

# Transistors

## TO-92L TO-92LS MRT

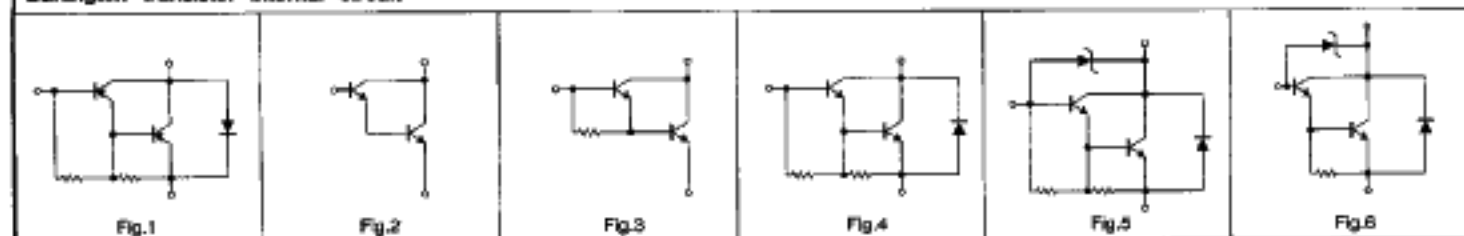
TO-92L is a high power version of TO-92 and TO-92LS is a slimmed TO-92L.

MRT is a 1.2W package power taped transistor designed for use with an automatic placement machine.

Application	Package			V <sub>CEO</sub> (V) *V <sub>CEB</sub>	I <sub>C</sub> (A)	I <sub>C</sub> Max. (A)	P <sub>C</sub> (W) (T <sub>a</sub> =25°C)			h <sub>FE</sub>	h <sub>FE</sub> Rating ext.	V <sub>CE</sub> (V)	I <sub>C</sub> (mA)	Internal circuit
	TO-92L	TO-92LS	MRT				TO-92L	TO-92LS	MRT					
Low Noise	-	2SA1819	-	-150	-0.05	-	-	0.8	-	120~390	Q R	-6	-2	-
	-	2SC4720	-	-150	0.05	-	-	0.8	-	120~390	Q R	6	2	-
Driver	2SA934	2SA1818	2SB1329	-32	-1	-2	0.75	0.9	1.2	82~390	P Q R	-3	-100	-
	2SA935	2SA1902	2SB1330	-80	-0.7	-	0.75	0.9	1.2	82~390	P Q R	-3	-100	-
	2SB1010	2SB1595	2SB1331	-32	-2	-3	0.75	0.9	1.2	82~390	P Q R	-3	-500	-
	2SB1041	-	2SB1332	-80	-1	-	0.9	-	1.2	82~390	P Q R	-3	-100	-
	2SB1043	-	-	-80	-1	-	0.9	-	-	82~390	P Q R	-3	-100	-
	2SB1212	2SB1596	2SB1328	-180	-1.5	-	0.9	0.9	1.2	56~270	N P Q	-5	-100	-
	2SB1425	-	-	-20	-2	-3	1.0	-	-	270~1200	S E U	-6	-500	-
	-	-	2SB1517	-50	-3	-	-	-	1.2	56~390	N P Q R	-3	-500	-
	2SC2060	2SC4719	2SD2005	32	1	2	0.75	0.9	1.2	82~390	P Q R	3	100	-
	2SC2061	2SC5061	2SD2006	80	0.7	1	0.75	0.9	1.2	82~390	P Q R	3	100	-
	2SD1292	-	2SD2008	80	1	2	0.9	-	1.2	82~390	P Q R	3	500	-
	2SD1384	2SD2450	2SD2007	32	2	2.5	0.75	0.9	1.2	82~390	P Q R	3	900	-
	2SD1812	2SD2451	2SD2004	180	1.5	-	0.9	0.9	1.2	56~270	N P Q	5	100	-
	-	-	2SD2146	50	3	-	-	-	1.2	56~390	N P Q R	3	500	-
Low V <sub>CE(sat)</sub>	-	2SA1903	-	-20	-3	-	-	0.9	-	82~390	P Q R	-2	-100	-
	2SB1374	2SA1820	-	-50	-2	-5	1.0	0.9	-	82~270	P Q	-2	-500	-
	-	2SC5062	-	20	3	-	-	0.9	-	120~560	Q R S	2	100	-
	2SD2069	2SC4721	-	50	2	5	1.0	0.9	-	82~270	P Q	2	500	-
Strobe Flash Low V <sub>CE(sat)</sub>	2SB1306	-	2SB1482	-20	-5	-10	1.2	-	1.2	82~390	P Q R	-2	-500	-
	2SD1961	-	-	20	5	10	1.2	-	-	120~560	Q R S	2	500	-
Chrome	2SC3259	2SC4722	2SC4243	300	0.1	-	0.75	0.9	1.0	39~180	M N P	10	10	-
High h <sub>FE</sub>	2SB1425	-	2SB1461	-20	-2	-3	1.0	-	1.2	270~820	S E	-6	-500	-
	2SD2159	-	-	25	2	3	1.0	-	-	390~2700	E U V W	6	500	-
High h <sub>FE</sub> High V <sub>CEO</sub>	2SD2172	-	-	25	1.2	2	1	-	-	560~2700	U V W	5	500	-
Darlington	2SB1256	-	2SB1333	-100	-2	-	1.2	-	1.2	1k~10k	-	-2	-1000	Fig.1
	-	-	2SB1515	-80	-4	-	-	-	1.2	1k~10k	-	-3	-2000	Fig.1
	-	-	2SD2452	31±4	2	3	-	-	1.2	1k~10k	-	2	1000	Fig.5
	2SD1809	-	2SD2009	60*	1	-	0.9	-	1.2	2k~	-	3	500	Fig.2
	2SD1929	-	2SD2010	60±10	2	-	1.2	-	1.2	1k~10k	-	2	1000	Fig.5
	2SD1930	-	2SD2011	100	2	-	1.2	-	1.2	1k~10k	-	2	1000	Fig.4
	-	-	2SC4724	100	3	5	-	-	1.2	2k~10k	-	2	1500	Fig.4
	2SD1931	-	-	60±10	1.5	-	0.9	-	-	1k~30k	-	2	1000	Fig.6
	-	-	2SD2308	80	4	-	-	-	1.2	1k~10k	-	3	2000	Fig.4
-	-	2SD2309	60	4	-	-	-	1.2	1k~10k	-	3	2000	Fig.3	
Darlington Driver	-	-	2SD2366	90 <sup>±20</sup> / <sub>10</sub>	2	3	-	-	1.2	1k~10k	-	2	1000	Fig.5
High Voltage SW	2SA1684	-	-	-400	-0.1	-0.2	0.9	-	-	56~270	N P Q	-10	-10	-
	2SA1780	2SA1884	2SA1809	-400	-0.5	-1	0.9	0.9	1.2	56~270	N P Q	-5	-50	-
	2SA1760	-	-	-400	-0.1	-0.2	0.9	-	-	56~270	N P Q	-10	-10	-
	-	-	2SA1861	-400	-2	-4	-	-	1.2	56~180	N P	-5	-100	-
	2SC4166	-	-	400	0.1	-	0.9	-	-	56~270	N P Q	10	10	-

Note: \*Under development

Darlington transistor internal circuit



[查询"2SB1306"供应商](#)

**Product Designation**

- When ordering, specify the type.
- Check each code against the tables shown below.
- Fill a space with the next character.

**Special code**

- Only for standard product.
- Factory assigned for custom product.

**2 S A 9 3 4**

Part No.

**T 1 0 3**

**Packaging**

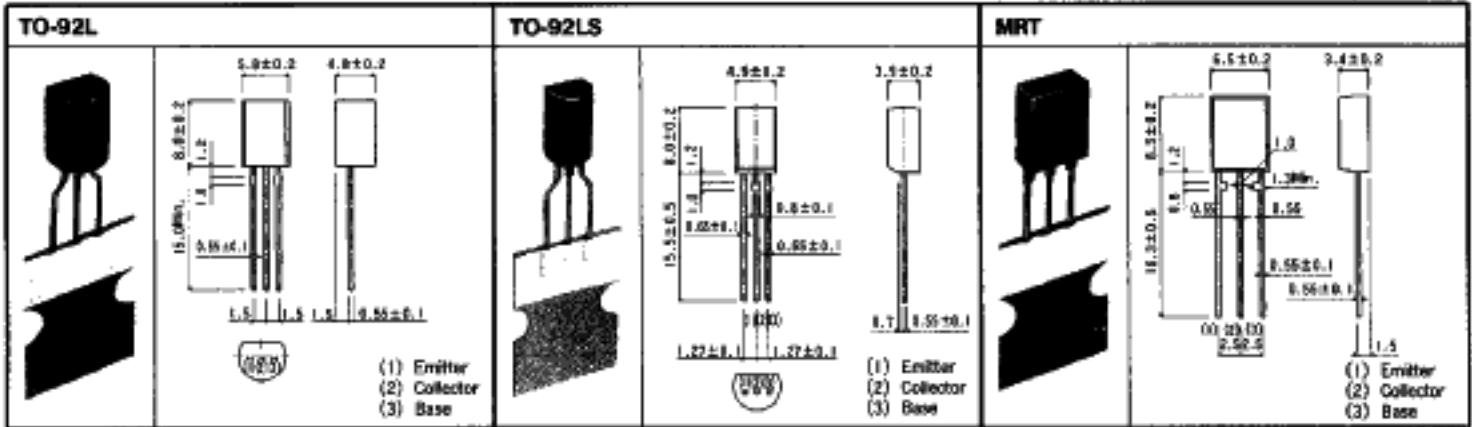
Package	Code	Package quantity	Quantity/Package (pcs)
TO-92L	T103	Ammo box	2,500
	None	Bulk	500
TO-92LS	TE4	Ammo box	3,000
	None	Bulk	1,000
MRT	T106	Ammo box	2,000

**h<sub>FE</sub> Ranking code**

Input h<sub>FE</sub> rank signal display  
 One rank preferred  P   
 Multiple rank preferred  P  R  
 (Min., Max. is displayed)

Code	h <sub>FE</sub> Range	Code	h <sub>FE</sub> Range
L	27~55	E	300~620
M	38~62	U	500~1200
N	56~120	V	820~1800
P	82~180	W	1200~2700
Q	120~270	A	1k~
R	180~390	B	5k~
S	270~580	C	10k~

(Unit : mm)



Magazine taping of TO-92L and TO-92LS : lead formed as shown below.

**Packaging Specifications**

(Unit : mm)

**TO-92L · TO-92LS Taping**

Symbol	TO-92L	TO-92LS	Symbol	TO-92L	TO-92LS
A	5.8±0.2	4.9±0.2	F <sub>0</sub>	5.0 <sup>+0.4</sup> <sub>-0.4</sub>	5.0 <sup>+0.4</sup> <sub>-0.4</sub>
B	4.8±0.2	3.9±0.2	F <sub>1</sub>	2.5 <sup>+0.5</sup> <sub>-0.5</sub>	2.5 <sup>+0.5</sup> <sub>-0.5</sub>
C	3.0Min.	3.0Min.	W	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>
H	8.0±0.2	8.0±0.2	H <sub>0</sub>	16.0±0.5	16.0±0.5
d	0.55±0.1	0.55±0.1	W <sub>0</sub>	6.0±0.5	6.0±0.3
P	12.7±1.0	12.7±1.0	W <sub>1</sub>	8.0±0.5	8.0±0.4
P <sub>0</sub>	12.7±0.5	12.7±0.5	Δh	0±1.0	0±1.0
D <sub>0</sub>	≤4.0±0.2	≤4.0±0.2	Δh <sub>1</sub>	0±0.5	0±0.5
P <sub>1</sub>	6.35±0.4	6.35±0.4	t	0.7±0.2	0.7±0.2

**MRT Taping**

**TO-92L · TO-92LS · MRT Ammo box**

	W	H	D
TO-92L	340	317	48
TO-92LS	340	270	48
MRT	340	317	48

Transistors

Transistors

The Case and Lead-etching Data for Standard and Special Standard Products, Units

Page 152