SKiiP 362 GDL 060 - 453 WT [12)]

Absolute Maximum Ratings

Symbol	Conditions [1)]	Values	Units
IGBT & Inverse Diode			
V_{CES}		600	V
V_{CC} [10)]	Operating DC link voltage	400	V
I_C	$T_{heatsink}$ = 25 °C	300	A
I_{CM}	$T_{heatsink}$ = 25 °C, t_p < 1 ms	600	A
T_j [3)]	IGBT & Diode	– 40 ... + 150	°C
V_{isol} [4)]	AC, 1 min.	2500	V
I_F	$T_{heatsink}$ = 25 °C	300	A
I_{FM}	$T_{heatsink}$ = 25 °C; t_p < 1 ms	600	A
I_{FSM}	t_p = 10 ms; sin.; T_j = 150 °C	2160	A
I^2t (Diode)	t_p = 10 ms; T_j = 150 °C	23,4	kA^2s
Driver			
V_{S1}	Stabilized power supply	18	V
V_{S2} [9)]	Nonstabilized power supply	30	V
dv/dt	Primary to second. side	75	kV/µs
T_{op}, T_{stg}	Operating / stor. temperature	– 25 ... + 85	°C

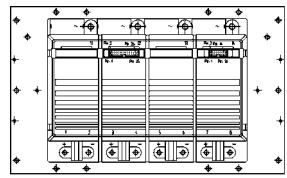
Characteristics

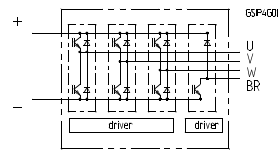
Symbol	Conditions [1)]	min.	typ.	max.	Units
$V_{(BR)CES}$	Driver without power supply	≥ V_{CES}	–	–	V
I_{CES}	V_{GE} = 0, T_j = 25 °C	–	0,3	–	mA
	V_{CE} = V_{CES}, T_j = 125 °C	–	6	–	mA
V_{CEsat}	I_C = 225 A, T_j = 25 (125) °C	–	2,1(2,0)	–	V
V_{CEsat}	I_C = 300 A, T_j = 25 (125) °C	–	2,3(2,4)	–	V
I_{CETRIP}	T_j = 125 °C, V_s = 15 V ± 0,6 V	≥ 375	–	–	A
C_{CHC}	per SKiiPPACK AC side	–	0,8	–	nF
L_{CE}	Top (Bottom)	–	15	–	nH
$t_{d(on)}$		–	120	–	ns
$t_{d(on)Driver}$	I_C = 300 A	–	1,2	–	µs
t_r	T_j = 125 °C, V_{CC} =	–	200	–	ns
$t_{d(off)}$	inductive load 300 V	–	0,4	–	µs
$t_{d(off)Driver}$		–	1,2	–	µs
t_f		–	850	–	ns
E_{on} + E_{off}	V_{CC} = 300 / 400 V	–	50/70	–	mJ
Inverse Diode [2)]					
V_F = V_{EC}	I_F = 225 A, T_j = 25 (125) °C	–	1,5(1,5)	–	V
	I_F = 300 A, T_j = 25 (125) °C	–	1,7(1,7)	–	V
E_{on} + E_{off}	I_F = 300 A; T_j = 125 °C	–	9	–	mJ
IGBT / Inverse Diode [2)]					
V_{TO}	T_j = 125 °C	–	0,9/0,74	–	V
r_T	T_j = 125 °C	–	5,1/3,3	–	mΩ
Diode [2)] **- brake chopper (BC)**					
V_F = V_{EC}	I_F = 225 A, T_j = 25 (125) °C	–	1,5(1,5)	–	V
	I_F = 300 A, T_j = 25 (125) °C	–	1,7(1,7)	–	V
V_{TO}	T_j = 125 °C	–	0,74	–	V
r_T	T_j = 125 °C	–	3,3	–	mΩ
Thermal Characteristics					
R_{thjh}	per IGBT	–	0,16	–	K/W
R_{thjh}	per diode inverter (BC)	–	0,27(0,27)	–	K/W
T_{tp} [11)]	Over temperature protection	109	115	121	°C
R_{thha} [6)]	P16/280 / P16/360 [6)]	–	0,036	–	K/W
Mechanical Data					
Mdc	for DC terminals, SI Units	4	–	6	Nm
Mac	for AC terminals, SI Units	8	–	10	Nm
Case			S5		

SKiiPPACK®
SK integrated intelligent Power PACK
3-phase bridge with brake chopper
SKiiP 362 GDL 060 + Driver 453 WT [7)]

Preliminary Data

Case S5



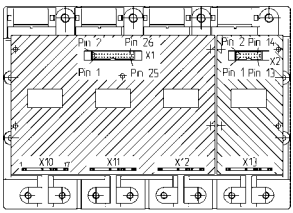


Features

- 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) inverter (other heatsink on request) SKiiPPACK type GD/GDL
7) W - Driver wire input
T - Temperature protection
9) 24 V supply voltage selective
10) with SK-DC link (low inductance)
11) thermal reference for R_{thjh}; R_{thha}
12) data for SKiiP362GD060-352WT (IGBT, Inverse diode) identical

SKiiPPACK®
SK integrated intelligent Power PACK
3-phase bridge with brake chopper
SKiiP 362 GDL 060 + Driver 453 WT [3]
Preliminary Driver Data



SKiiP 362 GDL 060 - 453 WT
Driver for 3-phase bridge and brake chopper

Absolute Maximum Ratings		3-phase bridge [4]	brake chopper		
Symbol	**Conditions**	**Values**		**Units**	**remark**
V_{S1}	supply voltage primary	18		V	
V_{S2} [1]	supply voltage primary	30		V	
I_{outmax}	output peak current max.	± 10	± 1,5	A	
I_{outAV}	output average current	± 50	± 90	mA	
f_{swmax}	switching frequency max.	12	5	kHz	
V_{CE}	collector emitter voltage sense across IGBT	600			
dv/dt	rate of rise and fall of voltage (secondary to primary side)	75	50	kV/µs	
$V_{isol\ IO}$	Isol. test volt. IN/OUT (RMS; 1 min)	2,5		kV~	
$V_{isol\ 12}$	Isol. test volt. OUT1-OUT2	1,5		kV=	
T_{op}, T_{stg}	operating / stor. temperature	– 25 ... + 85		°C	

Characteristics					
Symbol	**Conditions**	**Values**		**Units**	**remark**
V_{S1}	supply voltage primary	15,0 ± 4 %		V	
V_{S2} [1]	supply voltage primary	24,0		V	+25%/-15%
V_{UVS}	supply undervolt. monitoring	13		V	
V_{UVS} [1]	supply undervolt. monitoring	19,5	16	V	
I_{S01}	sup.current pr.side (standby)	380	67	mA	
I_{S02} [1]	sup.current pr.side (standby)	300	67	mA	
I_{S1}	sup. current pr.side (max)	900	77	mA	
I_{S2} [1]	sup. current pr.side (max)	700	77	mA	
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	0	V	
$t_{d(on)}$	propagation delay time on	1,2	< 20	µs	typ.
$t_{d(off)}$	propagation delay time off	1,2	< 25	µs	typ.
t_{TD}	dead time of interlock	3		µs	typ.
V_{CEstat}	VCE-thresh. st. monitoring	3,2		V	typ.
V_{OL} [2]	logic low output voltage	< 0,6			15 mA sink
			< 0,6		2,5mA sink
V_{oH} [2]	logic high output voltage	max. 30		V	
$V_{RESET\ L}$	Input voltage RESET Low		< 2	V	
$V_{RESET\ H}$	Input voltage RESET High		> 12	V	
V_{iL}	logic low input volt. Chop. ext. ON		< 5	V	> 5 mA
V_{iH}	logic high input volt.Chop. ext. ON		> 11,5	V	< 1 mA
$t_{pdon\text{-}error}$	propag. delay time-on error	6	< 60	µs	
$t_{p\ RESET}$	min. pulse width error memory RESET	5	300	µs ms	
T_{err}	max. temperature	115 ± 6		°C	
I_{AOmax}	max. output current	± 5		mA	pin 20

Features
3-phase bridge
- 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

Features
brake chopper
- Short circuit protection by V_{CE} monitoring and soft switch off
- Self controlled switching
- Supply undervoltage protection
- Overtemperature protection

1) 24 V - supply voltage selective
2) Open collector output, external pull-up resistor necessary
3) W - Driver wire input
   T - Temperature protection
4) Driver data also valid for SKiiP 362GD060 - 352 WT