

## 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 AIN 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.

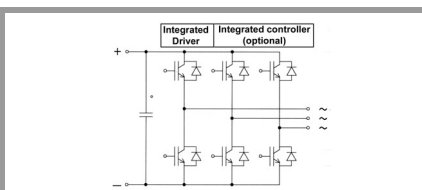
#### Typical Applications

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

1) Contact SEMIKRON for power loss calculations

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

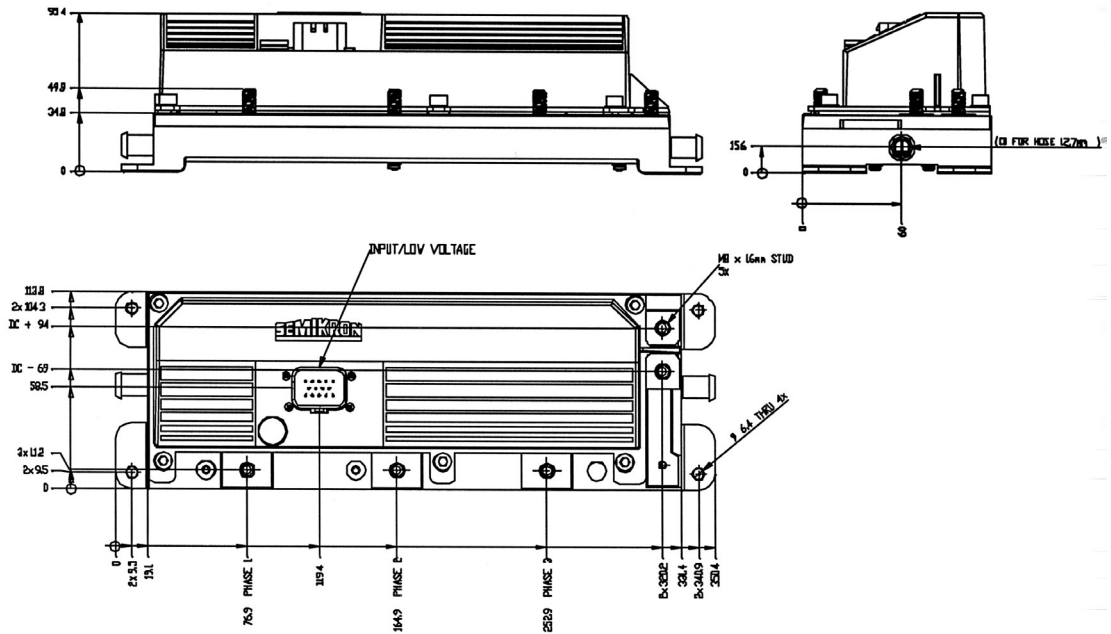
3) 50% Water, 50% Glycol



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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	400	A
	overload, $t<20s$	500	A
$V_{(BR)DSS}$ $R_{DS(ON)}$	<b>MOSFET</b> driver without supply; min	150	V
	$V_{GS} = 10V$ , $T_j = 25^{\circ}C$	1,98	m $\Omega$
	$V_{GS} = 10V$ , $T_j = 125^{\circ}C$	3,39	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> $I_F= 400A$ , $T_j = 25^{\circ}C$	0,98	V
	$I_F= 400A$ , $T_j = 125^{\circ}C$	0,9	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	0,014
Heatsink to coolant <sup>3)</sup> , flow rate $V_f= 5$ l/min		0,020	K/W
$P_{aDR}$	Pressure drop, Coolant flow rate $V_f= 5$ l/min	0,08	bar
	Pressure drop, Coolant flow rate $V_f= 15$ l/min	0,61	bar
$C_{eqvl}$ $V_{DCmax}$	<b>Capacitor bank</b> total equivalent capacitance	9	mF
	max. DC voltage applied to capacitor bank	120	V
$V_s$	<b>Driver</b> Power supply: min	18	V
	Power supply: max	30	V
$I_s$	Supply current	500	mA
$f_{swmax}$	Max. Switching Frequency	20	kHz
$V_{isol}$	power terminals to heatsink: AC, 1 min.	1000	V
$T_{vj}$	Junction temperature (not including driver)	-40...+175	$^{\circ}C$
$T_{stg}$	Storage Temperature	-40...+125	$^{\circ}C$
$T_{amb}$	Operating ambient temperature	-40...+85	$^{\circ}C$
$I_{TRIPSC}$ $T_{TRIP}$ $U_{DCTRIP}$	<b>Protection</b> Short Circuit Protection	850	A
	Over-Temp. Protection	115	$^{\circ}C$
	$V_{CC}$ Overvoltage Protection	126	V
L x W x H	Length x Width x Height	315 x 115 x	mm
		95	
w	approx.	3	kg



SKAI 5001MD15 1452 W: General dimensions

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.