

	Specification	Symbol	Condition / Comment		HTS 200-100 SCR	Unit
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	$V_{O(max)}$	$I_{off} < 150 \mu ADC$ , $T_{case} = 70^{\circ}C$		20	kVDC
	Maximum Isolation Voltage	$V_I$	Between HV switch and control / GND, continuously		$\pm 40$	kVDC
	Max. Housing Insulation Voltage	$V_{INS}$	Between switch and housing surface, 3 minutes		$\pm 50$	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 $< 1\%$	1000 800 650 240	ADC
	Max. Non-Repetitive Peak Current	$I_{P(nr)}$	$T_{case} = 25^{\circ}C$	Half sine single pulse, $t_p < 200 \mu s$ Half sine single pulse, $t_p < 20 \mu s$	2000 4000	ADC
	Max. Coutinuous Load Current	$I_L$	$T_{case} = 25^{\circ}C$	Standard Plastic case With Option GCF, cooling flange	0.36 26	ADC
	Max. Rate-of-Rise of OFF-State Voltage	$dv/dt$	@ $V_{O(max)}$ , exponential waveform		80	kV/ $\mu s$
	Max. Continuous Power Dissipation	$P_{d(max)}$	$T_{case} = 25^{\circ}C$	Standard devices & FC, forced air 4 m/s With opt. GCF, grounding cooling flange	6 500	Watt
	Linear Derating		Above $25^{\circ}C$	Standard devices & FC, forced air 4 m/s With opt. GCF, grounding cooling flange	0.14 15	W/K
	Operating Temperature Range	$T_O$	Standard devices & options CF, GCF, ILC. (Option DLC)		-40...70	$^{\circ}C$
	Storage Temperature Range	$T_S$	Switches with option ILC 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	$V_O$			$0... \pm 20$	kVDC
	Typical Breakdown Voltage	$V_{br}$	NOTE: $V_{br}$ is a test parameter for quality control purposes only. Not applicable in $I_{off} > 0.5 mA$		22	kVDC
	Typical Off-State Current	$I_{off}$	$0.8 \times V_O$ , $T_{case} = 25...70^{\circ}C$ , reduced $I_{off}$ on request		$< 150$	$\mu ADC$
	Typical Holding Current			$T_{case/flange} = 25^{\circ}C$ $T_{case/flange} = 70^{\circ}C$	70 50	mADC
	Typical On-State Voltage	$V_{sat}$	Each switching path $t_p < 1 \mu s$ , duty cycle $< 1\%$	$0.001 \times I_{P(max)}$ $0.01 \times I_{P(max)}$ $0.1 \times I_{P(max)}$ $1.0 \times I_{P(max)}$	8 15 28 150	VDC
	Typical Propagation Delay Time	$t_{d(on)}$	Resistive load, $0.1 \times I_{P(max)}$ , $0.8 \times V_{O(max)}$ , 50-50%		$< 200$	ns
	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%	$0.1 \times V_{O(max)}$ , $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$ , $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$ , $I_L = 1.0 \times I_{P(max)}$	250 50 170	ns
	Typical Turn-Off Time	$t_{off}, t_q$	Resistive load, 10-90%	$0.1 \times V_{O(max)}$ , $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$ , $I_L = 1.0 \times I_{P(max)}$	40 100	$\mu s$
	Maximum On Time	$t_{on(max)}$	Please note $P_d$ max. limitation		Depending on holding current flow only	
	Internal Driver Recovery Time	$t_{rc}$			100	ns
	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	Please contact the manufacturer!	
	Maximum Burst Frequency	$f_b(max)$	Use option HFB for $> 10$ pulses within 20 $\mu s$ 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 $> 630VDC$ and a capacitance of 100nF per additional pulse.	Standard Option I-HFB Option HFB	100 Use option HFB for $> 100$ Please contact the manufacturer!	Pulses
	Coupling Capacitance	$C_C$	HV side against control side		10	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.	$0.01 \times f_{(max)}$ @ $f_{(max)}$	200 600	mADC
	Fault Signal Output		Switch will be turn off, if $f > f_{(max)}$ , $V_{aux} < 4.75V$ 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	$L \times W \times H$	Standard housing Devices with option CF, non-isolated cooling fins Devices with option DLC	Please contact the manufacturer!	
Weight			Standard housing Devices with option CF, non-isolated cooling fins Devices with option DLC	Please contact the manufacturer!		
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 200-100 SCR	Thyristor Switch, 20 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 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 / $\pm 1\%$	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 <a href="http://www.behlke.com">www.behlke.com</a> for up-dates.						
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