	Specification	Symbol	Condition / Comment		HTS 1200-2400 SCR	Unit
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	$V_{O(max)}$	$I_{off} < 400$ μADC, $T_{case} = 70°C$		120	kVDC
	Maximum Isolation Voltage	V_I	Between HV switch and control / GND, continuously		± 130	kVDC
	Max. Housing Insulation Voltage	V_{INS}	Between switch and housing surface, 3 minutes		± 150	kVDC
	Maximum Turn-On Peak Current	$I_{P(max)}$	$T_{case} =$ 25°C	$t_p < 500$ μs, duty cycle <1%	24 000	ADC
				$t_p < 1$ ms, duty cycle <1%	12 000	
				$t_p < 10$ ms, duty cycle <1%	8160	
				$t_p < 100$ ms, duty cycle <1%	4800	
	Max. Non-Repetitive Peak Current	$I_{p(nr)}$	$T_{case} =$ 25°C	Half sine single pulse, tp<200 μs	48 000	ADC
				Half sine single pulse, tp<20 μs	96 000	
	Max. Coutinuous Load Current	I_L	$T_{case} = 25°C$	Standard plastic case	5,26	ADC
				With option CCS (air>4m/s)	11	
	Max. Rate-of-Rise of OFF-State Voltage	dv/dt	@ $V_{O(max)}$, exponential waveform		80	kV/ μs
	Max. Continuous Power Dissipation	$P_{d(max)}$	$T_{case} = 25°C$	Standard devices & FC, forced air 4 m/s	30	Watt
				Whit Option CF	200	
	Linear Derating		Above 25°C	Standard devices & FC, forced air 4 m/s	0.53	W/K
				Whit Option CF	2.33	
	Operating Temperature Range	T_O	Standard devices & options CF, GCF, ILC. (Option DLC)		-40...75	C°
	Storage Temperature Range	T_S	Switches with option ILC may require frost protection!		-50...90	C°
	Max. Permissible Magnetic Field	B	Homogeneous steady-field, surrounding the whole switch		25	mT
	Max. Auxilliary Voltage	V_{aux}	Built-in overvoltage limiter (replaceable)		5	VDC
ELECTRICAL CHARACTERISTICS	Permissible Operating Voltage Range	V_O			0... ± 120	kVDC
	Typical Breakdown Voltage	V_{br}	NOTE: V_{br} is a test parameter for quality control purposes only. Not applicable in	$I_{off} > 0.5$ mA	>132	kVDC
	Typical Off-State Current	I_{off}	$0.8xV_O$, $T_{case} =25...70°C$, reduced I_{off} on request		< 400	μADC
	Typical Holding Current			Tcase/ Tfin =25°C	50	mADC
				Tcase/ Tfin =70°C	35	
	Typical On-State Voltage	V_{sat}	Each switching path $t_p < 10$ μs, duty cycle < 1%	0.01 x $I_{P(max)}$	63	VDC
				0.1 x $I_{P(max)}$	162	
				1.0 x $I_{P(max)}$	720	
	Typical Propagation Delay Time	$t_{d(on)}$	Resistive load, 0.1 x $I_{P(max)}$, 0.8 x $V_{O(max)}$, 50-50%	Standard "DT"	1	μs
				Option DT-10	10	
	Typical Output Pulse Jitter	t_j	Impedance matched input, V_{aux} / V_{ctrl} = 5.00 VDC		50	ns
	Typical Turn-On Rise Time	$t_{r(on)}$	Resistive load, 10-90%	0.1 x $V_{O(max)}$, $I_L = 0.1$ x $I_{p(max)}$	600	ns
				0.8 x $V_{O(max)}$, $I_L = 0.1$ x $I_{p(max)}$	190	
				0.8 x $V_{O(max)}$, $I_L = 1.0$ x $I_{p(max)}$	400	
	Typical Turn-Off Time	t_{off}, t_q	Resistive load, 10-90%	0.1 x $V_{O(max)}$, $I_L = 0.1$ x $I_{p(max)}$	40	μs
				0.8 x $V_{O(max)}$, $I_L = 1.0$ x $I_{p(max)}$	100	
	On Time	t_{on}	Depends on holding current only. See product description		35….∞	μs
	Internal Driver Recovery Time	t_{rc}	Standard devices		1000	μs
			With Option HFB		100	
	Max. Continuous Switching Frequency	$f_{(max)}$	Please note the PD limitations!		200	Hz
	Maximum Burst Frequency	$f_{b(max)}$	With Option HFB, $I_{p(max)} < 12kA$, please consult factory		0.5	kHz
			With Option HFB, $I_{p(max)} < 4kA$, please consult factory		5	
	Maximum Number of Pulses / Burst	$N_{(max)}$			1	Pulses
	Coupling Capacitance	C_C	HV side against control side		>300	pF
	Control Voltage Range	V_{ctrl}	The V_{ctrl} has no impact on the output pulse shape.		4… 5	VDC
	Auxiliary Supply Voltage Range	V_{aux}	The +5 V supply is not required in the HFS mode.		5	VDC
	Typical Auxiliary Supply Current	I_{aux}	$V_{aux} = 5.00$ VDC, $T_{case} = 25°C$. Active current limitation above 1A.	0.01 x $f_{(max)}$	TBD.	mADC
				@ $f_{(max)}$	600	
	Fault Signal Output		Switch will be turn off, if f>$f_{(max)}$, V_{aux}<4.75V or T_{case}>75°C Fault condition is indicated by a logical "L"		H=4V, L=0.5V	VDC
	Trigger Voltage Range	V_{TR}	Switching behaviour is not influenced by trigger quality		<10	VDC
HOUSING	Dimensions	LxWxH	Standard housing Devices with option CF, non-isolated cooling fins Devices with option DLC		Please contact the manufactured!	mm³
	Weight		Standard housing Devices with option CF, non-isolated cooling fins Devices with option DLC		Please contact the manufactured!	g

FUNCTIONS

Control Signal Input — **Pin 1** / Yellow. TTL compatible with Schmitt-Trigger characteristics. Control voltage 2-10 V (3-5 V recommended for low jitter).

Logic GND / 5V Return — **Pin 2** / Black. The ground pin is internally connected with the safety earthing terminal (threaded insert) on bottom side.

5V Auxiliary Supply — **Pin 3** / Red. The 5 V input is used for rep rates up to the specified max. frequency $f_{(max)}$. Higher rep rates require option HFS.

Fault Signal Output — **Pin 4** / Orange. TTL output, short circuit proof. Indicating switch & driver over-heat, over-frequency, low auxiliary voltage. L = Fault.

Inhibit Signal Input — **Pin 5** / Green. TTL compatible, Schmitt-Trigger characteristics for the connection of external safety circuits. L = Switch Inhibited.

LED Indicators — **GREEN**: "Auxiliary power good, switch OFF". **YELLOW**: "Control signal received, switch ON". **RED**: "Fault condition, switch OFF"

Temperature Protection — **A)** Standard switches and switches with option CF, GCF: Thermo trigger 75°C, response time < 60 s @ 3xPd(max), ΔT=25K (50 to 75°C). Separate driver protection. **B)** Switches with option DLC: 65°C, response time < 3 s @ 3xPd(max), ΔT=25K (40 to 65°C), coolant flow > 3l / min. Separate driver protection.

ORDERINGTI

HTS 1200-24000 SCR	Thyristor Switch, 120 kVDC, 24000 ADC		
	Option LP	Low Pass. Input filter for increased noise immunity.	**Option CCS** — Ceramic Cooling Surface. $P_{d(max)}$ can be increased by the factor 2 to 3.
	Option S-TT	Soft Transition Time. Slower switching speed for simplified EMC.	**Option CCF** — Ceramic Flange Housing. $P_{d(max)}$ can be increased by the factor 3 to 15.
	Option HFB	High Frequency Burst, Improved burst capability by driver.	**Option CF** — Copper Cooling Fins. $P_{d(max)}$ can be increased by the factor 3 to 10.
	Option HFS	High Frequency Switching (two auxiliary supply inputs V1 & V2)	**Option GCF** — Grounded Cooling Flange (copper). $P_{d(max)}$ can be increased by the factor 3 to 15.
	Option UFTR	Ultra Fast Thermotrigger. Response time for shut down < 5s.	**Option ILC** — Indirect Liquid Cooling (for water). $P_{d(max)}$ can be increased by the factor 3 to 15.
	Option UFTS	Ultra Fast Thermosensor. Response time < 5s. NTC 10k / ± 1%	**Option DLC** — Direct Liquid Cooling (for FPE/PFC). $P_{d(max)}$ can be increased by the factor 10 to 100. 15.

FOR FURTHER PRODUCT OPTIONS PLEASE REFER TO THE OPTIONS PAGE.