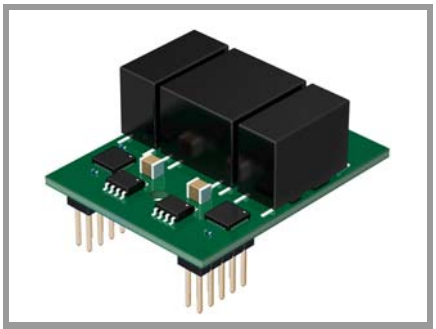
SKYPER 12 R



SKYPER®

Skyper 12 Driver Core

Order Nr. L5069901

SKYPER 12 R

Features

- Two output channels
- Integrated power supply
- Adjustable dead time
- Dynamic short-circuit detection
- SoftOff in error condition
- Adjustable filter setting
- Multi failure management
- ROHS, UL recognized

Typical Applications*

- Driver for IGBT modules in half bridge circuits in industrial applications

Remarks

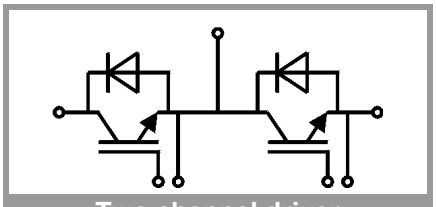
- Insulation test voltage with external high voltage diode
- The insulation test is not performed as 100% series test at SEMIKRON
- The driver power can be expanded to 20µC with external boost capacitors
- Max. DC link voltage limited by creepage/ clearance distances and partial discharge values
- Operating temperature is real ambient temperature around the driver core
- Environmental conditions see technical explanation

Absolute Maximum Ratings

Symbol	Conditions		Values	Unit
V_s	Supply voltage primary		15	V
V_{iH}	Input signal voltage (HIGH)		Vs + 0.3	V
V_{iL}	Input signal voltage (LOW)		GND - 0.3	V
$Iout_{PEAK}$	Output peak current		20	A
$Iout_{AVmax}$	Output average current		50	mA
f_{max}	Max. switching frequency	85 °C	50	kHz
		75°C	100	kHz
V_{CE}	Collector emitter voltage sense across the IGBT		1700	V
dv/dt	Rate of rise and fall of voltage secondary to primary side		50	kV/µs
$V_{isol\ IO}$	Insulation test voltage input - output (AC, rms, 2s)		5000	V
$Q_{out/pulse}$	Max. rating for output charge per pulse		20	µC
T_{op}	Operating temperature		-40 ... 85	°C
T_{stg}	Storage temperature		-40 ... 85	°C

Characteristics

Symbol	Conditions	min.	typ.	max.	Unit
V_s	Supply voltage primary side	14.55	15	15.45	V
I_{S0}	Supply current primary (no load)		110		mA
	Supply current primary side (max.)			400	mA
V_i	Input signal voltage on / off		Vs/0		V
V_{IT+}	Input treshold voltage (HIGH)			10	V
V_{IT-}	Input threshold voltage (LOW)	5			V
R_{IN}	Input resistance		-		kΩ
C_{IN}	Input capacitance (switching signals)		-		nF
$V_{G(on)}$	Turn on output voltage	14	15	15.7	V
$V_{G(off)}$	Turn off output voltage	-10	-9	-8.5	V
$t_{d(on)IO}$	Input-output turn-on propagation time		0.6		µs
$t_{d(off)IO}$	Input-output turn-off propagation time		0.6		µs
$t_{d(err)SCP}$	Error sec - prim propagation time		0.6		µs
$t_{d(err)HALT}$	Error primary - secondary side propagation time		0.6		µs
t_{TD}	Top-Bot interlock dead time		2		µs
t_{jitter}	Signal transfer prim - sec (total jitter)		25		ns
t_{SIS}	Short pulse suppression		0.395		µs
t_{POR}	Power-On-Reset completed		0.15		s
t_{pRESET}	Error reset time	0.03			ms
V_{CEstat}	Reference voltage for V_{CE}-monitoring	2		9	V
t_{bl}	VCE monitoring blanking time	2		9	µs
w	weight		20		g
MTBF	Mean Time Between Failure Ta = 40°C		12		10^6h



Two channel driver

Controller interface - primary side

PIN	Signal	Function	Specifications
X10:01	PWR_GND	Ground	To be connected to ground (GND)
X10:02	CFG_SELECT	Interlock set up	HIGH (VP) = No interlock LOW (GND) = Interlock 2µs
X10:03	nERROR_OUT	Error output	LOW (GND) = Error HIGH (Open Drain) = no Error Max 18V/10mA
X10:04	nERROR_IN	Error input	LOW (GND) = External error HIGH (VP) = No error 150KΩ impedance/15V
X10:05	MLI_SLCT	Error switch off setting for MLI configuration	LOW (GND) = Driver switches off on error HIGH (VP) = No switch off, just error indication
X10:06	FILTER_SLCT	Filter time set up	LOW (GND) = Analog filter HIGH (VP) = Digital filter
X10:07	TOP_IN	TOP Switching signal input	Digital 15V/0V LOW = TOP switches off HIGH = TOP switches on 33KΩ impedance/15V
X10:08	BOT_IN	BOT Switching signal input	Digital 15V/0V LOW = BOT switches off HIGH = BOT switches on 33KΩ impedance/15V
X10:09	PWR_15P	Drive core power supply	Stabilized +15V ±3% (VP)
X10:10	PWR_15P	Drive core power supply	Stabilized +15V ±3% (VP)

Module interface - secondary side

PIN	Signal	Function	Specifications
TOP IGBT side			
X100:01	TOP_VCE_CFG	V_{CE} reference	Input reference voltage adjustment
X100:02	TOP_VCE_IN	Input V_{CE} monitoring	External blocking diode necessary
X100:03	TOP_15P	Output power supply	Stabilized +15V/max.10mA Default: 4.7µF (=1.0µC)
X100:04	TOP_nERR_IN	External error input	15V logic input; LOW = ERROR; 150KΩ impedance /15V
X100:05	TOP_ON	On signal path to TOP IGBT	Connection to R_{ON}
X100:06	TOP_OFF	Off signal path to TOP IGBT	Connection to R_{OFF}
X100:07	TOP_CLMP	Over voltage TOP	HIGH (VP) = active clamp LOW (GND) = deactivated active clamp 150KΩ impedance/ 15V
X100:08	TOP_GND	GND for ps and digital signals	Emitter Potential
X100:09	TOP_SOFTOFF	SoftOff signal path to TOP IGBT	Connection to $R_{SoftOff}$
X100:10	TOP_8N	Output power supply	Stabilized -8V/max.10mA Default: 4.7µF (=1.0µC)

PIN	Signal	Function	Specifications
BOT IGBT side			
X200:01	BOT_VCE_CFG	V_{CE} reference	Input reference voltage adjustment
X200:02	BOT_VCE_IN	Input V_{CE} monitoring	External blocking diode necessary
X200:03	BOT_15P	Output power supply	Stabilized +15V/max.10mA Default: 4.7µF (=1.0µC)
X200:04	BOT_nERR_IN	External error input	15V logic input; LOW = ERROR; 150KΩ impedance /15V
X200:05	BOT_ON	On signal path to BOT IGBT	Connection to R_{ON}
X200:06	BOT_OFF	Off signal path to BOT IGBT	Connection to R_{OFF}
X200:07	BOT_CLMP	Over voltage BOT	HIGH (VP) = active clamp LOW (GND) = deactivated active clamp 150KΩ impedance/15V
X200:08	BOT_GND	GND for ps and digital signals	Emitter Potential
X200:09	BOT_SOFTOFF	SoftOff signal path to BOT IGBT	Connection to $R_{SoftOff}$
X200:10	BOT_8N	Output power supply	Stabilized -8V/max.10mA Default: 4.7µF (=1.0µC)

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, chapter IX.

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