	Specification	Symbol	Condition / Comment		HTS 201-40 LC2	HTS 241-40 LC2	HTS 301-40 LC4	Unit
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	$V_{O(max)}$	I_{off} < 250 µADC, T_{case} = 70°C		20	24	30	kVDC
	Minimum Operating Voltage	$V_{O(min)}$	$t_{r(on)}$ and $t_{r(off)}$ may increase sligthly if operated below 5% of $V_{O(max)}$			0		kVDC
	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	22	26	33	kVDC
	Maximum Isolation Voltage	V_I	Between HV switch and control / GND, continuously		± 40	± 40	± 40	VDC
	Max. Housing Insulation Voltage	V_{INS}	Between switch and housing surface, 3 minutes		± 40	± 40	± 40	VDC
	Maximum Turn-On Peak Current	$I_{P(max)}$	T_{case} = 25°C	t_p< 100 µs, duty cycle <1% t_p< 1 ms, duty cycle <1% t_p< 10 ms, duty cycle <1% t_p< 100 ms, duty cycle <1%		400 236 114 8.7		ADC
	Maximum Continuous Load Current	$I_{L(max)}$	T_{case} = 25°C	Increased $I_{L(max)}$ on request		3.4		ADC
	Max. Continuous Power Dissipation	$P_{d(max)}$	T_{case} = 25°C	Standard devices & FH, forced air 4 m/s	25	30	37.5	Watt
	Linear Derating		Above 25°C	Standard devices & FH, forced air 4 m/s	0.02	0.025	0.03	W/K
	Operating Temperature Range	T_O	Standard devices & options CF, GCF, ILC. (Option 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. auxiliary Voltage	V_O			0... ± 20	0... ± 24	0... ± 30	kVDC
	Max. Auxilliary Voltage	V_{aux}	Built-in overvoltage limiter (replaceable)			5.25		VDC
	Max. Off-State Current	I_{off}	0.8xV_O, T_{case} =25...70°C, reduced I_{off} on request			< 40		µADC
	Static On-Resistance	R_{stat}	T_{case} = 25°C	0.1x $I_{P(max)}$ 1.0x $I_{P(max)}$	1.9 4.5	2.3 5.5	2.9 2.9	Ohm
	Galvanic isolation	V_i	Continuously	Standard housing/PCB attachment Option PT-HV, pigtails for HV Option PT-HV + Option ISO-80 1)	25 40 80	25 40 80	40 40 80	kVDC
	Typical Propagation Delay Time	$t_{d(on)}$	Resistive load, 0.1 x $I_{P(max)}$, 0.8 x $V_{O(max)}$, 50-50%			200		ns
	Typical Turn-On Rise Time	$t_{r(on)}$	Resistive load, 10-80%	0.1 x $V_{O(max)}$, I_L = 0.1 x $I_{p(max)}$ 0.5 x $V_{O(max)}$, I_L = 0.1 x $I_{p(max)}$ 0.8 x $V_{O(max)}$, I_L = 0.1 x $I_{p(max)}$ 0.8 x $V_{O(max)}$, I_L = 1.0 x $I_{p(max)}$	53 58 68 94	50 59 77 104	46 83 88 105	ns
	Minimum On-Time	$t_{on(min)}$	Lower $t_{on(min)}$ on request			150		ns
	Maximum On-Time	$t_{on(max)}$	Please note $P_{d(max)}$ limitations!			∞		
	Typical Output Pulse Jitter	t_j	Impedance matched input, V_{aux} / V_{ctrl} = 5.00 VDC			1		ns
	Max. Switching Frequency	$f_{(max)}$	Please note $P_{d(max)}$ limitations!		0.1	1.7	2.1	kHz
	Maximum Burst Frequency	$f_{b(max)}$	Use HFB for >5 pulses within 100 µs			500		kHz
	Coupling Capacitance	C_C	Switch against control side	Standard devices & options CF, DLC Devices with options GCF, ILC		<15 70 ... 150		pF
	Natural Capacitance	C_N	Capacitance between switch poles at Vo_{max}		68	53	36	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.			4.75 ... 5.25		VDC
	Typical Auxiliary Supply Current	I_{aux}	V_{aux} = 5.00 VDC, T_{case} = 25°C. Active current limitation above 1A.	0.01 x $f_{(max)}$ @ specified $f_{(max)}$	280 800	230 800	200 800	
	Fault Signal Output Voltage		Short circuit proof, source/ sink current max. 10mA	Ready = High Fault = Low		> 4.0 < 0.8		VDC
	Control Signal Voltage	V_{tr}	>3VDC recommended			2-6		VDC
	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 <0.9 mA/kHz@25°C		190	236	206	VDC
HOUSING	Dimensions	LxWxH	Standard housing with option PT-HV Devices with option FC, Flat case Devices with option CF, non-isolated cooling fins, standard size		200x150x56 Please contact the manufactured!	252x175x56 Please contact the manufactured!	275x150x58 Please contact the manufactured!	mm^3
	Weight		Standard housing, with option PT-HV Devices with option FC, Flat case Devices with option CF, non-isolated cooling fins, standard size			Please contact the manufactured!		g

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: Pin 2). 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 3). 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 4). TTL output, short circuit proof. Indicating switch & driver over-heat, over-frequency, low auxiliary voltage. L = Fault.
Logic GND / 5V Return	**Pin 5** / Black (LS-C: Shielding). The ground pin is internally connected with the safety earthings terminals (threaded inserts) on bottom side.
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 201.40 LC2	Solid-state Switch, 20kV, 40 A
HTS 241-40 LC2	Solid-state Switch, 24kV, 40 A
HTS 301-40 LC2	Solid-state Switch, 30kV, 40 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
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. $P_{d(max)}$ can be increased by the factor 3 to
Option ISO-40	40kV Isolation. Isolation Voltage increased to 40kV.	**Option GCF**	Grounded Cooling Flange. $P_{d(max)}$ can be increased by the factor 3 to
Option ISO-80	80kV Isolation. Isolation Voltage increased to 80kV.	**Option ILC**	Indirect Liquid Cooling (for water). $P_{d(max)}$ can be increased by the factor 3
Option ISO-120	120kV Isolation. Isolation Voltage increased to 120kV.	**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**	

