

# SEMISTACK - SKAI



SKAI Solutions

## 1200V IGBT Advanced Drive System

**SKAI 3001GD12 1452 W**  
**SemiKron Advanced Integration (SKAI) module**  
**Liquid-cooled version**  
 Preliminary Data

### Features

- 1200V Trench IGBT technology on AIN DCB substrate
- Integrated DC-link film capacitor
- Pressure contact technology for improved power cycling performance
- Optimal thermal management with integrated liquid-cooled heatsink
- Two integrated current sensors with option to include three
- Integrated gate drive and power supply with under-voltage protection. 25-pin DB connector is standard on driver only versions
- Option to include an integrated controller based on TMS320LF2407ADSP. 14-pin AMP SEAL connector is standard on controller versions.

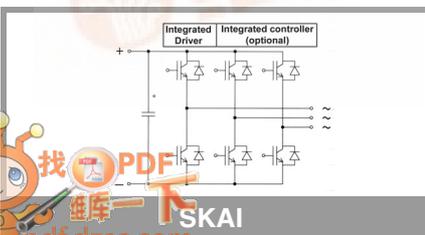
### Typical Applications

- Vehicles
- Hybrid vehicles
- Motor Drives
- Regenerative Drives

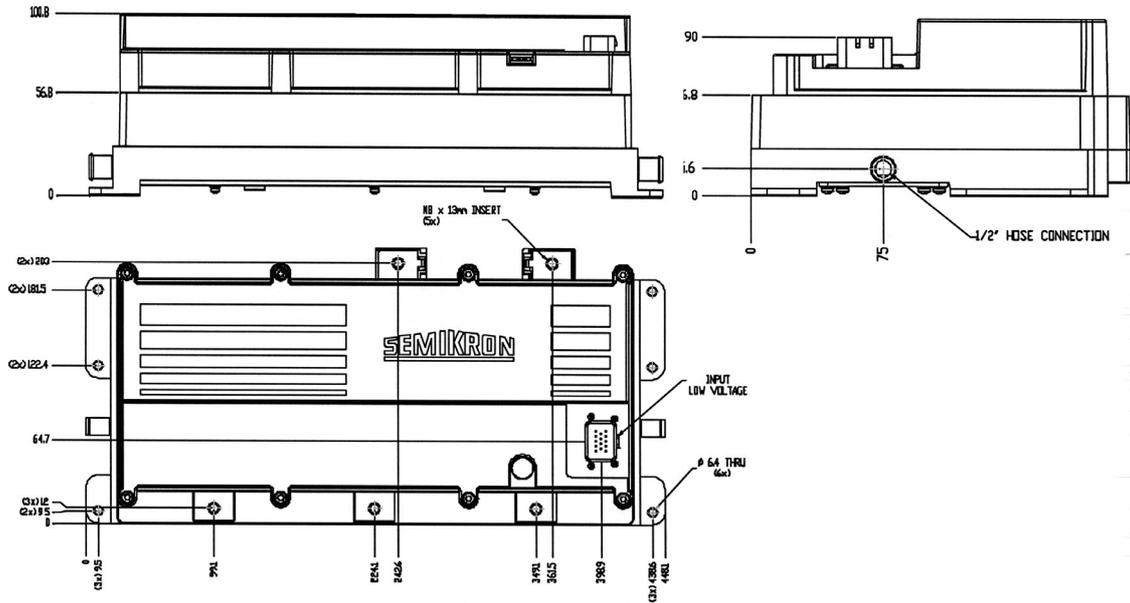
1) Contact SEMIKRON for power loss calculations  
 2) "s" referenced to built-in Temp. Sensor  
 3) 50% Water, 50% Glycol

Circuit	I <sub>rms</sub>	V <sub>dc</sub>	Types
B6CI	300	900	SKAI 3001GD12 1452 W

Symbol	Conditions	Values	Units
I <sub>rms</sub> <sup>1)</sup>	no overload, T <sub>coolant</sub> = 50°C, 5kHz, p.f.=0,8 overload, t<20s	300 400	A A
V <sub>CES</sub>		1200	V
V <sub>CEO</sub>	<b>IGBT</b> T <sub>j</sub> = 125°C	0,85	V
r <sub>CE</sub>	T <sub>j</sub> = 125°C	3,1	mΩ
V <sub>CESat</sub>	400A, T <sub>j</sub> = 25 / 125 °C	1,76 / 2,2	V
E <sub>ON</sub> + E <sub>OFF</sub>	V <sub>cc</sub> = 600/800V, I <sub>c</sub> = 400A, T <sub>j</sub> = 125°C	101 / 151	mJ
V <sub>TO</sub>	<b>Inverse diode</b> T <sub>j</sub> = 125°C	0,80	V
r <sub>T</sub>	T <sub>j</sub> = 125°C	1,87	mΩ
V <sub>F</sub> =V <sub>EC</sub>	400A, T <sub>j</sub> = 25 / 125 °C	1,56 / 1,55	V
E <sub>ON</sub> + E <sub>OFF</sub>	V <sub>cc</sub> = 600/800V, I <sub>c</sub> = 400A, T <sub>j</sub> = 125°C	32 / 38	mJ
R <sub>thjs</sub> <sup>2)</sup>	<b>Thermal Characteristics / Heatsink</b> per IGBT	0,065	K/W
R <sub>thjs</sub> <sup>2)</sup>	per diode	0,13	K/W
R <sub>thsa</sub> <sup>2)</sup>	Heatsink to coolant <sup>3)</sup> , flow rate V <sub>i</sub> = 15 l/min	9,3	K/kW
	Heatsink to coolant <sup>3)</sup> , flow rate V <sub>i</sub> = 5 l/min	13,4	K/kW
P <sub>aDR</sub>	Pressure drop, Coolant flow rate V <sub>i</sub> = 5 l/min	0,05	bar
	Pressure drop, Coolant flow rate V <sub>i</sub> = 15 l/min	0,55	bar
C <sub>eqvl</sub>	<b>Capacitor bank</b> total equivalent capacitance	1	mF
V <sub>DCmax</sub>	max. DC voltage applied to capacitor bank	900	V
V <sub>s</sub>	<b>Driver</b> Power supply: typ value	24	V
	Power supply: min / max values	8 / 30	V
I <sub>s</sub>	Supply current	500	mA
dV/dt	Primary to Secondary Side	15	kV/μs
f <sub>SWmax</sub>	Max. Switching Frequency	15	kHz
V <sub>isol</sub>	power terminals to heatsink and signal connector: AC, 1 min.	3000	V
T <sub>vj</sub>	Junction temperature	-40...+150	°C
T <sub>stg</sub>	Storage Temperature	-40...+125	°C
T <sub>amb</sub>	Operating ambient temperature	-40...+85	°C
I <sub>TRIPSC</sub>	<b>Protection</b> Short Circuit Protection	1000	A
T <sub>TRIP</sub>	Over-Temp. Protection	115	°C
U <sub>DCTRIP</sub>	V <sub>CC</sub> Overvoltage Protection	917	V
L x W x H	<b>Dimensions</b> Length x Width x Height	400 x 215 x 100	mm
w	approx.	8,2	kg



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SKAI 3001GD12 1452 W: General dimensions