

	Specification	Symbol	Condition / Comment	61-30 SiC	121-30 SiC	151-30 SiC	Unit	
<b>ABSOLUTE MAXIMUM RATINGS</b>	Maximum Operating Voltage	$V_{O(max)}$	$I_{off} < 50 \mu ADC$ , $T_{case} = 70^\circ C$	6	12	15	kVDC	
	Maximum Isolation Voltage	$V_i$	Between HV switch and control / GND, continuously		$\pm 25$		kVDC	
	Max. Housing Insulation Voltage	$V_{INS}$	Between switch and housing surface, 3 minutes		$\pm 50$		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 $< 1\%$		300 190 58 30		ADC	
	Maximum Continuous Load Current	$I_{L(max)}$	$T_{case} = 25^\circ C$		2.52 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	4.5 600	8.5 1450	10.5 1600	Watt
	Linear Derating		Above $25^\circ C$	Standard devices & FC, forced air 4 m/s Devices with option DLC	0.02 10	0.03 20	0.033 21	W/K
	Operating Temperature Range	$T_O$		Standard devices & options CF, GCF, ILC. (Option DLC)		-40...70 (60)		$^\circ C$
	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)		5.5		VDC	
<b>ELECTRICAL CHARACTERISTICS</b>	Permissible Operating Voltage Range	$V_O$		$0... \pm 6$	$0... \pm 12$	$0... \pm 15$	kVDC	
	Typical Breakdown Voltage	$V_{br}$	<b>NOTE:</b> $V_{br}$ is a test parameter for quality control purposes only. Not applicable in normal operation! $I_{off} > 0.5 mA$	6.6	9.3	11.6	kVDC	
	Typical Off-State Current	$I_{off}$	$0.8xV_O$ , $T_{case} = 25...70^\circ C$ , reduced $I_{off}$ on request		$< 80$		$\mu ADC$	
	Typical Turn-On Resistance	$R_{stat}$	Each switching path $t_p < 1 \mu s$ , duty cycle $< 1\%$	$0.1 x I_{P(max)}$ , $T_{case} = 25^\circ C$ $1.0 x I_{P(max)}$ , $T_{case} = 25^\circ C$ $1.0 x I_{P(max)}$ , $T_{case} = 70^\circ C$	0.12 0.25 0.5	0.24 0.5 0.9	0.28 0.6 1.3	Ohm
	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 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.	19 34 41	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			$\infty$		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			$\infty$		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	tbd. tbd. tbd.	10 tbd. tbd.	tbd. tbd. tbd.	kHz
	Maximum Burst Frequency	$f_b(max)$	Use option HFB for $>10$ pulses within 20 $\mu s$ or less			2		MHz
	Maximum Number of Pulses / Burst	$N_{(max)}$	@ $f_b(max)$ <b>Note:</b> 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, @ $0.5 x V_{O(max)}$			$<50$		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.			4.5 ... 5.5		VDC
	Typical Auxiliary Supply Current	$I_{aux}$	$V_{aux} = 5.00 VDC$ , $T_{case} = 25^\circ C$ . Active current limitation above 1A.	$0.01 x f_{(max)}$ @ $f_{(max)}$	130 800	150 800	160 800	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"			$>4.0$ $<0.8$		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 $< 0.5 mA/kHz$ @ $25^\circ C$			86	100	VDC	
Intrinsic Diode Forward Voltage	$V_F$	$T_{case} = 25^\circ C$ , $I_F = 0.3 x I_{P(max)}$		58	24	28	VDC	
Diode Reverse Recovery Time	$t_{rrc}$	$T_{case} = 25^\circ C$ , $I_F = 0.3 x I_{P(max)}$ , $di/dt = 100 A/\mu s$			$< 250ns$		ns	
<b>HOUSING</b>	Dimensions	LxWxH	Standard housing Devices with option DLC	103x70x35 tbd.	103x70x35 tbd.	175x75x56 tbd.	mm <sup>3</sup>	
	Weight		Standard housing Devices with option DLC		tbd.		g	
<b>FUNCTIONS</b>	Control Signal Input Logic GND / 5V Return 5V Auxiliary Supply Fault Signal Output Inhibit Signal Input LED Indicators Temperature Protection	<b>Pin 1 / Yellow (LS-C: Pin 1).</b> TTL compatible (LS-C: With 100 $\Omega$ termination). Schmitt-Trigger characteristics. Control voltage 2-10 V (3-5 V for low jitter). <b>Pin 2 / Black (LS-C: Shielding).</b> The ground pin is internally connected with the safety earthings terminals (threaded inserts) on bottom side. <b>Pin 3 / Red (LS-C: Pin 4).</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 (LS-C: Pin 3).</b> TTL output, short circuit proof. Indicating switch & driver over-heat, over-frequency, low auxiliary voltage. L = Fault. <b>Pin 5 / Green (LS-C: Pin 2).</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" Switches with option DLC: $65^\circ C$ , response time $< 3 s$ @ $3xP_{d(max)}$ , $\Delta T = 25K$ (40 to $65^\circ C$ ), coolant flow $> 3l / min$ . Separate driver protection.						
	<b>ORDERING</b>	HTS 61-30 SiC	Fast HV SiC Mosfet Switch, 6kV, 300 A	Option LP	Low Pass. Input filter for increased noise immunity.	Option I-PC	Integrated part components according to customer specification.	
HTS 121-15 SiC		Fast HV SiC Mosfet Switch, 12kV, 300 A	Option HFB	High Frequency Burst (improved capability by external capacitors)	Option UL-94	Flame retardant casting resin, UL94-V0		
HTS 151-30 SiC		Fast HV SiC Mosfet Switch, 15kV, 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.		
			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	Pulsar 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-40	40kV 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-60	60kV Isolation. Isolation Voltage increased to 200kV.	<b>FOR FURTHER PRODUCT OPTIONS PLEASE REFER TO THE OPTIONS</b>				