

## 1SP0635 SCALE™-2 Plug-and-Play IGBT Driver



**1SP0635 Series**  
Single-Channel Gate Driver Core 1.2 kV, 1.7 kV and 3.3 kV.  
Supports Direct Paralleling with Master-Slave Principle.

### PRODUCT DESCRIPTION

The new 1SP0635 SCALE™-2 Plug-and-Play drivers are specifically designed for the reliable and safe driving of 130x140 mm and 190x140 mm high-voltage and high-power IGBT modules from the 1200 V to the 3300 V voltage class.

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 (1SP0635V) can be used as a stand-alone driver without a slave to drive a single IGBT module or with up to three 1SP0635D 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 of the DC/DC converter.

The 1SP0635 drivers are based on Power Integrations highly integrated SCALE™-2 chipset. Thanks to SCALE™-2 technology, the new 1SP0635 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, built-in DC/DC converters, 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
- Flexible 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/-10 V gate driving
- Regulated gate voltage
- Direct paralleling of IGBTs
- 2-level and multilevel topologies
- Embedded paralleling capability
- Dynamic IGBT short-circuit protection
- Dynamic Advanced Active Clamping DAAC
- Built-in isolated DC/DC converter
- 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		15		V
Supply current 1SP0635x2Mx @ $f_{IN}=0$ Hz		120		mA
Per additional 1SP0635D2Sx @ $f_{IN}=0$ Hz		35		mA
Supply current, full load 1SP0635x2Mx		325		mA
Output power (1SP0635V2Mx or 1SP0635SMx)		3		W
Output power (1SP0635D2Sx)		2.6		W
Gate voltage		+15/-10		V
Peak output current (gate current)	-35		+35	A
Switching frequency $f_{IN}$ <sup>1)</sup>	0		30	kHz
Duty cycle	0		100	%
Turn-on delay		190		ns
Turn-off delay		185		ns
Creepage distance primary-secondary	21			mm
Clearance distance primary-secondary	21			mm
Dielectric test voltage (3.3 kV versions)	6000			V <sub>AC</sub>
Partial discharge extinction voltage (3.3 kV versions)	3630			V <sub>peak</sub>
Operating temperature	-40		+85	degC

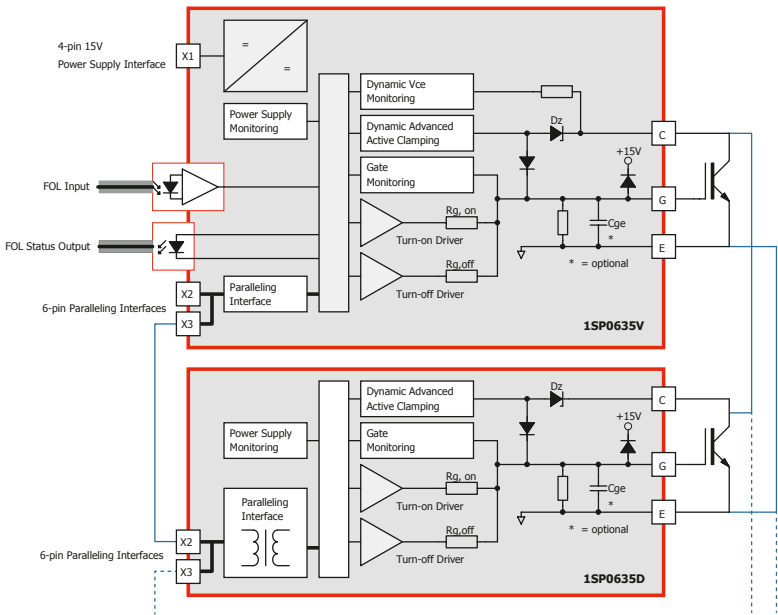
<sup>1)</sup> Maximum switching frequency depends on the IGBT gate charge. See data sheet for the value of a specific driver.

BASIC SCHEMATIC OF THE 1SP0635 DRIVER SERIES

MASTER-SLAVE SYSTEM  
1SP0635 SERIES

The master (1SP0635V or 1SP0635S) can be used as perfect standalone driver without a slave to drive IGBT modules without parallel connection or with one to three 1SP0635D 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.



ORDERING INFORMATION 1SP0635 DRIVER SERIES

	V-Type (Master)	S-Type (Master)	D-Type (Slave) <sup>2)</sup>
Type designation plus	1SP0635V2M1-xx	1SP0635S2M1-xx	1SP0635D2S1-xx
xx: Voltage basic type <sup>1)</sup> or xx: Specific module type	xx = 12 (1200 V) xx = 17 (1700 V) xx = 33 (3300 V) e.g. 5SNA1200E330100		
Modul package	IHM 130/190		
Input signal interface	Versatile FOL Input/Output	ST FOL Input/Output	n.a.
On-board connector	HFBR1522ETZ/2522ETZ	HFBR1412Z/2412Z	n.a.
Bus interface	X2/X3		
On-board connector	MBCON-6-1-0		
Connecting cable	MBC61-xxx-0 (xxx=030,050,070,110) <sup>3)</sup>		
Power supply	X1		n.a.
User-board connector	Right angle MBCON-4-1-0; vertical MBCON-4-2-0		n.a.
Connecting cable	MBC41-xxx-0 (xxx=035,045,070) <sup>3)</sup>		n.a.

<sup>1)</sup> Gate resistors have to be soldered by customer <sup>2)</sup> Only for parallel operation, needs master for control <sup>3)</sup> Cable length in cm