











Bipolar Power Product Selection Guide

Efficient, Reliable and Green



Thyristors

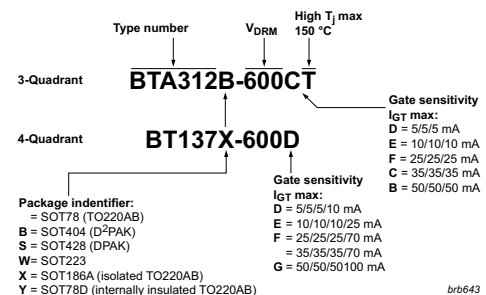
4-Quadrant Triacs

| $I_{T(RMS)}$ (A) | V_{DRM} (V) | I_{GT} (max) (mA) | SOT54 (TO92) | SOT78 (TO220AB) | SOT78D (internally insulated TO220AB) | SOT82 | SOT186A (isolated TO220AB) | SOT223 | SOT404 (D ² PAK) | SOT428 (DPAK) |
|------------------|---------------|---------------------|---|---|---|---|---|---|---|---|
| | | |  |  |  |  |  |  |  |  |
| 0.6 | 400 | 5/5/5/7 | MAC97A6 | | | | | | | |
| | 600 | 5/5/5/7 | MAC97A8 | | | | | | | |
| | 400 / 600 | 5/5/5/7 | BT1306-D | | | | | | | |
| 0.8 | 400 / 600 | 5/5/5/7 | BT1308-D | | | | | BT1308W-D | | |
| | 600 | 5/5/5/7 | Z00607MA | | | | | | | |
| 1 | 600 | 3/3/3/7 | | | | | | BT131W | | |
| | 600 / 800 | 3/3/3/7 | BT131 | | | | | | | |
| | 600 / 800 | 5/5/5/7 | BT131-D | | | | | | | |
| | 600 / 800 | 10/10/10/10 | BT131-E | | | | | | | |
| | 600 / 800 | 3/3/3/5 | Z0103MA/NA | | | | | Z0103MN/NN | | |
| | 600 / 800 | 5/5/5/7 | Z0107MA/NA | | | | | Z0107MN/NN | | |
| | 600 / 800 | 10/10/10/10 | Z0109MA/NA | | | | | Z0109MN/NN | | |
| | 600 / 800 | 3/3/3/5 | Z0103MA0/NA0** | | | | | Z0103MN0/NN0** | | |
| | 600 / 800 | 5/5/5/7 | Z0107MA0/NA0** | | | | | Z0107MN0/NN0** | | |
| | 600 / 800 | 10/10/10/10 | Z0109MA0/NA0** | | | | | Z0109MN0/NN0** | | |
| 4 | 600 | 5/5/5/10 | BT132-D* | | | | | | | |
| | 800 | D/E/-/G | | | | BT134 | | | | |
| | 600 | E/- | | | | BT134 | | | | |
| | 600 | D/- | | BT136 | | | BT136X | | | BT136S |
| | 600 | F | | | | | BT136X | | | BT136S |
| | 600 / 800 | E | | BT136 | | | BT136X | | BT136B | BT136S |
| | 800 | - | | | | | BT136X | | | BT136S |
| 6 | 600 | F/-/G | | | | | BT236X | | | |
| | 800 | -/G | | | | | BT236X | | | |
| 8 | 600 | D/-/G | | BT137 | | | BT137X | | | BT137S |
| | 600 | E | | BT137 | | | BT137X | | BT137B | BT137S |
| | 600 | F | | | | | BT137X | | BT137B | BT137S |
| | 800 | E | | BT137 | | | BT137X | | BT137B | BT137S |
| | 800 | F | | | | | | BT137B | | BT137S |
| | 800 | - | | BT137 | | | BT137X | | BT137B | |
| | 800 | G | | | | | | BT137B | | BT137S |
| 12 | 600 | D | | BT138 | | | BT138X | | | |
| | 600 | -/G | | BT138 | | | BT138X | | BT138B | |
| | 600 | F | | | | | BT138X | | BT138B | |
| | 600 / 800 | E | | BT138 | BT138Y | | BT138X | | BT138B | |
| | 800 | F | | | | | BT138X | | | |
| | 800 | - | | BT138 | | | BT138X | | | |
| 16 | 600 | E/- | | BT139 | | | BT139X | | BT139B | |
| | 600 | F | | | | | BT139X | | BT139B | |
| | 600 | G | | | | | BT139X | | BT139B | |
| | 800 | E | | BT139 | | | | | BT139B | |
| | 800 | F | | | | | | | BT139B | |
| | 800 | - | | BT139 | | | BT139X | | BT139B | |
| | 800 | G | | BT139 | | | | | BT139B | |
| 20 | 600 | 50/50/50/75 | | | | | MAC223A8X | | | |
| 25 | 400 | 50/50/50/75 | | MAC223A6 | | | | | | |
| | 600 / 800 | - | | BTA140 | | | | | | |

I_{GT} key:
D 5 mA (10 mA in 3+)
E 10 mA (25 mA in 3+)
F 25 mA (70 mA in 3+)
- 35 mA (70 mA in 3+)
G 50 mA (100 mA in 3+)

* Large chip / high I_{TSM}
** Enhanced immunity to false triggering





Triacs part numbering



Thyristors

3-Quadrant Triacs





types in **bold red** represent new products

| $I_{T(RMS)}$ (A) | V_{DRM} (V) | I_{GT} (max) (mA) | SOT54 (TO92) | SOT78 (TO220AB) | SOT78D (internally insulated TO220AB) | SOT186A (isolated TO220AB) | SOT223 | SOT404 (D ² PAK) | SOT428 (DPAK) |
|---------------------|------------------|------------------------|---|---|---|---|---------|--------------------------------|------------------|
| | | |  |  |  |  | | | |
| 0.8 | 600 / 800 | D/E | BTA2008 | | | | | | |
| 1 | 600 / 800 | B/E/ER | BTA201 | | | | | | |
| | 600 / 800 | E | | | | | BTA201W | | |
| 2 | 600 / 800 | D/E | | | | | | | |
| | 600 | B/C/D/E/F | | BTA204 | | BTA202X | | | BTA204S |
| | 800 | B/C/E | | BTA204 | | BTA204X | | | BTA204S |
| 4 | 1000 | C | | | | BTA204X | | | BTA204S |
| | 600 | B/D/E/F | | BTA208 | | BTA208X | | | BTA208S |
| | 800 | B/E | | BTA208 | | BTA208X | | | BTA208S |
| | 800 | F | | BTA208 | | BTA208X | | | BTA208S |
| | 1000 | B | | | | BTA208X | | | |
| | 1000 | C | | | | BTA208X | | BTA208B | |
| | 1000 | 5 min - 35 max | | | | BTA208X-1000C0 | | | |
| 12 | 600 | D | | BTA312 | | BTA312X | | BTA312B | |
| | 600 | CT | | BTA312 | | | | BTA312B | |
| | 600 / 800 | B/C/E | | BTA312 | | BTA312X | | BTA312B | |
| | 600 / 800 | C | | | BTA312Y | | | | |
| | 800 | ET | | BTA312 | | | | BTA312B | |
| 16 | 600 / 800 | B/C | | | BTA412Y | | | | |
| | 600 | BT/D | | BTA316 | | | | | |
| | 600 / 800 | B/C/E | | BTA316 | | BTA316X | | BTA316B | |
| | 600 / 800 | ET | | BTA316 | | | | | |
| | 800 | 10 min - 50 max | | | | BTA316X-800B0 | | | |
| 25 | 600 / 800 | B/C | | | BTA416Y | | | | |
| | 600 | BT | | BTA225 | | | | | |
| | 600 / 800 | B | | BTA225 | | | | BTA225B | |

I_{GT} key:
D 5 mA (10 mA in 3+)
E 10 mA (25 mA in 3+)
F 25 mA (70 mA in 3+)
- 35 mA (70 mA in 3+)
G 50 mA (100 mA in 3+)

Silicon Controlled Rectifiers

types in **bold red** represent new products




| $I_{T(RMS)}$ (A) | V_{DRM} & V_{RRM} (V) | I_{GT} (max) (mA) | SOT54 (TO92) | SOT78 (TO220AB) | SOT82 | SOT186A (isolated TO220AB) | SOT223 | SOT404 (D ² PAK) | SOT428 (DPAK) | SOT533 (IPAK) |
|---------------------|---------------------------|------------------------|---|---|---|---|-------------------|--------------------------------|------------------|------------------|
| | | |  |  |  |  | | | | |
| 0.8 | 400 | 0.012 | EC103D1 | | | | | | | |
| | 400 (V_{DRM} only) | 0.2 | NXL0840 | | | | | | | |
| | 200 / 400 / 600 | 0.2 | BT149B/D/G | | | | | | | |
| | 200 / 400 / 600 | 0.2 | BT169B/D/G | | | | | | | |
| | 400 | 0.05 | BT169D-L | | | | | | | |
| | 800 | 0.1 | BT169H | | | | | | | |
| | 500 / 600 | 0.02 min - 0.2 max | BT168E/G | | | | | | | |
| 1 | 200 | 0.2 | | | | | MCR08BT1 | | | |
| | 600 | 0.02 min - 0.2 max | | | | | BT168GW | | | |
| | 600 | 0.07 min - 0.45 max | | | | | BT168GWF** | | | |
| | 600 | 0.2 | | | | | BT148W-R* | | | |
| 4 | 400 / 500 / 600 | 0.2 | | | BT148-R | | | | | |
| | 600 | 0.2 | | | | | | | BT150S-R | |
| | 500 | 0.2 | | BT150-R | | | | | | |
| 8 | 800 | 0.05 | | | | | | | BT258S-LT | |
| | 500 / 600 / 800 | 0.2 | | BT258-R | | BT258X-R | | | | |
| | 600 | 0.2 | | | | | | | | BT258U-R |
| | 800 | 0.2 | | | | | | | BT258S-R | |
| 12 | 500 / 650 | 5 | | BT151-L | | | | | BT300S-R | |
| | 500 / 650 / 800 | 15 | | BT151-R | | BT151X-R | | | BT151S-L | |
| | 650 | 15 | | | | | | | BT151S-R | |
| | 500 / 650 / 800 | 15 | | BT151-C | | BT151X-C | | | BTH151S-R | |
| | 500 / 1000 | 15 | | BT151-RT | | | | | | |
| 20 | 400 / 600 / 800 | 32 | | BT152-R | | BT152X-R | | BT152B-R | | |
| | 500 | 32 | | BT152-RT | | | | | | |
| 25 | 800 | 35 | | BT145-R | | | | | | |

* Large chip / high I_{TSM}
** Hi-Com / fast turn-off
T: high T_{max} 150 °C

Thyristors

AC Thyristors



types in **bold red** represent new products

| $I_{T(RMS)}$ (A) | V_{DRM} (V) | I_{GT} (max) (mA) | SOT54 (TO92) | SOT223 | SO8 |
|------------------|---------------|---------------------|---|---|---|
| 0.2 | 600 | D |  |  |  |
| 0.8 | 600 | D | ACT108 | ACT108W | |
| | 600 | E | ACT108 | ACT108W | |
| | | | | | ACT102H |

I_{GT} key:
D = 5 mA
E = 10 mA

AC Thyristor Triacs

types in **bold red italic underline** represent products in development

| $I_{T(RMS)}$ (A) | V_{DRM} (V) | I_{GT} (max) (mA) | SOT186A | SOT428 |
|------------------|---------------|---------------------|---|---|
| 2 | 800 | E |  |  |
| | | | <i>ACTT2X</i> | <i>ACTT2S</i> |

I_{GT} key:
E = 10 mA

High Voltage Power Bipolar Transistors

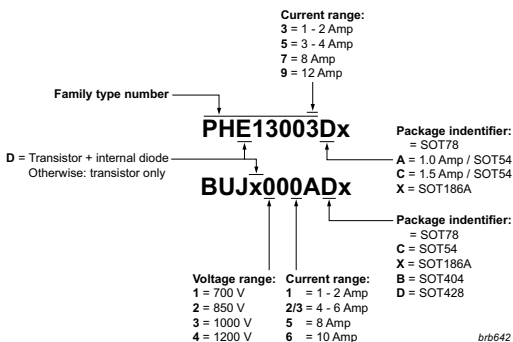
High Voltage Power Bipolar Transistors for lighting, SMPS and industrial applications

types in **bold red** represent new products

| V_{CESM} (V) | $I_{C(DC)}$ (max) (A) | 25 °C ind. t_i (typ) (ns) | @ I_C (A) | h_{FE} (typ) | @ I_C (A) | SOT54 (TO92) | SOT78 (TO220AB) | SOT186A (isolated TO220AB) | SOT404 (D ² PAK) | SOT428 (DPAK) | |
|----------------|-----------------------|-----------------------------|-------------|----------------|-------------|--------------|-----------------|----------------------------|-----------------------------|-------------------|------------|
| 700 | 1 | 80 | 1 | 7.5 | 0.8 | BUJ100LR | | | | | |
| | 1 | 80 | 1 | 7.5 | 0.8 | PHE13003A | | | | | |
| | 1 | 50 | 1 | 14 | 0.75 | BUJ100 | | | | | |
| | 1.5 | 100 | 0.5 | 9 | 1 | PHE13003C | | | | | |
| | 1.5 | 100 | 0.5 | 9 | 1 | PHD13003C* | | | | | |
| | 4 | 30 | 2 | 12.5 | 3 | | BUJ103A | BUJ103AX | | BUJ103AD | |
| | 4 | 30 | 2 | 12.5 | 3 | | | | | BUJD103AD* | |
| | 4 | 100 | 2 | 17 | 2 | | | PHE13005 | PHE13005X | | |
| | 4 | 100 | 2 | 17 | 2 | | | PHD13005* | | | |
| | 8 | 20 | 5 | 11 | 4 | | | BUJ105A | | BUJ105AB | BUJ105AD |
| | 8 | 20 | 5 | 11 | 4 | | | | | | BUJD105AD* |
| | 8 | 40 | 5 | 9 | 5 | | | PHE13007 | | | |
| 10 | 20 | 5 | 11 | 6 | | | BUJ106A | | | | |
| | 12 | 100 | 5 | 12.5 | 8 | | | PHE13009 | | | |
| 850 | 4 | 30 | 2 | 12.5 | 3 | | | BUJD203A* | BUJD203AX* | BUJD203AD* | |
| 1000 | 5 | 145 | 2.5 | 12 | 3 | | | BUJ303A | BUJ303AX | BUJ303AD | |
| 1050 | 4 | 520 | 2 | 41 | 0.8 | | | BUJ302A | BUJ302AX | BUJ302AD | |
| | 5 | 200 | 2.5 | 10.5 | 3 | | | BUJ303B | | | |
| 1200 | 6 | 170 | 2.5 | 15.5 | 3 | | | BUJ403A | | | |

*Integrated freewheeling diode
Package drawings are not to scale





PHx/BUJx series part numbering



Power Diodes

Hyperfast power diodes









types in ***bold red italic underline*** represent products in development

| V _{RRM} (V) | I _{F(AV)} (A) | V _F (typ) @ 150C (V) | @ I _F (A) | t _{rr} (typ) @ 25C (ns) | SOD59 (TO220AC) | SOD113 (2-pin SOT186A) | SOT78 (TO220AB) | SOT404 (D ² PAK) |
|----------------------|------------------------|---------------------------------|----------------------|----------------------------------|---|--|---|---|
| | | | | |  |  |  |  |
| 600 | 5 | 1.4 | 5 | 19 | BYC5-600 | BYC5X-600 | | BYC5B-600 |
| | 8 | 1.4 | 8 | 19 | BYC8-600 | BYC8X-600 | | BYC8B-600 |
| | 8 | 1.4 | 8 | 19 | <i>BYC8D-600</i> | <i>BYC8DX-600</i> | | |
| | 8 | 2 | 8 | 12.5 | | BYC58X-600 | | |
| | 10 | 1.4 | 10 | 19 | BYC10-600 | BYC10X-600 | | BYC10B-600 |
| | 2 x 5 | 1.4 | 5 | 19 | | | BYC10-600CT | |
| | 15 | 1.4 | 15 | 19 | BYC15-600 | BYC15X-600 | | |
| 20 | 1.4 | 20 | 19 | BYC20-600 | BYC20X-600 | | | |

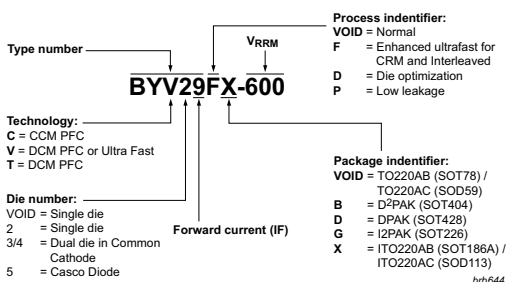
Power Diodes

Ultrafast power diodes

types in **bold red** represent new products

| V _{RRM} (V) | I _{F(AV)} (A) | V _F (typ) @ 150C (V) | @ I _F (A) | t _{rr} (typ) @ 25C (ns) | SOD59 (TO220AC) | SOD113 (2-pin SOT186A) | SOT78 (TO220AB) | SOT186A (isolated TO220AB) | SOT223 | SOT226 (I ² PAK) | SOT404 (D ² PAK) | SOT428 (DPAK) |
|----------------------|------------------------|---------------------------------|----------------------|----------------------------------|---|---|---|---|---|---|---|---|
| | | | | |  |  |  |  |  |  |  |  |
| 100 | 8 | 0.8 | 8 | 20 | BYW29E-100 | | | | | | | |
| | 2 x 10 | 0.72 | 8 | 20 | | | BYV32E-100 | | | | | |
| 150 | 2 x 0.75 | 0.5 | 0.5 | 10 | | | | | BYV40E-150 | | | |
| | 8 | 0.8 | 8 | 20 | BYW29E-150 | | | | | | | |
| | 2 x 10 | 0.72 | 8 | 20 | | | BYV32E-150 | | | | | |
| 200 | 2 x 15 | 0.78 | 15 | 20 | | | BYV42E-150 | | | | | |
| | 8 | 0.8 | 8 | 20 | BYW29E-200 | BYW29EX-200 | | | | | | BYW29ED-200 |
| | 2 x 5 | 0.8 | 5 | 15 | | | BYQ28E-200 | BYQ28X-200 | | | | BYQ28ED-200 |
| | 14 | 0.83 | 14 | 20 | BYV79E-200 | | | | | | | |
| | 2 x 8 | 0.84 | 8 | 20 | | | BYQ30E-200 | | | | | |
| | 2 x 10 | 0.72 | 8 | 20 | | | BYV32E-200 | | | | BYV32G-200 | BYV32EB-200 |
| 300 | 2 x 15 | 0.78 | 15 | 20 | | | BYV42E-200 | | | | BYV42G-200 | BYV42EB-200 |
| | 2 x 5 | 0.95 | 5 | 50 | | | BYT28-300 | | | | | |
| 400 | 9 | 0.9 | 8 | 50 | BYV29-400 | | | | | | | |
| | 2 x 10 | 0.87 | 10 | 50 | | | BYV34-400 | | | | | |
| 500 | 9 | 0.9 | 8 | 50 | BYV29-500 | BYV29X-500 | | | | | BYV29B-500 | |
| | 2 x 5 | 0.95 | 5 | 50 | | | BYT28-500 | | | | | |
| | 15 | 0.9 | 15 | 50 | BYT79-500 | | | | | | | |
| | 2 x 10 | 0.87 | 10 | 50 | | | BYV34-500 | | | | | |
| 600 | 2 x 15 | 0.95 | 15 | 50 | | | BYV44-500 | | | | | |
| | 5 | 0.97 | 5 | 50 | | BYV25X-600 | | | | BYV25G-600 | | BYV25D-600 |
| | 8 | 1.07 | 8 | 60 | BYR29-600 | BYR29X-600 | | | | | | |
| | 9 | 0.97 | 8 | 50 | BYV29-600 | BYV29X-600 | | | | | BYV29G-600 | BYV29B-600 |
| | 15 | 1 | 15 | 50 | BYT79-600 | BYT79X-600 | | | | | | |
| | 2 x 10 | 0.92 | 10 | 50 | | | BYV34-600 | BYV34X-600 | | | BYV34G-600 | |
| | 5 | 1.1 | 5 | 17.5 | BYV25F-600 | BYV25FX-600 | BYV25F-600 | | | | | BYV25FB-600 |
| 800 | 9 | 1.25 | 8 | 17.5 | BYV29F-600 | BYV29FX-600 | BYV29F-600 | | | | BYV29FB-600 | BYV29FD-600 |
| | 2 x 10 | 1.3 | 10 | 20 | | | BYV410-600 | BYV410X-600 | | | | |
| | 8 | 1.07 | 8 | 60 | BYR29-800 | BYR29X-800 | | | | | | |

Power Diode part numbering





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