SKiiP 1092 GB 170 - 470 WT/FT

Absolute Maximum Ratings

Symbol	Conditions [1]	Values	Units
IGBT & Inverse Diode			
V_{CES}		1700	V
V_{CC} [9]	Operating DC link voltage	1200	V
I_C	$T_{heatsink}$ = 25 °C	1000	A
I_{CM}	$T_{heatsink}$ = 25 °C; t_p < 1 ms	2000	A
T_j [3]	IGBT & Diode	– 55 . . .+ 150	°C
V_{isol} [4]	AC, 1 min.	4000	V
I_F= – I_C	$T_{heatsink}$ = 25 °C	830	A
I_{FM}	$T_{heatsink}$ = 25 °C; t_p < 1 ms	2000	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
Driver			
V_{S1}	Stabilized power supply	18	V
V_{S2} [10]	Nonstabilized power supply	30	V
dv/dt	Primary to second. side	75	kV/µs
T_{op}, T_{stg}	Operating / stor. temperature (version FT)	– 25(0) . . .+ 85(70)	°C

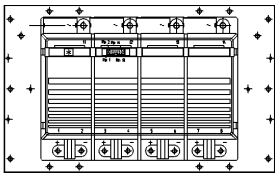
Characteristics

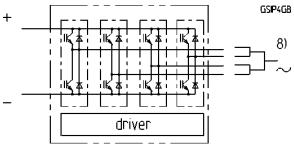
Symbol	Conditions [1]	min.	typ.	max.	Units
$V_{(BR)CES}$	Driver without power supply	≥ V_{CES}	–	–	V
I_{CES}	V_{GE} = 0, T_j = 25 °C	–	1,6	–	mA
	V_{CE} = V_{CES}, T_j = 125 °C	–	60	–	mA
V_{CEsat} [11]	I_C = 750A, T_j = 25 (125) °C	–	3,3 (4,6)	–	V
V_{CEsat} [11]	I_C = 1000A, T_j = 25 (125) °C	–	3,75 (5,65)	–	V
I_{CETRIP}	T_j = 125 °C; V_s = 15 V ± 0,6V	≥ 1250	–	–	A
C_{CHC}	per SKiiPPACK AC side	–	3,2	–	nF
L_{CE}	Top (Bottom)	–	4	–	nH
$t_{d(on)}$	V_{CC} = 1200 V	–	200	–	ns
$t_{d(on)Driver}$	I_C = 1000 A		1,2	–	µs
t_r	T_j = 125 °C	–	300	–	ns
$t_{d(off)}$	inductive load	–	2	–	µs
$t_{d(off)Driver}$		–	1,2	–	µs
t_f		–	120	–	ns
E_{on} + E_{off}		–	1300	–	mJ
Inverse Diode [2]					
V_F [11]=V_{EC}	I_F = 900A, T_j = 25 (125) °C	–	2,3 (2,1)	–	V
	I_F = 1200A, T_j = 25 (125) °C	–	2,6 (2,5)	–	V
V_{TO}	T_j = 125 °C	–	0,9	–	V
r_T	T_j = 125 °C	–	1,33	–	mΩ
E_{on} + E_{off}	I_F = 1000 A;T_j =125 °C	–	120	–	mJ
Thermal Characteristics					
R_{thjh}	per IGBT	–	0,020	–	K/W
R_{thjh}	per diode	–	0,07	–	K/W
T_{tp} [12]	Over temperature protection	109	115	121	°C
R_{thha} [6]	P16/360 F; v_{air} = 279 m^3 / h	–	0,033	–	K/W
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 1092 GB 170 + Driver 470 WT/FT [7]

Preliminary Data

Case S4





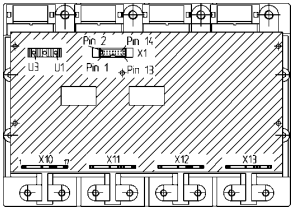
Features

- 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
- 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
6) other heatsink on request
7) W - Driver wire input
F - Fiber optic input
T - Temperature protection
8) AC connection busbars must be connected by user, copper bus-bars available on request
9) with SK-DC link (low inductance)
10) 24 V supply voltage
11) Chip voltage drop
12) thermal refernce for R_{thjh}; R_{thha}

SKiiPPACK®
SK integrated intelligent Power PACK
halfbridge
SKiiP 1092 GB 170 + Driver 470 WT/FT [3)]

Preliminary Data



Features

- CMOS compatible inputs
- Short circuit protection by V_{CE} monitoring and soft switch off
- Drive interlock top/bottom
- Isolation by transformers
- Supply undervoltage protection
- Overtemperature protection
- Fiber-optic connection

[1)] 24 V - supply voltage selective
[2)] Open collector output, external pull-up resistor necessary
[3)] W - Driver wire input
F - Fiber optic input
T - Temperature protection

SKiiP 1092 GB 170 - 470 WT/FT
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.	7	kHz	
V_{CE}	collector emitter voltage sense across IGBT	1700	V	
dv/dt	rate of rise and fall of voltage (secondary to primary side)	75	kV/µs	
$V_{isol\ IO}$	Isol. test volt. IN/OUT (RMS; 1 min)	4	kV~	
$V_{isol\ 12}$	Isol. test volt. output 1 - output 2	1,7	kV=	
T_{op}, T_{stg}	operating / stor. temperature	–25...+85	℃	WT-version
T_{op}, T_{stg}	operating / stor. temperature	0...+70	℃	FT-version

Characteristics

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)	200	mA	15 V supply
I_{S02} [1)]	sup. current pr.side (standby)	160	mA	24 V supply
I_{S1}	sup. current pr.side (max)	680	mA	15 V supply
I_{S2} [1)]	sup. current pr.side (max)	530	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	1,2	µs	typ.
$t_{d(off)}$	propagation delay time off	1,2	µs	typ.
t_{TD}	dead time of interlock	3	µs	typ.
V_{CEstat}	V_{CE}-thresh. st. monitoring	6,5	V	typ.
V_{ol} [2)]	logic low output voltage	< 500	mV	15 mA
V_{oH} [2)]	logic high output voltage	max. 30	V	
$t_{pdon-error}$	propag. delay time-on error	6	µs	typ.
$t_{p\ RESET}$	min. pulse width error memory RESET	5	µs	
T_{err}	max. temperature	115 ± 6	℃	
I_{AOmax}	max. output current	± 5	mA	pin 12