

	Specification	Symbol	Condition / Comment		HTS 701-80 LC2	HTS 901-80 LC2	Unit
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	$V_{O(max)}$	$I_{off} < 40 \mu ADC$, $T_{case} = 70^{\circ}C$		70	90	kVDC
	Maximum Isolation Voltage	V_I	Between HV switch and control / GND, continuously		± 120		kVDC
	Max. Housing Insulation Voltage	V_{INS}	Between switch and housing surface, 3 minutes		± 150		kVDC
	Maximum Turn-On Peak Current	$I_{P(max)}$	$T_{case} = 25^{\circ}C$	$t_p < 200 \mu s$, duty cycle $< 1\%$ $t_p < 1 ms$, duty cycle $< 1\%$ $t_p < 10 ms$, duty cycle $< 1\%$ $t_p < 100 ms$, duty cycle $< 1\%$	800 472 228 216		ADC
	Maximum Continuous Load Current	$I_{L(max)}$	$T_{case} = 25^{\circ}C$	Standard devices Devices with option DLC	6.8 60		ADC
	Max. Continuous Power Dissipation	$P_{d(max)}$	$T_{case} = 25^{\circ}C$	Standard devices & FC, forced air 4 m/s Devices with option DLC	70 5000		Watt
	Linear Derating		Above $25^{\circ}C$	Standard devices & FC, forced air 4 m/s Devices with option DLC	0.07 90.3		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!		-40...90		$^{\circ}C$
	Max. Permissible Magnetic Field	B	Homogeneous steady-field, surrounding the whole switch		25		mT
Max. Auxiliary Voltage	V_{aux}	Built-in overvoltage limiter (replaceable)		5		VDC	
ELECTRICAL CHARACTERISTICS	Permissible Operating Voltage Range	V_O			$0... \pm 70$	$0... \pm 90$	kVDC
	Typical Breakdown Voltage	V_{br}	NOTE: V_{br} is a test parameter for quality control purposes only. Not applicable in $I_{off} > 0.5 mA$		77	99	kVDC
	Typical Off-State Current	I_{off}	$0.8 \times V_O$, $T_{case} = -25...70^{\circ}C$, reduced I_{off} on request		< 40		μADC
	Typical Turn-On Resistance	R_{stat}	Each switching path $t_p < 1 \mu s$, duty cycle $< 1\%$	$0.1 \times I_{P(max)}$, $T_{case} = 25^{\circ}C$ $1.0 \times I_{P(max)}$, $T_{case} = 25^{\circ}C$ $1.0 \times I_{P(max)}$, $T_{case} = 70^{\circ}C$	3.2 4.0 8.3	4.25 5.23 10.9	Ohm
	Typical Propagation Delay Time	$t_{d(on)}$	Resistive load, $0.1 \times I_{P(max)}$, $0.8 \times V_{O(max)}$, 50-50%		250		ns
	Typical Output Pulse Jitter	t_j	Impedance matched input, $V_{aux} / V_{ctrl} = 5.00 VDC$		3		ns
	Typical Turn-On Rise Time	$t_{r(on)}$	Resistive load, 10-90%	$0.1 \times V_{O(max)}$, $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$, $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$, $I_L = 1.0 \times I_{P(max)}$	60 76 98		ns
	Typical Turn-Off Rise Time	t_{off}, t_q	Resistive load, 10-90%	$0.1 \times V_{O(max)}$, $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$, $I_L = 1.0 \times I_{P(max)}$	80 112		ns
	Maximum Turn-On Time	$t_{on(max)}$	No limitation		∞		
	Minimum Turn-On Time	$t_{on(min)}$	$t_{on(min)}$ can be customized. Please consult factory		250		ns
	Maximum Turn-Off Time	$t_{off(max)}$	No limitation		∞		
	Minimum Turn-Off Time	$t_{off(min)}$	$t_{off(min)}$ can be customized. Please consult factory		250		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	> 5 50 80		kHz
	Maximum Burst Frequency	$f_{b(max)}$	Use option HFB for > 10 pulses within 20 μs or less		500		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	Standard Option I-HFB Option HFB	> 10 > 100 > 10000		Pulses
	Coupling Capacitance	C_C	HV side against control side		< 100		pF
	Natural Capacitance	C_N	Between switch poles, @ $0.5 \times V_{O(max)}$		< 50		pF
	Control Voltage Range	V_{ctrl}	The V_{ctrl} has no impact on the output pulse shape.		3... 10		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 TBD		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
	Opt. HFS, Ext. Supply Voltage V1	$V_{HFS(V1)}$	Stability $\pm 3\%$, current consumption $< 0.4 mA/kHz$ @ $25^{\circ}C$		15		VDC
	Opt. HFS, Ext. Supply Voltage V2	$V_{HFS(V2)}$	Stability $\pm 3\%$, current consumption $< 0.9 mA/kHz$ @ $25^{\circ}C$		TBD		VDC
	Intrinsic Diode Forward Voltage	V_F	$T_{case} = 25^{\circ}C$, $I_F = 0.3 \times I_{P(max)}$		< 70		VDC
	Diode Reverse Recovery Time	t_{rrc}	$T_{case} = 25^{\circ}C$, $I_F = 0.3 \times I_{P(max)}$, $di/dt = 100 A/\mu s$		< 250		ns
	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!		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 TI	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 $> 3 l / min$. Separate driver protection.					
		HTS 701-80 LC2	Transistor Switch, 70 kVDC, 800 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.
	HTS 901-80 LC2	Transistor Switch, 90 kVDC, 800 ADC	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 www.behlke.com for up-dates.				Revision 02.09.2020 ©2018 All rights reserved			