

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
I _T ² (Diode)	t _n = 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	$\geq V_{CES}$	—	—	V
I_{CES}	$V_{GE} = 0$ } $T_J = 25^\circ\text{C}$ $V_{CE} = V_{CES}$ } $T_J = 125^\circ\text{C}$	—	0,3	—	mA
V_{CESat}	$I_C = 150\text{ A}$ } $T_J = 25 (125)^\circ\text{C}$	—	2,5(3)	—	V
V_{CESat}	$I_C = 200\text{ A}$ } $T_J = 25 (125)^\circ\text{C}$	—	2,9(3,5)	—	V
C_{CHC}	per SKiiPPACK AC side	—	0,8	—	nF
L_{CE}	Top (Bottom)	—	15	—	nH
$t_{d(on)}$	$I_C = 200\text{ A}$ $T_J = 125^\circ\text{C}$ inductive load } $V_{CC} = 600\text{ V}$	—	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
$E_{on} + E_{off}$	$V_{CC} = 600\text{ V} / 900\text{ V}$	—	60 / 98	—	mJ
Inverse Diode ²⁾					
$V_F = V_{EC}$	$I_F = 150\text{ A}$ } $T_J = 25 (125)^\circ\text{C}$ $I_F = 200\text{ A}$ } $T_J = 25 (125)^\circ\text{C}$	—	1,9(1,8)	—	V
		—	2,1(2,05)	—	V
$E_{on} + E_{off}$		—	8	—	mJ
IGBT / Inverse Diode ²⁾					
V_{TO}	$T_J = 125^\circ\text{C}$	—	1,4 / 0,9	—	V
r_T	$T_J = 125^\circ\text{C}$	—	11 / 6	—	$\text{m}\Omega$
Thermal Characteristics					
R_{thjh}	per IGBT	—	0,13	—	K/W
R_{thjd}	per diode	—	0,35	—	K/W
T_{ip} ¹²⁾	Over temperature protection	110	115	120	$^\circ\text{C}$
R_{thha} ⁶⁾	P16/280 F; $v_{\text{air}} = 285\text{ m}^3/\text{h}$	—	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	$^\circ\text{C}$
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

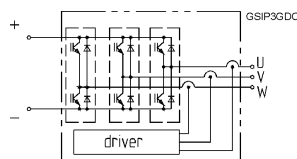
3-phase bridge

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

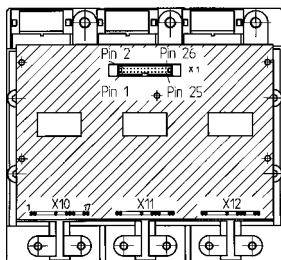
- ¹⁾ $T_{\text{heatsink}} = 25^\circ\text{C}$, unless otherwise specified
- ²⁾ CAL = Controlled Axial Lifetime Technology (soft and fast)
- ³⁾ without driver
- ⁴⁾ Driver input to DC link/AC output or DC link/AC output to heatsink
- ⁵⁾ 4 kV (AC; on request)
- ⁶⁾ other heatsink on request
- ⁷⁾ C - integrated current sensors
T - Temperature protection
V - 15 V or 24 V power supply with SK-DC link (low inductance)
- ⁹⁾ thermal reference for R_{thjh} ; R_{thha}
- ¹²⁾ option available for driver
- ¹³⁾ U - DC-link voltage sense

SKiIPACK®
SK integrated
intelligent Power PACK

3-phase bridge

SKiIP 232 GD 120
+ Driver 313 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
- 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) option available for driver
U - DC-link voltage sense
I_{AC} - AC-current per phase

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/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 (T _a = 25 °C)				
Symbol	Conditions	Values	Units	remark
V _{S1}	supply voltage primary	15,0 ± 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	μs	typ.
t _{d(off)}	propagation delay time off	1,0	μs	typ.
t _{TD}	dead time of interlock	2,2	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-error}	propag. delay time-on error	1	μs	typ.
t _{p RESET}	min. pulse width error memory RESET	8	μs	
T _{TRIP}	max. temperature	115 ± 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"