

SKiiP 232 GD 120 - 313 CTV

Absolute Maximum Ratings		Values	Units
Symbol	Conditions ¹⁾		
IGBT & Inverse Diode			
V _{CES}		1200	V
V _{CC} ⁹⁾	Operating DC link voltage	900	V
I _C	T _{heatsink} = 25 °C	200	A
T _J ³⁾	IGBT & Diode	- 40 ... + 150	°C
V _{isol} ⁴⁾	AC, 1 min.	3000 ⁵⁾	V
I _F	T _{heatsink} = 25 °C	200	A
I _{FM}	T _{heatsink} = 25 °C; t _p < 1 ms	400	A
I _{FSM}	t _p = 10 ms; sin.; T _J = 150 °C	1450	A
t _{2t} (Diode)	t _p = 10 ms; T _J = 150 °C	10,5	kA ² s

Characteristics		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
V _{(BR)CES}	Driver without power supply	≥ V _{CES}	-	-	V
I _{CES}	V _{GE} = 0 } T _J = 25 °C V _{CE} = V _{CES} } T _J = 125 °C	-	0,3	-	mA
V _{CEsat}	I _C = 150 A } T _J = 25 (125) °C	-	2,5(3)	-	V
V _{CEsat}	I _C = 200 A } T _J = 25 (125) °C	-	2,9(3,5)	-	V
C _{CHC}	per SKiiPPACK AC side	-	0,8	-	nF
L _{CE}	Top (Bottom)	-	15	-	nH
t _{d(on)}	I _C = 200 A } V _{CC} = T _J = 125 °C } 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	-	60 / 98	-	mJ
Inverse Diode ²⁾					
V _F = V _{EC}	I _F = 150 A } T _J = 25 (125) °C	-	1,9(1,8)	-	V
	I _F = 200 A } T _J = 25 (125) °C	-	2,1(2,05)	-	V
E _{on} + E _{off}		-	8	-	mJ
IGBT / Inverse Diode ²⁾					
V _{TO}	T _J = 125 °C	-	1,4 / 0,9	-	V
r _T	T _J = 125 °C	-	11 / 6	-	mΩ
Thermal Characteristics					
R _{thjh}	per IGBT	-	0,13	-	K/W
R _{thjd}	per diode	-	0,35	-	K/W
T _{tip} ¹²⁾	Over temperature protection	110	115	120	°C
R _{thha} ⁶⁾	P16/280 F; V _{air} = 285 m ³ / h	-	0,036	-	K/W
SKiiPPACK protection					
I _{TRIPSC}	Short circuit protection	245	250	255	A
I _{TRIPLG}	Ground fault protection	-	60	-	A
T _{TRIP}	Overtemperature protection	110	115	120	°C
U _{DCTRIP} ¹³⁾	U _{DC} -protection	900	920	940	V
Mechanical Data					
M _{dc}	for DC terminals, SI Units	4	-	6	Nm
M _{ac}	for AC terminals, SI Units	8	-	10	Nm
Case			S3		

SKiiPPACK® SK integrated intelligent Power PACK

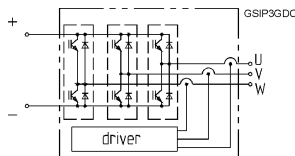
3-phase bridge

SKiiP 232 GD 120

+ Driver 313 CTV ^{7,13)}

Preliminary Data

Case S3



Features

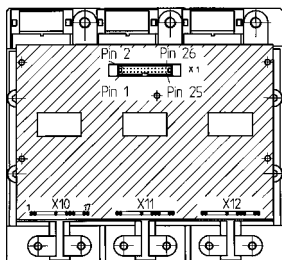
- Low thermal impedance
- Optimal thermal management with integrated heatsink
- Pressure contact technology with increased power cycling capability, compact design
- Low stray inductance
- High power, small losses
- Overtemp. protection
- Short circuit protection, due to evaluation of current sensor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

- ¹⁾ T_{heatsink} = 25 °C, unless otherwise specified
- ²⁾ CAL = Controlled Axial Lifetime Technology (soft and fast) without driver
- 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
U - DC-link voltage sense
- ⁹⁾ with SK-DC link (low inductance)
- ¹²⁾ thermal reference for R_{thjh}; R_{thha}
- ¹³⁾ option available for driver

SKiiPPACK®
SK integrated
intelligent Power PACK

3-phase bridge

SKiiP 232 GD 120
+ Driver 313 CTV^{3,5}
Preliminary Driver Data



SKiiP 232 GD 120 - 313 CTV
Driver for 3-phase bridge

Absolute Maximum Ratings				
Symbol	Conditions	Values	Units	remark
V_{S1}	supply voltage primary	18	V	pin 16 / 17
$V_{S2}^{1)}$	supply voltage primary	30	V	pin 14 / 15
I_{outmax}	output peak current max.	± 10	A	
I_{outAV}	output average current	± 50	mA	
f_{swmax}	switching frequency max.	20	kHz	
dv/dt	rate of rise and fall of voltage (secondary to primary side)	75	kV/ μ s	
$V_{isol IO}^{4)}$	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	$15,0 \pm 4\%$	V	pin 16 / 17
$V_{S2}^{1)}$	supply voltage primary	24,0 +25%/-15%	V	pin 14 / 15
V_{UVS}	supply voltage monitoring	13,5 / 19,5	V	15 V / 24 V
I_{S01}	sup.current pr.side (standby)	340	mA	15 V supply
$I_{S02}^{1)}$	sup.current pr.side (standby)	250	mA	24 V supply
I_{S1}	sup. current pr.side (max) at f_{swmax}	700 + $3 \cdot I_{AC}^{6)}$ 1000	mA	15 V supply
$I_{S2}^{1)}$	sup. current pr.side (max) at f_{swmax}	510 + $3 \cdot I_{AC}^{6)}$ 1350	mA	24 V supply
V_{IT+}	input thresh. volt. (high) min	11,2	V	
V_{IT-}	input thresh. volt. (low) max.	5,4	V	
$V_{GE(on)}$	turn-on output gate voltage	15	V	
$V_{GE(off)}$	turn-off output gate voltage	-7	V	
$t_{d(on)}$	propagation delay time on	1,0	μ s	typ.
$t_{d(off)}$	propagation delay time off	1,0	μ s	typ.
t_{TD}	dead time of interlock	2,2	μ s	typ.
$V_{ol}^{2)}$	logic low output voltage	< 600	mV	15 mA
$V_{oH}^{2)}$	logic high output voltage	max. 30	V	
$t_{pdon-error}$	propag. delay time-on error	1	μ s	typ.
$t_{p RESET}$	min. pulse width error memory RESET	8	μ s	
T_{TRIP}	max. temperature	$115 \pm 5-$	°C	
I_{AOmax}	max. output current	± 5	mA	pin 13/20/22/24/26
$U_{ITRIPSC}$	overcurrent trip level	10	V	10 V = 125% I_C
U_{DCTRIP}	overvoltage trip level	9	V	9 V = 900 V; using option "U"

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
- 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 kV_{AC} (on request)
- 4) 4 kV_{AC} (on request)
- 5) option available for driver
U - DC-link voltage sense
- 6) I_{AC} - AC-current per phase