

2SC0535T SCALE™-2 IGBT Gate Driver Core



2SC0535T-33

Dual-Channel IGBT Driver for 1.7 kV - 3.3 kV IGBTs.

PRODUCT DESCRIPTION

The driver is designed for industrial and traction applications requiring high reliability. The 2SC0535T drives all standard high-voltage IGBT modules up to 3300 V. Its embedded paralleling capability allows easy inverter design covering higher power ratings. Multi-level topologies with 1700 V IGBTs with higher requirements on the isolation can also be easily supported by 2SC0535T. The SCALE™-2 driver core 2SC0535T combines unrivalled compactness with broad applicability and cost efficiency.

The 2SC0535T is the most compact driver core in its voltage and power range, featuring a footprint of only 76.5 mm x 59.2 mm and an insertion height of max. 26 mm. It allows even the most restricted insertion spaces to be efficiently used. Compared with conventional drivers, the highly integrated SCALE™-2 chipset allows about 85 % of components to be dispensed with. This advantage is impressively reflected in increased reliability at simultaneously minimized cost.

The 2SC0535T combines a complete dual-channel driver core with all necessary safety features, such as short-circuit protection, advanced active clamping, an isolated DC/DC converter as well as supply voltage monitoring. Each of the two output channels is

electrically isolated from the primary side and the other secondary channel.

An output current of 35 A and 5 W drive power is available per channel, making the 2SC0535T an ideal driver platform for both high-power modules and parallel circuits. In dedicated IGBT mode, the driver provides a gate voltage swing of +15 V/-10 V. The turn-on voltage is regulated to maintain stable 15 V regardless of the output power level. Moreover, its temperature range has been increased to -55...85 degC to cover applications requiring lower temperature capability.

APPLICATIONS

- Traction
- Railroad power supplies
- Light rail vehicles
- HVDC
- Flexible AC transmission systems (FACTS)
- Medium-voltage converters
- Wind-power converters
- Industrial drives

KEY BENEFIT

The 2SC0535T is the most compact driver core in its voltage and power range - a cost-effective and compact dual-channel solution for various 3.3 kV applications.

KEY FEATURES

- IGBT blocking voltages up to 3300 V
- 2-level and multilevel topologies
- Embedded paralleling capability
- Switching frequency up to 100 kHz
- Very short delay time of <100 ns
- Small jitter of ±2 ns
- Gate current ±35 A
- +15 V (regulated)/-10 V gate driving
- Interface for 3.3 V...15 V logic level
- Direct and half-bridge modes
- IGBT short-circuit protection
- Supply under-voltage lockout
- Isolated DC/DC converter
- 2 x 5 W output power
- Operating temperature -55...85 degC
- Safe isolation EN50178 and EN50124
- UL compliant
- Superior EMC
- Reliable, long service life

KEY DATA OVERVIEW

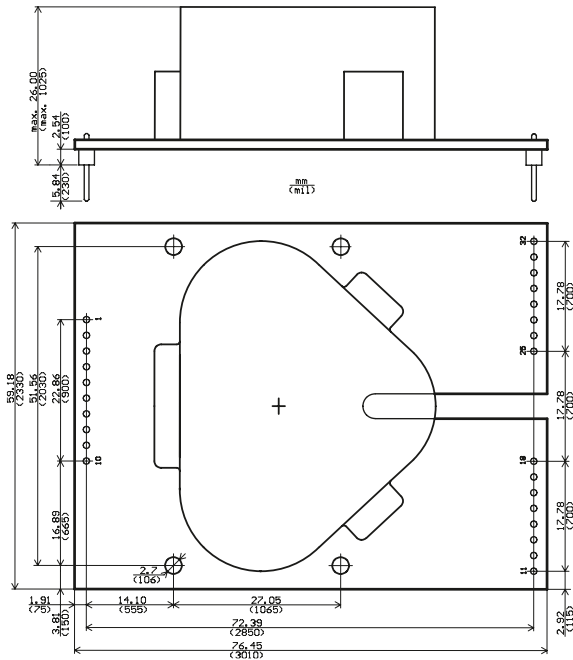
Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN} 0 Hz		87		mA
Supply current, full load		900		mA
Output power per channel		5		W
Gate voltage		+15/-10		V
Peak output current (gate current)	-35		+35	A
Switching frequency f_{IN} ¹⁾	0		100	kHz
Duty cycle	0		100	%
Turn-on delay		70		ns
Turn-off delay		70		ns
Output rise time		20		ns
Output fall time		20		ns
Creepage distance primary-secondary	44			mm
Creepage distance secondary-secondary	22			mm
Clearance distance primary-secondary	25			mm
Clearance distance secondary-secondary	14			mm
Dielectric test voltage	9100			V _{AC}
Partial discharge extinction voltage	4125			V _{peak}
dv/dt immunity, input to output		50		kV/us
Operating temperature	-40		+85	degC

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

MECHANICAL DIMENSIONS 2SC0535T

The primary and secondary side pin grid is 2.54 mm (100 mil) with a pin cross section of 0.64 mm x 0.64 mm. Total outline dimensions of the board are 59.2 mm x 76.5 mm. The total height of the driver is max. 26 mm measured from the bottom of the pin bodies to the top of the populated PCB.

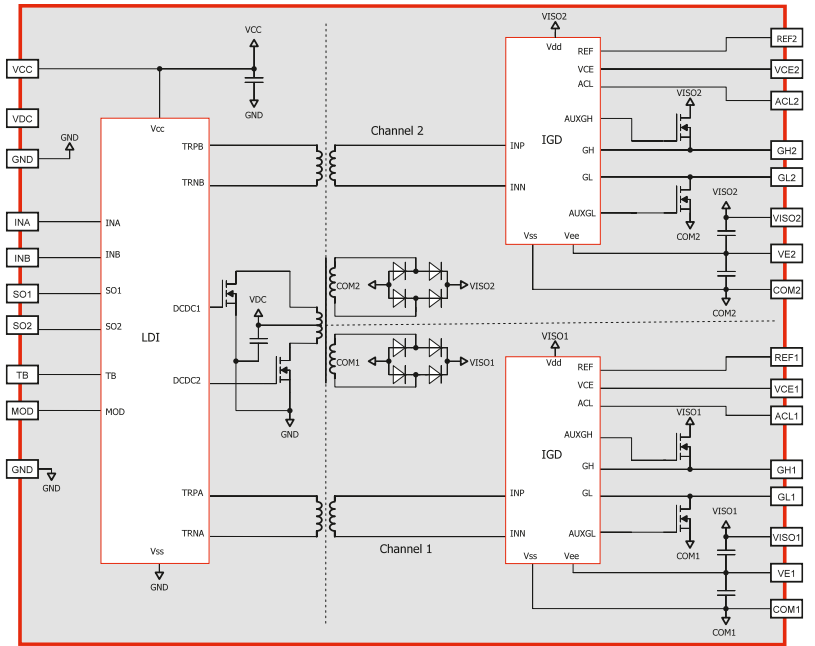
MECHANICAL DRAWING OF 2SC0535T



DRIVING PARALLEL-CONNECTED IGBTs

The driver allows direct parallel connection of any number of IGBT 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.

BASIC SCHEMATIC OF THE 2SC0535T



ORDERING INFORMATION 2SC0535T DUAL-CHANNEL SCALE™-2 GATE DRIVER CORE

Type Designation	Description	Temp degC	Lead free	Pin length
2SC0535T	2SC0535T2A1-33	-40...85	yes	5.84 mm