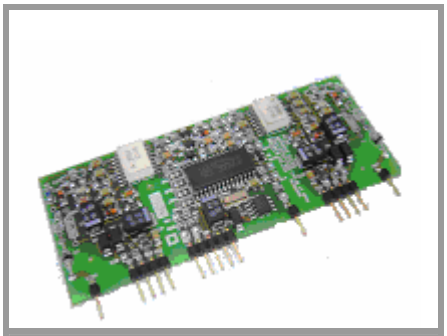
SKHI 20 opA



SEMIDRIVER®

SKHI 20opA

Preliminary Data

SEMIDRIVER®

Features

- For IGBT with V_{ces} up to 1200V
- Dual driver for half bridge IGBT modules
- May be used as two independent single drivers
- CMOS compatible input drivers
- Short circuit protection by V_{ce} monitoring with soft turn-off
- Secondary side supply under voltage protection
- Error memory, output signal with external or automatic reset
- Interlock TOP/BOTTOM
- DC BUS up to 800V

Typical Applications

- IGBT Driver for UPS, inverter drivers, welding inverter and SMPS

Absolute Maximum Ratings

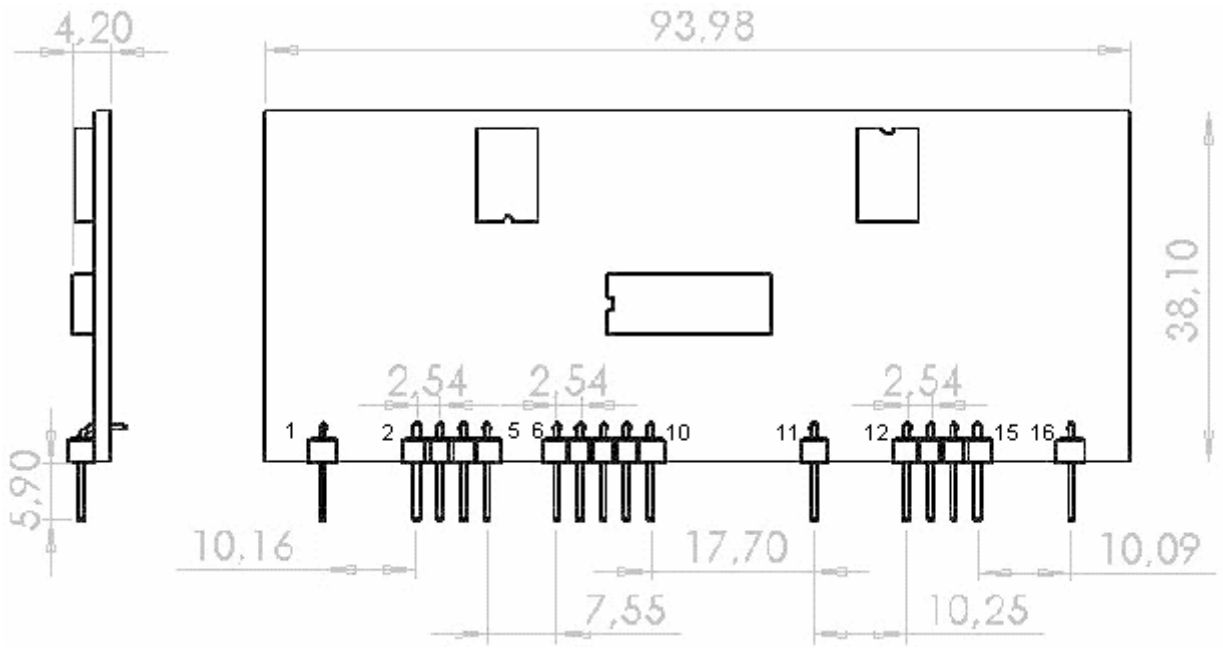
Symbol	Term	Value	Types
V_S	Supply voltage primary	18	V
V_{SS}	Supply voltage secondary	30	V
$Iout_{PEAK}$	Output peak current	2,5	A
f_{max}	max. switching frequency	100	kHz
V_{CE}	Collector-Emitter voltage sense across the IGBT	1000	V
dv/dt	Rate of rise and fall of voltage secondary to primary side	15	kV/µs
V_{isolIO}	Isolation test voltage input-output (1 min. AC)	2500	Vac
R_{Gmin}	Minimum rating for R_G	7.5	Ω
T_{op}	Operating temperature	- 40... + 70	°C
T_{stg}	Storage temperature	- 40... + 85	°C

Electrical Characteristics (T_a=25ºC)

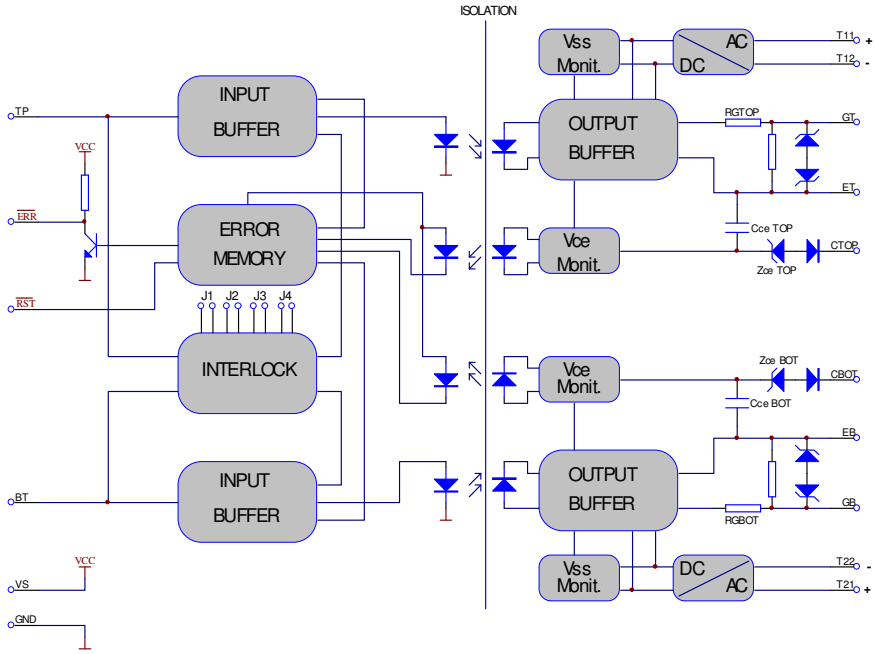
Symbol	Term	min	typ	max	Units
V_S	Supply voltage primary side	14,4	15	15,6	V
I_S	Supply current primary side			45	mA
V_{SS}	Isolated supply voltage secondary side	24	25,5	27	V
I_{SS}	Isolated supply current secondary side			20	mA
V_i	Input signal voltage (on/off)		15 / 0		V
V_{iT+}	Input threshold voltage (High)	11,0	12,4		V
V_{iT-}	Input threshold voltage (Low)		4,8	6,4	V
R_{in}	Input resistance		10		kΩ
$V_{G(on)}$	Turn-on gate voltage output		15	16	V
$V_{G(off)}$	Turn-off gate voltage output	-9	-8	-6	V
R_{GE}	Internal gate-emitter resistance		10		kΩ
$t_{d(on)IO}$	Input-output turn-on propagation time	350	550	750	ns
$t_{d(off)IO}$	Input-output turn-off propagation time	500	700	900	ns
t_{TD}	Top-bottom interlock dead time		4 [1)]		µs
V_{CEstat}	Ref. voltage for V_{CE} monitoring	6,5	7 [3)]	7,5	V
$t_{d(err)}$	Error input-output propagation time		0,6		µs
$t_{pERRreset}$	Error reset time		9 [2)]		µs
C_{ps}	Coupling capacity primary-secondary		3		pF
w	weight		17,5		g

1) Factory adjusted; see table Jumper Settings for other values.
2) For resetting the driver is necessary to turn off both pulses (top and bottom) or put reset signal low for at least 9us.
3) V_{ce} threshold is adjustable.

Dimensions in mm



Mechanical Data



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Electrical Data

Jumper 1 (JP1)	Jumper 2 (JP2)	Jumper 3 (JP3)	Interlock Time t_{TD}
close	open	Close	0.25 µs
close	open	Open	2 µs
open	open	Close	3 µs
open	open	Open	4 µs
x	close	X	no interlock

The interlock circuit prevents the two IGBTs (top/bottom) to switch at the same time, and its dead time can be adjusted with the jumpers JP1 and JP3 as above. This feature can be disabled by solder bridging the pads of JP2. JP4 is not used in this version, left it open always.

Jumper Settings

C_{CE} e Z_{CE} are applied for adjusting the steady-state threshold and short circuit dynamic. The Vce monitoring must remain disabled for a short time period following the turn-on of the IGBT to allow the collector voltage to fall below the voltage threshold. This time is set by the C_{CE} capacitor and the voltage threshold is set by the Z_{CE} zener diode.

The disable time is calculated by the following formula:

$$t_{disable} = (68+C_{CE})*7/250 \text{ usec.} \quad (\text{CCE is in pF})$$

The voltage threshold is calculated by the following formula:

$$V_{threshold} = (7\text{-}1.4\text{-}V_{Zener}) \text{ V} \quad (V_{zener} \text{ is the zener voltage})$$

Vce Setting

PIN No.	Designation	Explanation
6	RST	reset input signal (active low)
7	TP	switching signal top input (15V logic)
8	ER	error output, low=error, Max 30V/15mA
9	VS	+15V (± 3%) voltage supply
10	GND	related earth for input signals
11	BT	switching signal bottom input (15V logic)

Primary side PIN array

PIN No.	Designation	Explanation
1	CTOP	collector output IGBT 1 (TOP)
2	GT	gate output IGBT 1 (TOP)
3	ET	emitter output IGBT 1 (TOP)
4	T11	related earth for power supply (TOP)
5	T12	Switching signal for power supply (f_{sw}=450kHZ/V_{pk}=27V)
12	T22	Switching signal for power supply (f_{sw}=450kHZ/V_{pk}=27V)
13	T21	related earth for power supply (BOTTOM)
14	EB	emitter output IGBT 1 (BOTTOM)
15	GB	gate output IGBT 1 (BOTTOM)
16	CBOT	collector output IGBT 1 (BOTTOM)

The driver has an internal rectifier for the power supply of the secondary sides. The power supply for secondary sides can be a square wave of maximum 450kHz (50% duty cycle) and 27V peak.

Secondary side PIN array

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

Sales Information

Code	Description	Description 2	Status
97627930	SKHI 20 opA		K

