

Fast switching & reverse conducting thyristors

ABB offers three lines of fast switching thyristors: the standard fast thyristor, the medium frequency fast thyristor and the reverse conducting fast thyristor. All types feature optimized and very short turn-on and turn-off times, large critical rates of on-state current rise, high surge current ratings and a wide operating temperature range.

These thyristors are typically used in induction heating resonant inverters, DC chopper drives, UPS, pulse power and other fast switching applications.

The **standard fast thyristors** feature an amplifying gate structure and a special lifetime control technology, ensuring low on-state and switching losses, a low reverse recovery time and a high di/dt performance.

The **medium frequency fast thyristors** take advantage of the distributed gate technology. Their special cathode and gate designs allow for an effective operation in the medium frequency range of up to 10 kHz.

The **reverse conducting fast thyristors** feature a monolithically integrated free-wheeling diode. Several types of this thyristor are available as spare and replacement parts.



Standard fast thyristors

| Part number | V_{DRM}, V_{RRM} | I_{TAVM} | I_{TSM} | V_{TO} | r_T | Q_{rr} | t_q | T_{VJM} | R_{thJC} | R_{thCH} | F_m | Housing |
|-------------------------|--------------------|------------------------|-----------|-----------|------------|----------------|---------------|-----------|------------|------------|-------|---------|
| | T_{VJM} | $T_C=70^\circ\text{C}$ | 10ms | T_{VJM} | | 1) | 2) | | | | | |
| | V | A | kA | V | m Ω | μAs | μs | | | | | |
| 5STF 13F1220 | 1200 | 1252 | 21.0 | 1.772 | 0.248 | - | 20.0 | 125 | 16.0 | 4.0 | 22 | F |
| 5STF 15F1232 | 1200 | 1532 | 21.0 | 1.283 | 0.209 | - | 32.0 | 125 | 16.0 | 4.0 | 22 | F |
| 5STF 07D1413 | 1400 | 710 | 12.0 | 1.652 | 0.347 | 190 | 12.5 | 125 | 32.0 | 10.0 | 10 | D |
| 5STF 07T1413 | 1400 | 710 | 12.0 | 1.652 | 0.347 | 190 | 12.5 | 125 | 32.0 | 10.0 | 10 | T1 |
| 5STF 09D1420 | 1400 | 847 | 13.0 | 1.231 | 0.317 | 380 | 20.0 | 125 | 32.0 | 10.0 | 10 | D |
| 5STF 09T1420 | 1400 | 847 | 13.0 | 1.231 | 0.317 | 380 | 20.0 | 125 | 32.0 | 10.0 | 10 | T1 |
| 5STF 12F2040 | 2000 | 1202 | 17.0 | 1.999 | 0.218 | 550 | 40.0 | 125 | 16.0 | 4.0 | 22 | F |
| 5STF 14F2063 | 2000 | 1440 | 17.0 | 1.602 | 0.170 | 1100 | 63.0 | 125 | 16.0 | 4.0 | 22 | F |
| 5STF 23H2040 New | 2000 | 2322 | 42.0 | 1.516 | 0.111 | 1200 | 40.0 | 125 | 10.0 | 3.0 | 50 | H |
| 5STF 28H2060 New | 2000 | 2667 | 47.0 | 1.198 | 0.103 | 2400 | 60.0 | 125 | 10.0 | 3.0 | 50 | H |
| 5STF 10F3080 | 3000 | 1003 | 13.0 | 2.562 | 0.246 | 1000 | 80.0 | 125 | 16.0 | 4.0 | 22 | F |
| 5STF 11F3010 | 3000 | 1112 | 14.0 | 2.149 | 0.258 | 1600 | 100.0 | 125 | 16.0 | 4.0 | 22 | F |

1) at $I_T = 500(1000)$ A, $di_T/dt = -50\text{A}/\mu\text{s}$, $V_R = 100$ V 2) at $I_T = 500(1000)$ A, $di_T/dt = -50\text{A}/\mu\text{s}$, $V_R = 100$ V, $V_D = 2/3 V_{DRM}$, $dV/dt = 50\text{V}/\mu\text{s}$

Medium frequency fast thyristors

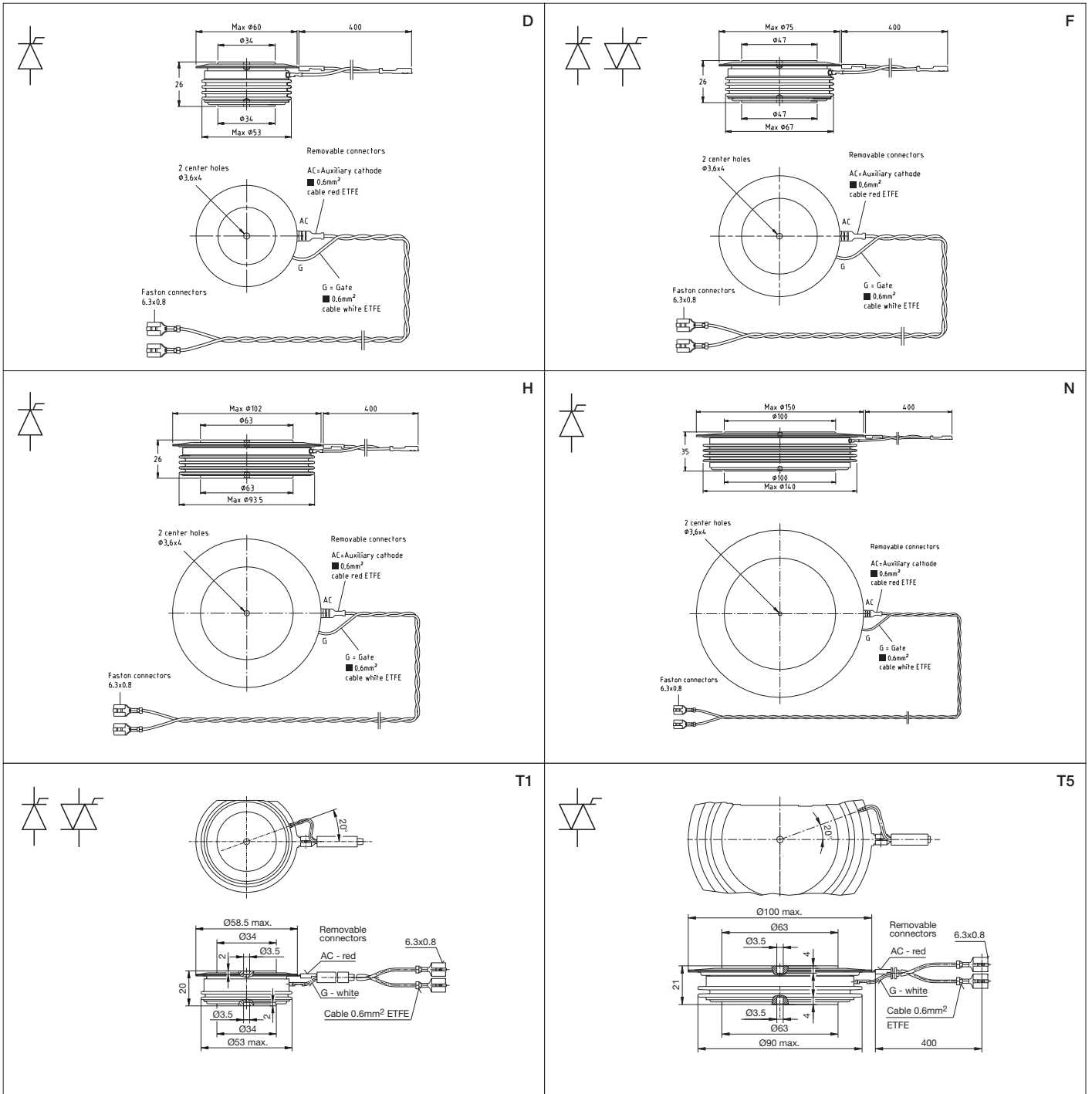
| Part number | V_{DRM}, V_{RRM} | I_{TAVM} | I_{TSM} | V_{T0} | r_T | Q_{rr} | t_q | T_{VJM} | R_{thJC} | R_{thCH} | F_m | Housing |
|--------------|--------------------|------------------------|-----------|-----------|------------|----------------|---------------|-----------|------------|------------|-------|---------|
| | T_{VJM} | $T_C=70^\circ\text{C}$ | 10ms | T_{VJM} | | 1) | 2) | | | | | |
| | V | A | kA | V | m Ω | μAs | μs | | | | | |
| 5STF 18F1210 | 1200 | 1779 | 22.0 | 1.374 | 0.094 | 380 | 10.0 | 125 | 16.0 | 4.0 | 22 | F |
| 5STF 06D1408 | 1400 | 568 | 11.0 | 2.311 | 0.365 | 80 | 8.0 | 125 | 32.0 | 10.0 | 10 | D |
| 5STF 06T1408 | 1400 | 568 | 11.0 | 2.311 | 0.365 | 80 | 8.0 | 125 | 32.0 | 10.0 | 10 | T1 |
| 5STF 07D1414 | 1400 | 736 | 12.0 | 1.683 | 0.274 | 160 | 12.5 | 125 | 32.0 | 10.0 | 10 | D |
| 5STF 07T1414 | 1400 | 736 | 12.0 | 1.683 | 0.274 | 160 | 12.5 | 125 | 32.0 | 10.0 | 10 | T1 |
| 5STF 16F1413 | 1400 | 1526 | 21.0 | 1.628 | 0.121 | 300 | 12.5 | 125 | 16.0 | 4.0 | 22 | F |
| 5STF 17F1420 | 1400 | 1693 | 21.0 | 1.403 | 0.114 | 670 | 20.0 | 125 | 16.0 | 4.0 | 22 | F |
| 5STF 06D2020 | 2000 | 557 | 8.0 | 2.348 | 0.386 | 240 | 20.0 | 125 | 32.0 | 10.0 | 10 | D |
| 5STF 06T2020 | 2000 | 557 | 8.0 | 2.348 | 0.386 | 240 | 20.0 | 125 | 32.0 | 10.0 | 10 | T1 |
| 5STF 07D2032 | 2000 | 679 | 9.0 | 1.849 | 0.306 | 440 | 32.0 | 125 | 32.0 | 10.0 | 10 | D |
| 5STF 07T2032 | 2000 | 679 | 9.0 | 1.849 | 0.306 | 440 | 32.0 | 125 | 32.0 | 10.0 | 10 | T1 |
| 5STF 12F2025 | 2000 | 1191 | 17.0 | 2.125 | 0.185 | 410 | 25.0 | 125 | 16.0 | 4.0 | 22 | F |
| 5STF 15F2040 | 2000 | 1489 | 17.0 | 1.605 | 0.144 | 1000 | 40.0 | 125 | 16.0 | 4.0 | 22 | F |
| 5STF 05D2425 | 2400 | 517 | 7.0 | 2.551 | 0.430 | 260 | 25.0 | 125 | 32.0 | 10.0 | 10 | D |
| 5STF 05T2425 | 2400 | 517 | 7.0 | 2.551 | 0.430 | 260 | 25.0 | 125 | 32.0 | 10.0 | 10 | T1 |
| 5STF 06D2440 | 2400 | 617 | 8.0 | 2.045 | 0.365 | 450 | 40.0 | 125 | 32.0 | 10.0 | 10 | D |
| 5STF 06T2440 | 2400 | 617 | 8.0 | 2.045 | 0.365 | 450 | 40.0 | 125 | 32.0 | 10.0 | 10 | T1 |

1) at $I_T = 500(1000)$ A, $di_T/dt = -50\text{A}/\mu\text{s}$, $V_R = 100$ V 2) at $I_T = 500(1000)$ A, $di_T/dt = -50\text{A}/\mu\text{s}$, $V_R = 100$ V, $V_D = 2/3 V_{DRM}$, $dV_D/dt = 50\text{V}/\mu\text{s}$

Reverse conducting fast thyristors

| Part number ** = $V_{DRM}/100\text{V}$ | V_{DRM} | I_{TAVM} / I_{FAVM} | I_{TSM} / I_{FSM} | V_{T0} / V_{F0} | r_T / r_F | t_q | T_{VJM} | R_{thJC} | R_{thCH} | F_m | Housing | |
|---|------------|------------------------|---------------------|-------------------|-------------|-------|-----------|------------|------------|-------|---------|----|
| | | $T_C=70^\circ\text{C}$ | 10ms | T_{VJM} | | | | | | | | |
| | | A | kA | V | m Ω | | | | | | | |
| 5STR 03T2040 | FST | 2000 | 360 | 5.0 | 1.55 | 1.010 | 40.0 | 125 | 55 | 10 | 10 | T1 |
| | Diode part | | 223 | 3.5 | 1.34 | 2.100 | 4.0 | 125 | 88 | - | - | |
| 5STR 07F2541 | FST | 2500 | 760 | 14.0 | 1.39 | 0.336 | 40.0 | 125 | 30 | 6 | 22 | F |
| | Diode part | | 202 | 4.0 | 1.35 | 1.330 | 5.6 | 125 | 100 | - | - | |
| 5STR 10T2520 | FST | 2500 | 857 | 14.0 | 2.04 | 0.321 | 20.0 | 125 | 20 | 3 | 30 | T5 |
| | Diode part | | 388 | 6.0 | 1.49 | 1.066 | 4.0 | 125 | 50 | - | - | |

Please refer to page 65 for part numbering structure.



Dimensions in mm