

## 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 time)

SANYO:CP

1:Base, 2:Emitter.

3:Collector 2

dc General-Purpose Type (※: T<sub>case</sub>25℃) For PNP, (-) sign is omitted.

| Type No.        | Package  | Absolute Maximum Ratings/Ta=25°C |                         |                       |                       | Electrical Characteristics/Ta=25°C |                                            |                             |                         |                        |                 |
|-----------------|----------|----------------------------------|-------------------------|-----------------------|-----------------------|------------------------------------|--------------------------------------------|-----------------------------|-------------------------|------------------------|-----------------|
|                 |          | V <sub>CEO</sub><br>(V)          | V <sub>CE0</sub><br>(V) | I <sub>C</sub><br>(A) | P <sub>C</sub><br>(W) | f <sub>T</sub><br>typ<br>(MHz)     | V <sub>CE</sub> / I <sub>C</sub><br>(V/mA) | C <sub>ob</sub> typ<br>(PF) | C <sub>re</sub><br>(PF) | V <sub>CB</sub><br>(V) | h <sub>FE</sub> |
| 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 |          | 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-126NL | 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         |          | 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

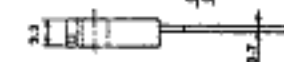
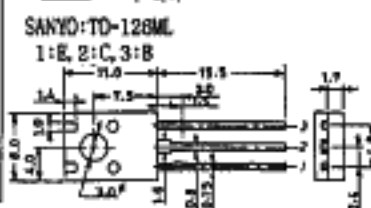
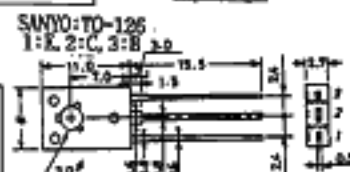
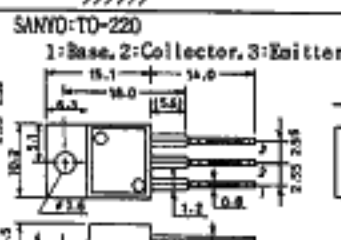
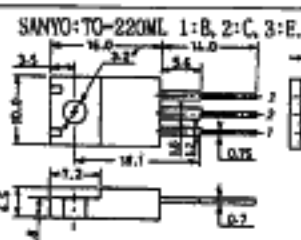
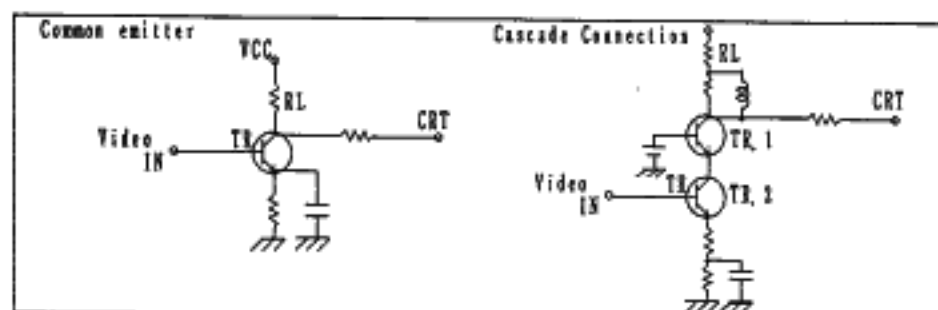
\*Classification by hFE

|           |   |    |    |   |     |     |   |     |     |   |     |
|-----------|---|----|----|---|-----|-----|---|-----|-----|---|-----|
| 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



SANTO:TD-220ML 1:R. 2:C. 3:E.

These specifications are subject to change without notice.

SANYO Discrete Device Package Outlines(unit:mm)

### Small-Signal Transistors

|                  |                                                                                                                                                            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outlines<br>name | SSFP, SMCP, MCP, MCP4/8, CP, CP4/5/8, CPB3/5/8, PCP, PCP4/5,<br>XP5/6, TP, TP-FA, WFP6, TSSOP8, SOP8, SPA, NP, WP, NWP, FLP, TO-126,<br>TO-126ML, TO-126LP |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Large-Signal Transistors

ZF, SMP, SMP-PD, TO-220, TO-220CI, 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.            |
| MC4/6   | Mini Chip Pack. (PH type)  |
| CP      | Chip Pack.                 |
| CS/6    | Chip Pack. (FC type)       |
| CH3/5/6 | * Chip Pack high-power     |
| PCP     | Power Chip Pack.           |
| PC4/5   | Power Chip Pack. (FP type) |
| XP      | Chip Pack. (FX type)       |
| TSOP8   | (TTS, FTS type)            |
| SOP8    | (FW, FSS type)             |
| TP-FA   | Tiny Package               |
| SMP-FD  | For large signal           |
| ZP      | For large signal           |

### Lead Types

ML:No insulating needed.

|                |                                   |
|----------------|-----------------------------------|
| NMP            | New NP                            |
| FLP            | Full Mold Large Package           |
| TO-18ELP       | Large-Power                       |
| TO-18MNL       | Nicaless                          |
| TO-220, 220MNL | ML:Nicaless type                  |
| TO-220C        | CI:Compact Isolation              |
| TO-220F (LS)   | Full Isolation (leads short type) |
| TO-220MF       | Mini Fin Short fin type.          |
| TO-3PB, 3PML   | Bushless, ML:Nicaless             |
| TO-3PML        | Nicaless                          |
| TO-3PBL        | Bushless Large                    |
| TO-3JL         | Jumbo Nicaless                    |

PR, RLine insulating needed

## No time

<sup>2</sup> 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, PCP4/6, IP5/6, SOP8, TSSOP8)

2<sup>nd</sup> S: SOP8 package

2'nd #: Double chips

2'nd Tr TSSCP8 package

2<sup>nd</sup> C: CP5/B package

2'nd P: PCP4/5 package

2nd X: XP5/6 package

2'nd D: Dual type

2'nd H: Ultra high freq. type  
3'nd S: Single

3rd St Single

Type Nos. of 1XX or 1XXX are n-channel types

Type Nos. of 1XX or 1XXX are J-channel types.  
Type Nos. of 2XX or 2XXX are N-channel types.

YP package is excluded

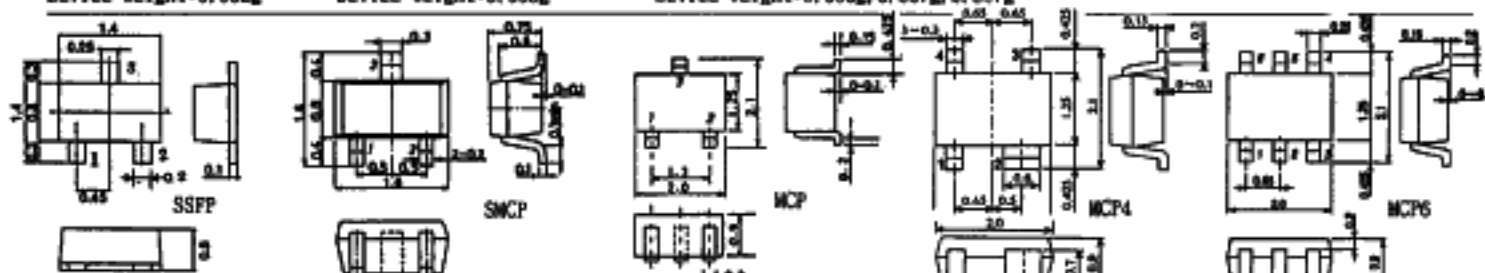
\*:How to name CPH3/6 devices. Package name followed by 1,2,3 or 4 and then tow-digit consecutive Nos. Figures following the package names mean: 1:PNP Tr. 2:NPN Tr.

\* Surface Mount Type Outlines (JEDEC and EIA name are in parentheses.)

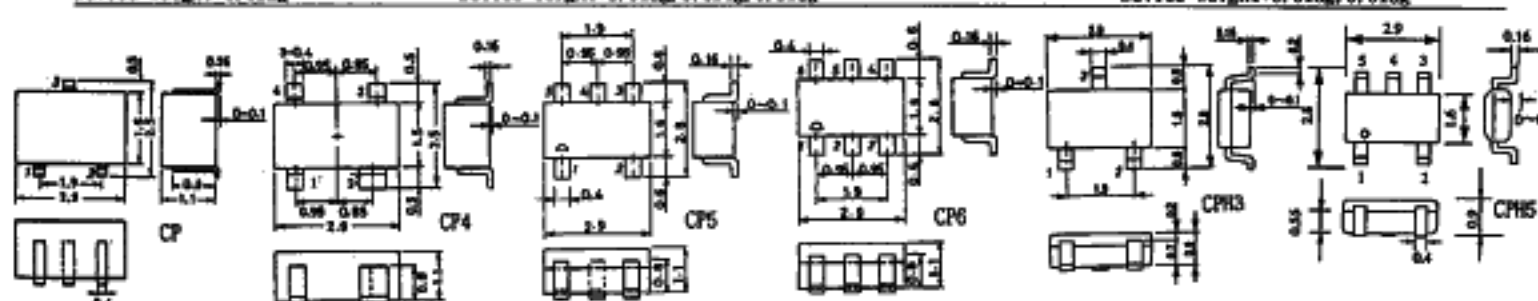
## Top View

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

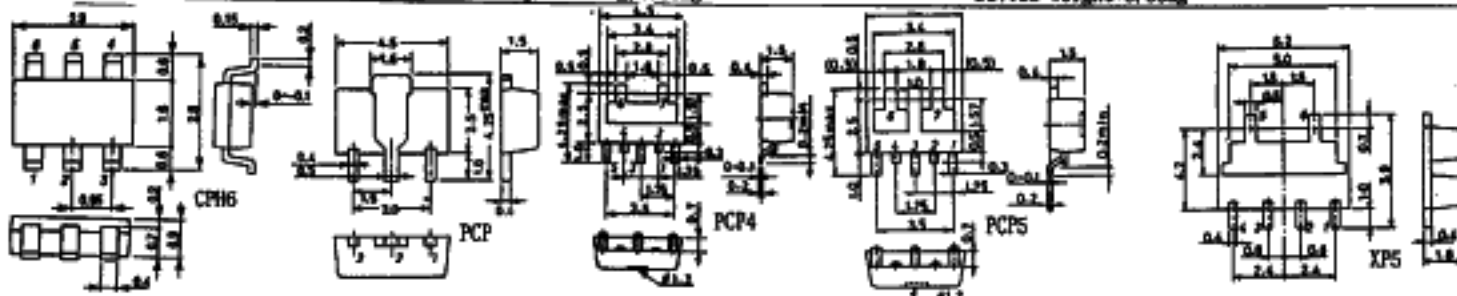
|                      |                      |                                        |
|----------------------|----------------------|----------------------------------------|
| SANYO:SSFF           | SANYO:SMCP(SC-75A)   | SANYO:MCP(SC-70), MCP4(SC-82, A), MCP6 |
| Device weight:0.002g | Device weight:0.003g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



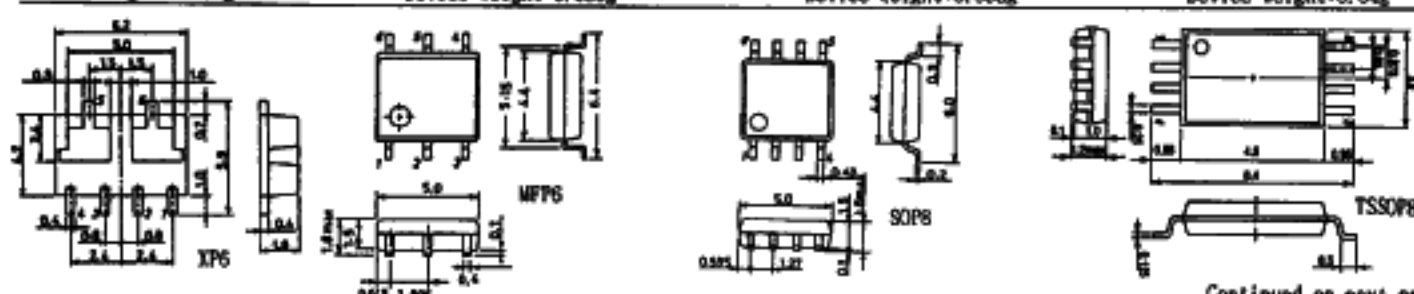
|                         |                                                   |                              |
|-------------------------|---------------------------------------------------|------------------------------|
| SANYO:CP(SC-69, TD-236) | SANYO:CP4, CP5, CP6(SC-61, SC-74A, SC-74, SOT143) | SANYO:CPH3, CPH5             |
| Device weight:0.013g    | Device weight:0.013g, 0.014g, 0.015g              | Device weight:0.013g, 0.015g |



|                      |                                             |                       |
|----------------------|---------------------------------------------|-----------------------|
| SANYO:CRH6           | SANYO:PCF, PCF4/5(SC-62, SOT89) Bottom View | SANYO:XP5 Bottom View |
| Device weight:0.015g | Device weight:0.068g, 0.052g                | Device weight:0.062g  |



| Table 1. Device weight |                      |                      |                     |
|------------------------|----------------------|----------------------|---------------------|
| SANYO:XP6 Bottom View  | SANYO:MFP6           | SANYO:SOIP8          | SANYO:TSSOP8        |
| Device weight:0.062g   | Device weight:0.089g | Device weight:0.093g | Device weight:0.04g |



Continued on next page

## 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)

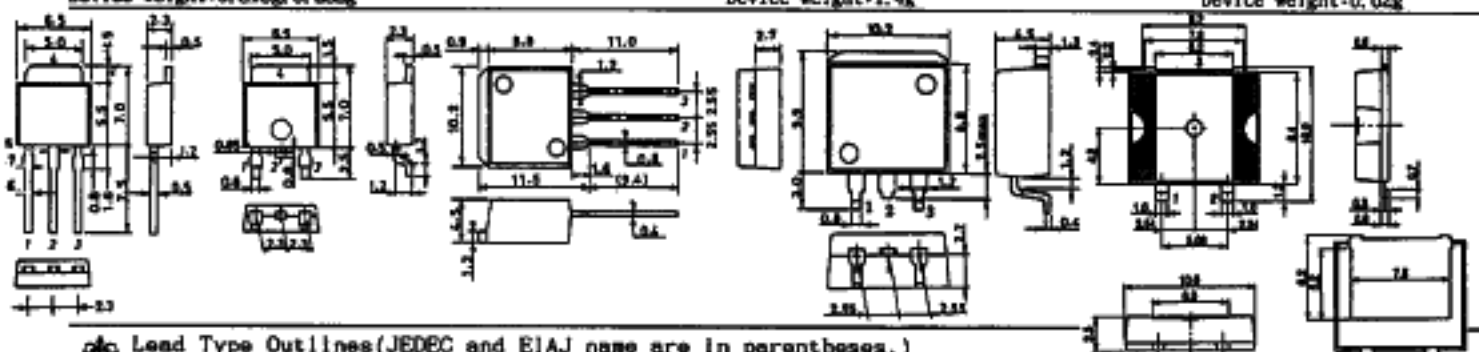
Device weight:0.315g, 0.282g

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

Device weight:1.4g

SANYO:2P

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)

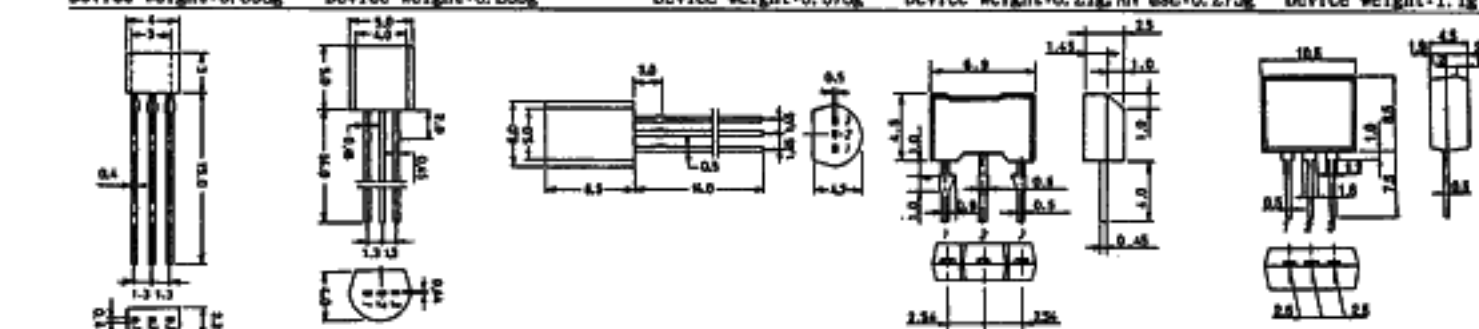
Device weight:0.578g

SANYO:NMP(SC-71)

Device weight:0.21g, AN use:0.275g

SANYO:FLP

Device weight:1.1g

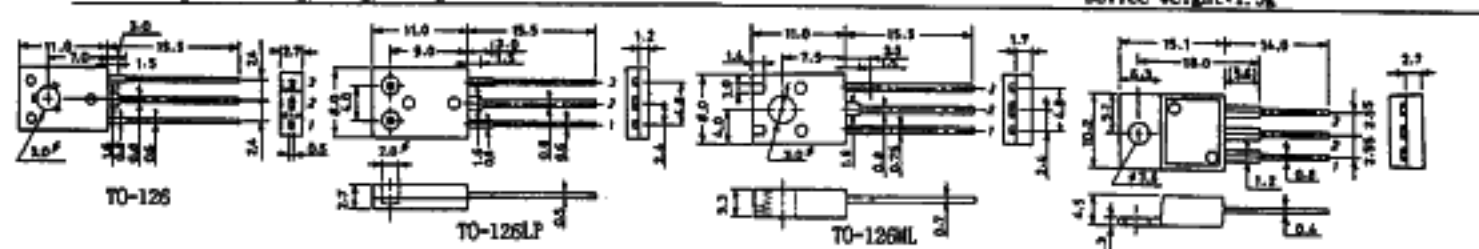


SANYO:TO-126(TO-126, TO-225, SOT-32), TO-126LP, TO-126ML(SOT-82)

Device weight:0.675g, 0.7g, 0.97g

SANYO:TO-220MR, AB(SC-45, 46, TO-220AA)

Device weight:1.9g



SANYO:TO-220C1

Device weight:1.75g

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

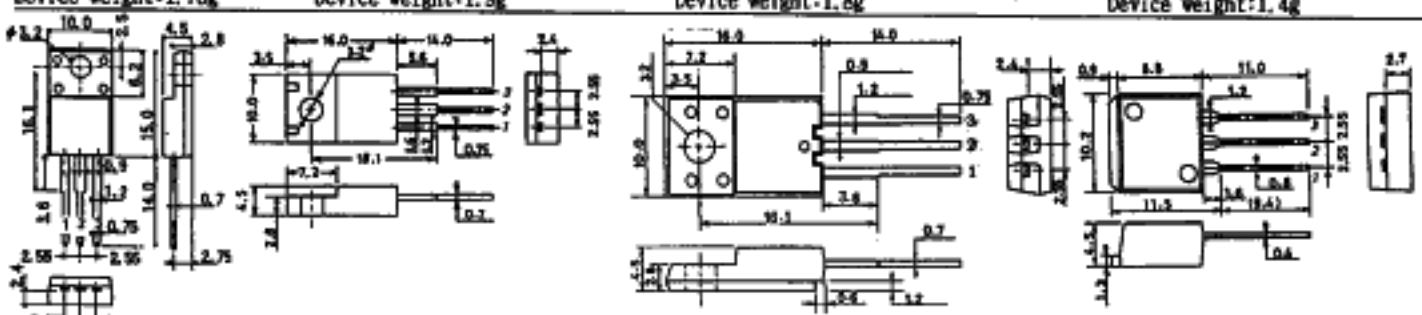
Device weight:1.5g

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

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(18WATT218)

Device weight:5.3g

SANYO:TO-3PBL(TO-247)

Device weight:9.2g

SANYO:TO-3JML

Device weight:9.2g

