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2SP0320 SCALE<sup>™</sup>-2 Plug-and-Play IGBT Driver

2SP0320 Series – Dual-Channel Driver for PrimePACK<sup>™</sup> and Equivalent IGBT Modules with Electrical or Fiber-Optic Interfaces.

# PRODUCT DESCRIPTION

The 2SP0320 is the ultimate driver platform for PrimePACK<sup>™</sup> and equivalent IGBT modules various manufacturers. As a member of the Power Intergrations plug-and-play driver family, it satisfies the requirements for optimized electrical performance and noise immunity.

The highly integrated SCALE<sup>™</sup>-2 chipset reduces the component count by 80 % compared to conventional solutions, thus significantly increasing reliability and reducing costs.

Thanks to SCALE<sup>™</sup>-2 technology, the 2SP0320 family comprises complete and extremely compact two-channel IGBT drivers equipped with DC/DC converters, short-circuit protection, advanced active clamping and supply-voltage monitoring.

The embedded paralleling capability allows easy inverter design covering higher power ratings. Specifically adapted drivers are available for all module types. All drivers are available with electrical and fiber-optic interfaces.

PrimePACK<sup>™</sup> is a registered trademark of Infineon Technology AG

The driver contains all necessary components for optimal and safe driving of the relevant IGBT module: smallest gate resistors in order to minimize switching losses, gate clamping, active-clamping diodes (overvoltage protection at turn-off), Vce monitoring (short-circuit protection) as well as the electrical connector input X1. Moreover, it includes components for setting the turn-off trip level, the response time and the dead time between both channels in half-bridge mode. Its plug-and-play capability means that it is ready to operate immediately after mounting. The user needs invest no effort in designing or adjusting the driver to a specific application.

# APPLICATIONS

- Wind-power converters
- Traction inverters
- Industrial drives
- Induction heating
- Elevators
- UPS and SMPS
- Medical (MRT, CT, X-Ray)
- Laser technology

# **KEY BENEFIT**

Ultimate driver platform for PrimePACK<sup>TM</sup> and equivalent IGBTs with an electrical or fiber-optic interface. Component count reduced by 80 % thanks to the SCALE<sup>TM</sup>-2 chipset.

### **KEY FEATURES**

- Compact plug-and-play solution up to 1.7 kV
- Very short delay time of <120 ns
- Small jitter of +/-2 ns
- Interface for 3.3 V...15 V logic level
- Electrical or fiber-optic interfaces
- Small jitter of +/-2 ns (electr. interface)
- +15 V/-10 V gate driving
- Easy mounting directly onto the IGBT
- Embedded paralleling capability
- Supports 2-level and 3-level converter topologies
- IGBT short-circuit protection
- Advanced active clamping
- Isolated DC/DC converter
- Supply under-voltage lockout
  Safe isolation to EN50178
- UL compliant
- Superior EMC
- Reliable, long service life

## **INTERFACE OPTIONS**

The 2SP0320 driver series is available with one electrical and two fiber-optic interfaces.

#### **Electrical Interface:** 2SP0320T

The DIC20 electrical interface is very simple and easy to use. The driver has the following terminals:

- Power supply and GND terminals
- 2x drive signal inputs
- 2x status outputs (failure returns)
- 1x mode selection
- (half-bridge mode/direct mode)
- 1x input to set the blocking time

All inputs are ESD-protected and all digital inputs have Schmitt-trigger characteristics.

#### Fiber-Optic Interfaces: 2SP0320V and 2SP0320S

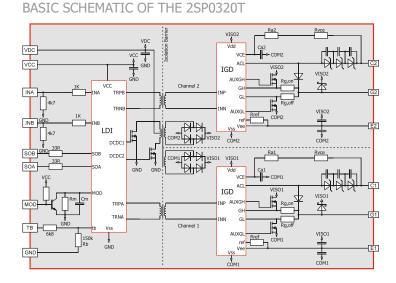
Fiber-optic links are used for the electrical insulation of the command and status-feedback signals. Two versions of the fiber-optic interfaces are available: - 2SP0320V versatile fiber-optic

- 2SP0320S ST fiber-optic

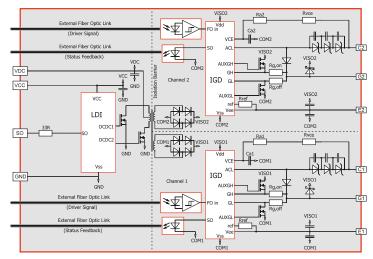
## **KEY DATA OVERVIEW**

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current 2SP0320T2xx @ f <sub>IN</sub> 0 Hz		56		mA
Supply current 2SP0320V2xx and 2SP0320S2xx @ fIN 0 Hz		164		mA
Supply current, full load 2SP0320T2xx		600		mA
Supply current, full load 2SP0320V2xx and 2SP0320S2xx		690		mA
Output power per channel		3		W
Gate voltage		+15/-10		V
Peak output current (gate current)	-20		+20	А
Switching frequency f <sub>IN</sub> <sup>1)</sup>	0		30	kHz
Duty cycle	0		100	%
Turn-on delay, 2SP0320T2xx		90		ns
Turn-off delay, 2SP0320T2xx		90		ns
Turn-on delay, 2SP0320V2xx and 2SP0320S2xx		120		ns
Turn-off delay, 2SP0320V2xx and 2SP0320S2xx		100		ns
Creepage distance primary-secondary	20			mm
Creepage distance secondary-secondary	17			mm
Dielectric test voltage	5000			Vac
Partial discharge extinction voltage	1768			Vpeak
dv/dt immunity, input to output			50	kV/us
Operating temperature	-40		+85	degC

<sup>1)</sup> Maximum switching frequency depends on the IGBT gate charge. See data sheet for actual values of specific drivers.



# BASIC SCHEMATIC OF THE 2SP0320V



## ORDERING INFORMATION 2SP0320 SERIES

	2SP0320T	2SP0320V	2SP0320S	<ol> <li>Gate resistors have to be soldered by customer</li> <li>Electrical connector on the driver: 71922-120LF from FCI, recommended cable connector: 71600-020LF from FCI. Recommended twisted</li> </ol>
Type designation	2SP0320T2A0-xx 2SP0320T2C0-12 2SP0320T2C0-17	2SP0320V2A0-xx	2SP0320S2A0-xx	
xx: Voltage basic type <sup>1)</sup> or xx: Specific module type				
Input signal interface	Electrical interface 2SP0320T2A0: 3.3-15 V logic level 2SP0320T2C0: 15 V logic level	Versatile FOL Input/Output	ST FOL Input/Output	
On-Board connector	DIC20 <sup>2)</sup>	HFBR 2522ETZ/1522ETZ	HFBR 2412Z/1412Z	

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