

# 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
	$T_{VJM}$	$T_C=70^\circ C$	10ms	$T_{VJM}$		1)	2)					
	V	A	kA	V	m $\Omega$	$\mu As$	$\mu s$					
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 <b>New</b>	2000	2322	42.0	1.516	0.111	1200	40.0	125	10.0	3.0	50	H
5STF 28H2060 <b>New</b>	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,  $di_T/dt = -50A/\mu s$ ,  $V_R = 100$  V      2) at  $I_T = 500(1000)$  A,  $di_T/dt = -50A/\mu s$ ,  $V_R = 100$  V,  $V_D = 2/3 V_{DRM}$ ,  $dV/dt = 50V/\mu s$

## Medium frequency fast thyristors

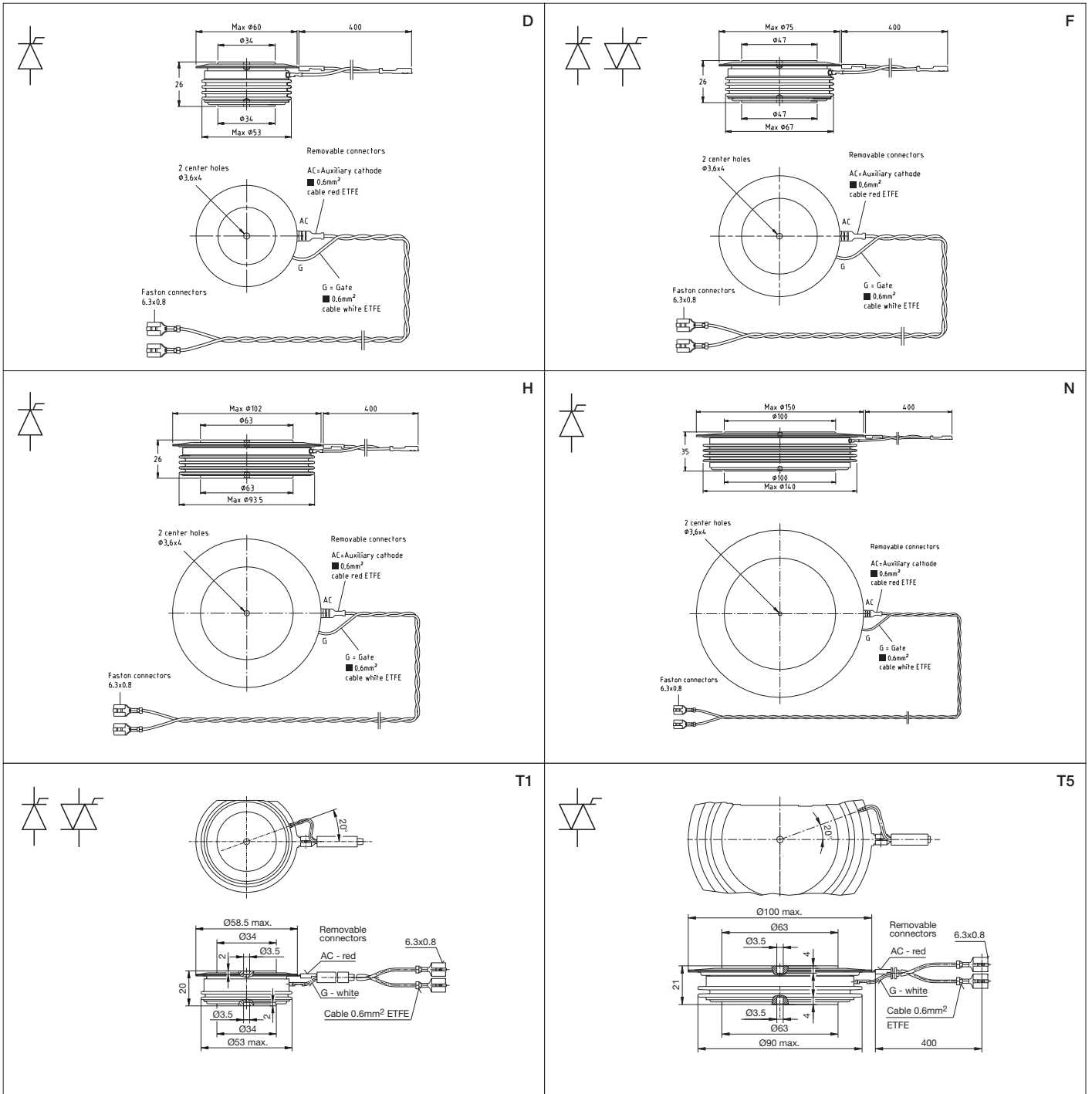
Part number	$V_{DRM}, V_{RRM}$	$I_{TAVM}$	$I_{TSM}$	$V_{T0}$	$r_T$	$Q_{rr}$	$t_q$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	$F_m$	Housing
	$T_{VJM}$	$T_C=70^\circ\text{C}$	10ms	$T_{VJM}$		1)	2)					
	V	A	kA	V	m $\Omega$	$\mu\text{As}$	$\mu\text{s}$					
5STF 18F1210	1200	1779	22.0	1.374	0.094	380	10.0	125	16.0	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	$T_{VJM}$		$T_{VJM}$						
		A	kA	V	m $\Omega$	$\mu\text{s}$						
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