

	Specification	Symbol	Condition / Comment		HTS 100-1600 SCR	Unit
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	$V_{O(max)}$	$I_{off} < 400 \mu ADC$, $T_{case} = 70^{\circ}C$		10	kVDC
	Maximum Isolation Voltage	V_i	Between HV switch and control / GND, continuously		± 40	kVDC
	Max. Housing Insulation Voltage	V_{INS}	Between switch and housing surface, 3 minutes		± 20	kVDC
	Maximum Turn-On Peak Current	$I_{P(max)}$	$T_{case} = 25^{\circ}C$	$t_p < 200 \mu s$, duty cycle $< 1\%$ $t_p < 1 ms$, duty cycle $< 1\%$ $t_p < 10 ms$, duty cycle $< 1\%$ $t_p < 100 ms$, duty cycle $< 1\%$	16000 8000 5440 3200	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, $t_p < 20 \mu s$	32000 64000	ADC
	Max. Coutinuous Load Current	I_L	$T_{case} = 25^{\circ}C$	Standard plastic case With option CCS (air>4m/s)	5.76 56	ADC
	Max. Rate-of-Rise of OFF-State Voltage	dv/dt	@ $V_{O(max)}$, exponential waveform		70	kV/ μs
	Max. Continuous Power Dissipation	$P_{d(max)}$	$T_{case} = 25^{\circ}C$	Standard devices & FC, forced air 4 m/s Whit Option CF	45 400	Watt
	Linear Derating		Above $25^{\circ}C$	Standard devices & FC, forced air 4 m/s Whit Option CF	0.66 8	W/K
	Operating Temperature Range	T_O	Standard devices & options CF, GCF, ILC. (Option DLC)		-40...75	$^{\circ}C$
	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			$0 \dots \pm 10$
Typical Breakdown Voltage		V_{br}	NOTE: V_{br} is a test parameter for quality control purposes only. Not applicable in $I_{off} > 0.5 mA$		> 11	kVDC
Typical Off-State Current		I_{off}	$0.8 \times V_O$, $T_{case} = 25 \dots 70^{\circ}C$, reduced I_{off} on request		< 400	μADC
Typical Holding Current				$T_{case}/ T_{fin} = 25^{\circ}C$ $T_{case}/ T_{fin} = 70^{\circ}C$	100 70	mADC
Typical On-State Voltage		V_{sat}	Each switching path $t_p < 1 \mu s$, duty cycle $< 1\%$	$0.01 \times I_{P(max)}$ $0.1 \times I_{P(max)}$ $1.0 \times I_{P(max)}$	10 20 55	VDC
Typical Propagation Delay Time		$t_{d(on)}$	Resistive load, $0.1 \times I_{P(max)}$, $0.8 \times V_{O(max)}$, 50-50%		450	ns
Typical Output Pulse Jitter		t_j	Impedance matched input, $V_{aux} / V_{drl} = 5.00 VDC$		1	ns
Typical Turn-On Rise Time		$t_{r(on)}$	Resistive load, 10-90%	$0.1 \times V_{O(max)}$, $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$, $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$, $I_L = 1.0 \times I_{P(max)}$	120 70 90	ns
Typical Turn-Off Time		t_{off}, t_q	Resistive load, 10-90%	$0.1 \times V_{O(max)}$, $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$, $I_L = 1.0 \times I_{P(max)}$	35 90	ns
On Time		t_{on}			$35 \dots \infty$	ns
Internal Driver Recovery Time		t_{rc}			1000	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	450 1000 2000	Hz
Maximum Burst Frequency		$f_{b(max)}$	With Option HFB, $I_{P(max)} < 16kA$, please consult factory With Option HFB, $I_{P(max)} < 3A$, please consult factory		1 10	kHz
Maximum Number of Pulses / Burst		$N_{(max)}$			1	Pulses
Coupling Capacitance		C_C	HV side against control side		> 240	pF
Control Voltage Range		V_{drl}	The V_{drl} 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.	$0.01 \times f_{(max)}$ @ $f_{(max)}$	300 600	mADC
Fault Signal Output			Switch will be turn off, if $t > f_{(max)}$, $V_{aux} < 4.75V$ 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		< 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.				
ORDERING	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 $< 60 s$ @ $3 \times Pd(max)$, $\Delta T = 25K$ (50 to $75^{\circ}C$). Separate driver protection. B) Switches with option DLC: $65^{\circ}C$, response time $< 3 s$ @ $3 \times Pd(max)$, $\Delta T = 25K$ (40 to $65^{\circ}C$), coolant flow $> 3l / min$. Separate driver protection.				
ORDERING	HTS 100-1600 SCR	Thyristor Switch, 10 kVDC, 1600 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 Thermotripping. 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 Cooding (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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