

# 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         | NP       | 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 | CP       | 70  | 60  | 50m | 0.2 | 700 | 10 / 10 | 1.7/1.3 | 1.3/1   | 10 | 60 ~ 270 |
| 2SA1433/2SC3504 |          | 70  | 60  | 50m | 0.9 | 700 | 10 / 10 | 1.7     | 1.3/1   | 10 | 60 ~ 320 |
| 2SA1370/2SC3467 | MP       | 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         | TO-126   | 300 | 300 | 0.1 | 1.5 | 70  | 30 / 10 | 2.6     | 1.8     | 30 | 60 ~ 320 |
| 2SA1352/2SC3416 |          | 200 | 200 | 0.1 | 1.2 | 70  | 30 / 10 | 2.6/1.7 | 1.7/1.2 | 30 | 40 ~ 320 |
| 2SA1353/2SC3417 | TO-126   | 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 | TO-126ML | 300 | 300 | 0.1 | 1.2 | 150 | 30 / 10 | 3.1/2.6 | 2.3/1.8 | 30 | 40 ~ 320 |
| 2SA1478/2SC3788 |          | 200 | 200 | 0.1 | 1.3 | 150 | 30 / 10 | 2.6/1.7 | 1.7/1.2 | 30 | 40 ~ 320 |
| 2SA1479/2SC3789 | TO-126ML | 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         | TO-220   | 200 | 200 | 0.1 | ※10 | 150 | 30 / 10 | 1.8     | 1.3     | 30 | 40 ~ 320 |

Underlined type Nos. are before mass production.

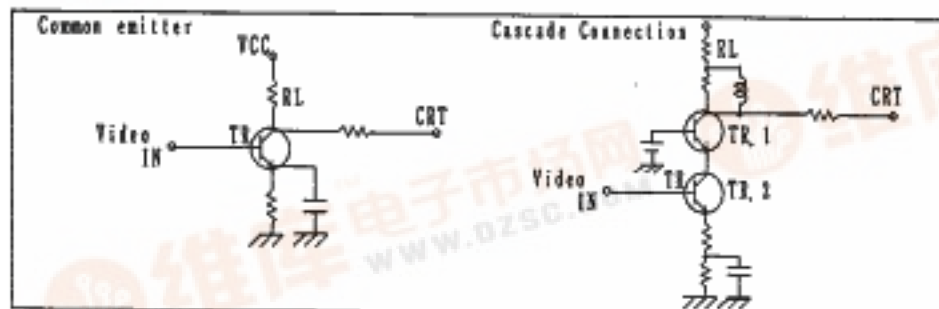
\* Classification by  $h_{FE}$

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

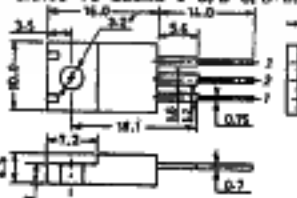
2SC5291(100~400)

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

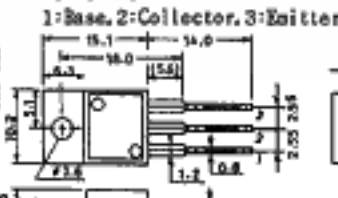
\* Equivalent Circuit for Video Output Use



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

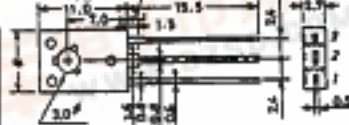


SANYO:TO-220



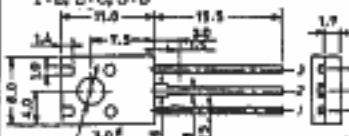
SANYO:TO-126

1:E, 2:C, 3:B



SANYO:TO-126ML

1:E, 2:C, 3:B



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

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

### Small-Signal Transistors

Outlines name SSFP, SMCP, MCP, MCP4/5, CP, CP4/5/5, CPB3/5/5, PCP, PCP4/5, XP5/5, TP, TP-FA, MFP6, TSSOP8, SOP8, SPA, NP, MP, NMP, FLP, TO-126, TO-126ML, TO-126LP

### Large-Signal Transistors

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

### Surface Mount Types

Surface Mount Types

Lead Types

ML:No insulating needed.

|          |                            |
|----------|----------------------------|
| SSFP     | Super Small Flat Package   |
| SMCP     | Super Mini Chip Pack.      |
| MCP      | Mini Chip Pack.            |
| MCP4/5   | Mini Chip Pack. (FH type)  |
| CP       | Chip Pack.                 |
| CP5/5    | Chip Pack. (FC type)       |
| CPB3/5/5 | Chip Pack high-power       |
| PCP      | Power Chip Pack.           |
| PCP4/5   | Power Chip Pack. (FP type) |
| XP       | Chip Pack. (FX type)       |
| TSSOP8   | Chip Pack. (FSS, FTD type) |
| SOP8     | Chip Pack. (FW, FSS type)  |
| TP-FA    | Tiny Package               |
| SMP-PD   | For large signal           |
| ZP       | For large signal           |

|               |                                   |
|---------------|-----------------------------------|
| NMP           | New NP                            |
| FLP           | Full Mold Large Package           |
| TO-126LP      | Large-Power                       |
| TO-126ML      | Nicaless                          |
| TO-220, 220ML | ML:Nicaless type                  |
| TO-220CI      | CI:Compact Isolation              |
| TO-220FI (LS) | Full Isolation (leads short type) |
| TO-220MF      | Mini Fin Short fin type.          |
| TO-3PB, 3PML  | Bushless, ML:Nicaless             |
| TO-3PBL       | Nicaless                          |
| TO-3JML       | Bushless Large                    |
|               | Junio Nicaless                    |

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.

(CP5/5, MCP4/5, PCP4/5, XP5/5, SOP8, TSSOP8)

2'nd S: SOP8 package

2'nd W: Double chips

2'nd T: TSSOP8 package

2'nd C: CP5/5 package

2'nd P: PCP4/5 package

2'nd X: XP5/5 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.

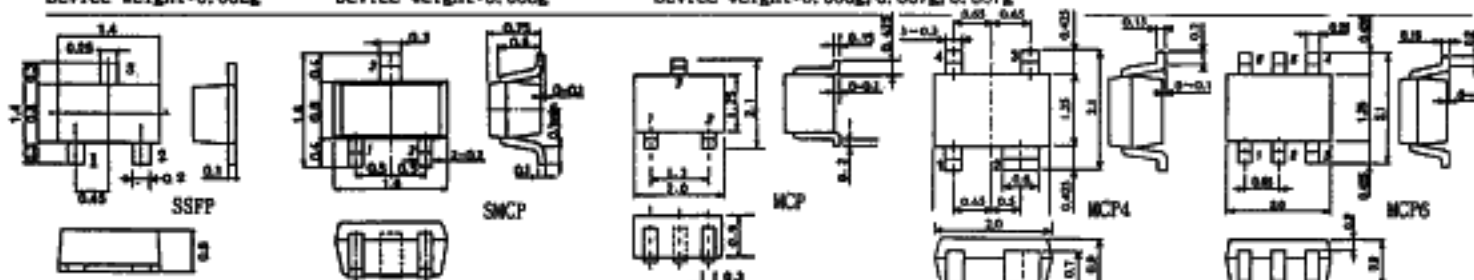
\*:How to name CPB3/5 devices. Package name followed by 1,2,3 or 4 and then tow-digit

consecutive Nos. Figures following the package names mean: 1:P-NP Tr. 2:NPN Tr. 3:P-ch MOSFET. 4:N-ch MOSFET.

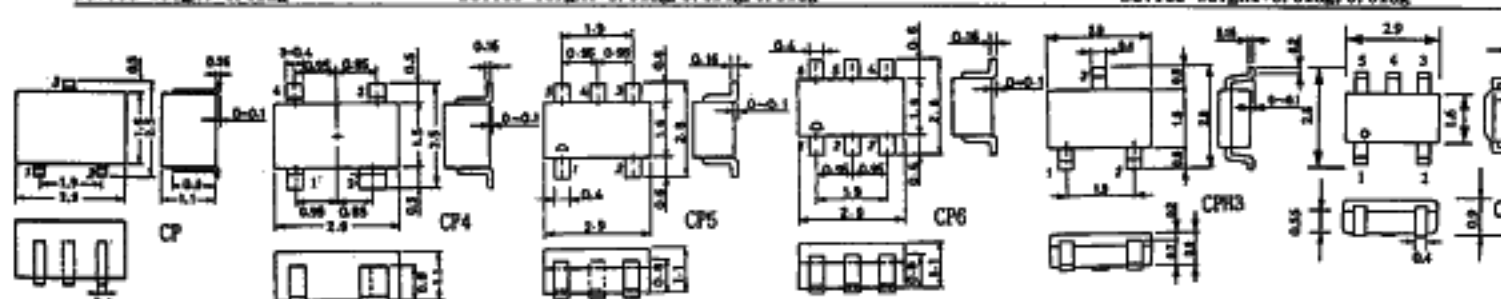
### Surface Mount Type Outlines(JEDEC and EIAJ name are in parentheses.)

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

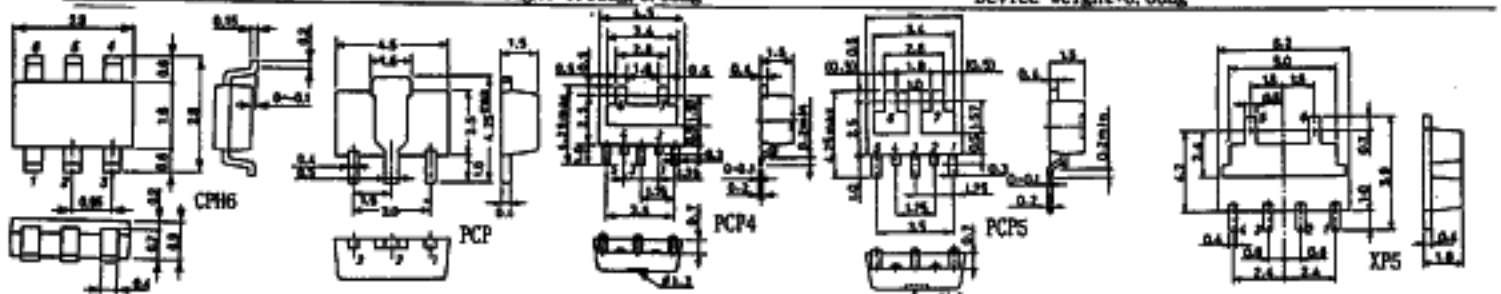
|                      |                      |  |
|----------------------|----------------------|--|
| SANYO:SSFP           | SANYO:SMCP(SC-75A)   | SANYO:MCP(SC-70), MCP4(SC-82, A), MCP5 |
| Device weight:0.002g | Device weight:0.003g | Device weight:0.006g, 0.007g, 0.007g   |



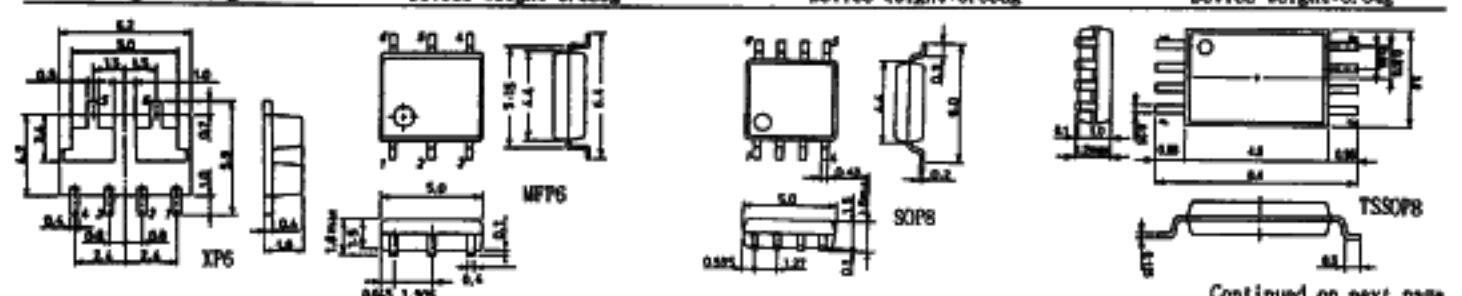
|                         |   |                              |
|-------------------------|---|------------------------------|
| SANYO:CP(SC-69, TO-236) | SANYO:CP4, CP5, CP6(SC-61, SC-74A, SC-74, SOT143) | SANYO:CPB3, CPB5             |
| Device weight:0.013g    | Device weight:0.013g, 0.014g, 0.015g              | Device weight:0.013g, 0.015g |



|                      |   |                       |
|----------------------|---|-----------------------|
| SANYO:CPB6           | SANYO:PCP, PCP4/5(SC-62, SOT89) Bottom View | SANYO:XP5 Bottom View |
| Device weight:0.015g | Device weight:0.058g, 0.052g                | Device weight:0.062g  |



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



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

o 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)

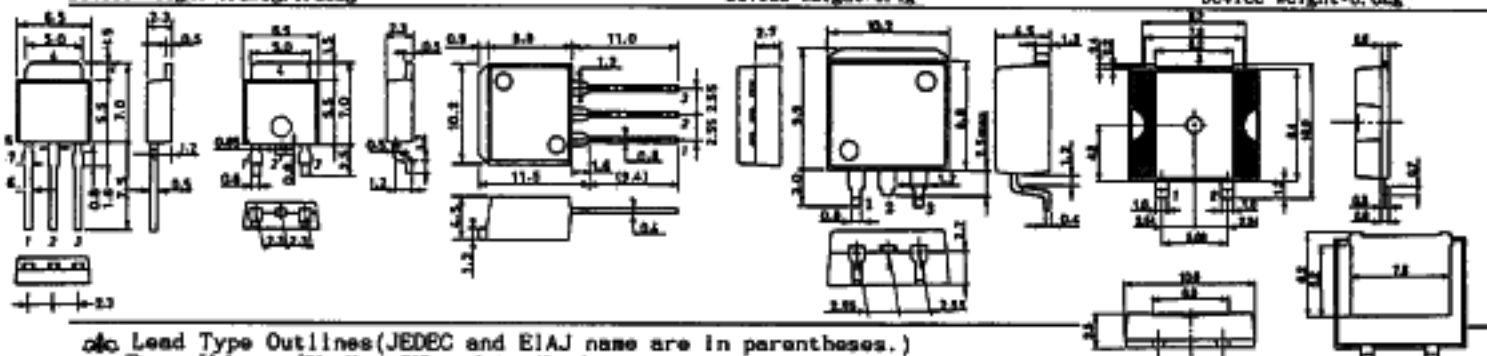
Device weight:0.315g, 0.282g

SANYO:SNP, SNP-PD(forming type)(SC-83)

Device weight:1.4g

SANYO:ZP

Device weight:0.62g



o 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-61, TO-226)

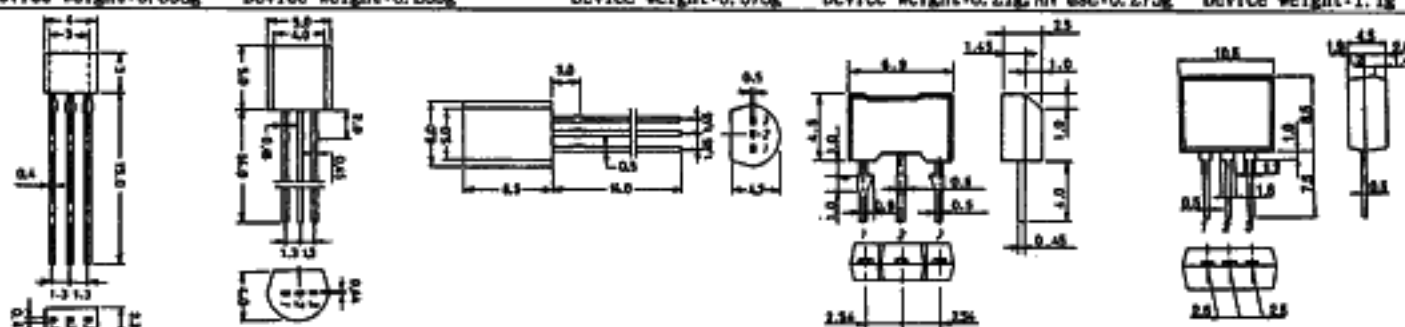
Device weight:0.578g

SANYO:NMP(SC-71)

Device weight:0.21g, AN use:0.275g

SANYO:FLP

Device weight:1.1g

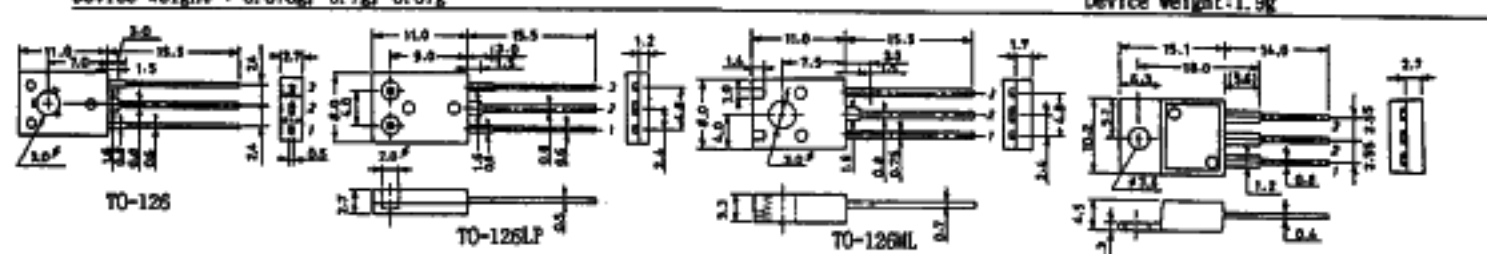


SANYO:TO-126(TO-126, TO-225, SOT-32), TO-126LP, TO-126ML(SOT-82)

Device weight : 0.675g, 0.7g, 0.97g

SANYO:TO-220ML, AB(SC-45, 46, TO-220A)

Device weight:1.9g



SANYO:TO-220C1

Device weight:1.75g

SANYO:TO-220ML(SC-67, SOT-186)

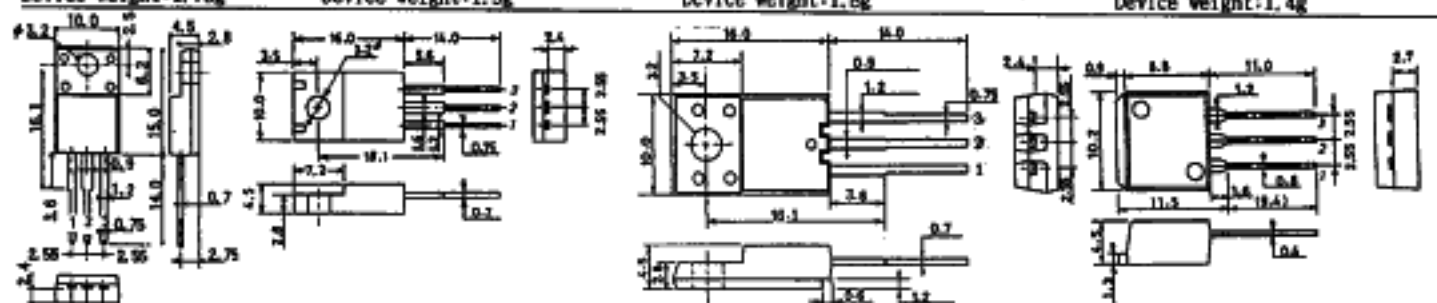
Device weight:1.9g

SANYO:TO-220P(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(180WATT218)

Device weight:5.3g

SANYO:TO-3PBL(TO-247)

Device weight:9.2g

SANYO:TO-3JML

Device weight:9.2g

