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- Application dependent gate trigger requirements of GTO thyristors
- The implementation of gate turn-off thyristors as high voltage turn-on switches for pulse power applications
- Improved semiconductor switches for pulse power applications
- Integrated 30kV Solid-State Switch for Pulse Power Applications
- Press-Pack IGBTs, Semiconductor Switches for Pulse Power
- The application of pressure contact IGBTs in pulse power
- Design concepts of a bondless pressure-contact IGBT
- Electromechanical characteristics of a bondless pressure contact IGBT
- Pressure Contacted IGBTs
- Pressure contact IGBT, the ideal switch for high power applications
- Pressure contact IGBT, testing for reliability
- New high current press-pack IGBTs
- Magazine Feature: Positive Development in high reliability completely bond free pressure contact IGBTs
- Application of Press-pack IGBTs in Traction Refurbishment
- New 5.2kV Extra Fast Recovery Diodes for IGBT and IGCT Applications
- New family of 4.5kV Press-Pack IGBTs
- New Extra Fast Soft Recovery Diodes and their Applications
- Managing power semiconductor obsolescence by press-pack IGBT substitution
- Westcode Product Nomenclatures (Capsules, Studs, and Pulse Thyristors)
- Terms & Symbols
- Mounting Instructions
- Press Releases

Rectifier Diodes - Capsule Types

Type		V_{RRM}	I_{FAV} $T_K=55^\circ\text{C}$	I_{FSM} 10ms ½ sine $V_R \leq 60\% V_{RRM}$	I^2t $V_R \leq 60\%$ V_{RRM} A^2s	V_{TO} @ $T_{j,max}$	r_T	$T_{j,max}$	R_{thJK}		Fig. No.
Part No.	Old Part No.	V	A	A	A^2s	V	mΩ	°C	180° Sine K/W	120° Rect. K/W	
W0507YH360	SW36HXC270	3600	507	7600	289×10^3	0.970	0.880	160	0.100	0.117	W3
W0507YH450	SW45HXC270	4500	507	7600	289×10^3	0.970	0.880	160	0.100	0.117	W3
W0614WC160	SW16CXC320	1600	614	4000	80×10^3	1.000	0.830	180	0.090	0.098	W1
W0614WC200	SW20CXC320	2000	614	4000	80×10^3	1.000	0.830	180	0.090	0.098	W1
W0614WC240	SW24CXC320	2400	614	4000	80×10^3	1.000	0.830	180	0.090	0.098	W1
W0642WC160	SW16CXC380	1600	642	5500	151×10^3	0.990	0.740	180	0.090	0.098	W1
W0642WC200	SW20CXC380	2000	642	5500	151×10^3	0.990	0.740	180	0.090	0.098	W1
W0642WC240	SW24CXC380	2400	642	5500	151×10^3	0.990	0.740	180	0.090	0.098	W1
W0646WC060	SW06CXC300	600	646	5500	151×10^3	0.950	0.750	180	0.090	0.098	W1
W0646WC120	SW12CXC300	1200	646	5500	151×10^3	0.950	0.750	180	0.090	0.098	W1
W0646WC150	SW15CXC300	1500	646	5500	151×10^3	0.950	0.750	180	0.090	0.098	W1
W0797WC040	SW04CXC400	400	797	7500	281×10^3	0.800	0.550	190	0.090	0.098	W1
W0797WC120	SW12CXC400	1200	797	7500	281×10^3	0.800	0.550	190	0.090	0.098	W1
W0797WC150	SW15CXC400	1500	797	7500	281×10^3	0.800	0.550	190	0.090	0.098	W1
W0944WC040	SW04CXC470	400	944	9000	405×10^3	0.790	0.342	190	0.090	0.098	W1
W0944WC120	SW12CXC470	1200	944	9000	405×10^3	0.790	0.342	190	0.090	0.098	W1
W0944WC150	SW15CXC470	1500	944	9000	405×10^3	0.790	0.342	190	0.090	0.098	W1
W1032LC500	SW50CXC350	5000	1032	7200	259×10^3	1.000	0.702	150	0.033	0.040	W4
W1032LC560	SW56CXC350	5600	1032	7200	259×10^3	1.000	0.702	150	0.033	0.040	W4
W1032LC600	n/a	6000	1032	7200	259×10^3	1.000	0.702	150	0.033	0.040	W4
W1074YC200	SW20CXC445	2000	1074	10800	583×10^3	0.920	0.390	160	0.050	0.061	W2
W1074YC320	SW32CXC445	3200	1074	10800	583×10^3	0.920	0.390	160	0.050	0.061	W2
W1074YH200	SW20CXC445	2000	1074	10800	583×10^3	0.920	0.390	160	0.050	0.061	W3
W1074YH320	SW32CXC445	3200	1074	10800	583×10^3	0.920	0.390	160	0.050	0.061	W3
W1185LC300	SW30CXC515	3000	1185	9200	423×10^3	1.000	0.575	160	0.033	0.040	W4
W1185LC360	SW36CXC515	3600	1185	9200	423×10^3	1.000	0.575	160	0.033	0.040	W4
W1185LC450	SW45CXC515	4500	1185	9200	423×10^3	1.000	0.575	160	0.033	0.040	W4
W1263YC160	SW16CXC565	1600	1263	11700	684×10^3	0.870	0.330	175	0.050	0.061	W2
W1263YC250	SW25CXC565	2500	1263	11700	684×10^3	0.870	0.330	175	0.050	0.061	W2
W1263YH160	SW16CXC565	1600	1263	11700	684×10^3	0.870	0.330	175	0.050	0.061	W3
W1263YH250	SW25CXC565	2500	1263	11700	684×10^3	0.870	0.330	175	0.050	0.061	W3
W1294NC500	SW50CXC500	5000	1294	10000	500×10^3	1.150	0.684	150	0.022	0.026	W5
W1294NC600	SW60CXC500	6000	1294	10000	500×10^3	1.150	0.684	150	0.022	0.026	W5
W1411LC300	SW30CXC595	3000	1411	10600	562×10^3	0.900	0.388	160	0.033	0.040	W4
W1411LC360	SW36CXC595	3600	1411	10600	562×10^3	0.900	0.388	160	0.033	0.040	W4
W1520NC500	SW50CXC620	5000	1520	12000	720×10^3	1.150	0.450	150	0.022	0.026	W5
W1520NC600	SW60CXC620	6000	1520	12000	720×10^3	1.150	0.450	150	0.022	0.026	W5
W1524LC240	SW24CXC635	2400	1524	12700	810×10^3	0.870	0.323	160	0.033	0.040	W4
W1524LC300	SW30CXC635	3000	1524	12700	810×10^3	0.870	0.323	160	0.033	0.040	W4
W1608NC400	SW40CXC680	4000	1608	13000	850×10^3	0.975	0.501	160	0.022	0.026	W5
W1608NC500	SW50CXC680	5000	1608	13000	850×10^3	0.975	0.501	160	0.022	0.026	W5
W1748LC080	SW08CXC805	800	1748	15400	1.19×10^6	0.870	0.280	175	0.033	0.040	W4
W1748LC180	SW18CXC805	1800	1748	15400	1.19×10^6	0.870	0.280	175	0.033	0.040	W4
W1748LC220	SW22CXC805	2200	1748	15400	1.19×10^6	0.870	0.280	175	0.033	0.040	W4
W1856NC400	SW40CXC815	4000	1856	16000	1.28×10^6	0.975	0.348	160	0.022	0.026	W5
W1856NC500	SW50CXC815	5000	1856	16000	1.28×10^6	0.975	0.348	160	0.022	0.026	W5
W2020NC360	SW36CXC818	3600	2020	18000	1.62×10^6	1.000	0.320	160	0.020	0.022	W5
W2020NC450	SW45CXC818	4500	2020	18000	1.62×10^6	1.000	0.320	160	0.020	0.022	W5
W2052NC300	SW30CXC820	3000	2052	19500	1.90×10^6	0.865	0.288	160	0.022	0.026	W5
W2052NC400	SW40CXC820	4000	2052	19500	1.90×10^6	0.865	0.288	160	0.022	0.026	W5
W2054NC360	SW36CXC920	3600	2054	19000	1.81×10^6	0.800	0.300	160	0.022	0.026	W5
W2054NC450	SW45CXC920	4500	2054	19000	1.81×10^6	0.800	0.300	160	0.022	0.026	W5
W2058LC020	SW02CXC935	200	2058	19500	1.90×10^6	0.790	0.192	175	0.033	0.040	W4
W2058LC100	SW10CXC935	1000	2058	19500	1.90×10^6	0.790	0.192	175	0.033	0.040	W4
W2058LC120	SW12CXC935	1200	2058	19500	1.90×10^6	0.790	0.192	175	0.033	0.040	W4

Outline drawings on pages 188 - 224

Rectifier Diodes - Capsule Types, continued

Type		V _{RRM} V	I _{FAV} T _K =55°C A	I _{FSM} 10ms ½ sine V _R ≤ 60% V _{RRM} A	I ² t V _R ≤ 60% V _{RRM} A ² s	V _{TO} @ T _{j max}		T _{j max} °C	R _{thJK}		Fig. No.
► New Part No.	Old Part No.					V	mΩ		°C	180° Sine K/W	
W5282ZC200	SW20CXC21C	2000	5282	60000	18.0 x 10 ⁶	0.970	0.064	160	0.011	0.012	W7
W5282ZC240	SW24CXC21C	2400	5282	60000	18.0 x 10 ⁶	0.970	0.064	160	0.011	0.012	W7
W5282ZC300	SW30CXC21C	3000	5282	60000	18.0 x 10 ⁶	0.970	0.064	160	0.011	0.012	W7
W5282ZD200	SW20DXC21C	2000	5282	60000	18.0 x 10 ⁶	0.970	0.064	160	0.011	0.012	W42
W5282ZD240	SW24DXC21C	2400	5282	60000	18.0 x 10 ⁶	0.970	0.064	160	0.011	0.012	W42
W5282ZD300	SW30DXC21C	3000	5282	60000	18.0 x 10 ⁶	0.970	0.064	160	0.011	0.012	W42
► W5292TC500	N/A	5000	5292	52700	13.9 x 10 ⁶	1.027	0.111	160	0.008	0.0085	W14
► W5292TC560	N/A	5600	5292	52700	13.9 x 10 ⁶	1.027	0.111	160	0.008	0.0085	W14
► W5292TD500	N/A	5000	5292	52700	13.9 x 10 ⁶	1.027	0.111	160	0.008	0.0085	W19
► W5292TD560	N/A	5600	5292	52700	13.9 x 10 ⁶	1.027	0.111	160	0.008	0.0085	W19
W5439VC020	SW02CXC22C	200	5439	52000	13.5 x 10 ⁶	0.650	0.067	190	0.016	0.018	W6
W5439VC100	SW10CXC22C	1000	5439	52000	13.5 x 10 ⁶	0.650	0.067	190	0.016	0.018	W6
W5439VC140	SW14CXC22C	1400	5439	52000	13.5 x 10 ⁶	0.650	0.067	190	0.016	0.018	W6
W5439VF020	SW02FXC22C	200	5439	52000	13.5 x 10 ⁶	0.650	0.067	190	0.016	0.018	W43
W5439VF100	SW10FXC22C	1000	5439	52000	13.5 x 10 ⁶	0.650	0.067	190	0.016	0.018	W43
W5439VF140	SW14FXC22C	1400	5439	52000	13.5 x 10 ⁶	0.650	0.067	190	0.016	0.018	W43
W5696VC020	SW02CXC27C	200	5696	53000	14.0 x 10 ⁶	0.650	0.059	190	0.016	0.018	W6
W5696VC100	SW10CXC27C	1000	5696	53000	14.0 x 10 ⁶	0.650	0.059	190	0.016	0.018	W6
W5696VC140	SW14CXC27C	1400	5696	53000	14.0 x 10 ⁶	0.650	0.059	190	0.016	0.018	W6
W5696VF020	SW02FXC27C	200	5696	53000	14.0 x 10 ⁶	0.650	0.059	190	0.016	0.018	W43
W5696VF100	SW10FXC27C	1000	5696	53000	14.0 x 10 ⁶	0.650	0.059	190	0.016	0.018	W43
W5696VF140	SW14FXC27C	1400	5696	53000	14.0 x 10 ⁶	0.650	0.059	190	0.016	0.018	W43
W5838ZC120	SW12CXC26C	1200	5838	64000	20.5 x 10 ⁶	0.800	0.074	175	0.011	0.012	W7
W5838ZC180	SW18CXC26C	1800	5838	64000	20.5 x 10 ⁶	0.800	0.074	175	0.011	0.012	W7
W5838ZC220	SW22CXC26C	2200	5838	64000	20.5 x 10 ⁶	0.800	0.074	175	0.011	0.012	W7
W5838ZD120	SW12DXC26C	1200	5838	64000	20.5 x 10 ⁶	0.800	0.074	175	0.011	0.012	W42
W5838ZD180	SW18DXC26C	1800	5838	64000	20.5 x 10 ⁶	0.800	0.074	175	0.011	0.012	W42
W5838ZD220	SW22DXC26C	2200	5838	64000	20.5 x 10 ⁶	0.800	0.074	175	0.011	0.012	W42
W6262ZC120	SW12CXC2850	1200	6262	67000	22.4 x 10 ⁶	0.740	0.065	175	0.011	0.012	W7
W6262ZC200	SW20CXC2850	2000	6262	67000	22.4 x 10 ⁶	0.740	0.065	175	0.011	0.012	W7
W6262ZC240	SW24CXC2850	2400	6262	67000	22.4 x 10 ⁶	0.740	0.065	175	0.011	0.012	W7
W6262ZD120	SW12DXC2850	1200	6262	67000	22.4 x 10 ⁶	0.740	0.065	175	0.011	0.012	W42
W6262ZD200	SW20DXC2850	2000	6262	67000	22.4 x 10 ⁶	0.740	0.065	175	0.011	0.012	W42
W6262ZD240	SW24DXC2850	2400	6262	67000	22.4 x 10 ⁶	0.740	0.065	175	0.011	0.012	W42
W7675ZC020	SW02CXC30C	200	7675	68000	23.1 x 10 ⁶	0.650	0.050	190	0.011	0.012	W7
W7675ZC100	SW10CXC30C	1000	7675	68000	23.1 x 10 ⁶	0.650	0.050	190	0.011	0.012	W7
W7675ZC140	SW14CXC30C	1400	7675	68000	23.1 x 10 ⁶	0.650	0.050	190	0.011	0.012	W7
W7675ZD020	SW02DXC30C	200	7675	68000	23.1 x 10 ⁶	0.650	0.050	190	0.011	0.012	W42
W7675ZD100	SW10DXC30C	1000	7675	68000	23.1 x 10 ⁶	0.650	0.050	190	0.011	0.012	W42
W7675ZD140	SW14DXC30C	1400	7675	68000	23.1 x 10 ⁶	0.650	0.050	190	0.011	0.012	W42
W8405ZC020	SW02CXC32C	200	8405	72000	25.9 x 10 ⁶	0.670	0.038	190	0.011	0.012	W7
W8405ZC100	SW10CXC32C	1000	8405	72000	25.9 x 10 ⁶	0.670	0.038	190	0.011	0.012	W7
W8405ZC140	SW14CXC32C	1400	8405	72000	25.9 x 10 ⁶	0.670	0.038	190	0.011	0.012	W7
W8405ZD020	SW02DXC32C	200	8405	72000	25.9 x 10 ⁶	0.670	0.038	190	0.011	0.012	W42
W8405ZD100	SW10DXC32C	1000	8405	72000	25.9 x 10 ⁶	0.670	0.038	190	0.011	0.012	W42
W8405ZD140	SW14DXC32C	1400	8405	72000	25.9 x 10 ⁶	0.670	0.038	190	0.011	0.012	W42

Rectifier Diodes - Capsule Types, continued



Fig. W1
Weight 70g



Fig. W2
Weight 90 g



Fig. W3
Weight 140 g



Fig. W4
Weight 340 g



Fig. W5
Weight 510 g



Fig. W6
Weight 1000 g



Fig. W7
Weight 1700 g



Fig. W28
Weight 1230 g

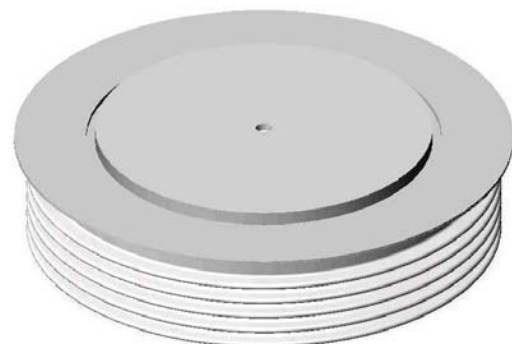


Fig. W29
Weight 1700 g

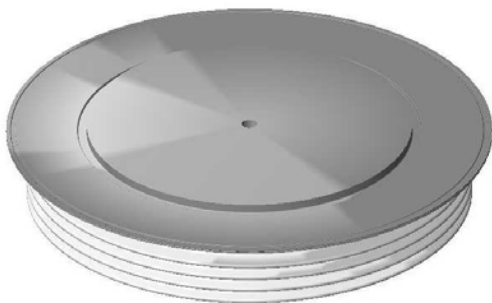


Fig. W42
Weight 1200 g



Fig. W43
Weight 800 g

Fast Recovery Diodes - Capsule Types

Type		V _{RRM}	I _{FAV} T _K =55°C	I _{FSM} 10ms ½ sine	I ² t V _R ≤ 60% V _{RRM}	Typ. Reverse Recovery Parameters				V _{T0} @T _J max	r _T	T _J max	R _{thJK} d.c.	Fig. No.
Part No.	Old Part No.	V	A	A	V _{RRM} A ² s	t _{rr} μs	Q _r μC	@ I _{FM} A	@ -di _p /dt A/μs	V	mΩ	°C	180° sine K/W	
M0588LC400	SM40CXC344	4000	588	3955	78.2 × 10 ³	3.5	200	1000	60	2.32	1.77	150	0.033	W4
M0588LC450	SM45CXC344	4500	588	3955	78.2 × 10 ³	3.5	200	1000	60	2.32	1.77	150	0.033	W4
M0790YC200	N/A	2000	790	9000	405 × 10 ³	4.0	300	1000	60	1.27	0.58	150	0.050	W2
M0790YC250	N/A	2500	790	9000	405 × 10 ³	4.0	300	1000	60	1.27	0.58	150	0.050	W2
M0790YH200	N/A	2000	790	9000	405 × 10 ³	4.0	300	1000	60	1.27	0.58	150	0.050	W3
M0790YH250	N/A	2500	790	9000	405 × 10 ³	4.0	300	1000	60	1.27	0.58	150	0.050	W3
M0914LC200	SM20CXC804	2000	914	8500	361 × 10 ³	3.2	170	1000	60	1.768	0.653	150	0.032	W4
M0914LC250	SM25CXC804	2500	914	8500	361 × 10 ³	3.2	170	1000	60	1.768	0.653	150	0.032	W4
M1010NC400	SM40CXC604	4000	1010	9600	461 × 10 ³	3.2	700	1000	200	1.70	1.03	150	0.022	W5
M1010NC450	SM45CXC604	4500	1010	9600	461 × 10 ³	3.2	700	1000	200	1.70	1.03	150	0.022	W5
M1163NC400	SM40CXC614	4000	1163	10800	583 × 10 ³	6.4	700	1000	60	1.50	0.77	150	0.022	W5
M1163NC450	SM45CXC614	4500	1163	10800	583 × 10 ³	6.4	700	1000	60	1.50	0.77	150	0.022	W5
M1502NC200	SM20CXC334	2000	1502	17000	1.45 × 10 ⁶	2.3	420	1000	60	1.24	0.44	150	0.022	W5
M1502NC250	SM25CXC334	2500	1502	17000	1.45 × 10 ⁶	2.3	420	1000	60	1.24	0.44	150	0.022	W5
M1583VC400	SM40CXC864	4000	1583	24800	3.08 × 10 ⁶	5.0	1100	1000	200	1.69	0.53	150	0.016	W6
M1583VC450	SM45CXC864	4500	1583	24800	3.08 × 10 ⁶	5.0	1100	1000	200	1.69	0.53	150	0.016	W6
M1583VF400	SM40FXC864	4000	1583	24800	3.08 × 10 ⁶	5.0	1100	1000	200	1.69	0.53	150	0.016	W43
M1583VF450	SM45FXC864	4500	1583	24800	3.08 × 10 ⁶	5.0	1100	1000	200	1.69	0.53	150	0.016	W43
M1609NC200	SM20CXC915	2000	1609	17500	1.53 × 10 ⁶	3.2	600	1000	200	1.31	0.35	150	0.022	W5
M1609NC260	SM26CXC915	2600	1609	17500	1.53 × 10 ⁶	3.2	600	1000	200	1.31	0.35	150	0.022	W5
M2408NC020	SM02CXC504	200	2408	24000	2.88 × 10 ⁶	1.9	160	1000	200	1.07	0.12	150	0.022	W5
M2408NC060	SM06CXC504	600	2408	24000	2.88 × 10 ⁶	1.9	160	1000	200	1.07	0.12	150	0.022	W5
M2408ND020	SM02CXC504	200	2408	24000	2.88 × 10 ⁶	1.9	160	1000	200	1.07	0.12	150	0.022	W5
M2408ND060	SM06CXC504	600	2408	24000	2.88 × 10 ⁶	1.9	160	1000	200	1.07	0.12	150	0.022	W5
M2639ZC360	SM36CXC954	3600	2639	27520	3.79 × 10 ⁶	8.5	1200	1000	60	1.38	0.29	150	0.011	W7
M2639ZC420	SM42CXC954	4200	2639	27520	3.79 × 10 ⁶	8.5	1200	1000	60	1.38	0.29	150	0.011	W7
M2639ZD360	SM36DXC954	3600	2639	27520	3.79 × 10 ⁶	8.5	1200	1000	60	1.38	0.29	150	0.011	W42
M2639ZD420	SM42DXC954	4200	2639	27520	3.79 × 10 ⁶	8.5	1200	1000	60	1.38	0.29	150	0.011	W42
M2698ZC250	SM25CXC964	2500	2698	27800	3.86 × 10 ⁶	6.2	620	1000	60	1.00	0.33	150	0.011	W7
M2698ZC280	SM28CXC964	2800	2698	27800	3.86 × 10 ⁶	6.2	620	1000	60	1.00	0.33	150	0.011	W7
M2698ZC350	SM35CXC964	3500	2698	27800	3.86 × 10 ⁶	6.2	620	1000	60	1.00	0.33	150	0.011	W7
M2698ZD250	SM25DXC964	2500	2698	27800	3.86 × 10 ⁶	6.2	620	1000	60	1.00	0.33	150	0.011	W42
M2698ZD280	SM28DXC964	2800	2698	27800	3.86 × 10 ⁶	6.2	620	1000	60	1.00	0.33	150	0.011	W42
M2698ZD350	SM35DXC964	3500	2698	27800	3.86 × 10 ⁶	6.2	620	1000	60	1.00	0.33	150	0.011	W42
M2837VC180	SM18CXC968	1800	2837	31800	5.1 × 10 ⁶	7.0	1100	1000	60	0.90	0.17	150	0.016	W6
M2837VC250	SM25CXC968	2500	2837	31800	5.1 × 10 ⁶	7.0	1100	1000	60	0.90	0.17	150	0.016	W6
M2837VF180	SM18FXC968	1800	2837	31800	5.1 × 10 ⁶	7.0	1100	1000	60	0.90	0.17	150	0.016	W43
M2837VF250	SM25FXC968	2500	2837	31800	5.1 × 10 ⁶	7.0	1100	1000	60	0.90	0.17	150	0.016	W43
M3770ZC200	SM20CXC974	2000	3770	44000	9.68 × 10 ⁶	7.0	1500	1000	60	1.19	1.18	150	0.011	W7
M3770ZC240	SM24CXC974	2400	3770	44000	9.68 × 10 ⁶	7.0	1500	1000	60	1.19	1.18	150	0.011	W7
M3770ZC300	SM30CXC974	3000	3770	44000	9.68 × 10 ⁶	7.0	1500	1000	60	1.19	1.18	150	0.011	W7
M3770ZD200	SM20DXC974	2000	3770	44000	9.68 × 10 ⁶	7.0	1500	1000	60	1.19	1.18	150	0.011	W42
M3770ZD240	SM24DXC974	2400	3770	44000	9.68 × 10 ⁶	7.0	1500	1000	60	1.19	1.18	150	0.011	W42
M3770ZD300	SM30DXC974	3000	3770	44000	9.68 × 10 ⁶	7.0	1500	1000	60	1.190	1.18	150	0.011	W42



Soft Recovery Diodes - Capsule Types, continued

Type		V _{RRM} V	I _{FAV} T _κ = 55°C A	I _{FSM} 10ms ½ sine V _R ≤ 60% V _{RRM} A	i ² t V _R ≤ 60% V _{RRM} A ² s	Typ. Reverse Recovery Parameters				V _{TO} @T _{Jmax} V	r _T mΩ	T _{Jmax} °C	R _{thJK} d.c. 180° sine K/W	Fig. No.
Part No.	Old Part No.					t _{rr} μs	Q _r μC	@I _{FM} A	@-di _F /dt A/μs					
M1242NC260	SM26CXC824	2600	1242	16400	1.34 × 10 ⁶	7.00	750	1000	60	1.270	0.420	125	0.022	W5
M1242NC360	SM36CXC824	3600	1242	16400	1.34 × 10 ⁶	7.00	750	1000	60	1.270	0.420	125	0.022	W5
M1494NC160	SM16CXC924	1600	1494	19600	1.92 × 10 ⁶	4.00	350	1000	60	1.150	0.265	125	0.022	W5
M1494NC250	SM25CXC924	2500	1494	19600	1.92 × 10 ⁶	4.00	350	1000	60	1.150	0.265	125	0.022	W5
M1565VC400	SM40CXC394	4000	1565	19700	1.94 × 10 ⁶	5.00	1550	1000	200	1.090	0.360	125	0.018	W6
M1565VC450	SM45CXC394	4500	1565	19700	1.94 × 10 ⁶	5.00	1550	1000	200	1.090	0.360	125	0.018	W6
M1565VF400	SM40FXC394	4000	1565	19700	1.94 × 10 ⁶	5.00	1550	1000	200	1.090	0.360	125	0.018	W43
M1565VF450	SM45FXC394	4500	1565	19700	1.94 × 10 ⁶	5.00	1550	1000	200	1.090	0.360	125	0.018	W43
M1858NC120	SM12CXC514	1200	1858	25000	3.25 × 10 ⁶	2.50	50	1000	60	1.130	0.127	125	0.022	W5
M1858NC160	SM16CXC514	1600	1858	25000	3.25 × 10 ⁶	2.50	50	1000	60	1.130	0.127	125	0.022	W5
M2273VC300	N/A	3000	2273	28000	3.92 × 10 ⁶	8.50	1300	1000	60	1.239	0.244	150	0.016	W6
M2273VC360	N/A	3600	2273	28000	3.92 × 10 ⁶	8.50	1300	1000	60	1.239	0.244	150	0.016	W6
M2273VF300	N/A	3000	2273	28000	3.92 × 10 ⁶	8.50	1300	1000	60	1.239	0.244	150	0.016	W43
M2273VF360	N/A	3600	2273	28000	3.92 × 10 ⁶	8.50	1300	1000	60	1.239	0.244	150	0.016	W43
M2322ZC300	SM30CXC384	3000	2322	23000	2.64 × 10 ⁶	6.50	1450	1000	150	1.670	0.186	125	0.011	W7
M2322ZC400	SM40CXC384	4000	2322	23000	2.64 × 10 ⁶	6.50	1450	1000	150	1.670	0.186	125	0.011	W7
M2322ZD300	SM30DXC384	3000	2322	23000	2.64 × 10 ⁶	6.50	1450	1000	150	1.670	0.186	125	0.011	W42
M2322ZD400	SM40DXC384	4000	2322	23000	2.64 × 10 ⁶	6.50	1450	1000	150	1.670	0.186	125	0.011	W42
M2413VC200	N/A	2000	2413	32000	5.12 × 10 ⁶	5.00	1275	1000	200	1.090	0.120	125	0.016	W6
M2413VC250	N/A	2000	2413	32000	5.12 × 10 ⁶	5.00	1275	1000	200	1.090	0.120	125	0.016	W6
M2413VF200	N/A	2000	2413	32000	5.12 × 10 ⁶	5.00	1275	1000	200	1.090	0.120	125	0.016	W43
M2413VF250	N/A	2000	2413	32000	5.12 × 10 ⁶	5.00	1275	1000	200	1.090	0.120	125	0.016	W43



Fig. W1 - 70 g



Fig. W2 - 80 g



Fig. W3 - 140 g



Fig. W4 - 340 g



Fig. W5 - 510 g



Fig. W6 - 1000 g



Fig. W7 - 1700 g



Fig. W42 - 1200 g



Fig. W43 - 800 g

Extra Fast Recovery Diodes - Capsule Types

These products are designed to offer the lowest practical values of recovered charge whilst offering wide safe operating area and high di/dt capability required by modern switching components.

Type	V _{RRM}	I _{FAV} T _K = 55°C	I _{FSM} 10ms ½ sine V _R ≤ 60% V _{RRM}	I ² t V _R ≤ 60% V _{RRM} A ² s	Typ. Reverse Recovery Parameters						V _{T0}	r _T @T _j max	T _j max	R _{thJK} d.c. 180° sine K/W	Fig. No.
					I _{RM}	t _{rr} μs	Q _r μC	@ I _{FM} A	@-di _r /dt A/μs	V					
► New Part No.	Old Part No.	V	A	A	A	A	μs	μC	A	A/μs	V	mΩ	°C	K/W	Fig. No.
► F0240YC250	N/A	250	240	3100	48.1 × 10 ³	40	2.0	40	550	40	2.271	2.853	150	0.100	W3
► F0240YH250	N/A	250	240	3100	48.1 × 10 ³	40	2.0	40	550	40	2.271	2.853	150	0.100	W2
► F0240YC300	N/A	300	240	3100	48.1 × 10 ³	40	2.0	40	550	40	2.271	2.853	150	0.100	W3
► F0240YH300	N/A	300	240	3100	48.1 × 10 ³	40	2.0	40	550	40	2.271	2.853	150	0.100	W2
F0300WC140	F0258WC140	1400	240	2700	36.5 × 10 ³	530	0.3	75	300	2000	1.760	2.210	125	0.095	W1
F0300WC180	F0258WC180	1800	240	2700	36.5 × 10 ³	530	0.3	75	300	2000	1.760	2.210	125	0.095	W1
F0800LC140	F0400LC140	1400	775	7630	291 × 10 ³	380	1.1	200	800	1000	1.494	0.692	125	0.032	W4
F0800LC180	F0400LC180	1800	775	7630	291 × 10 ³	380	1.1	200	800	1000	1.494	0.692	125	0.032	W4
F0900VC450	FX055VC450	4500	816	10450	546 × 10 ³	3000	1.4	2000	900	2000	2.024	1.274	115	0.016	W6
F0900VC520	FX055VC520	5200	816	10450	546 × 10 ³	3000	1.4	2000	900	2000	2.024	1.274	115	0.016	W6
F0900VF450	FX055VF450	4500	816	10450	546 × 10 ³	3000	1.4	2000	900	2000	2.024	1.274	115	0.016	W43
F0900VF520	FX055VF520	5200	816	10450	546 × 10 ³	3000	1.4	2000	900	2000	2.024	1.274	115	0.016	W43
F1000LC080	F0500LC080	800	826	8500	361 × 10 ³	320	1.6	250	1000	800	1.530	0.547	125	0.032	W4
F1000LC120	F0500LC120	1200	826	8500	361 × 10 ³	320	1.6	250	1000	800	1.530	0.547	125	0.032	W4
F1400NC140	FX004NC140	1400	1093	17250	1.49 × 10 ⁶	800	1.5	600	1400	1000	1.618	0.388	125	0.024	W5
F1400NC180	FX004NC180	1800	1093	17250	1.49 × 10 ⁶	800	1.5	600	1400	1000	1.618	0.388	125	0.024	W5
F1500NC200	FX056NC200	2000	1054	13750	950 × 10 ³	1065	1.5	800	1500	2000	1.372	0.535	125	0.024	W5
F1500NC250	FX056NC250	2500	1054	13750	950 × 10 ³	1065	1.5	800	1500	2000	1.372	0.535	125	0.024	W5
F1600NC080	FX021NC080	800	1326	20000	2.0 × 10 ⁶	480	2.3	550	1600	800	1.320	0.268	125	0.024	W5
F1600NC120	FX021NC120	1200	1326	20000	2.0 × 10 ⁶	480	2.3	550	1600	800	1.320	0.268	125	0.024	W5



Fig. W1 - 70 g



Fig. W2 - 80 g



Fig. W3 - 140 g



Fig. W4 - 340 g



Fig. W5 - 510 g



Fig. W6 - 1000 g



Fig. W43 - 800 g

High Power Sonic-FRDs™ - Capsule Types

Introducing a new world-leading class of ultra fast and ultra soft recovery diode available from 1.7kV to 4.5kV in current ratings from 300 to 2500A. These diodes incorporate a unique manufacturing process and novel lifetime control to offer a class leading trade-off between conduction and switching losses. Their exceptionally wide safe operating area (SOA) makes

them the number one choice for freewheeling diodes for snubberless IGBT and IGCT applications. In fact, most applications which require a fast, low loss diode can benefit from this new technology - for example, traction, medium voltage drives, induction heating and pulsed power applications.

Type		V _{RRM}	I _{FAV} T _K = 55°C	I _{FSM} 10ms ½ sine V _R ≤ 60% V _{RRM}	I ² t V _R ≤ 60% V _{RRM} A ² s	Typ. Reverse Recovery Parameters					V _{T0}	r _T	T _{j max}	R _{thJK} 180° Sine K/W	Fig. No.	
Part No.	Old Part No.	V	A	A	A ² s	T _{j max} (50% Chord)					@ T _{j max}	mΩ	°C			
						I _{rm} A	t _{rr} μs	Q _r μC	@ I _{FM} A	@ -di _p /dt A/μs	V					
E0300YH400	N/A	4000	277	2630	34.58 × 10 ³	605	0.75	245	300	2000	2.170	3.800	150	0.073	W3	
E0300YH450	N/A	4500	277	2630	34.58 × 10 ³	605	0.75	245	300	2000	2.170	3.800	150	0.073	W3	
E0400YH200	N/A	2000	348	3542	62.7 × 10 ³	572	0.74	175	400	1500	1.770	2.290	150	0.073	W3	
E0400YH250	N/A	2500	348	3542	62.7 × 10 ³	572	0.74	175	400	1500	1.770	2.290	150	0.073	W3	
E0900NC400	N/A	4000	969	15270	1.17 × 10 ⁶	1340	2.20	1440	900	2000	2.140	1.150	150	0.020	W5	
E0900NC450	N/A	4500	969	15270	1.17 × 10 ⁶	1340	2.20	1440	900	2000	2.140	1.150	150	0.020	W5	
E1500NC200	N/A	2000	1557	15180	1.15 × 10 ⁶	1450	2.30	1550	1500	2000	1.670	0.360	150	0.020	W5	
E1500NC250	N/A	2500	1557	15180	1.15 × 10 ⁶	1450	2.30	1550	1500	2000	1.670	0.360	150	0.020	W5	
E1500VF400	N/A	4000	1995	23600	2.78 × 10 ⁶	1730	3.00	2700	1500	2000	2.350	0.270	150	0.013	W6	
E1500VF450	N/A	4500	1995	23600	2.78 × 10 ⁶	1730	3.00	2700	1500	2000	2.350	0.270	150	0.013	W6	
E2000NC140	N/A	1400	1568	16500	1.13 × 10 ⁶	1880	1.00	950	2000	4000	1.770	0.350	150	0.020	W5	
E2000NC170	N/A	1700	1568	16500	1.13 × 10 ⁶	1880	1.00	950	2000	4000	1.770	0.350	150	0.020	W5	
E2500VF200	N/A	2000	2516	28600	4.10 × 10 ⁶	1750	1.40	1350	2500	3000	1.630	0.210	150	0.013	W6	
E2500VF250	N/A	2500	2516	28600	4.10 × 10 ⁶	1750	1.40	1350	2500	3000	1.630	0.210	150	0.013	W6	
EX175TC400	N/A	4000	Product Under Development										150	0.008	W28	
EX175TC450	N/A	4500	Product Under Development										150	0.008	W28	

Under development



Fig. W3
Weight 140 g



Fig. W5
Weight 510 g

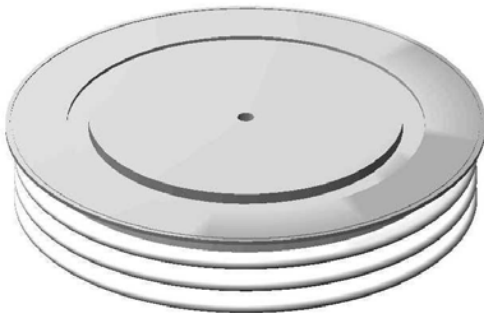


Fig. W6
Weight 1000 g



Fig. W7
Weight 1700 g

We provide one of the most comprehensive ranges of standard phase control thyristors available in the Industry.

Devices with voltage ranges from 600V up to 4.5kV are available, making them suitable for applications with line voltages from 230V to over 1kV (higher voltage applications are now served by our range of Medium Voltage Thyristors).

Westcode is a leading supplier of phase control products into demanding markets such as industrial DC drives, induction melting, marine/ rail propulsion systems, wind power converters, electrochemical power supplies and soft starters.

These devices are optimised to give low conduction losses and are primarily intended for applications from line frequency up to 400Hz.

Phase Control Thyristors - Stud Types

Type		V_{DRM} / V_{RRM} V	I_{TAV} $T_K = 55^\circ C$ A	I_{TSM} 10ms ½ sine $V_R = 60\% V_{RRM}$ A	I^2t $V_R = 60\%$ V_{RRM} A ² s	V_{T0} r_T @ T_{jmax}		T_{jmax} °C	R_{thJC}		Fig. No.
► New Part No.	Old Part No.					V	mΩ		d.c. 180° sine K/W	120° Rect. K/W	
N0131SH120	N086PH12	1200	131	1700	14×10^3	1.570	2.290	125	0.23	0.28	W17
N0131SH160	N086PH16	1600	131	1700	14×10^3	1.570	2.290	125	0.23	0.28	W17
► N0131SJ120	N/A	1200	131	1700	14×10^3	1.570	2.290	125	0.23	0.28	W16
► N0131SJ160	N/A	1600	131	1700	14×10^3	1.570	2.290	125	0.23	0.28	W16
N0180SH120	N105PH12	1200	180	2450	30×10^3	0.900	1.790	125	0.23	0.28	W17
N0180SH160	N105PH16	1600	180	2450	30×10^3	0.900	1.790	125	0.23	0.28	W17
► N0180SJ120	N/A	1200	180	2450	30×10^3	0.900	1.790	125	0.23	0.28	W16
► N0180SJ160	N/A	1600	180	2450	30×10^3	0.900	1.790	125	0.23	0.28	W16
N0290SC120	N170PH12	1200	290	4200	88.2×10^3	1.080	1.300	125	0.12	0.14	W18
N0290SC160	N170PH16	1600	290	4200	88.2×10^3	1.080	1.300	125	0.12	0.14	W18
► N0290SG120	N/A	1200	290	4200	88.2×10^3	1.080	1.300	125	0.12	0.14	W25
► N0290SG160	N/A	1600	290	4200	88.2×10^3	1.080	1.300	125	0.12	0.14	W25
N0335SC120	N195PH12	1200	335	4650	108×10^3	0.920	0.990	125	0.12	0.14	W18
N0335SC160	N195PH16	1600	335	4650	108×10^3	0.920	0.990	125	0.12	0.14	W18
► N0335SG120	N/A	1200	335	4650	108×10^3	0.920	0.990	125	0.12	0.14	W25
► N0335SG160	N/A	1600	335	4650	108×10^3	0.920	0.990	125	0.12	0.14	W25
N0416SC020	N275PH02	200	416	6000	180×10^3	0.850	0.535	125	0.12	0.14	W18
N0416SC080	N275PH08	800	416	6000	180×10^3	0.850	0.535	125	0.12	0.14	W18
► N0416SG020	N/A	200	416	6000	180×10^3	0.850	0.535	125	0.12	0.14	W25
► N0416SG080	N/A	800	416	6000	180×10^3	0.850	0.535	125	0.12	0.14	W25



Fig. W16
Weight 100 g

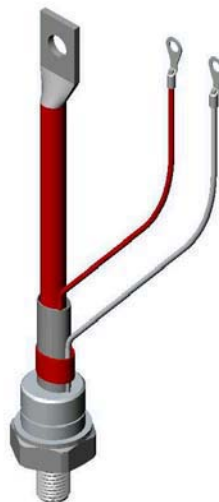


Fig. W17
Weight 130 g

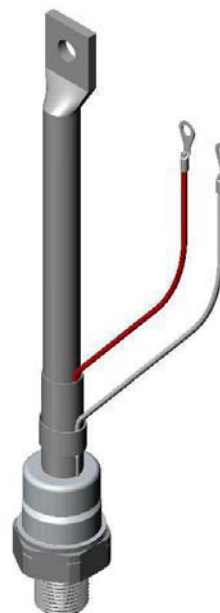


Fig. W18
Weight 250 g



Fig. W25
Weight 220g

The Wespac outline is a new concept in phase control thyristors for applications requiring devices rated to 2200V. It gives the maximum power rating for weight and volume without compromising on quality and reliability. It also gives the maximum current rating and lowest thermal resistance for the package size.

WESPACK Phase Control Thyristors - Capsule Types

Type	V_{DRM} / V_{RRM}	I_{TAV}	I_{TSM}	I^2t	V_{TO}	r_T	T_{jmax}	R_{thJK}		Fig. No.			
Part No.	Old Part No.	V	TK=55°C A	10ms ½ sine $V_R \leq 60\% V_{RRM}$ A	$V_R \leq 60\%$ V_{RRM} A ² s	V	@ T_{jmax} mΩ	°C	d.c. 180° sine K/W		120° Rect. K/W		
NX159JK200	n/a	2000	Product under development - Refer to Westcode factory								WP1		
NX159JK220	n/a	2200	Product under development - Refer to Westcode factory								WP1		
NX159JK160	n/a	1600	Product under development - Refer to Westcode factory								WP1		
NX159JK180	n/a	1800	Product under development - Refer to Westcode factory								WP1		
NX159JK120	n/a	1200	Product under development - Refer to Westcode factory								WP1		
NX159JK140	n/a	1400	Product under development - Refer to Westcode factory								WP1		
NX159JK020	n/a	200	Product under development - Refer to Westcode factory								WP1		
NX159JK060	n/a	600	Product under development - Refer to Westcode factory								WP1		
N1651QK200	n/a	2000	1651	17300	1.50×10^6	1.060	0.317	125	0.018	0.0217	WP2		
N1651QK220	n/a	2200	1651	17300	1.50×10^6	1.060	0.317	125	0.018	0.0217	WP2		
N1806QK160	n/a	1600	1806	19100	1.82×10^6	1.022	0.253	125	0.018	0.0217	WP2		
N1806QK180	n/a	1800	1806	19100	1.82×10^6	1.022	0.253	125	0.018	0.0217	WP2		
N2083QK080	n/a	800	2083	22000	2.42×10^6	0.955	0.177	125	0.018	0.0217	WP2		
N2083QK140	n/a	1400	2083	22000	2.42×10^6	0.955	0.177	125	0.018	0.0217	WP2		
NX155QK020	n/a	200	Product under development - Refer to Westcode factory								0.018	0.0217	WP2
NX155QK060	n/a	600	Product under development - Refer to Westcode factory								0.018	0.0217	WP2
N2367MK200	n/a	2000	2367	32400	5.25×10^6	0.883	0.210	125	0.014	0.0157	WP3		
N2367MK220	n/a	2200	2367	32400	5.25×10^6	0.883	0.210	125	0.014	0.0157	WP3		
N2593MK160	n/a	1600	2593	34500	5.95×10^6	0.940	0.154	125	0.014	0.0157	WP3		
N2593MK180	n/a	1800	2593	34500	5.95×10^6	0.940	0.154	125	0.014	0.0157	WP3		
NX149MK120	n/a	1200	Product under development - Refer to Westcode factory								0.014	0.0157	WP3
NX149MK140	n/a	1400	Product under development - Refer to Westcode factory								0.014	0.0157	WP3
N4004MK020	n/a	200	4004	45400	10.3×10^6	0.990	0.053	125	0.014	0.0157	WP3		
N4004MK060	n/a	600	4004	45400	10.3×10^6	0.990	0.053	125	0.014	0.0157	WP3		
NX160HK200	n/a	2000	Product under development - Refer to Westcode factory								0.009	0.0099	WP4
NX160HK220	n/a	2200	Product under development - Refer to Westcode factory								0.009	0.0099	WP4
N4472HK160	n/a	1600	4472	59000	17.40×10^6	0.986	0.068	125	0.009	0.0099	WP4		
N4472HK180	n/a	1800	4472	59000	17.40×10^6	0.986	0.068	125	0.009	0.0099	WP4		
NX160HK120	n/a	1200	Product under development - Refer to Westcode factory								0.009	0.0099	WP4
NX160HK140	n/a	1400	Product under development - Refer to Westcode factory								0.009	0.0099	WP4
NX157HK020	n/a	200	Product under development - Refer to Westcode factory								0.009	0.0099	WP4
NX157HK060	n/a	600	Product under development - Refer to Westcode factory								0.009	0.0099	WP4



Fig. WP1
Weight 180 g



Fig. WP2
Weight 200 g



Fig. WP3
Weight 260 g



Fig. WP4
Weight 550 g

Under development

Phase Control Thyristors - Capsule Types

Type		V_{DRM} / V_{RRM}	$I_{TAV} T_K=55^\circ C$	I_{TSM} 10ms 1/2 sine $V_R \leq 60\% V_{RRM}$	I^2t $V_R \leq 60\%$ $V_{RRM} A^2s$	$V_{TO} r_T$ @ T_{jmax}		T_{jmax}	R_{thJK}		Fig. No.
Part No.	Old Part No.					V	A		V	mΩ	
N0194WC120	N086CH12	1200	194	1700	14.5×10^3	1.570	2.290	125	0.135	0.190	W8
N0194WC160	N086CH16	1600	194	1700	14.5×10^3	1.570	2.290	125	0.135	0.190	W8
N0255WC120	N105CH12	1200	255	2450	30.0×10^3	0.900	1.790	125	0.135	0.190	W8
N0255WC160	N105CH16	1600	255	2450	30.0×10^3	0.900	1.790	125	0.135	0.190	W8
N0339WC120	N170CH12	1200	339	4200	88.2×10^3	1.080	1.300	125	0.095	0.110	W8
N0339WC160	N170CH16	1600	339	4200	88.2×10^3	1.080	1.300	125	0.095	0.110	W8
N0392WC120	N195CH12	1200	392	4650	108×10^3	0.920	0.990	125	0.095	0.110	W8
N0392WC160	N195CH16	1600	392	4650	108×10^3	0.920	0.990	125	0.095	0.110	W8
N0491WC020	N275CH02	200	491	6000	180×10^3	0.850	0.535	125	0.095	0.110	W8
N0491WC080	N275CH08	800	491	6000	180×10^3	0.850	0.535	125	0.095	0.110	W8
N0606YS200	N282SH20	2000	606	7100	252×10^3	1.103	0.804	125	0.050	0.058	W9
N0606YS250	N/A	2500	606	7100	252×10^3	1.103	0.804	125	0.050	0.058	W9
N0616LC400	N255CH40	4000	616	5250	138×10^3	1.220	1.530	125	0.032	0.040	W10
N0616LC450	N255CH45	4500	616	5250	138×10^3	1.220	1.530	125	0.032	0.040	W10
N0634LC380	N257CH38	3800	634	7000	245×10^3	1.100	1.500	125	0.032	0.040	W10
N0634LC420	N257CH42	4200	634	7000	245×10^3	1.100	1.500	125	0.032	0.040	W10
N0646LC300	N260CH30	3000	646	5700	162×10^3	1.210	1.360	125	0.032	0.040	W10
N0646LC360	N260CH36	3600	646	5700	162×10^3	1.210	1.360	125	0.032	0.040	W10
N0676YS120	N281SH12	1200	676	7500	281×10^3	1.090	0.587	125	0.050	0.058	W9
N0676YS180	N281SH18	1800	676	7500	281×10^3	1.090	0.587	125	0.050	0.058	W9
N0734YS120	N280SH12	1200	734	8400	353×10^3	1.030	0.483	125	0.050	0.058	W9
N0734YS160	N280SH16	1600	734	8400	353×10^3	1.030	0.483	125	0.050	0.058	W9
N0782YS120	N283SH12	1200	782	9420	444×10^3	0.920	0.450	125	0.050	0.058	W9
N0782YS140	N283SH14	1600	782	9420	444×10^3	0.920	0.450	125	0.050	0.058	W9
N0882NC400	N320CH40	4000	882	7700	296×10^3	1.300	0.920	125	0.024	0.030	W11
N0882NC450	N320CH45	5000	882	7700	296×10^3	1.300	0.920	125	0.024	0.030	W11
N0910LS200	N330SH20	2000	910	9200	423×10^3	1.040	0.606	125	0.032	0.040	W10a
N0910LS260	N330SH26	2600	910	9200	423×10^3	1.040	0.606	125	0.032	0.040	W10a
N0992YS020	N310SH02	200	992	11000	605×10^3	0.820	0.240	125	0.050	0.058	W9
N0992YS060	N310SH06	600	992	11000	605×10^3	0.820	0.240	125	0.050	0.058	W9
N1010NC300	N360CH30	3000	1010	12100	732×10^3	1.170	0.687	125	0.024	0.030	W11
N1010NC380	N360CH38	3800	1010	12100	732×10^3	1.170	0.687	125	0.024	0.030	W11
N1042LS120	N350SH12	1200	1042	11500	661×10^3	1.080	0.395	125	0.032	0.040	W10a
N1042LS180	N350SH18	1800	1042	11500	661×10^3	1.080	0.395	125	0.032	0.040	W10a
N1114LS120	N370SH12	1200	1114	12700	806×10^3	1.000	0.349	125	0.032	0.040	W10a
N1114LS180	N370SH18	1800	1114	12700	806×10^3	1.000	0.349	125	0.032	0.040	W10a
N1132NC300	N390CH30	3000	1132	14300	1.02×10^6	1.150	0.510	125	0.024	0.030	W11
N1132NC320	N390CH32	3200	1132	14300	1.02×10^6	1.150	0.510	125	0.024	0.030	W11
N1159NC380	N500CH38	3800	1159	14500	1.05×10^6	1.100	0.574	125	0.022	0.027	W11
N1159NC420	N500CH42	4200	1159	14500	1.05×10^6	1.100	0.574	125	0.022	0.027	W11
N1265LS120	N520SH12	1200	1265	15000	1.13×10^6	0.900	0.265	125	0.032	0.040	W10a
N1265LS150	N520SH15	1500	1265	15000	1.13×10^6	0.900	0.265	125	0.032	0.040	W10a
N1297NS200	N450SH20	2000	1297	17600	1.55×10^6	1.030	0.380	125	0.024	0.030	W11a
N1297NS260	N450SH26	2600	1297	17600	1.55×10^6	1.030	0.380	125	0.024	0.030	W11a
N1314NC300	N570CH30	3000	1314	16600	1.38×10^6	1.000	0.437	125	0.024	0.030	W11
N1314NC360	N570CH36	3600	1314	16600	1.38×10^6	1.000	0.437	125	0.024	0.030	W11
N1351VC400	N560CH40	4000	1351	17500	1.53×10^6	1.200	0.553	125	0.017	0.020	W12
N1351VC450	N560CH45	4500	1351	17500	1.53×10^6	1.200	0.553	125	0.017	0.020	W12
N1351VD400	N/A	4000	1351	17500	1.53×10^6	1.200	0.553	125	0.017	0.020	W50
N1351VD450	N/A	4500	1351	17500	1.53×10^6	1.200	0.553	125	0.017	0.020	W50
N1467NS200	N490SH20	2000	1467	21500	2.31×10^6	1.000	0.272	125	0.024	0.030	W11a
N1467NS260	N490SH26	2600	1467	21500	2.31×10^6	1.000	0.272	125	0.024	0.030	W11a
N1479NS240	N620SH24	2400	1436	21000	2.21×10^6	1.000	0.342	125	0.022	0.026	W11a
N1479NS300	N620SH30	3000	1436	21000	2.21×10^6	1.000	0.342	125	0.022	0.026	W11a
N1547NS160	N510SH16	1600	1547	23300	2.71×10^6	0.920	0.252	125	0.024	0.030	W11a
N1547NS200	N510SH20	2000	1547	23300	2.71×10^6	0.920	0.252	125	0.024	0.030	W11a
N1588NS200	N680SH20	2000	1588	22500	2.53×10^6	0.951	0.268	125	0.022	0.027	W11a
N1588NS260	N680SH26	2600	1588	22500	2.53×10^6	0.951	0.268	125	0.022	0.027	W11a

Phase Control Thyristors - Capsule Types, continued

Type		V_{DRM} / V_{RRM}	I_{TAV} $T_K=55^\circ\text{C}$	I_{TSM} 10ms ½ sine $V_R \leq 60\% V_{RRM}$	I^2t V_{RRM} A ² s	V_{TO} r_T @ T_{jmax}		$T_{i max}$	R_{thJK} 180° Sine K/W 120° Rect. K/W		Fig. No.
Part No.	Old Part No.	V	A	A	A ² s	V	mΩ	°C			
N1661VC300	N630CH30	3000	1661	23000	2.65×10^6	1.040	0.350	125	0.017	0.020	W12
N1661VC360	N630CH36	3600	1661	23000	2.65×10^6	1.040	0.350	125	0.017	0.020	W12
N1661VD300	N/A	3000	1661	23000	2.65×10^6	1.040	0.350	125	0.017	0.020	W50
N1661VD360	N/A	3600	1661	23000	2.65×10^6	1.040	0.350	125	0.017	0.020	W50
N1712VC240	N640CH24	2400	1712	24500	3.00×10^6	1.050	0.320	125	0.017	0.020	W12
N1712VC300	N640CH30	3000	1712	24500	3.00×10^6	1.050	0.320	125	0.017	0.020	W12
N1712VD240	N/A	2400	1712	24500	3.00×10^6	1.050	0.320	125	0.017	0.020	W50
N1712VD300	N/A	3000	1712	24500	3.00×10^6	1.050	0.320	125	0.017	0.020	W50
N1718NS120	N540SH12	1200	1718	27200	3.70×10^6	0.979	0.169	125	0.024	0.030	W11a
N1718NS180	N540SH18	1800	1718	27200	3.70×10^6	0.979	0.169	125	0.024	0.030	W11a
N1802NS120	N600SH12	1200	1802	29600	4.38×10^6	0.855	0.171	125	0.024	0.030	W11a
N1802NS160	N600SH16	1600	1802	29600	4.38×10^6	0.855	0.171	125	0.024	0.030	W11a
N2046NS120	N740SH12	1200	2046	29200	4.26×10^6	0.980	0.114	125	0.022	0.026	W11a
N2046NS160	N740SH16	1600	2046	29200	4.26×10^6	0.980	0.114	125	0.022	0.026	W11a
N2086NS060	N610SH06	600	2086	35000	6.13×10^6	0.840	0.108	125	0.024	0.030	W11a
N2086NS100	N610SH10	1000	2086	35000	6.13×10^6	0.840	0.108	125	0.024	0.030	W11a
N2172ZC400	N750CH40	4000	2172	28000	3.92×10^6	1.350	0.294	125	0.011	0.012	W13
N2172ZC450	N750CH45	4500	2172	28000	3.92×10^6	1.350	0.294	125	0.011	0.012	W13
N2172ZD400	N750DH40	4000	2172	28000	3.92×10^6	1.350	0.294	125	0.011	0.012	W46
N2172ZD450	N750DH45	4500	2172	28000	3.92×10^6	1.350	0.294	125	0.011	0.012	W46
N2293VC180	N760CH18	1800	2293	33800	5.71×10^6	0.956	0.148	125	0.017	0.020	W12
N2293VC220	N760CH22	2200	2293	33800	5.71×10^6	0.956	0.148	125	0.017	0.020	W12
N2293VD180	N/A	1800	2293	33800	5.71×10^6	0.956	0.148	125	0.017	0.020	W50
N2293VD220	N/A	2200	2293	33800	5.71×10^6	0.956	0.148	125	0.017	0.020	W50
N2418ZC300	N850CH30	3000	2418	30000	4.50×10^6	1.160	0.246	125	0.011	0.012	W13
N2418ZC360	N850CH36	3600	2418	30000	4.50×10^6	1.160	0.246	125	0.011	0.012	W13
N2418ZD300	N/A	3000	2418	30000	4.50×10^6	1.160	0.246	125	0.011	0.012	W46
N2418ZD360	N/A	3600	2418	30000	4.50×10^6	1.160	0.246	125	0.011	0.012	W46
N2500VC120	N990CH12	1200	2500	37000	6.85×10^6	0.880	0.124	125	0.017	0.020	W12
N2500VC160	N990CH16	1600	2500	37000	6.85×10^6	0.880	0.124	125	0.017	0.020	W12
N2500VD120	N/A	1200	2500	37000	6.85×10^6	0.880	0.124	125	0.017	0.020	W50
N2500VD160	N/A	1600	2500	37000	6.85×10^6	0.880	0.124	125	0.017	0.020	W50
N2543ZC240	N880CH24	2400	2543	32000	5.12×10^6	0.780	0.274	125	0.011	0.012	W13
N2543ZC300	N880CH30	3000	2543	32000	5.12×10^6	0.780	0.274	125	0.011	0.012	W13
N2543ZD240	N/A	2400	2543	32000	5.12×10^6	0.780	0.274	125	0.011	0.012	W46
N2543ZD300	N/A	3000	2543	32000	5.12×10^6	0.780	0.274	125	0.011	0.012	W46
N3012ZC200	N900CH20	2000	3012	45100	10.2×10^6	0.920	0.160	125	0.011	0.012	W13
N3012ZC260	N900CH26	2600	3012	45100	10.2×10^6	0.920	0.160	125	0.011	0.012	W13
N3012ZD200	N/A	2000	3012	45100	10.2×10^6	0.920	0.160	125	0.011	0.012	W46
N3012ZD260	N/A	2600	3012	45100	10.2×10^6	0.920	0.160	125	0.011	0.012	W46
N3476TC360	N1463CH36	3600	3476	46800	10.95×10^6	0.970	0.180	125	0.008	0.009	W14
N3476TC420	N1463CH42	4200	3476	46800	10.95×10^6	0.970	0.180	125	0.008	0.009	W14
N3476TD360	N1463DH36	3600	3476	46800	10.95×10^6	0.970	0.180	125	0.008	0.009	W19
N3476TD420	N1463DH42	4200	3476	46800	10.95×10^6	0.970	0.180	125	0.008	0.009	W19
N3533ZC140	N1400CH14	1400	3533	50000	12.50×10^6	0.970	0.095	125	0.011	0.012	W13
N3533ZC220	N1400CH22	2200	3533	50000	12.50×10^6	0.970	0.095	125	0.011	0.012	W13
N3533ZD140	N/A	1400	3533	50000	12.50×10^6	0.970	0.095	125	0.011	0.012	W46
N3533ZD220	N/A	2200	3533	50000	12.50×10^6	0.970	0.095	125	0.011	0.012	W46
N3839TC300	N1663CH30	3000	3839	49500	12.25×10^6	0.950	0.140	125	0.008	0.012	W14
N3839TC350	N1663CH35	3500	3839	49500	12.25×10^6	0.950	0.140	125	0.008	0.012	W14
N3839TD300	N1663DH30	3000	3839	49500	12.25×10^6	0.950	0.140	125	0.008	0.012	W19
N3839TD350	N1663DH35	3500	3839	49500	12.25×10^6	0.950	0.140	125	0.008	0.012	W19
N4085ZC080	N1600CH08	800	4085	64000	20.5×10^6	0.850	0.070	125	0.011	0.012	W13
N4085ZC120	N1600CH12	1200	4085	64000	20.5×10^6	0.850	0.070	125	0.011	0.012	W13
N4085ZD080	N/A	800	4085	64000	20.5×10^6	0.850	0.070	125	0.011	0.012	W46
N4085ZD120	N/A	1200	4085	64000	20.5×10^6	0.850	0.070	125	0.011	0.012	W46

Phase Control Thyristors - Capsule Types, continued

Type		V_{DRM} / V_{RRM}	I_{TAV} $T_K=55^\circ\text{C}$	I_{TSM} 10ms 1/2 sine $V_R \leq 60\% V_{RRM}$	I^2t $V_R \leq 60\%$ V_{RRM} A^2s	V_{TO} $@T_{jmax}$	r_T	T_{jmax}	R_{thJK}		Fig. No.
Part No.	Old Part No.	V	A	A		V	mΩ	°C	180° Sine K/W	120° Rect. K/W	Fig.
N4151FC360	N1483CH36	3600	4151	54000	14.6×10^6	0.850	0.170	125	0.0065	0.0068	W15
N4151FC420	N1483CH42	4200	4151	54000	14.6×10^6	0.850	0.170	125	0.0065	0.0068	W15
N4151FD360	N1483DH36	3600	4151	54000	14.6×10^6	0.850	0.170	125	TBC	TBC	W48
N4151FD420	N1483DH42	4200	4151	54000	14.6×10^6	0.850	0.170	125	TBC	TBC	W48
N4400TC120	N1863CH12	1200	4400	54000	14.6×10^6	0.900	0.100	125	0.008	0.0085	W14
N4400TC220	N1863CH22	2200	4400	54000	14.6×10^6	0.900	0.100	125	0.008	0.0085	W14
N4400TC280	N1863CH28	2800	4400	54000	14.6×10^6	0.900	0.100	125	0.008	0.0085	W14
N4400TD120	N1863DH12	1200	4400	54000	14.6×10^6	0.900	0.100	125	0.008	0.0085	W19
N4400TD220	N1863DH22	2200	4400	54000	14.6×10^6	0.900	0.100	125	0.008	0.0085	W19
N4400TD280	N1863DH28	2800	4400	54000	14.6×10^6	0.900	0.100	125	0.008	0.0085	W19
N4803FC300	N1683CH30	3000	4803	60000	18.0×10^6	0.920	0.110	125	0.0065	0.0068	W15
N4803FC350	N1683CH35	3500	4803	60000	18.0×10^6	0.920	0.110	125	0.0065	0.0068	W15
N4803FD300	N/A	3000	4803	60000	18.0×10^6	0.920	0.110	125	TBC	TBC	W48
N4803FD350	N/A	3500	4803	60000	18.0×10^6	0.920	0.110	125	TBC	TBC	W48
N5177FC200	N1883CH20	2000	5177	67500	22.8×10^6	0.800	0.100	125	0.0065	0.0068	W15
N5177FC280	N1883CH28	2800	5177	67500	22.8×10^6	0.800	0.100	125	0.0065	0.0068	W15
N5177FD200	N/A	2000	5177	67500	22.8×10^6	0.800	0.100	125	TBC	TBC	W48
N5177FD280	N/A	2800	5177	67500	22.8×10^6	0.800	0.100	125	TBC	TBC	W48
N5946FC180	N1983CH18	1800	5946	72000	25.9×10^6	0.855	0.065	125	0.0065	0.0068	W15
N5946FC220	N1983CH22	2200	5946	72000	25.9×10^6	0.855	0.065	125	0.0065	0.0068	W15
N5946FD180	N/A	1800	5946	72000	25.9×10^6	0.855	0.065	125	TBC	TBC	W48
N5946FD220	N/A	2200	5946	72000	25.9×10^6	0.855	0.065	125	TBC	TBC	W48



Fig. W8
Weight 70 g



Fig. W9
Weight 90 g



Fig. W10
Weight 340 g

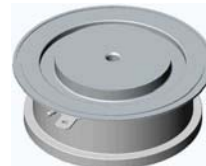


Fig. W10a
Weight 340 g



Fig. W11
Weight 510 g

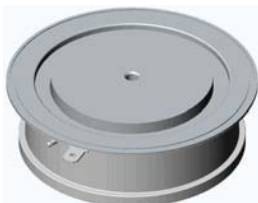


Fig. W11a
Weight 510 g



Fig. W12
Weight 1000 g



Fig. W13
Weight 1700 g



Fig. W14
Weight 1300 g



Fig. W15
Weight 2800 g

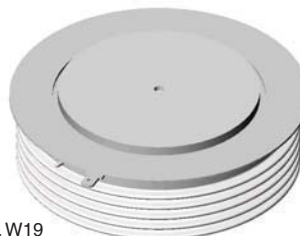


Fig. W19
Weight 1700 g

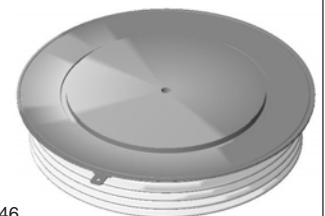


Fig. W46
Weight 1200 g



Fig. W48
Weight 1200 g

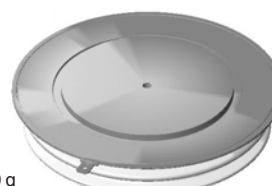


Fig. W50
Weight 750 g



Fig. W10
Weight 340 g



Fig. W11
Weight 510 g



Fig. W12
Weight 1000 g



Fig. W13
Weight 1700 g



Fig. W14
Weight 1300 g



Fig. W15
Weight 2800 g

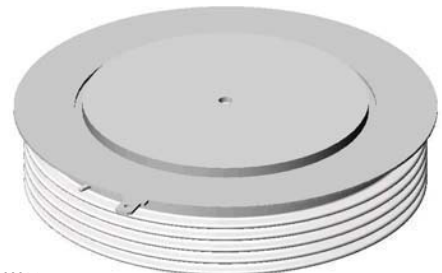


Fig. W19
Weight 1700 g

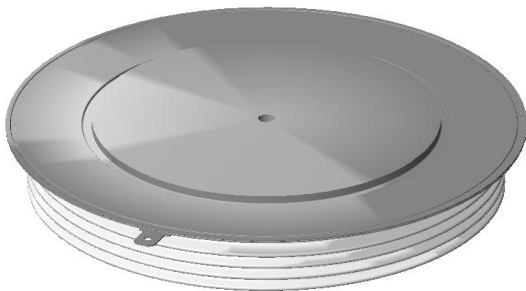


Fig. W46
Weight 1200 g



Fig. W50
Weight 750 g

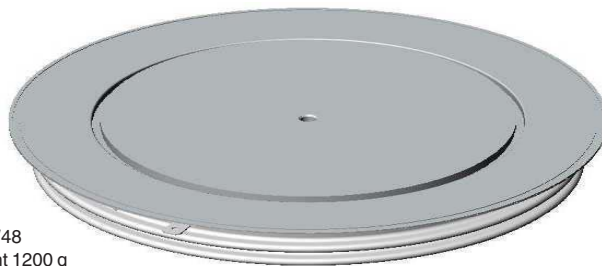


Fig. W48
Weight 1200 g

We are widely acknowledged as the global leader in fast switching thyristor technologies.

Devices with blocking voltages up to 4.5kV and current ratings up to 4kA are available with turn off times as low as 10µs. Our patented distributed gate architecture together with highly efficient axial lifetime control produce a unique combination of high di/dt capability, fast / soft recovery and low conduction losses.

Fast Turn-Off and Distributed Gate Thyristor devices allow the development of highly efficient, compact and reliable high frequency resonant converters for demanding applications such as induction heating, traction and UPS.

Additionally these devices make an excellent choice for fast high-energy switches such as pulsed power and crowbars. As with all of our high power semiconductors, these parts utilise advanced compression bonded construction ensuring long term reliability in applications subject to repeated power cycles.

Fast Turn-Off Thyristors - Stud Types

Type		V _{DRM} / V _{RRM}	I _{TAV} T _K = 55°C	I _{TSM} 10ms ½ sine V _R ≤ 60% V _{RRM}	I ² t V _R ≤ 60% V _{RRM} A ² s	t _q @ 200V/µs	Typ. Reverse Recovery Charge			V _{TO} @T _j max	r _T mΩ	T _j max °C	R _{thJC} d.c. 180° sine K/W	Fig. No.
Part No.	Old Part No.						Q _r µC	T _j max, 50% Chord @I _{TM} A	@-di/dt A/µs					
P0128SH10D	N/A	1000	128	1700	19 × 10 ³	20	25	100	10	1.600	2.490	125	0.23	W17
P0128SH10E	N/A	1000	128	1700	19 × 10 ³	25	25	100	10	1.600	2.490	125	0.23	W17
P0128SH10F	N/A	1000	128	1700	19 × 10 ³	30	25	100	10	1.600	2.490	125	0.23	W17
P0128SH12D	N/A	1200	128	1700	19 × 10 ³	20	25	100	10	1.600	2.490	125	0.23	W17
P0128SH12E	N/A	1200	128	1700	19 × 10 ³	25	25	100	10	1.600	2.490	125	0.23	W17
P0128SH12F	N/A	1200	128	1700	19 × 10 ³	30	25	100	10	1.600	2.490	125	0.23	W17
P0128SJ10D	N/A	1000	128	1700	19 × 10 ³	20	25	100	10	1.600	2.490	125	0.23	W16
P0128SJ10E	N/A	1000	128	1700	19 × 10 ³	25	25	100	10	1.600	2.490	125	0.23	W16
P0128SJ10F	N/A	1000	128	1700	19 × 10 ³	30	25	100	10	1.600	2.490	125	0.23	W16
P0128SJ12D	N/A	1200	128	1700	19 × 10 ³	20	25	100	10	1.600	2.490	125	0.23	W16
P0128SJ12E	N/A	1200	128	1700	19 × 10 ³	25	25	100	10	1.600	2.490	125	0.23	W16
P0128SJ12F	N/A	1200	128	1700	19 × 10 ³	30	25	100	10	1.600	2.490	125	0.23	W16
P0248SC10D	P200PH10	1000	248	2700	36.5 × 10 ³	20	25	300	20	1.600	1.230	125	0.12	W18
P0248SC10E	P200PH10	1000	248	2700	36.5 × 10 ³	25	25	300	20	1.600	1.230	125	0.12	W18
P0248SC10F	P200PH10	1000	248	2700	36.5 × 10 ³	30	25	300	20	1.600	1.230	125	0.12	W18
P0248SC12D	P200PH12	1200	248	2700	36.5 × 10 ³	20	25	300	20	1.600	1.230	125	0.12	W18
P0248SC12E	P200PH12	1200	248	2700	36.5 × 10 ³	25	25	300	20	1.600	1.230	125	0.12	W18
P0248SC12F	P200PH12	1200	248	2700	36.5 × 10 ³	30	25	300	20	1.600	1.230	125	0.12	W18
P0248SG10D	N/A	1000	248	2700	36.5 × 10 ³	20	25	300	20	1.600	1.230	125	0.12	W25
P0248SG10E	N/A	1000	248	2700	36.5 × 10 ³	25	25	300	20	1.600	1.230	125	0.12	W25
P0248SG10F	N/A	1000	248	2700	36.5 × 10 ³	30	25	300	20	1.600	1.230	125	0.12	W25
P0248SG12D	N/A	1200	248	2700	36.5 × 10 ³	20	25	300	20	1.600	1.230	125	0.12	W25
P0248SG12E	N/A	1200	248	2700	36.5 × 10 ³	25	25	300	20	1.600	1.230	125	0.12	W25
P0248SG12F	N/A	1200	248	2700	36.5 × 10 ³	30	25	300	20	1.600	1.230	125	0.12	W25
P0273SC10D	P202PH10	1000	273	3250	52.8 × 10 ³	20	45	300	20	1.550	0.870	125	0.12	W18
P0273SC10E	P202PH10	1000	273	3250	52.8 × 10 ³	25	45	300	20	1.550	0.870	125	0.12	W18
P0273SC10F	P202PH10	1000	273	3250	52.8 × 10 ³	30	45	300	20	1.550	0.870	125	0.12	W18
P0273SC12D	P202PH12	1200	273	3250	52.8 × 10 ³	20	45	300	20	1.550	0.870	125	0.12	W18
P0273SC12E	P202PH12	1200	273	3250	52.8 × 10 ³	25	45	300	20	1.550	0.870	125	0.12	W18
P0273SC12F	P202PH12	1200	273	3250	52.8 × 10 ³	30	45	300	20	1.550	0.870	125	0.12	W18
P0273SG10D	N/A	1000	273	3250	52.8 × 10 ³	20	45	300	20	1.550	0.870	125	0.12	W25
P0273SG10E	N/A	1000	273	3250	52.8 × 10 ³	25	45	300	20	1.550	0.870	125	0.12	W25
P0273SG10F	N/A	1000	273	3250	52.8 × 10 ³	30	45	300	20	1.550	0.870	125	0.12	W25
P0273SG12D	N/A	1200	273	3250	52.8 × 10 ³	20	45	300	20	1.550	0.870	125	0.12	W25
P0273SG12E	N/A	1200	273	3250	52.8 × 10 ³	25	45	300	20	1.550	0.870	125	0.12	W25
P0273SG12F	N/A	1200	273	3250	52.8 × 10 ³	30	45	300	20	1.550	0.870	125	0.12	W25
P0306SC04A	P214PH04	400	306	4700	101 × 10 ³	10	25	300	20	1.400	0.670	125	0.12	W18
P0306SC04B	P214PH04	400	306	4700	101 × 10 ³	12	25	300	20	1.400	0.670	125	0.12	W18
P0306SC04C	P214PH04	400	306	4700	101 × 10 ³	15	25	300	20	1.400	0.670	125	0.12	W18
P0306SC08A	P214PH08	800	306	4700	101 × 10 ³	10	25	300	20	1.400	0.670	125	0.12	W18
P0306SC08B	P214PH08	800	306	4700	101 × 10 ³	12	25	300	20	1.400	0.670	125	0.12	W18
P0306SC08C	P214PH08	800	306	4700	101 × 10 ³	15	25	300	20	1.400	0.670	125	0.12	W18
P0306SG04A	N/A	400	306	4700	101 × 10 ³	10	25	300	20	1.400	0.670	125	0.12	W25
P0306SG04B	N/A	400	306	4700	101 × 10 ³	12	25	300	20	1.400	0.670	125	0.12	W25
P0306SG04C	N/A	400	306	4700	101 × 10 ³	15	25	300	20	1.400	0.670	125	0.12	W25
P0306SG08A	N/A	800	306	4700	101 × 10 ³	10	25	300	20	1.400	0.670	125	0.12	W25
P0306SG08B	N/A	800	306	4700	101 × 10 ³	12	25	300	20	1.400	0.670	125	0.12	W25
P0306SG08C	N/A	800	306	4700	101 × 10 ³	15	25	300	20	1.400	0.670	125	0.12	W25

Fast Turn-Off Thyristors - Stud Types, continued

Type		V_{DRM} / V_{RRM}	$I_{TAV} / T_K = 55^\circ C$	I_{TSM} 10ms 1/2 sine $V_R \leq 60\% V_{RRM}$	I^2t $V_R \leq 60\%$ V_{RRM} A ² s	t_q @ 200V/ μ s	Typ. Reverse Recovery Charge			V_{TO} @ $T_{j,max}$	r_T m Ω	$T_{j,max}$ °C	R_{thJC} d.c. 180° sine K/W	Fig. No.
Part No.	Old Part No.						V	A	A					
P0311SC10E	P205PH10	1000	311	3600	64.8×10^3	25	30	300	20	1.170	0.920	125	0.12	W18
P0311SC10F	P205PH10	1000	311	3600	64.8×10^3	30	30	300	20	1.170	0.920	125	0.12	W18
P0311SC10G	P205PH10	1000	311	3600	64.8×10^3	35	30	300	20	1.170	0.920	125	0.12	W18
P0311SC12E	P205PH12	1200	311	3600	64.8×10^3	25	30	300	20	1.170	0.920	125	0.12	W18
P0311SC12F	P205PH12	1200	311	3600	64.8×10^3	30	30	300	20	1.170	0.920	125	0.12	W18
P0311SC12G	P205PH12	1200	311	3600	64.8×10^3	35	30	300	20	1.170	0.920	125	0.12	W18
P0311SG10E	N/A	1000	311	3600	64.8×10^3	25	30	300	20	1.170	0.920	125	0.12	W25
P0311SG10F	N/A	1000	311	3600	64.8×10^3	30	30	300	20	1.170	0.920	125	0.12	W25
P0311SG10G	N/A	1000	311	3600	64.8×10^3	35	30	300	20	1.170	0.920	125	0.12	W25
P0311SG12E	N/A	1200	311	3600	64.8×10^3	25	30	300	20	1.170	0.920	125	0.12	W25
P0311SG12F	N/A	1200	311	3600	64.8×10^3	30	30	300	20	1.170	0.920	125	0.12	W25
P0311SG12G	N/A	1200	311	3600	64.8×10^3	35	30	300	20	1.170	0.920	125	0.12	W25
P0330SC04C	P215PH04	400	330	5000	125×10^3	15	30	300	20	1.050	0.880	125	0.12	W18
P0330SC04D	P215PH04	400	330	5000	125×10^3	20	30	300	20	1.050	0.880	125	0.12	W18
P0330SC08C	P215PH08	800	330	5000	125×10^3	15	30	300	20	1.050	0.880	125	0.12	W18
P0330SC08D	P215PH08	800	330	5000	125×10^3	20	30	300	20	1.050	0.880	125	0.12	W18
P0330SG04C	N/A	400	330	5000	125×10^3	15	30	300	20	1.050	0.880	125	0.12	W25
P0330SG04D	N/A	400	330	5000	125×10^3	20	30	300	20	1.050	0.880	125	0.12	W25
P0330SG08C	N/A	800	330	5000	125×10^3	15	30	300	20	1.050	0.880	125	0.12	W25
P0330SG08D	N/A	800	330	5000	125×10^3	20	30	300	20	1.050	0.880	125	0.12	W25
P0431SC04B	P270PH04	400	431	6500	211×10^3	12	106	300	20	0.950	0.377	125	0.12	W18
P0431SC04C	P270PH04	400	431	6500	211×10^3	15	106	300	20	0.950	0.377	125	0.12	W18
P0431SC06B	P270PH06	600	431	6500	211×10^3	12	106	300	20	0.950	0.377	125	0.12	W18
P0431SC06C	P270PH06	600	431	6500	211×10^3	15	106	300	20	0.950	0.377	125	0.12	W18
P0431SG04B	N/A	400	431	6500	211×10^3	12	106	300	20	0.950	0.377	125	0.12	W25
P0431SG04C	N/A	400	431	6500	211×10^3	15	106	300	20	0.950	0.377	125	0.12	W25
P0431SG06B	N/A	600	431	6500	211×10^3	12	106	300	20	0.950	0.377	125	0.12	W25
P0431SG06C	N/A	600	431	6500	211×10^3	15	106	300	20	0.950	0.377	125	0.12	W25



Fig. W16
Weight 100 g

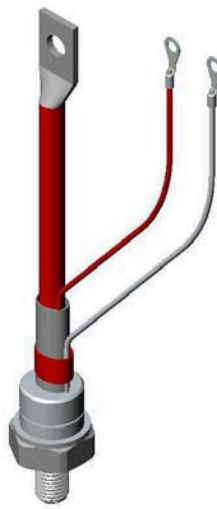


Fig. W17
Weight 130 g

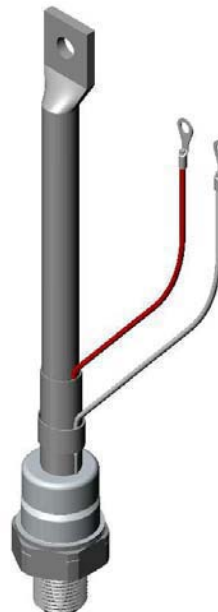


Fig. W18
Weight 250 g



Fig. W25
Weight 220g

Westcode "P" series of fast switching thyristors have regenerative gate structure to ensure low switching losses and high di/dt performance. "P" Series devices are particularly attractive to; Inverter, DC chopper

drives, UPS and Pulse Power applications. In addition to pressure contact technology these devices offer lower reverse recovery charge values, low forward switching losses and high reliability.

Fast Turn-Off Thyristors - Capsule Types

Type		V_{DRM} / V_{RRM}	I_{TAV} $T_K=55^\circ C$	I_{TSM} 10ms 1/2 sine $V_R \leq 60\% V_{RRM}$	I^2t $V_R \leq 60\%$ V_{RRM} A^2s	t_q @ 200V/ μs	Typ. Reverse Recovery Charge			V_{TO} @ T_{jmax}	r_T m Ω	T_{jmax} °C	R_{thJK} d.c. 180° sine K/W	Fig. No.
Part No.	Old Part No.						V	A	A					
P0295WC12D	P200CH12	1200	295	2700	36.5×10^3	20	25	300	20	1.600	1.230	125	0.095	W8
P0295WC12E	P200CH12	1200	295	2700	36.5×10^3	25	25	300	20	1.600	1.230	125	0.095	W8
P0295WC12F	P200CH12	1200	295	2700	36.5×10^3	30	25	300	20	1.600	1.230	125	0.095	W8
P0327WC12D	P202CH12	1200	327	3250	52.8×10^3	20	45	300	20	1.550	0.870	125	0.095	W8
P0327WC12E	P202CH12	1200	327	3250	52.8×10^3	25	45	300	20	1.550	0.870	125	0.095	W8
P0327WC12F	P202CH12	1200	327	3250	52.8×10^3	30	45	300	20	1.550	0.870	125	0.095	W8
P0366WC04A	P214CH04	400	366	4700	110×10^3	10	20	300	20	1.400	0.670	125	0.095	W8
P0366WC04B	P214CH04	400	366	4700	110×10^3	12	20	300	20	1.400	0.670	125	0.095	W8
P0366WC04C	P214CH04	400	366	4700	110×10^3	15	20	300	20	1.400	0.670	125	0.095	W8
P0366WC08A	P214CH08	800	366	4700	110×10^3	10	20	300	20	1.400	0.670	125	0.095	W8
P0366WC08B	P214CH08	800	366	4700	110×10^3	12	20	300	20	1.400	0.670	125	0.095	W8
P0366WC08C	P214CH08	800	366	4700	110×10^3	15	20	300	20	1.400	0.670	125	0.095	W8
P0367WC12E	P205CH12	1200	367	3600	64.8×10^3	25	45	300	20	1.170	0.920	125	0.095	W8
P0367WC12F	P205CH12	1200	367	3600	64.8×10^3	30	45	300	20	1.170	0.920	125	0.095	W8
P0367WC12G	P205CH12	1200	367	3600	64.8×10^3	35	45	300	20	1.170	0.920	125	0.095	W8
P0389WC04C	P215CH04	400	389	5000	125×10^3	15	30	300	20	1.050	0.880	125	0.095	W8
P0389WC04D	P215CH04	400	389	5000	125×10^3	20	30	300	20	1.050	0.880	125	0.095	W8
P0389WC08C	P215CH08	800	389	5000	125×10^3	15	30	300	20	1.050	0.880	125	0.095	W8
P0389WC08D	P215CH08	800	389	5000	125×10^3	20	30	300	20	1.050	0.880	125	0.095	W8
P0515WC04B	P270CH04	400	515	6500	211×10^3	12	100	300	20	0.950	0.377	125	0.095	W8
P0515WC04C	P270CH04	400	515	6500	211×10^3	15	100	300	20	0.950	0.377	125	0.095	W8
P0515WC04D	P270CH04	400	515	6500	211×10^3	20	100	300	20	0.950	0.377	125	0.095	W8
P0515WC06B	P270CH06	600	515	6500	211×10^3	12	100	300	20	0.950	0.377	125	0.095	W8
P0515WC06C	P270CH06	600	515	6500	211×10^3	15	100	300	20	0.950	0.377	125	0.095	W8
P0515WC06D	P270CH06	600	515	6500	211×10^3	20	100	300	20	0.950	0.377	125	0.095	W8
P0848YS04B	P280SH04	400	848	8750	383×10^3	12	80	550	40	1.010	0.305	125	0.050	W9
P0848YS04C	P280SH04	400	848	8750	383×10^3	15	80	550	40	1.010	0.305	125	0.050	W9
P0848YS04D	P280SH04	400	848	8750	383×10^3	20	80	550	40	1.010	0.305	125	0.050	W9
P0848YS06B	P280SH06	600	848	8750	383×10^3	12	80	550	40	1.010	0.305	125	0.050	W9
P0848YS06C	P280SH06	600	848	8750	383×10^3	15	80	550	40	1.010	0.305	125	0.050	W9
P0848YS06D	P280SH06	600	848	8750	383×10^3	20	80	550	40	1.010	0.305	125	0.050	W9
P1007LS12D	P300SH12	1200	1007	9500	451×10^3	20	200	800	50	1.509	0.265	125	0.032	W10a
P1007LS12E	P300SH12	1200	1007	9500	451×10^3	25	200	800	50	1.509	0.265	125	0.032	W10a
P1007LS12F	P300SH12	1200	1007	9500	451×10^3	30	200	800	50	1.509	0.265	125	0.032	W10a



Fig. W8
Weight 70 g



Fig. W10a
Weight 340 g



Fig. W9
Weight 90 g

Recognised as the worldwide leader in distributed gate thyristor technology, these devices are available with blocking voltages to 5.2kV and currents to 3kA, with t_q from 10 to 300μs.

The unique distributed gate design and lifetime control features give these devices both high di/dt capability and fast low recovery turn-off, while maintaining a low forward voltage drop.

Ideally suited to applications including; induction heating, power supplies, high frequency inverters/converters, UPS and pulse power.

Distributed Gate Thyristors - Capsule Types

Type		V_{DRM} $/V_{RRM}$	I_{TAV} $T_K=55^\circ C$	I_{TSM} 10ms 1/2 sine $V_R \leq 60\% V_{RRM}$	$I^2 t$ $V_R \leq 60\%$ V_{RRM} $A^2 s$	t_q @ 200V/μs	Typ. Reverse Recovery Charge $T_{j,max}, 50\% \text{ Chord}$			V_{TO}	r_T	$T_{j,max}$	R_{thJK} 180° Sine K/W	Fig. No.
Part No.	Old Part No.	V	A	A	$A^2 s$	μs	Q_{rr} μC	@ I_{TM} A	@ -di/dt A/μs	@ $T_{j,max}$ V	mΩ	°C		
R0487YS10D	R210SH10	1000	487	4300	92.45×10^3	20	40	550	40	1.738	0.943	125	0.050	W9
R0487YS10E	R210SH10	1000	487	4300	92.45×10^3	25	40	550	40	1.738	0.943	125	0.050	W9
R0487YS10F	R210SH10	1000	487	4300	92.45×10^3	30	40	550	40	1.738	0.943	125	0.050	W9
R0487YS14D	R210SH14	1400	487	4300	92.45×10^3	20	40	550	40	1.738	0.943	125	0.050	W9
R0487YS14E	R210SH14	1400	487	4300	92.45×10^3	25	40	550	40	1.738	0.943	125	0.050	W9
R0487YS14F	R210SH14	1400	487	4300	92.45×10^3	30	40	550	40	1.738	0.943	125	0.050	W9
R0577YS08C	R185SH08	800	577	6000	180×10^3	15	85	550	40	1.510	0.640	125	0.050	W9
R0577YS08D	R185SH08	800	577	6000	180×10^3	20	85	550	40	1.510	0.640	125	0.050	W9
R0577YS08E	R185SH08	800	577	6000	180×10^3	25	85	550	40	1.510	0.640	125	0.050	W9
R0577YS12C	R185SH12	1200	577	6000	180×10^3	15	85	550	40	1.510	0.640	125	0.050	W9
R0577YS12D	R185SH12	1200	577	6000	180×10^3	20	85	550	40	1.510	0.640	125	0.050	W9
R0577YS12E	R185SH12	1200	577	6000	180×10^3	25	85	550	40	1.510	0.640	125	0.050	W9
R0633YS08D	R216SH08	800	633	6300	199×10^3	20	85	125	40	1.250	0.614	125	0.050	W9
R0633YS08E	R216SH08	800	633	6300	199×10^3	25	85	125	40	1.250	0.614	125	0.050	W9
R0633YS08F	R216SH08	800	633	6300	199×10^3	30	85	125	40	1.250	0.614	125	0.050	W9
R0633YS12D	R216SH12	1200	633	6300	199×10^3	20	85	125	40	1.250	0.614	125	0.050	W9
R0633YS12E	R216SH12	1200	633	6300	199×10^3	25	85	125	40	1.250	0.614	125	0.050	W9
R0633YS12F	R216SH12	1200	633	6300	199×10^3	30	85	125	40	1.250	0.614	125	0.050	W9
R0717LS14G	R181SH06	1400	717	7050	249×10^3	35	150	1000	60	1.752	0.732	125	0.032	W10a
R0717LS14H	R181SH06	1400	717	7050	249×10^3	40	150	1000	60	1.752	0.732	125	0.032	W10a
R0717LS14J	R181SH06	1400	717	7050	249×10^3	50	150	1000	60	1.752	0.732	125	0.032	W10a
R0717LS16G	R181SH10	1600	717	7050	249×10^3	35	150	1000	60	1.752	0.732	125	0.032	W10a
R0717LS16H	R181SH10	1600	717	7050	249×10^3	40	150	1000	60	1.752	0.732	125	0.032	W10a
R0717LS16J	R181SH10	1600	717	7050	249×10^3	50	150	1000	60	1.752	0.732	125	0.032	W10a
R0736LS20J	R175SH20	2000	736	6800	231×10^3	50	240	1000	60	1.842	0.619	125	0.032	W10a
R0736LS20K	R175SH20	2000	736	6800	231×10^3	60	240	1000	60	1.842	0.619	125	0.032	W10a
R0736LS20L	R175SH20	2000	736	6800	231×10^3	65	240	1000	60	1.842	0.619	125	0.032	W10a
R0736LS20M	R175SH20	2000	736	6800	231×10^3	70	240	1000	60	1.842	0.619	125	0.032	W10a
R0736LS25J	R175SH25	2500	736	6800	231×10^3	50	240	1000	60	1.842	0.619	125	0.032	W10a
R0736LS25K	R175SH25	2500	736	6800	231×10^3	60	240	1000	60	1.842	0.619	125	0.032	W10a
R0736LS25L	R175SH25	2500	736	6800	231×10^3	65	240	1000	60	1.842	0.619	125	0.032	W10a
R0736LS25M	R175SH25	2500	736	6800	231×10^3	70	240	1000	60	1.842	0.619	125	0.032	W10a
R0809LS06A	R180SH06	600	809	8000	320×10^3	10	50	1000	60	2.100	0.300	125	0.032	W10a
R0809LS06B	R180SH06	600	809	8000	320×10^3	12	50	1000	60	2.100	0.300	125	0.032	W10a
R0809LS06C	R180SH06	600	809	8000	320×10^3	15	50	1000	60	2.100	0.300	125	0.032	W10a
R0809LS10A	R180SH10	1000	809	8000	320×10^3	10	50	1000	60	2.100	0.300	125	0.032	W10a
R0809LS10B	R180SH10	1000	809	8000	320×10^3	12	50	1000	60	2.100	0.300	125	0.032	W10a
R0809LS10C	R180SH10	1000	809	8000	320×10^3	15	50	1000	60	2.100	0.300	125	0.032	W10a
R0830LS10D	R190SH10	1000	830	8500	361×10^3	20	110	1000	60	1.900	0.357	125	0.032	W10a
R0830LS10E	R190SH10	1000	830	8500	361×10^3	25	110	1000	60	1.900	0.357	125	0.032	W10a
R0830LS10F	R190SH10	1000	830	8500	361×10^3	30	110	1000	60	1.900	0.357	125	0.032	W10a
R0830LS10G	R190SH10	1000	830	8500	361×10^3	35	110	1000	60	1.900	0.357	125	0.032	W10a
R0830LS14D	R190SH14	1400	830	8500	361×10^3	20	110	1000	60	1.900	0.357	125	0.032	W10a
R0830LS14E	R190SH14	1400	830	8500	361×10^3	25	110	1000	60	1.900	0.357	125	0.032	W10a
R0830LS14F	R190SH14	1400	830	8500	361×10^3	30	110	1000	60	1.900	0.357	125	0.032	W10a
R0830LS14G	R190SH14	1400	830	8500	361×10^3	35	110	1000	60	1.900	0.357	125	0.032	W10a
R0878LS14K	R200SH16	1600	878	7500	281×10^3	60	350	1000	60	1.447	0.480	125	0.032	W10a
R0878LS14M	R200SH16	1600	878	7500	281×10^3	70	350	1000	60	1.447	0.480	125	0.032	W10a
R0878LS18K	R200SH18	1800	878	7500	281×10^3	60	350	1000	60	1.447	0.480	125	0.032	W10a
R0878LS18M	R200SH18	1800	878	7500	281×10^3	70	350	1000	60	1.447	0.480	125	0.032	W10a
R0878LS21K	R200SH21	2100	878	7500	281×10^3	60	350	1000	60	1.447	0.480	125	0.032	W10a
R0878LS21M	R200SH21	2100	878	7500	281×10^3	70	350	1000	60	1.447	0.480	125	0.032	W10a

Distributed Gate Thyristors - Capsule Types, Packages

Type		V_{DRM} / V_{RRM}	I_{TAV} $T_K = 55^\circ C$	I_{TSM} 10ms 1/2 sine $V_R \leq 60\% V_{RRM}$	I^2t $V_R \leq 60\%$ V_{RRM} A^2s	t_q @ 200V/ μs	Typ. Reverse Recovery Charge			V_{TO}	r_T	T_{jmax}	R_{thJK} 180° Sine K/W	Fig. No.
Part No.	Old Part No						V	A	A					
R3559TD16K	R1966DH16	1600	3559	38900	7.57×10^6	60	750	4000	60	1.173	0.155	125	0.008	W19
R3559TD16N	R1966DH16	1600	3559	38900	7.57×10^6	100	750	4000	60	1.173	0.155	125	0.008	W19
R3559TD16R	R1966DH16	1600	3559	38900	7.57×10^6	140	750	4000	60	1.173	0.155	125	0.008	W19
R3559TD16T	R1966DH16	1600	3559	38900	7.57×10^6	200	750	4000	60	1.173	0.155	125	0.008	W19
R3559TD20K	R1966DH20	2000	3559	38900	7.57×10^6	60	750	4000	60	1.173	0.155	125	0.008	W19
R3559TD20N	R1966DH20	2000	3559	38900	7.57×10^6	100	750	4000	60	1.173	0.155	125	0.008	W19
R3559TD20R	R1966DH20	2000	3559	38900	7.57×10^6	140	750	4000	60	1.173	0.155	125	0.008	W19
R3559TD20T	R1966DH20	2000	3559	38900	7.57×10^6	200	750	4000	60	1.173	0.155	125	0.008	W19
R3708FC40V	R1386CH40	4000††	3708	50000	12.5×10^6	250	4000	4000	60	1.473	0.156	125	0.0065	W15
R3708FC40W	R1386CH40	4000††	3708	50000	12.5×10^6	300	4000	4000	60	1.473	0.156	125	0.0065	W15
R3708FC45V	R1386CH45	4500††	3708	50000	12.5×10^6	250	4000	4000	60	1.473	0.156	125	0.0065	W15
R3708FC45W	R1386CH45	4500††	3708	50000	12.5×10^6	300	4000	4000	60	1.473	0.156	125	0.0065	W15
R3708FD40V	N/A	4000††	3708	50000	12.5×10^6	250	4000	4000	60	1.473	0.156	125	TBC	W48
R3708FD40W	N/A	4000††	3708	50000	12.5×10^6	300	4000	4000	60	1.473	0.156	125	TBC	W48
R3708FD45V	N/A	4500††	3708	50000	12.5×10^6	250	4000	4000	60	1.473	0.156	125	TBC	W48
R3708FD45W	N/A	4500††	3708	50000	12.5×10^6	300	4000	4000	60	1.473	0.156	125	TBC	W48
RX075FC24R	N/A	2400	3814	64500	20.8×10^6	140	1800	4000	60	1.568	0.133	125	0.0065	W15
RX075FC24T	N/A	2400	3814	64500	20.8×10^6	200	1800	4000	60	1.568	0.133	125	0.0065	W15
RX075FC28R	N/A	2800	3814	64500	20.8×10^6	140	1800	4000	60	1.568	0.133	125	0.0065	W15
RX075FC28T	N/A	2800	3814	64500	20.8×10^6	200	1800	4000	60	1.568	0.133	125	0.0065	W15
RX075FD24R	N/A	2400	3814	64500	20.8×10^6	140	1800	4000	60	1.568	0.133	125	TBC	W48
RX075FD24T	N/A	2400	3814	64500	20.8×10^6	200	1800	4000	60	1.568	0.133	125	TBC	W48
RX075FD28R	N/A	2800	3814	64500	20.8×10^6	140	1800	4000	60	1.568	0.133	125	TBC	W48
RX075FD28T	N/A	2800	3814	64500	20.8×10^6	200	1800	4000	60	1.568	0.133	125	TBC	W48

NB: †† - V_{rm} 3000V max

Under development



Fig. W9
Weight 90 g

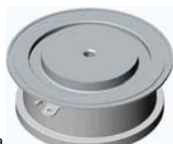


Fig. W10a
Weight 340 g



Fig. W11
Weight 510 g

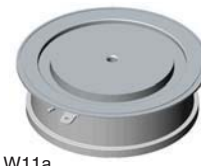


Fig. W11a
Weight 510 g



Fig. W13
Weight 1700 g



Fig. W14
Weight 1300 g

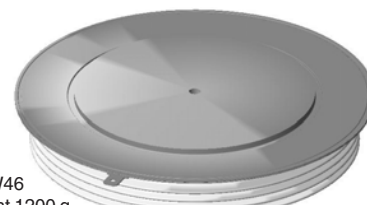


Fig. W46
Weight 1200 g

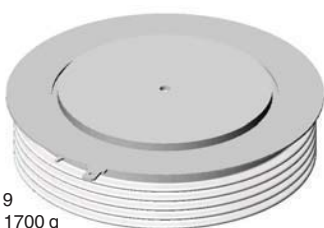


Fig. W19
Weight 1700 g



Fig. W15
Weight 2800 g



Fig. W48
Weight 1000 g

We offer a broad range of high specification devices incorporating advanced features such as buffer layer, fine pattern and transparent emitter technologies.

Offering both symmetrical devices for applications with a reverse blocking requirement e.g. current sourced inverters and anode shorted devices for applications where no reverse blocking requirement exists e.g. voltage sourced inverters.

Devices with voltage ratings to 6kV (3.8kV DC link) and controllable current ratings of up to 4kA are available to meet the toughest demands in applications such as traction propulsion and auxiliaries, AC industrial drives, FACTs and active VAR controllers.

Gate Turn-Off Thyristors are still the component of choice when it comes to very high power converters and we remain totally committed to this technology for the foreseeable future.

Gate Turn-Off Thyristors - Capsule Types

Type		V_{DRM}	V_{RRM}	I_{TGQM} @ C_S		I_{TAV} $T_K=55^\circ C$	I_{TSM} 10ms ½ sine $V_R \leq 10V$	I^2t $V_R \leq 10V$ A^2s	Typ. Switching Times		V_T $I_T=I_{TGQM}$	T_{jmax}	R_{thJK} 180° Sine K/W	Fig. No.
Part No.	Old Part No.	V	V	A	μF	A	kA		t_{gt} μs	t_{gq} μs	V	°C		
S0500KC200	N/A	2000	2000	500	1.0	330	4.0	80×10^3	3.5	10	2.5	125	0.065	W34
S0500KC20Y	N/A	2000	100	500	1.0	330	4.0	80×10^3	3.5	10	2.5	125	0.065	W34
S0500KC25D	N/A	2500	2000	500	1.0	330	4.0	80×10^3	3.5	10	2.5	125	0.065	W34
S0500KC25Y	N/A	2500	100	500	1.0	330	4.0	80×10^3	3.5	10	2.5	125	0.065	W34
S0700KC140	N/A	1400	1400	700	1.5	430	5.0	125×10^3	3.0	10	2.2	125	0.065	W34
S0700KC14Y	N/A	1400	100	700	1.5	430	5.0	125×10^3	3.0	10	2.2	125	0.065	W34
S0700KC17D	N/A	1700	1400	700	1.5	430	5.0	125×10^3	3.0	10	2.2	125	0.065	W34
S0700KC17Y	N/A	1700	100	700	1.5	430	5.0	125×10^3	3.0	10	2.2	125	0.065	W34
S1200NC200	N/A	2000	2000	1200	3.0	790	13.0	840×10^3	4.5	19	2.7	125	0.027	W36
S1200NC20Y	N/A	2000	100	1200	3.0	790	13.0	840×10^3	4.5	19	2.7	125	0.027	W36
S1200NC25D	N/A	2500	2000	1200	3.0	790	13.0	840×10^3	4.5	19	2.7	125	0.027	W36
S1200NC25Y	N/A	2500	100	1200	3.0	790	13.0	840×10^3	4.5	19	2.7	125	0.027	W36
H0500KC200	N/A	2500	2000	500	1.0	280	3.0	45×10^3	2.0	5	3.2	125	0.065	W34
H0500KC20Y	N/A	2500	100	500	1.0	280	3.0	45×10^3	2.0	5	3.2	125	0.065	W34
H0500KC25D	N/A	2500	2000	500	1.0	280	3.0	45×10^3	2.0	5	3.2	125	0.065	W34
H0500KC25Y	N/A	2500	100	500	1.0	280	3.0	45×10^3	2.0	5	3.2	125	0.065	W34
H0700KC140	N/A	1400	1400	700	1.5	360	4.0	80×10^3	3.0	5	2.75	125	0.065	W34
H0700KC14Y	N/A	1400	100	700	1.5	360	4.0	80×10^3	3.0	5	2.75	125	0.065	W34
H0700KC17D	N/A	1700	1400	700	1.5	360	4.0	80×10^3	3.0	5	2.75	125	0.065	W34
H0700KC17Y	N/A	1700	100	700	1.5	360	4.0	80×10^3	3.0	5	2.75	125	0.065	W34
H1200NC200	N/A	2000	2000	1200	3.0	670	10.5	550×10^3	3.0	12	3.3	125	0.027	W36
H1200NC20Y	N/A	2000	100	1200	3.0	670	10.5	550×10^3	3.0	12	3.3	125	0.027	W36
H1200NC25D	N/A	2500	2000	1200	3.0	670	10.5	550×10^3	3.0	12	3.3	125	0.027	W36
H1200NC25Y	N/A	2500	100	1200	3.0	670	10.5	550×10^3	3.0	12	3.3	125	0.027	W36
GX152QC450	N/A	4500	18	1000	1.0	Product under development					125		W35	
GX185QC250	N/A	2500	18	1000	1.0	Product under development					125		W35	
G1000NC450	N/A	4500	18	1000	2.0	545	8.0	320×10^3	4.5	14	4.0	125	0.027	W36
G2000VC250	WG20025SN	2500	18	2000	4.0	1020	16.0	1.28×10^6	5.0	24	2.8	125	0.022	W31
G2000VC450	WG20045SN	4500	18	2000	4.0	870	13.0	845×10^3	8.0	25	3.5	125	0.022	W31
G3000TC250	WG30025SN	2500	18	3000	5.0	1640	30.0	4.50×10^6	3.0	25	2.5	125	0.015	W32
G3000TC450	WG30045SN	4500	18	3000	6.0	1180	24.0	2.88×10^6	9.0	28	4.0	125	0.015	W32
G3000TC600	WG30060SN	6000	18	3000	3.0	1100	24.0	2.88×10^6	7.5	28	3.5	110	0.015	W32
G4000EC450	WG40045SN	4500	18	4000	6.0	1270	25.0	3.13×10^6	7.5	28	4.4	125	0.014	W33



Fig. W31
Weight 800 g

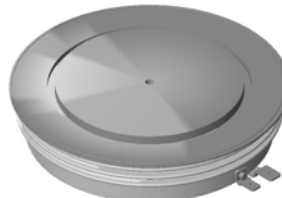


Fig. W32
Weight 1500 g

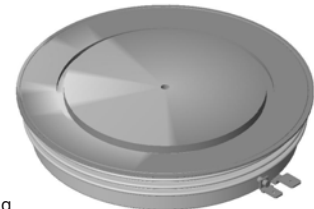


Fig. W33
Weight 1500 g



Under development
Fig. W34
Weight 120 g

Fig. W35
Weight approx 300 g
Product in development

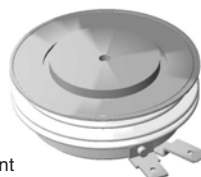


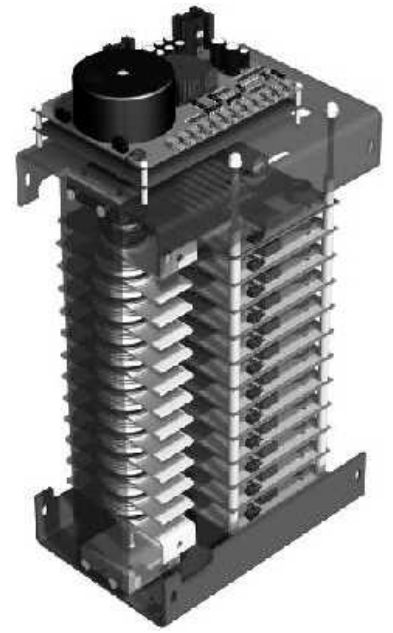
Fig. W36
Weight 500 g



We have long since been at the forefront of solid state pulsed power technology, offering custom solutions to complex pulsed power problems. Pulse thyristors are, in essence, optimised Gate Turn-Off thyristors and as such we are able to offer a flexible range of parts depending upon customer needs.

Devices with voltage ratings to 6kV (3.8kV DC link), pulsed currents to 150kA peak and di/dt capabilities to over 30kA/μs are available.

A selection of preferred parts is shown here, for other parts and technical support please contact the Westcode factory.



Pulse Thyristors - Capsule Types

Type		V_{DRM} $V_{GK=}$ -2V V	V_{RRM} V	V_{DC} $V_{GK=}$ -2V V	I_{PULSE} kA	di/dt_{cr} kA/μs	V_{T0} @ $T_{j max}$ V	r_T mΩ	$T_{j max}$ °C	R_{thJK} d.c. 180° sine K/W	Fig. No.
Part No.	Old Part No.										
Y2002KC250	N/A	2500	2000	1500	20	5	1.216	2.196	125	0.065	W34
Y5002NC250	N/A	2500	2000	1500	50	11	1.755	1.122	125	0.027	W36
Y8002VC450	N/A	4500	17	2200	80	15	1.800	0.850	125	0.022	W31



Fig. W34
Weight 120 g



Fig. W36
Weight 500 g



Fig. W31
Weight 800 g

As a pioneer of Press-Pack IGBT technology, we are able to offer a range of class leading devices with voltage ratings of 2.5kV (1.25kV DC link) and 4.5kV (2.8kV DC link).

The construction of these devices is totally free from wire and solder bonds which all but eliminates the problems of mechanical fatigue associated with conventional modules. Internal stray inductance in both the gate connections and emitter connections is vastly reduced when compared to conventional modules leading to improved ruggedness and short circuit behaviour, which is further enhanced by direct cooling of the emitter side of the chip.

These devices are based on a state-of-the-art soft punch through (SPT) process, which yields exceptional values $V_{CE(sat)}$ and quiet switching behaviour despite the high voltage ratings, yet the devices feature a positive temperature coefficient making them suitable for reliable parallel operation.

Devices are available with or without integral anti-parallel diode – a range of complementary High Power Sonic-FRDs™ optimised for use with these IGBTs are available, please contact your representative for further details.

The press pack construction offers several advantages over conventional IGBT modules.

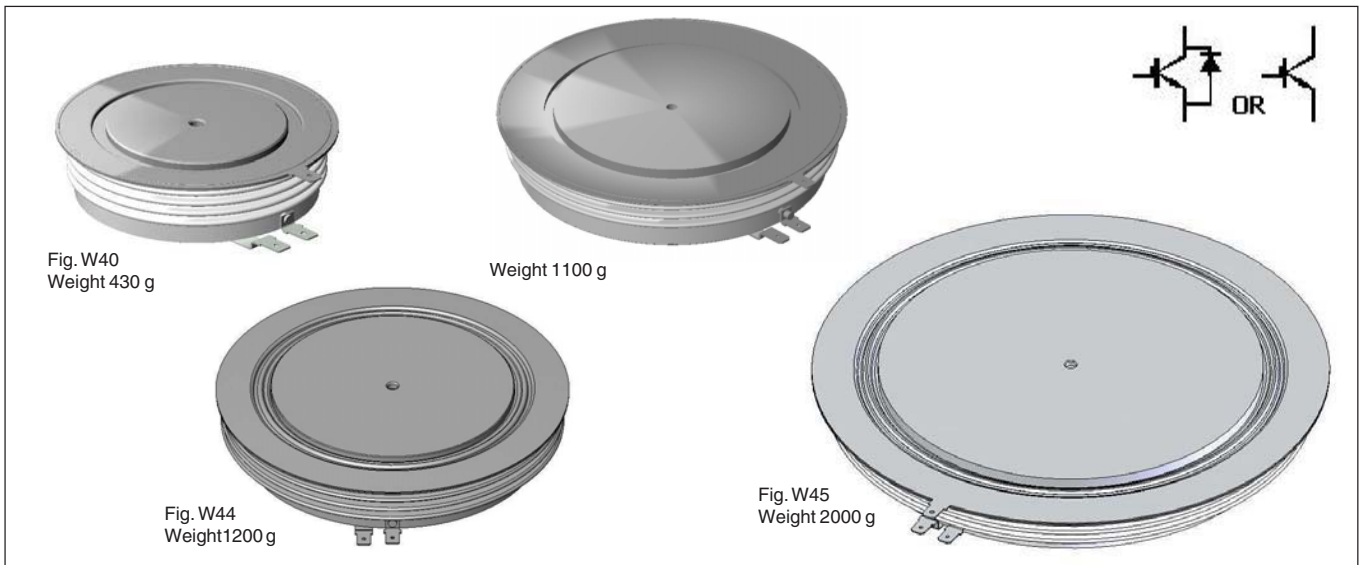
- They exhibit exceptional power cycling performance – typically an order of magnitude better than modules – making them highly suited to applications such as induction heating and mass transits where there are repeated cyclic power demands.

- They are explosion rated making them a good choice in critical applications such as mining, the petro-chemical industry, and transportation applications.
- They have a stable short circuit failure mode which, as well as safety benefits, makes them an ideal choice for medium and high voltage applications where series connection is required. Press-pack construction is the obvious choice where series connection is needed and the short circuit failure mode allows for the design in of n+1 redundancy. Typical examples include HVDC, active VAR controllers and medium voltage drives.
- They are largely backwardly compatible with standard 2.5kV and 4.5kV Gate Turn-Off thyristors (including GCTs) in many applications such as AC drives. This makes these parts a simple and economical path to upgrade or refurbish equipment that previously used Gate Turn-Off thyristors, such as locomotives or medium voltage drives.
- They are suitable for all cooling options including direct liquid immersion.
- Applications include Medium Voltage drives, traction (main drives and auxiliaries), Utilities (HVDC and Active VAR controllers), motor control, pulsed power and induction heating power supplies. Press-pack IGBTs are particularly suited to Safety critical applications for the mining and petrochemical industries.
- Complementary gate drives, mounting clamps and passive components are available.

Press-Pack IGBTs - Capsule Types

Type Part No.	V_{CES} V	I_C A	I_{CM} A	$V_{CE(sat)}$ $I_C=I_C$ V	IGBT Switching Typical		V_F $I_F=I_C$ V	Diode Recovery Typical			$T_{j\ max}$ °C	R_{thJK}		Fig. No.
					E_{ON} J	E_{OFF} J		I_{rm} A	t_{rr} µs	Q_r µC		IGBT K/W	Diode K/W	
T0160NA45A	4500	160	310	4.6	0.50	0.42	3.6	400	0.96	340	125	0.058	0.095	W40
T0240NA45E	4500	240	400	4.7	0.73	0.88	N/A	N/A	N/A	N/A	125	0.042	N/A	W40
T0360NA25A	2500	360	720	3.6	0.75	0.34	2.5	250	0.93	285	125	0.054	0.087	W40
T0500NA25E	2500	500	1000	3.6	0.80	0.50	N/A	N/A	N/A	N/A	125	0.039	N/A	W40
T0600TA45A	4500	600	1000	4.7	1.75	1.50	3.6	1400	0.92	650	125	0.016	0.039	W41
T0800TA45E	4500	800	1500	4.6	2.20	1.92	3.6	N/A	N/A	N/A	125	0.012	N/A	W41
T0900EA45A	4500	900	1500	4.6	2.80	2.60	3.6	1800	0.85	800	125	0.014	0.026	W44
T1200TA25A	2500	1200	2400	3.6	2.50	1.40	2.5	670	1.50	830	125	0.017	0.029	W41
T1200EA45E	4500	1200	2100	4.6	3.20	3.80	3.6	N/A	N/A	N/A	125	0.010	N/A	W44
T1500TA25E	2500	1500	3000	3.6	3.30	1.70	N/A	N/A	N/A	N/A	125	0.013	N/A	W41
T1800GA45A	4500	1800	3000	4.7	TBC	TBC	3.6	TBC	TBC	TBC	125	0.008	0.014	W45
T2400GA45E	4500	2400	4200	4.7	TBC	TBC	3.6	TBC	TBC	TBC	125	0.005	N/A	W45
TX168NA17A	1700	Products under development											W40	
TX167NA17E	1700												W40	
TX115TA17A	1700												W41	
TX116TA17E	1700												W41	

Under development



High Voltage IGBT Gate Drive Units – C0030BG400

The C0030BG400 is a single channel 30A peak rated gate drive unit (GDU), suitable for low and high side applications with DC link voltages of up to 3.5kV (5kV available on request) and with dv/dt immunity of over 100kV/μs.

This GDU performs all of the necessary supervisory functions including under voltage lockout and SCSOA protection with user configurable response and feedback. The unit requires a simple 15V DC power supply and features fibre optic command and feedback signals.

This GDU is capable of driving virtually all IGBTs including our range of press-pack devices at frequencies from DC up to 20kHz with no duty cycle limitations.

Options include standard variants set up for use with each of Westcode’s range of IGBTs (see table) and the core module for integration into end user PCBs. Additionally our application engineers can develop semi-custom solutions based around the standard core module.

Type of IGBT	$R_{g(on)}$ W	$R_{g(off)}$ W	GDU part
T0360NA25A	33	15	C0030BG400SAA
T0500NA25E	22	15	C0030BG400SAB
T1200TA25A	12	6.8	C0030BG400SAC
T1500TA25E	10	6.8	C0030BG400SAD
T0160NA45A	15	8.2	C0030BG400SAK
T0240NA45E	10	8.2	C0030BG400SAL
T0600TA45A	5.6	3.3	C0030BG400SAM
T0800TA45E	4.7	3.3	C0030BG400SAN
T0900EA45A	3.9	2.7	C0030BG400SAP
T1200EA45E	3.3	2.2	C0030BG400SAR

Features

- 30A peak drive current (500ns rise time)
- 10kV AC rms isolation test
- Partial discharge free up to 4kV AC rms
- 100kV/μs dv/dt immunity
- Temperature range –40°C up to +70°C (–55°C up to +80°C available)
- ±15V gate drive voltage
- Standard HP Versatile Link™ Fibre Optic links
- Status feedback signal
- User configurable SCSOA protection



The launch of this new complementary product demonstrates our continued commitment to provide our customers with complete solutions for power electronics and further strengthens our assemblies’ capability. This GDU also provides our customers with a rapid route to prototype with our range of high voltage press-pack IGBTs without having to solve the additional problems associated with high isolation voltage gate drives.

Power Semiconductor Assemblies from IXYS and Westcode

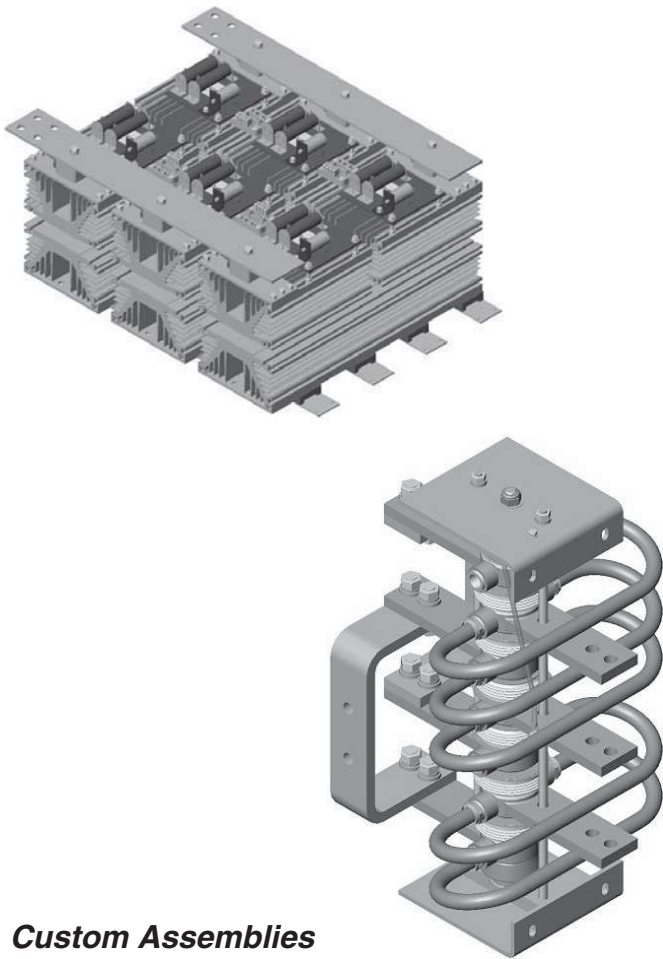
WESTCODE

Power Semiconductor Assemblies

From discrete devices to complete assemblies, our customers can procure our products in whatever form suits their needs on a global basis. Supply management is critical to every manufacturer and reducing costs without compromising quality is essential. Our experienced, international, team of engineers is on hand to help our customers to get more from their products and keep at the forefront of technology in an increasingly competitive marketplace.

Standard Assemblies

We have a comprehensive range of standard assemblies for all of the common converter topologies utilising either natural air, forced air or liquid cooling. These well-proven designs provide an economical alternative to in house design and assembly of discrete parts. These assemblies are available on short lead-times to suit most common line voltages and current ratings from 35A to 15kA.



Custom Assemblies

With over 70 years of experience in power circuit design and manufacture, our dedicated team of design engineers can deliver custom solutions for a whole range of design problems ranging from simple crowbar applications to complicated multi-megawatt power converters. Utilising the latest 3D modeling techniques, we can reduce the cycle time from concept to manufacture and ensure successful system level integration into our customers equipment.

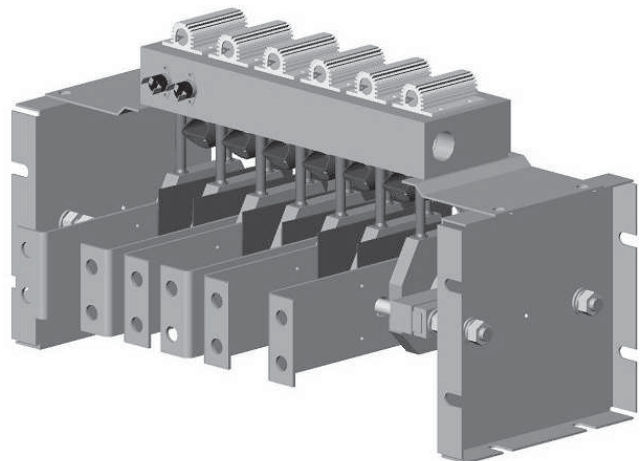
Pulsed Power

As a pioneer in the development of solid state pulsed power components and systems, we are able to deliver anything from discrete components to fully integrated energy transfer switches. With systems successfully delivering voltage ratings of over 50kV and pulsed currents to 140kA, we have wealth of experience to put at your disposal. Our modular design solutions based on either pulse thyristor or press-pack IGBT technology and integrating control and protection functions provide you with a flexible "black box" approach to energy transfer problems.



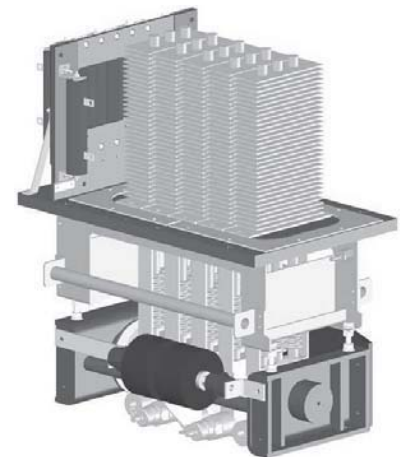
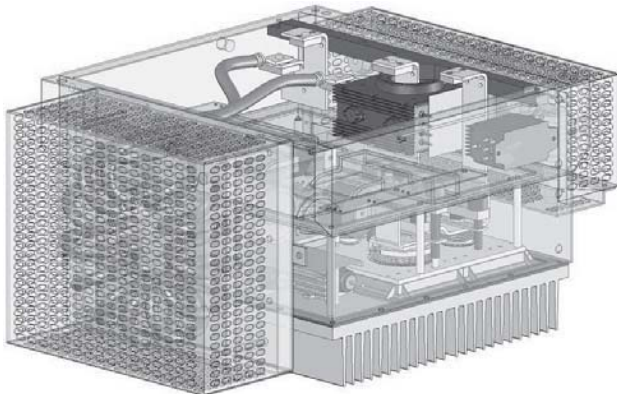
We are involved with pulsed power on global basis, working with prestigious research organisations such as CERN, Switzerland as well as medium volume manufacture for emerging commercial applications such as laser supplies, PUV and PEF sterilisation, magnetisation and metal forming.

We have a philosophy of working closely with our customers to ensure that we deliver the right solution in the right time and right price – first time and every time.



Transportation

We have a long association with the railway industry and over the years have gained an enviable reputation within railway industry as a solution provider. Using our experience and wide ranging contacts within the industry, we are able to offer assistance in tackling issues such as component obsolescence, improving power equipment reliability, contract maintenance of power modules, refurbishment of power electronics and upgrades to existing systems.



Working systematically to the highest international standards, we can give your equipment a new lease of life and help protect your investment in these valuable assets. For larger projects, such as fleet wide re-fits, we are able to work within a consortium of specialist companies to ensure that you have the right skills to hand to deliver a turnkey solution to your requirements.

Silicon Assemblies

A wide range of units is available, incorporating international standard outline silicon semiconductors. Westcode products have gained a worldwide reputation for quality in military, industrial and domestic applications.

Standard extruded aluminium heatsink profiles are used for mounting discrete semiconductor devices in various configurations, for example:

- Single-phase diode bridges with current ratings from 70 to 5170 Amps DC
- Single-phase half or fully controlled bridges from 35 to 2200 Amps DC
- Three-phase diode bridges with current ratings from 100 to 7190 Amps DC
- Three-phase half or fully controlled bridges from 45 to 3790 Amps DC
- Hexaphase single way diode assemblies from 200 to 14380 Amps DC
- Hexaphase single way Thyristor assemblies from 90 to 7580 Amps DC
- AC Regulators, single and three phase, from 40 to 2940 Amps RMS

Water Cooled AC Regulators

Included in our standard range are solid state, water cooled AC Regulators for resistance welding, with ratings from 315 to 3020 Amps RMS.

Also available are water cooled, single and three phase assemblies from 1200 to 6000 Amps DC.

All the above range is suitable for 440 VRMS 50Hz mains operation.

Outlines on pages 188 - 224

Beyond Semiconductors

Our flexible manufacturing facility is able to readily adapt to our customers needs. In addition to power semiconductor assembly, we can offer complementary sub-assemblies to our customer's requirements, such as fuse panels and capacitor banks as well as contract manufacture to your designs.

Application and Engineering Support

Our highly experienced technical team is on hand to provide our customers with first class support for everything from the application of our range of discrete devices to the design and development of complex systems. We can help you from concept through design to manufacture and test, working closely with you at every step of the way.

Components

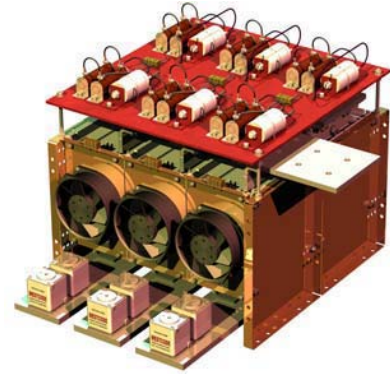
We offer a full portfolio of components which are complementary to our range of power semiconductors including:

Heatsinks Coolers Mounting Clamps
Ultra Rapid Semiconductor Protection Fuses
Capacitors for Power Electronics
Gate Drive Units

A standard assembly module provides the basic building block for this new range of assemblies.

Assembly modules can incorporate either single or dual devices and allow for the building of; single-phase diode and thyristor bridges, 3-phase diode and thyristor bridges, or 6-phase single way diode and thyristor assemblies.

A custom built assembly can be provided when a standard solution is not suitable.



Westack - Modular Solutions

Single phase diode bridges											Approx. total loss $2xI_{DC}$ @ 25°C	
Assembly Part Number	I _{DC} amps Air Forced 2.5m/s			I _{FSM} amps I _{TSM} amps	I ² t A ² s	Dimensions mm				Mass kg	Device Type and Quantity	Heat Sink Type
	T _a 25°C	T _a 35°C	T _a 45°C			Fig.	W	H	D			
SXB1375B	1375	1303	1230	19500	1.9x10 ⁶	1	382	325	405	20	W2058LC (4)	B(2x83,1x180)
SXB2096B	2096	1987	1874	33000	5.45x10 ⁶	1	382	325	405	20	W3270NC (4)	B(2x83,1x180)
SXB3442B	3442	3277	3109	53000	13.5x10 ⁶	2	382	593	405	40	W5696VC (4)	B(2x180)
SXB4264B	4264	4051	3835	72000	22.5x10 ⁶	2	382	593	405	40	W8405ZC (4)	B(2x180)

Three phase diode bridges											Approx. total loss $2.5xI_{DC}$ @ 25°C	
Assembly Part Number	I _{DC} amps Air Forced 2.5m/s			I _{FSM} amps I _{TSM} amps	I ² t A ² s	Dimensions mm				Mass kg	Device Type and Quantity	Heat Sink Type
	T _a 25°C	T _a 35°C	T _a 45°C			Fig.	W	H	D			
SXB1920G	1920	1822	1721	19500	1.9x10 ⁶	3	548	325	405	30	W2058LC (6)	B(2x83,1x180)
SXB2939G	2939	2788	2634	33000	5.45x10 ⁶	3	548	325	405	30	W3270NC (6)	B(2x83,1x180)
SXB4869G	4869	4640	4407	53000	13.5x10 ⁶	4	548	593	405	60	W5696VC (6)	B(2x180)
SXB5993G	5993	5701	5402	72000	22.5x10 ⁶	4	548	593	405	60	W8405ZC (6)	B(2x180)

Six phase diode, single way with IPT											Approx. total loss $1.25xI_{DC}$ @ 25°C	
Assembly Part Number	I _{DC} amps Air Forced 2.5m/s			I _{FSM} amps I _{TSM} amps	I ² t A ² s	Dimensions mm				Mass kg	Device Type and Quantity	Heat Sink Type
	T _a 25°C	T _a 35°C	T _a 45°C			Fig.	W	H	D			
SXB3840HEX	3840	3644	3442	19500	1.9x10 ⁶	5	548	325	395	30	W2058LC (6)	B(2x83,1x180)
SXB5877HEX	5877	5576	5268	33000	5.45x10 ⁶	5	548	325	395	30	W3270NC (6)	B(2x83,1x180)
SXB9737HEX	9737	9281	8813	53000	13.5x10 ⁶	6	548	593	395	60	W5696VC (6)	B(2x180)
SXB11987HEX	11987	11401	10804	72000	22.5x10 ⁶	6	548	593	395	60	W8405ZC (6)	B(2x180)

Six phase thyristor, single way with IPT											Approx. total loss $1.5xI_{DC}$ @ 25°C	
Assembly Part Number	I _{DC} amps Air Forced 2.5m/s			I _{FSM} amps I _{TSM} amps	I ² t A ² s	Dimensions mm				Mass kg	Device Type and Quantity	Heat Sink Type
	T _a 25°C	T _a 35°C	T _a 45°C			Fig.	W	H	D			
SXB2428HEXT	2428	2233	2030	15000	1.13x10 ⁶	5	548	325	395	30	N1265LS (6)	B(2x83,1x180)
SXB3529HEXT	3529	3244	2949	29600	4.38x10 ⁶	5	548	325	395	30	N1802NS (6)	B(2x83,1x180)
SXB4649HEXT	4649	4270	3878	37000	6.85x10 ⁶	6	548	593	395	60	N2500VC (6)	B(2x180)
SXB6240HEXT	6240	5714	5173	64000	20.5x10 ⁶	6	548	593	395	60	N4085ZC (6)	B(2x180)

Single phase fully controlled bridges											Approx. total loss $2.5xI_{DC}$ @ 25°C	
Assembly Part Number	I _{DC} amps Air Forced 2.5m/s			I _{FSM} amps I _{TSM} amps	I ² t A ² s	Dimensions mm				Mass kg	Device Type and Quantity	Heat Sink Type
	T _a 25°C	T _a 35°C	T _a 45°C			Fig.	W	H	D			
SXB868FB	868	797	724	15000	1.13x10 ⁶	1	382	325	405	20	N1265LS (4)	B(2x83,1x180)
SXB1265FB	1265	1161	1054	29600	4.38x10 ⁶	1	382	325	405	20	N1802NS (4)	B(2x83,1x180)
SXB1645FB	1645	1508	1367	37000	6.85x10 ⁶	2	382	593	405	40	N2500VC (4)	B(2x180)
SXB2167FB	2167	1981	1790	64000	20.5x10 ⁶	2	382	593	405	40	N4085ZC (4)	B(2x180)

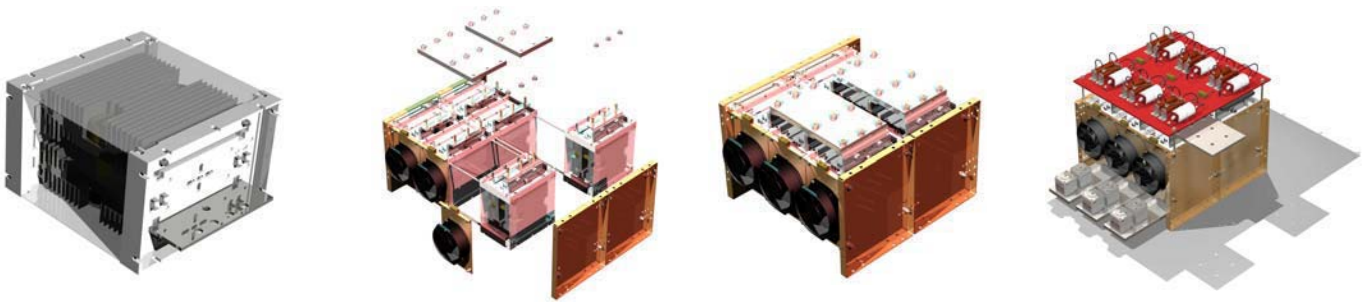
Three phase fully controlled bridges											Approx. total loss $3xI_{DC}$ @ 25°C	
Assembly Part Number	I _{DC} amps Air Forced 2.5m/s			I _{FSM} amps I _{TSM} amps	I ² t A ² s	Dimensions mm				Mass kg	Device Type and Quantity	Heat Sink Type
	T _a 25°C	T _a 35°C	T _a 45°C			Fig.	W	H	D			
SXB1214FG	1214	1116	1015	15000	1.13x10 ⁶	3	548	325	405	30	N1265LS (6)	B(2x83,1x180)
SXB1764FG	1764	1622	1475	29600	4.38x10 ⁶	3	548	325	405	30	N1802NS (6)	B(2x83,1x180)
SXB2324FG	2324	2135	1939	37000	6.85x10 ⁶	4	548	593	405	60	N2500VC (6)	B(2x180)
SXB3120FG	3120	2857	2586	64000	20.5x10 ⁶	4	548	593	405	60	N4085ZC (6)	B(2x180)

Cooling for each module section is provided by the use of a low noise 115/230V ac fan which is protected against overloading by an integral thermal cut-out.

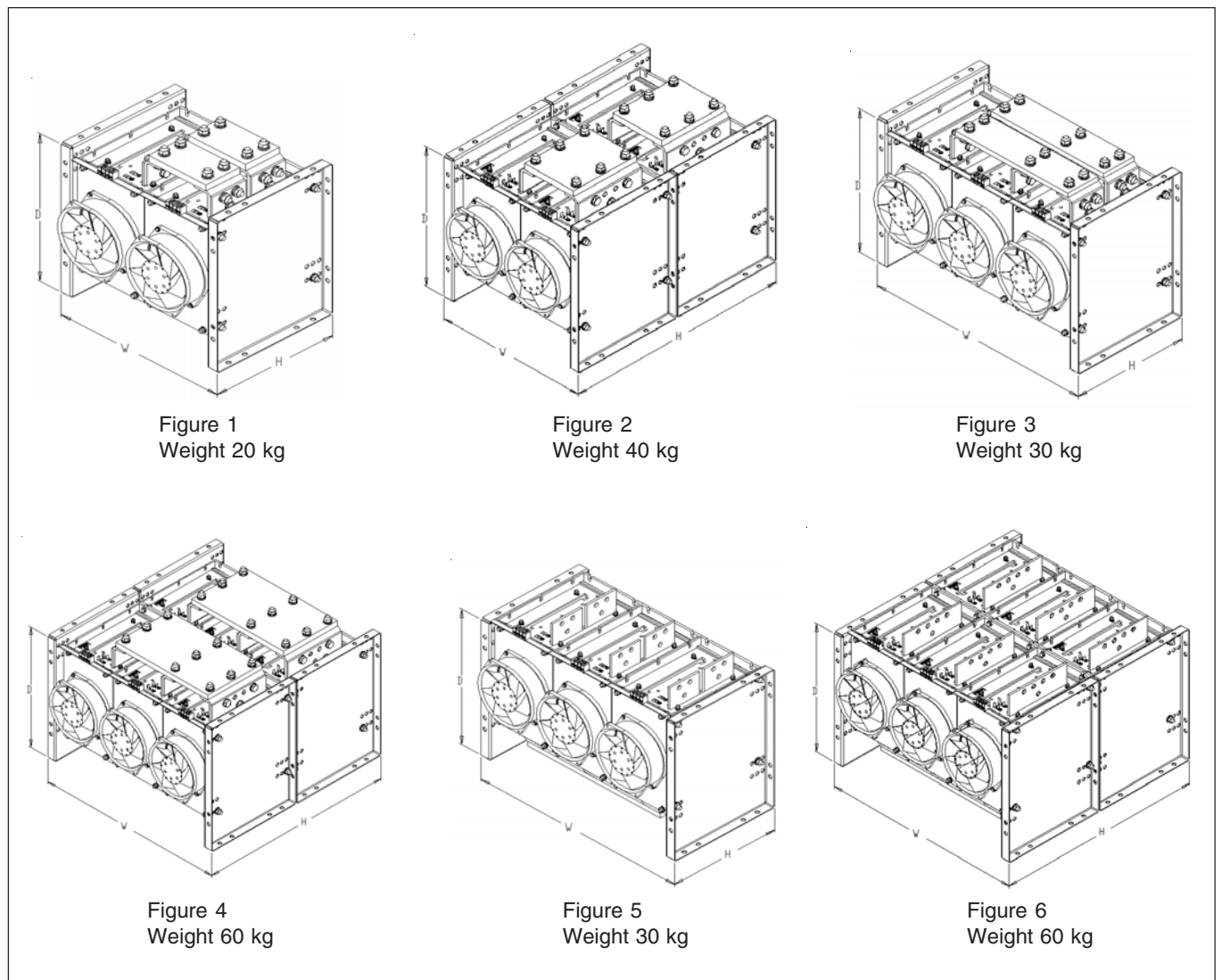
Surge suppression and fusing provides reliable and safe operation. Surge suppression (protecting the devices from voltage transients) and high speed fuses (to protect against short circuit) are available. Contact Westcode for details.

All plastic components are UL recognised and meet the requirements of the European Union Directive 2002/95/EC covering the restricted use of certain hazardous substances in electrical and electronic equipment.

ISO 9000 2000 provides the standard against which all our products and services are measured.



Westack - Modular Solutions are available in 6 standard configurations, others by request.

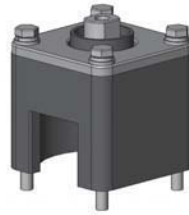


Capsule Mounting Clamps

The "Bar" type clamp uses a two rod system with a straight bar spring that is bent over a central point to give the clamping force on the device. This force is achieved when the indicators, metal shims at each end of the clamp, become just trapped. (CMK 9000 uses a disc spring stack).

The "Box" type clamp uses a four bolt system with disc springs and the correct force on the device is achieved when the bottom of the box just touches the heatsink.

As the force indication is contained within these clamps, special equipment or torque spanners are not required. The clamps can therefore be reset to the correct force at any time, using only a box spanner.



Box clamps are suitable for devices with 19mm, 25mm or 34mm diameter mounting surfaces and of 13.8mm, 14.6 or 26.2mm nominal thicknesses respectively.



Bar clamps are suitable for devices with 19mm to 125mm diameter mounting surfaces and 450kgf to 9000kgf clamping forces.

Bar Type	Fixing Centres mm	Rod Size	Capsule Device		
			Outline	Mounting Surface Diameter mm	Nominal Thickness mm
CMK450S56M CMK450D56M CMK450DT56M	65	M8	DO-200AA/TO-200AB	19.0	13.8
CMK550S56M CMK550D56M	65	M8	GTO	29.5	16.0
CMK900S56M CMK900D56M CMK900DT56M	65	M8	Diode/Thyristor	25.1	14.6
CMK0600S74M CMK0600D74M	89	M10	Press-Pack IGBTs	47.0	27.0
CMK1000S74M CMK1000D74M	89	M10	Press-Pack IGBTs	47.0	27.0
CMK1100D76M	89	M10	DO-200AB/TO-200AC	34.0	26.2
CMK1130S76M CMK1130D76M CMK1130DT76M	89	M10	DO-200AB/TO-200AC	34.0	26.2
CMK1800S76M CMK1800D76M CMK1800DT76M	89	M10	Wespack PCT	38.0	14.0
CMK2100S76M* CMK2100D76M*	89	M10	GTO	47.0	27.0
CMK2140S76M* CMK2140D76M* CMK2140DT76M*	89	M10	DO-200/Thyristor	47.0	26.8
CMK2700S76M CMK2700D76M CMK2700DT76M	89	M10	Wespack PCT	50.0	14.0

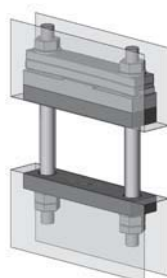
Bar Type	Fixing Centres mm	Rod Size	Capsule Device		
			Outline	Mounting Surface Diameter mm	Nominal Thickness mm
CMK2000S114M CMK2000D114M	132	M12	Press-Pack IGBTs	75.0	26.0
CMK2500S114M CMK2500D114M	132	M12	Press-Pack IGBTs	75.0	26.0
CMK2500S116M* CMK2500D116M*	132	M12	GTO	63.0	26.0
CMK3000S116M* CMK3000D116M*	132	M12	DO-200AD/Thyristor	63.0	33.0
CMK3500S116M* CMK3500D116M*	132	M12	GTO	75.0	26.0
CMK4000S116M* CMK4000D116M*	132	M12	Diode/Thyristor	73.0	36.8
CMK5000D128M* CMK7000D128M*	146	M16	GTO	75.0	26.0
CMK3060S140ML CMK3060D140ML	154	M12	Press-Pack IGBTs	85.1	26.0
CMK9000S160M* CMK9000D160M*	180	M16	Thyristor	99.3	35.8
CMK6120S180ML CMK6120D180ML	196	M16	Press-Pack IGBTs	125.0	26.0

* M for T_j up to 190°C, ML for T_j 125°C.

Note: 1Kgf = 9.8 Newtons

Outline Drawings for both Bar and Box type Clamps are available from Westcode via the website

www.westcode.com



CMK	XXXX	S, D or DT	XX	M
Capsule Mounting Kit	Nominal Clamping Force Kgf	S-Single side cooled (tapped heatsink) D-Double side cooled (through hole in heatsink) DT-Double side cooled (tapped heatsink)	Maximum Capsule Diameter mm	Metric Fixings M8, 10 or 12

Box Type	Fixing Centres mm	Rod Size	Capsule Device		
			Outline	Mounting Surface Diameter mm	Nominal Thickness mm
CMK450B 19M CMK450B 25M CMK1500B 34M	50 PCD 70 PCD	M5x50 Bolts M6x50 Bolts	DO-200AA/TO-200AB Diode/Thyristor DO-200AB/TO-200AC	19.0 25.1 34.0	13.8 14.6 26.2

Note: 1Kgf = 9.8 Newtons

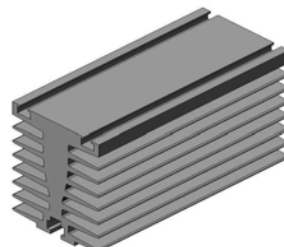


CMK	XXX	B	XX	M
Capsule Mounting Kit	Nominal Clamping Force Kgf	Box Clamp	Capsule Mounting Surface Diameter 19, 25 or 34mm	Metric Fixing Bolts (See Chart)

Coolers and Heatsinks

A comprehensive range of coolers and heatsinks are offered, details available upon request.

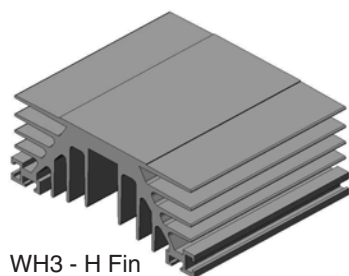
Heatsink Type	Weight Kg/m	Periphery mm	Area mm ²
G Fin	8.1	1059	2979
GA Fin	15.6	1682	5867
H Fin	12.7	1684	4655
T Fin	20	2065	7573
TB Fin	29	2467	10905
TC Fin	28	2544	10561
LP100 Fin (40 Vane)	30	6620	11172
WS46 Fin	20	2822	7411
WS30 Copper Fin Dimensions 125mm x 125mm x 4 vanes			



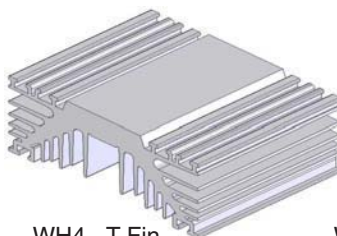
WH1 - G Fin



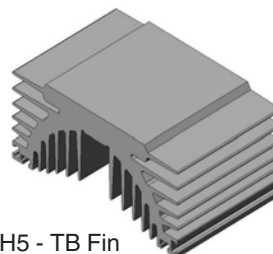
WH2 - GA Fin



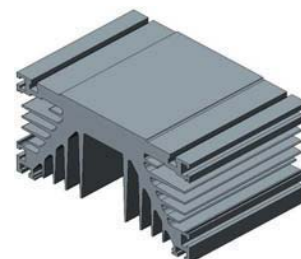
WH3 - H Fin



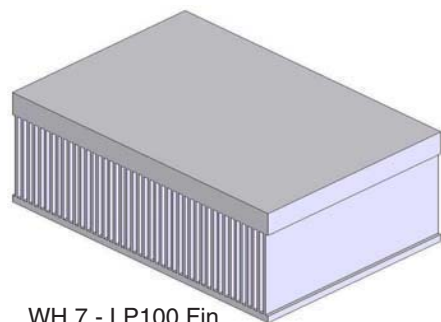
WH4 - T Fin



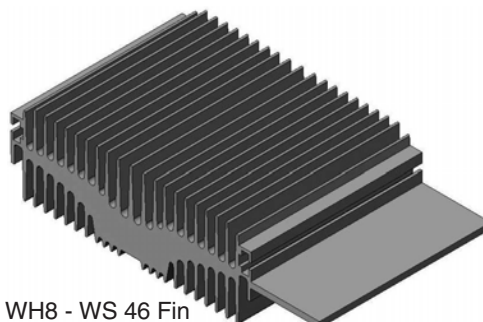
WH5 - TB Fin



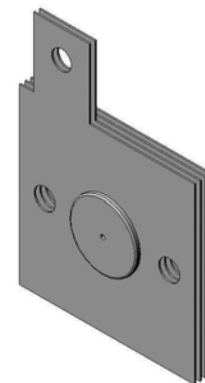
WH6 - TC Fin



WH7 - LP100 Fin

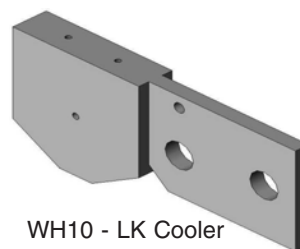


WH8 - WS 46 Fin

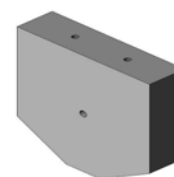


WH9 - WS 30 Copper Fin

Cooler Type	Weight kg	Cooler Thickness mm	Busbar Thickness mm
LK	0.612	16	6,4
LKA	0.418	16	n/a
LKB	1.75	20	10
LKC	1.30	20	n/a
WS27	0.375	15	n/a



WH10 - LK Cooler



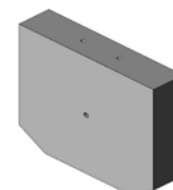
WH11 - LKA Cooler



WH14 - WS 27 Cooler



WH12 - LKB Cooler



WH13 - LKC Cooler