

2SP0115T SCALE™-2 Plug-and-Play IGBT Driver



2SP0115T Dual-Channel Gate Driver with Electrical Interface for 17 mm-Dual IGBT Modules.

PRODUCT DESCRIPTION

The 2SP0115T is a dual-channel driver with an electrical interface. The driver is based on Power Integrations SCALE™-2 chipset, a highly integrated technology for the reliable driving and safe operation of IGBTs.

Perfectly matched driver versions are available for all 17 mm dual IGBT modules. The plug-and-play capability of the driver allows immediate operation after mounting. The user needs invest no effort in designing or adjusting it to a specific application.

2SP0115T is the ultimate low-cost ultra-compact driver platform for EconoDUAL™ IGBT modules. As a member of the Power Integrations' plug-and-play driver family, it satisfies the requirements for optimized electrical performance and noise immunity.

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

Thanks to SCALE™-2 technology, the 2SP0115T 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.

Perfectly matched driver versions are available for all 17 mm dual IGBT modules. Users need only solder them onto the corresponding IGBT module. The plug-and-play capability of the driver allows immediate operation with no further development or matching effort. Shortest design cycles are achieved without compromising overall system efficiency in any way.

The embedded paralleling capability allows easy inverter design covering higher power ratings. Specifically adapted drivers are available for all module types. The DIC20 electrical interface is very simple and easy to use.

APPLICATIONS

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

KEY BENEFIT

Compact driver solution for 17 mm dual IGBT modules with an electrical interface for 2-level, 3-level and multilevel converter topologies with paralleling capability.

KEY FEATURES

- Very short delay time of <100 ns
- Small jitter of ±4 ns
- +15 V (regulated)/-8 V gate driving
- Separate gate current paths (on/off)
- Suitable for IGBTs up to 1700 V
- Interface for 3.3 V...15 V logic level
- Direct and half-bridge modes
- Embedded paralleling capability
- 2-level and multilevel topologies
- IGBT short-circuit protection
- Advanced active clamping
- Isolated DC/DC converter
- 2 x 1 W output power
- Supply under-voltage lockout
- Safe isolation to EN50178
- UL compliant
- Superior EMC
- Reliable, long service life

DRIVING PARALLEL-CONNECTED IGBTs

The driver allows direct parallel connection of any number of 17 mm modules with individual drivers. This new pioneering concept for simple and reliable parallel connection makes it practical for the first time to set up converter series with discrete modules as well as parallel-connected IGBTs without any additional development effort.

ELECTRICAL INTERFACE DIC20

The 2SP0115T driver series is equipped with DIC20 electrical interface, fully compatible to PrimePACK™ driver series 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.

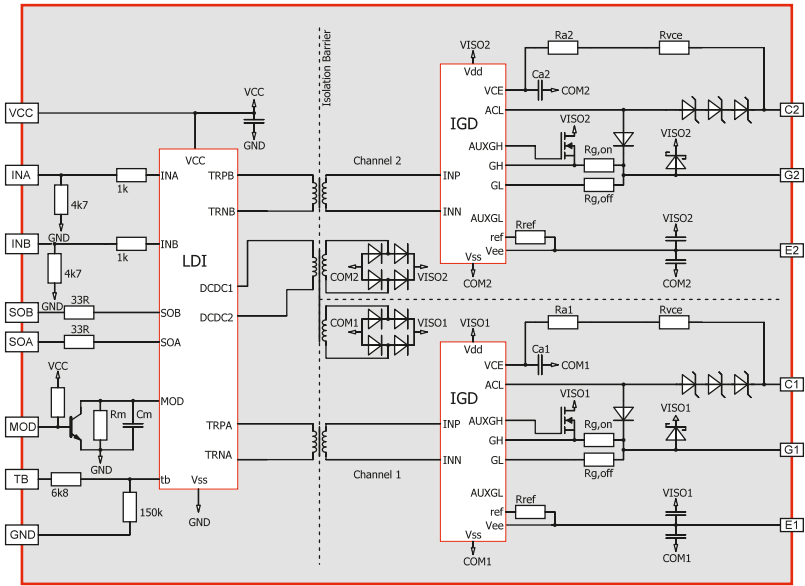
KEY DATA OVERVIEW

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ $f_{IN}=0$ Hz		33		mA
Supply current, full load			220	mA
Output power per channel		1		W
Gate voltage		+15/-8		V
Peak output current (gate current)	-8		+15	A
Switching frequency f_{IN} ¹⁾	0		50	kHz
Duty cycle	0		100	%
Turn-on delay		75		ns
Turn-off delay		65		ns
Creepage distance primary-secondary	12.6			mm
Creepage distance secondary-secondary	6.6			mm
Clearance distance primary-secondary	12.3			mm
Clearance distance secondary-secondary	6.6			mm
Dielectric test voltage (600 V/1200 V versions)	3800			V _{AC}
Dielectric test voltage (1700 V versions)	5000			V _{AC}
Partial discharge extinction voltage (600/1200 V versions)	1200			V _{peak}
Partial discharge extinction voltage (1700 V versions)	1700			V _{peak}
dv/dt immunity, input to output		50		kV/us
Operating temperature 2SP0115T2Ax-xx	-20		+85	degC
Operating temperature 2SP0115T2Bx-xx	-40		+85	degC

¹⁾ Maximum switching frequency depends on the IGBT gate charge.
See data sheet for actual value of specific driver.

BASIC SCHEMATIC OF THE 2SP0115T

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), V_{ce} monitoring (short-circuit protection) as well as the input electrical connector 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 to invest no effort in designing or adjusting the driver for a specific application.



ORDERING INFORMATION 2SP0115T DUAL-CHANNEL SCALE™-2 PLUG-AND-PLAY DRIVER

Type Designation	Description
2SP0115T	
2SP0115T2A0	Standard version (-20...85 degC)
2SP0115T2B0	Extended operating temperature (-40...85 degC)
2SP0115T2A0-xx or 2SP0115T2B0-xx	xx: voltage basic type (for any module type) ¹⁾ xx = 06 (600 V) / xx = 12 (1200 V) / xx = 17 (1700 V) xx: specific module type (Infineon, Fuji, Mitsubishi, Starnpower, Powerex) such as 2MBI300VN-120-50
2SP0115T2C0-xx	xx: voltage basic type xx = 06 (600 V) / xx = 12 (1200 V) / xx = 17 (1700 V) 15 V logic level, extended operating temperature (-40...85 degC)

¹⁾ Gate resistors have to be soldered by customer