

2SD1225M 2SD1858

エピタキシャルプレーナ形 NPN シリコントランジスタ
中電力増幅用/Medium Power Amp.
Epitaxial Planar NPN Silicon Transistors

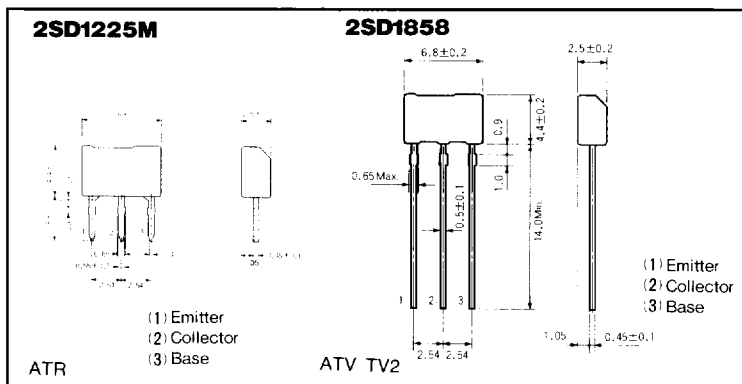
● 特長

- 1) $P_C=1W$ と大きい。
- 2) $V_{CE(sat)}=150mV$ (at 500mA) と低い。
- 3) 2SB909M/2SB1237とコンプリ。

● Features

- 1) Large power in a compact ATR package: $P_C=1W$
- 2) Low saturation voltage:
 $V_{CE(sat)}=150mV$ (at 500mA)
- 3) Complementary pair with 2SB909M, 2SB1237.

● 外形寸法図/Dimensions (Unit : mm)



注：ATVの外形仕様については、TV3/4/6タイプも用意しています (p.38参照)。

● 絶対最大定格/Absolute Maximum Ratings ($T_a=25^\circ C$)

| Parameter | Symbol | Limits | Unit |
|--------------|-----------|---------|------------|
| コレクタ・ベース間電圧 | V_{CBO} | 40 | V |
| コレクタ・エミッタ間電圧 | V_{CEO} | 32 | V |
| エミッタ・ベース間電圧 | V_{EBO} | 5 | V |
| コレクタ電流 | I_C | 1 | A |
| コレクタ損失 | P_C | 1 | W* |
| 接合部温度 | T_j | 150 | $^\circ C$ |
| 保存温度範囲 | T_{stg} | -55~150 | $^\circ C$ |

* プリント基板：
コレクタ部分の銅箔面積 $1cm^2$ 以上、
厚み1.7mm

● 電気的特性/Electrical Characteristics ($T_a=25^\circ C$)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---------------|---------------|------|------|------|---------|------------------------------|
| コレクタ・エミッタ降伏電圧 | BV_{CEO} | 32 | — | — | V | $I_C=1mA$ |
| コレクタ・ベース降伏電圧 | BV_{CBO} | 40 | — | — | V | $I_C=50\mu A$ |
| エミッタ・ベース降伏電圧 | BV_{EBO} | 5 | — | — | V | $I_E=50\mu A$ |
| コレクタシャ断電流 | I_{CBO} | — | — | 0.5 | μA | $V_{CB}=20V$ |
| エミッタシャ断電流 | I_{EBO} | — | — | 0.5 | μA | $V_{EB}=4V$ |
| コレクタ・エミッタ飽和電圧 | $V_{CE(sat)}$ | — | — | 0.4 | V | $I_C/I_B=500mA/50mA$ |
| 直流電流増幅率 | h_{FE} | 82 | — | 390 | — | $V_{CE}/I_C=3V/100mA$ |
| 利得帯域幅積 | f_T | 50 | 150 | — | MHz | $V_{CE}=5V, I_E=-50mA$ |
| 出力容量 | C_{ob} | — | 15 | 30 | pF | $V_{CB}=10V, I_E=0A, f=1MHz$ |

h_{FE} の値により下表のように分類します。

| Item | P | Q | R |
|----------|--------|---------|---------|
| h_{FE} | 82~180 | 120~270 | 180~390 |

● 標準品・準標準品一覧表

(◎)：標準品 (○)：準標準品

| Type | h_{FE} | 包装名 記号 基本発注単位(個) | バルク | コンテナ | テーピング | |
|----------|----------|------------------------|-------|-------|-------|-------|
| | | | 1 000 | 4 000 | 2 500 | 2 500 |
| 2SD1225M | PQR | | ◎ | ○ | — | — |
| 2SD1858 | PQR | | — | — | ◎ | ○ |

トランジスタ

2SDタイプ

● 電気的特性曲線/Electrical Characteristic Curves

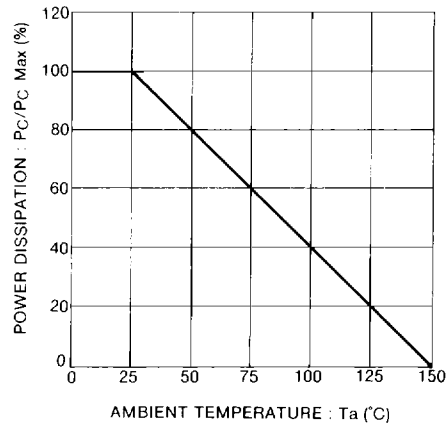


Fig.1 電力軽減曲線

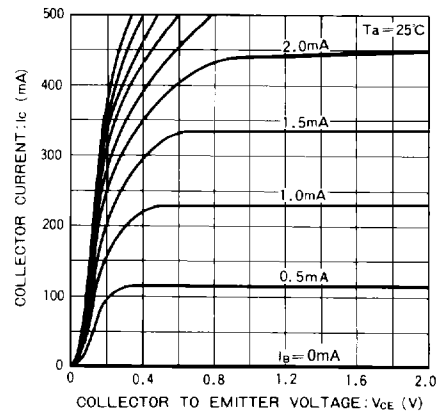


Fig.2 エミッタ接地出力静特性

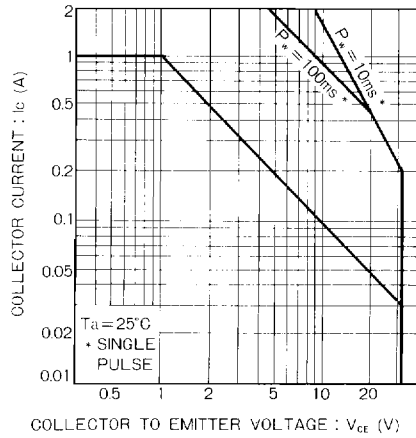


Fig.3 安全動作領域

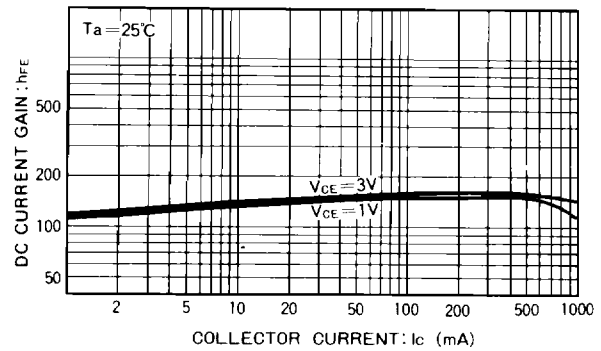


Fig.4 直流電流増幅率—コレクタ電流特性

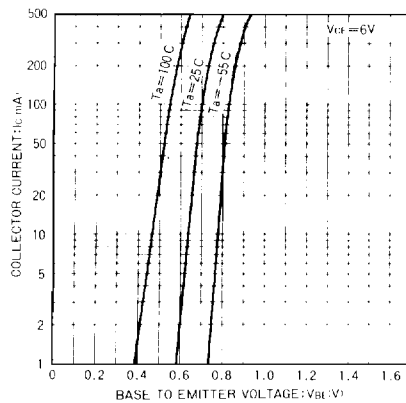


Fig.5 エミッタ接地伝達静特性

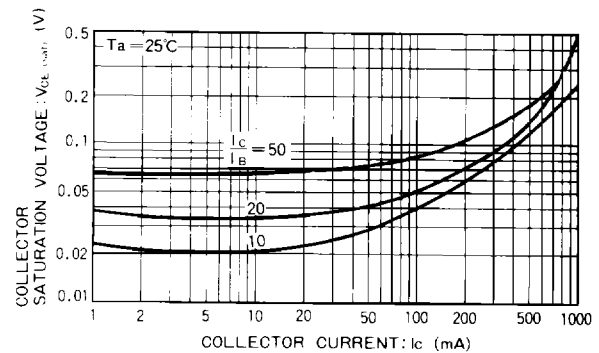


Fig.6 コレクタ・エミッタ飽和電圧—コレクタ電流特性

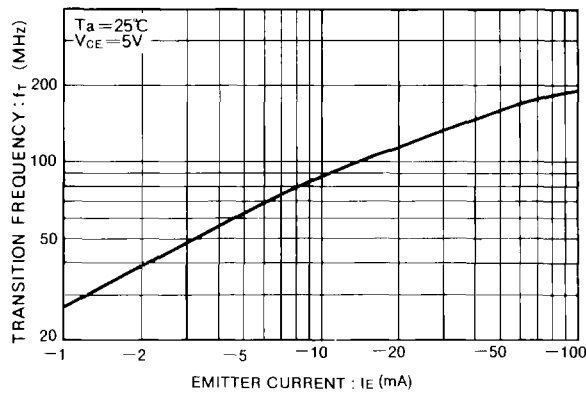


Fig.7 利得帯域幅積—エミッタ電流特性

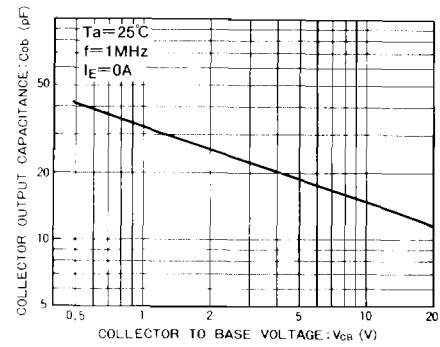


Fig.8 コレクタ出力容量—コレクタ—ベース電圧特性

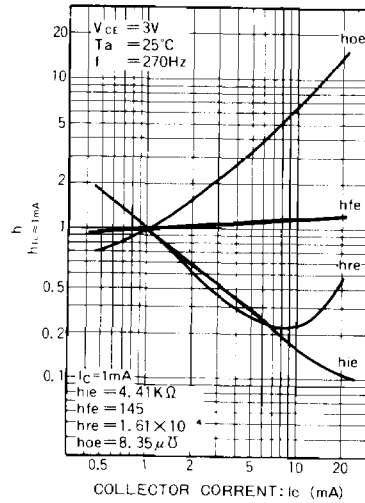


Fig.9 h定数—コレクタ電流特性

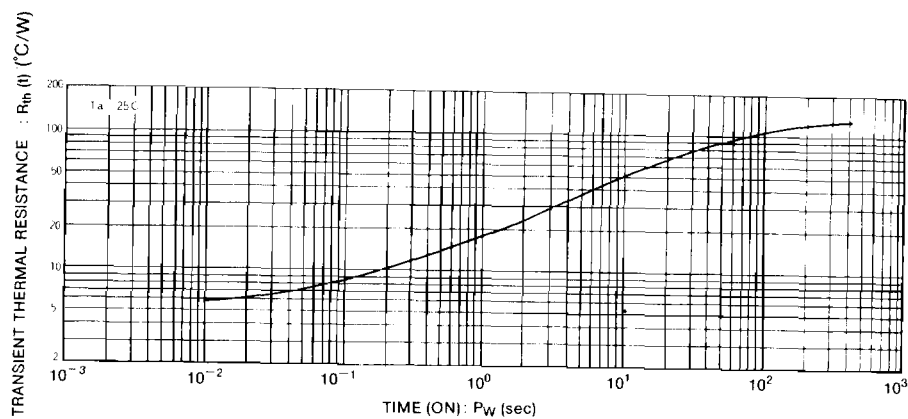


Fig.10 過渡熱抵抗

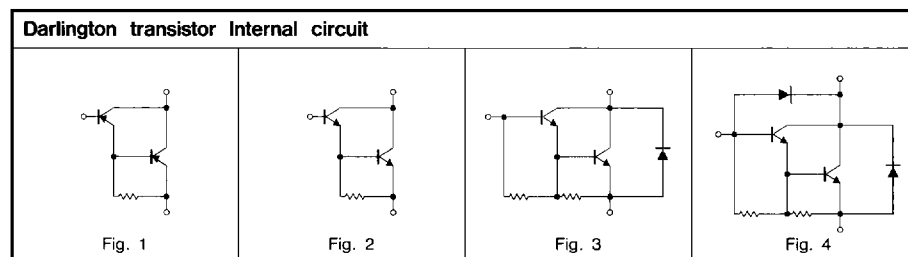
Transistors

ATR • ATV

Approximately the same size as the TO-92 with up to 1 W power capability.
Taped type for automated placement or bulk packaging available.

| Application | Package | | V _{CEO} (V) *V _{CES} **V _{CER} | I _c (A) | I _c Max. (A) | P _c (mW) (T _a = 25°C) | h _{FE} | Internal circuit | | |
|--------------------------|---------------|----------|--|--------------------|-------------------------|--|-----------------|---------------------|---------------------|--------|
| | ATR | ATV | | | | | | V _{CE} (V) | I _c (mA) | |
| | Part No. | | | | | | | | | |
| Low Noise | 2SA937AMLN | — | -50 | -0.15 | — | 300 | 180~560 | -6 | -1 | — |
| | 2SC2021MLN | — | 40 | 0.15 | — | 300 | 390~820 | 6 | 1 | — |
| | — | — | 50 | 0.15 | — | 300 | 180~560 | 6 | 1 | — |
| Pre Amp | 2SA937AM | 2SA1547A | -50 | -0.15 | — | 300 | 82~390 | -6 | -1 | — |
| | 2SC2021M | 2SC4010 | 40 | 0.15 | — | 300 | 390~820 | 6 | 1 | — |
| | — | — | 50 | 0.15 | — | 300 | 120~560 | 6 | 1 | — |
| Driver | 2SC4776M | 2SC4778 | 25 | 0.1 | 0.2 | 400 | 180~560 | 6 | 1 | — |
| | 2SA874M | 2SA1548 | -32 | -0.5 | — | 300 | 82~390 | -3 | -100 | — |
| | 2SB909M | 2SB1237 | -32 | -1 | — | 1000* | 82~390 | -3 | -100 | — |
| | 2SB910M | 2SB1238 | -80 | -0.7 | — | 1000* | 82~390 | -3 | -100 | — |
| | 2SB911M | 2SB1240 | -32 | -2 | -3 | 1000* | 82~390 | -3 | -500 | — |
| | 2SB1042M | 2SB1241 | -80 | -1 | — | 1000* | 82~390 | -3 | -100 | — |
| | 2SB1044M | 2SB1242 | -50 | -1 | — | 1000* | 82~390 | -3 | -100 | — |
| | 2SB1066M | 2SB1243 | -50 | -3 | — | 1000* | 56~390 | -3 | -500 | — |
| | 2SB1130AM | 2SB1236A | -160 | -1.5 | -3 | 1000* | 56~270 | -5 | -100 | — |
| | 2SB1130M | 2SB1236 | -120 | -1.5 | -3 | 1000* | 56~390 | -5 | -100 | — |
| | 2SC1652M | 2SC4016 | 32 | 0.5 | — | 400 | 82~390 | 3 | 100 | — |
| | 2SD1225M | 2SD1858 | 32 | 1 | — | 1000* | 82~390 | 3 | 100 | — |
| | 2SD1226M | 2SD1859 | 80 | 0.7 | — | 1000* | 82~390 | 3 | 100 | — |
| | 2SD1227M | 2SD1862 | 32 | 2 | 2.5 | 1000* | 82~390 | 3 | 500 | — |
| | 2SD1228M | 2SD1860 | 50 | 0.5 | — | 600 | 82~390 | 3 | 100 | — |
| | 2SD1293M | 2SD1863 | 80 | 1 | 2 | 1000* | 82~390 | 3 | 500 | — |
| | 2SD1507M | 2SD1864 | 50 | 3 | — | 1000* | 82~390 | 3 | 500 | — |
| | 2SD1665AM | 2SD1857A | 160 | 1.5 | 3 | 1000* | 56~270 | 5 | 100 | — |
| | 2SD1665M | 2SD1857 | 120 | 1.5 | 3 | 1000* | 56~390 | 5 | 100 | — |
| | Storobo Flash | 2SB1307M | 2SB1326 | -20 | -5 | -10 | 1000* | 82~390 | -2 | -500 |
| Low V _{CE(sat)} | 2SD1962M | 2SD2097 | 20 | 5 | 10 | 1000* | 120~560 | 2 | 500 | — |
| Low V _{CE(sat)} | 2SB1485M | 2SB1443 | -50 | -2 | -5 | 1000* | 82~270 | -2 | -500 | — |
| | 2SD1469M | 2SD1865 | 15 | 1 | — | 600 | 120~560 | 3 | 100 | — |
| | — | 2SD2264 | 20 | 3 | 5 | 1000* | 120~560 | 2 | 100 | — |
| — | 2SD2197M | 2SD2279 | 50 | 2 | 5 | 1000* | 82~270 | 2 | 500 | — |
| Chroma | 2SC3270M | 2SC4015 | 300 | 0.1 | — | 1000* | 39~180 | 10 | 10 | — |
| High h _{FE} | — | 2SB1460 | -20 | -2 | -3 | 1000* | 270~1200 | -6 | -500 | — |
| High h _{FE} | 2SD2145M | 2SD2192 | 20 | 0.5 | 1 | 400 | 560~2700 | 3 | 10 | — |
| High V _{EB0} | 2SD2313M | 2SD2315 | 50 | 0.15 | 0.2 | 400 | 560~2700 | 5 | 1 | — |
| Darlington | 2SA790M | 2SA1549 | -32** | -0.3 | -1.5 | 300 | 5k~ | -5 | -100 | Fig. 1 |
| | 2SB1076M | 2SB1239 | -40** | -2 | — | 1000* | 1k~ | -3 | -500 | Fig. 1 |
| | 2SC1545M | 2SC4017 | 32** | 0.3 | 1.5 | 300 | 5k~ | 5 | 100 | Fig. 2 |
| | 2SD1536M | 2SD1861 | 40** | 2 | — | 1000* | 1k~ | 3 | 500 | Fig. 2 |
| | 2SD1660M | 2SD1867 | 100 | 2 | — | 1000* | 1k~10k | 2 | 1000 | Fig. 3 |
| | 2SD1661M | 2SD1866 | 60±10 | 2 | — | 1000* | 1k~10k | 2 | 1000 | Fig. 4 |
| High Voltage | — | 2SA1776 | -400 | -0.5 | -1 | 1000* | 82~270 | -5 | -50 | — |
| SW | 2SC4295M | 2SC4620 | 400 | 0.1 | — | 1000* | 56~270 | 10 | 10 | — |

Note : ★PC board (collector's copper foil area, 1cm² or over ; PC board thickness, 1.7mm)



ATR • ATV High frequency type

| Application | Package | | V _{CEO} (V) | I _c (mA) | f _t (MHz) | C _{ob} (pF) | h _{FE} | Internal circuit | | |
|-------------|-----------------------|----------|----------------------|---------------------|----------------------|----------------------|-----------------|---------------------|---------------------|---|
| | ATR | ATV | | | | | | V _{CE} (V) | I _c (mA) | |
| | Part No. | | | | | | | | | |
| AM FM | FM IF AM RF | 2SC3078M | 2SC4012 | 32 | 100 | 230 | 1.8 | 56~180 | 6 | 2 |
| | | 2SC2063M | 2SC4011 | 25 | 50 | 300 | 1.6 | 56~270 | 6 | 1 |
| VHF UHF | FM RF Mix. Osc. | 2SC3079M | 2SC4013 | 20 | 20 | 500 | 1.4 | 39~180 | 6 | 1 |
| | TV Tuner Mix. Osc. | 2SC3080M | 2SC4014 | 19 | 50 | 1100 | 1.2 | 39~270 | 10 | 5 |

●Product Designation

Specify part No., packaging specification code and h_{FE} ranking code.

Blank unless otherwise required



Part No.

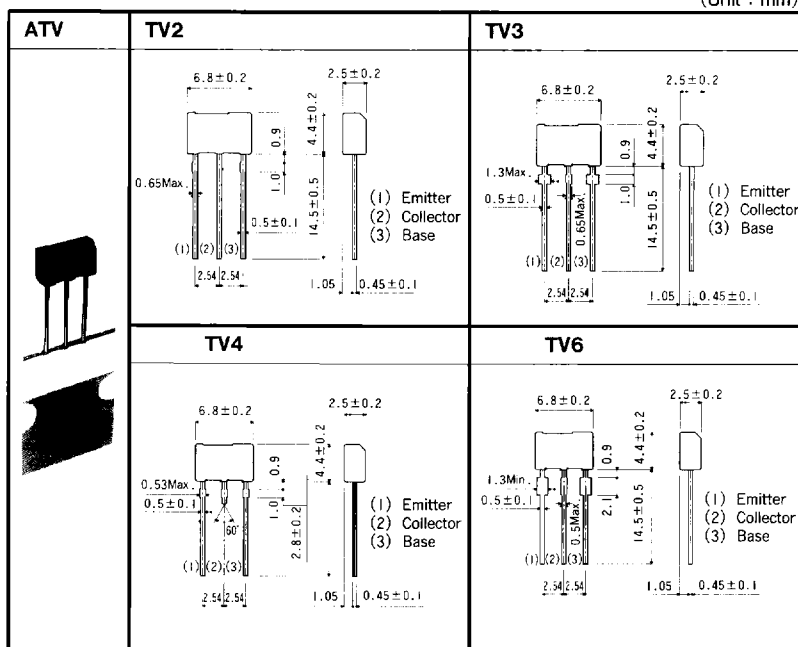
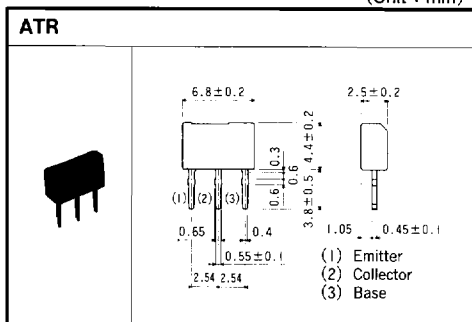
Packaging specification code

h_{FE} Ranking code

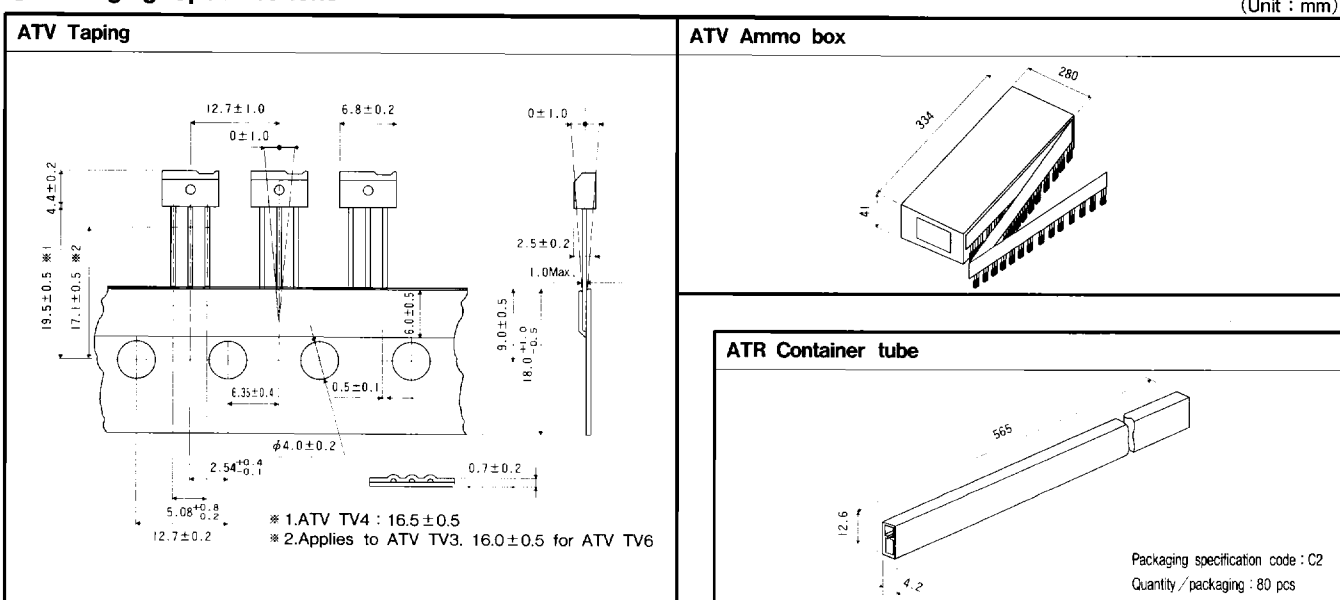
| Code | Package | Package specifications | Quantity/Package (pcs) |
|------|---------|------------------------|------------------------|
| - | ATR | Bulk | 2,000 |
| C2 | | Tube | 8,000 (80pcs×100) |
| TV2 | ATV | Ammo box | 2,500 |
| TV3 | | | |
| TV4 | | | |
| TV6 | | | |

| Code | h _{FE} Range | Code | h _{FE} Range |
|------|-----------------------|------|-----------------------|
| L | 27~56 | E | 390~820 |
| M | 39~82 | U | 560~1200 |
| N | 56~120 | V | 820~1800 |
| P | 82~180 | W | 1200~2700 |
| Q | 120~270 | A | 1k~ |
| R | 180~390 | B | 5k~ |
| S | 270~560 | C | 10k~ |

(Unit : mm)



●Packaging Specifications



Transistors TRANSISTORS

The Class and Base ordering Units for Standard and Semi-standard Products Units Page 155