

BRA144ETP Series

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

HITACHI

ADE-208-1446B (Z)

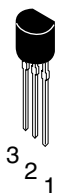
Rev.2
Sep. 2001

Features

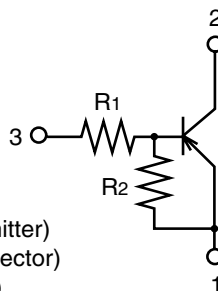
- Built-in Resistor Type
- Simplifies Circuit Design
- Reduces Board Space
- Complementary pair with BRC144ETP series

Outline

TO-92



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



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 |

BRA144ETP Series

Absolute Maximum Ratings

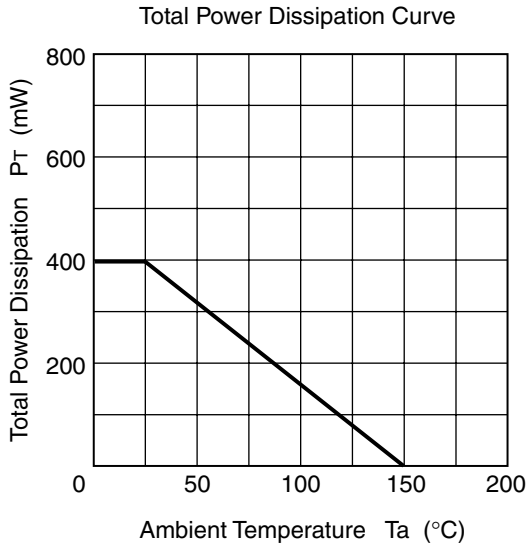
($T_a = 25^\circ\text{C}$)

| Item | | Symbol | Ratings | Unit |
|-------------------------|-----------|----------|-------------|------------------|
| Supply voltage | | V_{CC} | -50 | V |
| Input voltage | BRA144ETP | V_I | +10 to -50 | V |
| | BRA124ETP | | +10 to -50 | |
| | BRA114ETP | | +10 to -50 | |
| | BRA143ETP | | +10 to -35 | |
| | BRA123ETP | | +10 to -24 | |
| Output current | | I_o | -100 | mA |
| Total power dissipation | | P_T | 400 | mW |
| Storage temperature | | Tstg | -55 to +150 | $^\circ\text{C}$ |

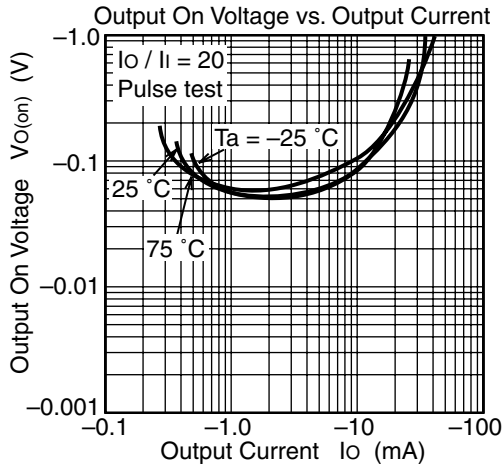
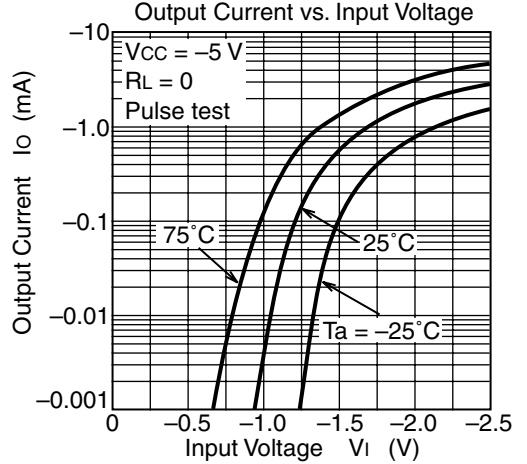
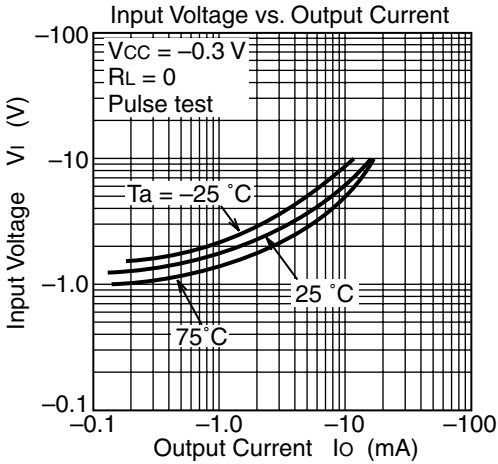
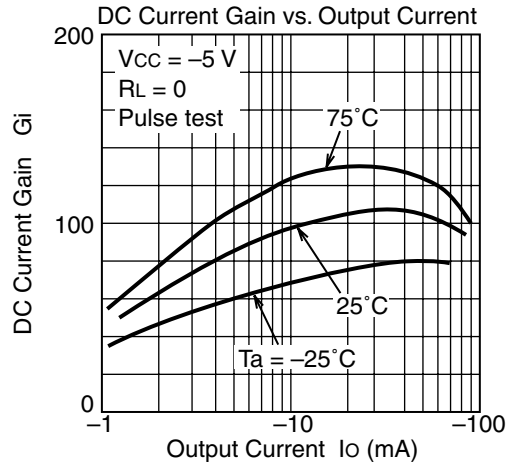
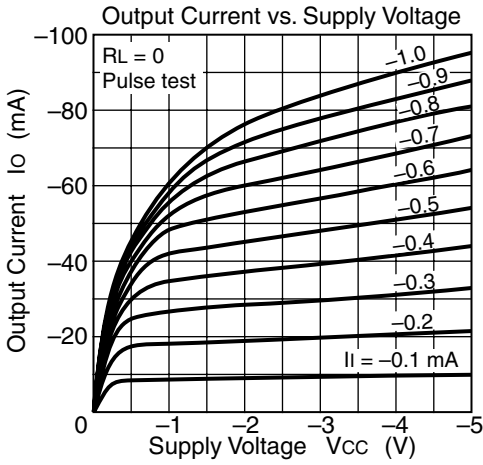
Electrical Characteristics

(Ta = 25°C)

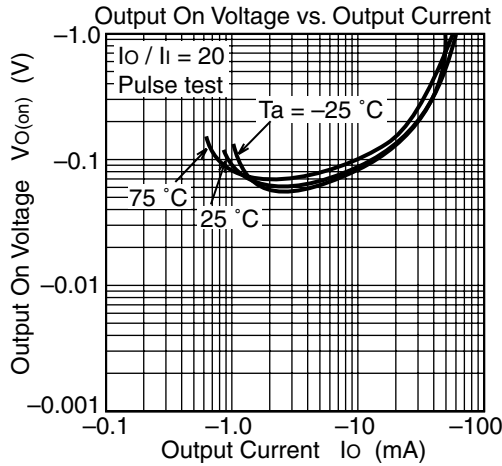
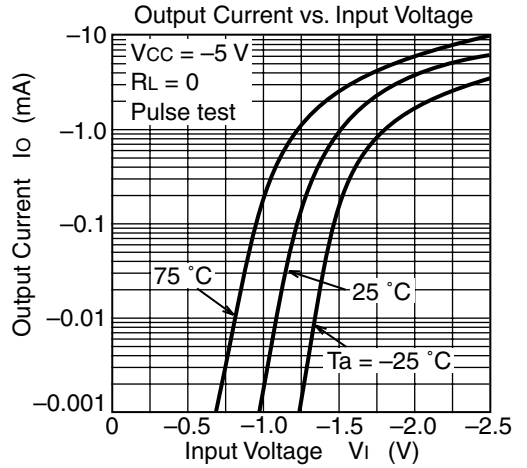
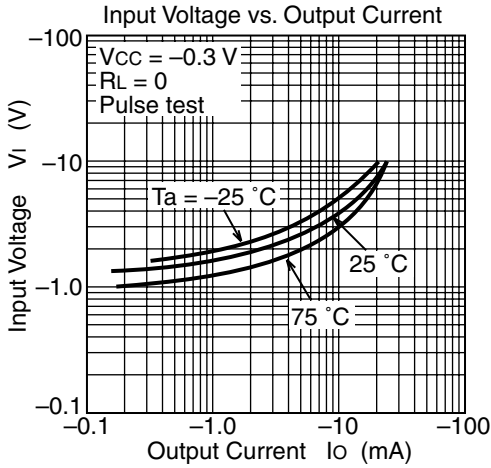
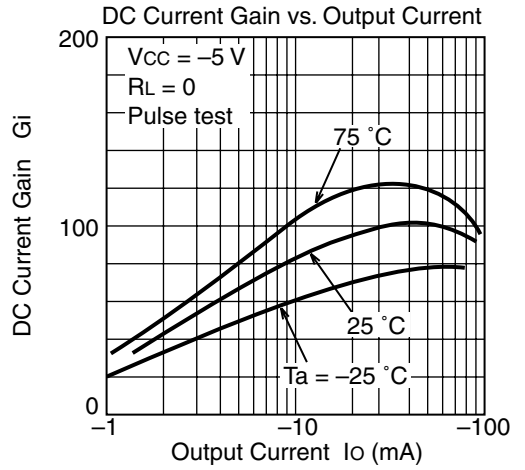
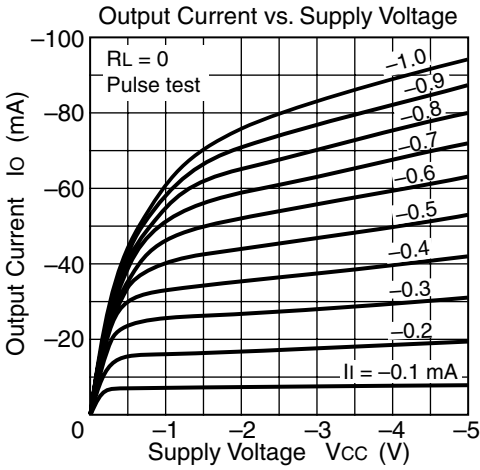
| Item | | Symbol | Min | Typ | Max | Unit | Test conditions | |
|---------------------------|-----------|--------------|------|-----|------|------------|--|-------------------------------|
| Input on voltage | BRA144ETP | $V_{I(on)}$ | -1.5 | — | -4.5 | V | $V_{cc} = -0.3 V,$ $I_o = -5 mA$ | |
| | BRA124ETP | | -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 | $V_{cc} = -5 V,$ $I_o = -100 \mu A$ | |
| | 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 | $I_o = -10 mA,$ $I_i = -0.5 mA$ | |
| Output cutoff current | | $I_{O(off)}$ | — | — | -0.5 | μA | $V_{cc} = -50 V, I_i = 0$ | |
| DC current transfer ratio | BRA144ETP | G_i | 70 | — | — | | $V_{cc} = -5 V, I_o = -5 mA$ | |
| | BRA124ETP | | 56 | — | — | | | |
| | BRA114ETP | | 30 | — | — | | | |
| | BRA143ETP | | 20 | — | — | | | $V_{cc} = -5 V, I_o = -10 mA$ |
| | BRA123ETP | | 20 | — | — | | | $V_{cc} = -5 V, I_o = -20 mA$ |
| 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_1/R_2 | 0.8 | 1.0 | 1.2 | | | |



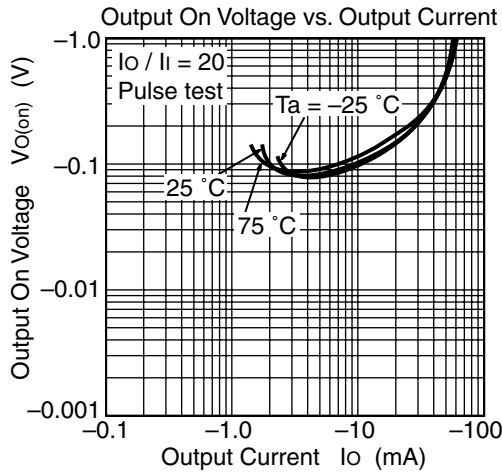
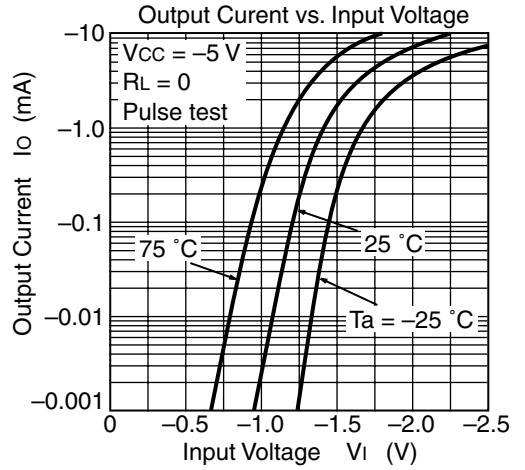
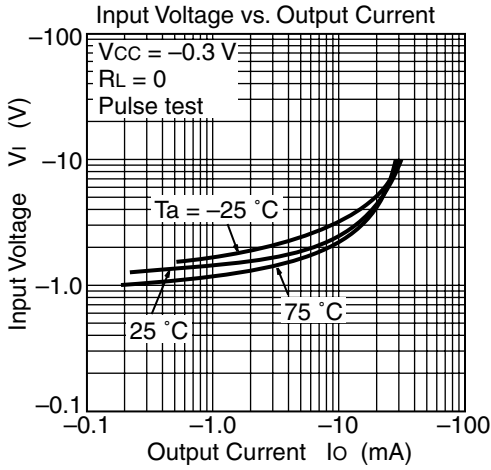
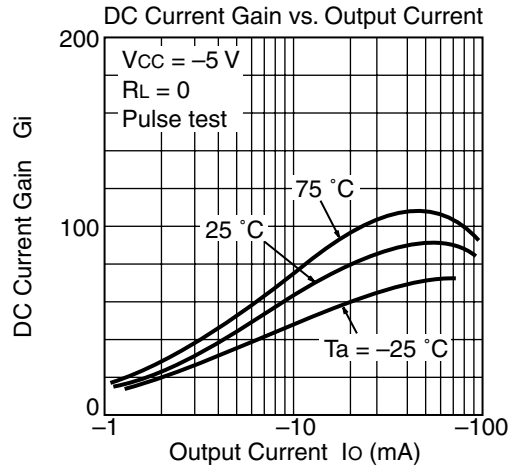
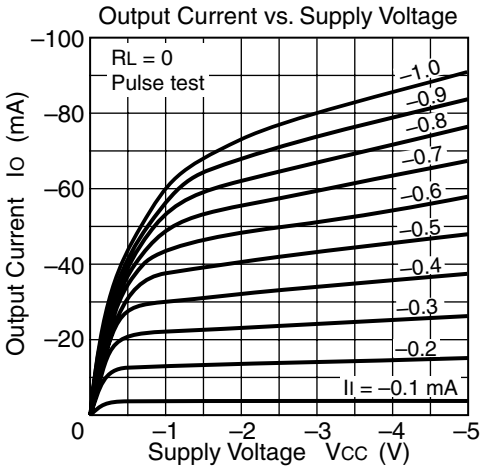
Main Characteristics (BRA144ETP)



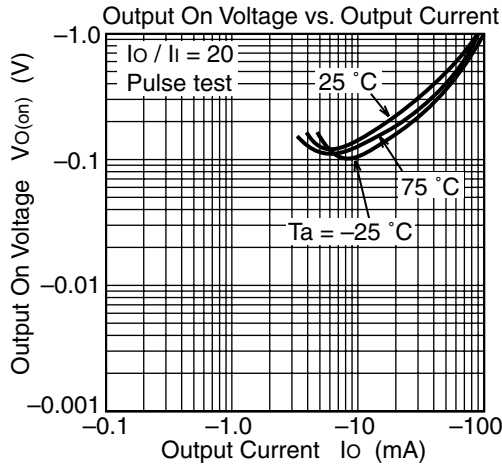
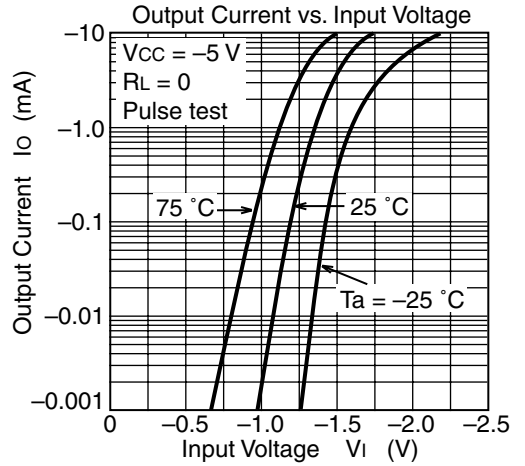
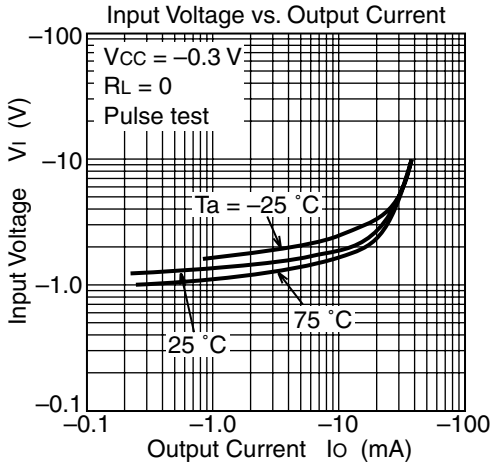
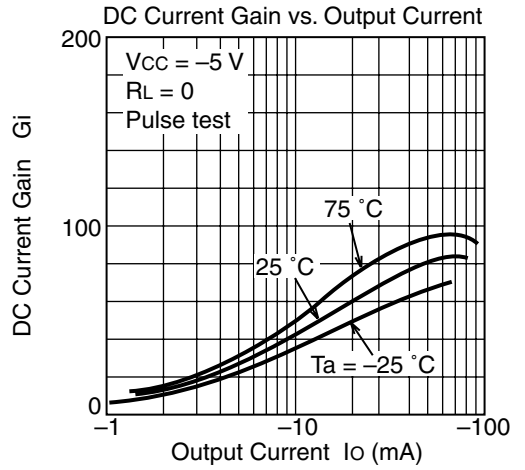
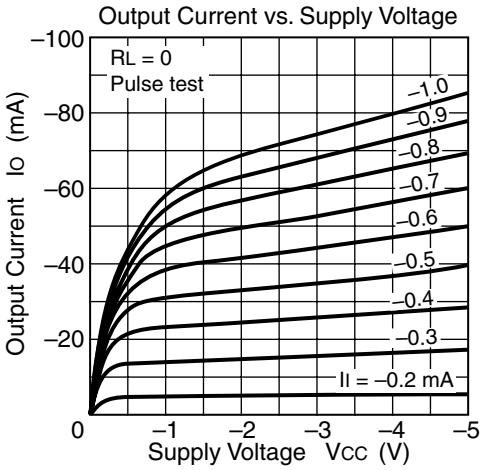
Main Characteristics (BRA124ETP)



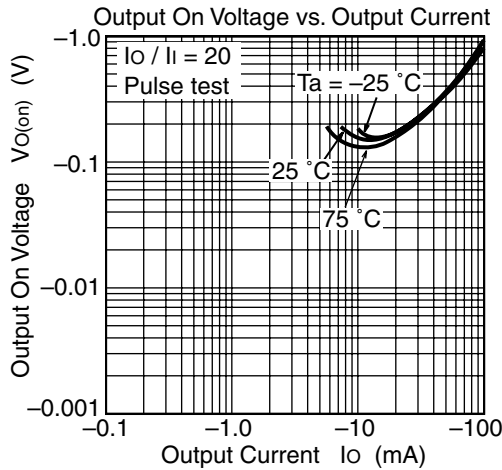
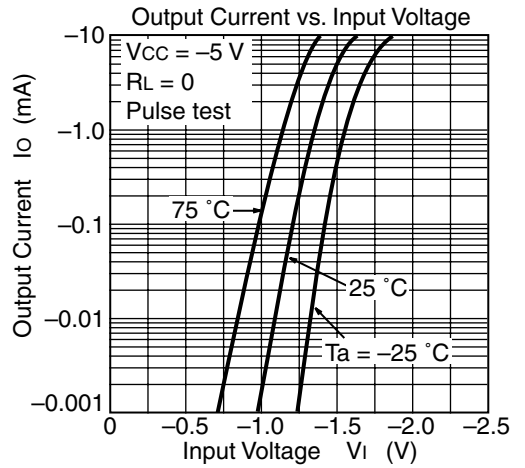
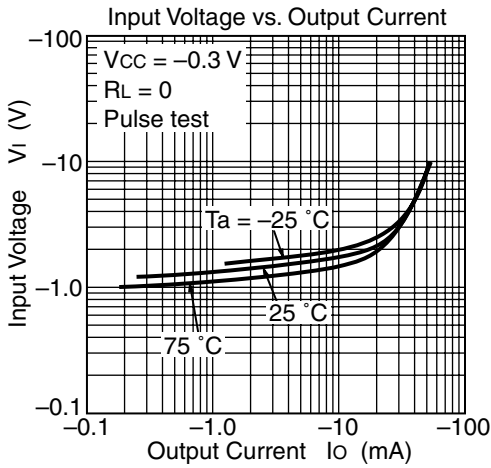
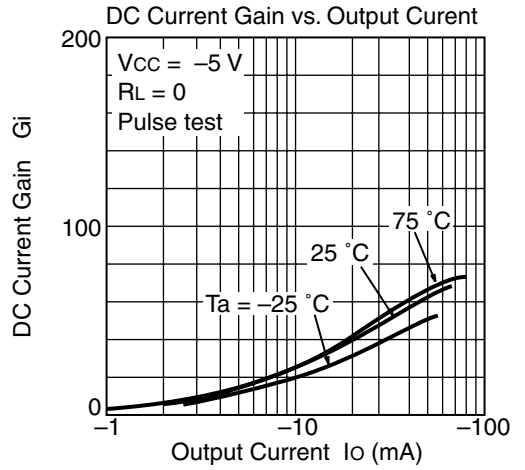
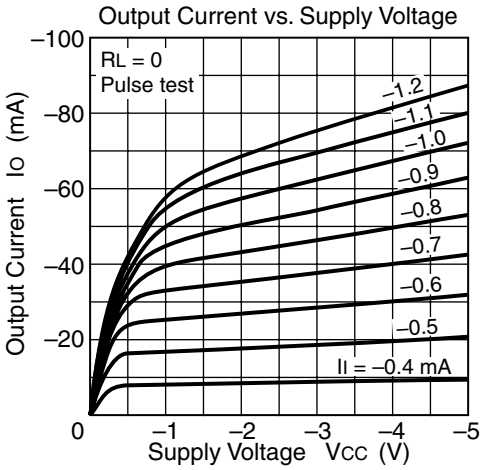
Main Characteristics (BRA114ETP)



Main Characteristics (BRA143ETP)



Main Characteristics (BRA123ETP)

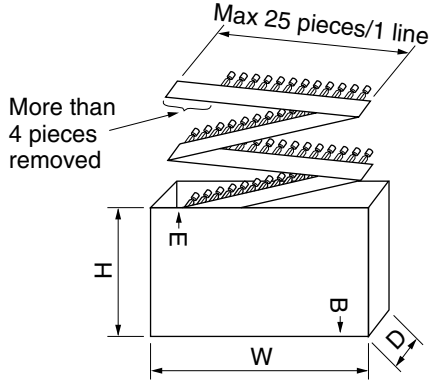


Taping Specification

Purchasing Identification Code: Type No. + Grade + TZ

The tape is held in every 25 pitches to a hold box.

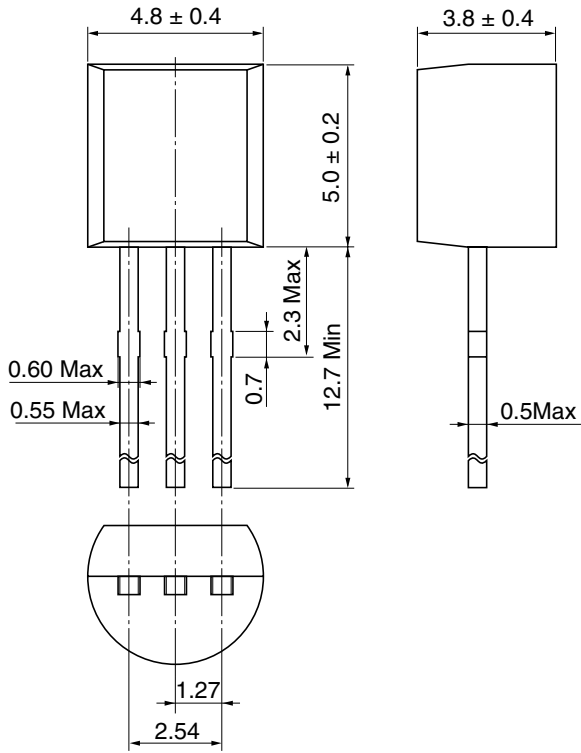
Packing quantity is 2500 pieces.



| W | H | D | Unit: mm |
|-----|-----|----|----------|
| 336 | 262 | 47 | |

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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