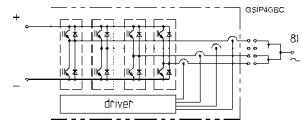
SKiiP 1242 GB 120 - 407 CTV

Absolute Maximum Ratings Symbol	Conditions [1]	Values	Units
IGBT & Inverse Diode			
V_{CES}		1200	V
V_{CC} [9]	Operating DC link voltage	900	V
I_C	$T_{heatsink}$ = 25 °C	1200	A
T_j [3]	IGBT & Diode	– 40 ... + 150	°C
V_{isol} [4]	AC, 1 min.	3000 [5]	V
I_F	$T_{heatsink}$ = 25 °C	1200	A
I_{FM}	$T_{heatsink}$ = 25 °C; t_p < 1 ms	2400	A
I_{FSM}	t_p = 10 ms; sin.; T_j = 150 °C	8600	A
I^2t (Diode)	t_p = 10 ms; T_j = 150 °C	374	kA^2s

Characteristics Symbol	Conditions [1]	min.	typ.	max.	Units
$V_{(BR)CES}$	Driver without power supply	≥ V_{CES}	–	–	V
I_{CES}	V_{GE} = 0; T_j = 25 °C	–	1,2	–	mA
	V_{CE} = V_{CES}; T_j = 125 °C	–	60	–	mA
V_{CEsat}	I_C = 900 A; T_j = 25 (125) °C	–	2,6(3)	–	V
V_{CEsat}	I_C = 1200 A; T_j = 25 (125) °C	–	3(3,6)	–	V
C_{CHC}	per SKiiPPACK AC side	–	3,2	–	nF
L_{CE}	Top (Bottom)	–	4	–	nH
$t_{d(on)}$	I_C = 1200 A; T_j = 125 °C; V_{CC} = 600 V; inductive load	–	150	–	ns
$t_{d(on)Driver}$		–	1,0	–	µs
t_r		–	100	–	ns
$t_{d(off)}$		–	0,6	–	µs
$t_{d(off)Driver}$		–	1,0	–	µs
t_f		–	80	–	ns
E_{on} + E_{off}	V_{CC} = 600 V / 900 V	–	360/588	–	mJ
Inverse Diode [2]					
V_F = V_{EC}	I_F = 900 A; T_j = 25 (125) °C	–	1,9(1,8)	–	V
	I_F = 1200 A; T_j = 25 (125) °C	–	2,1(2,05)	–	V
E_{on} + E_{off}	I_F = 1200 A; T_j =125 °C	–	48	–	mJ
IGBT / Inverse Diode [2]					
V_{TO}	T_j = 125 °C	–	1,4 / 0,9	–	V
r_T	T_j = 125 °C	–	1,8 / 1	–	mΩ
Thermal Characteristics					
R_{thjh}	per IGBT	–	0,023	–	K/W
R_{thjh}	per diode	–	0,06	–	K/W
T_{tp} [12]	Over temperature protection	110	115	120	°C
R_{thha} [6]	P16/360 F; v_{air} = 279 m^3 / h	–	0,033	–	K/W
SKiiPPACK protection					
I_{TRIPSC}	Short circuit protection	1470	1500	1530	A
T_{TRIP}	Overtemperature protection	110	115	120	°C
U_{DCTRIP} [13]	U_{DC}-protection	900	820	940	V
Mechanical Data					
Mdc	for DC terminals, SI Units	4	–	6	Nm
Mac	for AC terminals, SI Units	8	–	10	Nm
Case			S4		

SKiiPPACK®
SK integrated intelligent Power PACK halfbridge
SKiiP 1242 GB 120 + Driver 407 CTV [7,13)
Preliminary Data

Case S4

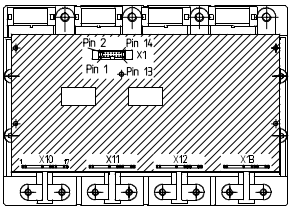


Features

- Low thermal impedance
- Optimal thermal management with integrated heatsink
- Pressure contact technology with increased power cycling capability, compact design
- Low stray inductance
- High power, small losses
- Overtemp. protection
- Short circuit protection, due to evalutation of current sensor signals
- Isolated power supply

1) $T_{heatsink}$ = 25 °C, unless otherwise specified
2) CAL = Controlled Axial Lifetime Technology (soft and fast)
3) without driver
4) Driver input to DC link/AC output or DC link/AC output to heatsink
5) 4 kV (AC; on request)
6) other heatsink on request
7) C - integrated current sensors
T - Temperature protection
V - 15 V or 24 V power supply
8) AC connection busbars must be connected by user, copper busbars available on request
9) with SK-DC link (low inductance)
12) thermal reference for R_{thjh}; R_{thha}
13) options available for driver
U - DC-link voltage sense
F - Fiber optic connector

SKiiPPACK®
SK integrated intelligent Power PACK halfbridge
SKiiP 1242 GB 120 + Driver 407 CTV [3,5)]
Preliminary Driver Data



Features

- CMOS compatible inputs
- Short circuit protection by evaluation of current sensor signals
- Drive interlock top/bottom
- Isolation by transformers
- Supply undervoltage protection
- Overtemperature protection
- Fiber optic connector (option)
- U_{DC}-monitoring (option)

1) 24 V - power supply
2) Open collector output, external pull-up resistor necessary
3) C - integrated current sensors
T - Temperature protection
V - 15 V or 24 V power supply
4) 4 kV_{AC} (on request)
5) options available for driver
U - DC-link voltage sense
F - Fiber optic connectors
6) I_{AC} - AC-current per phase

SKiiP 1242 GB 120 - 407 CTV
Driver for Halfbridge

Absolute Maximum Ratings

Symbol	Conditions	Values	Units	remark
V_{S1}	supply voltage primary	18	V	pin 8 / 9
V_{S2} [1)]	supply voltage primary	30	V	pin 6 / 7
I_{outmax}	output peak current max.	± 10	A	
I_{outAV}	output average current	± 100	mA	
f_{swmax}	switching frequency max.	12	kHz	
dv/dt	rate of rise and fall of voltage (secondary to primary side)	75	kV/µs	
$V_{isol\ IO}$ [4)]	Isol. test volt. IN/OUT (RMS; 1 min)	3	kV~	
$V_{isol\ 12}$	Isol. test volt. output 1 - output 2	1,5	kV=	
T_{op}, T_{stg}	operating / stor. temperature	– 25 ... + 85	°C	

Characteristics (Ta = 25 °C)

Symbol	Conditions	Values	Units	remark
V_{S1}	supply voltage primary	15,0 ± 4 %	V	pin 8 / 9
V_{S2} [1)]	supply voltage primary	24,0 +25%/-15%	V	pin 6 / 7
V_{UVS}	supply voltage monitoring	13 / 19,5	V	15 V / 24 V
I_{S01}	sup.current pr.side (standby)	290	mA	15 V supply
I_{S02} [1)]	sup.current pr.side (standby)	220	mA	24 V supply
I_{S1}	sup. current pr.side (max) at f_{swmax}	750 + $\frac{1{,}3 \cdot I_{AC}}{1000}$ [6)]	mA	15 V supply
I_{S2} [1)]	sup. current pr.side (max) at fswmax	560 + $\frac{1{,}3 \cdot I_{AC}}{1350}$ [6)]	mA	24 V supply
V_{iT+}	input thresh. volt. (high) min	12,9	V	
V_{iT-}	input thresh. volt. (low) max.	2,1	V	
$V_{GE(on)}$	turn-on output gate voltage	15	V	
$V_{GE(off)}$	turn-off output gate voltage	– 8	V	
$t_{d(on)}$	propagation delay time on	1,0	µs	typ.
$t_{d(off)}$	propagation delay time off	1,0	µs	typ.
t_{TD}	dead time of interlock	3	µs	typ.
V_{ol} [2)]	logic low output voltage	< 600	mV	15 mA
V_{oH} [2)]	logic high output voltage	max. 30	V	
$t_{pdon\text{-}error}$	propag. delay time-on error	1	µs	typ.
$t_{p\ RESET}$	min. pulse width error memory RESET	5	µs	
T_{TRIP}	max. temperature	115 ± 5	°C	
I_{AOmax}	max. output current	± 5	mA	pin 12/14
$U_{ITRIPSC}$	overcurrent trip level	10	V	10 V=125% I_C
U_{DCTRIP}	overvoltage trip level	9	V	9 V = 900 V; using option "U"

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