

	Specification	Symbol	Condition / Comment		HTS 1200-100 SCR	Unit
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	$V_{O(max)}$	$I_{off} < 250 \mu ADC$, $T_{case} = 70^{\circ}C$		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	$I_{P(max)}$	$T_{case} = 25^{\circ}C$	$t_p < 100 \mu s$, duty cycle $< 1\%$ $t_p < 500 \mu s$, duty cycle $< 1\%$ $t_p < 1 ms$, duty cycle $< 1\%$ $t_p < 10 ms$, duty cycle $< 1\%$ $t_p < 100 ms$, duty cycle $< 1\%$	1000 800 650 240 115	ADC
	Max. Non-Repetitive Peak Current	$I_{P(nr)}$		Half sine single pulse, $t_p < 200 \mu s$	2000	ADC
	Max. Coutinuous Load Current	I_L	$T_{case} = 25^{\circ}C$	Standard plastic case With Option DLC	0.7 10	ADC
	Max. Rate-of-Rise of OFF-State Voltage	dv/dt	@ $V_{O(max)}$, exponential waveform		80	kV/ μs
	Max. Continuous Power Dissipation	$P_{d(max)}$	$T_{case} = 25^{\circ}C$	Standard devices & FC, forced air 4 m/s With opt. DLC	40 2000	Watt
	Linear Derating		Above $25^{\circ}C$	Standard devices & FC, forced air 4 m/s With opt. DLC	1.11 80.8	W/K
	Operating Temperature Range	T_O	Standard devices & options Option DLC		-40...75	$^{\circ}C$
	Storage Temperature Range	T_S	Switches with option DLC may require frost protection!		-50...90	$^{\circ}C$
	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}	$0.8 \times V_O$, $T_{case} = 25...70^{\circ}C$, reduced I_{off} on request		250	μADC
	Typical Holding Current			$T_{case} = 25^{\circ}C$ $T_{case} = 70^{\circ}C$	100 70	mADC
	Typical On-State Voltage	V_{sat}	Each switching path $t_p < 1 \mu s$, duty cycle $< 1\%$	$0.01 \times I_{P(max)}$ $0.1 \times I_{P(max)}$ $1.0 \times I_{P(max)}$	58 120 650	VDC
	Typical Propagation Delay Time	$t_{d(on)}$	Resistive load, $0.1 \times I_{P(max)}$, $0.8 \times V_{O(max)}$, 50-50%		0.4	μs
	Typical Output Pulse Jitter	t_j	Impedance matched input, $V_{aux} / V_{ctrl} = 5.00 VDC$		1	ns
	Typical Turn-On Rise Time	$t_{r(on)}$	Resistive load, 10-90%	$0.1 \times V_{O(max)}$, $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$, $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$, $I_L = 1.0 \times I_{P(max)}$	TBD TBD TBD	ns
	Typical Turn-Off Time	t_{off} , t_q	Resistive load, 10-90%	$0.1 \times V_{O(max)}$, $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$, $I_L = 1.0 \times I_{P(max)}$	TBD TBD	ns
	On Time	t_{on}			35... ∞	ns
	Internal Driver Recovery Time	t_{rc}		Standard devices With Option HFB	100 10	μs
	Max. Continuous Switching Frequency	$f_{(max)}$	@ $V_{aux} = 5.00 V$ Sw. shutdown if $f_{(max)}$ is exceeded	Standard devices without HFS option Standard devices with HFS supply Opt. HFS + sufficient cooling option	TBD TBD TBD	kHz
	Maximum Burst Frequency	$f_{b(max)}$	Use option HFB for > 10 pulses within 20 μs or less		10	kHz
	Maximum Number of Pulses / Burst	$N_{(max)}$	@ $f_{b(max)}$ Note: Option HFB requires external buffer capacitors with a voltage rating of $> 630 VDC$ and a capacitance of 100nF per additional	Standard Option I-HFB Option HFB	10 Use option HFB for > 10 > 100 > 1000	Pulses
	Coupling Capacitance	C_C	HV side against control side		> 30	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}	$V_{aux} = 5.00 VDC$, $T_{case} = 25^{\circ}C$. Active current limitation above 1A.	$0.01 \times f_{(max)}$ @ $f_{(max)}$	TBD 600	mADC
	Fault Signal Output		Switch will be turn off, if $t > f_{(max)}$, $V_{aux} < 4.75 V$ or $T_{case} > 75^{\circ}C$ 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		3-10	VDC
HOUSING	Dimensions	LxWxH	Standard housing Devices with option CF, non-isolated cooling fins Devices with option DLC		Please contact the manufacturer!	mm ³
	Weight		Standard housing Devices with option CF, non-isolated cooling fins Devices with option DLC		Please contact the manufacturer!	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 $75^{\circ}C$, response time $< 60 s$ @ $3 \times P_{d(max)}$, $\Delta T = 25K$ (50 to $75^{\circ}C$). Separate driver protection. B) Switches with option DLC: $65^{\circ}C$, response time $< 3 s$ @ $3 \times P_{d(max)}$, $\Delta T = 25K$ (40 to $65^{\circ}C$), coolant flow $> 3 l / min$. Separate driver protection.				
ORDERING TI	HTS 1200-100 SCR	Thyristor Switch, 120 kVDC, 1000 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 UFTS	Ultra Fast Thermotrigger. Response time for shut down $< 5 s$.	Option ILC	Indirect Liquid Cooling (for water). $P_{d(max)}$ can be increased by the factor 3 to 15.
			Option UFS	Ultra Fast Thermosensor. Response time $< 5 s$. NTC 10k / $\pm 1\%$	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.					
Customized switching units are available on request. All data and specifications subject to change without notice. Please visit www.behlke.com for up-dates.						
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