

	Specification	Symbol	Condition / Comment	241-30 SiC	Unit	
ABSOLUTE MAXIMUM RATINGS	Maximum Operating Voltage	V _{O(max)}	I _{off} < 20 μADC, T _{case} = 70°C	24	kVDC	
	Maximum Isolation Voltage	V _I	Between HV switch and control / GND, continuously	± 40	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% 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°C Standard devices Devices with option DLC	2.52 60	ADC	
	Max. Continuous Power Dissipation	P _{d(max)}	T _{case} = 25°C Standard devices & FC, forced air 4 m/s Devices with option DLC	20 2000	Watt	
	Linear Derating		Above 25°C Standard devices & FC, forced air 4 m/s Devices with option DLC	0.07 24	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 _{aux}	Built-in overvoltage limiter (replaceable)	5.5	VDC		
ELECTRICAL CHARACTERISTICS	Permissible Operating Voltage Range	V _O		0... ± 24	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	26	kVDC	
	Typical Off-State Current	I _{off}	0.8xV _O , T _{case} =25...70°C, reduced I _{off} on request	< 20	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	0.48 0.172 1.44	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)}	18 22 50	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	200	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	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 Standard devices with HFS supply Opt. HFS + sufficient cooling option	16 50 100	kHz	
	Maximum Burst Frequency	f _{b(max)}	Use option HFB for >10 pulses within 20μs or less	500	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	>10 >100 >1000	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)}	6	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)	300 800	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	101	VDC	
	Intrinsic Diode Forward Voltage	V _F	T _{case} = 25°C, I _F = 0.3 x I _{P(max)}	<100	VDC	
	Diode Reverse Recovery Time	t _{rrc}	T _{case} = 25°C, I _F = 0.3 x I _{P(max)} , di/dt = 100 A/μs	<50	ns	
HOUSING	Dimensions	LxWxH	Standard housing Devices with option DLC	Please contact the manufacturer!	mm ³	
	Weight		Standard housing Devices with option DLC	Please contact the manufacturer!	g	
FUNCTIONS	Control Signal Input Logic GND / 5V Return 5V Auxiliary Supply Fault Signal Output Inhibit Signal Input LED Indicators Temperature Protection	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 @ 3xPd(max), ΔT=25K (40 to 65°C), coolant flow > 3l / min. Separate driver protection.				
ORDERING	HTS 241-30 SiC	Fast HV SiC Mosfet Switch, 24kV, 300 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 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
			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-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.	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 www.behlke.com for up-dates. 241-30-SiC-RS / Revision 12-11-2020 ©2017 All rights						