

- HV push-pull switch in halfbridge configuration
- Two switching paths for fast rise and fall time
- Safe operation due to passive switching path locking
- No cross-over current
- Ideal for precise HV square wave pulses into capacitive load
- No working resistor required
- No necessity for large HV input energy storage capacitors

Note: The model number contains coded information about voltage, current and turn-on behavior. The first digits stand for the voltage in kV, the last digit before the dash indicates the turn-on behavior (0 = fixed on-time, 1 = variable on-time). The digits after the dash indicate the current in Amperes x10. Special features are coded by the letters after a second dash

Example HTS 31-03-HB-C: HTS = HV Transistor Switch, 3 = 3 kV, 1 = variable on-time, 03 = 30 Ampere, HB = Half Bridge, C = Compact Series.

Model [sorted by dimensions]	Description / Comment • Preferred stock type ◦ Limited stock X Not for new development	Drawing (PDF)	Dimensions [mm3]	Voltage [kV]	Pk. Current [A]	On-Resist. [Ω]	On-Time [ns]
HTS 11-07-HB-C	• Compact series. HV screw connectors at bottom side (for PCB's)	PDF	79 x 38 x 17	2 x 1.2	2 x 70	2 x 1.2	50...∞
HTS 31-03-HB-C	• Compact series. HV screw connectors at bottom side (for PCB's)	PDF	79 x 38 x 17	2 x 3	2 x 30	2 x 5	50...∞
HTS 31-13-HB-B-C	• Compact series. HV screw connectors at bottom side (for PCB's)	PDF	79 x 38 x 17	2 x 3.9	2 x 130	2 x 0.5	150...∞
HTS 41-02-HB-LC-C	• Compact series. HV screw connectors at bottom side (for PCB's)	PDF	79 x 38 x 17	2 x 4.8	2 x 25	2 x 7	50...∞
HTS 61-01-HB-C	• Compact series. HV screw connectors at bottom side (for PCB's)	PDF	79 x 38 x 17	2 x 6	2 x 15	2 x 22	50...∞
HTS 91-01-HB-C	• Compact series. HV screw connectors at bottom side (for PCB's)	PDF	79 x 38 x 17	2 x 9	2 x 12	2 x 42	50...∞
HTS 21-07-HB-C	• Compact series. HV screw connectors at bottom side (for PCB's)	request	125 x 38 x 17	2 x 2.4	2 x 70	2 x 2.4	50...∞
HTS 61-03-HB-C	• Compact series. HV screw connectors at bottom side (for PCB's)	request	125 x 38 x 17	2 x 6	2 x 30	2 x 10	70...∞
HTS 71-13-HB-B-C	• Compact series. HV screw connectors at bottom side (for PCB's)	request	125 x 38 x 17	2 x 7.8	2 x 130	2 x 1	180...∞
HTS 91-02-HB-LC-C	• Compact series. HV screw connectors at bottom side (for PCB's)	request	125 x 38 x 17	2 x 9.6	2 x 25	2 x 15	70...∞
HTS 121-01-HB-C	• Compact series. HV screw connectors at bottom side (for PCB's)	request	125 x 38 x 17	2 x 12	2 x 15	2 x 44	70...∞
HTS 181-01-HB-C	• Compact series. HV pigtailed at front side (for free wiring)	request	140 x 38 x 20	2 x 18	2 x 12	2 x 84	70...∞
HTS 111-13-HB-B-C	• Compact series. HV screw connectors at bottom side (for PCB's)	request	158 x 38 x 17	2 x 11.7	2 x 130	2 x 1.5	220...∞
HTS 21-03-GSM	• HV soldering connectors at front side	request	89 x 64 x 27	2 x 2	2 x 30	2 x 3.4	80...∞
HTS 21-06-GSM	• HV soldering connectors at front side	request	89 x 64 x 27	2 x 2	2 x 60	2 x 1.7	80...∞
HTS 31-01-GSM	• HV soldering connectors at front side	request	89 x 64 x 27	2 x 3	2 x 15	2 x 16	80...∞
HTS 31-03-GSM	• HV soldering connectors at front side	PDF	89 x 64 x 27	2 x 3	2 x 30	2 x 8	80...∞
HTS 41-03-GSM	• HV screw connectors at bottom side (for PCB attachment)	PDF	112 x 64 x 27	2 x 4	2 x 30	2 x 7.2	60...∞
HTS 41-06-GSM	• HV screw connectors at bottom side (for PCB attachment)	PDF	112 x 64 x 27	2 x 4	2 x 60	2 x 3.6	60...∞
HTS 61-01-GSM	• HV screw connectors at bottom side (for PCB attachment)	PDF	112 x 64 x 27	2 x 6	2 x 15	2 x 32	60...∞
HTS 61-03-GSM	• HV screw connectors at bottom side (for PCB attachment)	PDF	112 x 64 x 27	2 x 6	2 x 30	2 x 16	60...∞
HTS 81-03-GSM	• HV screw connectors at bottom side (for PCB attachment)	request	163 x 64 x 27	2 x 8	2 x 30	2 x 16	150...∞
HTS 81-06-GSM	• HV screw connectors at bottom side (for PCB attachment)	request	163 x 64 x 27	2 x 8	2 x 60	2 x 8	150...∞
HTS 151-01-GSM	• HV screw connectors at bottom side (for PCB attachment)	request	163 x 64 x 27	2 x 15	2 x 15	2 x 72	150...∞
HTS 151-03-GSM	• HV screw connectors at bottom side (for PCB attachment)	request	163 x 64 x 27	2 x 15	2 x 30	2 x 36	150...∞
HTS 111-03-GSM	• HV screw connectors at bottom side (for PCB attachment)	request	200 x 70 x 28	2 x 11	2 x 30	2 x 20.4	150...∞
HTS 111-06-GSM	• HV screw connectors at bottom side (for PCB attachment)	PDF	200 x 70 x 28	2 x 11	2 x 60	2 x 10.2	150...∞
HTS 121-10-GSM	• HV pigtail connectors at front side (PT-HV, for free wiring)	PDF	200 x 150 x 68	2 x 12	2 x 100	2 x 5	180...∞
HTS 151-10-GSM	• HV pigtail connectors at front side (PT-HV, for free wiring)	request	200 x 150 x 68	2 x 15	2 x 100	2 x 6	180...∞
HTS 151-20-GSM	• HV pigtail connectors at front side (PT-HV, for free wiring)	request	200 x 150 x 68	2 x 15	2 x 200	2 x 3	230...∞
HTS 161-03-GSM	• HV screw connectors at bottom side (for PCB attachment)	request	263 x 70 x 35	2 x 16	2 x 30	2 x 32	150...∞
HTS 161-06-GSM	• HV screw connectors at bottom side (for PCB attachment)	request	263 x 70 x 35	2 x 16	2 x 60	2 x 16	150...∞
HTS 201-01-GSM	• HV screw connectors at bottom side (for PCB attachment)	request	200 x 70 x 28	2 x 20	2 x 15	2 x 96	150...∞
HTS 201-03-GSM	• HV screw connectors at bottom side (for PCB attachment)	request	200 x 70 x 28	2 x 20	2 x 30	2 x 48	150...∞
HTS 241-10-GSM	• HV pigtail connectors at front side (PT-HV, for free wiring)	request	250 x 100 x 68	2 x 24	2 x 100	2 x 12	200...∞
HTS 241-20-GSM	• HV pigtail connectors at front side (PT-HV, for free wiring)	PDF	250 x 150 x 68	2 x 24	2 x 200	2 x 6	250...∞
HTS 301-01-GSM	• HV pigtail connectors at front side (PT-HV, for free wiring)	request	263 x 70 x 35	2 x 30	2 x 15	2 x 144	150...∞
HTS 301-03-GSM	• HV pigtail connectors at front side (PT-HV, for free wiring)	PDF	263 x 70 x 35	2 x 30	2 x 30	2 x 72	150...∞
HTS 301-10-GSM	• HV pigtail connectors at front side (PT-HV, for free wiring)	request	300 x 100 x 68	2 x 30	2 x 100	2 x 14	200...∞
HTS 301-20-GSM	• HV pigtail connectors at front side (PT-HV, for free wiring)	request	300 x 150 x 68	2 x 30	2 x 200	2 x 7	250...∞
HTS 401-10-GSM	• HV pigtail connectors at front side (PT-HV, for free wiring)	PDF	372 x 100 x 70	2 x 40	2 x 100	2 x 18	250...∞
HTS 651-01-GSM	• HV pigtail connectors at front or top side (PT-HV, for free wiring)	request	312 x 200 x 70	2 x 65	2 x 15	2 x 288	250...∞
HTS 651-03-GSM	• HV pigtail connectors at front or top side (PT-HV, for free wiring)	request	312 x 200 x 70	2 x 65	2 x 30	2 x 144	250...∞
HTS 651-10-GSM	• HV pigtail connectors at front or top side (PT-HV, for free wiring)	request	372 x 280 x 70	2 x 65	2 x 100	2 x 28	300...∞
HTS 701-10-GSM	• HV pigtail connectors at front or top side (PT-HV, for free wiring)	PDF	375 x 300 x 70	2 x 70	2 x 100	2 x 30	300...∞
HTS 901-10-GSM	• HV pigtail connectors at front or top side (PT-HV, for free wiring)	request	425 x 300 x 70	2 x 90	2 x 100	2 x 32	300...∞
HTS 901-20-GSM	• HV pigtail connectors at front or top side (PT-HV, for free wiring)	request	425 x 300 x 70	2 x 90	2 x 200	2 x 16	300...∞
HTS 1401-10-GSM	• HV pigtail connectors at front or top side (PT-HV, for free wiring)	request	672 x 350 x 90	2 x 140	2 x 100	2 x 52	300...∞
HTS 1401-20-GSM	• HV pigtail connectors at front or top side (PT-HV, for free wiring)	request	672 x 350 x 90	2 x 140	2 x 200	2 x 26	300...∞
HTS 80-PGSM	X Replaced by HTS 91-01-HB-C (compact series)						
HTS 150-PGSM	X Replaced by HTS 181-01-HB-C (compact series)						

Options (1)
B-CON

	Beginner's Configuration: The standard switch is equipped with various options to simplify first time experiments for users, which are inexperienced with high voltage and high frequency circuit design. The beginner's configuration includes option FH and PT-HV for easy wiring and attachment without printed circuit boards, as well as option LS-C, LP and S-TT for an uncritical EMC behavior. Inexperienced users should also consider the combination with option I-PC or PC to avoid possible difficulties from the high voltage wiring and / or high frequency noise behavior. (2)
HFB	High Frequency Burst: Improved burst capability of driver by means of external buffer capacitors. Recommended if more than 10 pulses with less than 10 μ s spacing are generated.
HFS	High Frequency Switching: External supply of auxiliary driver voltage (50-350 VDC according to type). Necessary if the specified "Maximum Operating Frequency" shall be exceeded. (2)
LP	Low Pass: Low pass filter at the control input. Propagation delay time will be increased by ~50 ns. Jitter + 500 ps. Improved noise immunity and less critical wiring in high speed applications. (3)
S-TT	Soft Transition Time: "Turn-On Rise Time" & "Turn-Off Rise Time" increased by ~20%. Simplified EMC design and less critical wiring if the shortest possible edge steepness is not required. (3)
LNC	Low Natural Capacitance: C_N reduced by approximately 30%. To minimize capacitive power losses in applications with high switching frequency and high switching voltage ($P_c = V^2 \times C \times f$).
LL	Low Leakage Current: Off-state current reduced to less than 10% of the specified value. Not available in connection with the cooling fin options and for switches of the UF series.
LN	Low Noise: Internal power driver modified for zero noise emission for a specific period of time. Relevant in conjunction with sensitive detector amplifiers (e.g. SEV/MCP applications) only. (2)
ISO-25	25 kV Isolation: Isolation Voltage increased to 25 kVDC. Housing dimensions may change for some models.
ISO-40	40 kV Isolation: Isolation Voltage increased to 40 kVDC. Housing dimensions may change for some models. Only in connection with option PT-HV.
ISO-80	80 kV Isolation: Isolation Voltage increased to 80 kVDC. Housing dimensions may change for some models. Only in connection with option PT-HV.
ISO-120	120 kV Isolation: Isolation Voltage increased to 120 kVDC. Housing dimensions may change for some models. Only in connection with option PT-HV.
ISO-200	200 kV Isolation: Isolation Voltage increased to 200 kVDC. Housing dimensions may change for some models. Only in connection with option PT-HV.
I-PC	Integrated Part Components: Integration of small part components according to customer's specifications (e.g. buffer capacitors, snubbers, damping resistors, diodes, opto couplers). (2)
PCC	Pulsar Configuration: Switch combined with custom specific part components. Integrated in a flange housing with hv connectors according to the customers specifications. (2)
I-FWD	Integrated Free-Wheeling Diode: Built-in parallel diode with short recovery time. In connection with inductive load only.
I-FWDN	Integrated Free-Wheeling Diode Network: Built-in parallel diode plus serial blocking diode with short recovery time. In connection with inductive load only.
LS-C	LEMO socket for Control Connection. Input Z=100 Ω . An assembled linkage cable (1m/3ft) with two plugs and one socket is included in supply. For improved noise immunity. (3)
PT-C	Pigtail for Control Connection: Flexible leads (l=75 mm) with AMP-modu plug. Refers to switching modules with pins only. Suggested for modules with options CF & GCF.
PT-HV	Pigtails for HV Connection: Flexible leads with cable lugs. For increased creepage. PT-HV is standard for all types with >25 kV switching voltage. Not for extremely fast circuits.
ST-HV	Screw Terminals for HV Connection: Threaded inserts at the bottom of module for PCB attachment. Operation above 25 kV requires liquid insulation (Galden®/Oil) or potting.
SEP-C	Separated Control Unit: Control unit with LED indicators in a separate housing (dim. 79x38x17 mm). Linkage cable (<1m) with plug. Control unit with soldering pins or pigtails.
FOI-I	Fibre Optics Input / Inhibit: Additional optical inhibit input to turn-off the switch by using the inhibit input with a fibre-optical signal (only in combination with option SEP-C) (2)
FOI-C	Fibre Optics Input / Control: Additional optical control input to trigger the switch with a fibre-optical signal (only in combination with option SEP-C) (2)
FOO-F	Fibre Optical Output / Fault: Additional optical output to read-out the failure condition with a fibre-optical signal (only in combination with option SEP-C) (2)
UL94	Flame Retardant Casting Resin: Flame Retardant Casting Resin: Casting resin according to UL-94-VO. Minimum order quantity required. (2)
FH	Flange Housing: Plastic flange housing for isolated attachment on conductive surfaces. Ideal if the switch is not intended for printed circuit boards. Option PT-HV is suggested.
TH	Tubular Housing: Tubular instead of rectangular housing. Adaption to specific ambient conditions or in case of difficult assembly situations. (2)
FC	Flat Case: Height of standard plastic housings reduced to 19 mm or less. Not in combination with cooling options CF, GCF and DLC.
ITC	Increased Thermal Conductivity: Special moulding process to increase the thermal conductivity of the module. $P_{d(max)}$ will be increased by approx. 20-30%. (2)
CF	Copper Cooling Fins d = 0.5 mm: Fin height 35 mm. Nickel plated. For air cooling with forced or natural convection as well as for liquid cooling with non-conductive coolants.
CF-1	Copper Cooling Fins d = 1 mm: Fin thickness 1.0 mm instead of 0.5 mm. The Max. Power Dissipation $P_{d(max)}$ will be increased by ~80 %. For air or liquid cooling (e.g. Galden® or oil).
CF-X2	Copper Cooling Fins "XL": Fin area enlarged by factor 2. Recommended for natural air convection. No significant cooling power improvement in connection with forced air or liquid cooling.
CF-X3	Copper Cooling Fins "XXL": Fin area enlarged by factor 3. Recommended for natural air convection. No significant cooling power improvement in connection with forced air or liquid cooling.
CF-CS	Copper Cooling Fins with customized shape: Individual shape to meet specific OEM requirements. (2) Can be combined with options CF-1, CF-D and CF-S for increased cooling power.
CF-LC	Copper Cooling Fins for liquid cooling: Double fins, nickel plated copper, height 20 mm. For the immersion in oil tanks etc. Forced convection recommended. Combinable with opt. CF-S.
CF-D	Double Copper Cooling Fins: Approx. 100% more cooling power, approx. 2mm spacing between fins, forced convection recommended. Combinable with opt. CF-S, CF-X2, CF-X3 and CF-CS.
CF-S	Copper Cooling Fins: Semiconductors soldered on fins. Approx. 30% to 100% more cooling power (type depending). Combinable with options CF-D, CF-X2, CF-X3 and CF-CS.
CF-GRA	Non-isolated Cooling Fins made of graphite: Very light weight compared to copper at similar heat transfer, but reduced heat capacity. 0.5 or 1 mm thickness, height 35 mm.
CF-CER	Isolated Cooling Fins made of ceramics: Heat transfer properties similar to alumina. Forced convection recommended due to 2 mm spacing between fins. Height 35 mm.
CCS	Ceramic Cooling Surface: Top side of switching module made of ceramics. Heat transfer properties similar to alumina. Max. 20 kVDC isolation. Forced convection recommended.
CCF	Ceramic Cooling Flange: Bottom side of switching module made of a plano grinded ceramic plate. Integrated metal frame for uniform and safe contact pressure. Max. 40 kVDC isolation.
C-DR	Cooling for Driver: Extra cooling for the driver and control electronics. Recommended in combination with option HFS at higher switching frequencies. (2)
GCF	Grounded Cooling Flange: Nickel-plated copper flange for medium power. Max. isolation voltage 40kV. Increased coupling capacitance C_c .
GCF-X2	Grounded Cooling Flange, Max. Continuous Power Dissipation increased by x2: Thermal resistance "Switch to Flange" reduced for twice the power capability. (2)
ILC	Indirect Liquid Cooling: Liquid cooling for all kind of conductive coolants incl. water. Internal heat exchanger made of ceramics. For medium power dissipation.
DLC	Direct Liquid Cooling: Internal cooling channels around the power semiconductors. The most efficient cooling for high frequency applications. Non-conductive coolants only.
HI-REL	High Reliability / MIL Versions: Available on request. (2)

(1) New option code: Data sheets may differ from this coding system (especially older ones) and do not indicate all possible options as per above table. (2) Please consult factory for detailed information.
(3) These options are EMC-relevant and are recommended for industrial power applications, difficult noise ambients, prototype experiments with flying leads and for users without special EMC design experience.

Further information, data sheets and drawings are available on request. All data and specifications subject to change without notice.

REV 20-MAY-2016

BEHLKE Product Lines

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