

	Specification	Symbol	Condition / Comment		HTS 1001-15 SiC	Unit
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	V <sub>O(max)</sub>	I <sub>off</sub> < 50 μADC, T <sub>case</sub> = 70°C		100	kVDC
	Maximum Isolation Voltage	V <sub>I</sub>	Between HV switch and control / GND, continuously		± 180	kVDC
	Max. Housing Insulation Voltage	V <sub>INS</sub>	Between switch and housing surface, 3 minutes		± 200	kVDC
	Maximum Turn-On Peak Current	I <sub>P(max)</sub>	T <sub>case</sub> = 25°C	t <sub>p</sub> < 200 μs, duty cycle <1% t <sub>p</sub> < 1 ms, duty cycle <1% t <sub>p</sub> < 10 ms, duty cycle <1% t <sub>p</sub> < 100 ms, duty cycle <1%	150 100 65 45	ADC
	Maximum Continuous Load Current	I <sub>L(max)</sub>	T <sub>case</sub> = 25°C	Standard devices Devices with option DLC	1.26 16.5	ADC
	Max. Continuous Power Dissipation	P <sub>d(max)</sub>	T <sub>case</sub> = 25°C	Standard devices & FC, forced air 4 m/s Devices with option DLC	60 4800	Watt
	Linear Derating		Above 25°C	Standard devices & FC, forced air 4 m/s Devices with option DLC	1.4 218	W/K
	Operating Temperature Range	T <sub>O</sub>	Standard devices & options CF, GCF, ILC. (Option DLC)		-40...60	°C
	Storage Temperature Range	T <sub>S</sub>	Switches with option ILC may require frost protection!		-40...90	°C
	Max. Permissible Magnetic Field	B	Homogeneous steady-field, surrounding the whole switch		25	mT
	Max. Auxiliary Voltage	V <sub>aux</sub>	Built-in overvoltage limiter (replaceable)		5.5	VDC
ELECTRICAL CHARACTERISTICS	Permissible Operating Voltage Range	V <sub>O</sub>			0... ± 100	kVDC
	Typical Breakdown Voltage	V <sub>br</sub>	NOTE: V <sub>br</sub> is a test parameter for quality control purposes only. Not applicable in normal operation!	I <sub>off</sub> > 0.5 mA	110	kVDC
	Typical Off-State Current	I <sub>off</sub>	0.8xV <sub>O</sub> , T <sub>case</sub> =25...70°C, reduced I <sub>off</sub> on request		<80	μADC
	Typical Turn-On Resistance	R <sub>stat</sub>	Each switching path t <sub>p</sub> < 1μs, duty cycle < 1%	0.1 x I <sub>P(max)</sub> , T <sub>case</sub> =25°C 1.0 x I <sub>P(max)</sub> , T <sub>case</sub> =25°C 1.0 x I <sub>P(max)</sub> , T <sub>case</sub> =70°C	3.36 8.1 13.5	Ohm
	Typical Propagation Delay Time	t <sub>d(on)</sub>	Resistive load, 0.1 x I <sub>P(max)</sub> , 0.8 x V <sub>O(max)</sub> , 50-50%		250	ns
	Typical Output Pulse Jitter	t <sub>j</sub>	Impedance matched input, V <sub>aux</sub> / V <sub>ctrl</sub> = 5.00 VDC		3	ns
	Typical Turn-On Rise Time	t <sub>r(on)</sub>	Resistive load, 10-90%	0.1 x V <sub>O(max)</sub> , I <sub>L</sub> = 0.1 x I <sub>P(max)</sub> 0.8 x V <sub>O(max)</sub> , I <sub>L</sub> = 0.1 x I <sub>P(max)</sub> 0.8 x V <sub>O(max)</sub> , I <sub>L</sub> = 1.0 x I <sub>P(max)</sub>	108 260 283	ns
	Typical Turn-Off Rise Time	t <sub>off</sub> , t <sub>q</sub>	Resistive load, 10-90%	0.1 x V <sub>O(max)</sub> , I <sub>L</sub> = 0.1 x I <sub>P(max)</sub> 0.8 x V <sub>O(max)</sub> , I <sub>L</sub> = 1.0 x I <sub>P(max)</sub>	50 100	ns
	Maximum Turn-On Time	t <sub>on(max)</sub>	No limitation		∞	ns
	Minimum Turn-On Time	t <sub>on(min)</sub>	t <sub>on(min)</sub> can be customized. Please consult factory		250	ns
	Maximum Turn-Off Time	t <sub>off(max)</sub>	No limitation		∞	ns
	Minimum Turn-Off Time	t <sub>off(min)</sub>	t <sub>off(min)</sub> can be customized. Please consult factory		250	ns
	Max. Continuous Switching Frequency	f <sub>(max)</sub>	@ V <sub>aux</sub> = 5.00 V Sw. shutdown if f <sub>(max)</sub> is exceeded	Standard devices without HFS option Standard devices with HFS supply Opt. HFS + sufficient cooling option	5 50 100	kHz
	Maximum Burst Frequency	f <sub>b(max)</sub>	Use option HFB for >10 pulses within 20μs or less		500	kHz
	Maximum Number of Pulses / Burst	N <sub>(max)</sub>	@ f <sub>b(max)</sub>  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	>10 >100 >1000	Pulses
	Coupling Capacitance	C <sub>C</sub>	HV side against control side		<100	pF
	Natural Capacitance	C <sub>N</sub>	Between switch poles, @ 0.5 x V <sub>O(max)</sub>		<10	pF
	Control Voltage Range	V <sub>ctrl</sub>	The V <sub>ctrl</sub> has no impact on the output pulse shape.		3 ... 10	VDC
	Auxiliary Supply Voltage Range	V <sub>aux</sub>	The +5 V supply is not required in the HFS mode.		4.5 ... 5.5	VDC
	Typical Auxiliary Supply Current	I <sub>aux</sub>	V <sub>aux</sub> = 5.00 VDC, T <sub>case</sub> = 25°C. Active current limitation above 1A.	0.01 x f <sub>(max)</sub> @ f <sub>(max)</sub>	200 800	mADC
	Fault Signal Output		Switch will be turn off, if f>f <sub>(max)</sub> , V <sub>aux</sub> <4.75V or T <sub>case</sub> >75°C Fault condition is indicated by a logical "L"		>4.0 <0.8	VDC
	Opt. HFS, Ext. Supply Voltage V1	V <sub>HFS(V1)</sub>	Stability ±3%, current consumption <0.4 mA/kHz @ 25°C		15	VDC
	Opt. HFS, Ext. Supply Voltage V2	V <sub>HFS(V2)</sub>	Stability ±3%, current consumption <0.5 mA/kHz @ 25°C		300	VDC
	Intrinsic Diode Forward Voltage	V <sub>F</sub>	T <sub>case</sub> = 25°C, I <sub>F</sub> = 0.3 x I <sub>P(max)</sub>		133	VDC
	Diode Reverse Recovery Time	t <sub>rrc</sub>	T <sub>case</sub> = 25°C, I <sub>F</sub> = 0.3 x I <sub>P(max)</sub> , di/dt = 100 A/μs		<34ns	ns
HOUSING	Dimensions	LxWxH	Standard housing Devices with option DLC		TBD	mm³
	Weight		Standard housing Devices with option DLC		TBD	Kg
FUNCTIONS	Control Signal Input	<b>Pin 1 / Yellow (LS-C: Pin 1).</b> TTL compatible (LS-C: With 100Ω termination). Schmitt-Trigger characteristics. Control voltage 2-10 V (3-5 V for low jitter). <b>Pin 2 / Black (LS-C: Shielding).</b> The ground pin is internally connected with the safety earthings terminals (threaded inserts) on bottom side. <b>Pin 3 / Red (LS-C: Pin 4).</b> The 5 V input is used for rep rates up to the specified max. frequency f <sub>(max)</sub> . Higher rep rates require option HFS. <b>Pin 4 / Orange (LS-C: Pin 3).</b> TTL output, short circuit proof. Indicating switch & driver over-heat, over-frequency, low auxiliary voltage. L = Fault. <b>Pin 5 / Green (LS-C: Pin 2).</b> TTL compatible, Schmitt-Trigger characteristics for the connection of external safety circuits. L = Switch Inhibited. <b>GREEN:</b> "Auxiliary power good, switch OFF". <b>YELLOW:</b> "Control signal received, switch ON". <b>RED:</b> "Fault condition, switch OFF" 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.				
	Logic GND / 5V Return					
5V Auxiliary Supply						
Fault Signal Output						
Inhibit Signal Input						
ORDERING	LED Indicators					
	Temperature Protection					
	HTS 1001-15-SiC	Fast HV Mosfet Switch, 100kV, 150 A	Option LP	Low Pass. Input filter for increased noise immunity.	Option I-PC	Integrated part components according to customer specification.
			Option HFB	High Frequency Burst (improved capability by external capacitors)	Option UL-94	Flame retardant casting resin, UL94-V0
			Option HFS	High Frequency Switching (two auxiliary supply inputs V1 & V2 )	Option I-FWD	Integrated Free-Wheeling Diode. In connection with inductive load only.
			Option I-HFS	Integrated High Frequency Burst	Option I-FWDN	Integrated Freewheeling Diode Network. In connection with inductive load.
			Option S-TT	Soft Transition Time decrease the rise and fall time by 20%	Option PT-C	Pigtail for control connection: Flexible leads (l=75mm) with lemo
			Option Min-On	Individually increased "Min. On-Time" to avoid unwanted triggering	Option SEP-C	Separated control unit. Control unit with LED indicators in a separate
			Option Min-Off	Individually increased "Min. Off-Time" to avoid unwanted triggering	Option TH	Tubular Housing
			Option PCC	Pulser Configuration. Switch combined with custom specific parts.	Option CF	Copper Cooling Fins. P <sub>d(max)</sub> can be increased by the factor 3 to 10.
			Option ISO-120	120kV Isolation. Isolation Voltage increased to 120kV.	Option DLC	Direct Liquid Cooling. P <sub>d(max)</sub> can be increased by the factor 10 to 100.
		Option ISO-200	200kV Isolation. Isolation Voltage increased to 200kV.	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.						