

	Specification	Symbol	Condition / Comment		HTS 901-15 GSM- SiC	Unit
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	$V_{O(max)}$	$I_{off} < 40 \mu ADC$ , $T_{case} = 70^{\circ}C$		90	kVDC
	Maximum Isolation Voltage	$V_i$	Between HV switch and control / GND, continuously		$\pm 110$	kVDC
	Max. Housing Insulation Voltage	$V_{INS}$	Between switch and housing surface, 3 minutes		$\pm 140$	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 $< 1\%$	150 90 26 15	ADC
	Maximum Continuous Load Current	$I_{L(max)}$	$T_{case} = 25^{\circ}C$	Standard devices Devices with option DLC	2.52 35	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	60 4000	Watt
	Linear Derating		Above $25^{\circ}C$	Standard devices & FC, forced air 4 m/s Devices with option DLC	0.12 80	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	$V_o$			90	kVDC
	Typical Breakdown Voltage	$V_{br}$	NOTE: $V_{br}$ is a test parameter for quality control purposes only. Not applicable in $I_{off} > 0.5 mA$		99	kVDC
	Typical Off-State Current	$I_{off}$	$0.8 \times V_o$ , $T_{case} = 25...70^{\circ}C$ , reduced $I_{off}$ on request		$< 40$	$\mu ADC$
	Typical Turn-On Resistance	$R_{stat}$	$t_p < 1 \mu s$ , duty cycle $< 1\%$	Each switching path $0.1 \times I_{P(max)}$ , $T_{case} = 25^{\circ}C$ $1.0 \times I_{P(max)}$ , $T_{case} = 25^{\circ}C$ $1.0 \times I_{P(max)}$ , $T_{case} = 70^{\circ}C$	3.6 5.8 14	Ohm
	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, $V_{aux} / V_{ctrl} = 5.00 VDC$		3	ns
	Typical Turn-On/Off Rise Time	$t_{r(on)}$ / $t_{r(off)}$	Resistive load, 10-90%	$0.1 \times V_{O(max)}$ , $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$ , $I_L = 0.1 \times I_{P(max)}$ $0.8 \times V_{O(max)}$ , $I_L = 1.0 \times I_{P(max)}$	110 120 140	ns
	Maximum Turn-On Time	$t_{on(max)}$	No limitation		$\infty$	
	Minimum Turn-On Time	$t_{on(min)}$	$t_{on(min)}$ can be customized. Please consult factory		220	ns
	Maximum Turn-Off Time	$t_{off(max)}$	No limitation		$\infty$	
	Minimum Turn-Off Time	$t_{off(min)}$	$t_{off(min)}$ can be customized. Please consult factory		220	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	$< 2$ 30 70	kHz
	Maximum Burst Frequency	$f_b(max)$	Use option HFB for $> 10$ pulses within $20 \mu s$ or less		400	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	$> 10$ Use option HFB for $> 10$ $> 100$ $> 1000$	Pulses
	Coupling Capacitance	$C_C$	HV side against control side		$< 50$	pF
	Natural Capacitance	$C_N$	Between switch poles, @ $0.5 \times V_{O(max)}$		$< 20$	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.		5	VDC
	Typical Auxiliary Supply Current	$I_{aux}$	$V_{aux} = 5.00 VDC$ , $T_{case} = 25^{\circ}C$ . Active current limitation above 1A.	$0.01 \times f_{(max)}$ @ $f_{(max)}$	$> 250$ 800	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 $< 0.9 mA/kHz$ @ $25^{\circ}C$		170	VDC
	Intrinsic Diode Forward Voltage	$V_F$	$T_{case} = 25^{\circ}C$ , $I_F = 0.3 \times I_{P(max)}$		120	VDC
	Diode Reverse Recovery Time	$t_{rr}$	$T_{case} = 25^{\circ}C$ , $I_F = 0.3 \times I_{P(max)}$ , $di/dt = 100 A/\mu s$		$< 50$	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!
Weight			Standard housing Devices with option CF, non-isolated cooling fins Devices with option DLC		Please contact the manufacturer!	g
FUNCTIONS	Control Signal Input	<b>Pin 1 / Yellow.</b> TTL compatible with Schmitt-Trigger characteristics. Control voltage 2-10 V (3-5 V recommended for low jitter). <b>Pin 2 / Black.</b> The ground pin is internally connected with the safety earthing terminal (threaded insert) on bottom side. <b>Pin 3 / Red.</b> The 5 V input is used for rep rates up to the specified max. frequency $f_{(max)}$ . Higher rep rates require option HFS. <b>Pin 4 / Orange.</b> TTL output, short circuit proof. Indicating switch & driver over-heat, over-frequency, low auxiliary voltage. L = Fault. <b>Pin 5 / Green.</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" <b>A)</b> 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>B)</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 $> 3l/min$ . Separate driver protection.				
	Logic GND / 5V Return					
	5V Auxiliary Supply					
	Fault Signal Output					
	Inhibit Signal Input					
	LED Indicators					
Temperature Protection						
ORDERING TI	HTS 901-15 SiC GSM	Transistor Switch, 90 kVDC, 150 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 Thermotriiger. 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.
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.						
Revision 10-10-2019 ©2017 All rights reserved						