2SC0435T Description and Application Manual

Dual-Channel High-power Low-cost IGBT Driver

Abstract

The new low-cost SCALE-2 dual-driver core 2SC0435T combines unrivalled compactness with broad applicability. The driver was designed for universal applications requiring high reliability. The 2SC0435T drives all usual high-power IGBT modules up to 1700V. The embedded paralleling capability allows easy inverter design covering higher power ratings. Multi-level topologies are also supported.

The 2SC0435T is the most compact driver core in its power range available for industrial applications, with a footprint of only 57.2 x 51.6mm and an insertion height of max. 20mm. It allows even the most restricted insertion spaces to be efficiently used.

![2SC0435T driver core](image)

Fig. 1 2SC0435T driver core
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**Driver Overview**

The 2SC0435T is a driver core equipped with CONCEPT’s latest SCALE-2 chipset /1/. The SCALE-2 chipset is a set of application-specific integrated circuits (ASICs) that cover the main range of functions needed to design intelligent gate drivers. The SCALE-2 driver chipset is a further development of the proven SCALE technology /2/.

The 2SC0435T targets medium-power, dual-channel IGBT and MOSFET applications. The driver supports switching up to 100kHz at best-in-class efficiency. The 2SC0435T comprises a complete dual-channel IGBT driver core, fully equipped with an isolated DC/DC converter, short-circuit protection, advanced active clamping and supply-voltage monitoring.

Fig. 2  Block diagram of the driver core 2SC0435T
Mechanical Dimensions

**Fig. 3  Mechanical drawing**

The primary side and secondary side pin grid is 2.54mm (100mil) with a pin cross section of 0.64mmx0.64mm. Total outline dimensions of the board are 57.2mmx51.6mm. The total height of the driver is max. 20mm measured from the bottom of the pin bodies to the top of the populated PCB.

Recommended diameter of solder pads: Ø 2mm (79 mil)
Recommended diameter of drill holes: Ø 1mm (39 mil)
## Pin Designation

<table>
<thead>
<tr>
<th>Pin No. and Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Side</strong></td>
<td></td>
</tr>
<tr>
<td>1 VDC</td>
<td>DC/DC converter supply</td>
</tr>
<tr>
<td>2 SO1</td>
<td>Status output channel 1; normally high-impedance, pulled down to low on fault</td>
</tr>
<tr>
<td>3 SO2</td>
<td>Status output channel 2; normally high-impedance, pulled down to low on fault</td>
</tr>
<tr>
<td>4 MOD</td>
<td>Mode selection (direct/half-bridge mode)</td>
</tr>
<tr>
<td>5 TB</td>
<td>Set blocking time</td>
</tr>
<tr>
<td>6 VCC</td>
<td>Supply voltage; 15V supply for primary side</td>
</tr>
<tr>
<td>7 GND</td>
<td>Ground</td>
</tr>
<tr>
<td>8 INA</td>
<td>Signal input A; non-inverting input relative to GND</td>
</tr>
<tr>
<td>9 INB</td>
<td>Signal input B; non-inverting input relative to GND</td>
</tr>
<tr>
<td>10 GND</td>
<td>Ground</td>
</tr>
<tr>
<td><strong>Secondary Sides</strong></td>
<td></td>
</tr>
<tr>
<td>11 ACL1</td>
<td>Active clamping feedback channel 1; leave open if not used</td>
</tr>
<tr>
<td>12 VCE1</td>
<td>V&lt;sub&gt;CE&lt;/sub&gt; sense channel 1; connect to IGBT collector through resistor network</td>
</tr>
<tr>
<td>13 REF1</td>
<td>Set V&lt;sub&gt;CE&lt;/sub&gt; detection threshold channel 1; resistor to VE1</td>
</tr>
<tr>
<td>14 COM1</td>
<td>Secondary side ground channel 1</td>
</tr>
<tr>
<td>15 VE1</td>
<td>Emitter channel 1; connect to (auxiliary) emitter of power switch</td>
</tr>
<tr>
<td>16 VISO1</td>
<td>DC/DC output channel 1</td>
</tr>
<tr>
<td>17 GH1</td>
<td>Gate high channel 1; pulls gate high through turn-on resistor</td>
</tr>
<tr>
<td>18 GL1</td>
<td>Gate low channel 1; pulls gate low through turn-off resistor</td>
</tr>
<tr>
<td>19 Free</td>
<td></td>
</tr>
<tr>
<td>20 Free</td>
<td></td>
</tr>
<tr>
<td>21 Free</td>
<td></td>
</tr>
<tr>
<td>22 ACL2</td>
<td>Active clamping feedback channel 2; leave open if not used</td>
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<tr>
<td>23 VCE2</td>
<td>V&lt;sub&gt;CE&lt;/sub&gt; sense channel 2; connect to IGBT collector through resistor network</td>
</tr>
<tr>
<td>24 REF2</td>
<td>Set V&lt;sub&gt;CE&lt;/sub&gt; detection threshold channel 2; resistor to VE2</td>
</tr>
<tr>
<td>25 COM2</td>
<td>Secondary side ground channel 2</td>
</tr>
<tr>
<td>26 VE2</td>
<td>Emitter channel 2; connect to (auxiliary) emitter of power switch</td>
</tr>
<tr>
<td>27 VISO2</td>
<td>DC/DC output channel 2</td>
</tr>
<tr>
<td>28 GH2</td>
<td>Gate high channel 2; pulls gate high through turn-on resistor</td>
</tr>
<tr>
<td>29 GL2</td>
<td>Gate low channel 2; pulls gate low through turn-off resistor</td>
</tr>
</tbody>
</table>

Note: Pins with the designation “Free” are not physically present.
Recommended Interface Circuitry for the Primary Side Connector

Both ground pins must be connected together with low parasitic inductance. A common ground plane or wide tracks are strongly recommended. The connecting distance between ground pins must be kept at a minimum.

Description of Primary Side Interface

General

The primary side interface of the driver 2SC0435T is very simple and easy to use.

The driver primary side is equipped with a 10-pin interface connector with the following terminals:

- 2 x power-supply terminals
- 2 x drive signal inputs
- 2 x status outputs (fault returns)
- 1 x mode selection input (half-bridge mode / direct mode)
- 1 x input to set the blocking time

All inputs and outputs are ESD-protected. Moreover, all digital inputs have Schmitt-trigger characteristics.

VCC terminal

The driver has one VCC terminal on the interface connector to supply the primary side electronics with 15V.
**VDC terminal**

The driver has one VDC terminal on the interface connector to supply the DC-DC converters for the secondary sides.

VDC should be supplied with 15V. It is recommended to connect the VCC and VDC terminals to a common +15V power supply. In this case the driver limits the inrush current at startup and no external current limitation of the voltage source for VDC is needed.

**MOD (mode selection)**

The MOD input allows the operating mode to be selected with a resistor connected to GND.

**Direct mode**

If the MOD input is connected to GND, direct mode is selected. In this mode, there is no interdependence between the two channels. Input INA directly influences channel 1 while INB influences channel 2. High level at an input (INA or INB) always results in turn-on of the corresponding IGBT. In a half-bridge topology, this mode should be selected only when the dead times are generated by the control circuitry so that each IGBT receives its own drive signal.

**Caution:** Synchronous or overlapping timing of both switches of a half-bridge basically shorts the DC link.

**Half-bridge mode**

If the MOD input is connected to GND with a resistor 71k<R<181k, half-bridge mode is selected. In this mode, the inputs INA and INB have the following functions: INA is the drive signal input while INB acts as the enable input (see Fig. 5).

When input INB is low level, both channels are blocked. If it goes high, both channels are enabled and follow the signal on the input INA. At the transition of INA from low to high, channel 2 turns off immediately and channel 1 turns on after a dead time $T_D$.

![Fig. 5 Signals in half-bridge mode](image)
The value of the dead time $T_D$ is determined by the value of the resistor $R_m$ according to the following formula (typical value):

$$R_m [k\Omega] = 31.5 \cdot T_D [\mu s] + 52.7 \quad \text{where} \quad 0.6\mu s < T_D < 4.1\mu s \text{ and } 72k\Omega < R_m < 182k\Omega$$

**INA, INB (channel drive inputs, e.g. PWM)**

INA and INB are basically drive inputs, but their function depends on the MOD input (see above). They safely recognize signals in the whole logic-level range between 3.3V and 15V. Both input terminals feature Schmitt-trigger characteristics (refer to the driver data sheet /3/). An input transition is triggered at any edge of an incoming signal at INA or INB.

**SO1, SO2 (status outputs)**

The outputs SOx have open-drain transistors. When no fault condition is detected, the outputs have high impedance. An internal current source of 500μA pulls the SOx outputs to a voltage of about 4V when left open. When a fault condition (primary side supply undervoltage, secondary side supply undervoltage, IGBT short-circuit or overcurrent) is detected, the corresponding status output SOx goes to low (connected to GND).

The diodes D1 and D2 must be Schottky diodes and must only be used when using 3.3V logic. For 5V…15V logic, they can be omitted.

The maximum SOx current in a fault condition should not exceed the value specified in the driver data sheet /3/.

Both SOx outputs can be connected together to provide a common fault signal (e.g. for one phase). However, it is recommended to evaluate the status signals individually to allow fast and precise fault diagnosis.

**How the status information is processed**

a) A fault on the secondary side (detection of short-circuit of IGBT module or supply undervoltage) is transmitted to the corresponding SOx output immediately. The SOx output is automatically reset (returning to a high impedance state) after a blocking time $T_B$ has elapsed (refer to $TB$ (input for adjusting the blocking time $T_B$) for timing information).

b) A supply undervoltage on the primary side is indicated to both SOx outputs at the same time. Both SOx outputs are automatically reset (returning to a high impedance state) when the undervoltage on the primary side disappears.

**TB (input for adjusting the blocking time $T_B$)**

The terminal TB allows the blocking time to be set by connecting a resistor $R_B$ to GND (see Fig. 4). The following equation calculates the value of $R_B$ connected between pins TB and GND in order to program the desired blocking time $T_B$ (typical value):

$$R_B [k\Omega] = 1.0 \cdot T_B [ms] + 51 \quad \text{where} \quad 20ms < T_B < 130ms \text{ and } 71k\Omega < R_B < 181k\Omega$$

The blocking time can also be set to a minimum of 9μs (typical) by selecting $R_B = 0 \Omega$. The terminal TB must not be left floating.

Note: It is also possible to apply a stabilized voltage at TB. The following equation is used to calculate the voltage $V_B$ between TB and GND in order to program the desired blocking time $T_B$ (typical value):

$$V_B [V] = 0.02 \cdot T_B [ms] + 1.02 \quad \text{where} \quad 20ms < T_B < 130ms \text{ and } 1.42 < V_B < 3.62V$$
Recommended Interface Circuitry for the Secondary Side Connectors

![Recommended Interface Circuitry for the Secondary Side Connectors](image)

Fig. 6 Recommended user interface of 2SC0435T with advanced active clamping (secondary sides)
Description and Application Manual

**Description of Secondary Side Interfaces**

**General**

Each driver’s secondary side (driver channel) is equipped with an 8-pin interface connector with the following terminals (x stands for the number of the drive channel 1 or 2):

- 1 x DC/DC output terminal VISOx
- 1 x emitter terminal VEx
- 1 x reference terminal REFx for overcurrent or short-circuit protection
- 1x collector sense terminal VCEx
- 1x active clamping terminal ACLx
- 1x turn-on gate terminals GHx
- 1x turn-off gate terminals GLx

All inputs and outputs are ESD-protected.

**DC/DC output (VISOx), emitter (VEx) and COMx terminals**

The driver is equipped with blocking capacitors on the secondary side of the DC/DC converter (for values, refer to the data sheet /3/).

Power semiconductors with a gate charge of up to 3μC can be driven without additional capacitors on the secondary side. For IGBTs or MOSFETs with a higher gate charge, a minimum value of 3µF external blocking capacitance is recommended for every 1μC gate charge beyond 3µC. The blocking capacitors must be placed between VISOx and VEx (C1x in Fig. 6) as well as between VEx and COMx (C2x in Fig. 6). They must be connected as close as possible to the driver’s terminal pins with minimum inductance. It is recommended to use the same capacitance value for both C1x and C2x. Ceramic capacitors with a dielectric strength >20V are recommended.

If the capacitances C1x or C2x exceed 150µF, please contact CONCEPT’s support service.

No static load should be applied between VISOx and VEx, or between VEx and COMx. A static load can be applied between VISOx and COMx if necessary.

**Reference terminal (REFx)**

The reference terminal REFx allows the threshold to be set for short-circuit and/or overcurrent protection with a resistor placed between REFx and VEx. A constant current of 150µA is provided at pin REFx.

**Collector sense (VCEx)**

The collector sense must be connected to the IGBT collector or MOSFET drain with the circuit shown in Fig. 6 in order to detect an IGBT or MOSFET overcurrent or short-circuit.

- It is recommended to dimension the resistor value of $R_{vces}$ in order to get a current of about 0.6-1mA flowing through $R_{vces}$ (e.g. 1.2-1.8MΩ for $V_{DC-LINK}=1200V$). It is possible to use a high-voltage resistor as well as series connected resistor. In any case, the min. creepage distance related to the application should be considered.
The diode D6x must have a very low leakage current and a blocking voltage of > 40V (e.g. BAS416). Schottky diodes must be explicitly avoided.

For more details about the functionality of this feature and the dimensioning of the response time, refer to “VCE monitoring / short-circuit protection” on page 13.

**Active clamping (ACLx)**

Active clamping is a technique designed to partially turn on the power semiconductor as soon as the collector-emitter (drain-source) voltage exceeds a predefined threshold. The power semiconductor is then kept in linear operation.

Basic active clamping topologies implement a single feedback path from the IGBT’s collector through transient voltage suppressor devices (TVS) to the IGBT gate. The 2SC0435T supports CONCEPT’s advanced active clamping, where the feedback is also provided to the driver’s secondary side at pin ACLx: as soon as the voltage on the right side of the 20Ω resistor (see Fig. 6) exceeds about 1.3V, the turn-off MOSFET is progressively switched off in order to improve the effectiveness of the active clamping and to reduce the losses in the TVS. The turn-off MOSFET is completely off when the voltage on the right side of the 20Ω resistor (see Fig. 6) approaches 20V (measured to COMx).

It is recommended to use the circuit shown in Fig. 6. The following parameters must be adapted to the application:

- TVS D1x, D2x: it is recommended to use:
  - 1x440V TVS (or 2x220V TVS) with 600V IGBTs with DC-link voltages up to 400V
  - 2x440V TVS (or 4x220V TVS) with 1200V IGBTs with DC-link voltages up to 800V and
  - 3x440V TVS (or 6x220V TVS) with 1700V IGBTs with DC-link voltages up to 1200V
- Raclx and Caclx: These parameters allow the effectiveness of the active clamping as well as the losses in the TVS to be optimized. It is recommended to determine the value with measurements in the application. Typical values are: Raclx=0…150Ω and Raclx*Caclx=100ns…500ns.
- D3x, D4x and D5x: it is recommended to use Schottky diodes with blocking voltages >35V (>1A depending on the application).

Please note that the 20Ω resistor as well as diodes D3x, D4x and D5x should not be omitted if advanced active clamping is used. If advanced active clamping is not used the 20Ω resistor as well as diodes D3x, D4x can be omitted.

**Gate turn-on (GHx) and turn-off (GLx) terminals**

These terminals allow the turn-on (GHx) and turn-off (GLx) gate resistors to be connected to the gate of the power semiconductor. The GHx and GLx pins are available as separated terminals in order to set the turn-on and turn-off resistors independently without the use of an additional diode. Please refer to the driver data sheet /3/ for the limit values of the gate resistors used.

A resistor between GLx and COMx of 4.7k (other values are also possible) may be used in order to provide a low-impedance path from the IGBT/MOSFET gate to the emitter/source even if the driver is not supplied with power. No static load (e.g. resistors) must be placed between GLx and the emitter terminal VEx.

Note however that it is not advisable to operate the power semiconductors within a half-bridge with a driver in the event of a low supply voltage. Otherwise, a high rate of increase of Vce may cause partial turn-on of these IGBTs.
How Do 2SC0435T SCALE-2 Drivers Work in Detail?

**Power supply and electrical isolation**

The driver is equipped with a DC/DC converter to provide an electrically insulated power supply to the gate driver circuitry. All transformers (DC/DC and signal transformers) feature safe isolation to EN 50178, protection class II between primary side and either secondary side.

Note that the driver requires a stabilized supply voltage.

**Power-supply monitoring**

The driver’s primary side as well as both secondary-side driver channels are equipped with a local undervoltage monitoring circuit.

In the event of a primary-side supply undervoltage, the power semiconductors are driven with a negative gate voltage to keep them in the off-state (the driver is blocked) and the fault is transmitted to both outputs SO1 and SO2 until the fault disappears.

In case of a secondary-side supply undervoltage, the corresponding power semiconductor is driven with a negative gate voltage to keep it in the off-state (the channel is blocked) and a fault condition is transmitted to the corresponding SOx output. The SOx output is automatically reset (returning to a high impedance state) after the blocking time.

**IGBT and MOSFET operation mode**

The driver features two operation modes:

- The first mode is the default IGBT setup with both a positive (regulated) turn-on voltage of 15V (typical) and a second (non-regulated) turn-off voltage (see Fig. 6).

- The second mode has been specifically designed for ultra-fast MOSFET switching. It incorporates a single turn-on voltage only. The turn-off voltage is set to 0V. This MOSFET mode is activated by connecting the secondary-side terminals COMx and VEx. If 2SC0435T drivers are to be used in the MOSFET mode, please consult CONCEPT’s technical support service.
VCE monitoring / short-circuit protection

Each channel of the 2SC0435T driver is equipped with a VCE monitoring circuit. The recommended external circuitry is shown in Fig. 6. A resistor (Rthx in Fig. 6) is used as the reference element for defining the turn-off threshold. The value of the current through Rthx is 150μA (typical). It is recommended to choose threshold levels of about 10V (Rthx values around 68kΩ). In this case the driver will safely protect the IGBT against short-circuit, but not necessarily against overcurrent. Overcurrent protection has a lower timing priority and is recommended to be realized within the host controller.

In order to ensure that the 2SC0435T can be applied as universally as possible, the response time capacitor Cax is not integrated in the driver, but must be connected externally.

During the response time, the VCE monitoring circuit is inactive. The response time is the time that elapses after turn-on of the power semiconductor until the collector/drain voltage is measured (see Fig. 7).

Both IGBT collector-emitter voltages are measured individually. VCE is checked after the response time at turn-on to detect a short circuit or overcurrent. If the measured VCE at the end of the response time is higher than the programmed threshold Vthx, the driver detects a short circuit or overcurrent. The driver then switches off the corresponding power semiconductor. The fault status is immediately transferred to the corresponding SOx output of the affected channel. The power semiconductor is kept in off state (non-conducting) and the fault is shown at pin SOx as long as the blocking time TB is active.

The blocking time TB is applied independently to each channel. TB starts as soon as VCE exceeds the threshold of the VCE monitoring circuit outside the response time span.

The value of the response time capacitors Cax can be determined with the following table in order to set the desired response time (RVDC=1.8MΩ, DC-link voltage VDC-LINK>550V):
Table 1 Typical response time in function of the capacitance $C_{ax}$ and the resistance $R_{thx}$

<table>
<thead>
<tr>
<th>$C_{ax}$ [pF]</th>
<th>$R_{thx}$ [kΩ]/$V_{thx}$ [V]</th>
<th>Response time [μs]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>43 / 6.45</td>
<td>1.2</td>
</tr>
<tr>
<td>15</td>
<td>43 / 6.45</td>
<td>3.2</td>
</tr>
<tr>
<td>22</td>
<td>43 / 6.45</td>
<td>4.2</td>
</tr>
<tr>
<td>33</td>
<td>43 / 6.45</td>
<td>5.8</td>
</tr>
<tr>
<td>47</td>
<td>43 / 6.45</td>
<td>7.8</td>
</tr>
<tr>
<td>0</td>
<td>68 / 10.2</td>
<td>1.5</td>
</tr>
<tr>
<td>15</td>
<td>68 / 10.2</td>
<td>4.9</td>
</tr>
<tr>
<td>22</td>
<td>68 / 10.2</td>
<td>6.5</td>
</tr>
<tr>
<td>33</td>
<td>68 / 10.2</td>
<td>8.9</td>
</tr>
<tr>
<td>47</td>
<td>68 / 10.2</td>
<td>12.2</td>
</tr>
</tbody>
</table>

As the parasitic capacitances on the host PCB may influence the response time it is recommended to measure it in the final design. It is important to define a response time which is smaller than the max. allowed short-circuit duration of the used power semiconductor.

Note that the response time increases at DC-link voltage values lower than 550V and/or higher threshold voltage values $V_{thx}$. The response time will decrease at lower threshold voltage values.

Desaturation protection with sense diodes

Desaturation protection with sense diodes can also be implemented with 2SC0435T drivers. The circuit shown in Fig. 8 should replace the corresponding circuit parts of Fig. 6.

![Fig. 8 Recommended circuit for desaturation protection with sense diodes](image)

It is recommended to use standard network diodes such as 1N4007 for D1 and D2 (2 diodes for 1200V IGBTs, 3 diodes for 1700V IGBTs). D3 should be a Schottky diode with a blocking voltage > 35V.

The value of the resistance $R_{ax}$ can be calculated with the following equation in order to program the desired response time $T_{ax}$ at turn-on:

$$R_{ax} [kΩ] \approx \frac{1000 \cdot T_{ax} [μs]}{C_{ax} [pF] \cdot \ln\left(\frac{15V + |V_{GLx}|}{15V - V_{thx}}\right)}$$
V_{GLx} is the absolute value of the turn-off voltage at the driver output. The value of V_{GLx} depends on the driver load and can be found in the driver data sheet /3/.

Recommended values for C_{ax} and R_{ax} are:

- C_{ax}=100pF...1nF
- R_{ax}=24k\Omega...62k\Omega

Note that the actual V_{CE} threshold voltage is determined by the voltage at pin REFx (150\mu A through R_{thx}) minus the voltage across the 180\Omega resistor as well as the forward voltages across D1 and D2. The voltage of pin VCEx is pulled to COMx at turn-off. As soon as the power semiconductor is turned on, a current mainly determined by R_{ax} flows out of pin VCEx.

Note that the minimum turn-off pulse duration should not be shorter than about T_{min}[ns]=1400*C_{ax}[nF] in order not to significantly reduce the response time for the next coming turn-on pulse.

Example: A resistor with R_{ax}≈46k\Omega is necessary in order to define a response time of 6\mu s with C_{ax}=150pF, R_{thx}=33k\Omega and V_{GL}=9V. The minimum turn-off pulse should be longer than about 210ns.

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**Parallel connection of 2SC0435T**

If parallel connection of 2SC0435T drivers is required, please refer to the application note AN-0904 on www.IGBT-Driver.com/go/app-note.

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**3-level or multilevel topologies**

If 2SC0435T drivers are to be used in 3-level or multilevel topologies, please refer to the application note AN-0901 on www.IGBT-Driver.com/go/app-note.

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**Bibliography**

/1/ “Smart Power Chip Tuning”, Bodo’s Power Systems, May 2007
/2/ “Description and Application Manual for SCALE Drivers”, CONCEPT
/3/ Data sheet SCALE-2 driver core 2SC0435T, CONCEPT

**Note:** These papers are available on the Internet at www.IGBT-Driver.com/go/papers
Description and Application Manual

The Information Source: SCALE-2 Driver Data Sheets

CONCEPT offers the widest selection of gate drivers for power MOSFETs and IGBTs for almost any application requirements. The largest website on gate-drive circuitry anywhere contains all data sheets, application notes and manuals, technical information and support sections: www.IGBT-Driver.com

Quite Special: Customized SCALE-2 Drivers

If you need an IGBT driver that is not included in the delivery range, please don't hesitate to contact CONCEPT or your CONCEPT sales partner.

CONCEPT has more than 20 years experience in the development and manufacture of intelligent gate drivers for power MOSFETs and IGBTs and has already implemented a large number of customized solutions.

Technical Support

CONCEPT provides expert help with your questions and problems: www.IGBT-Driver.com/go/support

Quality

The obligation to high quality is one of the central features laid down in the mission statement of CT-Concept Technologie AG. The quality management system covers all stages of product development and production up to delivery. The drivers of the SCALE-2 series are manufactured to the ISO9001:2000 quality standard.

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.

<table>
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<tr>
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<th>Description</th>
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<td>2SC0435T2A0-17</td>
<td>Dual-channel SCALE-2 driver core</td>
</tr>
</tbody>
</table>

Product home page: [www.IGBT-Driver.com/go/2SC0435T](http://www.IGBT-Driver.com/go/2SC0435T)

Refer to [www.IGBT-Driver.com/go/nomenclature](http://www.IGBT-Driver.com/go/nomenclature) for information on driver nomenclature

Information about Other Products

For other driver cores:

Direct link: [www.IGBT-Driver.com/go/cores](http://www.IGBT-Driver.com/go/cores)

For other drivers, product documentation, evaluation systems and application support

Please click onto: [www.IGBT-Driver.com](http://www.IGBT-Driver.com)

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