	Specification	Symbol	Condition / C	omment			301-10-GSM	701-10-GSM	901-10-GSM	Unit			
_	Maximum Operating Voltage						± 30	± 70	± 90	kVDC			
RATINGS	Maximum Isolation Voltage	V <sub>O(max)</sub>	Between HV switch and control / GND, continuously			inuouely	± 30	± 100	± 30	kVDC			
	Max. Housing Insulation Voltage	V <sub>INS</sub>	Between switch and housing surface, 3 minutes					± 140		kVDC			
	Maximum Turn-On Peak Current	I <sub>P(max)</sub>	T <sub>case</sub> = 25°C					100					
4					duty cycle <1%			59					
				t <sub>p</sub> < 10 ms, duty cycle <1%				36					
Ş				t <sub>p</sub> < 100 ms	s, duty cycle <1%	6		27		ADC			
Ĭ	Maximum Continuous Load Current	I <sub>L(max)</sub>	T 0500	Standard devices				1.26					
MAXIMUM		, ,	I <sub>case</sub> = 25°C	Devices with option DLC				16.5		ADC			
Ž	Max. Continuous Power Dissipation	P <sub>d(max)</sub>		Standard devices & EC forced air / m/s			18	40	59				
		-()	I <sub>case</sub> = 25°C	T <sub>case</sub> = 25°C Devices with option DLC			1650	3400	3600	Watt			
BSOLUTE	Linear Derating	Standard devices & EC forced air / m/s		ced air 4 m/s	0.43	1,02	1.2						
7		Above 25°		Devices with option DLC			71	178	228	W/K			
Š	Operating Temperature Range	To	Standard device	andard devices & options CF, GCF, ILC. (Option DLC)			-4070 (60)		°C				
4	Storage Temperature Range	Ts	Switches with option ILC may require frost protection!				-4090		°C				
	Max. Permissible Magnetic Field	В					25		mT				
			Homogeneous steady-field, surrounding the whole switch										
	Max. Auxilliary Voltage	V <sub>aux</sub>		Built-in overvoltage limiter (replaceable)			0 40	5.5		VDC			
	Permissible Operating Voltage	Vo		Unipolar operation (one switch pole grounded or floated)			0 ± 40	0 ± 70	0 ± 90	kVDC			
	Range			Bipolar operation (positive & negative voltage applied)			0 ± 20	0 ± 30	0 ± 45				
	Typical Breakdown Voltage	V <sub>br</sub>		NOTE: V <sub>br</sub> is a test parameter for quality control		33	76	98	kVDC				
	Typical Off State Current	purposes only. Not applicable in normal operation!				< 10							
		• •		(V <sub>O</sub> , T <sub>case</sub> =2570°C, reduced l <sub>off</sub> on request			4.4	< 40	20	μADC			
	Typical Turn-On Resistance	R <sub>stat</sub>	Each switching path 0.1 x I <sub>P(max)</sub> , T <sub>case</sub> =25°C			14	30	32					
			$t_p$ < 1 $\mu$ s, duty cy	/cie < 1%	1.0 x I <sub>P(max)</sub> , T <sub>c</sub>		34	71.8	63.4	<u> </u>			
			1.0 x I <sub>P(max)</sub> , T <sub>case</sub> =70°C			61.5	144.5	157.5	Ohm				
	Typical Propagation Delay Time	Resistive load, 0.1 x I <sub>P(max)</sub> , 0.8 x V <sub>O(max)</sub> , 50-50%				250		ns					
	Typical Output Pulse Jitter	tj	Impedance mate	ched input, \				3	<del></del>	ns			
	Typical Ouput Transition Time t <sub>r</sub> , t <sub>f</sub>		Resistive load,	10-90%	•		12	14	15				
Si	(Rise Time & Fall Time)				0.8 x V <sub>O(n</sub>	$_{\text{nax}}$ , $I_{\text{L}} = 0.1 \text{ x } I_{\text{p(max)}}$	32	45	56				
Ĕ	, ,					$_{\text{nax}}$ , $I_{\text{L}} = 1.0 \text{ x } I_{\text{p(max)}}$	36	50	62	ns			
CHARACTERISTICS	Maximum Turn-On Time	t <sub>on(max)</sub>	No limitation	1, 2				∞		ns			
	Minimum Turn-On Time	ton(min)	can be customiz	zed Please	consult factory			250		ns			
C	Max. Continuous Switching		@ V <sub>aux</sub> = 5.00 V		devices without	HEC option	1.8	1.2	0.2	110			
Ž	· ·	f <sub>(max)</sub>	_				30	30	25				
3	Frequency		Sw. shutdown if Standard devices with HFS supply Opt. HFS + sufficient cooling option						1.11=				
£		_	f <sub>(max)</sub> is exceeded			<u> </u>	70	60	50	kHz			
7	Maximum Burst Frequency	f <sub>b(max)</sub>	Use option HFB	Use option HFB for >10 pulses within 20µs or less				400		kHz			
3	Maximum Number of Pulses / Burst	@ f <sub>b(max)</sub>					>10		Pulses				
Ž			Note: Option HFB requires external buffer capacitors with a voltage Option I-HFB >100										
C			rating of > 630VDC and a cpacitance of 100nF per additional pulse. Option HFB					>1000					
ELECTRICAL	Coupling Capacitance	HV side against control side					<100		pF				
T T				poles, @ 0.	.5 x V <sub>O(max)</sub>		32	20	15	pF			
	Control Voltage Range	V <sub>ctrl</sub> The V <sub>ctrl</sub> has no impact on the output pulse shape.			shape.		3 10		VDC				
	Auxiliary Supply Voltage Range	Vaux				<u>'</u>		4.5 5.5		VDC			
	Typical Auxiliary Supply Current	The +5 V supply is not required in the HFS mode. $V_{aux} = 5.00 \text{ VDC}$ , $T_{case} = 25^{\circ}\text{C}$ . $0.01 \text{ x f}_{(max)}$			280	350	450	120					
	Typical Auxiliary Supply Current I <sub>aux</sub>					800	800	800	mADC				
	Foult Cional Output			9 , ,		800	>4.0	000	MADC				
	Fault Signal Output		Switch will be turn off, if f > f <sub>(max)</sub> , V <sub>aux</sub> < 4.75V or T <sub>case</sub> > 75°C						VDC				
	0.1 1150 5 1 0 1 1/2 15 1/4	V <sub>HFS(V1)</sub>	Fault condition is indicated by a logical "L"				<0.8		VDC				
	Opt. HFS, Ext. Supply Voltage V1	Stability ±3%, current consumption <0.4 mA/kHz @ 25°C			450	15	200	VDC					
	Opt. HFS, Ext. Supply Voltage V2	Stability ±3%, current consumption <0.5 mA/kHz @ 25°C			150	269	360	VDC					
	Intrinsic Diode Forward Voltage	$T_{case} = 25^{\circ}C, I_F = 0.3 \text{ x } I_{P(max)}$			36	57	74	VDC					
	Diode Reverse Recovery Time	T <sub>case</sub> = 25°C, I <sub>F</sub>		x), di/dt = $100  A/p$	ıs		<250ns		ns				
	Dimensions	Standard housing			250x150x68	375x300x70	372x100x70						
8		Devices with option DLC			TBD	552x300x131	672x375x131	mm <sup>3</sup>					
SI	l		·										
HOUSING	Weight	Standard housing Devices with option DLC				Please contact the							
							manufactured!		Kg				
										1			
	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).												
S	Logic GND / 5V Return   Pin 2 / Black (LS-C: Shielding). The ground pin is internally connected with the safety earthings terminals (threaded inserts) on bottom side.												
NO	5V Auxiliary Supply Pin 3 / Red (LS-C: Pin 4). The 5 V input is used for rep rates up to the specified m												
6													
101	Fault Signal Output Pin 4 / C								-				
NCTIO	-		C. Blu Al I II 🗠										
FUNCTIO	Inhibit Signal Input Pin 5 / G	Green (LS-		tob OFF" '									
FUNCTIONS	Inhibit Signal Input Pin 5 / G LED Indicators GREEN:	Green (LS- "Auxiliary	power good, swi			•							
FUNCTIO	Inhibit Signal Input LED Indicators Temperature Protection GREEN: Switches	Green (LS- "Auxiliary with option	power good, swi DLC: 65°C, respo	onse time < 3	3 s @ 3xPd(max)	, ∆T=25K (40 to 65°	C), coolant flow > 3I / n	nin. Separate driver prot					
FUNCTIO	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with option 1, 30kV, 100 A	power good, swi n DLC: 65°C, response Option LP	onse time < 3 Low Pass. Inpu	3 s @ 3xPd(max) ut filter for increased n	, ΔT=25K (40 to 65° oise immunity.	C), coolant flow > 3l / n	nin. Separate driver prote	according to customer spe	ecification.			
FUNCTIO	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch HTS 701-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with option 1, 30kV, 100 A 1, 70kV, 100 A	power good, swi n DLC: 65°C, responsible Option LP	onse time < 3 Low Pass. Inpu High Frequency	3 s @ 3xPd(max) ut filter for increased n y Burst (improved cap	, $\Delta T$ =25K (40 to 65° oise immunity.	C), coolant flow > 3l / n  Option I-PC  tors) Option UL-94	nin. Separate driver prote Integrated part components Flame retardant casting resir	according to customer spe n, UL94-V0				
<u> </u>	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with option 1, 30kV, 100 A 1, 70kV, 100 A	power good, swi n DLC: 65°C, respo Option LP Option HFB	Low Pass. Input High Frequency	3 s @ 3xPd(max) ut filter for increased n y Burst (improved cap y Switching (two auxil	, ΔT=25K (40 to 65° oise immunity.	C), coolant flow > 3l / n  Option I-PC  tors) Option UL-94  2) Option I-FWD	nin. Separate driver prote Integrated part components a Flame retardant casting resin Integrated Free-Wheeling Diode	according to customer spe n, UL94-V0 e. In connection with inductiv	e load only.			
<u> </u>	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch HTS 701-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with option 1, 30kV, 100 A 1, 70kV, 100 A	power good, swi n DLC: 65°C, respo Option LP Option HFB Option HFS Option I-HFS	Low Pass. Input High Frequency High Frequency Integrated High	3 s @ 3xPd(max) ut filter for increased n y Burst (improved cap y Switching (two auxil n Frequency Burst	, $\Delta T$ =25K (40 to 65° oise immunity. pability by external capacitiary supply inputs V1 & V2	C), coolant flow > 31 / n  Option I-PC  tors) Option UL-94  2) Option I-FWD  Option I-FWDN	nin. Separate driver proteintegrated part components. Flame retardant casting resir Integrated Free-Wheeling Diode Integrated Freewheeling Diode	according to customer spe n, UL94-V0 e. In connection with inductiv Network. In connection with	e load only.			
<u> </u>	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch HTS 701-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with option 1, 30kV, 100 A 1, 70kV, 100 A	power good, swi DLC: 65°C, responsible Option LP Option HFS Option HFS Option HFS Option S-TT	Low Pass. Input High Frequency High Frequency Integrated High Soft Transition Ti	3 s @ 3xPd(max)  It filter for increased n  y Burst (improved cap  y Switching (two auxil  requency Burst  ime decrease the rise a	, $\Delta T$ =25K (40 to 65° oise immunity. vability by external capacitiary supply inputs V1 & V3 and fall time by 20%	C), coolant flow > 3l / n	nin. Separate driver prote Integrated part components a Flame retardant casting resin Integrated Free-Wheeling Diode Integrated Freewheeling Diode Pigtail for control connection: Fl	according to customer spe n, UL94-V0 e. In connection with inductiv Network. In connection with exible leads (I=75mm) with le	e load only. inductive load. emo			
<u> </u>	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch HTS 701-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with option 1, 30kV, 100 A 1, 70kV, 100 A	power good, swi n DLC: 65°C, responsible to the control of the con	Low Pass. Input High Frequency High Frequency Integrated High Soft Transition Ti Individually incr	3 s @ 3xPd(max)  It filter for increased n  y Burst (improved cap  y Switching (two auxil  n Frequency Burst  ime decrease the rise a  reased "Min. On-Time	, $\Delta T$ =25K (40 to 65° oise immunity. vability by external capacitiary supply inputs V1 & V: and fall time by 20% "to avoid unwanted trigg:	C), coolant flow > 3I / n	nin. Separate driver protein tegrated part components in Flame retardant casting resine Integrated Free-Wheeling Diode Integrated Free-Wheeling Diode Pigtail for control connection: Fl Separated control unit. Control	according to customer spe n, UL94-V0 e. In connection with inductiv Network. In connection with exible leads (I=75mm) with le	e load only. inductive load. emo			
<u> </u>	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch HTS 701-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with option 1, 30kV, 100 A 1, 70kV, 100 A	power good, swi n DLC: 65°C, respu Option LP Option HFB Option HFS Option HFS Option Min-On Option Min-Onf	Low Pass. Input High Frequency High Frequency Integrated High Soft Transition To Individually incomplete Individual Individ	3 s @ 3xPd(max) ut filter for increased in y Burst (improved car y Switching (two auxil in Frequency Burst ime decrease the rise a reased "Min. On-Time reased "Min. Off-Time	, $\Delta T$ =25K (40 to 65° oise immunity.  Ability by external capacitiary supply inputs V1 & V.  And fall time by 20%  To avoid unwanted trigg.  To avoid unwanted trigg.	C), coolant flow > 3I / n	nin. Separate driver prote Integrated part components a Flame retardant casting resin Integrated Free-Wheeling Diode Integrated Freewheeling Diode Pigtail for control connection: Fl	according to customer spen, UL94-VO e. In connection with inductiv Network. In connection with exible leads (I=75mm) with le unit with LED indicators in a	e load only. inductive load. emo separate			
ORDERING FUNCTION	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch HTS 701-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with option 1, 30kV, 100 A 1, 70kV, 100 A	power good, swi n DLC: 65°C, respo n Option LP n Option HFB Option HFS Option HFS Option S-TT Option Min-On Option Min-Off Option PCC	onse time < 3 Low Pass. Input High Frequency High Frequency Integrated High Soft Transition Ti Individually inco Individually inco Pulser Configur	3 s @ 3xPd(max) ut filter for increased in y Burst (improved car y Switching (two auxil in Frequency Burst ime decrease the rise a reased "Min. On-Time reased "Min. Off-Time	, $\Delta T$ =25K (40 to 65° oise immunity.  Ability by external capacitiary supply inputs V1 & V.  And fall time by 20%  To avoid unwanted trigg.  To avoid unwanted trigged with custom specific predictions.	C), coolant flow > 3I / n	nin. Separate driver protein. Separate driver protein tegrated part components: Flame retardant casting resin Integrated Free-Wheeling Diode Integrated Free-Wheeling Diode Pigtail for control connection: Fl Separated control unit. Control Tubular Housing	according to customer spen, UL94-V0 e. In connection with inductiv Network. In connection with exhible leads (I=75mm) with le unit with LED indicators in a second be increased by the factors.	re load only. inductive load. emo separate actor 3 to 10.			
<u> </u>	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch HTS 701-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with option 1, 30kV, 100 A 1, 70kV, 100 A	power good, swi n DLC: 65°C, respo	onse time < 3 Low Pass. Input High Frequency High Frequency Integrated High Soft Transition Ti Individually incr Individually incr Pulser Configur 40kV Isolation. 80kV Isolation.	3 s @ 3xPd(max)  It filter for increased n  y Burst (improved cap  y Switching (two auxil  Frequency Burst ime decrease the rise a  reased "Min. On-Time  ration. Switch combin  Isolation Voltage incr  Isolation Voltage incr	, $\Delta T$ =25K (40 to 65° oise immunity.  Ability by external capacitiary supply inputs V1 & V.  And fall time by 20%  To avoid unwanted trigger  to avoid unwanted trigger  with custom specific present of 40kV.  Eased to 40kV.	C), coolant flow > 3I / n Option I-PC tors) Option UL-94 2) Option I-FWD Option I-FWDN Option FT-C ering Option SEP-C ering Option TH arts. Option GCF Option ILC	nin. Separate driver protein litegrated part components. Flame retardant casting resin Integrated Free-Wheeling Diode Integrated Free-Wheeling Diode Pigtall for control connection: Fl Separated control unit. Control Intubular Housing Copper Cooling Fins. Pa(max) Grounded Cooling Flange. Payin Indirect Liquid Cooling (for water	according to customer spen, UL94-V0 e. In connection with inductiv Network. In connection with exible leads (I=75mm) with le unit with LED indicators in a second be increased by the fa exity can be increased by the fa exity). Palmany can be increased by the farty.	e load only. inductive load. emo separate actor 3 to 10. actor 3 to 15. by the factor 3 to			
<u> </u>	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch HTS 701-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with option 1, 30kV, 100 A 1, 70kV, 100 A	power good, swi n DLC: 65°C, respo n Option LP n Option HFB Option HFS Option I-HFS Option S-TT Option Min-On Option Min-Off Option PCC Option ISO-40 Option ISO-40 Option ISO-320	Onse time < 3 Low Pass. Input High Frequency High Frequency Integrated High Soft Transition Ti Individually incr Individually incr Pulser Configur 40kV Isolation. 120kV Isolation.	3 s @ 3xPd(max)  It filter for increased n  y Burst (improved cap  y Switching (two auxil  Frequency Burst ime decrease the rise a  reased "Min. On-Time reation. Switch combin  Isolation Voltage incr.  Isolation Voltage incr.	, $\Delta T$ =25K (40 to 65° oise immunity.  sability by external capacitiary supply inputs V1 & V.  and fall time by 20%  " to avoid unwanted triggy " to avoid unwanted trigge with custom specific preased to 40kV.  eased to 80kV.  creased to 120kV.	C), coolant flow > 3I / n Option I-PC tors) Option UL-94 2) Option I-FWD Option I-FWDN Option FT-C ering Option SEP-C ering Option TH arts. Option GCF Option ILC Option DLC	nin. Separate driver prote Integrated part components. Flame retardant casting resir Integrated Free-Wheeling Diode Integrated Free-Wheeling Diode Pigtali for control connection: Fl Separated control unit. Control Tubular Housing Copper Cooling Fins. Pd(max) Grounded Cooling Flange, Pdim Indirect Liquid Cooling, Pd(max) casting Cooling.	according to customer spen, UL94-V0 e. In connection with inductiv Network. In connection with exible leads (I=75mm) with le unit with LED indicators in a : can be increased by the fa and can be increased by the fa rf). Pdman, can be increased by n be increased by the factor	e load only. inductive load. emo separate actor 3 to 10. actor 3 to 15. by the factor 3 to 10 to 100.			
ORDERING	Inhibit Signal Input LED Indicators Temperature Protection HTS 301-10-GSM Fast HV Push-Pull Switch HTS 701-10-GSM Fast HV Push-Pull Switch	Green (LS- "Auxiliary with optior n, 30kV, 100 A n, 70kV, 100 A n, 90kV, 100 A	power good, swi n DLC: 65°C, responsible of the control of the con	Onse time < 3 Low Pass. Inpu High Frequency High Frequency Integrated High Soft Transition Ti Individually incr Individually incr Individually incr Valve Configur 40kV Isolation. 120kV Isolation. 200kV Isolation	3 s @ 3xPd(max)  It filter for increased n  y Burst (improved cap  y Switching (two auxil  n Frequency Burst  ime decrease the rise a  reased "Min. On-Time  reased "Min. Off-Time  reased "Min Voltage incr  Isolation Voltage incr	, $\Delta T$ =25K (40 to 65° oise immunity.  sublify by external capacitiary supply inputs V1 & V.  and fall time by 20%  and fall time by 20%  to avoid unwanted trigg.  to avoid unwanted trigg.  to avoid unwanted trigg.  eased to 40kV.  eased to 80kV.  creased to 120kV.  creased to 200kV.	C), coolant flow > 3I / n Option I-PC tors) Option UL-94 2) Option I-FWD Option I-FWDN Option FFC erring Option SEP-C erring Option TH arts. Option CF Option ILC Option DLC FOR FURTHER F	nin. Separate driver protein separate driver protein tegrated part components. Flame retardant casting resine Integrated Free-Wheeling Diode Pigtail for control connection: Flame and the separated control unit. Control Tubular Housing Copper Cooling Fins. Pd(max) Copper Cooling Flange. Pd(max) Copper Cooling	according to customer spen, UL94-V0 e. In connection with inductiv Network. In connection with exible leads (I=75mm) with le unit with LED indicators in a : can be increased by the fa and can be increased by the fa rf). Pdman, can be increased by n be increased by the factor	re load onlinductive emo separate actor 3 to actor 3 to 10 to 100 ONS PA			