

Transistors for Very High-Definition CRT Display Horizontal Deflection Output Use (3)

Dynamic Focus Use (No picture ever out of focus with better focus characteristics)

High reliability and high breakdown voltage (HVP technology) make it possible to make the grid voltage higher and the collector capacitance is made small to make high-frequency operation possible.

New outline: a product line of TO-220FI (LS) (full isolation: Perfect isolation type) is provided and is possible to be changed from TO-220.

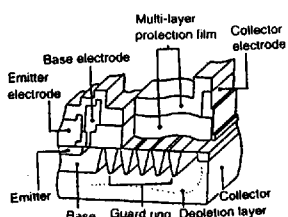
HVP Product features (HVP: High-voltage planar)

In conventional transistor structure, the depletion region expansion required by high withstand voltage operation is unstable. To make the depletion layer expand steadily, diffusion layers (guard rings) of the same conduction type as that of the base layer were made within the collector.

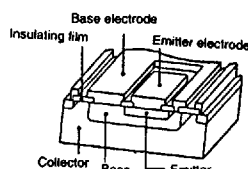
This allows the depletion layer from the base-collector junction to expand with the depletion layers of the guard rings one after the other, resulting in a stable depletion layer cross the collector.

In addition, a multi-layer protection film is added to prevent the withstand voltage level changing due to device status, producing high-reliability devices with high withstand voltages.

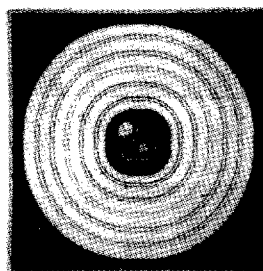
Isometric cross section
HVP (High-voltage planar)



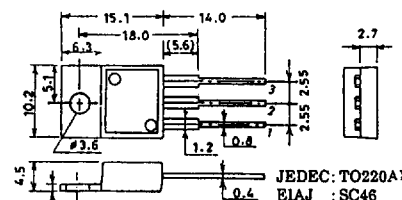
Conventional products



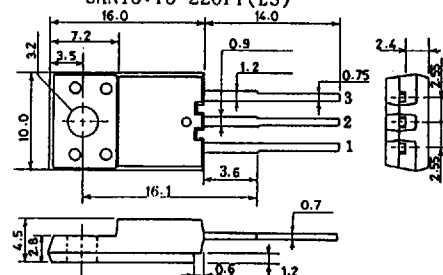
Dynamic focus transistor chip



Case Outlines (unit:mm)
SANYO: TO-220
1: Base, 2: Collector, 3: Emitter.



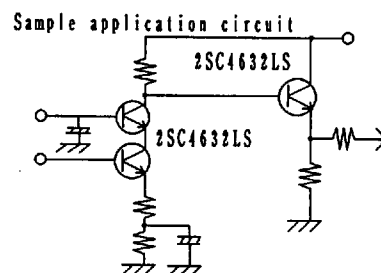
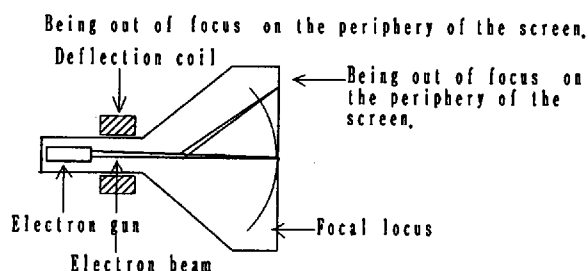
SANYO: TO-220FI (LS)



Features *High breakdown voltage *Small Cob *Wide ASO *High reliability

Type No.	Package	Absolute Maximum Ratings /Ta=25°C				Electrical Characteristics /Ta=25°C					
		V _{CBO} (V)	V _{CEO} (V)	I _C (A)	P _C (W)	V _{CE} (V)	I _C (mA)	h _{FE} min max	V _{CB} (V)	C _{ob} (PF)	
2SC4630LS 2SC4631LS	TO-220FI (LS)	1500	900	0.1	2	5	10	min30	100	2.8	
		1500	900	0.3			30	min30		5.0	
2SC4632LS 2SC4633LS		1500	1200	10m			0.5	10 ~ 60		1.6	
		1500	1200	30m			1.5	10 ~ 60		2.0	
2SC4634LS 2SC4635LS		1500	1500	10m			0.2	10 ~ 60		1.5	
		1500	1500	20m			0.6	10 ~ 60		1.9	
2SC4636LS 2SC4637LS		2000	1800	10m			0.1	10 ~ 60		1.4	
		2000	1800	15m			0.3	10 ~ 60		1.8	
2SC4710LS		2100	2100	10m			0.5	10 ~ 60		1.3	

A spot size of an electron beam is always kept constant all over the CRT screen by changing a focus of a CRT's electron beam while scanning horizontally and vertically. This eliminates being out of focus of the screen and gives you a very clear image. Thus this technology is indispensable for high definition displays.



High-voltage amp.

High-voltage switching (HVP: High-voltage planar process). For PNP, (-) sign is omitted.

Type No.	Package	Absolute Maximum Ratings /Ta=25°C				Electrical Characteristics /Ta=25°C									
		V _{CBO} (V)	V _{CEO} (V)	I _C (mA)	P _C (W)	V _{CE} (V)	I _C (mA)	h _{FE} min max	V _{CE} (V)	I _C (mA)	f _T typ (MHz)	C _{ob} typ (PF)	I _C (mA)	I _B (mA)	V _{CE(sat)} max (V)
2SA1967	TO-220	900	900	10	1.75	5	1	20 50	10	1	6	2.2	0.5	0.1	1
2SC4572		800	800	20	1.75		2	20 50		2	40	1.6	10	2	1
2SC4578		1700	900	50	1.75		2	20 120		2	6	2	5	1	5
2SC4579		2000	900	20	1.75		1	20 120		1	6	1.6	2	0.4	5
2SA1968LS	TO220FI (LS)	900	900	10	2		1	20 50		1	6	2.2	0.5	0.1	1

These specifications are subject to change without notice. In addition to these, TO-220MFs are available. see the table.

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
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Large-Signal Transistors

ZP, SMP, SMP-FD, 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.
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

ML:No insulating needed.

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

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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 fre
3'rd S: Single

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

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

XP package is excluded.

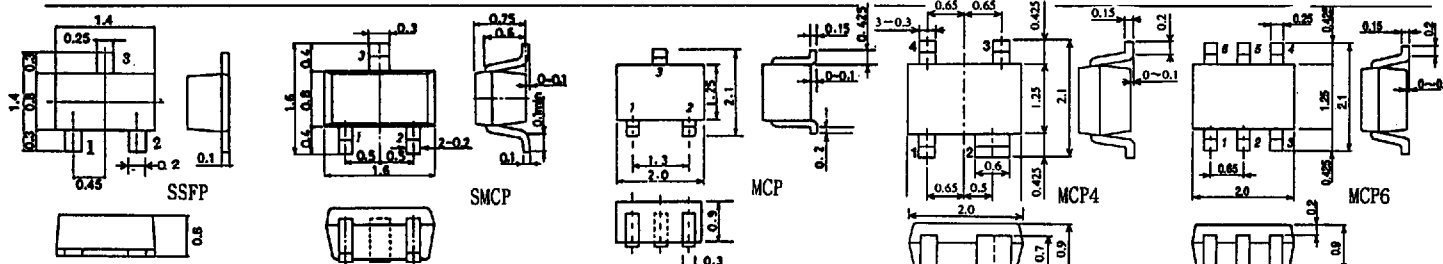
***:How to name CPH3/6 devices. Package name followed by 1,2,3 or 4 and then tow-digit**

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

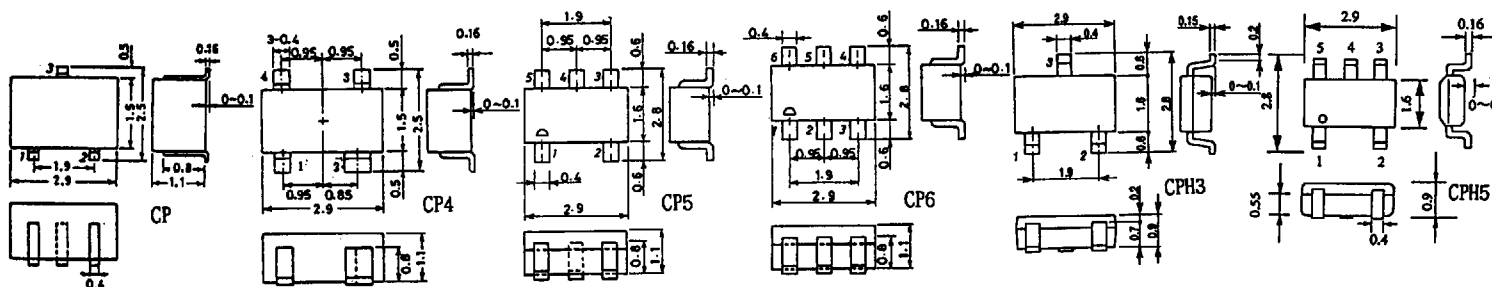
Surface Mount Type Outlines (JEDEC and EIAJ name are in parentheses.)

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

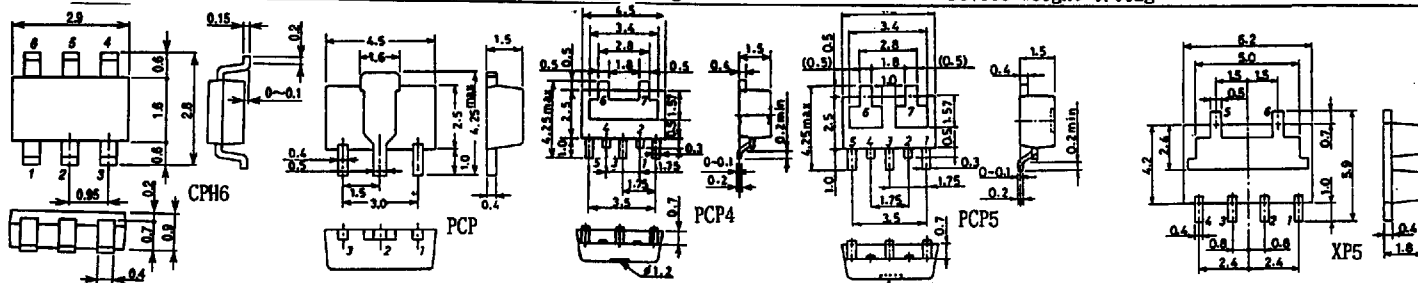
SANYO:SSFP	SANYO:SMCP(SC-75A)	SANYO:MCP(SC-70), MCP4(SC-82, A), MCP6
Device weight:0.002g	Device weight:0.003g	Device weight:0.006g, 0.007g, 0.007g



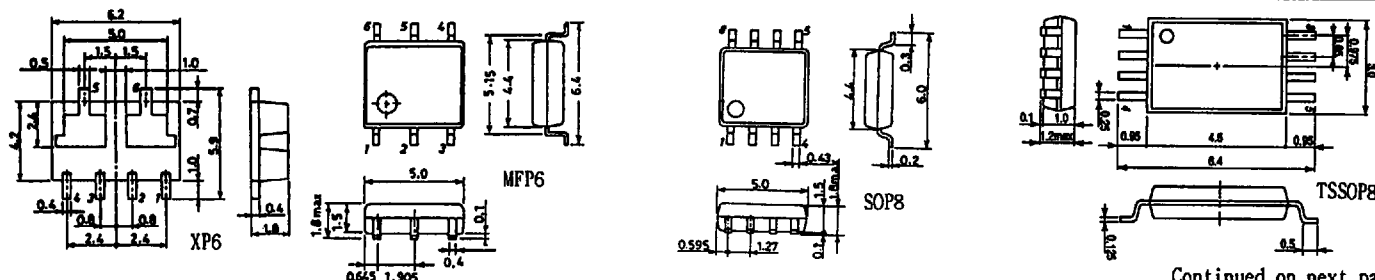
SANYO:CP(SC-59, TO-236)	SANYO:CP4, CP5, CP6(SC-61, SC-74A, SC-74, SOT143)	SANYO:CPH3, CPH5
Device weight:0.013g	Device weight:0.013g, 0.014g, 0.015g	Device weight:0.013g, 0.015g



SANYO:CPH6	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



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)

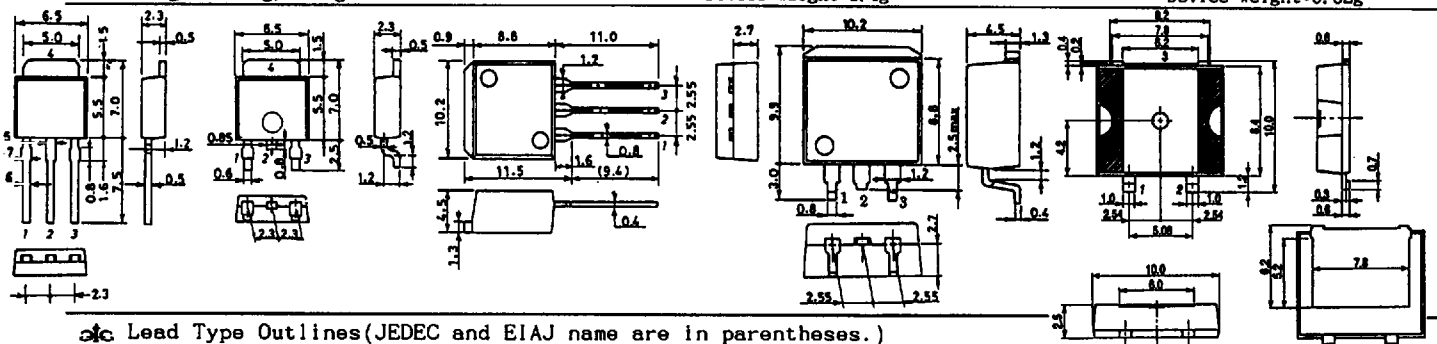
Device weight:0.315g, 0.282g

SANYO: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)

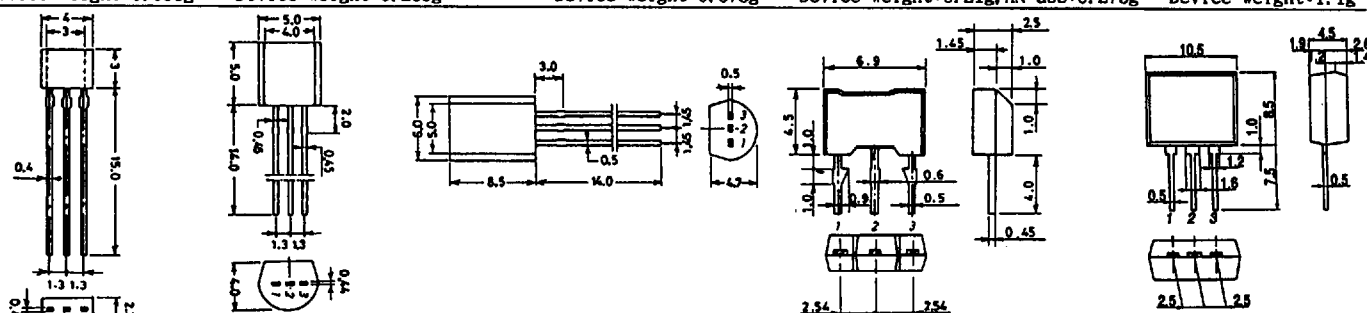
Device weight:0.578g

SANYO:NMP(SC-71)

Device weight:0.21g, AN use:0.275g

SANYO:FLP

Device weight:1.1g

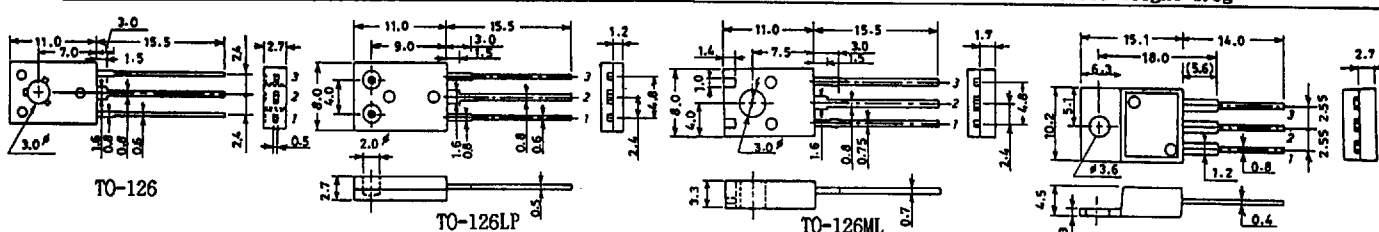


SANYO:TO-126(TO-126, TO-225, SOT-32), TO-126LP, TO-126ML(SOT-82)

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)

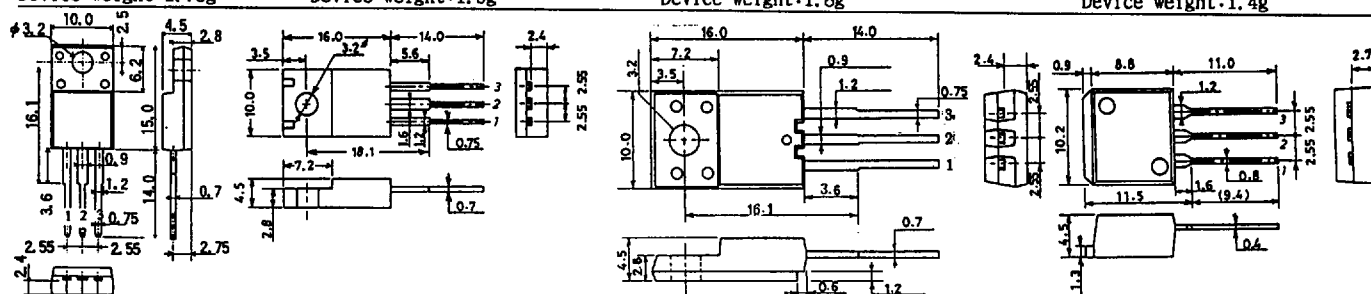
Device weight:1.9g

SANYO:TO-220FI(1S)(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

