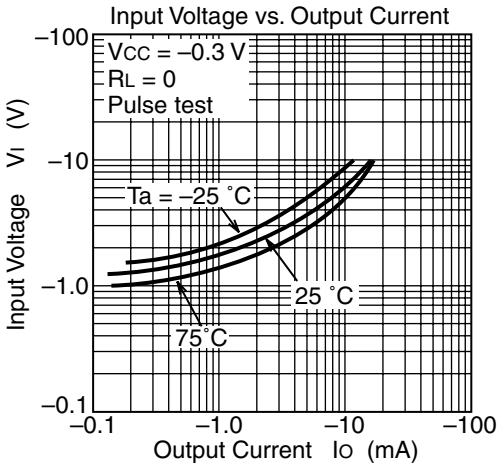
Total Power Dissipation Curve

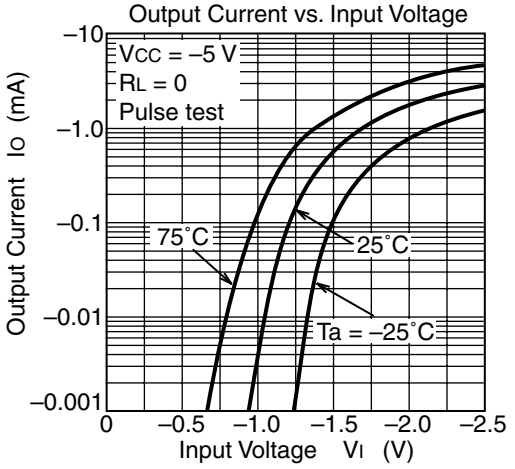


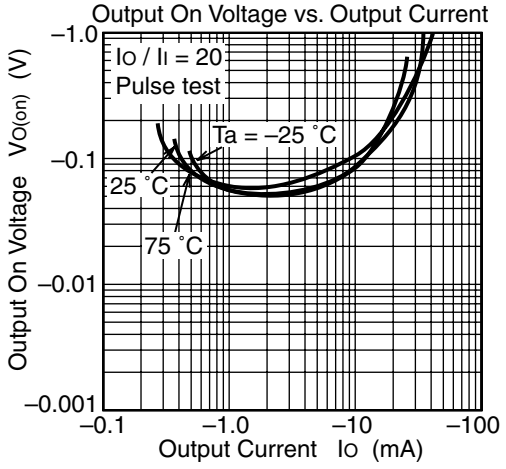
Main Characteristics (BRA144EMP)



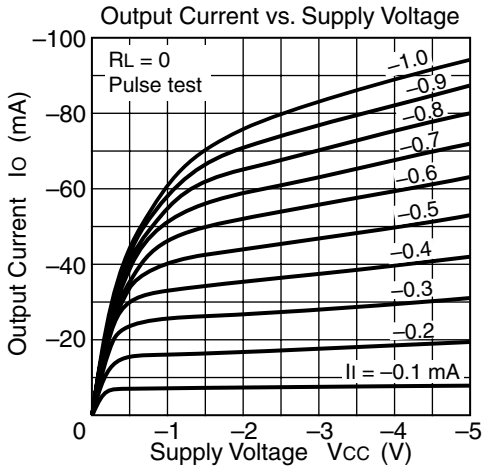


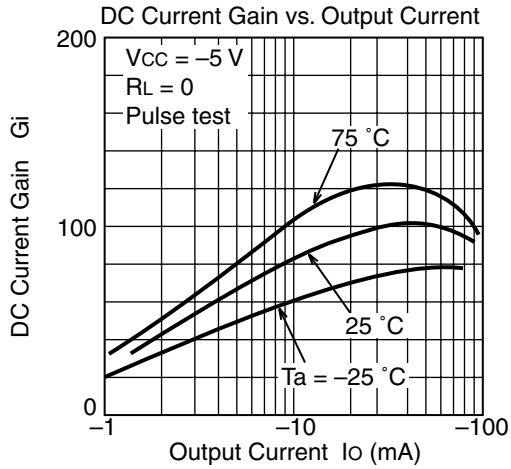


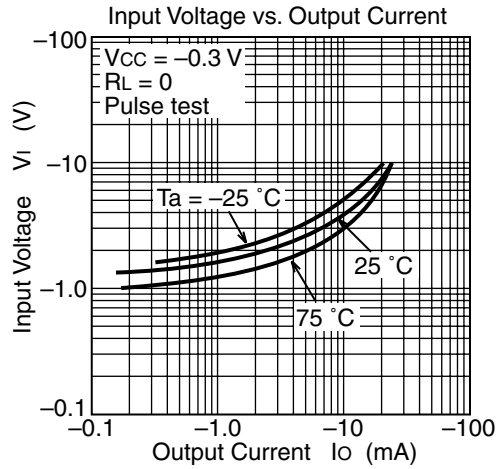


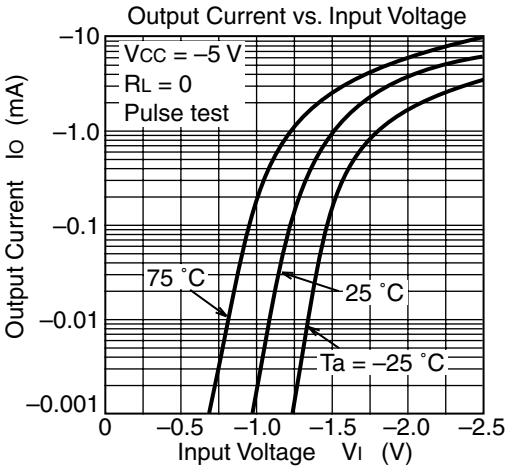


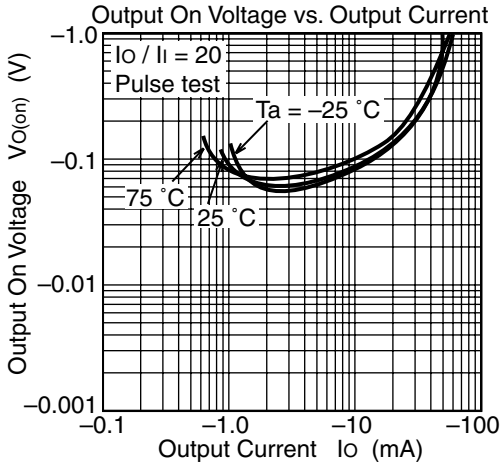
Main Characteristics (BRA124EMP)



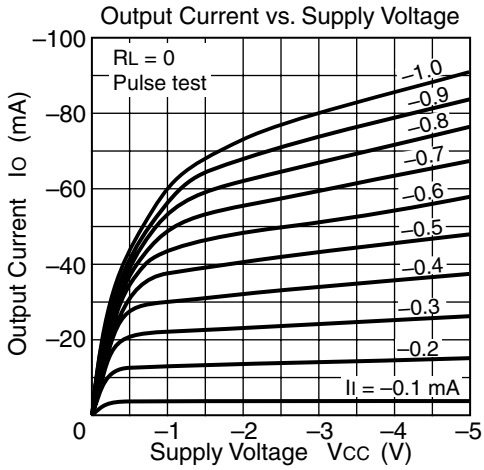


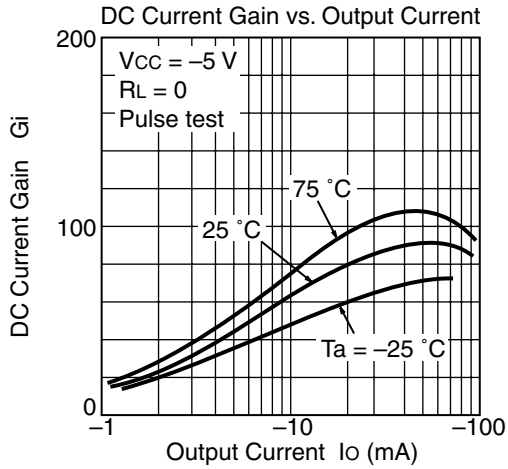


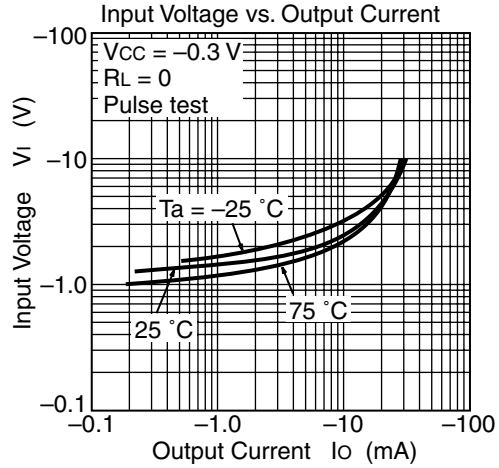


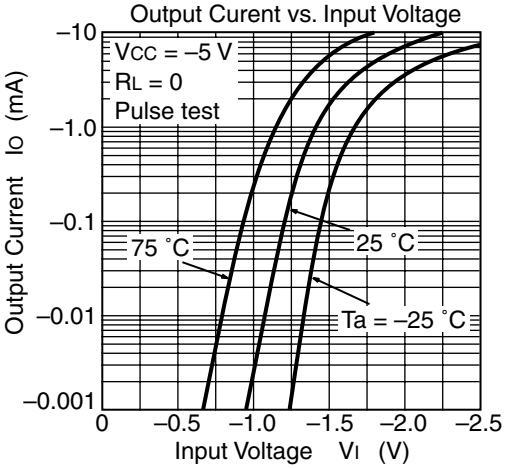


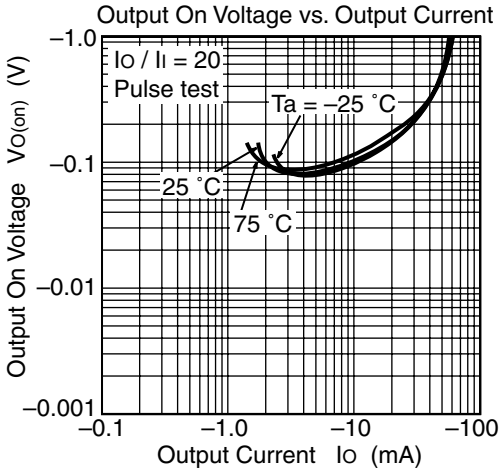
Main Characteristics (BRA114EMP)



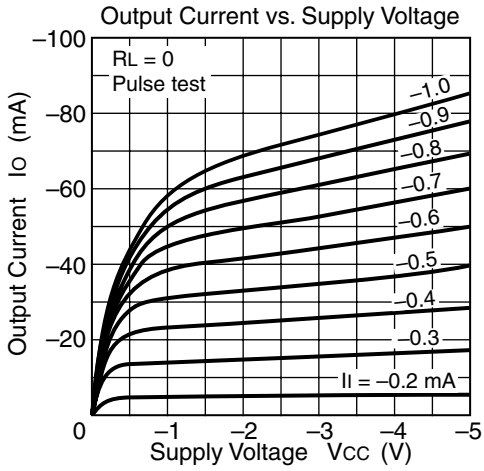


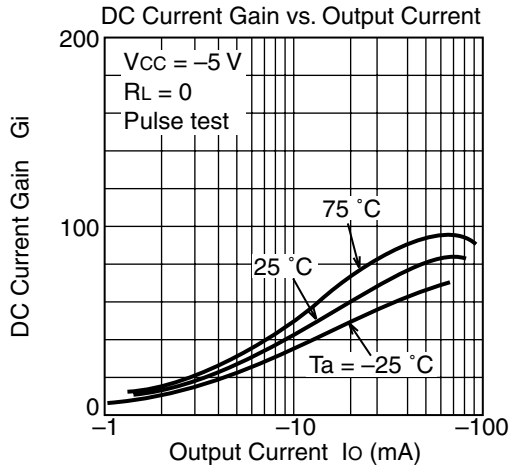


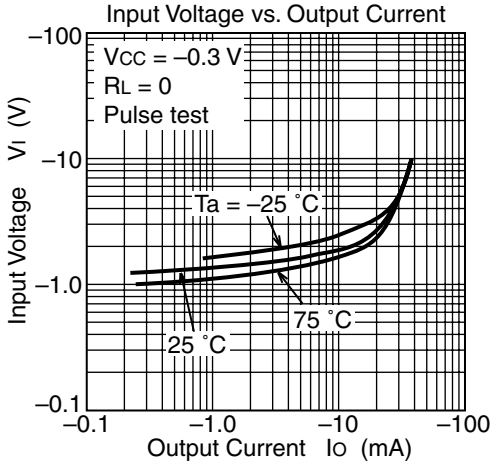


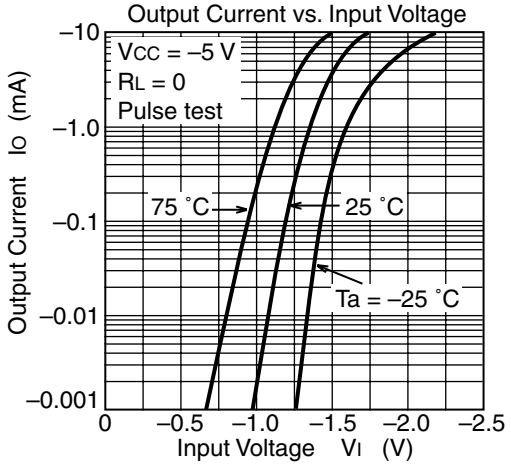


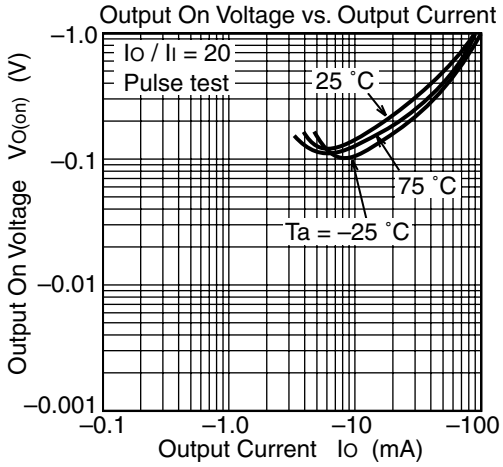
Main Characteristics (BRA143EMP)



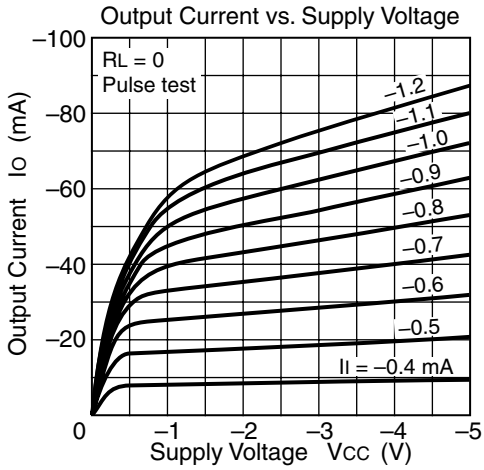


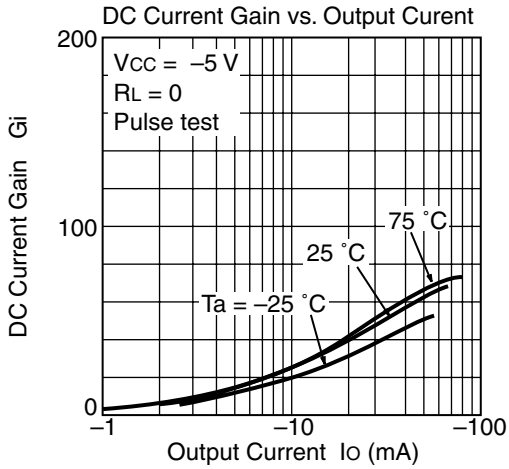


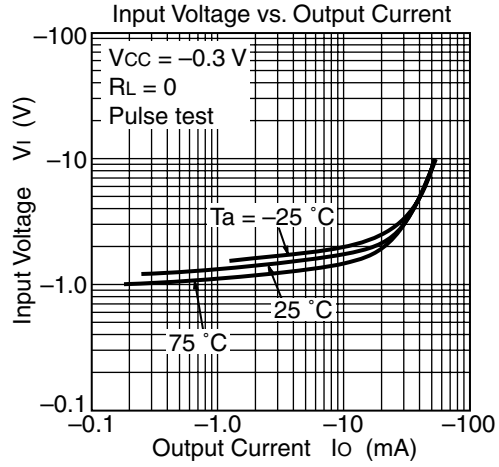


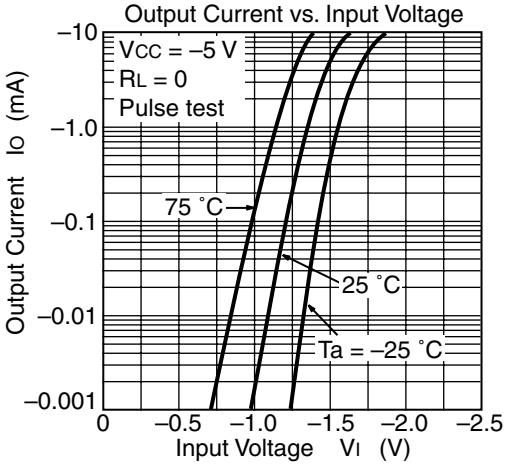


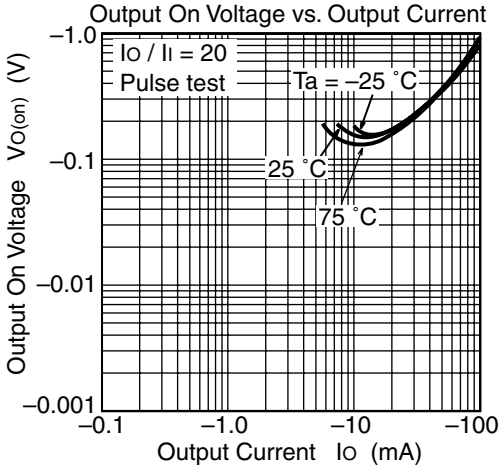
Main Characteristics (BRA123EMP)











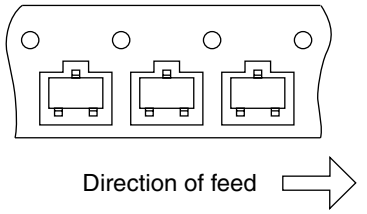
Taping Specification

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**

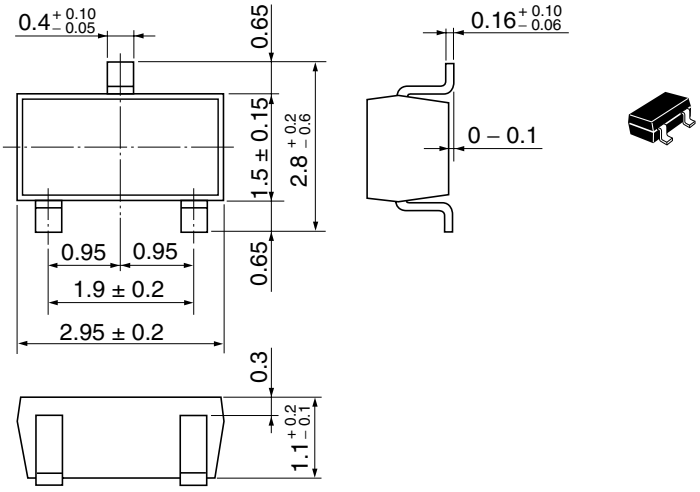


Marking face is up.
Center lead goes to left.

Direction of feed

Package Dimensions

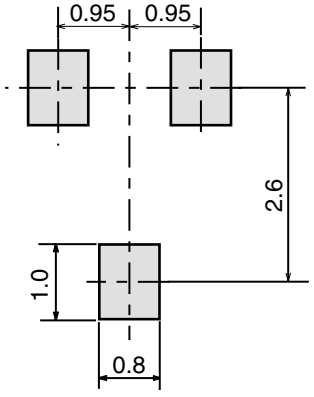
Unit: mm



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

Footprint

MPAK



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