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1SP0335
SCALE™-2 Plug-and-Play IGBT Driver

1SP0335 Series
Single Channel Driver 6.5 kV/4.5 kV with Separate Power Supply Unit for High Voltage IGBT Modules (10.2 kV Iso).

DC/DC converter ISO5125I connected to 1SP0335D (slave) with 1SP0335V (master) each screwed onto a 6.5 kV IGBT module.

PRODUCT DESCRIPTION

The 1SP0335 SCALE™-2 Plug-and-Play drivers are specifically designed for the reliable and safe driving of 130x140 mm and 190x140 mm IGBT modules with 10.2 kV isolation voltage and blocking voltages from 3.3 kV to 6.5 kV. They are optimally suited to high-reliability applications in railway technology and industry.
The driver concept relies on a master-slave principle that allows the safe operation of parallel connected IGBT modules. The master (1SP0335V or 1SP0335S) can be used as a stand-alone driver without a slave to drive a single IGBT module or with up to three 1SP0335D slaves, to drive up to four parallel connected IGBT modules.
The master is equipped with a fibre-optic interface and global fault management. In master-slave configurations, the slaves are connected to the master by a bus cable which distributes the common command signal and the secondary-side supply voltages for the DC/DC converter.

The 1SP0335 drivers are based on Power Integrations highly integrated SCALE™-2 chipset. Thanks to SCALE™-2 technology, the new 1SP0335 family comprises highly integrated, high-performance, complete and extremely compact single-channel IGBT drivers.

The SCALE™-2 chipset reduces the component count by 85 % compared to conventional solutions, thus significantly increasing reliability and reducing costs.
The drivers are equipped with Dynamic Advanced Active Clamping (DAAC), short-circuit protection, regulated turn-on gate driving voltage and supply-voltage monitoring. Perfectly matched driver versions are available for all mechanically compatible IGBT modules. The plug-and-play capability of the driver allows immediate operation after mounting. The user needs to invest no effort in designing or adjusting it to a specific application.

APPLICATIONS

- Traction
- Railroad power supplies
- Light rail vehicles
- HVDC
- Flexibel AC transmission systems
- Medium-voltage converters
- Industrial drives
- Wind-power converters

KEY BENEFIT

Reliable and safe operation of parallel connected high-voltage and high-power IGBT modules.

KEY FEATURES

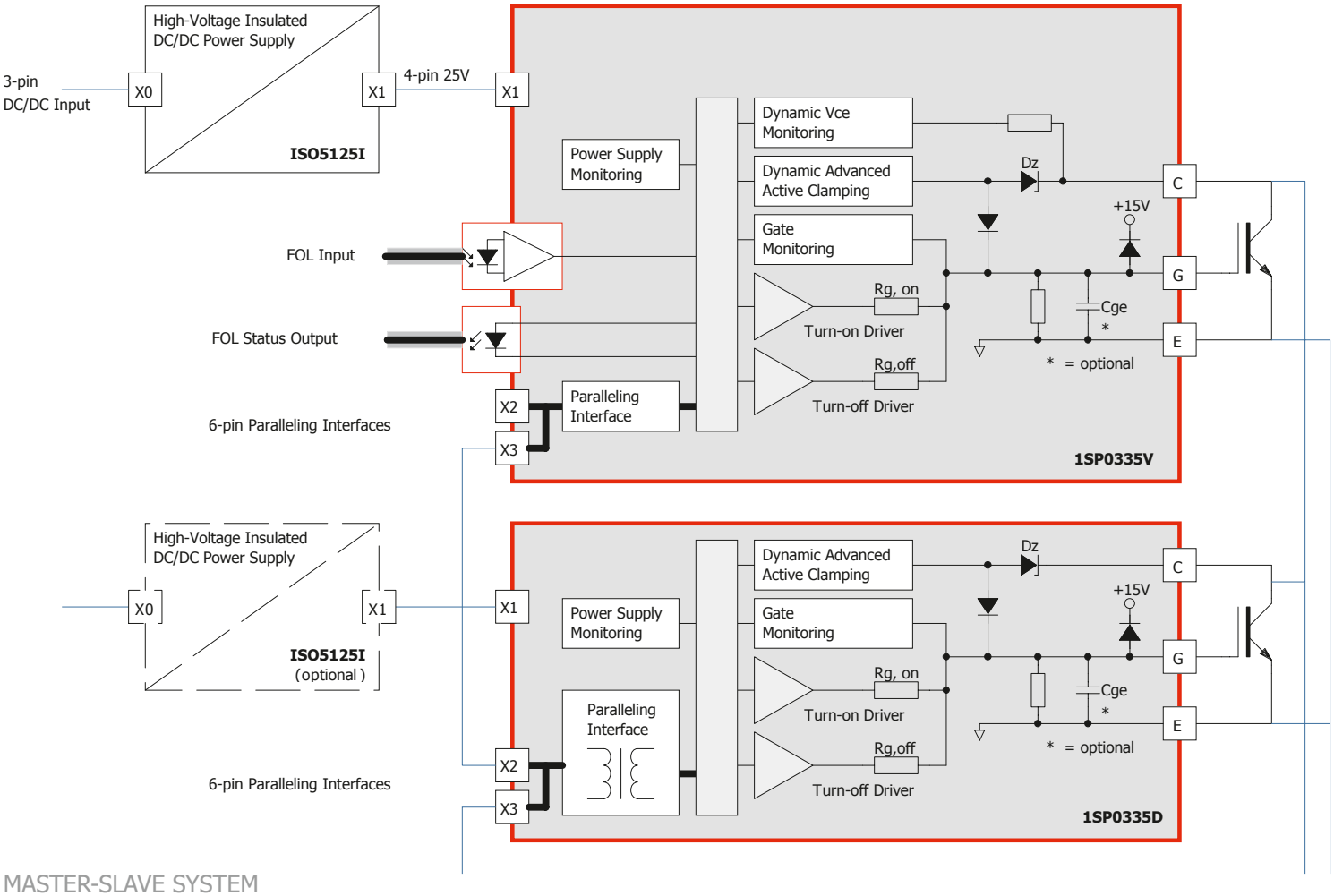
- Single channel driver
- Compact Plug-and-Play solution
- Fibre-optic interfaces
- +15 V (regulated)/-10 V gate driving
- Direct paralleling of IGBTs
- 2-level and multilevel topologies
- Dynamic IGBT short-circuit protection
- Dynamic Advanced Active Clamping DAAC
- Supply under-voltage lockout
- Creepage and clearances acc. IEC 60077-1
- UL compliant
- Superior EMC
- Easy mounting directly onto the IGBT
- Extremely reliable, long service life

KEY DATA OVERVIEW

Parameter	Min	Typical	Max	Unit
Nominal supply voltage f_{IN} [1]		25		V
Supply current 1SP0335x2Mx @ f_{IN}=0 Hz		45		mA
per additional 1SP0335D2Sx @ f_{IN}=0 Hz		20		mA
Output power (1SP0335V2Mx)		3.5		W
Output power (1SP0335D2Sx)		3.3		W
Gate voltage		+15/-10		V
Peak output current (gate current)	-35		+35	A
Switching frequency f_{IN} [2]	0		30	kHz
Duty cycle	0		100	%
Turn-on delay		190		ns
Turn-off delay		185		ns
Operating temperature	-40		+85	degC

[1] 25 V is the nominal output voltage of the ISO5125I power supply. The power supply works with nominal 15 V input voltage.
[2] Maximum switching frequency depends on the IGBT gate charge. See data sheet for the value of a specific driver.

BASIC SCHEMATIC OF THE 1SP0335 DRIVER SERIES



MASTER-SLAVE SYSTEM 1SP0335 SERIES

The master (1SP0335V or 1SP0335S) can be used as perfect standalone driver without a slave to drive IGBT modules without parallel connection or with up to three 1SP0335D slaves, to drive up to four parallel-connected IGBT modules. Paralleling is achieved by simply connecting the master and slaves via the provided paralleling interfaces X2 and X3, which are identical.

In contrast to the other SCALE™-2 plug-and-play drivers, the drivers of the 1SP0335 family are modular in the sense that the driver card and power supply (DC/DC converter) are two separate units. Thanks to this modular concept, any driver unit that was developed to match a specific IGBT module can be used for any required insulation specifications. Only the separate power supply unit ISO5125I must be chosen to a specific application.