



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.

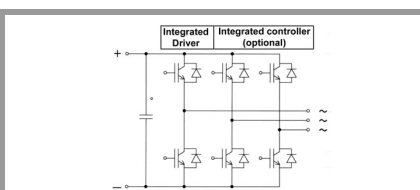
Typical Applications

- Vehicles
- Hybrid vehicles
- Motor Drives
- Regenerative Drives

¹⁾ Contact SEMIKRON for power loss calculations

²⁾ "s" referenced to built-in Temp. Sensor

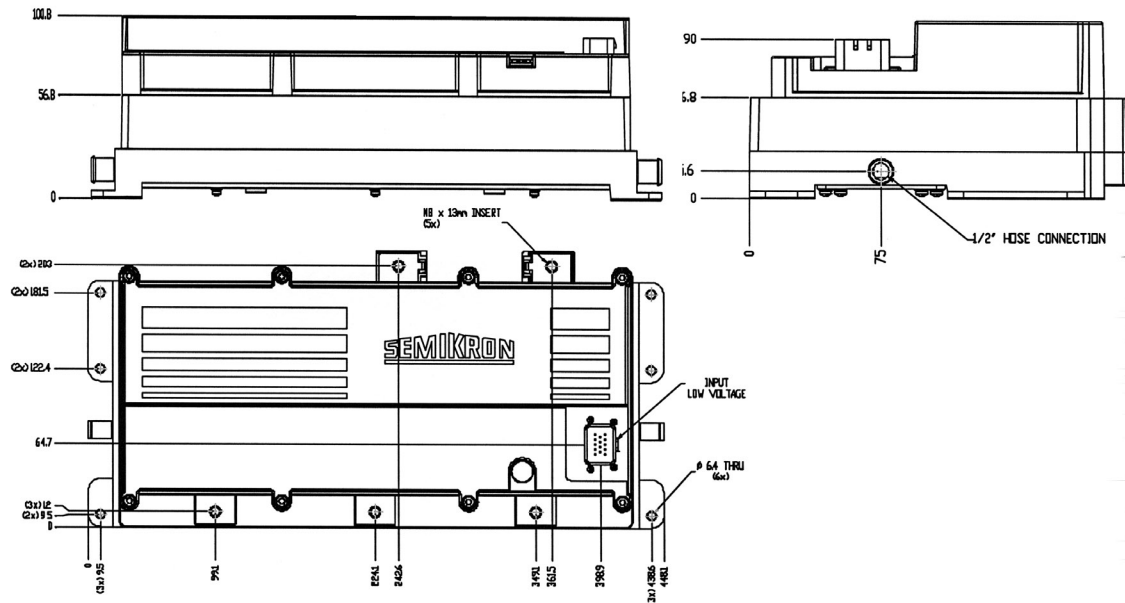
³⁾ 50% Water, 50% Glycol



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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}	IGBT $T_j = 125^{\circ}C$	1	V
r_{CE}	$T_j = 125^{\circ}C$	2,75	mΩ
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
V_{TO}	Inverse diode $T_j = 125^{\circ}C$	0,81	V
r_T	$T_j = 125^{\circ}C$	1,65	mΩ
$V_F = V_{EC}$	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
$R_{thjs}^{2)}$	Thermal Characteristics / Heatsink per IGBT	0,065	K/W
$R_{thjs}^{2)}$	per diode	0,13	K/W
$R_{thsa}^{2)}$	Heatsink to coolant ³⁾ , flow rate $V_f = 15$ l/min	9,3	K/kW
	Heatsink to coolant ³⁾ , flow rate $V_f = 5$ l/min	13,4	K/kW
Pa_{DR}	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
C_{eqvl}	Capacitor bank total equivalent capacitance	1	mF
V_{DCmax}	max. DC voltage applied to capacitor bank	450	V
V_s	Driver 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/μs
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	°C
T_{stg}	Storage Temperature	-40...+125	°C
T_{amb}	Operating ambient temperature	-40...+85	°C
I_{TRIPSC}	Protection Short Circuit Protection	1000	A
T_{TRIP}	Over-Temp. Protection	115	°C
U_{DCTrip}	V_{CC} Overvoltage Protection	458	V
	Dimensions		
L x W x H	Length x Width x Height	400 x 215 x 100	mm
w	approx.	8,2	kg



SKAI 4001GD06 1452 W: General dimensions

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