1SP0335D2Sx-FZ750R65KE3
Target Data Sheet

Compact, high-performance, plug-and-play single-channel IGBT driver based on SCALE-2 technology for parallel-connected modules in 2-level, 3-level and multilevel converter topologies

Abstract

The SCALE-2 plug-and-play driver 1SP0335D2Sx-FZ750R65KE3 is a compact single-channel intelligent gate driver designed for Infineon's HVI IGBTs FZ750R65KE3. The driver is to be used in conjunction with 1SP0335x2Mx-FZ750R65KE3 (master) to drive up to 3 parallel-connected IGBT modules FZ750R65KE3.

For drivers adapted to other types of high-power and high-voltage IGBT modules, refer to

www.IGBT-Driver.com/go/plug-and-play

Features

- ✓ Plug-and-play solution
- ✓ Allows parallel connection of IGBT modules
- ✓ For 2-level, 3-level and multilevel topologies
- ✓ Built-in interface to 1SP0335x2Mx
- ✓ Duty cycle 0… 100%
- ✓ Active clamping of V_{ce} at turn-off
- ✓ Monitoring of supply voltage
- ✓ Monitoring of gate voltage
- ✓ Extremely reliable; long service life
- ✓ Shortens application development time
- ✓ Suitable for FZ750R65KE3

Applications

- ✓ Traction
- ✓ Railroad power supplies
- ✓ Light rail vehicles
- ✓ HVDC
- ✓ Flexibel AC transmission systems (FACTS)
- ✓ Medium-voltage converters
- ✓ Industrial drives
- ✓ Wind-power converters
- ✓ Medical applications
- ✓ Research
- ✓ and many others

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Safety Notice!

The data contained in this data sheet is intended exclusively for technically trained staff. Handling all high-voltage equipment involves risk to life. Strict compliance with the respective safety regulations is mandatory!

Any handling of electronic devices is subject to the general specifications for protecting electrostatic-sensitive devices according to international standard IEC 60747-1, Chapter IX or European standard EN 100015 (i.e. the workplace, tools, etc. must comply with these standards). Otherwise, this product may be damaged.

Important Product Documentation

This data sheet contains only product-specific data. For a detailed description, must-read application notes and common data that apply to the whole series, please refer to "Description & Application Manual for 1SP0335 SCALE-2 IGBT Drivers" on www.IGBT-Driver.com/go/1SP0335.

When applying SCALE-2 plug-and-play drivers, please note that these drivers are specifically adapted to a particular type of IGBT module. Therefore, the type designation of SCALE-2 plug-and-play drivers also includes the type designation of the corresponding IGBT module. These drivers are not valid for IGBT modules other than those specified. Incorrect use may result in failure.

Mechanical Dimensions

Dimensions: See the relevant "Description and Application Manual"

Mounting principle: Connected to IGBT module with screws

Electrical Connectors

Interface	Remarks	Part type #
Bus connectors	On-board connectors (Note 1)	214013

Absolute Maximum Ratings

Parameter	Remarks	Min	Max	Unit
Gate peak current I_{out}	Note 2	-35	+35	A
Gate output power	Ambient temperature <70°C (Note 3)		t.b.d.	W
	Ambient temperature 85°C (Note 3)		2	W
Switching frequency F			t.b.d.	kHz
Max. emitter-emitter voltage	Between slave and master (Note 4)		200	V
|dV/dt|	Between slave and master (Note 5)		t.b.d.	kV/µs
Max. interface current	X2 and X3, total rms value (Note 6)		4	A_{rms}
	X2 and X3, total peak value (Note 6)		20	A_{peak}
DC-link voltage	Note 7		4400	V
Operating temperature	Note 12	-40	+70	°C
Storage temperature		-40	+90	°C

Electrical Characteristics

Transformer interface	Remarks	Min	Typ	Max	Unit
Coupling capacitance C_{io}	Signal transformer interface		t.b.d.		pF

Power Supply Monitoring	Remarks	Min	Typ	Max	Unit
Supply threshold V_{iso}-V_{ee}	Clear fault	12.1	12.6	13.1	V
	Set fault (Note 8)	11.5	12.0	12.5	V
Monitoring hysteresis	Set/clear fault	0.35			V
Supply threshold V_{ee}-V_{COM}	Clear fault	5	5.15	5.3	V
	Set fault (Note 8)	4.7	4.85	5	V
Monitoring hysteresis	Set/clear fault	0.15			V

Bus from 1SP0335x2Mx	Remarks	Min	Typ	Max	Unit
Supply voltage			VDC		V
Turn-on command	To COM		15		V
Turn-off command	To COM		0		V

Timing Characteristics	Remarks	Min	Typ	Max	Unit
Output rise time $t_{r(out)}$	G to E (Note 9)		t.b.d.		ns
Output fall time $t_{f(out)}$	G to E (Note 9)		t.b.d.		ns

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Gate output	Remarks	Min	Typ	Max	Unit
Turn-on gate resistor $R_{g(on)}$	Note 10		1		Ω
Turn-off gate resistor $R_{g(off)}$	Note 10		7.5		Ω
Auxiliary gate capacitor C_{ge}			not assembled		nF
Gate voltage at turn-on	Note 11		15		V
Gate-voltage at turn-off	Note 11		-10		V
Gate resistance to emitter			22		kΩ

All data refer to +25°C and V_{DC} = 25V unless otherwise specified

Footnotes to the Key Data

1) This connector is to be used to connect 1SP0335D2Sx-xxx (slaves) to 1SP0335x2Mx-xxx (master). Recommended cable: order code 839076 (length 500mm, connectors on both sides). Refer to www.IGBT-Driver.com/go/erni.
2) The gate current is limited by the gate resistors located on the driver.
3) If the specified value is exceeded, this indicates a driver overload. It should be noted that the driver is not protected against overload. From 70°C to 85°C, the maximum permissible output power can be linearly interpolated from the given data.
4) The max. dynamic voltage between auxiliary emitter of the master (1SP0335x2Mx-xxx) and auxiliary emitter of the connected slaves (1SP0335x2Mx-xxx) due to asymmetrical operation at turn-on and turn-off must be limited to the given value.
5) Max. allowed rate of change of auxiliary emitter voltage of the master (1SP0335x2Mx-xxx) and auxiliary emitter of the connected slaves (1SP0335x2Mx-xxx). This specification guarantees that the drive information will be transferred reliably even with high rate of change of auxiliary emitter voltages (asymmetrical operation).
6) Dynamic voltages between auxiliary emitter of the master (1SP0335x2Mx-xxx) and auxiliary emitter of the connected slaves (1SP0335x2Mx-xxx) at turn-on and turn-off lead to equalizing currents over the bus X2 or X3 to the master. The peak and the rms value of the resulting current must be limited to the given value.
7) This limit is due to active clamping. Refer to "Description & Application Manual for 1SP0335 SCALE-2 IGBT Drivers". Note that a dynamic active clamping function will be implemented in later series. It will allow to increase slightly the max. DC-Link voltage when the IGBT is not switching e.g. in case of emergency turn-off.
8) Undervoltage monitoring of the supply voltage (Viso to Vee and Vee to COM which correspond with the approximate turn-on and turn-off gate-emitter voltages). If the corresponding voltage drops below this limit, the IGBT is switched off. If the IGBT was turned on, a fault will be generated by the gate-monitoring on the master which will turn-off all paralleled IGBT after the corresponding delay.
9) Refers to the direct output of the gate drive unit (excluding the delay of the gate resistors).
10) The gate resistors can be leaded or surface mounted. CONCEPT reserves the right to determine which type will be used. Typically, higher quantities will be produced with SMD resistors and small quantities with leaded resistors.
11) The driver supply voltage VDC is split into two distinct voltages on the driver. The first one is the turn-on voltage which is regulated at about 15V. The difference between VDC and the turn-on voltage is the turn-off voltage which is not regulated and mainly dependent on the driver input voltage VDC.
12) Only valid for ENG samples. The temperature range will be increased to 85°C in later series.

Legal Disclaimer

This data sheet specifies devices but cannot promise to deliver any specific characteristics. No warranty or guarantee is given – either expressly or implicitly – regarding delivery, performance or suitability.

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Ordering Information

The general terms and conditions of delivery of CT-Concept Technologie AG apply.

Interface	CONCEPT Driver Type #	Related IGBT
Electrical interface to 1SP0335x2M0	1SP0335D2S0-FZ750R65KE3	FZ750R65KE3

Product home page: www.IGBT-Driver.com/go/1SP0335

Refer to www.IGBT-Driver.com/go/nomenclature for information on driver nomenclature

Information about Other Products

For other drivers, evaluation systems product documentation and application support

Please click: www.IGBT-Driver.com

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