	Specification	Symbol	Condition / Comment	501-30-GSM-SiC	Unit
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	$V_{O(max)}$	I_{off} < 50 µADC, T_{case} = 70°C	± 50	kVDC
	Maximum Isolation Voltage	V_I	Between HV switch and control / GND, continuously	± 25	kVDC
	Max. Housing Insulation Voltage	V_{INS}	Between switch and housing surface, 3 minutes	± 50	kVDC
	Maximum Turn-On Peak Current	$I_{P(max)}$	T_{case} = 25°C; t_p< 200 µs, duty cycle <1%	300	ADC
			t_p< 1 ms, duty cycle <1%	190	
			t_p< 10 ms, duty cycle <1%	58	
			t_p< 100 ms, duty cycle <1%	30	
	Maximum Continuous Load Current	$I_{L(max)}$	T_{case} = 25°C; Standard devices	2.52	ADC
			Option CF, cooling fins	6.1	
			Devices with option DLC	35	
	Max. Continuous Power Dissipation	$P_{d(max)}$	T_{case} = 25°C; Standard devices & FC, forced air 4 m/s	50	Watt
			Devices with option DLC	3500	
	Linear Derating		Above 25°C; Standard devices & FC, forced air 4 m/s	0.11	W/K
			Devices with option DLC	69	
	Operating Temperature Range	T_O	Standard devices & options ILC, DLC	-40...70 (60)	°C
	Storage Temperature Range	T_S	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. Auxilliary Voltage	V_{aux}	Built-in overvoltage limiter (replaceable)	5.5	VDC
ELECTRICAL CHARACTERISTICS	Permissible Operating Voltage Range	V_O	Unipolar operation (one switch pole grounded or floated)	0... ± 50	kVDC
			Bipolar operation (positive & negative voltage applied)	0... ± 25	
	Typical Breakdown Voltage	V_{br}	**NOTE:** V_{br} is a test parameter for quality control purposes only. Not applicable in normal operation! I_{off} > 0.5 mA	± 55	kVDC
	Typical Off-State Current	I_{off}	0.8xV_O, T_{case} =25...70°C, reduced I_{off} on request	< 40	µADC
	Typical Turn-On Resistance	R_{stat}	Each switching path, t_p < 1µs, duty cycle < 1%; 0.1 x $I_{P(max)}$, T_{case} =25°C	1.0	Ohm
			1.0 x $I_{P(max)}$, T_{case} =25°C	1.1	
			1.0 x $I_{P(max)}$, T_{case} =70°C	1.9	
	Typical Capacitive Power Dissipation of Switch (Natural Power Dissipation)	P_{dc}	Switch capacitances only- without external load and parasitic capacitances!; 0.8 x $V_{O(max)}$, f = 10Hz	1.035	Watt
			0.8 x $V_{O(max)}$, f = 100Hz	0.35	
			0.8 x $V_{O(max)}$, f = 10000Hz	35	
	Typical Propagation Delay Time	$t_{d(on)}$	Resistive load, 0.1 x $I_{P(max)}$, 0.8 x $V_{O(max)}$, 50-50%	150	ns
	Typical Output Pulse Jitter	t_j	Impedance matched input, V_{aux} / V_{ctrl} = 5.00 VDC	2	ns
	Typical Ouput Transition Time (Rise Time & Fall Time)	t_r, t_f	Resistive load, 10-90%; 0.1 x $V_{O(max)}$, I_L = 0.1 x $I_{p(max)}$	150	ns
			0.8 x $V_{O(max)}$, I_L = 0.1 x $I_{p(max)}$	192	
			0.8 x $V_{O(max)}$, I_L = 1.0 x $I_{p(max)}$	236	
	Maximum Turn-On Time	$t_{on(max)}$	No limitation	∞	ns
	Minimum Turn-On Time	$t_{on(min)}$	can be customized. Please consult factory	200	ns
	Max. Continuous Switching Frequency	$f_{(max)}$	@ V_{aux}= 5.00 V, Sw. shutdown if $f_{(max)}$ is exceeded; Standard devices without HFS option	3	kHz
			Standard devices with HFS supply	tbd.	
			Opt. HFS + sufficient cooling option	tbd.	
	Maximum Burst Frequency	$f_{b(max)}$	Use option HFB for >10 pulses within 20µs or less	2	MHz
	Maximum Number of Pulses / Burst	$N_{(max)}$	f_b=1MHz (1µs spacing). Switch shutdown if $N_{(max)}$ is exceeded.	100 Use burst option HFB for >100 pulses	Pulses
	Coupling Capacitance	C_C	Switch against control side; Standard devices & options CF, DLC	< 100	pF
	Natural Capacitance	C_N	Between switch poles, @ 0.5 x $V_{O(max)}$	< 20	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.	4.5 ... 5.5	VDC
	Typical Auxiliary Supply Current	I_{aux}	V_{aux} = 5.00 VDC, T_{case} = 25°C. Active current limitation above 1A.; 0.01 x $f_{(max)}$	200	mADC
			@ specified $f_{(max)}$	500	
	Opt. HFS, Ext. Supply Voltage V1	$V_{HFS(V1)}$	Stability ±3%, current consumption <0.4 mA/kHz @ 25°C	15	VDC
	Opt. HFS, Ext. Supply Voltage V2	$V_{HFS(V2)}$	Stability ±3%, current consumption <0.5 mA/kHz @ 25°C	tbd.	VDC
	Intrinsic Diode Forward Voltage	V_F	T_{case} = 25°C, I_F = 0.3 x $I_{P(max)}$	20	VDC
	Diode Reverse Recovery Time	t_{rrc}	T_{case} = 25°C, I_F = 0.3 x $I_{P(max)}$, di/dt = 100 A/µs	< 250	µs
HOUSING	Dimensions	LxWxH	Standard housing, without pigtails	Please contact the manufactured!	mm^3
			Devices with option ILC & DLC		
	Weight		Standard housing	Please contact the manufactured!	g
			Devices with option ILC & DLC		

FUNCTIONS	
Control Signal Input	**Pin 1** / Yellow (LS-C: Pin 1). TTL compatible (LS-C: With 100Ω termination). Schmitt-Trigger characteristics. Control voltage 2-10 V (3-5 V for low jitter).
Logic GND / 5V Return	**Pin 2** / Black (LS-C: Shielding). The ground pin is internally connected with the safety earthings terminals (threaded inserts) on bottom side.
5V Auxiliary Supply	**Pin 3** / Red (LS-C: Pin 4). 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 (LS-C: Pin 3). TTL output, short circuit proof. Indicating switch & driver over-heat, over-frequency, low auxiliary voltage. L = Fault.
Inhibit Signal Input	**Pin 5** / Green (LS-C: Pin 2). 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 opt. FC, CF , GCF: Thermo trigger 75°C, response time < 60 s @ 3xPd(max), ΔT=25K (50 to 75°C). Separate driver protection. **B)** 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.

ORDERING

HTS 501-30-GSM-SiC	Fast HV Push-Pull Switch, 50kV, 300	**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 connector.
		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 housing.
		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. $P_{d(max)}$ can be increased by the factor 3 to 10.
		Option ISO-80	80kV Isolation. Isolation Voltage increased to 80kV.	**Option GCF**	Grounded Cooling Flange. $P_{d(max)}$ can be increased by the factor 3 to 15.
		Option ISO-120	120kV Isolation. Isolation Voltage increased to 120kV.	**Option ILC**	Indirect Liquid Cooling (for water). $P_{d(max)}$ can be increased by the factor 3 to 15.
		Option ISO-160	160kV Isolation. Isolation Voltage increased to 160kV.	**Option DLC**	Direct Liquid Cooling. $P_{d(max)}$ 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.**	