

	Specification	Symbol	Condition / Comment		1001-30-SiC	1201-30-SiC	1401-30-SiC	1601-30-SiC	Unit	
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	V _{O(max)}	I _{off} < 50 μADC, T _{case} = 70°C		100	120	140	160	kVDC	
	Maximum Isolation Voltage	V _I	Between HV switch and control / GND, continuously		± 180				kVDC	
	Max. Housing Insulation Voltage	V _{INS}	Between switch and housing surface, 3 minutes		± 200				kVDC	
	Maximum Turn-On Peak Current	I _{P(max)}	T _{case} = 25°C	t _p < 200 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%	300 177 108 81				ADC	
	Maximum Continuous Load Current	I _{L(max)}	T _{case} = 25°C	Standard devices Devices with option DLC	6.5 85				ADC	
	Max. Continuous Power Dissipation	P _{d(max)}	T _{case} = 25°C	Standard devices & FC, forced air 4 m/s Devices with option DLC	120 10000	150 13000	185 15000	200 16000	Watt	
	Linear Derating		Above 25°C	Standard devices & FC, forced air 4 m/s Devices with option DLC	2.85 475	3,482 614,62	3,734 709,62	4.12 786.32	W/K	
	Operating Temperature Range	T _O	Standard devices & options CF, GCF, ILC. (Option DLC)		-40...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 _{aux}	Built-in overvoltage limiter (replaceable)		5.5				VDC		
ELECTRICAL CHARACTERISTICS	Permissible Operating Voltage Range	V _O			0... ± 100	0... ± 120	0... ± 140	0... ± 160	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		110	132	148	164	kVDC	
	Typical Off-State Current	I _{off}	0.8xV _O , T _{case} =25...70°C, reduced I _{off} on request		100-600				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 x I _{P(max)} , T _{case} =25°C 1.0 x I _{P(max)} , T _{case} =70°C	0.7 1,8 3.3	0.9 2.4 4.3	1.2 2.9 5.2	1.4 3.3 5.9	Ohm	
	Typical Propagation Delay Time	t _{d(on)}	Resistive load, 0.1 x I _{P(max)} , 0.8 x 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 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)}	TBD TBD TBD	TBD TBD TBD	TBD TBD TBD	TBD TBD TBD	ns	
	Typical Turn-Off Rise Time	t _{off} , t _q	Resistive load, 10-90%	0.1 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)}	50 100				ns	
	Maximum Turn-On Time	t _{on(max)}	No limitation		∞				ns	
	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		∞				ns	
	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	1.5 100 200	1.4 100 200	0.8 100 200	0.7 100 200	kHz	
	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(max)} 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	>100 >1000 >10000				Pulses	
	Coupling Capacitance	C _C	HV side against control side		<100				pF	
	Natural Capacitance	C _N	Between switch poles, @ 0.5 x V _{O(max)}		4	3.2	2.8	2,4	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) @ f _(max)	TBD 1000	TBD 1000	TBD 1000	TBD 1000	mADC	
	Fault Signal Output		Switch will be turn off, if f>f _(max) , V _{aux} <4.75V or T _{case} >75°C Fault condition is indicated by a logical "L"		>4.0 <0.8				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 <0.5 mA/kHz @ 25°C		TBD	TBD	TBD	TBD	VDC	
	Intrinsic Diode Forward Voltage	V _F	T _{case} = 25°C, I _F = 0.3 x I _{P(max)}		133	160	186	213	VDC	
	Diode Reverse Recovery Time	t _{rrc}	T _{case} = 25°C, I _F = 0.3 x I _{P(max)} , di/dt = 100 A/μs		<34ns				ns	
	HOUSING	Dimensions	LxWxH	Standard housing Devices with option DLC	432x200x68 432x200x131	552x200x68 552x200x131	672x200x68 672x200x131	672x200x68 672x200x131	mm ³	
		Weight		Standard housing Devices with option DLC	11 13	15 18	20 24	20 24	Kg	
	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). Pin 2 / Black (LS-C: Shielding). The ground pin is internally connected with the safety earthings terminals (threaded inserts) on bottom side. 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. Pin 4 / Orange (LS-C: Pin 3). TTL output, short circuit proof. Indicating switch & driver over-heat, over-frequency, low auxiliary voltage. L = Fault. Pin 5 / Green (LS-C: Pin 2). TTL compatible, Schmitt-Trigger characteristics for the connection of external safety circuits. L = Switch Inhibited. GREEN: "Auxiliary power good, switch OFF". YELLOW: "Control signal received, switch ON". RED: "Fault condition, switch OFF" Switches with option DLC: 65°C, response time < 3 s @ 3xP _{d(max)} , ΔT=25K (40 to 65°C), coolant flow > 3l / min. Separate driver protection.							
		Logic GND / 5V Return								
	ORDERING	5V Auxiliary Supply								
Fault Signal Output										
Inhibit Signal Input										
LED Indicators										
Temperature Protection										
HTS 1001-30-SiC		Fast HV Mosfet Switch, 100kV, 300 A	Option LP	Low Pass. Input filter for increased noise immunity.	Option I-PC	Integrated part components according to customer specification.				
HTS 1201-30-SiC		Fast HV Mosfet Switch, 120kV, 300 A	Option HFB	High Frequency Burst (improved capability by external capacitors)	Option UL-94	Flame retardant casting resin, UL94-V0				
HTS 1401-30-SiC		Fast HV Mosfet Switch, 140kV, 300 A	Option HFS	High Frequency Switching (two auxiliary supply inputs V1 & V2)	Option I-FWD	Integrated Free-Wheeling Diode. In connection with inductive load only.				
HTS 1601-30-SiC		Fast HV Mosfet Switch, 160kV, 300 A	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 lermo 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					
		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-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						