

TO-220MF (Mini Fin) Power Transistor Series

SANYO

Features

Sanyo power transistor case outline TO-220MF (Mini Fin) is a small-sized package suited for mounting on electronic equipment that is limited in height. When mounted on the board, the height above the board is approximately 10mm lower compared with the TO-220 type heretofore in use.

For PNP, (-) sign is omitted. ☆:Tc=25°C

Type No.	Main Use	Absolute Maximum Ratings/Ta=25°C				Electrical Characteristics/Ta=25°C								Related Type No. (TO-220)
		V _{CEO} (V)	V _{CE0} (V)	I _C (A)	P _C (W)	V _{CE} (V)	I _C (A)	h _{FE}	I _C (A)	I _B (A)	V _{CE(sat)} max (V)	f _T typ (MHz)		
2SB1267 2SD1903	High-current switching	60	30	8	1.65	2	1	70 ~ 280	3	0.15	0.5 0.4	120	B919 D1235	
2SB1268 2SD1904		60	50	5	1.65	2	1	70 ~ 280	3	0.3	0.4	30	B824 D1060	
2SB1269 2SD1905		60	50	7	1.65	2	1	70 ~ 280	4	0.4	0.4	10	B825 D1061	
2SB1270 2SD1906		90	80	5	1.65	2	1	70 ~ 280	3	0.3	0.5 0.4	20	B920 D1236	
2SB1271 2SD1907		90	80	7	1.65	2	1	70 ~ 280	4	0.4	0.5 0.4	20	B921 D1237	
2SC4030	High-voltage amp High-voltage switching	1700	900	50m	1.2	5	2m	20 ~ 120	5m	1m	5	6	C4578	
2SC4031		2000	900	20m	1.2	5	1m	20 ~ 120	2m	0.4m	5	6	C4579	
2SC4493		800	800	20m	1.65	5	2m	20 ~ 50	10m	2m	1	40	-	
2SC4171	Switching (Standard type)	800	500	3	☆40	5	0.3	15 ~ 50	1.5	0.3	1	18	C3086	
2SC4172				5	☆50		0.6		3	0.6			C3087	
2SC4219	Switching (High-speed type)	500	400	4	☆40		0.4		2	0.4	0.8	20	C4105	
2SC4220				7	☆50		0.8		4	0.8			C4106	
2SC4221		800	500	3	☆40		0.3	1.5	0.3	1	18	C3446		
2SC4222				5	☆50		0.6	3	0.6			C3447		
2SC4223		1100	800	1.5	☆40		0.1	10 ~ 40	0.75	0.15	2	15	C3456	
2SC4224				3	☆50		0.2		1.5	0.3			C3457	
2SB1471 2SD2223	Various drivers	70	60	4	☆30	2	2	min 2000	2	4m	1.5	20	B880 D1190	
2SB1472 2SD2224				7	☆35		3.5		3.5	7m			B881 D1191	
2SD2048 2SD2049 2SD2050			110	100	3 5 8	☆30 ☆35 ☆40	3	1.5 2.5 4	min 1500	1.5 2.5 4	3m 5m 8m	1.5	20	D1194 D1195 D1196

* Classification by h_{FE} (2SB1267-B1271, 2SD1903-D1907)

7 0	Q	1 4 0	1 0 0	R	2 0 0	1 4 0	S	2 8 0
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Switching regulators (V_{CEO}=400V, 500V)

1 5	L	3 0	2 0	M	4 0	3 0	N	5 0
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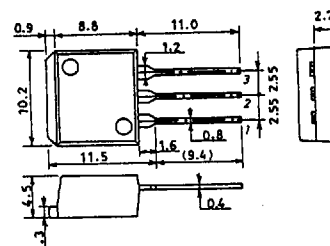
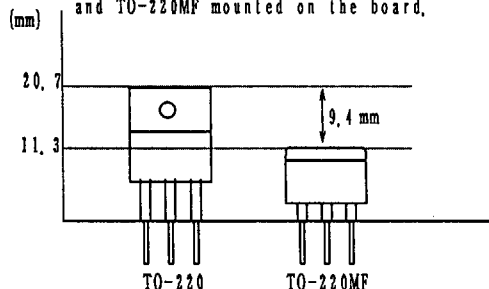
Switching regulators (V_{CEO}=800V)

1 0	K	2 0	1 5	L	3 0	2 0	M	4 0
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* Case Outline (unit:mm)

1:Base,
2:Collector
3:Emitter

* Comparison of height between the TO-220 and TO-220MF mounted on the board.



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
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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
TO-126LP	Large-Power
TO-126ML	Micaless
TO-220, 220ML	ML:Micaless type
TO-220C	CI:Compact Isolation
TO-220F(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)

2nd S: SOP8 package

2'nd W: Double chips
2'nd T: TSSOP8 package

2nd I: TSSOP8 package
2nd C: CP5/6 package

2'nd P: PCP4/5 package

2nd X: XP5/6 package

2'nd D: Dual type

2'nd H: Ultra high fre
3'rd S: Single

3 rd S: Single

nos. of 1XX or 1XXX are n-channel types

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

XP package is excluded.

XP

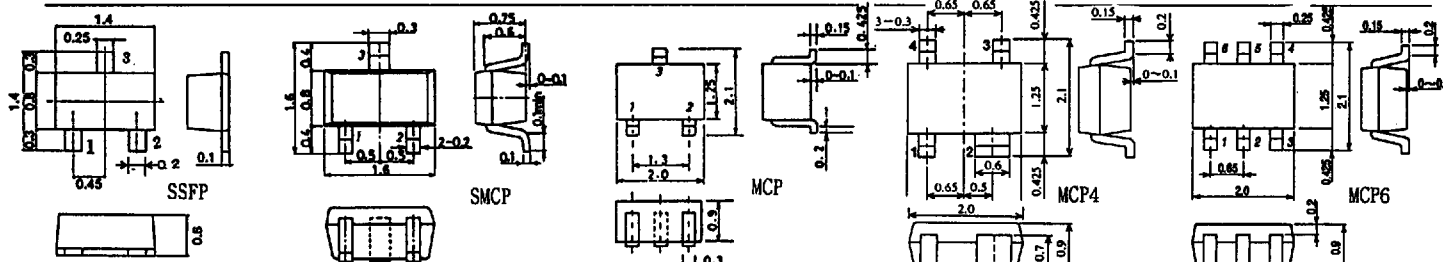
***:How to name CPH3/6 devices. Package name followed by 1,2,3 or 4 and then tow-digit**

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

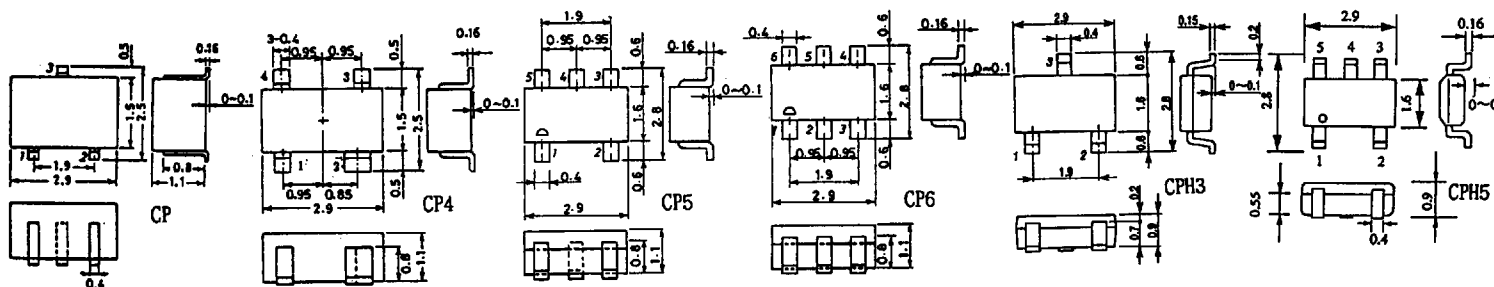
Surface Mount Type Outlines (JEDEC and EIAJ name are in parentheses.)

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

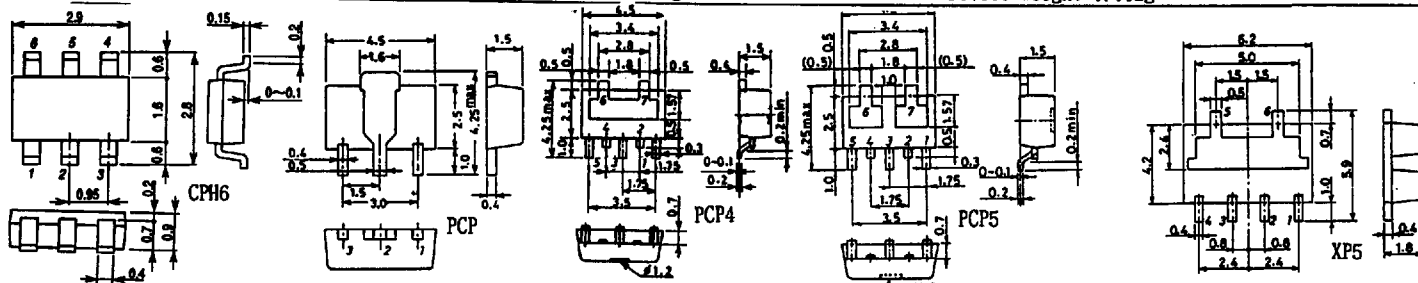
SANYO:SSFP	SANYO:SMCP(SC-75A)	SANYO:MCP(SC-70), MCP4(SC-82, A), MCP6
Device weight:0.002g	Device weight:0.003g	Device weight:0.006g, 0.007g, 0.007g



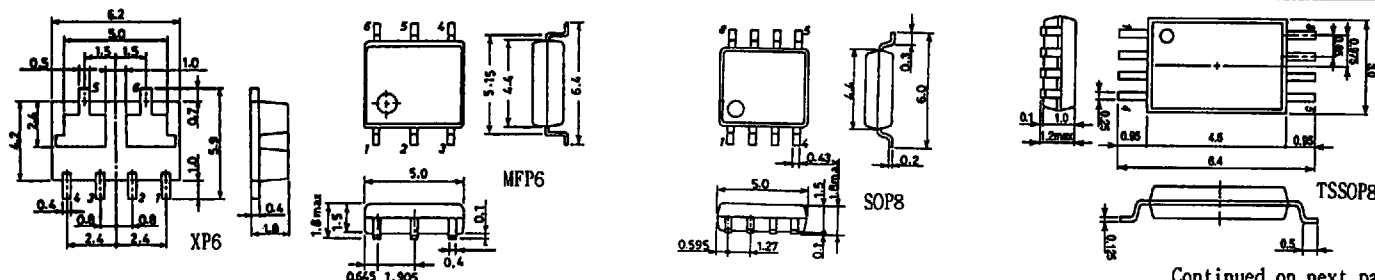
SANYO:CP(SC-59, TO-236)	SANYO:CP4, CP5, CP6(SC-61, SC-74A, SC-74, SOT143)	SANYO:CPH3, CPH5
Device weight:0.013g	Device weight:0.013g, 0.014g, 0.015g	Device weight:0.013g, 0.015g



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



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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)

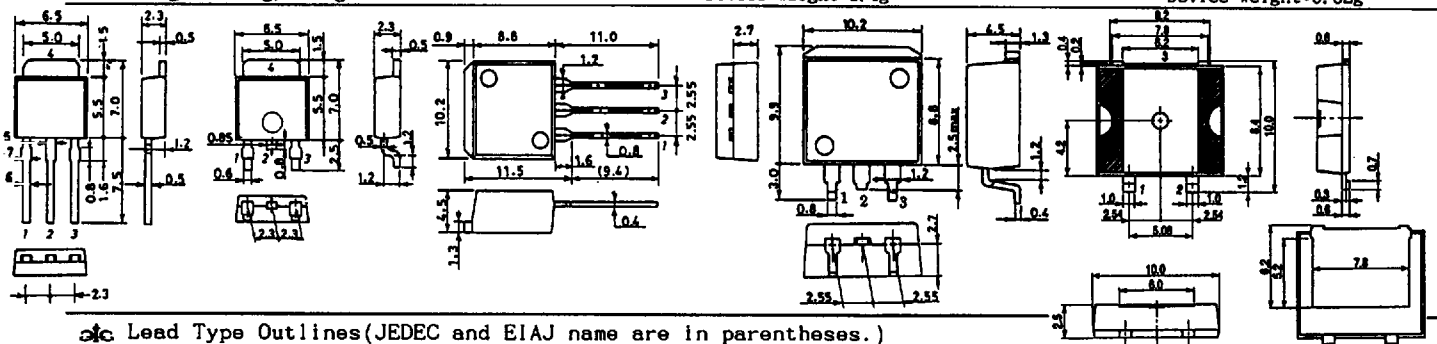
Device weight:0.315g, 0.282g

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)

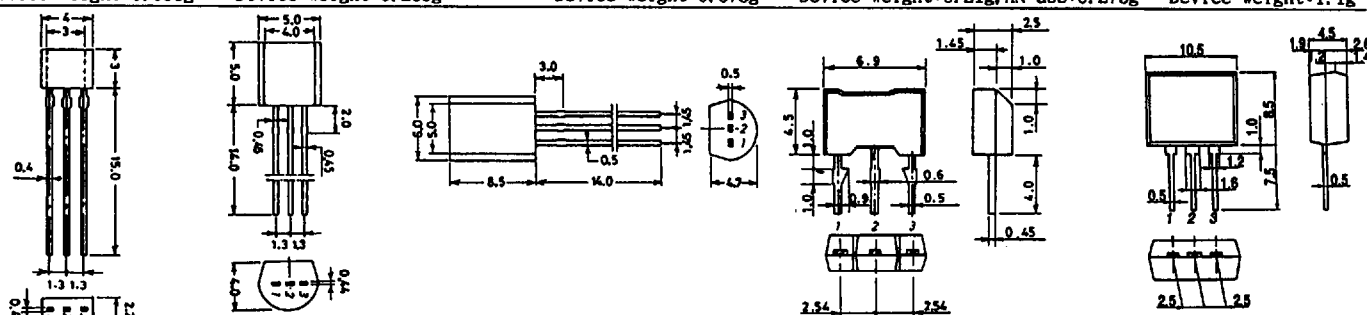
Device weight:0.578g

SANYO:NMP(SC-71)

Device weight:0.21g, AN use:0.275g

SANYO:FLP

Device weight:1.1g

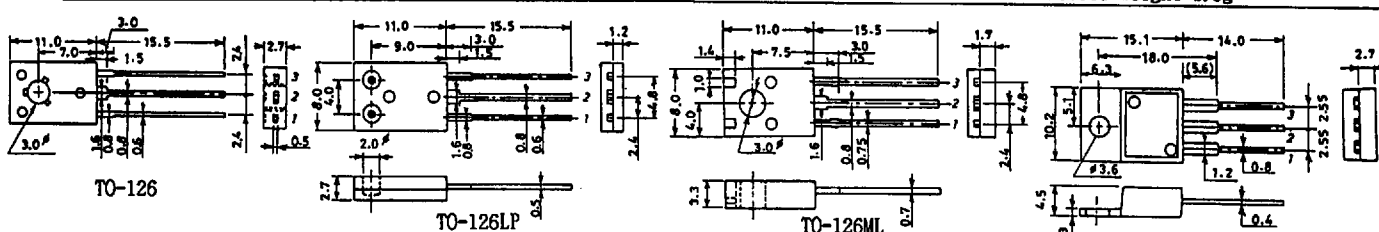


SANYO:TO-126(TO-126, TO-225, SOT-32), TO-126LP, TO-126ML(SOT-82)

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)

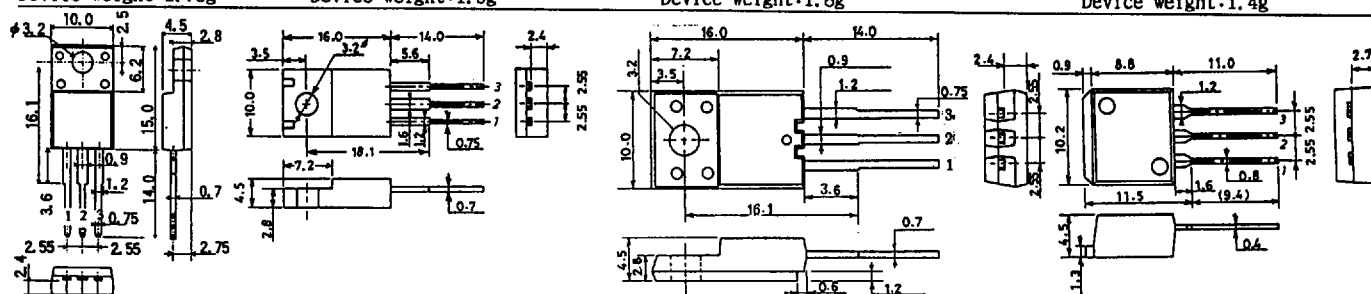
Device weight:1.9g

SANYO:TO-220FI(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

