

## Transistors for TV Display Video Output Use

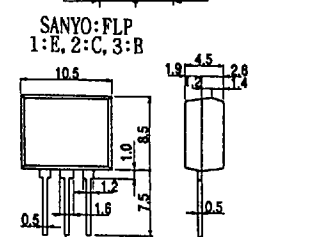
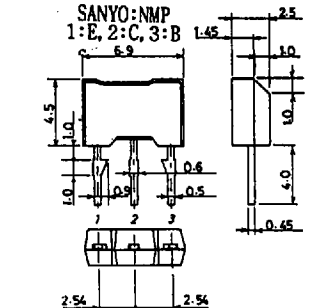
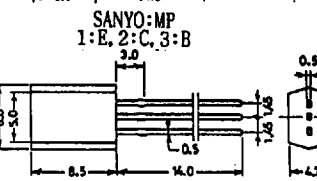
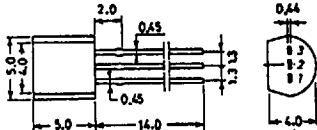
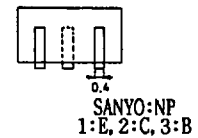
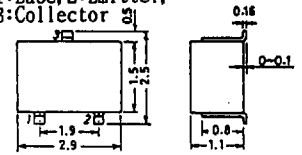
Features \*Excellent HF characteristic. \*Small reverse transfer capacitance. \*Complementary PNP and NPN types.  
\*Adoption of MBIT, FBET processes. \*Highly resistant to dielectric breakdown.

Case Outline (unit:mm)  
SANYO:CP

1:Base, 2:Emitter,  
3:Collector

General-Purpose Type (\*:  $T_c=25^\circ\text{C}$ ) For PNP, (-) sign is omitted.

| Type No.        | Package  | Absolute Maximum Ratings/ $T_a=25^\circ\text{C}$ |                  |              |              | Electrical Characteristics/ $T_a=25^\circ\text{C}$ |                          |                      |                  |                 |           |
|-----------------|----------|--|------------------|--------------|--------------|--|--------------------------|----------------------|------------------|-----------------|-----------|
|                 |          | $V_{CB0}$<br>(V)                                 | $V_{CEO}$<br>(V) | $I_C$<br>(A) | $P_C$<br>(W) | $f_T$<br>typ<br>(MHz)                              | $V_{CE} / I_C$<br>(V/mA) | $C_{ob}$ typ<br>(PF) | $C_{re}$<br>(PF) | $V_{CB}$<br>(V) | $h_{FE}$  |
| 2SC2857         | N P      | 180  | 180              | 50m          | 0.5          | min50  | 30 / 10                  | 4                    | -                | 10              | 40 ~ 320  |
| 2SA1689/2SC4449 |          | 300  | 300              | 50m          | 0.6          | 70   | 30 / 10                  | 2.4/1.5              | 1.5/1            | 30              | 100 ~ 320 |
| 2SC5291         | FLP      | 180  | 160              | 1.5          | 1.5          | 120  | 10 / 50                  | 14                   | -                | 10              | 100 ~ 400 |
| 2SC4075         | TO-220ML | 300  | 300              | 0.2          | *10          | min50  | 30 / 10                  | 5.3                  | -                | 50              | 40 ~ 200  |



High-Definition CRT Display Use

|                 |          |     |     |     |     |     |         |         |         |    |          |
|-----------------|----------|-----|-----|-----|-----|-----|---------|---------|---------|----|----------|
| 2SA1580/2SC4104 | C P      | 70  | 60  | 50m | 0.2 | 700 | 10 / 10 | 1.7/1.3 | 1.3/1   | 10 | 60 ~ 270 |
| 2SA1433/2SC3504 | M P      |     |     |     | 0.9 | 700 | 10 / 10 | 1.7     | 1.3/1   | 10 | 60 ~ 320 |
| 2SA1370/2SC3467 | M P      | 200 | 200 | 0.1 | 1.0 | 150 | 30 / 10 | 2.6/1.7 | 1.7/1.2 | 30 | 40 ~ 320 |
| 2SA1371/2SC3468 |          | 300 | 300 | 0.1 | 1.0 | 150 | 30 / 10 | 3.1/2.6 | 2.3/1.8 | 30 | 40 ~ 320 |
| 2SA1710/2SC4490 | NMP      | 300 | 300 | 0.1 | 1.0 | 70  | 30 / 10 | 3.1/2.6 | 2.3/1.8 | 30 | 40 ~ 320 |
| 2SA1787/2SC4650 |          | 200 | 200 | 0.1 | 1.0 | 150 | 30 / 10 | 2.6/1.7 | 1.7/1.2 | 30 | 40 ~ 320 |
| 2SA1828/2SC4732 | FLP      | 200 | 200 | 0.1 | 1.3 | 150 | 30 / 10 | 2.6/1.7 | 1.7/1.2 | 30 | 60 ~ 320 |
| 2SA1829/2SC4733 |          | 300 | 300 | 0.1 | 1.3 | 150 | 30 / 10 | 3.1/2.6 | 2.3/1.8 | 30 | 60 ~ 320 |
| 2SC4884         |          | 300 | 300 | 0.1 | 1.5 | 70  | 30 / 10 | 2.6     | 1.8     | 30 | 60 ~ 320 |
| 2SA1352/2SC3416 | TO-126   | 200 | 200 | 0.1 | 1.2 | 70  | 30 / 10 | 2.6/1.7 | 1.7/1.2 | 30 | 40 ~ 320 |
| 2SA1353/2SC3417 |          | 300 | 300 | 0.1 | 1.2 | 70  | 30 / 10 | 3.1/2.6 | 2.3/1.8 | 30 | 40 ~ 320 |
| 2SA1380/2SC3502 |          | 200 | 200 | 0.1 | 1.2 | 150 | 30 / 10 | 2.6/1.7 | 1.7/1.2 | 30 | 40 ~ 320 |
| 2SA1381/2SC3503 |          | 300 | 300 | 0.1 | 1.2 | 150 | 30 / 10 | 3.1/2.6 | 2.3/1.8 | 30 | 40 ~ 320 |
| 2SA1478/2SC3788 | TO-126ML | 200 | 200 | 0.1 | 1.3 | 150 | 30 / 10 | 2.6/1.7 | 1.7/1.2 | 30 | 40 ~ 320 |
| 2SA1479/2SC3789 |          | 300 | 300 | 0.1 | 1.5 | 70  | 30 / 10 | 3.1/2.6 | 2.3/1.8 | 30 | 40 ~ 320 |
| 2SA1480/2SC3790 |          | 300 | 300 | 0.1 | 1.5 | 150 | 30 / 10 | 3.1/2.6 | 2.3/1.8 | 30 | 40 ~ 320 |
| 2SC4217         | TO-220   | 300 | 300 | 0.2 | 1.5 | 70  | 10 / 10 | 3.5     | -       | 50 | 40 ~ 200 |
| 2SC4378         |          | 300 | 300 | 0.2 | 1.5 | 100 | 30 / 10 | 3.9     | 3.2     | 30 | 60 ~ 320 |
| 2SC4188         |          | 200 | 200 | 0.1 | *10 | 150 | 30 / 10 | 1.8     | 1.3     | 30 | 40 ~ 320 |

Underlined type Nos. are before mass production.

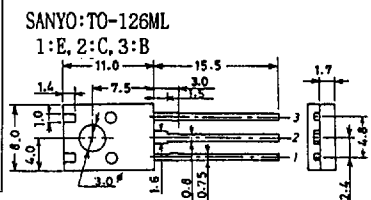
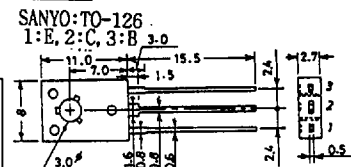
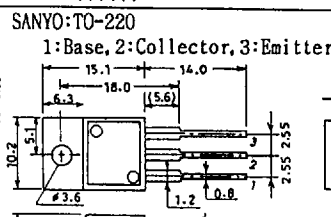
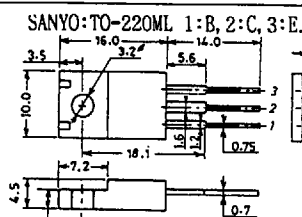
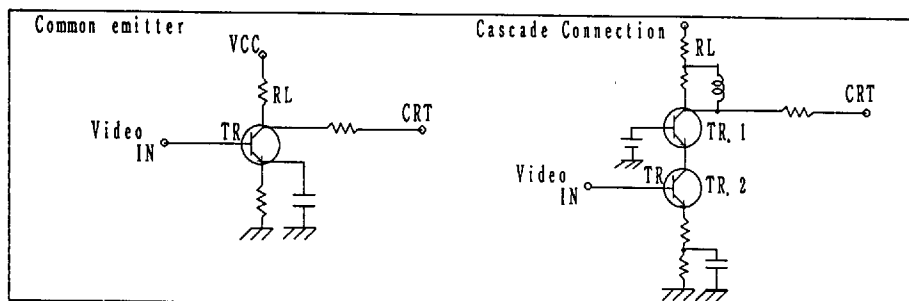
\*Classification by  $h_{FE}$

|           |   |    |     |    |     |     |     |     |     |   |     |
|-----------|---|----|-----|----|-----|-----|-----|-----|-----|---|-----|
| 40        | C | 80 | 60  | D  | 120 | 100 | E   | 200 | 160 | F | 320 |
| (CP type) |   |    |     |    |     |     |     |     |     |   |     |
| 60        |   | 3  | 120 | 90 | 4   | 180 | 135 | 5   | 270 |   |     |

2SC5291(100~400)

|     |   |     |     |   |     |     |   |     |
|-----|---|-----|-----|---|-----|-----|---|-----|
| 100 | R | 200 | 140 | S | 280 | 200 | T | 400 |
|-----|---|-----|-----|---|-----|-----|---|-----|

\*Equivalent Circuit for Video Output Use



SANYO:TO-220ML 1:B, 2:C, 3:E.

These specifications are subject to change without notice.

## SANYO Discrete Device Package Outlines (unit:mm)

### Small-Signal Transistors

Outlines name SSFP, SMCP, MCP, MCP4/6, CP, CP4/5/6, CPH3/5/6, PCP, PCP4/5, XP5/6, TP, TP-FA, MFP6, TSSOP8, SOP8, SPA, NP, MP, NMP, FLP, TO-126, TO-126ML, TO-126LP

### Large-Signal Transistors

ZP, SMP, SMP-FD, TO-220, TO-220C1, TO-220ML, TO-220FI (LS), TO-220MF, TO-3PB, TO-3PML, TO-3PBL, TO-3JML

### SANYO Transistor Package Name List.

#### Surface Mount Types

SSFP Super Small Flat Package  
 SMCP Super Mini Chip Pack.  
 MCP Mini Chip Pack.  
 MCP4/6 Mini Chip Pack. (FH type)  
 CP Chip Pack.  
 CP5/6 Chip Pack. (FC type)  
 CPH3/5/6 \* Chip Pack high-power  
 PCP Power Chip Pack.  
 PCP4/5 Power Chip Pack. (FP type)  
 XP (FX type)  
 TSSOP8 (FTS, FTD type)  
 SOP8 (FW, FSS type)  
 TP-FA Tiny Package  
 SMP-FD For large signal  
 ZP For large signal

#### Lead Types

NMP New MP  
 FLP Full Mold Large Package  
 TO-126LP Large-Power  
 TO-126ML Micaless  
 TO-220, 220ML ML:Micaless type  
 TO-220C1 CI:Compact Isolation  
 TO-220FI (LS) Full Isolation (leade short type)  
 TO-220MF Mini Fin Short fin type.  
 TO-3PB, 3PML Bushless, ML:Micaless  
 TO-3PML Micaless  
 TO-3PBL Bushless Large  
 TO-3JML Jumbo Micaless

PB, BL:no insulating needed.

#### Notes

Nomenclature of house Nos.  
 The first several letters of the type Nos. of the FSS, FTD, FW, FTS, FC, FP, FH, series mean:

- 1'st F : Packages for complex type devices. (CP5/6, MCP4/6, PCP4/5, XP5/6, SOP8, TSSOP8)
- 2'nd S: SOP8 package
- 2'nd W: Double chips
- 2'nd T: TSSOP8 package
- 2'nd C: CP5/6 package
- 2'nd P: PCP4/5 package
- 2'nd X: XP5/6 package
- 2'nd D: Dual type
- 2'nd H: Ultra high freq. type
- 3'rd S: Single

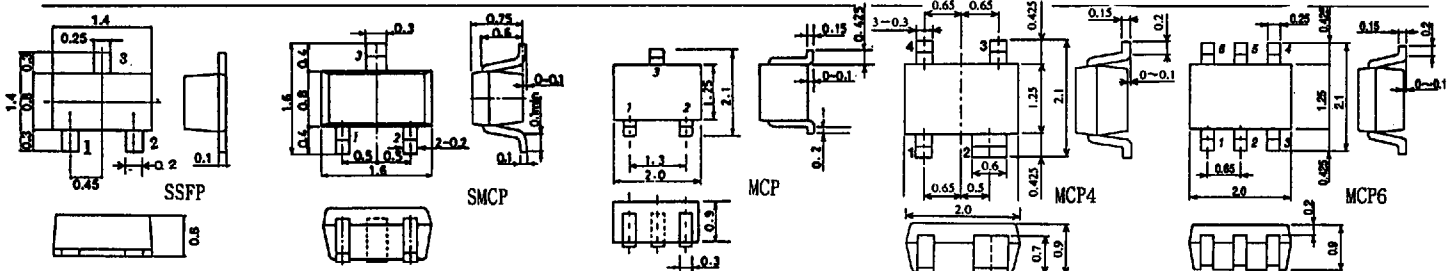
Type Nos. of 1XX or 1XXX are p-channel types.  
 Type Nos. of 2XX or 2XXX are N-channel types.  
 XP package is excluded.

\*:How to name CPH3/6 devices. Package name followed by 1, 2, 3 or 4 and then tow-digit consecutive Nos. Figures following the package names mean: 1:PNP Tr, 2:NPN Tr, 3:P-ch MOSFET, 4:N-ch MOSFET.

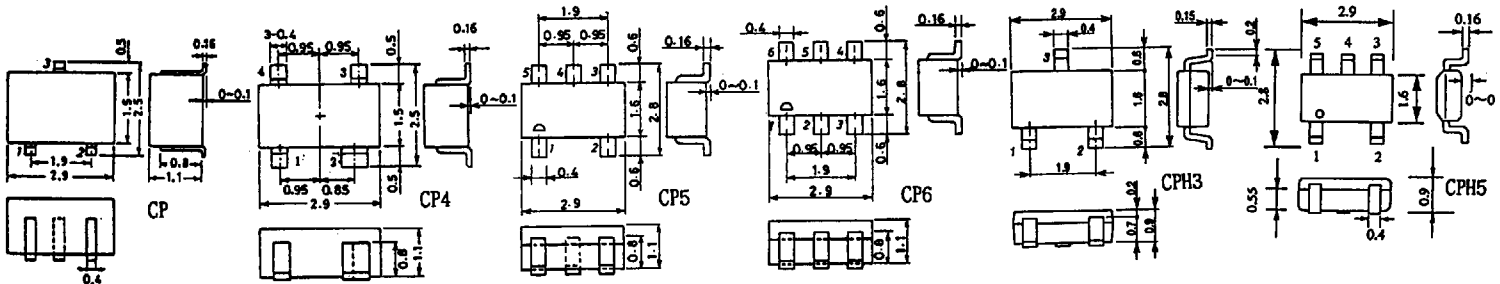
### Surface Mount Type Outlines (JEDEC and EIAJ name are in parentheses.)

Top View Pin Nos. of top view are CAD register Nos. Bottom side : Heat sink side.

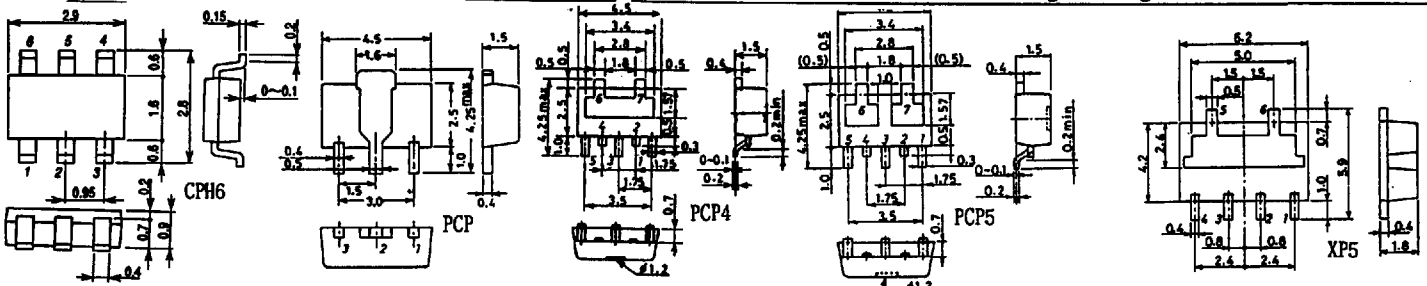
SANYO:SSFP Device weight:0.002g SANYO:SMCP(SC-75A) Device weight:0.003g SANYO:MCP(SC-70), MCP4(SC-82, A), MCP6 Device weight:0.006g, 0.007g, 0.007g



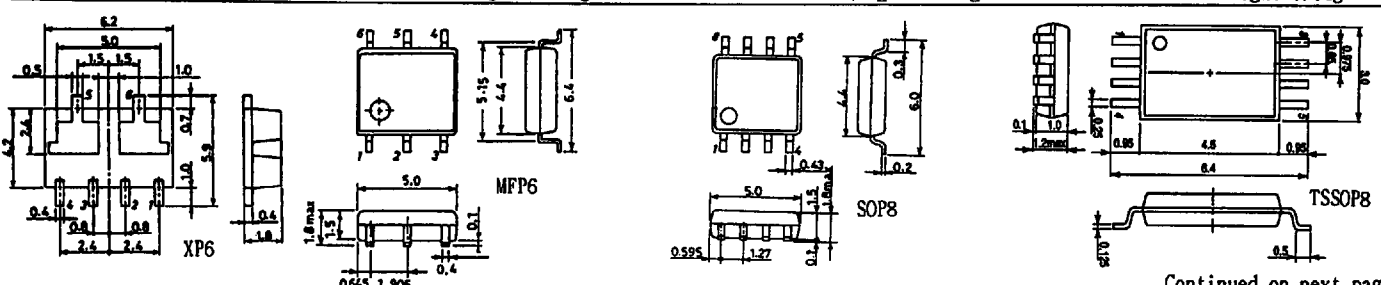
SANYO:CP(SC-59, TO-236) Device weight:0.013g SANYO:CP4, CP5, CP6(SC-61, SC-74A, SC-74, SOT143) Device weight:0.013g, 0.014g, 0.015g SANYO:CPH3, CPH5 Device weight:0.013g, 0.015g



SANYO:CPH6 Device weight:0.015g SANYO:PCP, PCP4/5(SC-62, SOT89) Bottom View Device weight:0.058g, 0.052g SANYO:XP5 Bottom View Device weight:0.062g



SANYO:XP6 Bottom View Device weight:0.062g SANYO:MFP6 Device weight:0.089g SANYO:SOP8 Device weight:0.093g SANYO:TSSOP8 Device weight:0.04g



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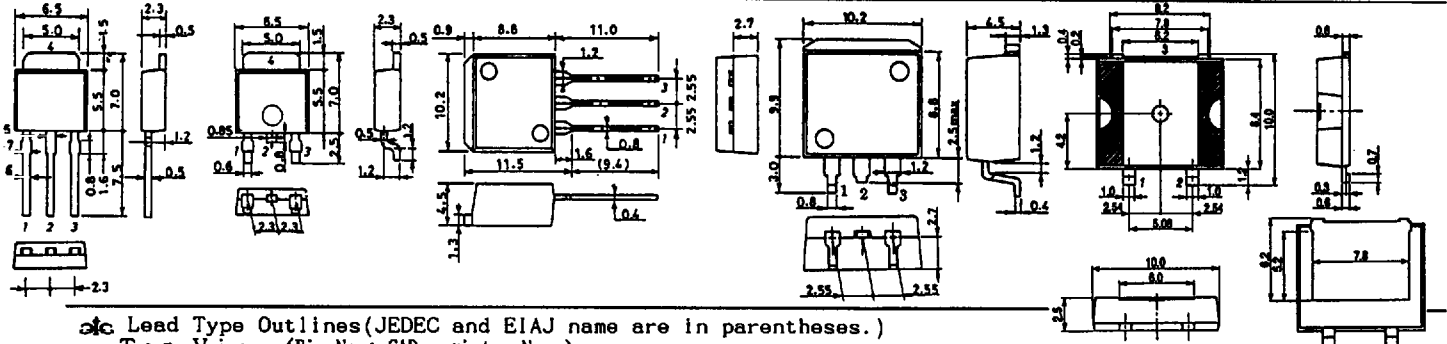
## SANYO Discrete Device Package Outlines (unit:mm)

Surface Mount Type Outlines (JEDEC and EIAJ name are in parentheses.)  
 Top View Pin Nos. of top view are CAD register Nos. Bottom side: Heat sink side.

SANYO:TP, TP-FA(SC-64, SC-63, TO-251)  
 Device weight:0.315g, 0.282g

SANYO:SMP, SMP-FD(forming type)(SC-83)  
 Device weight:1.4g

SANYO:ZP  
 Device weight:0.62g



Lead Type Outlines (JEDEC and EIAJ name are in parentheses.)  
 Top View (Pin No.: CAD register Nos.)

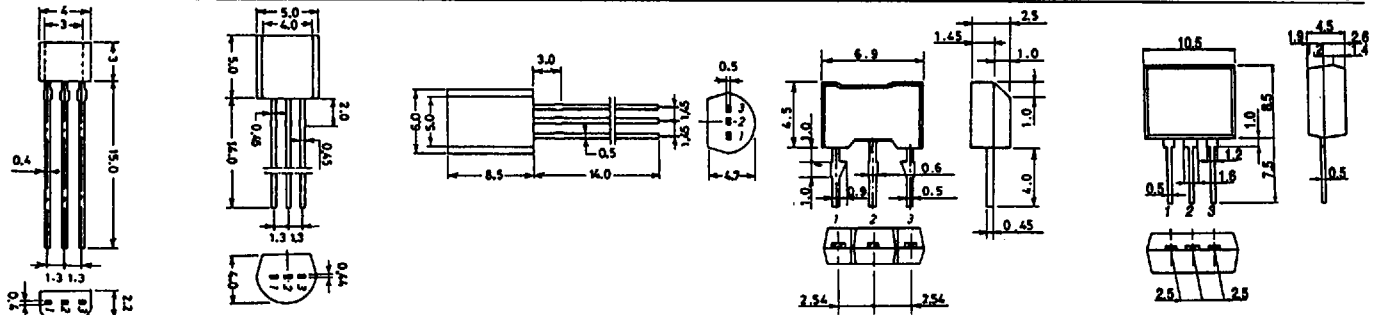
SANYO:SPA(TO-18, TO-39)  
 Device weight:0.098g

SANYO:NP(SC-43A, TO-92, SOT-54)  
 Device weight:0.269g

SANYO:MP(SC-51, TO-226)  
 Device weight:0.578g

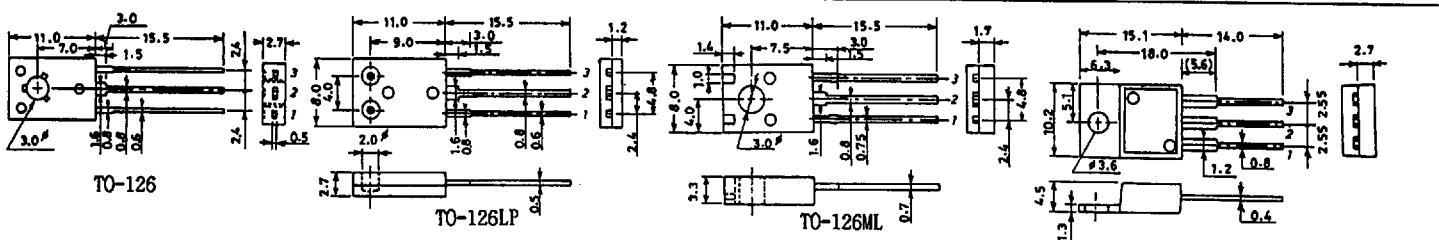
SANYO:NMP(SC-71)  
 Device weight:0.21g, AN use:0.275g

SANYO:FLP  
 Device weight:1.1g



SANYO:TO-126(TO-126, TO-225, SOT-32), TO-126LP, TO-126ML(SOT-82)  
 Device weight:0.675g, 0.7g, 0.97g

SANYO:TO-220AB, AB(SC-45, 46, TO-220AA)  
 Device weight:1.9g

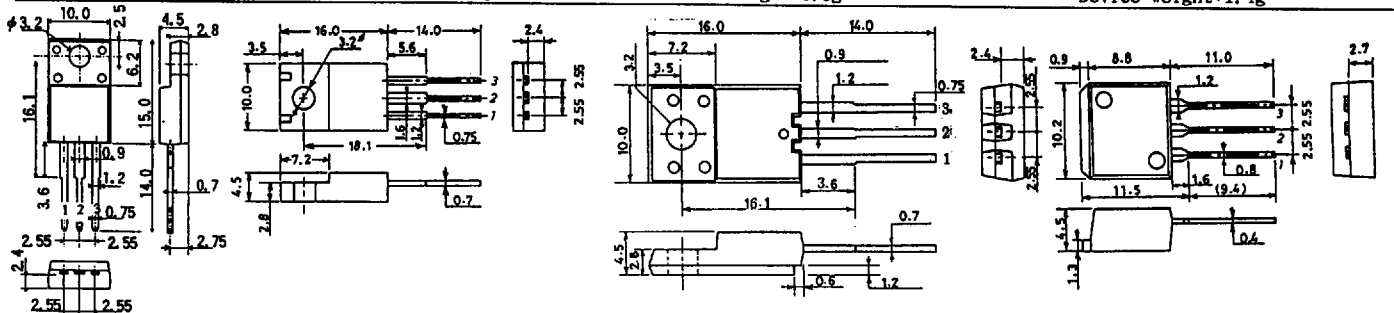


SANYO:TO-220CI  
 Device weight:1.75g

SANYO:TO-220ML(SC-67, SOT-186)  
 Device weight:1.9g

SANYO:TO-220FI(LS)(SC-67, SOT-189)  
 Device weight:1.8g

SANYO:TO-220MF  
 Device weight:1.4g



SANYO:TO-3PB(SC-65, TO-218)  
 Device weight:5.8g

SANYO:TO-3PML(1SOWATT218)  
 Device weight:5.3g

SANYO:TO-3PBL(TO-247)  
 Device weight:9.2g

SANYO:TO-3JML  
 Device weight:9.2g

