

Transistors

TO-92 (JEDEC Standards Numbers)

●NPN Transistors

General purpose small signal amplifiers

| Part No. | Package | V_{CB0} Min. | V_{CE0} Min. | V_{EB0} Min. | I_{CB0} Max. | @ V_{CB} | h_{FE} Min. Max. | @ I_C & V_{CE} | $V_{CE(sat)}$ Max. | $V_{BE(sat)}$ & Max. | @ I_C | C_{ob} Max. | f_T Min. | @ I_C | NF | I_C Max. |
|-------------------|-------------------------|-------------------|-------------------|-------------------|--------------------|------------|-----------------------|--|---------------------------|-------------------------|--------------|------------------|---------------|---------|-----------------|---------------|
| 2N2925 | TO-92 (ECB) | 25V | 25V | 5V | 100nA | 25V | 235 470 | 2.0mA 10V | | | | 10pF | 180MHz | Typ. | | 200mA |
| 2N3711 MPS3711 | TO-92 (ECB) (EBC) | 30V | 30V | 6V | 100nA | 20V | 180 660 | 1.0mA 5V | 1.0V | | 10mA | | | | | 200mA |
| 2N3860 | TO-92 (ECB) | 30V | 30V | 4V | 50nA | 40V | 150 300 | 2.0mA 4.5V | 0.125V | | 10mA | 4pF | 90MHz | 2.0mA | | 100mA |
| 2N5088 | TO-92 (EBC) | 35V | 30V | 4.5V | 100nA | 30V | 300 350 300 | 100 μ A 5V 1.0mA 5V 10mA 5V | 0.3V | 0.8V | 10mA | 4pF | 50MHz | 0.5mA | 3dB | 200mA |
| 2N5172 MPS172 | TO-92 (ECB) (EBC) | 25V | 25V | 5V | 100nA | 25V | 100 500 | 10mA 10V | 0.25V | 1.2V | 10mA | 10pF | 200MHz | Typ. | | 200mA |
| 2N5210 | TO-92 (EBC) | 50V | 50V | 4.5V | 50nA | 35V | 200 250 250 | 100 μ A 5V 1.0mA 5V 10mA 5V | 0.7V | 0.85V | 10mA | 4pF | 30MHz | 0.5mA | 2dB | 200mA |
| 2N5232A | TO-92 (ECB) | 70V | 50V | 5V | 100nA | 50V | 250 500 | 2mA 5V | 0.125V | | 10mA | 4pF | | | 5dB | 100mA |
| MPS8097 | TO-92 (EBC) | 60V | 40V | 6V | 30nA 10 μ A | 40V 60V | 250 700 | 100 μ A 5V | 0.65V ($V_{BE(on)}$) | | 100mA | 4pF | 200MHz | 10mA | 2dB | 200mA |
| MPS-A09 | TO-92 (EBC) | 50V | 50V | 3V | 100nA | 25V | 100 600 | 100 μ A 5V | 0.9V | | 10mA | 5pF | 30MHz | 0.5mA | 1.4dB (Typ.) | 200mA |
| MPS-A18 | TO-92 (EBC) | 45V | 45V | 6.5V | 50nA | 30V | 400 500 500 | 10 μ A 5V 100 μ A 5V 1.0mA 5V 10mA 5V | 0.2V 0.3V | | 10mA 50mA | 3pF | 100MHz | 1mA | 4dB (Typ.) | 200mA |
| MPS-A20 | TO-92 (EBC) | 40V | 40V | 4V | 100nA | 30V | 40 400 | 5mA 10V | 0.25V | | 10mA | 4pF | 125MHz | 5mA | | 100mA |

General purpose amplifiers and switches

| Part No. | Package | V_{CB0} Min. | V_{CE0} Min. | V_{EB0} Min. | I_{CB0} Max. | @ V_{CB} | h_{FE} Min. Max. | @ I_C & V_{CE} | $V_{CE(sat)}$ Max. | $V_{BE(sat)}$ & Max. | @ I_C | C_{ob} Max. | f_T Min. | @ I_C | t_{off} Max. | I_C Max. |
|-------------------|-------------------------|-------------------|-------------------|-------------------|-------------------|------------|-----------------------------------|--|-----------------------|-------------------------|----------------|------------------|---------------|---------|-------------------|---------------|
| PN2222 | TO-92 (EBC) | 60V | 30V | 5V | 100nA | 50V | 35 50 75 100 50 30 | 0.1mA 10V 1.0mA 10V 10mA 10V 150mA 10V 150mA 1V 500mA 10V | 0.4V 1.6V | 1.3V 2.6V | 150mA 500mA | 8pF | 250MHz | 20mA | | 600mA |
| PN2222A | TO-92 (EBC) | 75V | 40V | 6V | 100nA | 60V | 35 50 75 100 50 30 | 0.1mA 10V 1.0mA 10V 10mA 10V 150mA 10V 150mA 1V 500mA 10V | 0.3V 1V | 1.2V 2V | 150mA 500mA | 8pF | 250MHz | 20mA | 285ns | 600mA |
| 2N3704 MPS3704 | TO-92 (ECB) (EBC) | 50V | 30V | 5V | 100nA | 20V | 100 300 | 50mA 2V | 0.6V | 1.0V | 100mA | 12pF | 100MHz | 50mA | | 800mA |
| 2N3706 MPS3706 | TO-92 (ECB) (EBC) | 40V | 20V | 5V | 100nA | 20V | 30 600 | 50mA 2V | 1.0V | 1.0V | 100mA | 12pF | 100MHz | 50mA | | 300mA |
| 2N3903 | TO-92 (EBC) | 80V | 40V | 6V | 50nA (CEX) | 30V | 20 35 50 30 15 | 0.1mA 1V 1.0mA 1V 10mA 1V 50mA 1V 100mA 1V | 0.2V 0.3V | 0.85V 0.95V | 10mA 50mA | 4pF | 250MHz | 10mA | 225ns | 200mA |

General purpose amplifiers and switches

| Part No. | Package | BV _{CBO} Min. | BV _{CEO} Min. | BV _{EBO} Min. | I _{CBO} Max. | h _{FE} | | | V _{CE} (sat) Max. | V _{BE} (sat) | | C _{ob} Max. | f _T Min. | t _{off} Max. | I _C Max. | | | |
|----------|----------------|---------------------------|---------------------------|---------------------------|--------------------------|------------------|-------|-------|-------------------------------|------------------------------------|-------|-------------------------|------------------------|--------------------------|------------------------|-------|------------------|-------|
| | | | | | | @V _{CB} | Min. | Max. | | @ I _C & V _{CE} | Max. | | | | | Max. | @ I _C | |
| 2N3904 | TO-92 (EBC) | 60V | 40V | 6V | 50nA | 30V | (CEX) | 40 | 0.1mA | 1V | 0.2V | 0.85V | 10mA | 300MHz | 250ns | 200mA | | |
| | | | | | | | | 70 | 1.0mA | 1V | | | | | | | | |
| | | | | | | | | 150 | 10mA | 1V | | | | | | | | |
| | | | | | | | | 60 | 50mA | 1V | | | | | | | | |
| | | | | | | | | 30 | 100mA | 1V | | | | | | | | |
| 2N4124 | TO-92 (EBC) | 30V | 25V | 5V | 50nA | 20V | 120 | 360 | 2.0mA | 1V | 0.3V | 0.95V | 50mA | 4pF | 300MHz | 10mA | 200mA | |
| | | | | | | | 60 | | 50mA | 1V | | | | | | | | |
| 2N4400 | TO-92 (EBC) | 60V | 40V | 6V | 100nA | 35V | 20 | 1.0mA | 1V | 0.4V | 0.95V | 150mA | 200MHz | 20mA | 255ns | 600mA | | |
| | | | | | | | 40 | 10mA | 1V | | | | | | | | | |
| | | | | | | | 50 | 150mA | 1V | | | | | | | | | |
| | | | | | | | 20 | 500mA | 2V | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| 2N4401 | TO-92 (EBC) | 60V | 40V | 6V | 100nA | 35V | 20 | 0.1mA | 1V | 0.4V | 0.95V | 150mA | 250MHz | 20mA | 225ns | 600mA | | |
| | | | | | | | 40 | 1mA | 1V | | | | | | | | | |
| | | | | | | | 80 | 10mA | 1V | | | | | | | | | |
| | | | | | | | 100 | 150mA | 1V | | | | | | | | | |
| | | | | | | | 40 | 500mA | 2V | | | | | | | | | |
| MPS6515 | TO-92 (EBC) | 40V | 25V | 4V | 50nA | 30V | 250 | 500 | 2mA | 10V | 0.5V | | 50mA | 3.5pF | 250MHz | 10mA | NF 2dB | 100mA |
| MPS6530 | TO-92 (EBC) | 60V | 40V | 5V | 100nA | 40V | 30 | 40 | 10mA | 1V | 0.5V | 1.0V | 100mA | 8pF | 390MHz | Typ. | | 600mA |
| MPS6531 | TO-92 (EBC) | 60V | 40V | 5V | 50nA | 40V | 60 | 90 | 10mA | 1V | 0.3V | 1.0V | 100mA | 5pF | 390MHz | Typ. | | 600mA |
| | | | | | | | 50 | 270 | 100mA | 10V | | | | | | | | |

Transistors

Medium power amplifiers

| Part No. | Package | BV _{CBO} Min. | BV _{CEO} Min. | BV _{EBO} Min. | I _{CBO} Max. | h _{FE} | | | V _{CE} (sat) Max. | V _{BE} (sat) | | C _{ob} Max. | f _T Min. | t _{off} Max. | I _C Max. | | | |
|----------|----------------|---------------------------|---------------------------|---------------------------|--------------------------|------------------|------|------|-------------------------------|------------------------------------|-------|-------------------------|------------------------|--------------------------|------------------------|------|------------------|-------|
| | | | | | | @V _{CB} | Min. | Max. | | @ I _C & V _{CE} | Max. | | | | | Max. | @ I _C | |
| MPS-A05 | TO-92 (EBC) | 60V | 60V | 4V | 100nA | 60V | 100 | 100 | 10mA | 1V | 0.25V | | 100mA | | 50MHz | 10mA | | 500mA |
| MPS-A06 | TO-92 (EBC) | 80V | 80V | 4V | 100nA | 80V | 100 | 100 | 10mA | 1V | 0.25V | | 100mA | | 50MHz | 10mA | | 500mA |

Darlington amplifiers

| Part No. | Package | BV _{CBO} Min. | BV _{CEO} Min. | BV _{EBO} Min. | I _{CBO} Max. | h _{FE} | | | V _{CE} (sat) Max. | V _{BE} (sat) | | C _{ob} Max. | f _T Min. | t _{off} Max. | NF | I _C Max. | | |
|----------|----------------|---------------------------|---------------------------|---------------------------|--------------------------|------------------|------|-------|-------------------------------|------------------------------------|------|-------------------------|------------------------|--------------------------|--------|------------------------|-------|------------------|
| | | | | | | @V _{CB} | Min. | Max. | | @ I _C & V _{CE} | Max. | | | | | | Max. | @ I _C |
| 2N6426 | TO-92 (EBC) | 40V | 40V | 12V | 50nA | 30V | 20k | 200k | 10mA | 5V | 1.2V | 2.0V | 5mA | 7pF | | 10dB | 500mA | |
| | | | | | | | 30k | 300k | 100mA | 5V | | | | | | | | |
| | | | | | | | 20k | 200k | 500mA | 5V | | | | | | | | |
| 2N6427 | TO-92 (EBC) | 40V | 40V | 12V | 50nA | 30V | 10k | 100k | 10mA | 5V | 1.2V | 2.0V | 50mA | 7pF | | 10dB | 500mA | |
| | | | | | | | 20k | 200k | 100mA | 5V | | | | | | | | |
| | | | | | | | 14k | 140k | 500mA | 5V | | | | | | | | |
| MPS-A13 | TO-92 (EBC) | (CES) 30V | | 10V | 100nA | 30V | 5k | 10k | 10mA | 5V | 1.5V | | 100mA | 10pF | 125MHz | 10mA | | 500mA |
| MPS-A14 | TO-92 (EBC) | (CES) 30V | | 10V | 100nA | 30V | 10k | 20k | 10mA | 5V | 1.5V | | 100mA | 10pF | 125MHz | 10mA | | 500mA |
| MPS-A26 | TO-92 (EBC) | (CES) 50V | | 10V | 100nA | 40V | 10k | 10k | 10mA | 5V | 1.5V | | 100mA | | | | | 500mA |
| MPS-A27 | TO-92 (EBC) | (CES) 60V | | 10V | 100nA | 50V | 10k | 10k | 10mA | 5V | 1.5V | | 100mA | | | | | 500mA |
| MPS-A28 | TO-92 (EBC) | (CES) 80V | | 12V | 100nA | 60V | 10k | 10k | 10mA | 5V | 1.5V | | 100mA | 8pF | 125MHz | 10mA | | 500mA |
| MPS-A29 | TO-92 (EBC) | (CES) 100V | | 12V | 100nA | 80V | 10k | 10k | 10mA | 5V | 1.2V | | 10mA | 8pF | 125MHz | 10mA | | 500mA |
| MPS-D04 | TO-92 (EBC) | 25V | | 10V | 1.0 μA | 20V | 1k | 10mA | 5V | 1.0V | | 100mA | | | | | 500mA | |
| | | | | | | | 2k | 100mA | 5V | | | | | | | | | |
| | | | | | | | 1k | 300mA | 5V | | | | | | | | | |

Transistors

TO-92 (JEDEC Standards Numbers)

●PNP Transistors

General purpose small signal amplifiers

| Part No. | Package | BV _{CEO} Min. | BV _{CE0} Min. | BV _{EBO} Min. | I _{CBO} Max. | @V _{CB} | | h _{FE} Min. Max. | @I _c & V _{CE} | V _{CE} (sat) & V _{BE} (sat) Max. Max. | | @ I _c | C _{ob} Max. | f _T Min. @ I _c | | t _{off} /NF Max. | I _c Max. |
|-------------------|-------------------------|---------------------------|---------------------------|---------------------------|--------------------------|------------------|-----------------|------------------------------|-----------------------------------|--|---------------------------------|------------------|-------------------------|---|----------------|------------------------------|------------------------|
| | | | | | | I _{CBO} | V _{CB} | | | V _{CE} (sat) | V _{BE} (sat) | | | f _T | I _c | | |
| 2N3703 MPS3703 | TO-92 (ECB) (EBC) | 50V | 30V | 5V | 100nA | 20V | | 30 150 | 50mA 5V | 0.25V | 1.0V (V _{BE} (on)) | 50mA | 12pF | 100MHz | 50mA | | 200mA |
| 2N5086 | TO-92 (EBC) | 50V | 50V | 3V | 100nA | 40V | | 150 500 150 150 | 100 μA 5V 1.0mA 5V 10mA 5V | 0.3V | 0.85V (V _{BE} (on)) | 10mA | 6pF | 40MHz | 0.5mA | NF 3dB | 200mA |
| 2N5087 | TO-92 (EBC) | 50V | 50V | 3V | 100nA | 40V | | 250 800 250 250 | 100 μA 5V 1.0mA 5V 10mA 5V | 0.3V | | 10mA | 6pF | 40MHz | 0.5mA | NF 2dB | 200mA |
| MPS-A70 | TO-92 (EBC) | 40V | 40V | 4V | 100nA | 30V | | 40 400 | 5mA 10V | 0.25V | | 10mA | 6pF | 125MHz | 5mA | | 100mA |

General purpose amplifiers and switches

| Part No. | Package | BV _{CEO} Min. | BV _{CE0} Min. | BV _{EBO} Min. | I _{CBO} Max. | @V _{CB} | | h _{FE} Min. Max. | @I _c & V _{CE} | V _{CE} (sat) & V _{BE} (sat) Max. Max. | | @ I _c | C _{ob} Max. | f _T Min. @ I _c | | t _{off} Max. | I _c Max. |
|----------|----------------|---------------------------|---------------------------|---------------------------|--------------------------|------------------|-----------------|---------------------------------------|--|--|-----------------------|------------------|-------------------------|---|----------------|--------------------------|------------------------|
| | | | | | | I _{CBO} | V _{CB} | | | V _{CE} (sat) | V _{BE} (sat) | | | f _T | I _c | | |
| PN2907 | TO-92 (EBC) | 60V | 40V | 5V | 100nA | 50V | | 35 50 75 100 100 300 30 30 | 0.1mA 10V 1.0mA 10V 10mA 10V 150mA 10V 500mA 10V | 0.4V 1.6V | 1.3V 2.6V | 150mA 500mA | 8pF | 200MHz | 50mA | 180ns | 600mA |
| PN2907A | TO-92 (EBC) | 60V | 60V | 5V | 100nA | 50V | | 75 100 100 100 100 300 50 50 | 0.1mA 10V 1.0mA 10V 10mA 10V 150mA 10V 500mA 10V | 0.4V 1.6V | 1.3V 2.6V | 150mA 500mA | 8pF | 200MHz | 50mA | 180ns | 600mA |
| 2N3906 | TO-92 (EBC) | 40V | 40V | 5V | 50nA (CES) | 30V | | 60 80 150 300 60 30 | 0.1mA 1V 1.0mA 1V 10mA 1V 50mA 1V 100mA 1V | 0.25V 0.4V | 0.85V 0.95V | 10mA 50mA | 4.5pF | 250MHz | 10mA | 300ns | 200mA |
| 2N4125 | TO-92 (EBC) | 30V | 30V | 4V | 50nA | 20V | | 50 150 25 25 | 2mA 1V 50mA 1V | 0.4V | 0.95V | 50mA | 4.5pF | 200MHz | 10mA | | 200mA |
| 2N4126 | TO-92 (EBC) | 25V | 25V | 4V | 50nA | 20V | | 120 360 60 60 | 2mA 1V 50mA 1V | 0.4V | 0.95V | 50mA | 4.5pF | 250MHz | 10mA | | 200mA |
| 2N4403 | TO-92 (EBC) | 40V | 40V | 5V | 100nA | 35V | | 30 60 100 100 100 300 20 20 | 0.1mA 1V 1mA 1V 10mA 1V 150mA 2V 500mA 2V | 0.4V 0.75V | 0.95V 1.3V | 150mA 500mA | 8.5pF | 200MHz | 20mA | 255ns | 600mA |
| 2N6076 | TO-92 (ECB) | 25V | 25V | 5V | 100nA (CES) | 25V | | 100 500 | 10mA 10V | 0.25V | 0.85V | 10mA | 13pF | 200MHz | Typ. | 260ns | 100mA |
| MPS3638 | TO-92 (EBC) | 25V | (CES) 25V | 4V | 100nA (CES) | 15V | | 20 30 30 20 | 10mA 10V 50mA 1V 300mA 2V | 0.25V 1.0V | 1.1V 2.0V | 50mA 300mA | 20pF | 100MHz | 50mA | 170ns | 500mA |
| MPS3638A | TO-92 (EBC) | 25V | (CES) 25V | 4V | 100nA (CES) | 15V | | 80 100 100 100 100 20 | 1.0mA 10V 10mA 10V 50mA 1V 300mA 2V | 0.25V 1.0V | 1.1V 2.0V | 50mA 300mA | 10pF | 150MHz | 50mA | 170ns | 500mA |
| MPS4250 | TO-92 (EBC) | 40V | 40V | 5V | 100nA | 40V | | 250 700 250 250 | 0.1mA 5V 1mA 5V 10mA 5V | 0.25V | | 10mA | 6pF | | | NF 2.0dB | 200mA |
| MPS6519 | TO-92 (EBC) | 40V | 25V | 4V | 50nA | 20V | | 250 500 150 150 | 2mA 10V 100mA 10V | 0.5V | | 50mA | 6pF | 200MHz | Typ. | NF 2.0dB | 100mA |
| MPS6534 | TO-92 (EBC) | 40V | 40V | 4V | 100nA | 30V | | 60 90 90 270 50 50 | 10mA 1V 100mA 1V 500mA 10V | 0.5V | 1.0V | 100mA | 8pF | 260MHz | Typ. | | 500mA |

● Medium power amplifiers

| Part No. | Package | BV _{CEO} Min. | BV _{CE0} Min. | BV _{EBO} Min. | I _{CEO} Max. | @V _{CB} | h _{FE} Min. | h _{FE} Max. | @I _c & V _{CE} | V _{CE} (sat) Max. | V _{BE} (sat) Max. | @ I _c | C _{ob} Max. | f _T Min. | @ I _c | t _{on} Max. | I _c Max. | |
|----------|-------------|------------------------|------------------------|------------------------|-----------------------|------------------|----------------------|----------------------|--|---------------------------------|----------------------------|--------------------------------|----------------------|---------------------|------------------|----------------------|---------------------|-------|
| 2N5819 | TO-92 (EBC) | 50V | 40V | 5V | 100nA | 25V | 150 | 300 | 2mA 500mA | 5V 2V | 0.75V | 1.2V | 500mA | 15pF | 135MHz | 50mA | | 750mA |
| MPS4354 | TO-92 (EBC) | 60V | 60V | 5V | 100nA | 50V | 25 | 40 | 0.1mA 1.0mA 10mA 100mA 500mA | 10V 10V 10V 10V 10V | 0.15V 0.50V | 0.9V 1.1V | 150mA 500mA | 30pF | 100MHz | 50mA | 400ns | 800mA |
| MPS6562 | TO-92 (EBC) | 25V | 25V | 5V | 100nA | 20V | 35 | 50 | 10mA 100mA 500mA | 1V 1V 3V | 0.50V | 1.2V | 500mA | 30pF | 60MHz | 10mA | | 500mA |
| MPS-A55 | TO-92 (EBC) | 60V | 60V | 4V | 100nA | 60V | 100 | 100 | 10mA 100mA | 1V 1V | 0.25V | 1.2V (V _{BE(on)}) | 100mA | | 50MHz | 100mA | | 500mA |
| MPS-A56 | TO-92 (EBC) | 80V | 80V | 4V | 100nA | 80V | 50 | 50 | 10mA 100mA | 1V 1V | 0.25V | 1.2V (V _{BE(on)}) | 100mA | | 50MHz | 100mA | | 500mA |

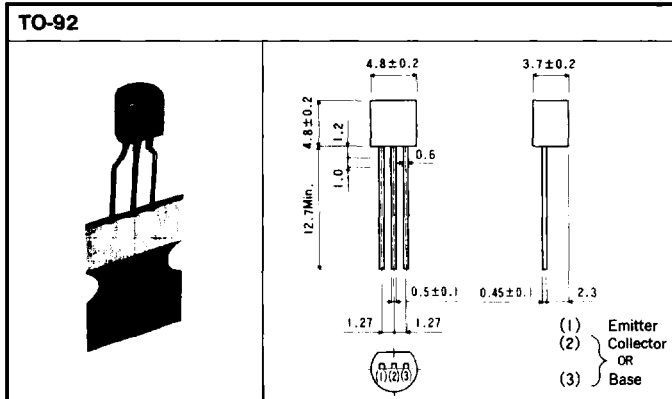
● Darlington amplifiers

| Part No. | Package | BV _{CEO} Min. | BV _{CE0} Min. | BV _{EBO} Min. | I _{CEO} Max. | @V _{CB} | h _{FE} Min. | h _{FE} Max. | @I _c & V _{CE} | V _{CE} (sat) Max. | V _{BE} (sat) Max. | @ I _c | C _{ob} Max. | f _T Min. | @ I _c | t _{off} /NF | I _c Max. |
|----------|-------------|------------------------|------------------------|------------------------|-----------------------|------------------|----------------------|----------------------|-----------------------------------|----------------------------|----------------------------|------------------|----------------------|---------------------|------------------|----------------------|---------------------|
| MPS-A63 | TO-92 (EBC) | 30V | 30V (CES) | 10V | 100nA | 30V | 5K | 10K | 10mA 100mA | 5V 5V | 1.5V | 100mA | 7pF | 125MHz | 10mA | | 500mA |
| MPS-A64 | TO-92 (EBC) | 30V | 30V (CES) | 10V | 100nA | 30V | 10K | 20K | 10mA 100mA | 5V 5V | 1.5V | 100mA | 7pF | 125MHz | 10mA | | 500mA |
| MPS-A65 | TO-92 (EBC) | 30V | 30V (CES) | 8V | 100nA | 30V | 50K | 20K | 10mA 100mA | 5V 5V | 1.5V | 100mA | | 100MHz | 10mA | 2dB Typ. | 500mA |

Transistors

TO-92

(Unit : mm)



● Packaging specifications

(Unit : mm)

