

Transistors

TO-92L • TO-92LS • MRT

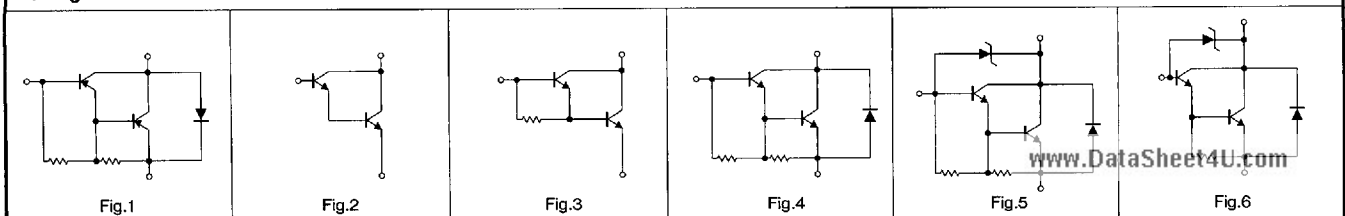
TO-92L is a high power version of TO-92 and TO-92LS is a slimmed TO-92L.

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

| Application | Package | | | V _{CE0} (V) *V _{CES} | I _c (A) | I _c Max. (A) | P _c (W) (T _a =25°C) | | | h _{FE} | h _{FE} Ranking code | V _{CE} (V) | I _c (mA) | Internal circuit |
|---|----------|---------|----------|---|--------------------|-------------------------|---|---------|--------|-----------------|------------------------------|---------------------|---------------------|------------------|
| | TO-92L | TO-92LS | MRT | | | | TO-92L | TO-92LS | MRT | | | | | |
| | Part No. | | | | | | | | | | | | | |
| 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 | — | — | -50 | -1 | — | 0.9 | — | — | 82~390 | P Q R | -3 | -100 | — |
| | 2SB1212 | 2SB1596 | 2SB1328 | -160 | -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 | 500 | — |
| | 2SD1812 | 2SD2451 | 2SD2004 | 160 | 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 _{CE(sat)} | — | 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 | — |
| Strobo Flash Low V _{CE(sat)} | 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 | — |
| Chroma | 2SC3269 | 2SC4722 | 2SC4243 | 300 | 0.1 | — | 0.75 | 0.9 | 1.0 | 39~180 | M N P | 10 | 10 | — |
| High h _{FE} | 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 _{FE} High V _{EBO} | 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 | — | — | 2SD2388 | 90 ⁺²⁰ ₋₁₀ | 2 | 3 | — | — | 1.2 | 1k~10k | — | 2 | 1000 | Fig.5 |
| High Voltage SW | 2SA1584 | — | — | -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



●Product Designation

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

Special code

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

2 S A 9 3 4

Part No.

T 1 0 3

Packaging

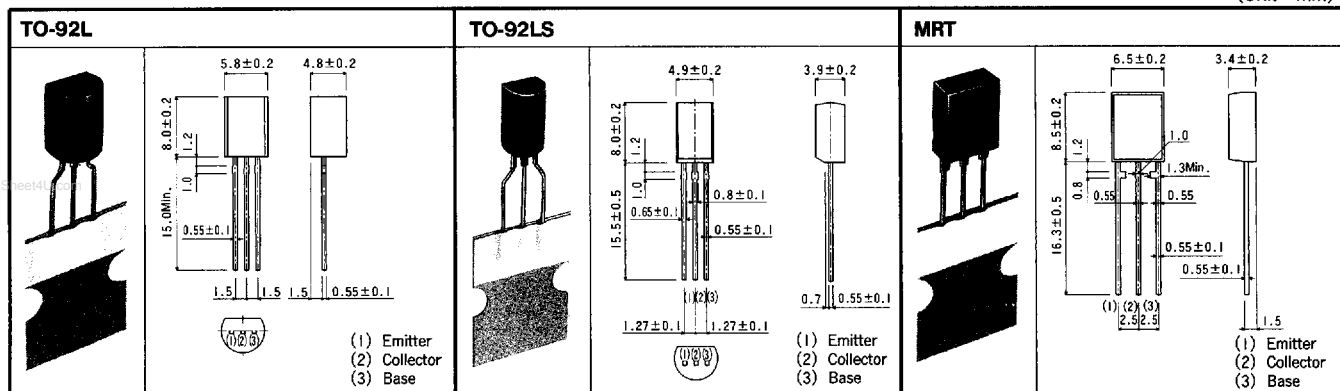
| Package | Code | Package specifications | Quantity /Package (pcs) |
|---------|------|------------------------|-------------------------|
| TO-92L | T103 | Ammo box | 2,500 |
| | None | Bulk | 500 |
| TO-92LS | TE4 | Ammo box | 3,000 |
| | None | Bulk | 1,000 |
| MRT | T105 | Ammo box | 2,000 |

h_{FE} Ranking code

Input h_{FE} rank signal display
 One rank preferred P
 Multiple rank preferred P R
 (Min., Max. is displayed)

| Code | h _{FE} Range | Code | h _{FE} Range |
|------|-----------------------|------|-----------------------|
| L | 27~56 | E | 390~820 |
| M | 39~82 | U | 560~1200 |
| N | 56~120 | V | 820~1800 |
| P | 82~180 | W | 1200~2700 |
| Q | 120~270 | A | 1k~ |
| R | 180~390 | B | 5k~ |
| S | 270~560 | C | 10k~ |

(Unit : mm)



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

●Packaging Specifications

(Unit : mm)

