

## SKAI Solutions

### 150V MOSFET Advanced Drive System

**SKAI 5001MD15 1452 W**  
**SemiKron Advanced**  
**Integration (SKAI) module**  
**Liquid-cooled version**

#### Features

- 150V Trench MOSFET technology on AlN DCB substrate
- Integrated DC-link electrolytic capacitors
- 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 TMS320LF2406ADSP. 14-pin AMP SEAL connector is standard on controller versions.

#### Typical Applications

- Automotive Starter Generator
- Hybrid Vehicles
- Fork Lifts
- Recreation Vehicles
- Fuel Cell Inverters

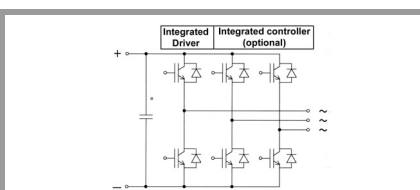
<sup>1)</sup> Contact SEMIKRON for power loss calculations

<sup>2)</sup> "r" referenced to built-in Temp. Sensor

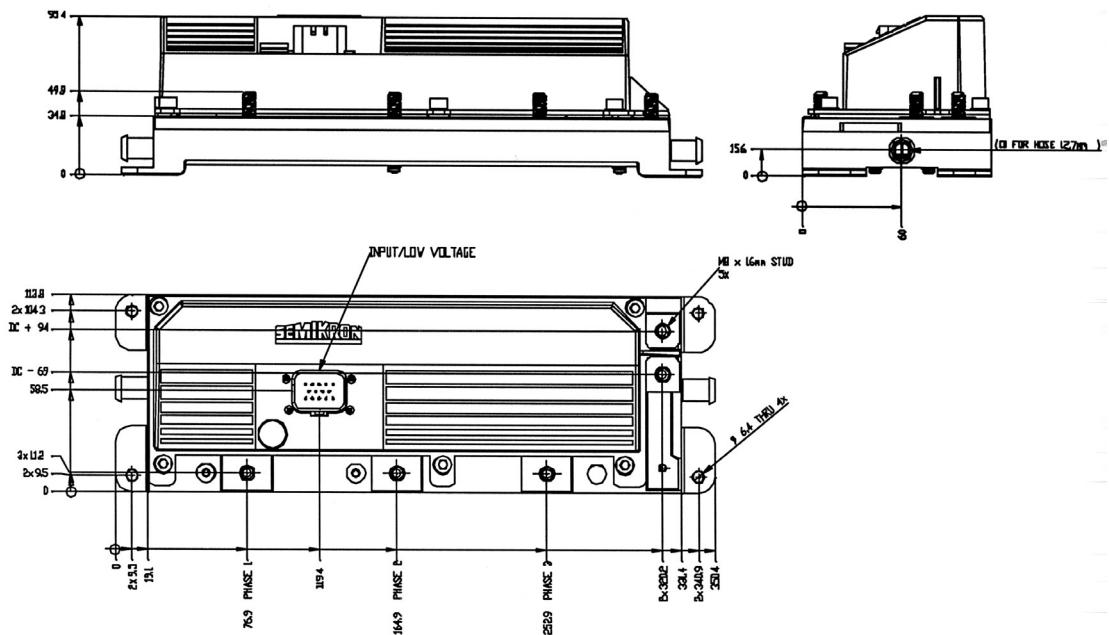
<sup>3)</sup> 50% Water, 50% Glycol

Circuit	$I_{rms}$	$V_{dc}$	Types
B6CI	400	120	SKAI 5001MD15 1452 W

Symbol	Conditions	Values	Units
$I_{rms}^{1)}$	no overload, $T_{coolant} = 70^{\circ}C$ , 10kHz, p.f.=0,8 overload, $t < 20s$	400 500	A A
$V_{(BR)DSS}$ $R_{DS(ON)}$	<b>MOSFET</b> driver without supply; min $V_{GS} = 10V$ , $T_j = 25^{\circ}C$ $V_{GS} = 10V$ , $T_j = 125^{\circ}C$	150 1,98 3,39	V $m\Omega$ $m\Omega$
$E_{ON} + E_{OFF}$	$V_{cc} = 50V$ , $I_D = 300A$ , $T_j = 125^{\circ}C$	5,1	mJ
$V_{SD}$	<b>Inverse diode</b> $I_F = 400A$ , $T_j = 25^{\circ}C$ $I_F = 400A$ , $T_j = 125^{\circ}C$	0,98 0,9	V V
$E_{ON} + E_{OFF}$	$V_{cc} = 50V$ , $I_F = 300A$ , $T_j = 125^{\circ}C$	1,1	mJ
$R_{thjr}^{2)}$	<b>Thermal Characteristics / Heatsink</b> per MOSFET switch	0,085	K/W
$R_{thra}^{2)}$	Heatsink to coolant <sup>3)</sup> , flow rate $V_f = 15$ l/min Heatsink to coolant <sup>3)</sup> , flow rate $V_f = 5$ l/min	0,014 0,020	K/W K/W
$Pa_{DR}$	Pressure drop, Coolant flow rate $V_f = 5$ l/min Pressure drop, Coolant flow rate $V_f = 15$ l/min	0,08 0,61	bar bar
$C_{eqvl}$ $V_{DCmax}$	<b>Capacitor bank</b> total equivalent capacitance max. DC voltage applied to capacitor bank	9 120	mF V
$V_s$ $I_s$	<b>Driver</b> Power supply: min Power supply: max Supply current	18 30 500	V V mA
$f_{swmax}$	Max. Switching Frequency	20	kHz
$V_{isol}$	power terminals to heatsink: AC, 1 min.	1000	V
$T_{vj}$ $T_{stg}$ $T_{amb}$	Junction temperature (not including driver) Storage Temperature Operating ambient temperature	-40...+175 -40...+125 -40...+85	$^{\circ}C$ $^{\circ}C$ $^{\circ}C$
$I_{TRIPSC}$ $T_{TRIP}$ $U_{DCTrip}$	<b>Protection</b> Short Circuit Protection Over-Temp. Protection $V_{CC}$ Overvoltage Protection	850 115 126	A $^{\circ}C$ V
$L \times W \times H$ $w$	<b>Dimensions</b> Length x Width x Height approx.	315 x 115 x 95 3	mm kg



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## SKAI 5001MD15 1452 W: General dimensions

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