

BRA144EMP Series

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

HITACHI

ADE-208-1442B (Z)

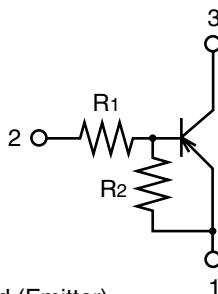
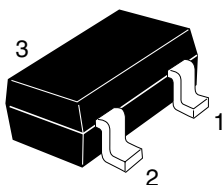
Rev.2
Sep. 2001

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 Ω) | R2 (k Ω) |
|-----------|---------|------------------|------------------|
| 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

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

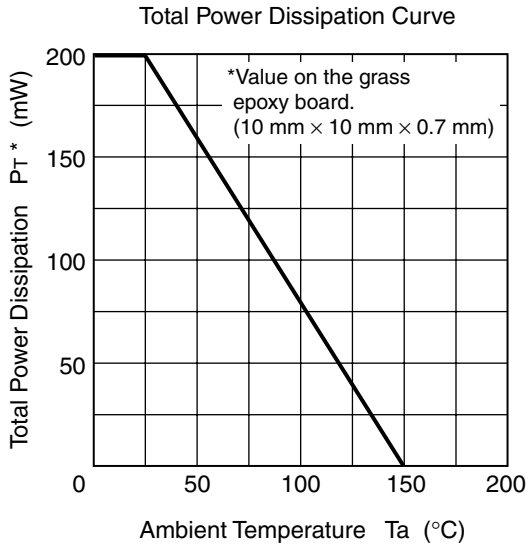
| Item | | Symbol | Ratings | Unit |
|-------------------------|-----------|-----------|-------------|------------------|
| Supply voltage | | V_{CC} | -50 | V |
| Input voltage | BRA144EMP | V_I | +10 to -50 | V |
| | BRA124EM | | +10 to -50 | |
| | BRA114EMP | | +10 to -35 | |
| | BRA143EMP | | +10 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)

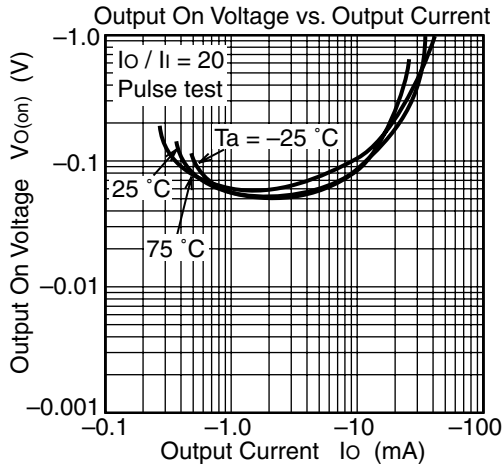
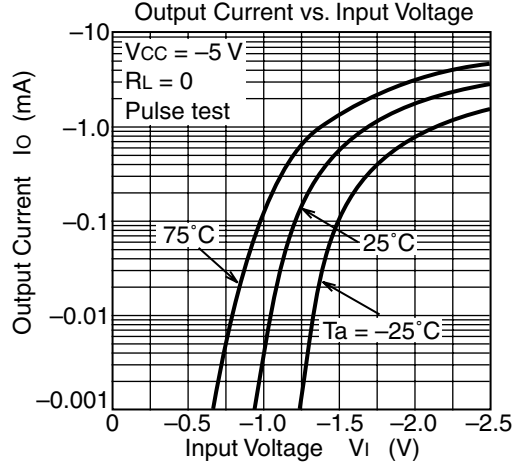
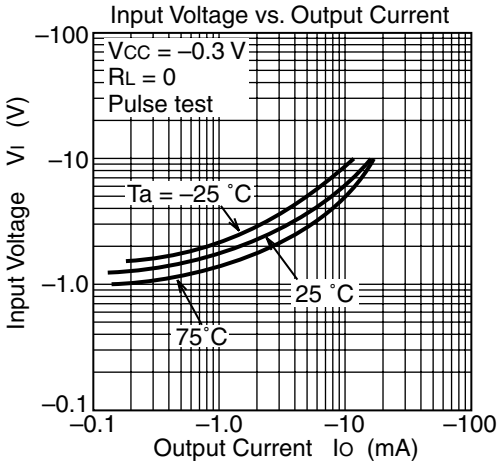
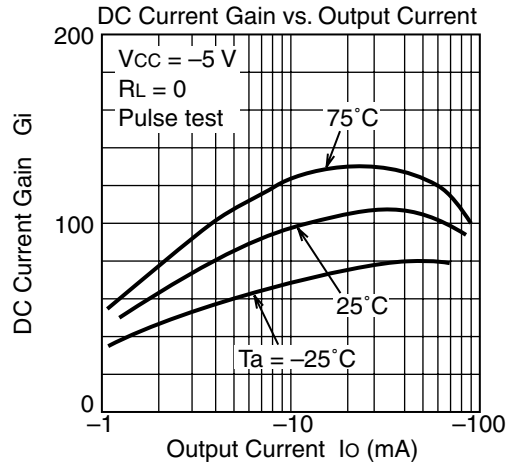
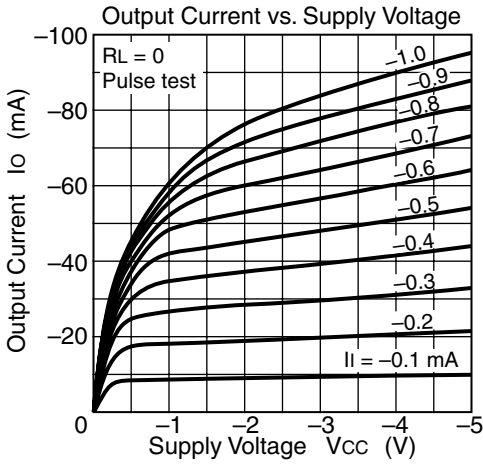
Electrical Characteristics

(Ta = 25°C)

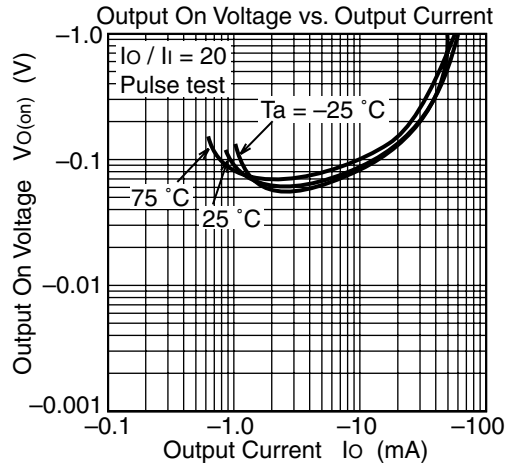
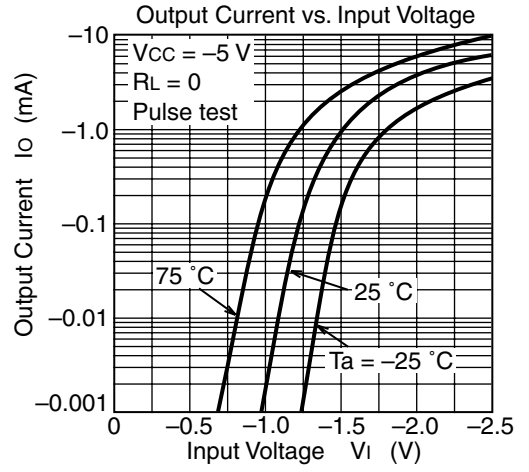
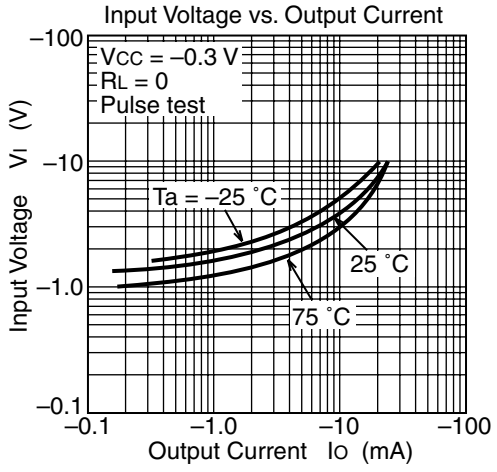
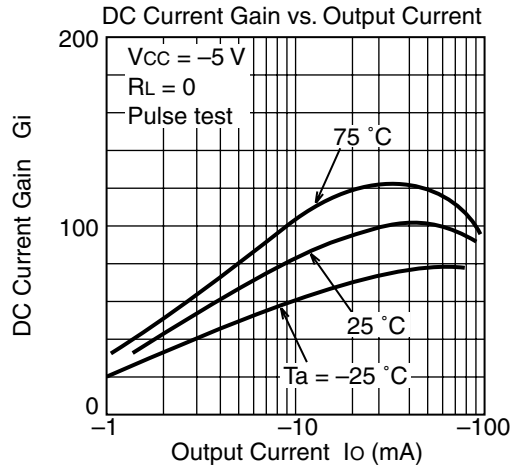
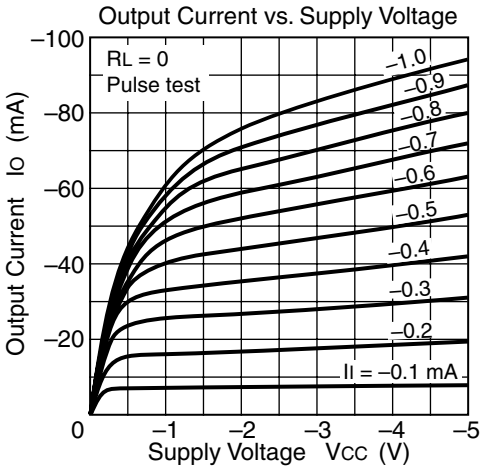
| Item | | Symbol | Min | Typ | Max | Unit | Test conditions | |
|---------------------------|-----------|--------------|------|-----|------|------------|--|-------------------------------|
| Input on voltage | BRA144EMP | $V_{I(on)}$ | -1.5 | — | -4.5 | V | $V_{cc} = -0.3 V,$ $I_o = -5 mA$ | |
| | BRA124EMP | | -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 | μA | $V_{cc} = -50 V, I_i = 0$ | |
| 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 Ω | | |
| | 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 | | | |



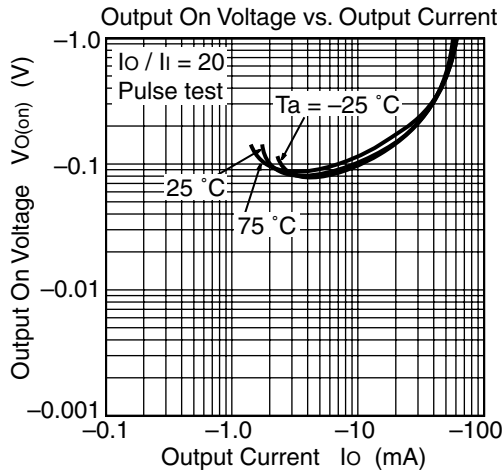
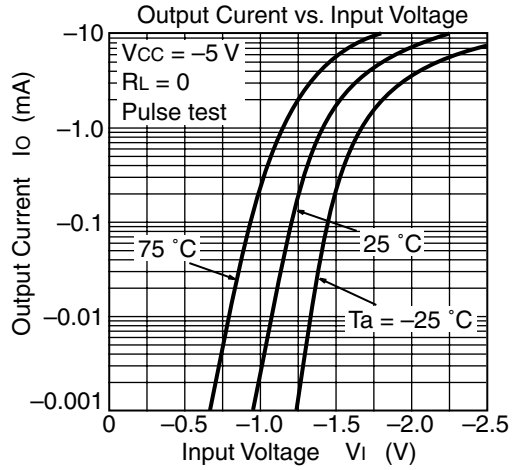
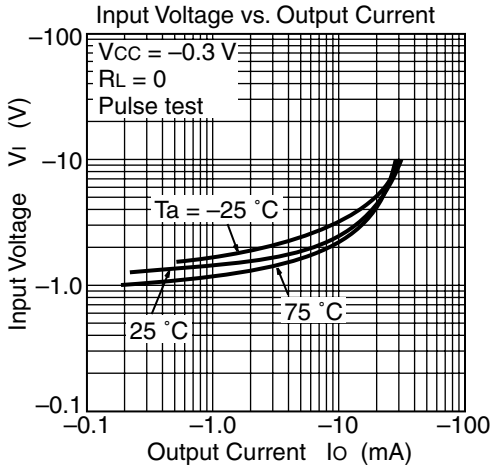
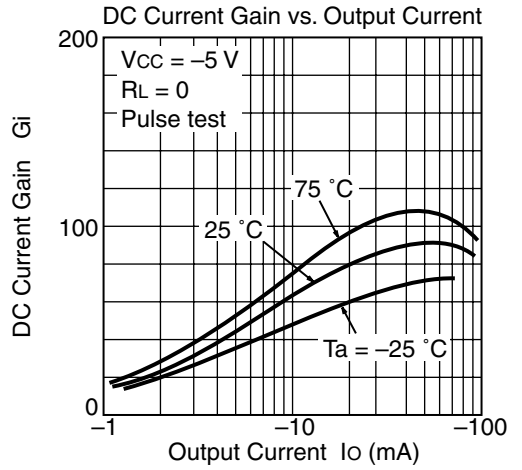
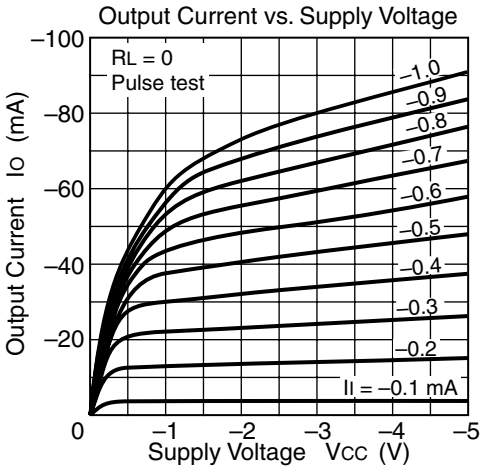
Main Characteristics (BRA144EMP)



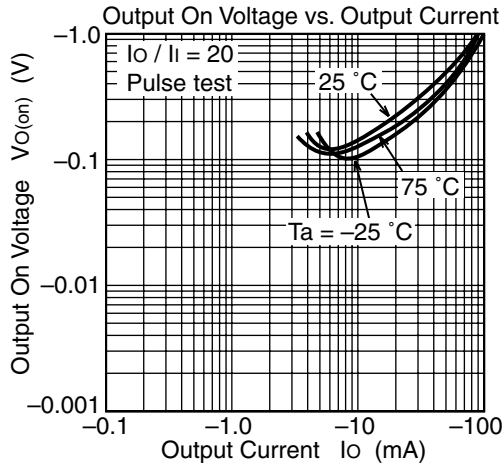
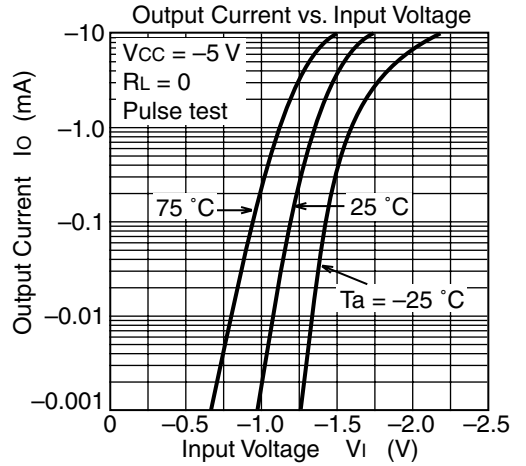
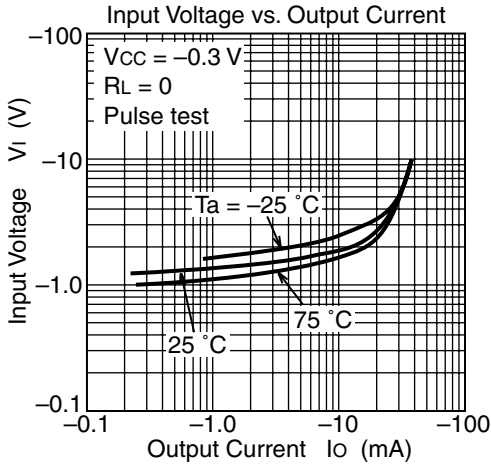
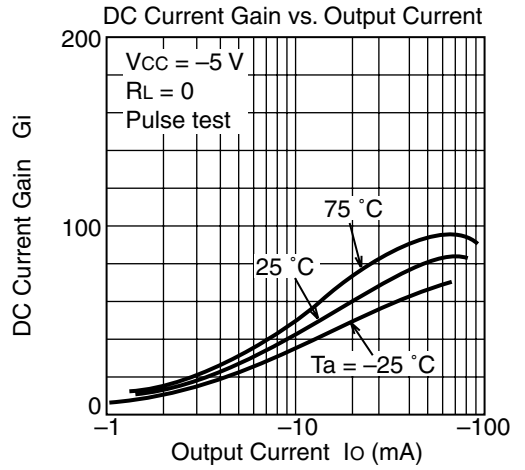
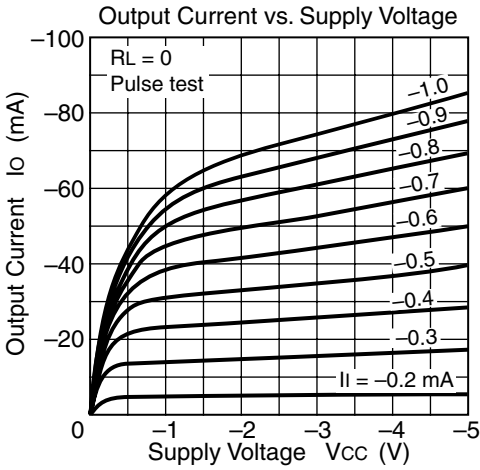
Main Characteristics (BRA124EMP)



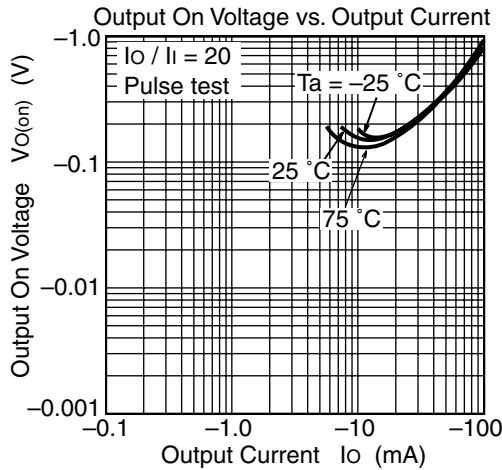
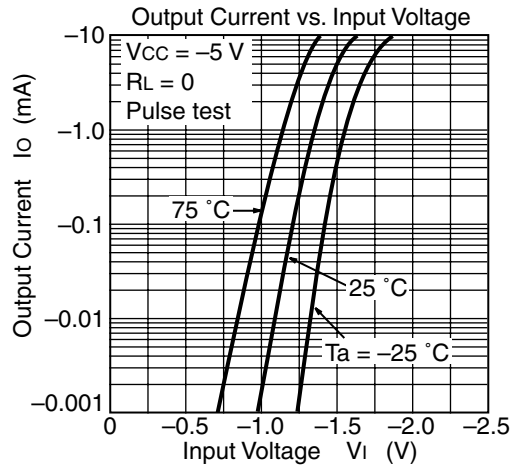
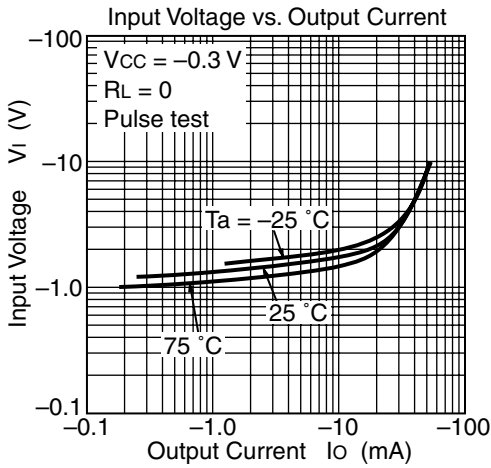
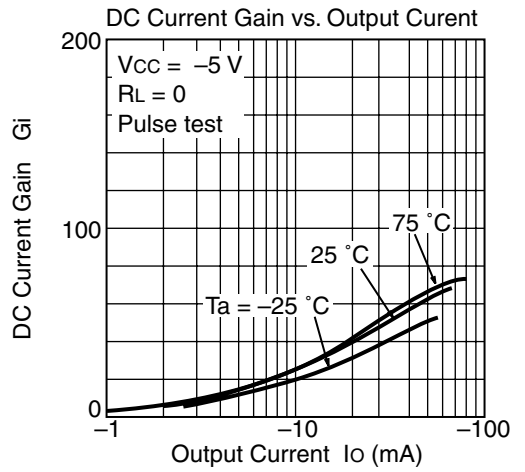
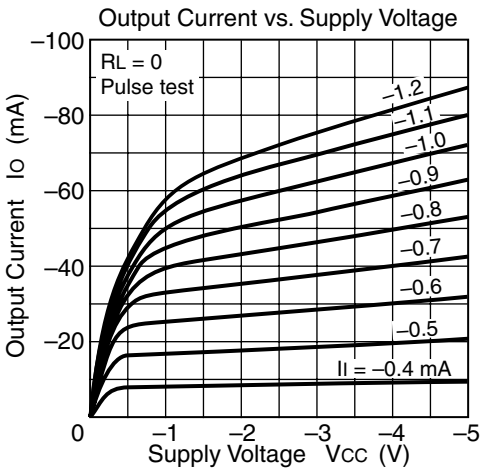
Main Characteristics (BRA114EMP)



Main Characteristics (BRA143EMP)



Main Characteristics (BRA123EMP)



Taping Specification

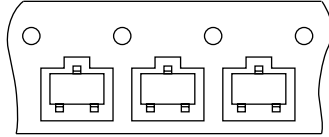
There are two different size reels in MPAK packaging.

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**

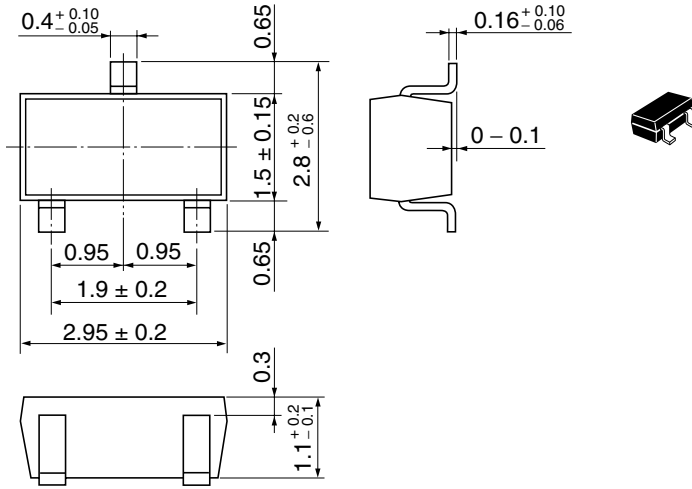


Marking face is up.
Center lead goes to left.

Direction of feed →

Package Dimensions

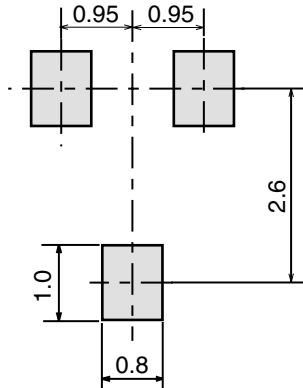
Unit: mm



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

Footprint

MPAK



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HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: (03) 3270-2111 Fax: (03) 3270-5109

URL <http://www.hitachisemiconductor.com/>

For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive
San Jose, CA 95134
Tel: <1> (408) 433-1990
Fax: <1>(408) 433-0223

Hitachi Europe Ltd.
Electronic Components Group
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 585200

Hitachi Europe GmbH
Electronic Components Group
Dornacher Straße 3
D-85622 Feldkirchen
Postfach 201, D-85619 Feldkirchen
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Asia Ltd.
Hitachi Tower
16 Collyer Quay #20-00
Singapore 049318
Tel : <65>-538-6533/538-8577
Fax : <65>-538-6933/538-3877
URL : <http://semiconductor.hitachi.com.sg>

Hitachi Asia Ltd.
(Taipei Branch Office)
4/F, No. 167, Tun Hwa North Road
Hung-Kuo Building
Taipei (105), Taiwan
Tel : <886>-(2)-2718-3666
Fax : <886>-(2)-2718-8180
Telex : 23222 HAS-TP
URL : <http://www.hitachi.com.tw>

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower
World Finance Centre,
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon Hong Kong
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