

# SEMISTACK - SKAI



## SKAI Solutions

### 600V IGBT Advanced Drive System

#### SKAI 4001GD06 1452 W

#### SemiKron Advanced Integration (SKAI) module Liquid-cooled version

#### Preliminary Data

#### Features

- New generation 600V NPT IGBT 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.

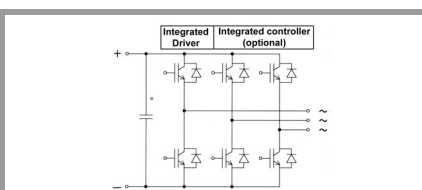
#### Typical Applications

- 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

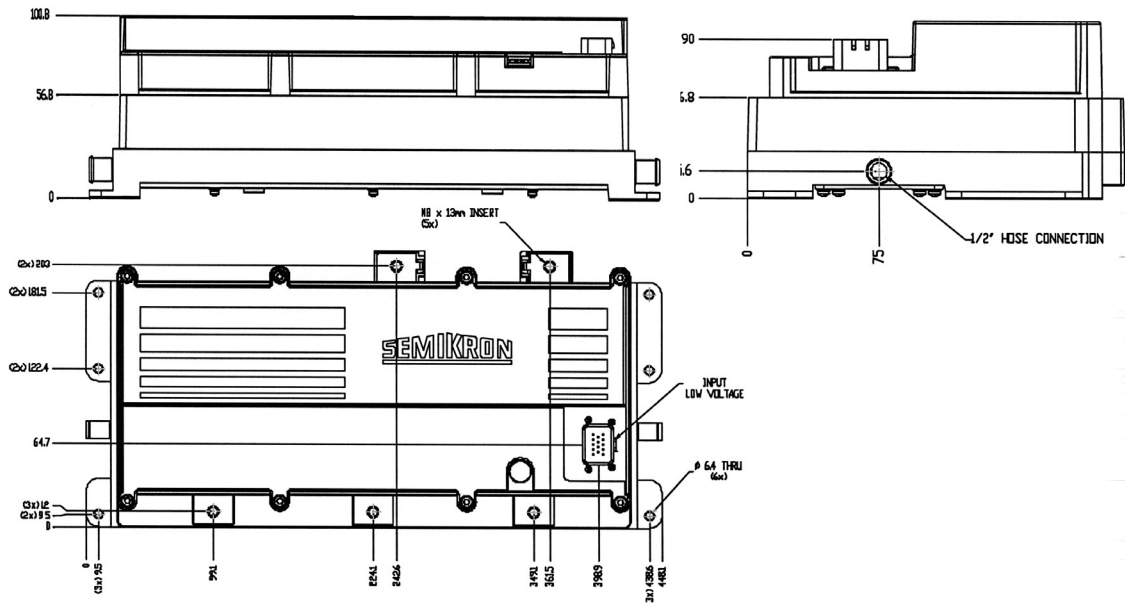


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Circuit	$I_{rms}$	$V_{dc}$	Types
B6CI	400	450	SKAI 4001GD06 1452 W

Symbol	Conditions	Values	Units
$I_{rms}^{1)}$	no overload, $T_{coolant}= 50^{\circ}C$ , 10kHz, p.f.=0,8 overload, $t<20s$	400 500 600	A A V
$V_{CES}$			
$V_{CEO}$	<b>IGBT</b> $T_j= 125^{\circ}C$	1	V
$r_{CE}$	$T_j= 125^{\circ}C$	2,75	m $\Omega$
$V_{CESat}$	400A, $T_j= 25 / 125^{\circ}C$	1,9 / 2,1	V
$E_{ON} + E_{OFF}$	$V_{cc}= 300/400V$ , $I_c= 400A$ , $T_j= 125^{\circ}C$	27 / 38	mJ
	<b>Inverse diode</b>		
$V_{TO}$	$T_j= 125^{\circ}C$	0,81	V
$r_T$	$T_j= 125^{\circ}C$	1,65	m $\Omega$
$V_F=V_{EC}$	400A, $T_j= 25 / 125^{\circ}C$	1,46 / 1,47	V
$E_{ON} + E_{OFF}$	$V_{cc}= 300/400V$ , $I_c= 400A$ , $T_j= 125^{\circ}C$	10 / 13,0	mJ
	<b>Thermal Characteristics / Heatsink</b>		
$R_{thjs}^{2)}$	per IGBT	0,065	K/W
$R_{thjs}^{2)}$	per diode	0,13	K/W
$R_{thsa}^{2)}$	Heatsink to coolant <sup>3)</sup> , flow rate $V_f= 15$ l/min	9,3	K/kW
	Heatsink to coolant <sup>3)</sup> , flow rate $V_f= 5$ l/min	13,4	K/kW
$P_{ADR}$	Pressure drop, Coolant flow rate $V_f= 5$ l/min	0,05	bar
	Pressure drop, Coolant flow rate $V_f= 15$ l/min	0,55	bar
	<b>Capacitor bank</b>		
$C_{eqvl}$	total equivalent capacitance	1	mF
$V_{DCmax}$	max. DC voltage applied to capacitor bank	450	V
	<b>Driver</b>		
$V_s$	Power supply: typ value	24	V
	Power supply: min / max values	8 / 30	V
$I_s$	Supply current	500	mA
$dV/dt$	Primary to Secondary Side	15	kV/ $\mu$ s
$f_{swmax}$	Max. Switching Frequency	20	kHz
$V_{isol}$	power terminals to heatsink and signal connector: AC, 1 min.	2500	V
$T_{vj}$	Junction temperature (not including driver)	-40...+150	$^{\circ}C$
$T_{stg}$	Storage Temperature	-40...+125	$^{\circ}C$
$T_{amb}$	Operating ambient temperature	-40...+85	$^{\circ}C$
	<b>Protection</b>		
$I_{TRIPSC}$	Short Circuit Protection	1000	A
$T_{TRIP}$	Over-Temp. Protection	115	$^{\circ}C$
$U_{DCTRIP}$	$V_{CC}$ Overvoltage Protection	458	V
	<b>Dimensions</b>		
L x W x H	Length x Width x Height	400 x 215 x 100	mm
w	approx.	8,2	kg

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SKAI 4001GD06 1452 W: General dimensions

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