C6 HV switch with variable on-time, general purpose, IGBT

● Versatile HV switch with true relay character ● On-time controllable by TTL signal ● Low turn-on losses ● Very high peak current capability ● Current rise time 4ns ~ 150 ns (depending on current)

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 31-480-SI: HTS = HV Transistor Switch, 3 = 3 kV, 1 = variable on-time, 480 = 4800 Ampere, SI = Standard IGBT

Model [sorted by dimensions]	**Description / Comment** ● Preferred stock type ○ Limited stock X Not for new development		**Dimensions** [mm³]	**Voltage** [kV]	**Pk. Current** [A]	**Sat. Voltage** [V] @ 0.1I(pmax)	**On-Time** [µs]
HTS 31-480-SI	●	Standard IGBT	200 x 76 x 25	3	4800	9	1 µs…∞
HTS 51-240-SI	●	Standard IGBT	200 x 76 x 25	5	2400	15	1 µs…∞
HTS 61-240-SI	●	Standard IGBT	200 x 76 x 25	6	2400	18	1 µs…∞
HTS 31-320-FI	●	Fast IGBT	200 x 76 x 25	3	3200	13	0.2 µs…∞
HTS 51-160-FI	●	Fast IGBT	200 x 76 x 25	5	1600	27	0.2 µs…∞
HTS 61-160-FI	●	Fast IGBT	200 x 76 x 25	6	1600	22	0.2 µs…∞
HTS 101-120-SI	●	Standard IGBT	153 x 102 x 25	10	1200	30	1µs…∞
HTS 101-80-FI	●	Fast IGBT	153 x 102 x 25	10	800	44	0.2 µs…∞
HTS 31-960-SI	●	Standard IGBT	252 x 200 x 45	3	9600	9	1 µs…∞
HTS 61-480-SI	●	Standard IGBT	252 x 200 x 45	6	4800	18	1 µs…∞
HTS 31-640-FI	●	Fast IGBT	252 x 200 x 45	3	6400	13	0.2 µs…∞
HTS 61-320-FI	●	Fast IGBT	252 x 200 x 45	6	3200	22	0.2 µs…∞
HTS 121-240-SI	●	Standard IGBT	252 x 200 x 45	12	2400	36	1 µs…∞
HTS 121-160-FI	●	Fast IGBT	252 x 200 x 45	12	1600	44	0.2 µs…∞
HTS 91-480-SI	●	Standard IGBT	312 x 200 x 45	9	4800	27	1 µs…∞
HTS 181-240-SI	●	Standard IGBT	312 x 200 x 45	18	2400	54	1 µs…∞
HTS 91-320-FI	●	Fast IGBT	312 x 200 x 45	9	3200	39	0.2 µs…∞
HTS 181-160-FI	●	Fast IGBT	312 x 200 x 45	18	1600	66	0.2 µs…∞
HTS 181-400-FI	-	On request. Sync. I/O. Modular design, separate control part	372 x 250 x 45	18	4000		0.3 µs…∞
HTS 361-200-FI	-	On request. Sync. I/O. Modular design, separate control part	372 x 250 x 45	36	2000		0.3 µs…∞

Options (1)

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 µs 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)
MIN-ON	**Minimum On-Time:** Individually increased Minimum On-Time to ensure a minimum on duration indepently of control signal. For safety relevant circuits.
MIN-OFF	**Minimum Off-Time:** Individually increased Minimum Off-Time to ensure a minimum off duration indepently of control signal. For safety relevant circuits.
ST	**Stage Tapping:** Connectors at the individual stages of stack in order to utilize single power semiconductors. To achieve fast rise times also at very low operating voltages (<0.01xVo).
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 ($Pc= V^2 \times C \times f$).
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.
PL	**Passive Lock:** Special inhibit function for two single switches in fast push-pull circuits. The input of the passive switch will be locked by the activated switch to avoid turn-on by noise.
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)
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=100Ω. 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 PCB connector. This option is only relevant for switching modules with pins. Recommended for modules with options CF & GCF.
PIN-C	**Pins for Control Connection:** Gold plated pins for printed circuit board designs (special sockets available). This option is only relevant for switching modules which have pigtails as standard.
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 recommended in extremely fast circuits.
ST-HV	**Screw Terminals for HV Connection:** Threaded inserts at the bottom of module (if not standard). For PCB design. Operation above 25 kV requires liquid insulation (Galden®/Oil) or potting.
UL94	**Flame Retardant Casting Resin:** Casting resin according to UL-94-VO. Minimum order quantity required. (2)
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	**Non-Isolated Cooling Fins:** Standard sizes in categories I to VII according to model. Nickel plated copper 0.5 mm, fin height 35 mm. For air and oil cooling.
CF-1	**Non-Isolated Cooling Fins d=1mm:** Nickel plated copper 1.0 mm instead of 0.5 mm. The Max. Power Dissipation will be increased by ~80 %. For air and oil cooling.
CF-X2	**Non-Isolated Cooling Fins enlarged by x2:** Fin area enlarged by factor 2. Not relevant in connection with liquid cooling.
CF-CS	**Non-Isolated Cooling Fins with customized shape:** Individual shape to meet specific OEM requirements. (2)

CF-LC	**Non-isolated Cooling Fins optimized for liquid cooling:** Double fins, nickel plated copper, 0.5 mm thickness, height 20 mm.
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, height 35 mm.
CCS	**Ceramic Cooling Surface.** Top side of switching module made of special ceramics. Heat transfer properties similar to alumina. Forced convection recommended.
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 CC.
ILC	I**ndirect 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 arround 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.

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