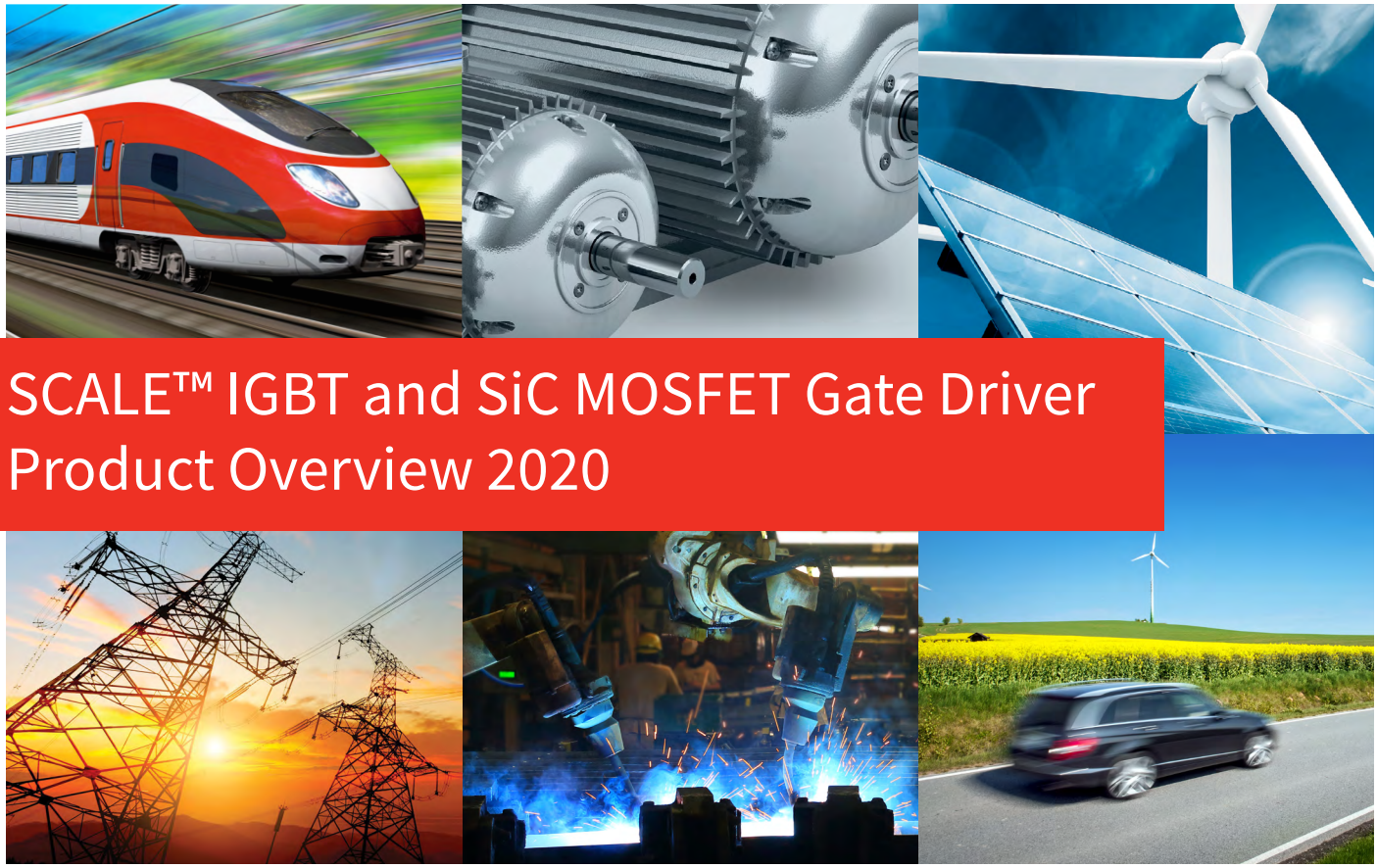
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SCALE™ IGBT and SiC MOSFET Gate Driver Product Overview 2020

www.power.com

ac-dc converters led drivers gate drivers motor drivers

Power Everywhere

As the leading gate driver experts for medium- and high-power inverter systems, Power Integrations continuously invests in technology development, IC packaging, applications expertise and manufacturing excellence. This enables us to deliver high-performance gate driver solutions from 5 kW up to MW for blocking voltages up to 6.5 kV.

As well as addressing our traditional markets—industrial, railway, HVDC, PV—we now have AEC-Q100 qualification for some members of our SCALE-iDriver™ gate driver IC family. This development enables automotive designers to use our leading products in Battery Electric Vehicle (BEV) and Plug-in Hybrid Electric Vehicle (PHEV) applications such as vehicle drivetrain, power conversion, on-board chargers and charging stations. We also offer optimized products for emerging SiC MOSFET applications, addressing that burgeoning market, and we have added new SCALE™-2 solutions for PrimePack3+™ and HVDC designs. These are just a few highlights in this new catalog.

By expanding our portfolio with conformal coating and burn-in services, we have further improved the robustness of our gate drivers—which were already renowned in industry for long life and operational safety—and we are able to respond faster to customer-specific requirements. With the implementation of a new state-of-the-art production board test system, we have further increased product reliability and now provide high-quality PCBA testing at the highest fault coverage rate without sacrificing throughput which is demanded by customers in all our key market segments—automotive, industrial, railway, HVDC, PV, etc.

Check out this catalog to see if we have a solution for your application. If you cannot find an exact match for your requirement, we welcome the opportunity to develop a custom or tailored solution. Please contact your local sales office to discuss your specific needs.

Power Integrations – Power Everywhere.

Best regards,

Thomas Simonis
VP - Gate Drivers - Power Integrations

PI Databook

Notes at Your Fingertips



All Power Integrations Products

- AC-DC converters
- LED drivers
- Gate drivers
- Motor drivers

Useful Product Information

- Technical documents including data sheets and application notes

Convenient and Easy to Use

- Intuitive interface
- Available in five languages
- Download, print, email, and share product documents

Download on the App Store

GET IT ON Google Play

Free download on iOS or Android
Scan the QR Code to Begin

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Gate Driver Isolation [1]



[1] Gate Driver Isolation Coordination by IEC 60664-1, IEC 61800-5-1, IEC 60077-1

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SCALE-iDriver™ Gate Driver ICs

Power Integrations is a technology and market leader in mid- and high-power gate drivers. Using highly integrated technology, the company's gate drivers employ up to 85% fewer components than other commonly-available solutions. Power Integrations has 30 years' history of supporting demanding industries such as railway, power generation, power transmission and industrial automation with products that combine outstanding reliability, best-in-class performance and competitive pricing.

Innovative Technology

The SCALE-iDriver family of gate driver ICs, optimized for driving both IGBTs and SiC MOSFETs, are the first products to bring Power Integrations' pioneering FluxLink™ magneto-inductive bi-directional communications technology for driver applications ranging from 650 V up to 1700 V.

- FluxLink technology eliminates the need for short-lived opto-electronics and associated compensation circuitry, thereby enhancing operational stability while reducing system complexity.
- Advanced system safety and protection features, commonly found in medium- and high-voltage applications, enhance product reliability.
- Innovative eSOP™ package features 9.5 mm of creepage and a Comparative Tracking Index (CTI) = 600, ensuring substantial operating voltage margin and high system reliability.

Automotive Applications

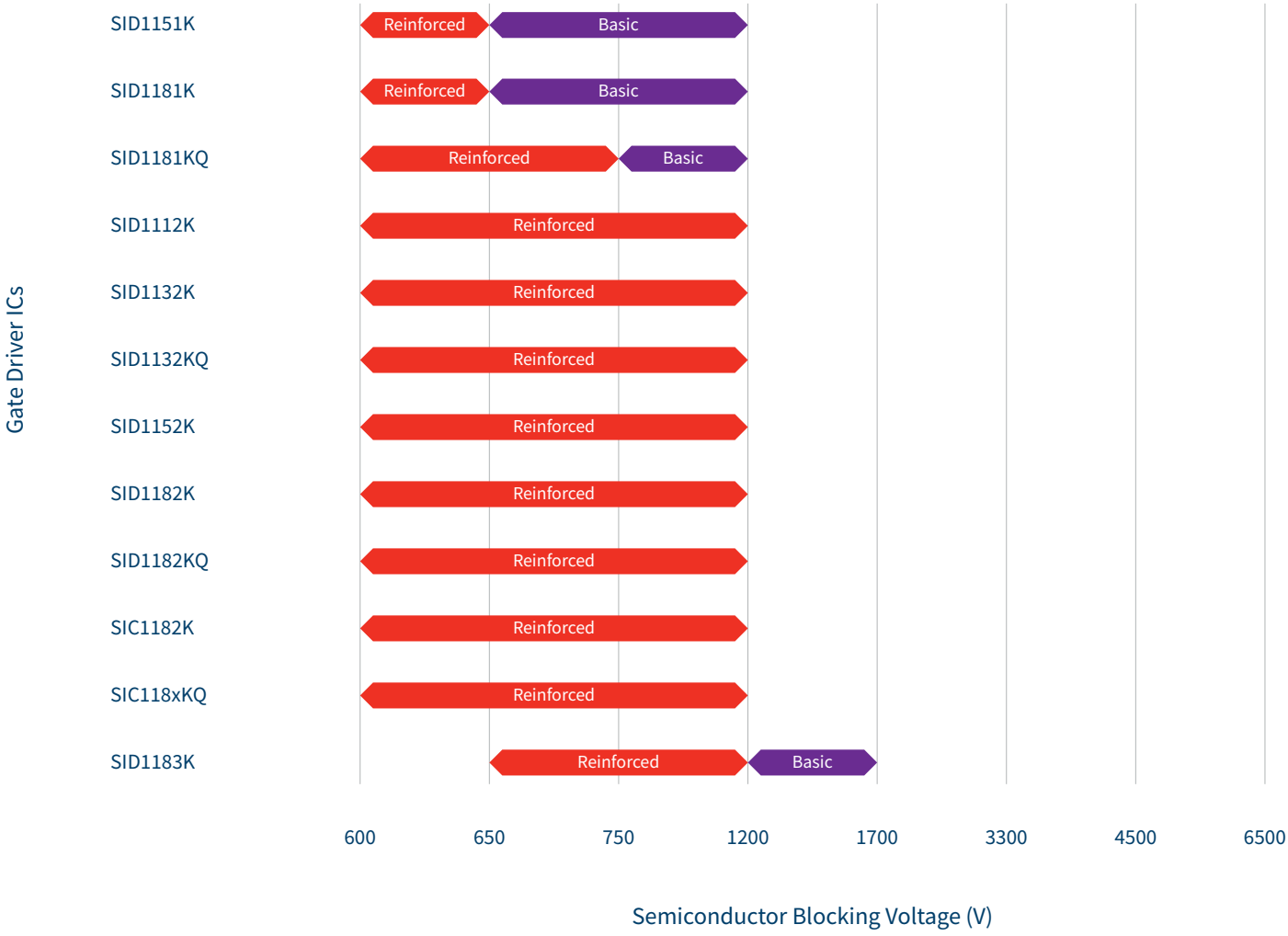
Power Integrations SCALE-iDriver ICs for automotive applications (SID11xxKQ / SIC118xKQ) are AEC-Q100 qualified, can drive up to 8 A and support 600 V, 650 V, 750 V and 1200 V IGBT and SiC MOSFET inverter designs up to several hundred kW.

SCALE-iDriver Gate Driver ICs

The SCALE-iDriver family of galvanic isolated single-channel gate driver ICs ranges in output current from 1 A up to 8 A. SCALE-iDriver devices are optimized for driving IGBT and SiC MOSFETs from 600 V to 1700 V, and enable inverters to be built up to 110 kW using only a few external components.

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Gate Driver Isolation [1]



[1] Gate Driver Isolation Coordination according to IEC 60664-1 and VDE 0884-10

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1200 V SCALE-iDriver™ Gate Driver SID1112K, SID1132K, SID1152K, SID1182K

Galvanically-Reinforced Isolated Single-Channel Gate Driver IC; Output Currents from 1 A to 8 A; Drives Inverters Up to 110 kW Using Only a Few External Components

Applications

- Industrial motor drives (GPD, VFD, AC drives and servo drives)
- Uninterruptible power supplies (UPS)
- Photovoltaic inverters
- Industrial (welding, health care, plasma, inductive heating)
- EV charger (supply and station)

Certification

- Reinforced isolation according to VDE 0884-10 and IEC 60747-10
- UL 1577 certified: E358471 complies with IEC 61000-4-8 and IEC 61000-4-9 standards

Key Features

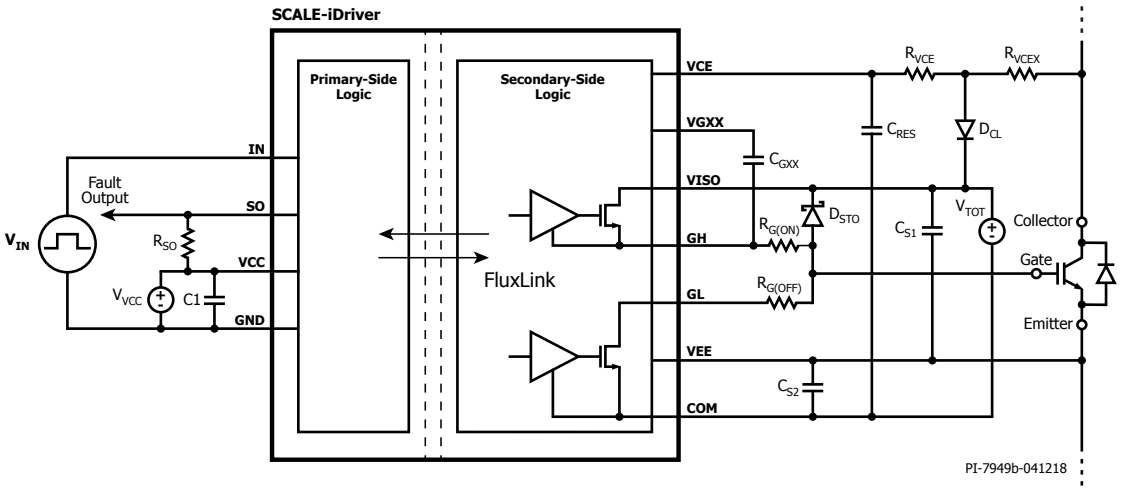
- eSOP™ package: CTI 600, 9.5 mm creepage and clearance
- Increased reliability, smaller size, lower system cost
- SCALE technology reduces component count and system cost; smaller and simpler PCB
- ASSD function controls di / dt in desaturation without adjustment or development work
- VEE regulator avoids parasitic turn on
- Splitted outputs only require a unipolar power supply for secondary side

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Key Data Overview

Parameter	Min	Typical	Max	Unit
Primary-side supply voltage (V_{VCC})	4.75	5	5.25	V
Secondary-side total supply voltage (V_{TOT})	22	25	28	V
Maximum gate sourcing peak current (I_{GH})		7.3		A
Maximum gate sinking peak current (I_{GL})		8		A
Operating switching frequency (f_S)	0	20	75	kHz
Propagation delay jitter			±5	ns
Turn-on propagation delay time ($t_{P(LH)}$)		253		ns
Turn-off propagation delay time ($t_{P(HL)}$)		262		ns
Minimum turn-on and -off PWM pulses extension ($t_{GE(MIN)}$)			650	ns
Creepage distance primary-secondary (L2)	9.5			mm
Clearance distance primary-secondary (L1)	9.5			mm
Tracking resistance (Comparative Tracking Index - CTI)		600		
Maximum package dissipated power (P_S)			1.79	W
100% production withstanding isolation voltage test (V_{TEST})	6			kV_{RMS}
100% production partial discharge test ($V_{PD(m)}$)	2652			V_{PEAK}

Application Circuit (SID11x2K)



Reference Designs

gate-driver.power.com/design-support/reference-designs

RDHP	Product	Technology	Channels	Voltage Class	Power Module Package	Related Power Module	Interface
RDHP-1526	SID1182K	SCALE-iDriver	2	1200 V	Any	Up to 3600 A	Electrical (5 V logic)
RDHP-1608	SID1182K	SCALE-iDriver	2	1200 V	Any	Up to 600 A	Electrical (5 V logic)

Ordering Information

Part Number	Rated Current	IGBT Collector Current Ratings	Ordering Code Tubes – 48 pcs	Ordering Code Tape & Reel – 1000 pcs
SID1112K	1 A	Up to 50 A	SID1112K	SID1112K-TL
SID1132K	2.5 A	Up to 100 A	SID1132K	SID1132K-TL
SID1152K	5 A	Up to 300 A	SID1152K	SID1152K-TL
SID1182K	8 A	Up to 600 A	SID1182K	SID1182K-TL

600 / 650 V SCALE-iDriver™ Gate Driver SID1151K, SID1181K



Up to 8 A Single-Channel IGBT / SiC MOSFET Gate Driver Providing Reinforced Galvanic Isolation Up to 650 V Blocking Voltage and Basic Isolation Up to 1200 V

Applications

- Delivery vehicles
- General purpose drives
- General industrial equipment

Certification

- Reinforced isolation according to VDE 0884-10 and IEC 60747-10
- UL 1577 certified: E358471 complies with IEC 61000-4-8 and IEC 61000-4-9 standards

Key Features

- Split outputs providing up to 8 A peak drive current
- Integrated FluxLink™ technology
- Rail-to-rail stabilized output voltage
- Unipolar supply voltage for secondary-side
- Suitable for 600 V / 650 V / 1200 V IGBT and SiC MOSFET switches
- Providing basic isolation up to 1200 V blocking voltage
- Up to 75 kHz switching frequency
- -40 °C to 125 °C operating ambient temperature
- High common-mode transient immunity
- eSOP™ package with 9.5 mm creepage and clearance

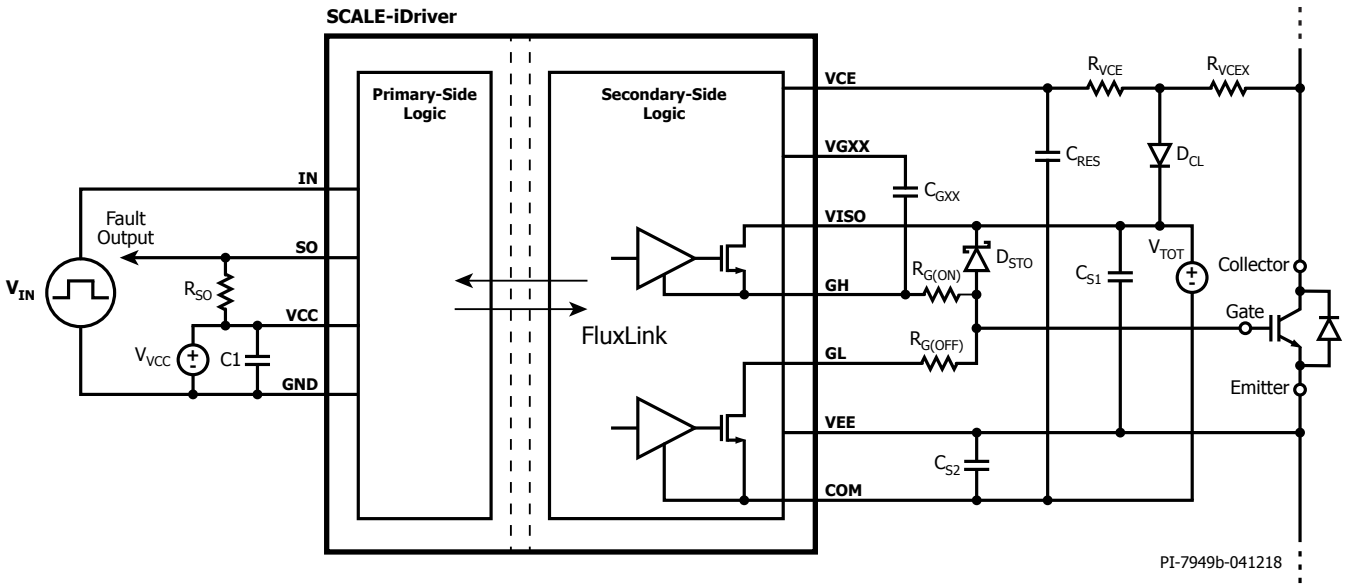
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Key Data Overview

Parameter [1]	Min	Typical	Max	Unit
Primary-side supply voltage (V_{VCC})	4.75	5	5.25	V
Secondary-side total supply voltage (V_{TOT})	22	25	28	V
Maximum gate sourcing peak current (I_{GH})		7.3		A
Maximum gate sinking peak current (I_{GL})		8		A
Operating switching frequency (f_S)	0	20	75	kHz
Propagation delay jitter			±5	ns
Turn-on propagation delay time ($t_{P(LH)}$)		253		ns
Turn-off propagation delay time ($t_{P(HL)}$)		262		ns
Minimum turn-on and -off PWM pulses extension ($t_{GE(MIN)}$)			650	ns
Creepage distance primary-secondary (L2)	9.5			mm
Clearance distance primary-secondary (L1)	9.5			mm
Tracking resistance (Comparative Tracking Index - CTI)		600		
Maximum package dissipated power (P_S)			1.79	W
100% production withstanding isolation voltage test (V_{TEST})	6			kV_{RMS}
100% production partial discharge test ($V_{PD(m)}$)	1800			V_{PEAK}

[1] Parameters apply to SID1181K

Application Circuit (SID11x1K)



Ordering Information

Part Number	Rated Current	IGBT Collector Current Ratings	Ordering Code Tubes – 48 pcs	Ordering Code Tape & Reel – 1000 pcs
SID1151K	5 A	Up to 300 A	SID1151K	SID1151K-TL
SID1181K	8 A	Up to 600 A	SID1181K	SID1181K-TL

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1700 V SCALE-iDriver™ Gate Driver SID1183K



Single-Channel Gate Driver for Up to 1700 V Application with Basic Isolation

Applications

- VFD (Variable Frequency Drives), AC drives from 500 V to 690 V
- Photovoltaic inverters
- Medium Voltage Drives (MVD) and LV STATCOM
- Commercial e-mobility (E-bus, E-truck, CAV)
- Railway auxiliary inverters

Certification

- Basic isolation according to VDE 0884-10 and IEC 60747-10
- UL 1577 certified: E358471 complies with IEC 61000-4-8 and IEC 61000-4-9 standards

Key Features

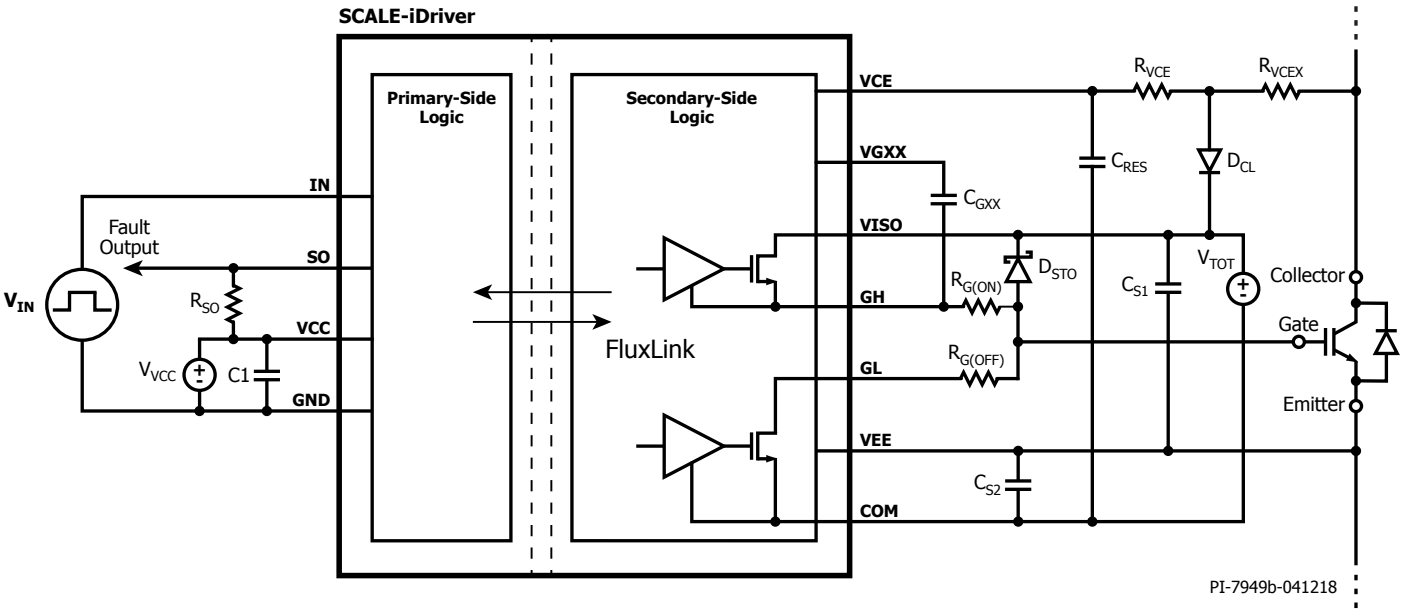
- Full platform solution: same device across the whole voltage range from 1200 V to 1700 V
- FluxLink™ provides basic isolation for applications using 1700 V IGBTs
- eSOP™ package provides CTI 600 and >9.5 mm creepage and clearance distance
- SCALE features reduced component count and system cost
- ASSD function controls di / dt of the semiconductor in desaturation without adjustment or development work
- VEE regulator avoids parasitic turn on
- Switching up to 1700 V and 600 A IGBT modules without external boosters (ASSD function still effective)

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Key Data Overview

Parameter	Min	Typical	Max	Unit
Primary-side supply voltage (V_{VCC})	4.75	5	5.25	V
Secondary-side total supply voltage (V_{TOT})	22	25	28	V
Maximum gate sourcing peak current (I_{GH})		7.3		A
Maximum gate sinking peak current (I_{GL})		8		A
Operating switching frequency (f_S)	0	20	75	kHz
Propagation delay jitter			±5	ns
Turn-on propagation delay time ($t_{P(LH)}$)		253		ns
Turn-off propagation delay time ($t_{P(HL)}$)		262		ns
Minimum turn-on and -off PWM pulses extension ($t_{GE(MIN)}$)			650	ns
Creepage distance primary-secondary (L2)	9.5			mm
Clearance distance primary-secondary (L1)	9.5			mm
Tracking resistance (Comparative Tracking Index - CTI)		600		
Maximum package dissipated power (P_S)			1.79	W
100% production withstanding isolation voltage test (V_{TEST})	6			kV_{RMS}
100% production partial discharge test ($V_{PD(m)}$)	2550			V_{PEAK}

Application Circuit (SID1183K)



Reference Design

gate-driver.power.com/design-support/reference-designs

RDHP	Product	Technology	Channels	Voltage Class	Power Module Package	Related Power Module	Interface
RDHP-1702	SID1183K	SCALE-iDriver	2	1700 V	Any	N/A	Electrical (5 V logic)

Ordering Information

Part Number	Rated Current	IGBT Collector Current Ratings	Ordering Code Tubes – 48 pcs	Ordering Code Tape & Reel – 1000 pcs
SID1183K	8 A	Up to 600 A	SID1183K	SID1183K-TL

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SCALE-iDriver™ Gate Driver SID1102K

Single-Channel IGBT and SiC MOSFET Gate Driver in eSOP™ Package with Reinforced Galvanic Isolation

Applications

- Uninterruptible power supplies (UPS)
- VFD (Variable Frequency Drives), AC drives
- Photovoltaic inverters
- Commercial air conditioners
- EV charger (supply and station)
- Welding

Certification

- Reinforced isolation according to VDE 0884-10 and IEC 60747-10
- UL 1577 certified: E358471 complies with IEC 61000-4-8 and IEC 61000-4-9 standards

Key Features

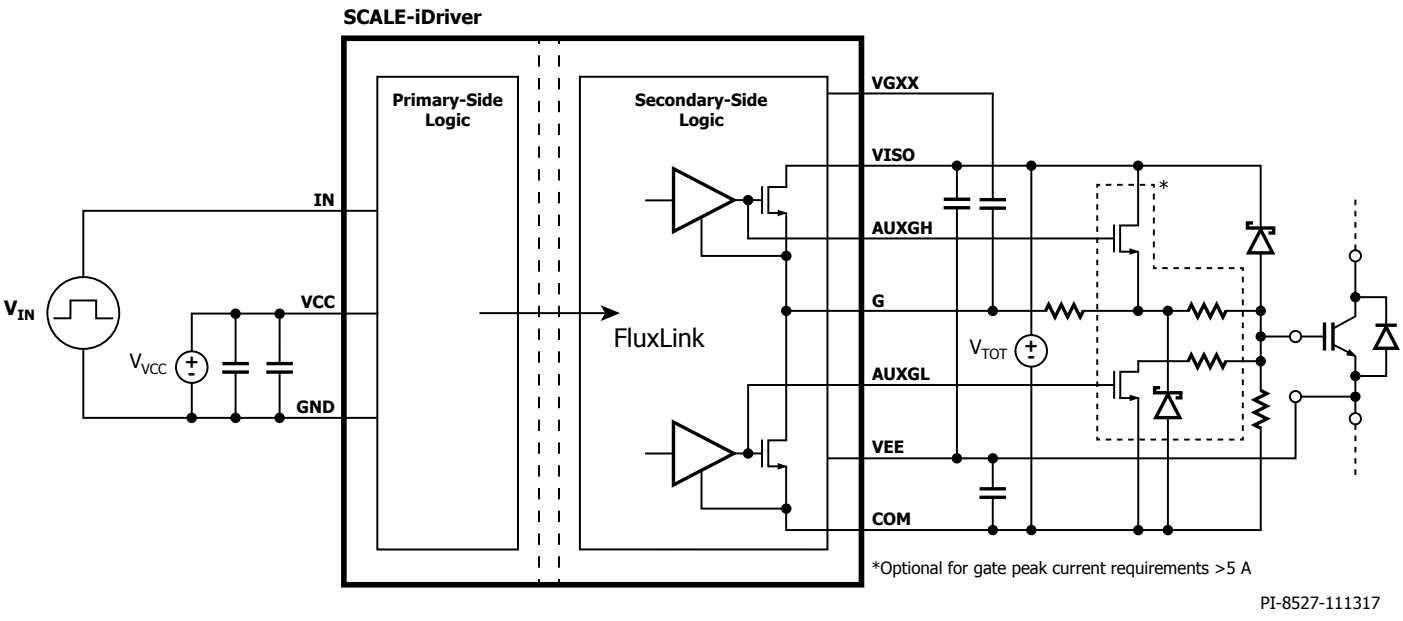
- Straightforward single channel 5 A IGBT gate driver with optionally scalable external N-channel MOSFET booster for up to 60 A peak gate current (N-channel has lower losses and lowers total system cost), with wide flexible use to drive IGBT modules up to 1200 V and current from 50 A up to 3600 A
- Undervoltage lockout
- Integrated FluxLink™ technology provides safe isolation between primary side and secondary side
- Rail-to-rail stabilized output voltage
- Suitable for 600 V / 650 V / 1200 V IGBT and SiC MOSFET switches
- Up to 75 kHz switching frequency
- -40 °C to 125 °C operating ambient temperature
- eSOP package with 9.5 mm creepage and clearance

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Key Data Overview

Parameter	Min	Typical	Max	Unit
Primary-side supply voltage (V_{VCC})	4.75	5	5.25	V
Secondary-side total supply voltage (V_{TOT})	22	25	28	V
Maximum gate sourcing peak current (I_{GH})		3.3		A
Maximum gate sinking peak current (I_{GL})		5		A
Operating switching frequency (f_S)		75		kHz
Propagation delay jitter			±5	ns
Turn-on propagation delay time ($t_{P(LH)}$)		262		ns
Turn-off propagation delay time ($t_{P(HL)}$)		262		ns
Minimum turn-on and -off PWM pulses extension ($t_{GE(MIN)}$)			650	ns
Creepage distance primary-secondary (L2)	9.5			mm
Clearance distance primary-secondary (L1)	9.5			mm
Tracking resistance (Comparative Tracking Index - CTI)		600		
Maximum package dissipated power (P_S)			1.79	W
100% production withstanding isolation voltage test (V_{TEST})	6			kV_{RMS}
100% production partial discharge test ($V_{PD(m)}$)	2652			V_{PEAK}

Application Circuit (SID1102K)



Ordering Information

Part Number	Rated Current	IGBT Collector Current Ratings without Booster	Ordering Code Tubes – 48 pcs	Ordering Code Tape & Reel – 1000 pcs
SID1102K	5 A	Up to 300 A	SID1102K	SID1102K-TL

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Automotive Application Gate Drivers
SID1132KQ, SID1181KQ, SID1182KQ, SIC118xKQ



2.5 A and Up to 8 A Single-Channel IGBT / SiC MOSFET Gate Driver for Automotive Applications Providing Reinforced Galvanic Isolation

Applications

- Electric vehicle power train for BEV and BHEV
- Electric vehicle and charger stations
- High reliability drivers and inverters

Certification

- AEC-Q100 qualified reaching automotive grade level 1
- Full safety and regulatory compliance
- 100% production partial discharge test
- 100% production HIPOT compliance testing
- Reinforced isolation according to VDE 0884-10 and IEC 60747-10
- UL 1577 certified: E358471 complies with IEC 61000-4-8 and IEC 61000-4-9 standards

Key Features

- Split outputs providing up to 8 A peak drive current
- Integrated FluxLink™ technology providing safe isolation between primary-side and secondary-side
- Rail-to-rail stabilized output voltage
- Unipolar supply voltage for secondary side
- Suitable for 600 V / 650 V / 750 V / 1200 V IGBT and SiC MOSFET switches
- Up to 75 kHz switching frequency
- -40 °C to +125 °C operating ambient temperature
- High common-mode transient immunity
- eSOP™ package with 9.5 mm creepage and clearance

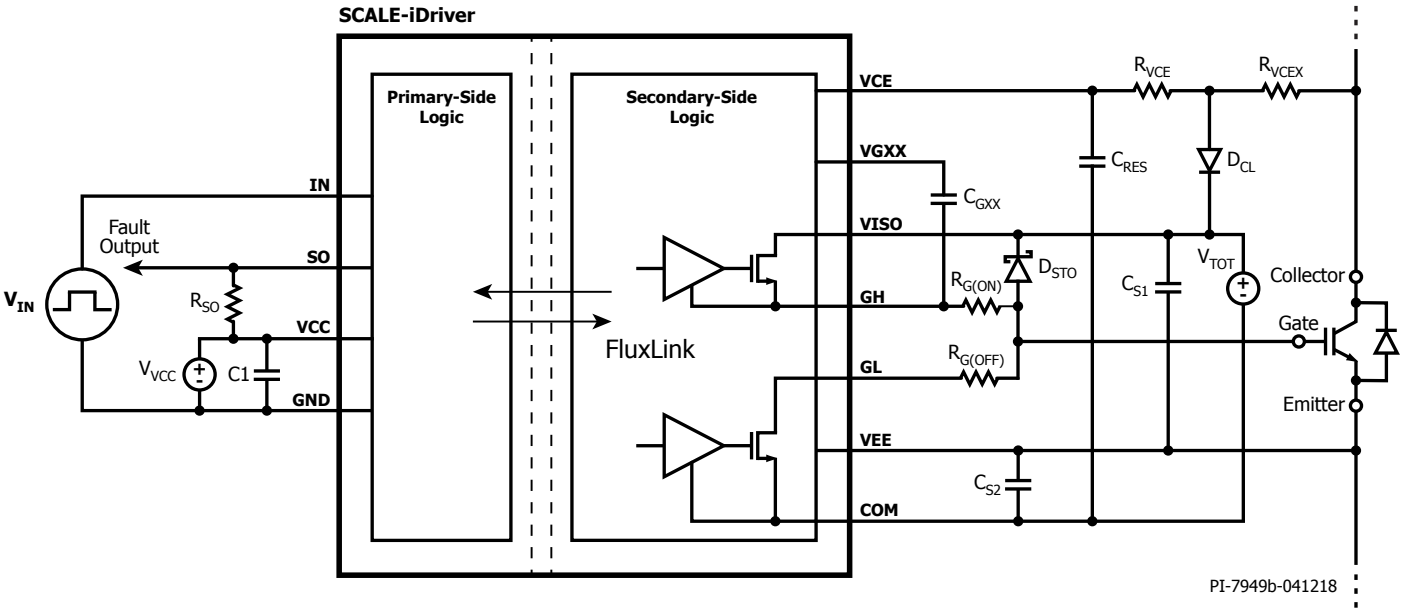
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Primary-side supply voltage (V_{VCC})	-0.5	5	6.5	V
Secondary-side total supply voltage (V_{TOT})	-0.5	25	30	V
Maximum gate sourcing peak current (I_{GH})		7.3		A
Maximum gate sinking peak current (I_{GL})		8		A
Operating switching frequency (f_S)		20	75	kHz
Propagation delay jitter			±5	ns
Turn-on propagation delay time ($t_{P(LH)}$)		253		ns
Turn-off propagation delay time ($t_{P(HL)}$)		262		ns
Minimum turn-on and -off PWM pulses extension ($t_{GE(MIN)}$)			650	ns
Creepage distance primary-secondary (L2)	9.5			mm
Clearance distance primary-secondary (L1)	9.5			mm
Tracking resistance (Comparative Tracking Index - CTI)		600		
Maximum package dissipated power (P_S)			1.79	W
100% production withstanding isolation voltage test (V_{TEST})	6 / 5 [1]			kV_{RMS}
100% production partial discharge test ($V_{PD(m)}$)	2652 / 1407 [1]			V_{PEAK}

[1] For SID1181KQ

Application Circuit (SID11xxKQ)



Ordering Information

Part Number	Rated Current	IGBT / SiC MOSFET Collector Current Ratings	Ordering Code Tubes – 48 pcs	Ordering Code Tape & Reel – 1000 pcs
SID1132KQ	2.5 A	Up to 100 A	SID1132KQ	SID1132KQ-TL
SID1182KQ	8 A	Up to 600 A	SID1182KQ	SID1182KQ-TL
SID1181KQ	8 A	Up to 600 A	SID1181KQ	SID1181KQ-TL
SIC1181KQ	8 A	Up to 600 A	SIC1181KQ	SIC1181KQ-TL
SIC1182KQ	8 A	Up to 800 A	SIC1182KQ	SIC1182KQ-TL

SCALE-iDriver™ (SiC MOSFET)
SIC1182K



8 A Single-Channel SiC MOSFET Gate Driver Providing Reinforced Galvanic Isolation Up to 1200 V

Applications

- Uninterruptible power supplies (UPS)
- Photovoltaic inverters
- Welding inverters
- Servo drives
- Industrial applications
- Off-board EV charger (supply and station)

Certification

- Reinforced isolation according to VDE 0884-10 and IEC 60747-10
- UL 1577 certified: E358471 complies with IEC 61000-4-8 and IEC 61000-4-9 standards

Key Features

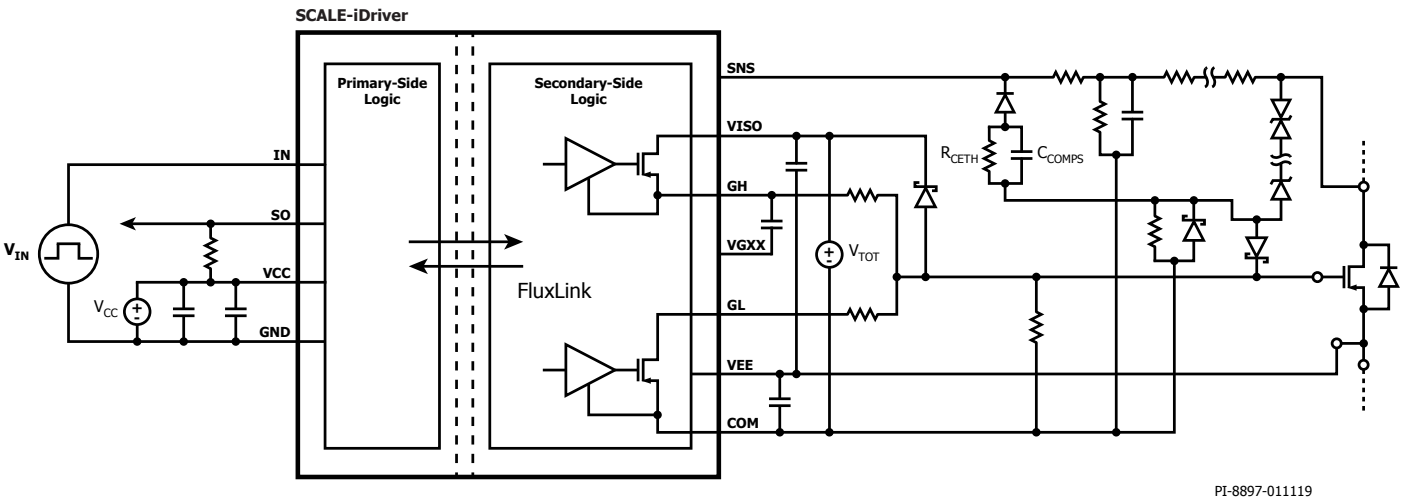
- Highest efficiency (8 A) driver for Silicon Carbide switches
- Ultra-fast short-circuit detection (typically <2 µs)
- Drain-Source overvoltage protection
- Advanced Active Clamping (SiC-AAC)
- Externally configurable gate-drive voltages match multiple SiC architectures

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Key Data Overview

Parameter	Min	Typical	Max	Unit
Primary-side supply voltage (V_{VCC})	-0.5		6.5	V
Secondary-side total supply voltage (V_{TOT})	-0.5		30	V
Maximum gate sourcing peak current ($I_{G(H)}$)			7.8	A
Maximum gate sinking peak current ($I_{G(L)}$)			7.3	A
Operating switching frequency (fS)			150	kHz
Propagation delay jitter		±5		ns
Turn-on propagation delay time ($t_{P(LH)}$)		265		ns
Turn-off propagation delay time ($t_{P(HL)}$)		270		ns
Minimum turn-on and -off PWM pulses extension ($t_{GE(MIN)}$)			650	ns
Creepage distance primary-secondary (L2)	9.5			mm
Clearance distance primary-secondary (L1)	9.5			mm
Tracking resistance (Comparative Tracking Index - CTI)		600		
Maximum package dissipated power (P_S)			1.79	W
100% production withstanding isolation voltage test (V_{TEST})	6000			V
100% production partial discharge test ($V_{PD(m)}$)	2652			V_{PEAK}

Application Circuit (SIC1182K / SIC118xKQ)



Ordering Information

Part Number	Rated Current	Ordering Code Tubes – 48 pcs	Ordering Code Tape & Reel – 1000 pcs
SIC1182K	8A	SIC1182K	SIC1182K-TL

SIT12xxI DC-DC Converter Family
SIT1217I, SIT1253I



DC-DC Transformer for SCALE-iDriver™ Gate Driver ICs Providing Reinforced Isolation

Applications

- Industrial drives (GPD, VFD, AC drives and servo drives)
- LV STATCOM
- Uninterruptible power supplies (UPS)
- Photovoltaic inverters

Certification

- EN 61558-2-16+A1:2013 compliant
- 100% HIPOT test at 5.4 kV RMS 1s (pri-sec), 2.7 kV RMS 1s (sec-sec)
- DIN EN 61558-1 approved
- UL 1446 approved
- Halogen free and RoHS compliant

Key Features

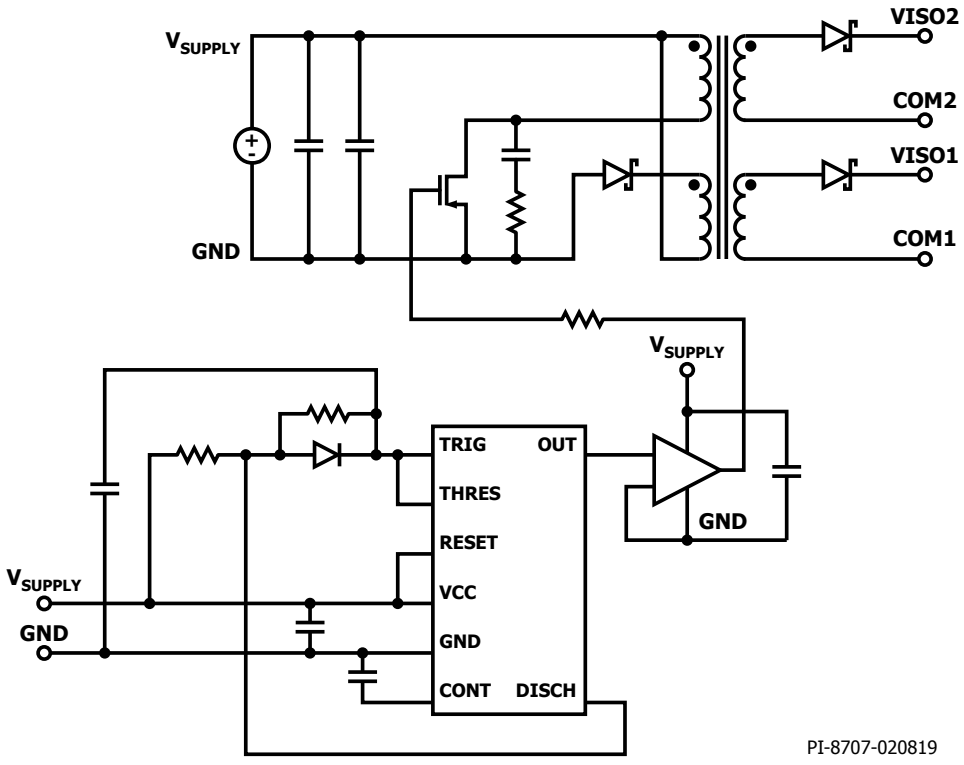
- 1.3 W output per channel
- Dual-channel DC-DC transformer
- Choice of primary-to-secondary winding ratios
- Reinforced isolation for 600 V / 650 V / 1200 V IGBT and SiC MOSFET applications
- Designed for use with all SCALE-iDriver ICs
- Optimized for use in forward DC-DC converter topologies
- -40 °C to 105 °C operating ambient temperature
- ≤10 pF primary-to-secondary coupling capacitance

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Key Data Overview

Parameter	Min	Typical	Max	Unit
Power per channel (P_{TOT})			1.3	W
Repetitive peak isolation voltage (V_{IORM})			1200	V
Operating ambient temperature (T_A)	-40		105	°C
Storage temperature (T_S)	-30		70	°C
Clearance and creepage distance primary-secondary	19			mm
Clearance and creepage distance secondary-secondary	10.5			mm
Coupling capacitance (C_K)			10	pF
100% production withstanding isolation voltage test ($V_{TEST, PRIM - SEC}$)	5400			V
100% production partial discharge test ($V_{PD, PRIM - SEC}$)	2700			V

Application Circuit (SIT12xxI)



Ordering Information

Part Number	Primary Side Input Voltage	Ordering Code Tape & Reel – 115 pcs
SIT1217I	15 V	SIT1217I
SIT1253I	5 V	SIT1253I

Gate Driver Cores

Power Integrations is a technology and market leader in mid- and high-power gate drivers. Using highly integrated technology, the company's gate drivers employ up to 85% fewer components than other commonly-available solutions. Power Integrations has 30 years' history of supporting demanding industries such as railway, power generation, power transmission and industrial automation with products that combine outstanding reliability, best-in-class performance and competitive pricing.

Innovative Technology

Power Integrations' SCALE™-2 IGBT and SiC MOSFET gate drivers use an ASIC chip set specifically designed to reduce count, save space and increase product reliability and functionality. A recent technology development, SCALE-2+, enables Soft Shut Down (SSD) to be implemented in the event of a short circuit without requiring additional components (SSD function exclusive in 2SC0106T and 2SC0108T). This is particularly beneficial in applications with low stray-inductance where Advanced Active Clamping (AAC) may not be required.

Design Support and Customization

Power Integrations develops reference designs and semi-custom gate drive designs based on the company's driver cores and produces full-custom drivers using the company's SCALE-2 platform for large projects.

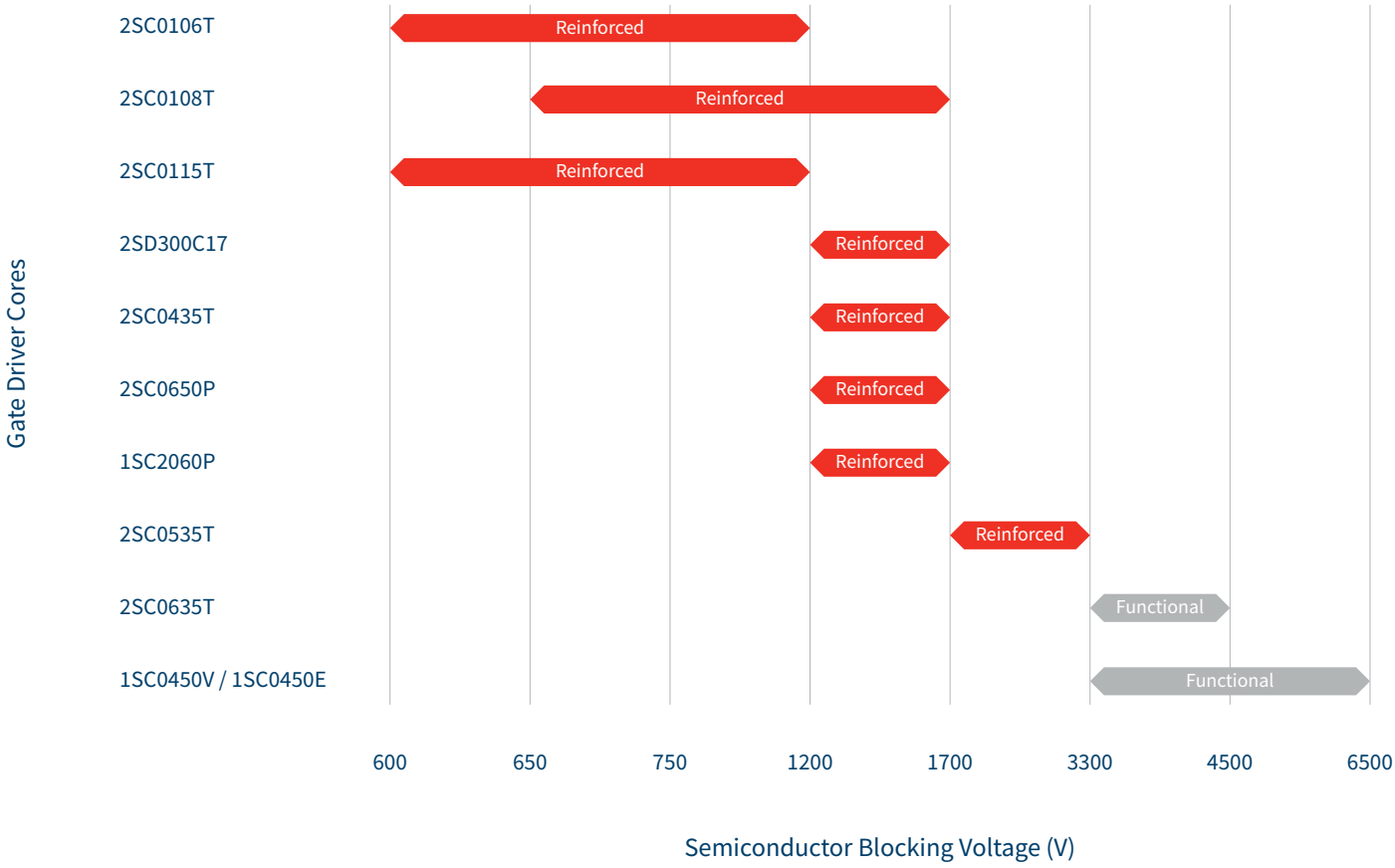
Everything a Designer Needs

Power Integrations' gate driver cores incorporate driver functions including galvanic isolation, protection functions, DC-DC converter, etc., on board presenting designers with a complete yet extremely flexible system solution.

Gate driver cores are available with blocking voltage capabilities from 600 V to 6500 V and output power from 1 W to 20 W per channel. They are also suitable for driving wide bandgap devices based on emerging materials such as Silicon Carbide (SiC) at frequencies of up to 500 kHz. Gate driver cores are supported by reference designs for fast design-ins.

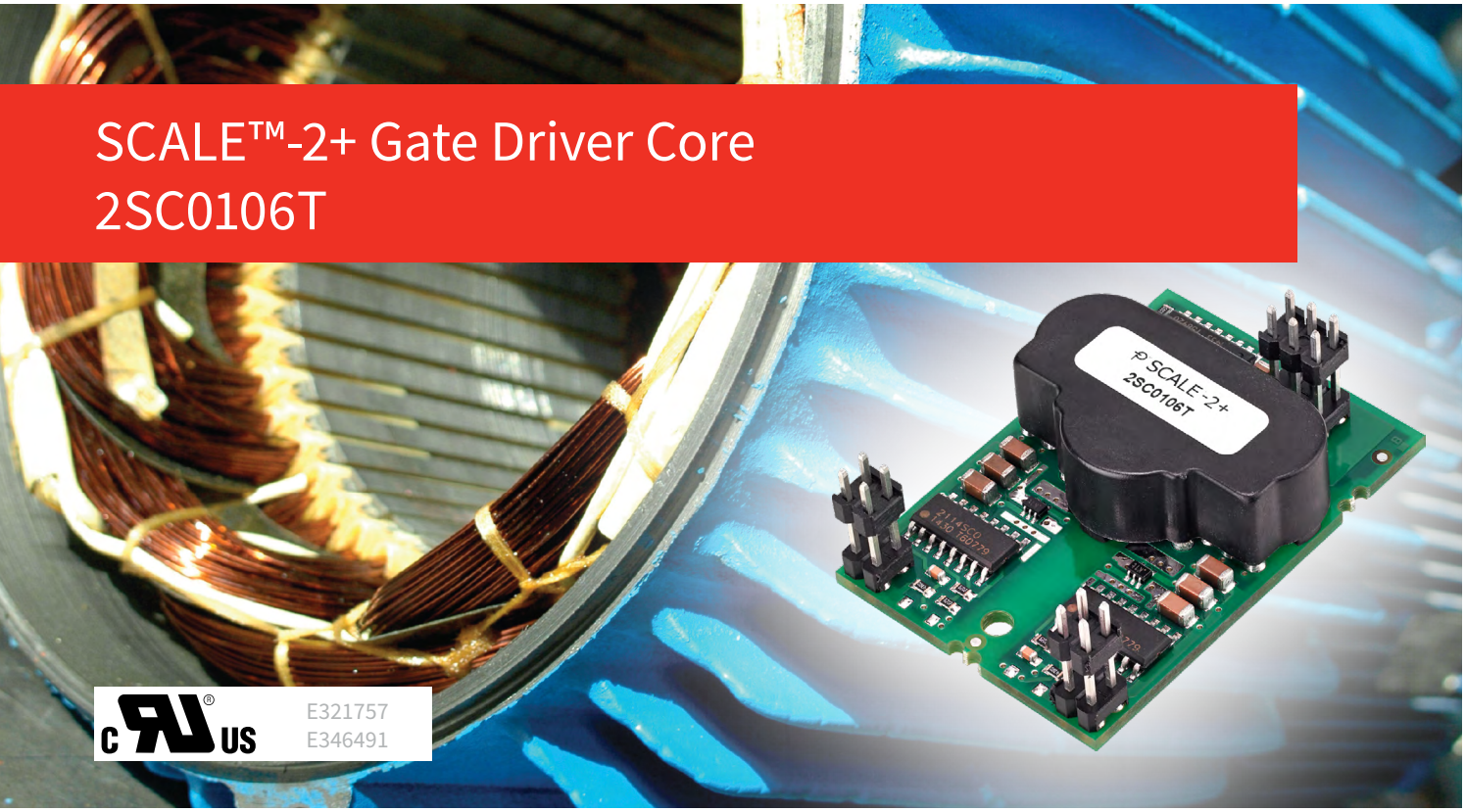
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Gate Driver Isolation [1]



[1] Gate Driver Isolation Coordination according to IEC 61800-5-1, IEC 60664-1, UL 508C and UL 60950-1

SCALE™-2+ Gate Driver Core 2SC0106T



Dual-Channel Gate Driver Core for 1200 V IGBTs—The Alternative to Optocoupler Driver Solutions for Inverter Designs Requiring Reinforced Isolation up to 110 kW

Applications

- Industrial motor drives
- Uninterruptible power supplies (UPS)
- Photovoltaic inverters
- Commercial e-mobility (E-bus, E-truck, CAV)
- Medical (MRT, CT, X-ray)
- Welding

Certification

- Reinforced isolation according to IEC 61800-5-1 and IEC 60664-1
- UL-recognized under E321757 for UL 508C and E346491 for UL 60950-1

Key Features

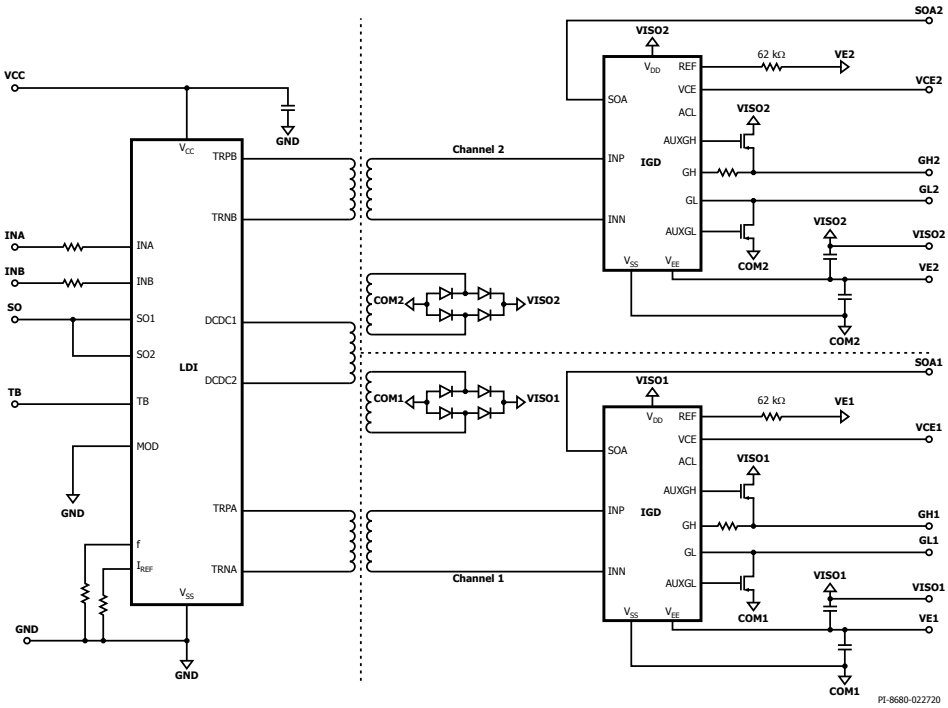
- Dual-channel driver core for blocking voltages up to 1200 V
- ±6 A peak output gate current
- 2 x 1 W output power
- High reliability (reduced component count)
- IGBT short-circuit protection
- Switching frequency up to 50 kHz
- Operating temperature -40 °C to +85 °C (105 °C with derating)
- Lead-free and RoHS compliant
- Soft Shut Down (SSD)
- Supply undervoltage lockout

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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN} = 0 Hz		40		mA
Supply current, full load		300		mA
Output power per channel		1		W
Gate voltage		+15 / -8		V
Peak output current (gate current)	-6		+6	A
Switching frequency (f_S)	0		50	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	9			mm
Clearance distance primary-secondary	9			mm
Dielectric test voltage	4000			VAC
Partial discharge extinction voltage	1800			V_{PEAK}
dv / dt immunity, input-to-output			50	kV/µs
Operating temperature	-40		+105	°C

Application Circuit (2SC0106T)



Reference Design

gate-driver.power.com/design-support/reference-designs

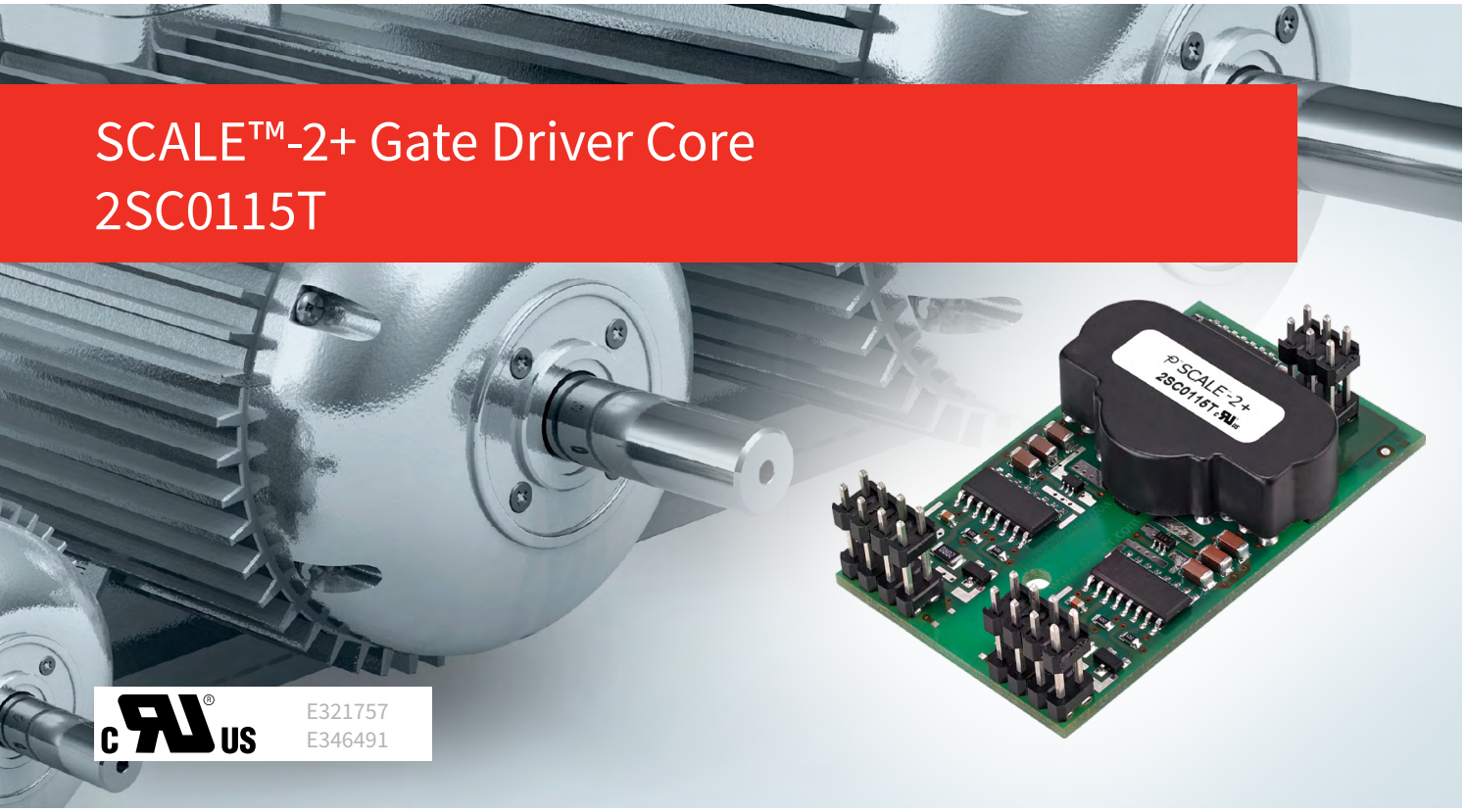
RDHP	Part Number	Technology	Channels	Voltage Class	Power Module Package	Related Power Module	Interface
RDHP-1423	2SC0106T	SCALE-2+	2	600 V and 1200 V	Any	N/A	Electrical (15 V logic)

Ordering Information

Part Number	Type Designation	Temperature	Overvoltage Protection
2SC0106T [1]	2SC0106T2A1-12	-40 °C to +85 °C	Soft Shut Down

[1] Also available with conformal coating. Please refer to the "Conformal Coating for Gate Drivers" section in this catalog.

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SCALE™-2+ Gate Driver Core 2SC0115T

Dual-Channel Gate Driver Core—The Alternative to Optocoupler Driver Solutions for Inverter Designs up to 500 kW Power Range

Applications

- Industrial motor drives
- Uninterruptible power supplies (UPS)
- Photovoltaic inverters
- Medical (MRT, CT, X-ray)
- Welding

Certification

- Reinforced isolation according to IEC 61800-5-1 and IEC 60664-1
- UL-recognized under E321757 for UL 508C and E346491 for UL 60950-1

Key Features

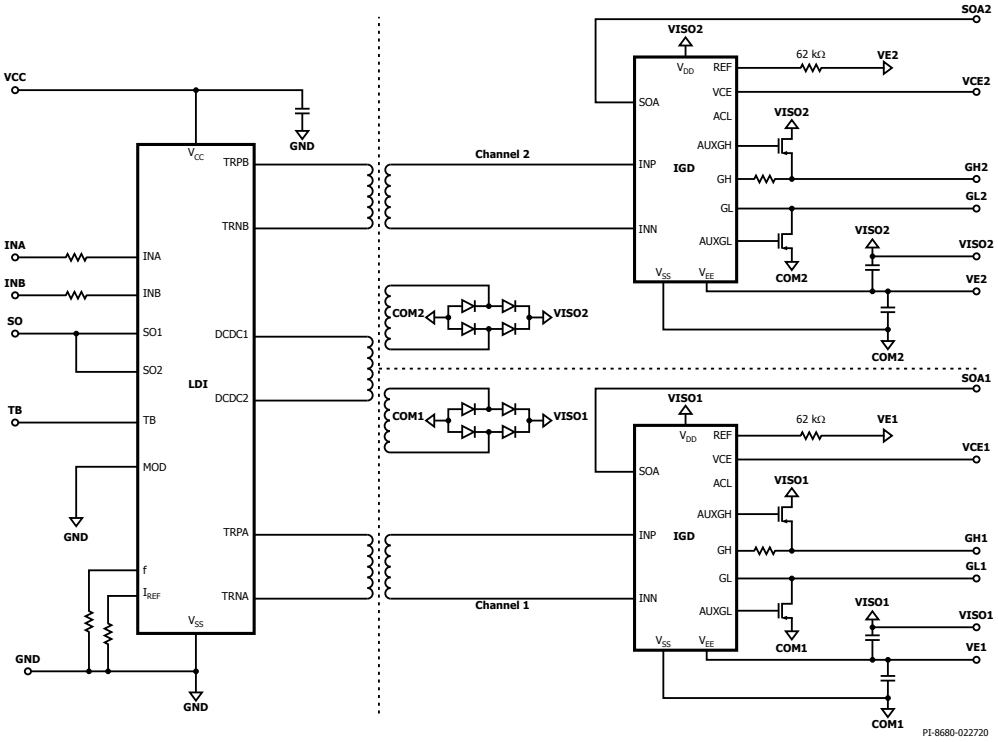
- Dual channel driver core for blocking voltages up to 1200 V
- ±15 A peak output gate current
- +15 V (regulated) / -6 V gate driving
- 2 x 1 W
- High reliability (reduced component count)
- IGBT short-circuit protection
- Switching frequency up to 50 kHz
- Advanced Active Clamping (AAC)
- Lead free and RoHS compliant
- Supply undervoltage lockout
- SiC MOSFET ready

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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN} = 0 Hz		40		mA
Output power per channel		1	1.4	W
Gate voltage		+15 / -6		V
Peak output current (gate current)	-15		+15	A
Switching frequency (f_S)	0		50	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	9			mm
Clearance distance primary-secondary	9			mm
Dielectric test voltage	4000			VAC
Partial discharge extinction voltage	1800			V_{PEAK}
dv / dt immunity, input-to-output		50		kV/µs
Operating temperature	-40		+105	°C

Application Circuit (2SC0115T)



Reference Design

gate-driver.power.com/design-support/reference-designs

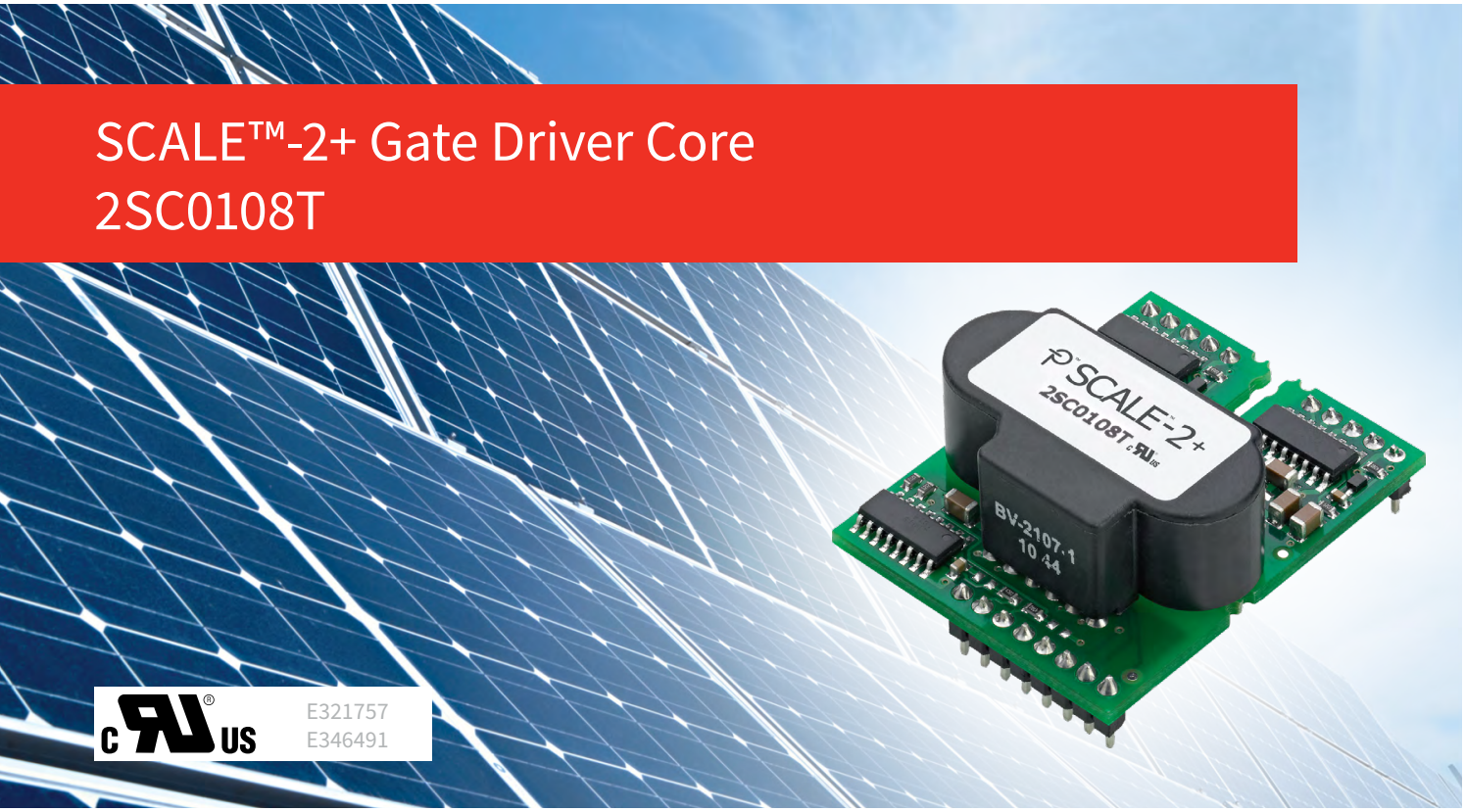
RDHP	Part Number	Technology	Channels	Voltage Class	Power Module Package	Related Power Module	Interface
RDHP-1521	2SC0115T	SCALE-2+	2	600 V and 1200 V	Any	N/A	Electrical (15 V logic)

Ordering Information

Part Number	Type Designation	Overvoltage Protection	Temperature	Lead Free	Pin Length
2SC0115T [1]	2SC0115T2A0-12	Advanced Active Claming	-40 °C to +105 °C	Yes	3.00 mm

[1] Also available with conformal coating. Please refer to the "Conformal Coating for Gate Drivers" section in this catalog.

SCALE™-2+ Gate Driver Core 2SC0108T



E321757
E346491

Ultra-Compact Dual-Channel Gate Driver Core for up to 1700 V IGBTs

Applications

- General purpose drives
- Uninterruptible power supplies (UPS)
- Photovoltaic and wind power inverters
- Railway auxiliary inverters
- Commercial e-mobility (E-bus, E-truck, CAV)
- Medical (MRT, CT, X-ray)
- Medium voltage drives

Certification

- Reinforced isolation according to IEC 60664-1
- UL-recognized under E321757 for UL 508C and E346491 for UL 60950-1

Key Features

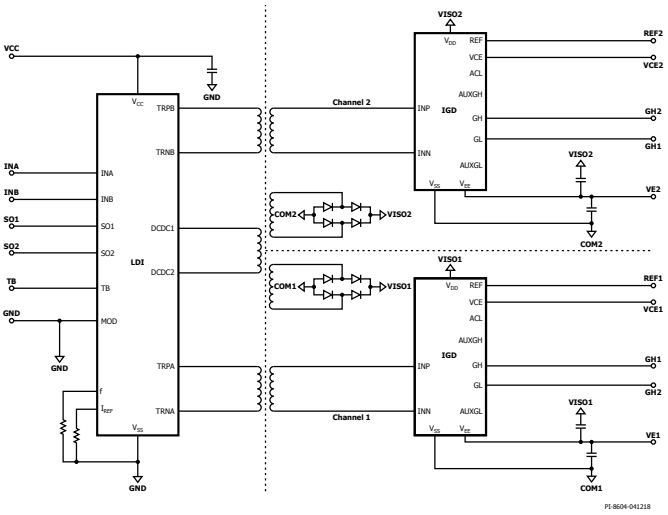
- Dual-channel driver core for blocking voltages up to 1700 V
- Switching frequency up to 50 kHz
- ±8 A peak output gate current
- +15 V (regulated) / -8 V gate driving
- Interface for 3.3 V – 15 V logic level
- Direct and half bridge modes
- Supports two-level and multi-level topologies
- IGBT short-circuit protection, undervoltage lockout
- Isolated DC-DC converter
- 2 x 1 W output power
- Supply undervoltage lockout
- 45 mm x 34.3 mm footprint
- Lead free and RoHS compliant versions available

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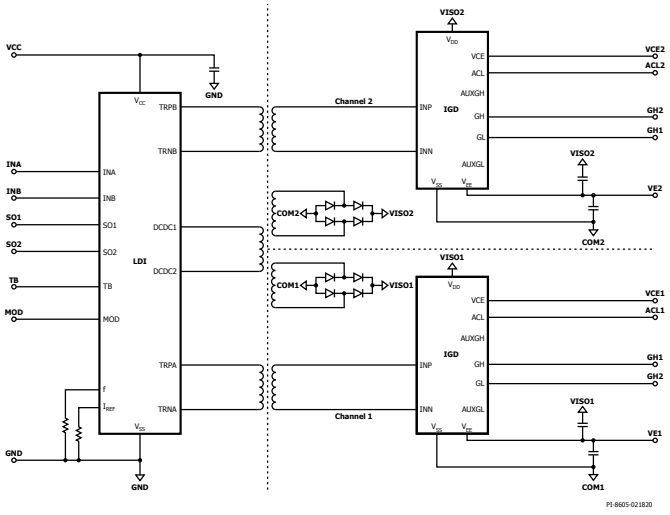
Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN} = 0 Hz		31		mA
Supply current, full load		240		mA
Output power per channel		1		W
Gate voltage		+15 / -8		V
Peak output current (gate current)	-8		+8	A
Switching frequency (f_S)	0		50	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	12.9			mm
Clearance distance primary-secondary	12.9			mm
Dielectric test voltage	5000			VAC
Partial discharge extinction voltage	1768			V_{PEAK}
dv / dt immunity, input-to-output			75	kV/µs

Application Circuit (2SC0108T)



Application Circuit (2SC0108T2D0-xx)



Reference Designs

gate-driver.power.com/design-support/reference-designs

RDHP	Part Number	Technology	Channels	Voltage Class	Power Module Package	Related Power Module	Interface
RDHP-1415	2SC0108T	SCALE-2+	2	600 V, 1200 V and 1700 V	Any	N/A	Electrical (15 V logic)
RDHP-1531	2SC0108T	SCALE-2+	2	600 V, 1200 V and 1700 V	Any	N/A	Electrical (15 V logic)

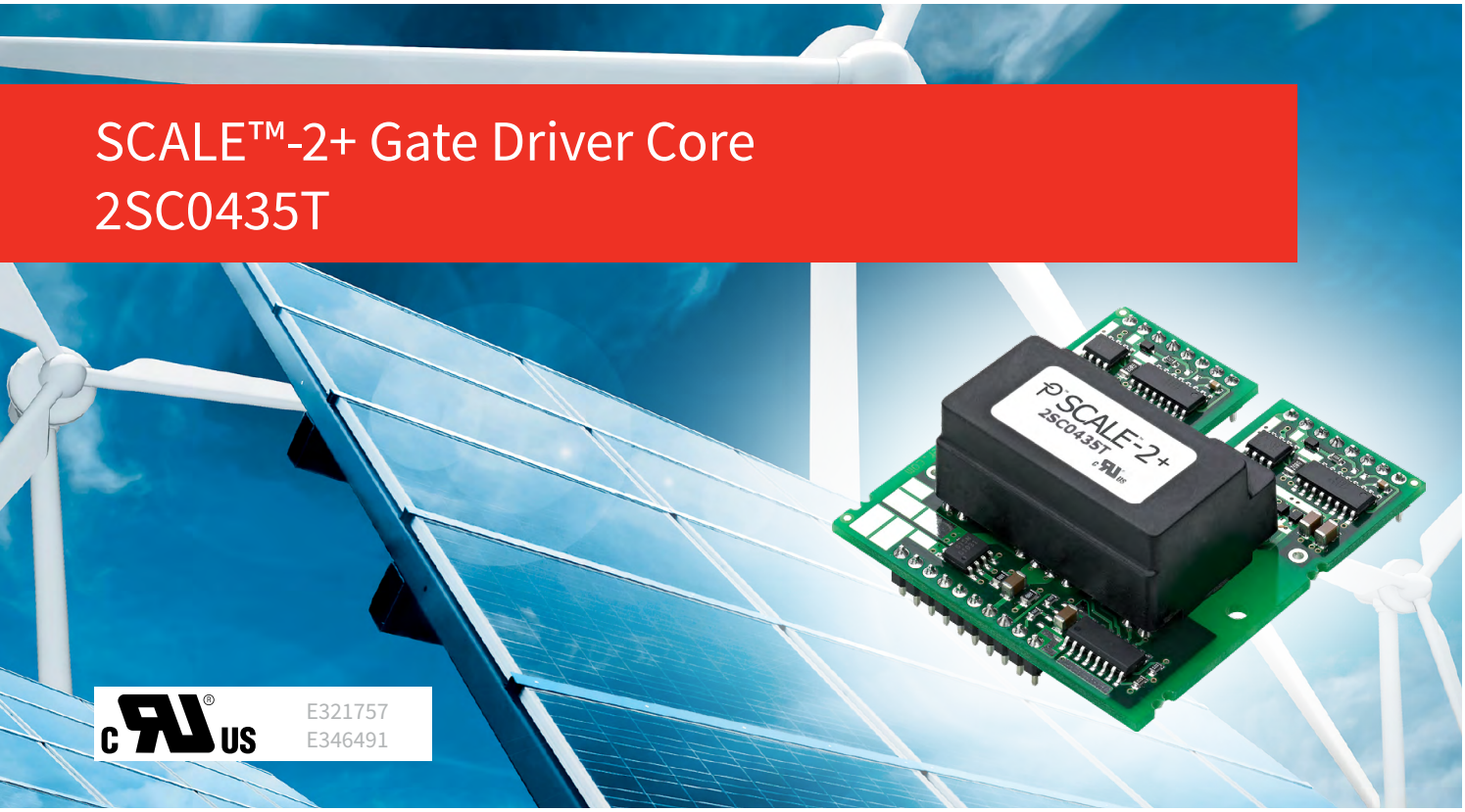
Ordering Information

Part Number	Type Designation	Overvoltage Protection	Temperature	Lead Free	Pin Length
2SC0108T [1]	2SC0108T2D0-12	Advanced Active Clamping	-40 °C to +85 °C	No	2.54 mm
	2SC0108T2H0-17	Soft Shut Down	-40 °C to +85 °C	Yes	2.54 mm
	2SC0108T2F1-17	Soft Shut Down	-40 °C to +85 °C	Yes	5.84 mm
	2SC0108T2G0-17	Soft Shut Down	-40 °C to +85 °C	Yes	3.10 mm

[1] Also available with conformal coating. Please refer to the "Conformal Coating for Gate Drivers" section in this catalog.

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SCALE™-2+ Gate Driver Core 2SC0435T



c UL us E321757 E346491

1700 V Dual-Channel Gate Driver Core

Applications

- Photovoltaic and wind power inverters
- Industrial motor drives
- Medium voltage drives
- Railway main and auxiliary inverters
- Uninterruptible power supplies (UPS)
- Commercial e-mobility (E-bus, E-truck, CAV)
- Medical (MRT, CT, X-ray)
- Industrial power supplies

Certification

- Reinforced isolation according to IEC 60664-1
- UL-recognized under E321757 for UL 508C and E346491 for UL 60950-1

Key Features

- Dual-channel driver core for blocking voltages up to 1700 V
- Switching frequency up to 100 kHz
- ±35 A peak output gate current
- Interface for 3.3 V to 15 V logic level
- Direct and half bridge modes
- Supports two-level and multi-level topologies
- IGBT short-circuit protection, undervoltage lockout
- Advanced Active Clamping
- Isolated DC-DC converter
- 2 x 4 W output power
- Supply undervoltage lockout
- 57.2 mm x 51.6 mm footprint
- Lead free and RoHS compliant
- SiC MOSFET ready

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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN} = 0 Hz		58		mA
Supply current, full load		700		mA
Output power per channel		4		W
Gate voltage		+15 / -10		V
Peak output current (gate current)	-35		+35	A
Switching frequency (f_S)	0		100	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	15.7			mm
Clearance distance primary-secondary	15.7			mm
Dielectric test voltage	5000			VAC
Partial discharge extinction voltage	1768			V_{PEAK}
dv / dt immunity, input-to-output			50	kV/µs
Operating temperature	-40		+85	°C

Reference Designs

gate-driver.power.com/design-support/reference-designs

RDHP	Part Number	Technology	Channels	Voltage Class	Power Module Package	Related Power Module	Interface
RDHP-1424	2SC0435T	SCALE-2+	2	1200 V and 1700 V	Dual 130 mm x 140 mm power modules	N/A	Electrical (15 V logic) or optical
RDHP-1516 RDHP-1532	2SC0435T	SCALE-2+	2	600 V, 1200 V and 1700 V	Any	N/A	Electrical (15 V logic)

Ordering Information

Part Number	Type Designation	Overvoltage Protection	Temperature	Lead Free	Pin Length
2SC0435T [1]	2SC0435T2F1-17	Advanced Active Clamping	-40 °C to +85 °C	Yes	2.54 mm
	2SC0435T2G1-17	Advanced Active Clamping	-40 °C to +85 °C	Yes	3.10 mm
	2SC0435T2H0-17	Advanced Active Clamping	-40 °C to +85 °C	Yes	5.84 mm

[1] Also available with conformal coating. Please refer to the "Conformal Coating for Gate Drivers" section in this catalog.

SCALE™-2 IGBT Gate Driver Core 2SD300C17



1700 V Dual-Channel Gate Driver Core

Applications

- Railway main and auxiliary inverters
- Photovoltaic inverters
- Wind power inverters
- Medium voltage drives
- Industrial motor drives

Certification

- Reinforced isolation according to IEC 60664-1

Key Features

- Dual-channel driver core for blocking voltages up to 1700 V
- Switching frequency up to 60 kHz
- ±30 A peak output gate current
- ±15 V gate voltage
- 15 V logic level interface
- Direct and half bridge modes
- IGBT short-circuit protection
- Soft Shut Down
- Isolated DC-DC converter
- 2 x 4 W output-power
- Supply undervoltage lockout

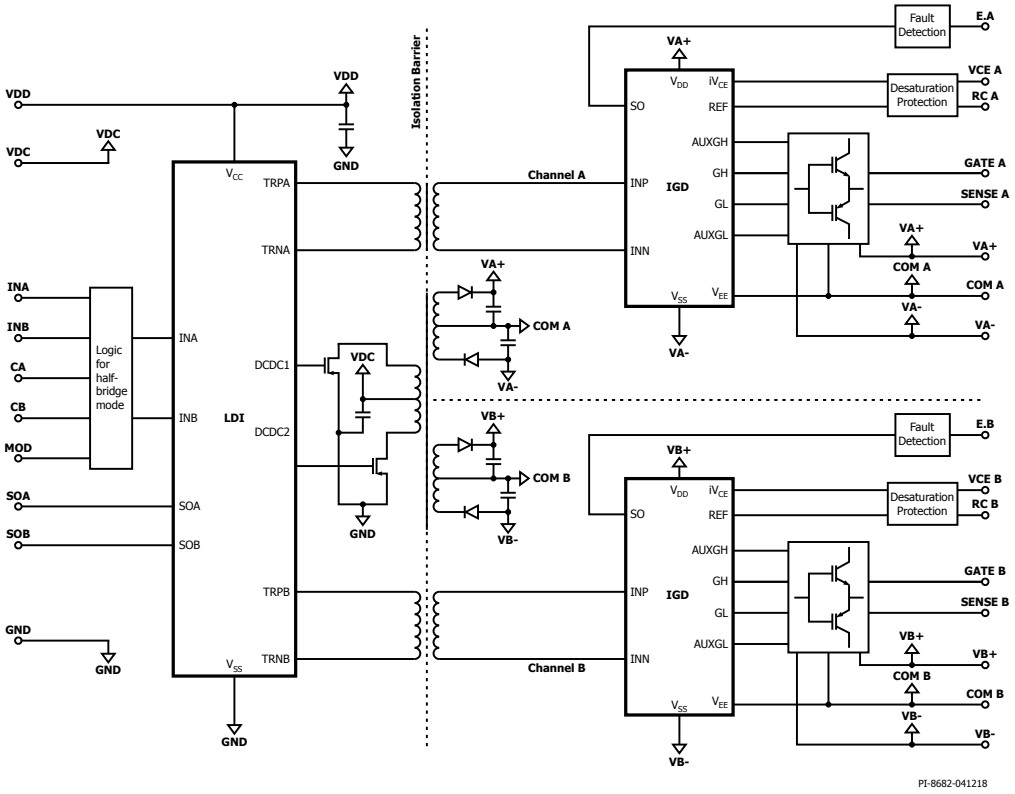
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN} = 0 Hz		65		mA
Supply current @ f_{IN} = 60 Hz		21		mA
Output power		4		W
Gate voltage		+15 / -15		V
Peak output current (gate current)	-30		+30	A
Switching frequency (f_S [1])			60	kHz
Duty cycle	0		100	%
Turn-on delay		630		ns
Turn-off delay		490		ns
Operating temperature	-40		+85	°C

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

Application Circuit (2SD300C17)



Ordering Information

Part Number	Type Designation	Description	Lead Free
2SD300C17 [1]	2SD300C17A2	Standard version	Yes
	2SD300C17A3	Increased EMI capability	Yes

[1] Also available with conformal coating. Please refer to the "Conformal Coating for Gate Drivers" section in this catalog.

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SCALE™-2 Planar Driver Core 2SC0650P



Dual-Channel IGBT, MOSFET and SiC MOSFET Gate Driver Core with Planar Transformers; Highest Power Density for High Power and High Frequency; 50 A Gate Current and 2 x 6 W Output Power at 85 °C Ambient Temperature

Applications

- High gate current driving applications
- High frequency applications
- Wind power inverters
- Induction heating
- Industrial motor drives
- Railway main and auxiliary inverters
- SiC MOSFET applications

Certification

- Reinforced isolation according to IEC 60664-1
- UL compliant

Key Features

- Ultra-low-profile solution
- Planar transformer isolation
- Dual-Channel driver core for blocking voltages up to 1700 V
- Switching frequency up to 150 kHz
- ±50 A peak output gate current
- IGBT short-circuit protection
- Advanced Active Clamping
- 2 x 6 W output power
- Supply undervoltage lockout
- SiC MOSFET ready

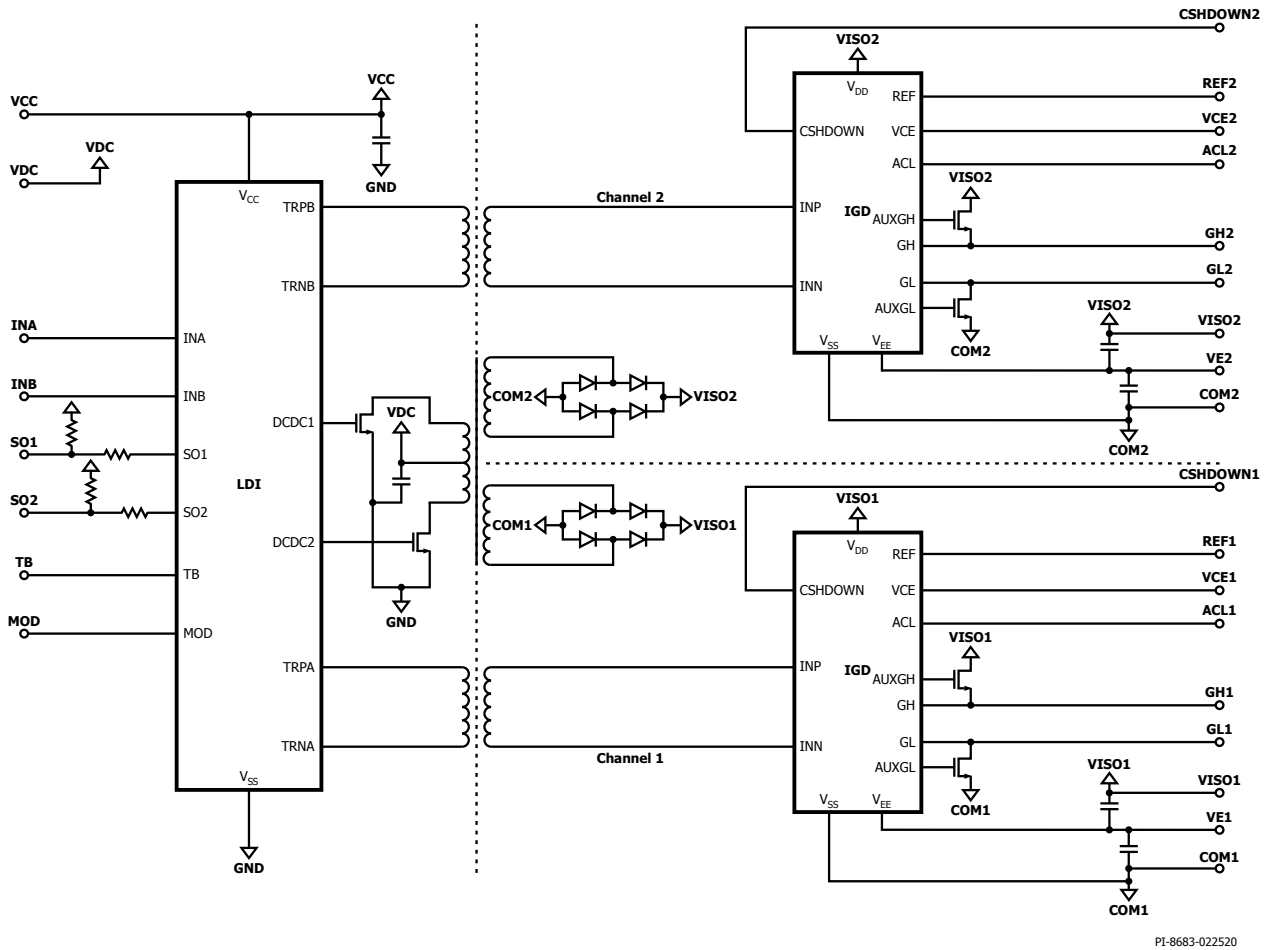
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN} = 0 Hz		61		mA
Supply current, full load			1335	mA
Output power per channel			6.5	W
Gate voltage		+15 / -10		V
Peak output current (gate current)	-50		+50	A
Switching frequency (f_S [1])			150	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	15			mm
Clearance distance primary-secondary	15			mm
Dielectric test voltage	5000			VAC
Partial discharge extinction voltage	1768			V_{PEAK}
dv / dt immunity, input-to-output			100	kV/µs
Operating temperature	-40		+85	°C

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

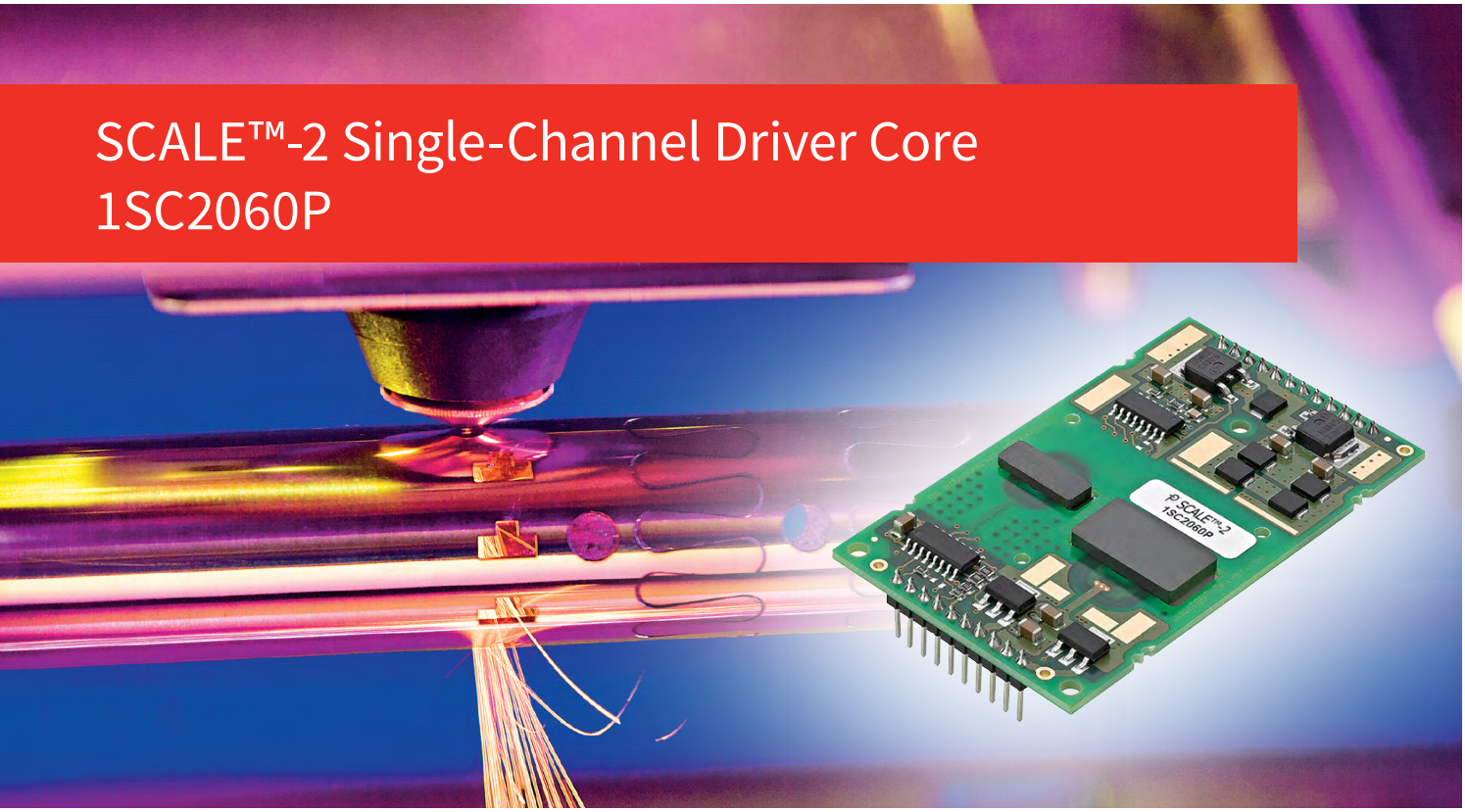
Application Circuit (2SC0650P)



Ordering Information

Part Number	Type Designation	Overvoltage Protection	Temperature	Lead Free	Pin Length
2SC0650P	2SC0650P2A0-17	Advanced Active Clamping	-40 °C to +85 °C	No	2.54 mm
	2SC0650P2C0-17	Advanced Active Clamping	-40 °C to +85 °C	No	5.84 mm

SCALE™-2 Single-Channel Driver Core 1SC2060P



Single-Channel Gate Driver Core with ±60 A Gate Current for Driving IGBT Modules and SiC MOSFET; 20 W Output Power for High Frequency Applications Up to 500 kHz

Applications

- High frequency applications
- High gate current driving applications
- Wind power inverters
- Railway main and auxiliary inverters
- Industrial motor drives
- Induction heating
- SiC MOSFET applications

Certification

- Reinforced isolation according to IEC 60664-1
- UL compliant

Key Features

- Ultra-low-profile solution
- Planar transformer isolation
- Switching frequency up to 500 kHz
- Single-Channel gate driver for blocking voltages up to 1700 V
- <80 ns delay time
- <±1 ns jitter
- ±60 A peak output gate current
- IGBT short-circuit protection
- Advanced Active Clamping
- Isolated DC-DC converter
- 20 W output power
- Supply undervoltage lockout
- SiC MOSFET ready

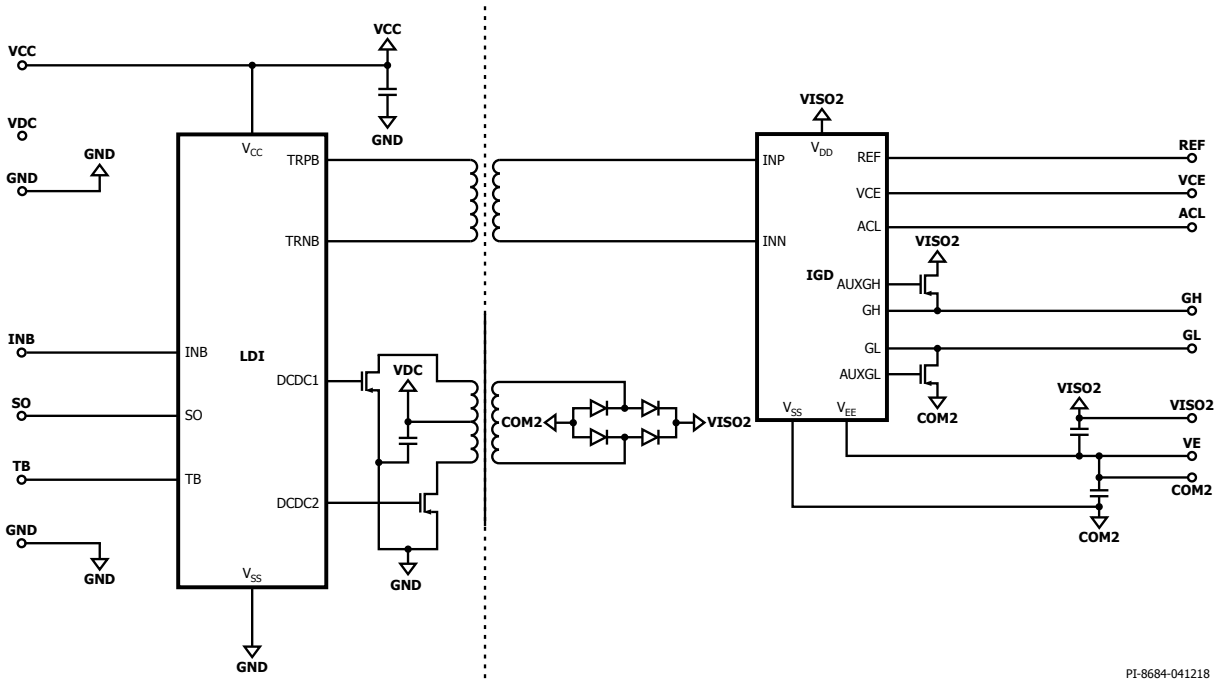
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN}= 0 Hz		48		mA
Supply current, full load			2131	mA
Output power per channel			23	W
Gate voltage		+15 / -10		V
Peak output current (gate current)	-60		+60	A
Switching frequency (f_S [1])			500	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	15			mm
Clearance distance primary-secondary	15			mm
Dielectric test voltage	5000			VAC
Partial discharge extinction voltage	1768			V_{PEAK}
dv / dt immunity, input-to-output			100	kV/µs
Operating temperature	-40		+85	°C

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

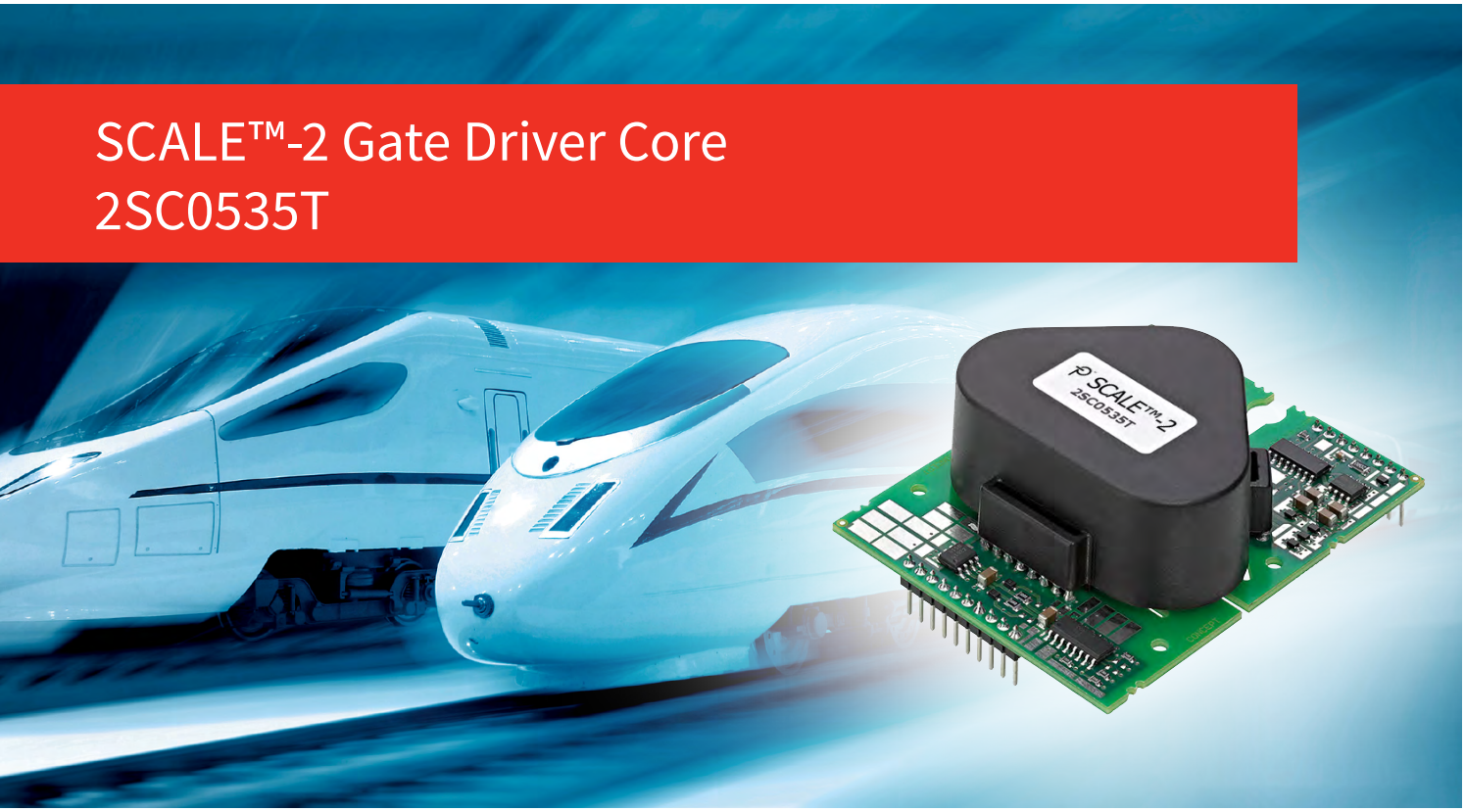
Application Circuit (1SC2060P)



Ordering Information

Part Number	Type Designation	Overvoltage Protection	Temperature	Lead Free	Pin Length
1SC2060P	1SC2060P2A0-17	Advanced Active Clamping	-40 °C to +85 °C	No	5.84 mm

SCALE™-2 Gate Driver Core 2SC0535T



Dual-Channel Gate Driver for 1.7 kV to 3.3 kV IGBTs and SiC MOSFETs

Applications

- Railway main inverters
- High Voltage DC transmission systems (HVDC)
- Flexible AC transmission systems (FACTS)
- STATCOM
- Medium voltage drives
- Wind power inverters
- Industrial motor drives
- 3-level Photovoltaic Inverters

Certification

- Reinforced isolation according to IEC 61800-5-1
- UL compliant

Key Features

- Dual-Channel driver core for blocking voltages up to 3300 V
- Supports two-level and multi-level topologies
- Switching frequency up to 100 kHz
- ±35 A peak output gate current
- Regulated gate emitter voltage
- Interface for 3.3 V to 15 V logic level
- Direct and half bridge modes
- IGBT short-circuit protection
- Supply undervoltage lockout
- Isolated DC-DC converter
- 2 x 5 W output power
- Operating temperature -55 °C to +85 °C
- SiC MOSFET ready

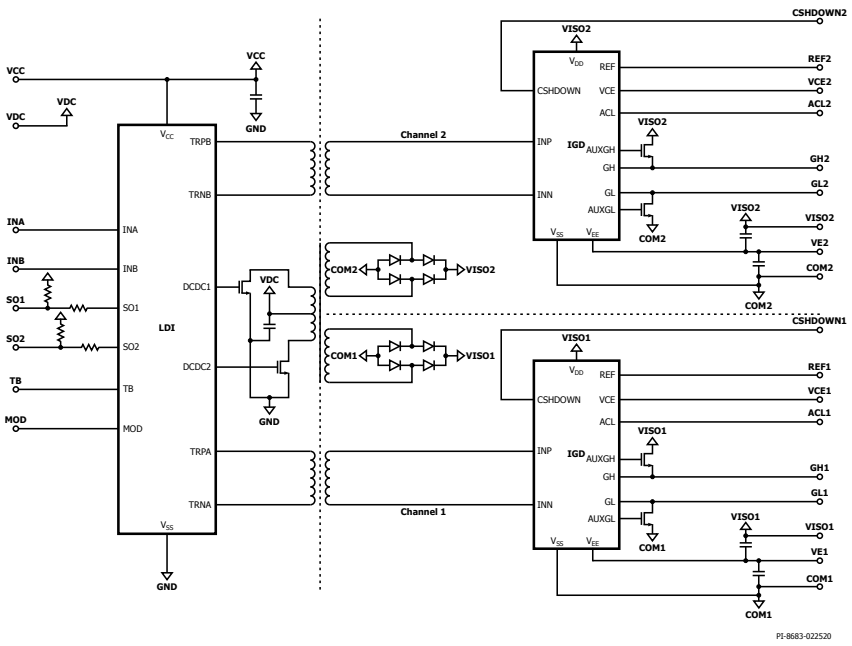
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Key Data Overview

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_S [1])	0		100	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	44			mm
Clearance distance primary-secondary	25			mm
Dielectric test voltage	9100			VAC
Partial discharge extinction voltage	4125			V_{PEAK}
dv / dt immunity, input-to-output			50	kV/µs
Operating temperature	-55		+85	°C

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

Application Circuit (2SC0535T)



Reference Designs

gate-driver.power.com/design-support/reference-designs

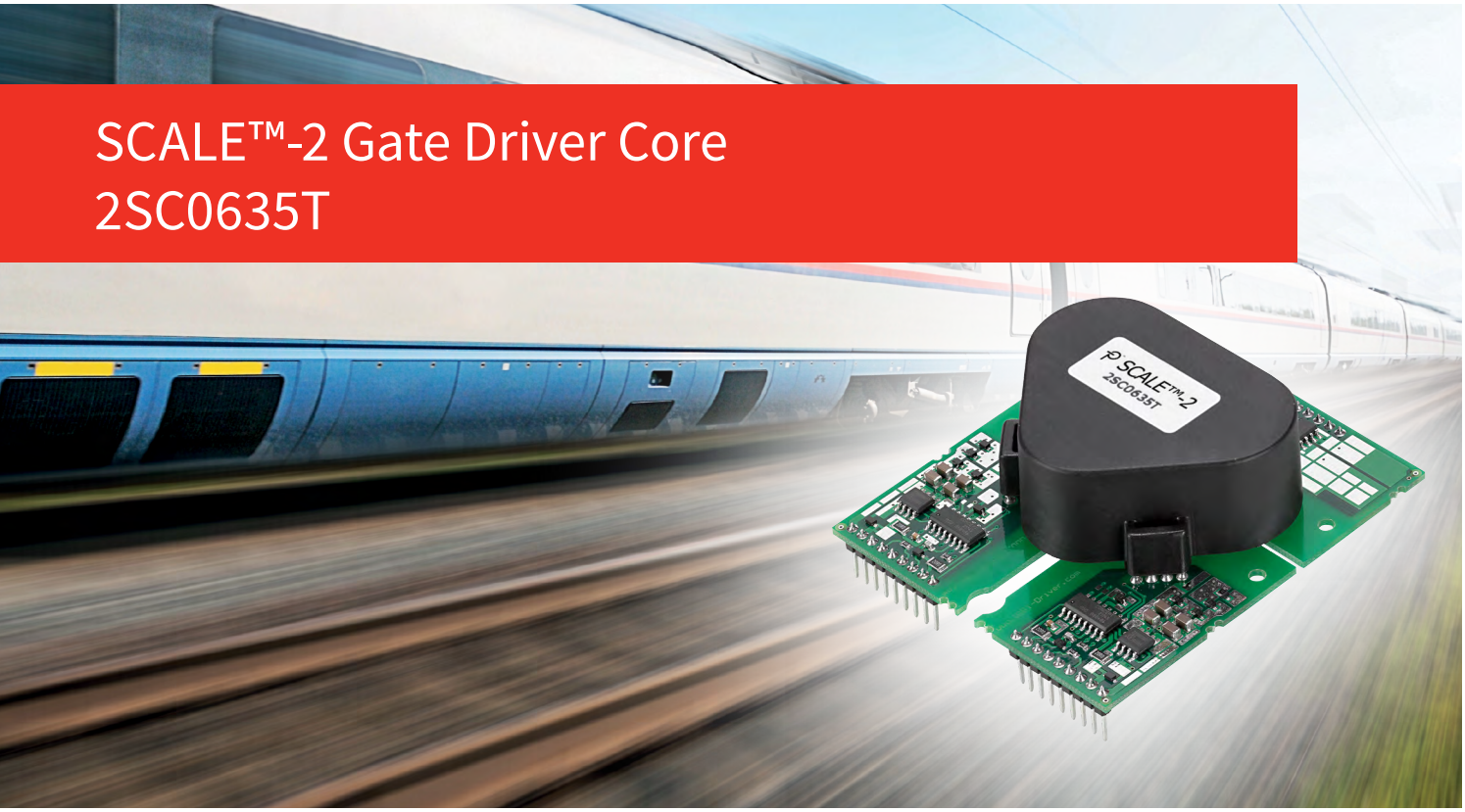
RDHP	Part Number	Technology	Channels	Voltage Class	Power Module Package	Related Power Module	Interface
RDHP-1517	2SC0535T	SCALE-2	2	3300 V	Any	N/A	Electrical (15V logic)

Ordering Information

Part Number	Type Designation	Overvoltage Protection	Temperature	Lead Free	Pin Length
2SC0535T [1]	2SC0535T2A1-33	Advanced Active Clamping	-55 °C to +85 °C	Yes	5.84 mm
2SC0535T [1]	2SC0535T2G0-33	Advanced Active Clamping	-55 °C to +85 °C	Yes	3.10 mm

[1] Also available with conformal coating. Please refer to the "Conformal Coating for Gate Drivers" section in this catalog.

SCALE™-2 Gate Driver Core 2SC0635T



Dual Gate Driver Cores for 4.5 V IGBTs

Applications

- Railway main inverters
- High Voltage DC transmission systems (HVDC)
- Flexible AC transmission systems (FACTS)
- STATCOM
- Medium voltage drives

Certification

- Isolation according to IEC 61800-5-1
- UL compliant

Key Features

- Dual-channel driver core for blocking voltages up to 4500 V
- ±35 A peak output gate current
- 2 x 6 W ouput power
- For 1700 V / 3300 V three-level converters
- Advanced Active Clamping
- IGBT short-circuit protection
- Adjustable short-circuit turn-off delay (three-level converters)
- Switching frequency up to 100 kHz
- Supply undervoltage lockout
- SiC MOSFET ready

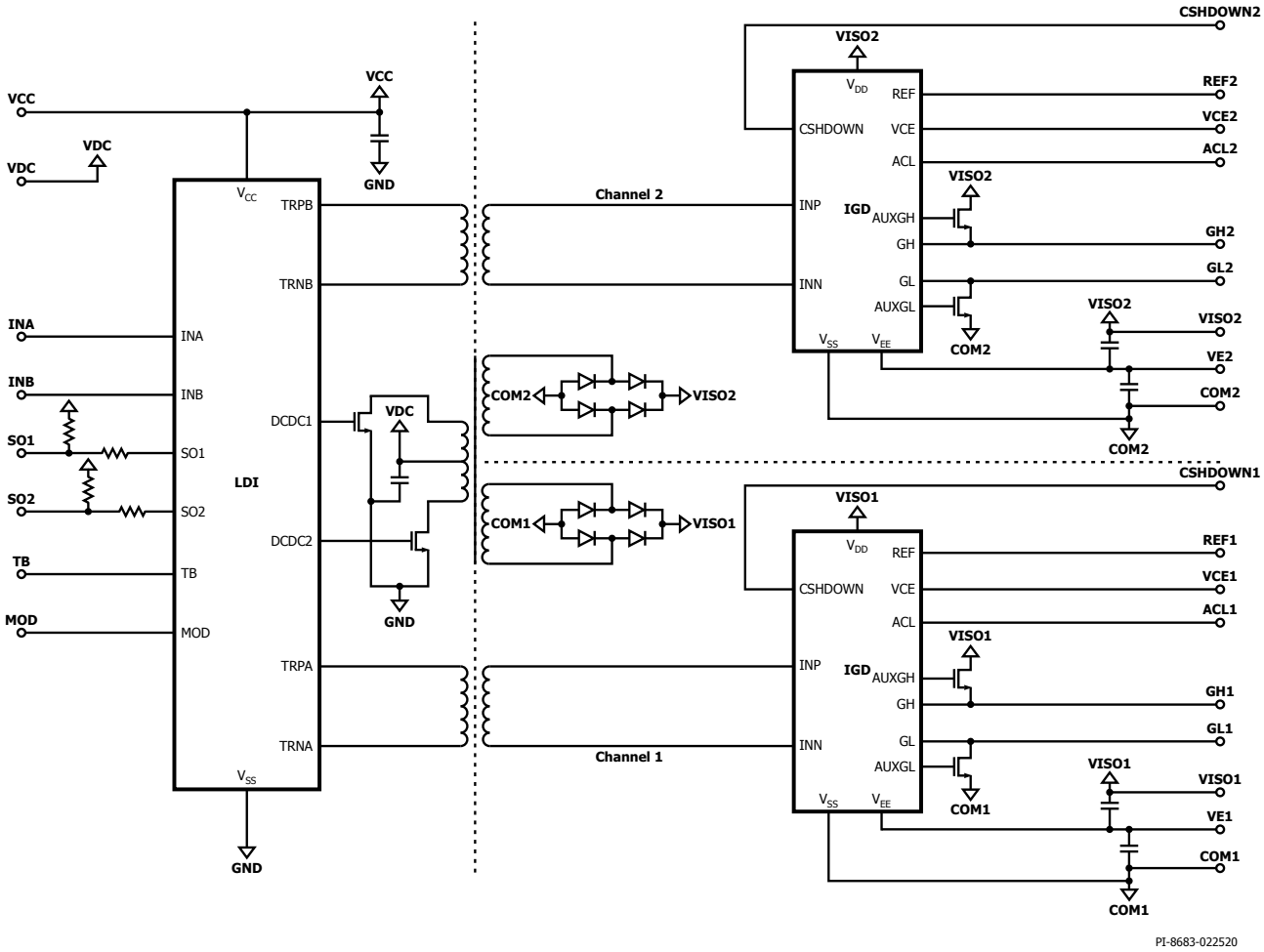
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN} = 0 Hz		130		mA
Supply current, full load			880	mA
Output power per channel			8	W
Gate voltage		+15 / -10		V
Peak output current (gate current)	-50		+50	A
Switching frequency (f_S [1])			10	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	45			mm
Clearance distance primary-secondary	25			mm
Dielectric test voltage	10300			VAC
Partial discharge extinction voltage	5400			V_{PEAK}
dv / dt immunity, input-to-output			35	kV/µs
Operating temperature	-40		+85	°C

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

Application Circuit (2SC0635T)

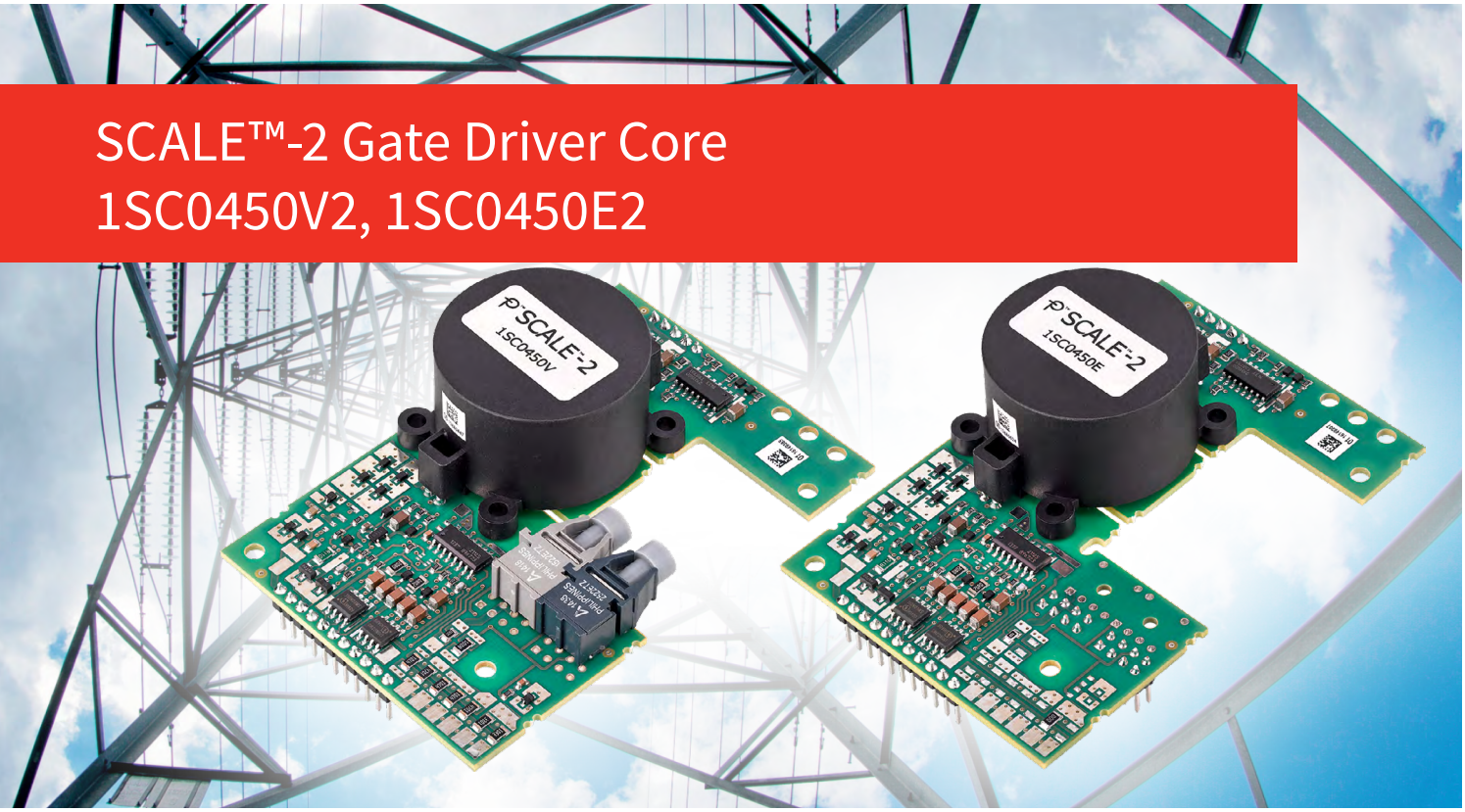


Ordering Information

Part Number	Type Designation	Overvoltage Protection	Temperature	Lead Free	Pin Length
2SC0635T	2SC0635T2A1-45	Advanced Active Clamping	-40 °C to +85 °C	Yes	3.1 mm

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SCALE™-2 Gate Driver Core 1SC0450V2, 1SC0450E2



High-Voltage 4.5 kV and 6.5 kV Single-Channel Gate Driver with Integrated DC-DC Converter

Applications

- Railway main inverters
- High Voltage DC transmission systems (HVDC)
- STATCOM
- Medium voltage drives
- Flexible AC transmission systems (FACTS)

Certification

- Isolation according to IEC 61800-5-1
- UL compliant

Key Features

- Single-channel driver core for blocking voltages up to 4.5 kV and 6.5 kV
- ±50 A peak output gate current
- 6 W output power
- High reliability (reduced component count)
- Advanced Active Clamping and Dynamic Advanced Active Clamping
- IGBT short-circuit protection
- Lead free
- -40 °C to +85 °C
- Supply undervoltage lockout

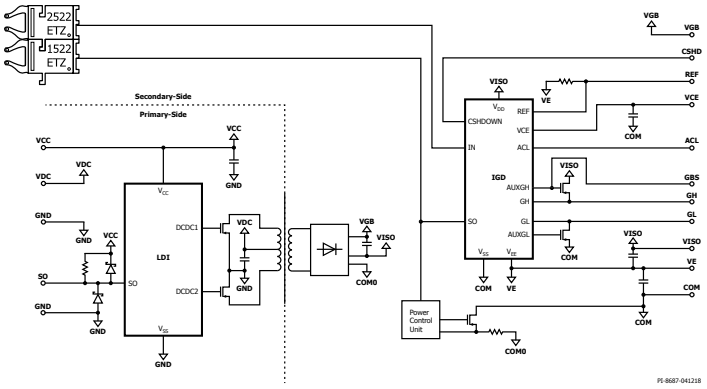
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Key Data Overview

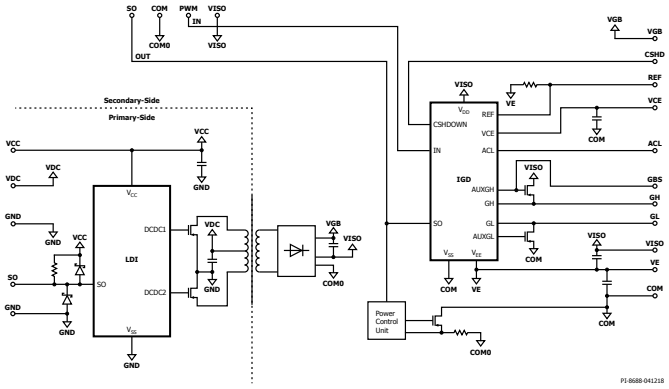
Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN} = 0 Hz		130		mA
Supply current, full load			880	mA
Output power per channel			8	W
Gate voltage		+15 / -10		V
Peak output current (gate current)	-50		+50	A
Switching frequency (f_S [1])			10	kHz
Duty cycle	0		100	%
Turn-on delay		135		ns
Turn-off delay		105		ns
Creepage distance primary-secondary	45			mm
Clearance distance primary-secondary	25			mm
Dielectric test voltage	10300			VAC
Partial discharge extinction voltage	5400 / 7800			V_{PEAK}
dv / dt immunity, input-to-output			35	kV/µs
Operating temperature	-40		+85	°C

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

Application Circuit (1SC0450V)



Application Circuit (1SC0450E)



Ordering Information

Part Number	Type Designation	Description	Temperature	Lead Free	Pin Length
1SC0450 [1]	1SC0450V2B0-45	Fiberoptic interface	-40 °C to +85 °C	Yes	5.84 mm
	1SC0450V2B0-65	Fiberoptic interface	-40 °C to +85 °C	Yes	5.84 mm
	1SC0450E2B0-45	Non-isolated electrical interface	-40 °C to +85 °C	Yes	5.84 mm
	1SC0450E2B0-65	Non-isolated electrical interface	-40 °C to +85 °C	Yes	5.84 mm

[1] Also available with conformal coating. Please refer to the "Conformal Coating for Gate Drivers" section in this catalog.

Plug-and-Play Gate Drivers

Power Integrations is a technology and market leader in mid- and high-power gate drivers. Using highly integrated technology, the company's gate drivers employ up to 85% fewer components than other commonly-available solutions. Power Integrations has 30 years' history of supporting demanding industries such as railway, power generation, power transmission and industrial automation with products that combine outstanding reliability, best-in-class performance and competitive pricing.

Innovative Technology

Power Integrations pioneered the use of ASIC technology to develop highly-integrated, ultra-efficient, high-performance gate drivers. Our SCALE™-2 design methodology uses an ASIC chipset to reduce component count and save space. It is manufactured on an automotive-qualified BiCMOS wafer processing line, so performance and reliability are ensured. By owning the IC design, Power Integrations is also able to insure a long service life.

Design Support and Customisation

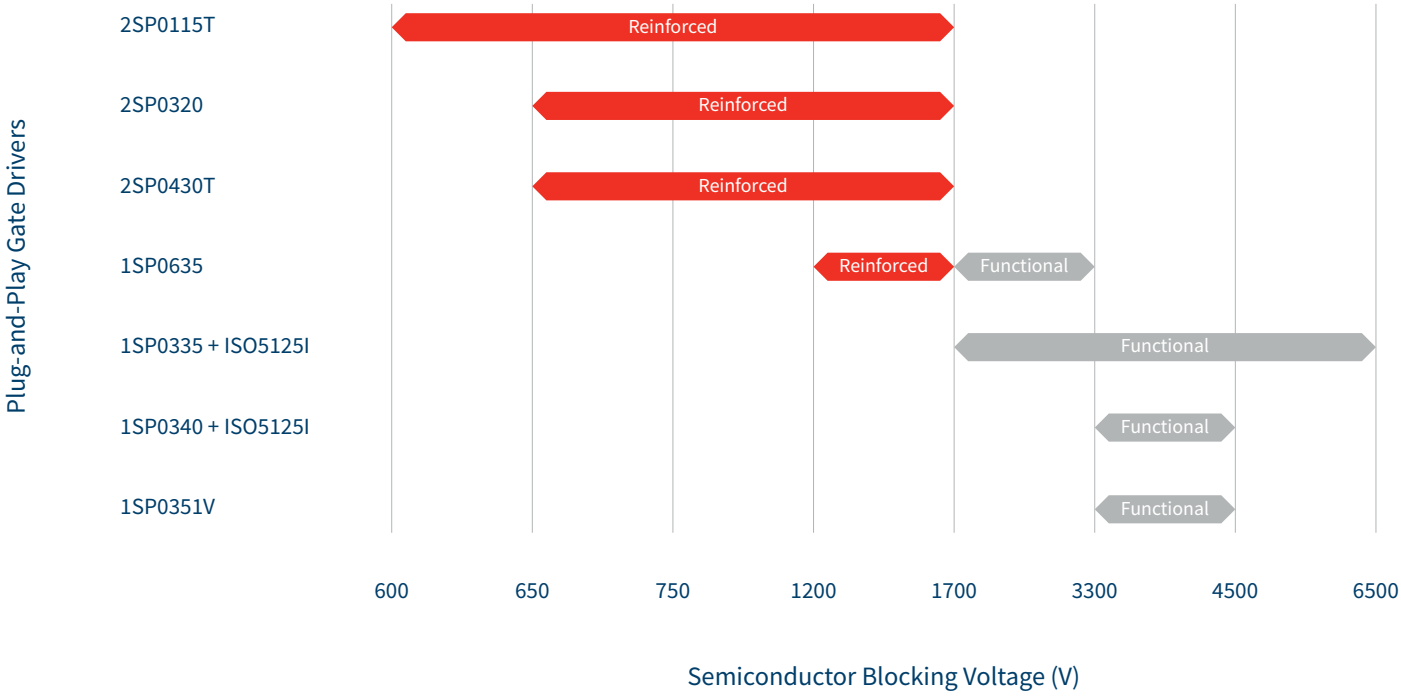
Power Integrations develops reference designs and semi-custom gate drive designs based on the company's driver cores and produces full-custom drivers using the company's SCALE-2 platform for large projects.

Complete and Ready to Use

Plug-and-play products are complete, ready-to-use IGBT gate drivers that have been tightly matched to a specific IGBT module. Drivers are available to cover a large selection of high-power and high-voltage IGBT modules with reverse blocking voltages from 600 V to 6500 V. All plug-and-play drivers are equipped with DC-DC converters, short-circuit protection, active clamping, supply monitoring, soft start and more.

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Gate Driver Isolation [1]



[1] Gate Driver Isolation Coordination according to IEC 60664-1 and IEC 60077-1

SCALE™-2 Plug-and-Play Gate Driver 2SP0115T



Dual-Channel Gate Driver with Electrical Interface for 17 mm Dual IGBT Modules

Applications

- Wind power inverters
- Industrial motor drives
- Railway auxiliary inverters
- Induction heating
- Photovoltaic inverters
- Uninterruptible power supplies (UPS)
- Medical (MRT, CT, X-ray)

Certification

- Reinforced isolation according to IEC 60664-1
- UL compliant

Key Features

- Dual-Channel Plug-and-Play IGBT driver for blocking voltages up to 1700V
- +15 V (regulated) / -8 V gate driving
- Interface for 3.3 V to 15 V logic level
- Direct and half bridge modes
- Supports two-level and multi-level topologies
- IGBT short-circuit protection
- Advanced Active Clamping
- Isolated DC-DC converter
- 2 x 1 W output power
- Supply undervoltage lockout
- Reliable, long service life
- Lead free and RoHS compliant version available

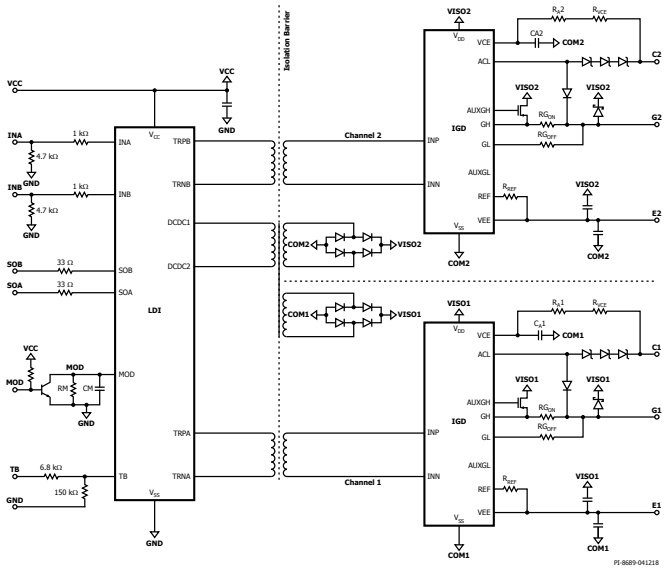
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current @ f_{IN} = 0 Hz		33		mA
Supply current, full load			220	mA
Output power per channel		1		W
Gate voltage		+15 / -8		V
Peak output current (gate current)	-8		+15	A
Switching frequency (f_S [1])	0		50	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	12.6			mm
Clearance distance primary-secondary	12.3			mm
Dielectric test voltage (600 V / 1200 V versions)	3800			VAC
Dielectric test voltage (1700 V version)	5000			VAC
Partial discharge extinction voltage (600 / 1200 V versions)	1220			V_{PEAK}
Partial discharge extinction voltage (1700 V version)	1768			V_{PEAK}
dv / dt immunity, input-to-output			50	kV/µs
Operating temperature 2SP0115T2Ax-xx	-20		+85	°C
Operating temperature 2SP0115T2Bx-xx, 2SP0115T2Cx-xx, 2SP0115T2Dx-xx	-40		+85	°C

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

Application Circuit (2SP0115T)



Ordering Information

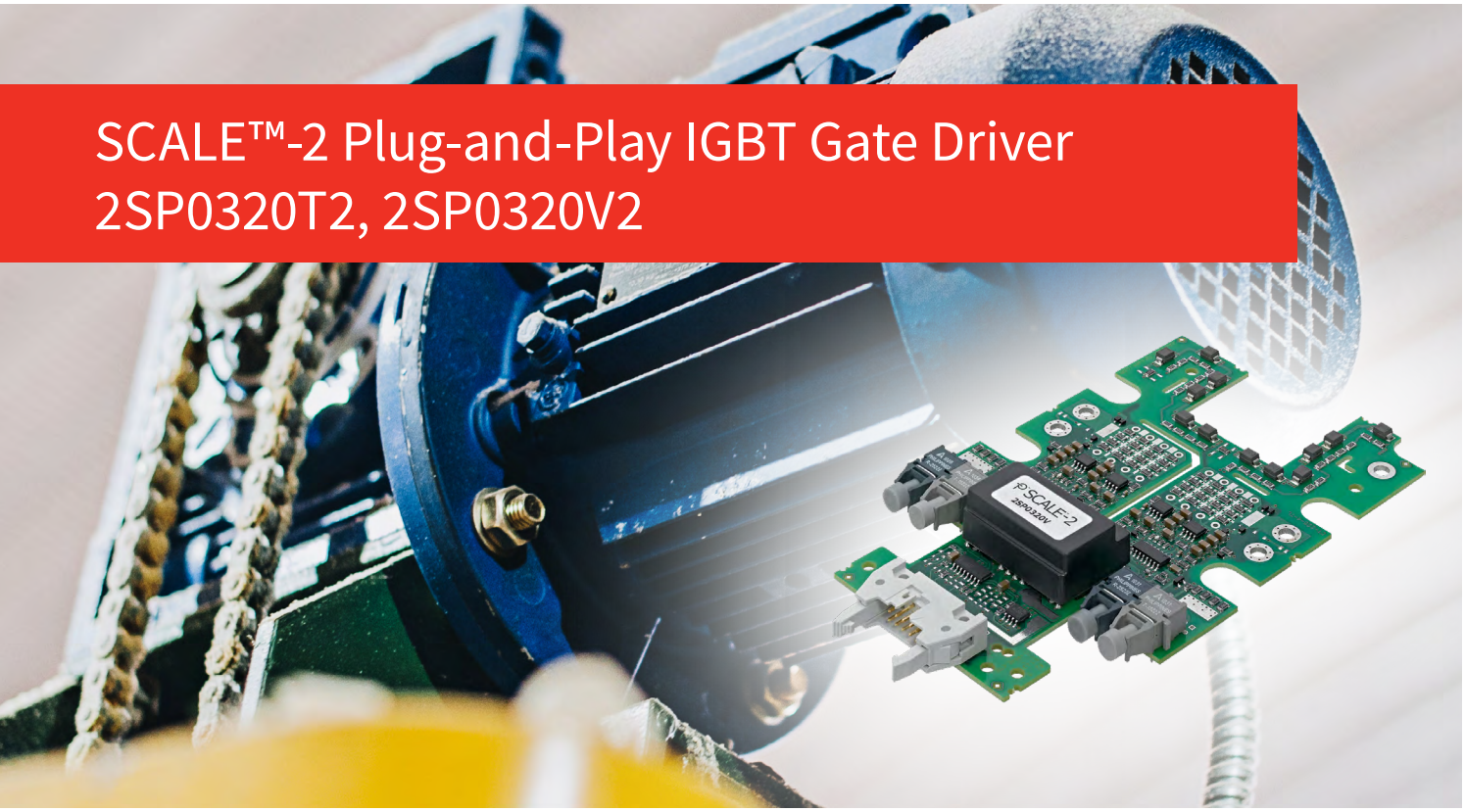
Part Number	Type Designation	Description
2SP0115T [1]	2SP0115T2A0	Standard version (-20 °C to +85 °C)
	2SP0115T2B0	Extended operating temperature (-40 °C to +85 °C)
	2SP0115T2C0	15 V logic level, extended operating temperature (-40 °C to +85 °C)
	2SP0115T2D0	15V logic level, extended operating temperature (-40 °C to +85 °C), lead free
	2SP0115T2A0-xx	xx: either voltage basic type [2] or specific module type
	2SP0115T2B0-xx	xx: either voltage basic type [2] or specific module type
	2SP0115T2C0-xx	xx: voltage basic type [2]
	xx: specific module type (Infineon, Fuji, Mitsubishi, ABB) such as 2MBI300VN-120-50	
	xx: voltage basic type xx = 06 (600 V) / xx = 12 (1200 V) / xx = 17 (1700 V)	

[1] Also available with conformal coating. Please refer to the "Conformal Coating for Gate Drivers" section in this catalog.

[2] Gate resistors have to be soldered by customer

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SCALE™-2 Plug-and-Play IGBT Gate Driver 2SP0320T2, 2SP0320V2



Dual-Channel Gate Driver for PrimePACK™ and Equivalent IGBT Modules with Electrical or Fiberoptic Interfaces

Applications

- Wind power inverters
- Industrial motor drives
- Railway auxiliary inverters
- Induction heating
- Commercial air conditioners
- Uninterruptible power supplies (UPS)
- Medical (MRT, CT, X-ray)

Certification

- Reinforced isolation according to IEC 60664-1
- UL compliant

Key Features

- Dual-Channel plug-and-play IGBT gate driver for blocking voltages up to 1700 V
- Interface for 3.3 V to 15 V logic level
- Electrical or fiberoptic interfaces
- +15 V (regulated) / -10 V gate driving
- Easy mounting directly onto the IGBT
- Supports two-level and three-level converter topologies
- IGBT short-circuit protection
- Advanced Active Clamping
- Isolated DC-DC converter
- Supply undervoltage lockout
- Lead free and RoHS compliant version available

PrimePACK™ is a registered trademark of Infineon Technology AG

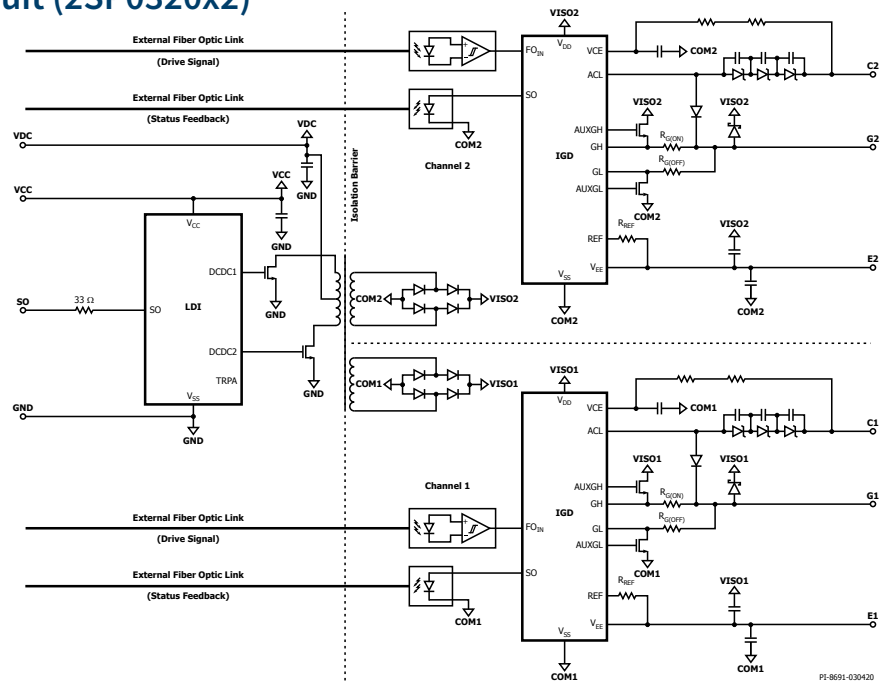
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		15		V
Supply current 2SP0320T2xx @ f_{IN} = 0 Hz		56		mA
Supply current 2SP0320V2xx and 2SP0320S2xx @ f_{IN} = 0 Hz		164		mA
Supply current, full load 2SP0320T2xx		600		mA
Supply current, full load 2SP0320V2xx and 2SP0320S2xx		690		mA
Output power per channel		3		W
Gate voltage		+15 / -10		V
Peak output current (gate current)	-20		+20	A
Switching frequency (f_S [1])	0		30	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	20			mm
Dielectric test voltage	5000			VAC
Partial discharge extinction voltage	1768			V_{PEAK}
dv / dt immunity, input-to-output			50	kV/µs
Operating temperature	-40		+85	°C

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

Application Circuit (2SP0320x2)

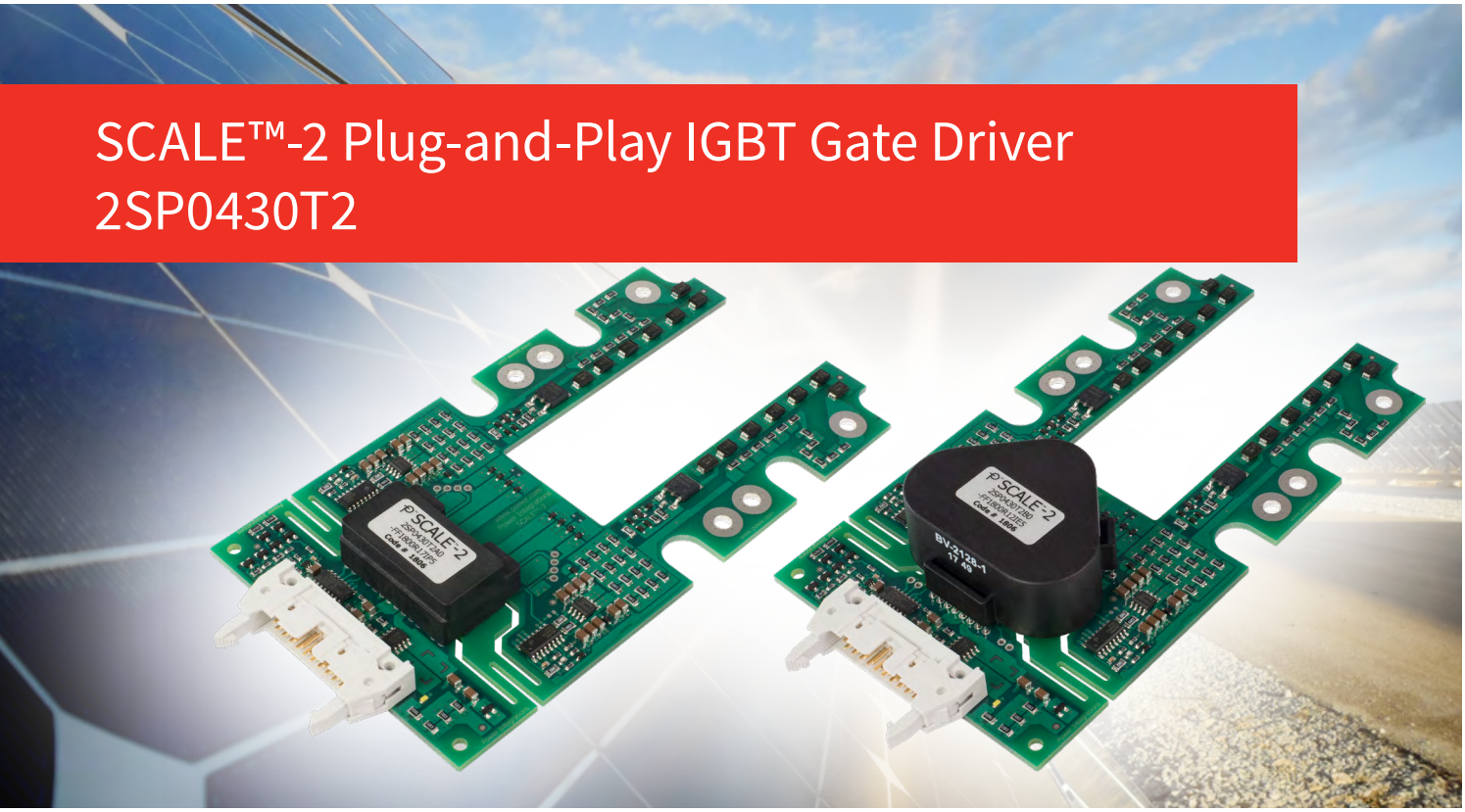


Ordering Information

	2SP0320T2 [1]	2SP0320V2 [1]
Type designation	2SP0320T2A0-xx	2SP0320V2A0-xx
	2SP0320T2C0-12, 2SP0320T2D0-12	2SP0320V2D0-12
	2SP0320T2C0-17 , 2SP0320T2D0-17	2SP0320V2D0-17
xx: Voltage basic type [1] or xx: Specific module typical	xx = 12 (1200 V) / xx = 17 (1700 V)	
	xx = e.g., 2MBI900VXA-120E-50	
Input signal interface	Electrical interface	
	2SP0320T2A0: 3.3-15 V logic level	A0: Versatile FO input / output
	2SP0320T2C0: 15 V logic level	
	2SP0320T2D0: 15V logic level, lead free	D0: Versatile FO input / output, lead free
On-board connector	DIC20	HFBR 2522ETZ / 1522ETZ

[1] Gate resistors must be soldered by customer

SCALE™-2 Plug-and-Play IGBT Gate Driver 2SP0430T2



Dual-Channel Gate Driver for PrimePACK™ 3+ and Equivalent Power Modules

Applications

- Wind power inverters
- Photovoltaic inverters
- Uninterruptible power supplies (UPS)
- Industrial motor drives
- Railway main and auxiliary inverters

Certification

- Reinforced isolation according to IEC 60664-1
- UL compliant

Key Features

- Dual-channel plug-and-play IGBT gate driver for blocking voltages up to 1700 V in three level topologies
- +15 V (regulated) / -10 V gate drive
- Supports three-level converter topologies
- IGBT short-circuit protection
- Isolated DC-DC converter
- Supply undervoltage lockout
- Dynamic Advanced Active Clamping (DAAC)
- Conformal coating

PrimePACK™ is a registered trademark of Infineon Technology AG

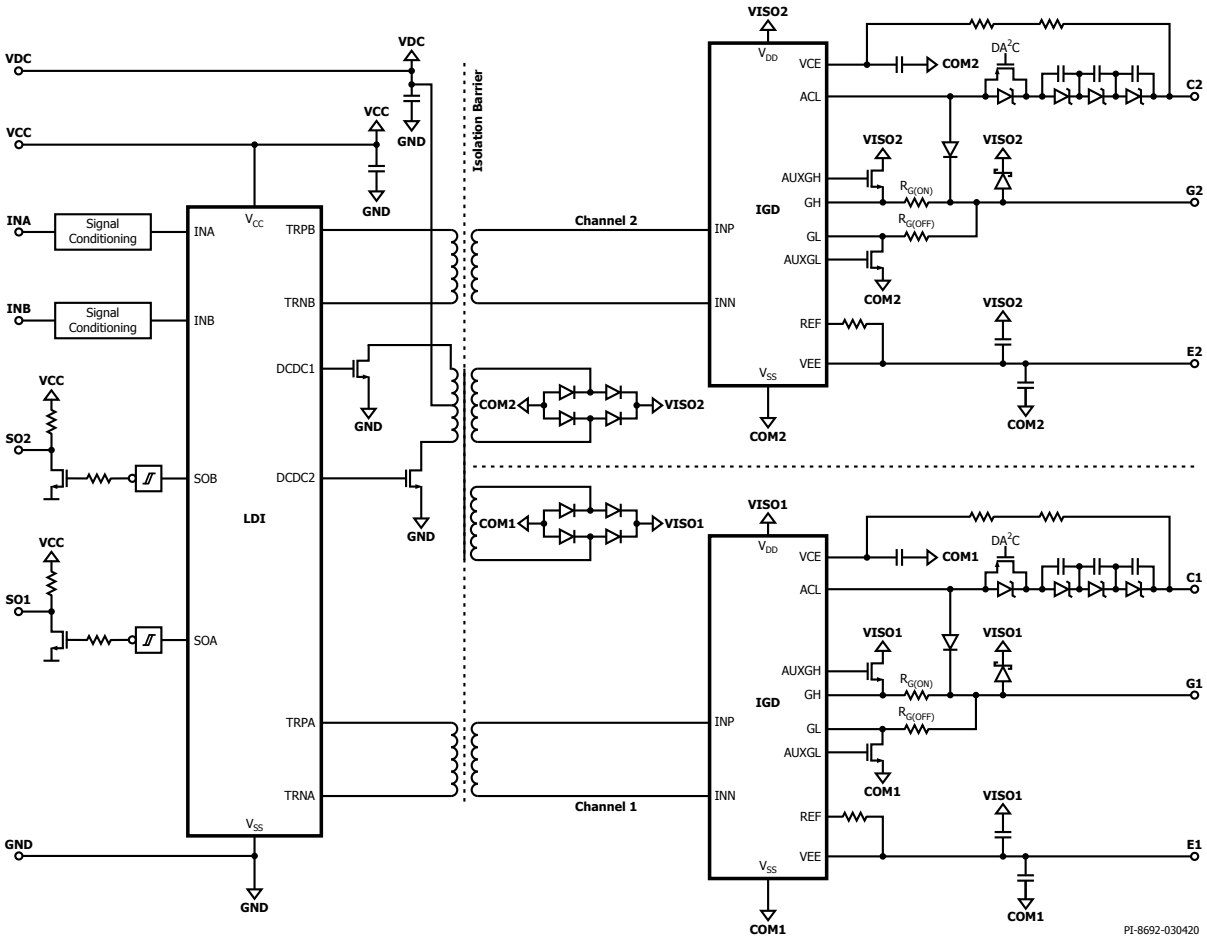
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage (V_{VDD}), (V_{VCC})		15		V
Supply current, full load (I_{VDC})			480	mA
Output power per channel (P_{gx})			2	W
Peak output current (gate current)	-30		30	A
Switching frequency f_{SW}		10		kHz
Creepage distance primary-secondary (C_{PGP-S})	30			mm
Clearance distance primary-secondary (C_{PGS-S})	12.6			mm
Dielectric test voltage A-Type ($V_{iso,ps}$)	5000			V_{RMS}
Dielectric test voltage B-Type ($V_{iso,ps}$)	9100			V_{RMS}
Partial discharge extinction voltage A-Type ($P_{D,ps}$)	1768			V_{PEAK}
Partial discharge extinction voltage B-Type ($P_{D,ps}$)	3100			V_{PEAK}
dv / dt immunity, input-to-output			50	kV/µs
Operating temperature	-40		85	°C

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

Application Circuit (2SP0430T2xx)



Ordering Information

Part Number	Type Designation	Description
2SP0430T2A	2SP0430T2A0C-xx [1]	For 2-level operation
2SP0430T2B	2SP0430T2B0C-xx [1]	For 3-level operation

[1] xx: specific module type, e.g. FF1800R17IP5

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SCALE™-2 Plug-and-Play IGBT Gate Driver 1SP0635V2



Single-Channel Plug-and-Play Gate Driver for 1.2 kV, 1.7 kV and 3.3 kV IHM modules– Supports Direct Paralleling with Master / Slave Configuration

Applications

- Railway main inverters
- Railroad power supplies
- High Voltage DC transmission systems (HVDC)
- Flexible AC transmission systems (FACTS)
- Medium voltage drives
- Industrial motor drives

Certification

- Isolation according to IEC 60077-1
- UL compliant

Key Features

- Single-channel plug-and-play gate driver for blocking voltages up to 3300 V
- Fiberoptic interfaces
- +15 V (regulated) / -10 V gate driving
- Direct paralleling of IGBTs
- Supports two-level and multi-level topologies
- IGBT short-circuit protection
- Dynamic Advanced Active Clamping (DAAC)
- Built-in isolated DC-DC converter
- Supply undervoltage lockout
- Easy mounting directly onto the IGBT
- Extremely reliable, long service life

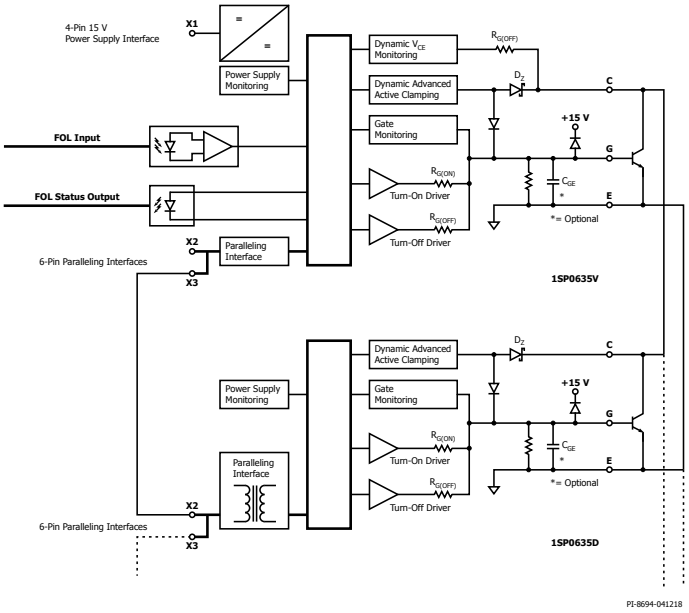
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Key Data Overview

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_s [1])	0		30	kHz
Duty cycle	0		100	%
Creepage distance primary-secondary	21			mm
Clearance distance primary-secondary	21			mm
Dielectric test voltage (3.3 kV versions)	6000			VAC
Partial discharge extinction voltage (3.3 kV versions)	3630			V_{PEAK}
Operating temperature	-40		+85	°C

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

Application Circuit (1SP0635)



Ordering Information

	V-Type (Master)	S-Type (Master)	D-Type (Slave)
Type designation plus	1SP0635V2M1-xx [1]	1SP0635S2M1-xx [1]	1SP0635D2S1-xx [1]
xx: Voltage basic type	xx = 12 (1200 V); xx = 17 (1700 V); xx = 33 (3300 V)		
or xx: Specific module type	e.g., 5SNA1200E330100		
Module package	IHM 130 / 140; 190 / 140		
Input signal interface	Versatile FOL input / output	ST FOL input / output	N/A
On-board connector	HFBR-1522ETZ / 2522ETZ	HFBR1412Z / 2412Z	N/A
Bus interface			
On-board connector	MBCON-6-1-0		
Connecting cable	MBC61-xxx-0 (xxx = 030, 050, 070, 110)		
Power supply			
Connecting cable	MBC41-xxx-0 (xxx = 035, 045, 070)		N/A

[1] Also available with conformal coating. Please refer to the "Conformal Coating for Gate Drivers" section in this catalog.

SCALE™-2 Plug-and-Play IGBT Gate Driver 1SP0340V2 and DC-DC Converter ISO5125I



Compact Plug-and-Play Gate Driver for 4.5 kV IGBT Modules in a Low-Voltage (6 kV) Package

Applications

- Railway main inverters
- High Voltage DC transmission systems (HVDC)
- Medium and high-voltage drives
- Pulse power applications
- Flexible AC transmission systems (FACTS)
- STATCOM

Certification

- Creepage and clearances according to IEC 60077-1
- UL compliant

Key Features

- Single-channel plug-and-play gate driver
- Fiberoptic interfaces
- +15 V (regulated) / -10 V gate driving
- Direct paralleling of IGBTs
- Supports two-level and multi-level topologies
- IGBT short-circuit protection
- Dynamic Advanced Active Clamping (DAAC)
- Supply undervoltage lockout
- Gate monitoring
- Active Miller clamping
- Easy mounting directly onto the IGBT
- External DC-DC converter ISO5125I necessary

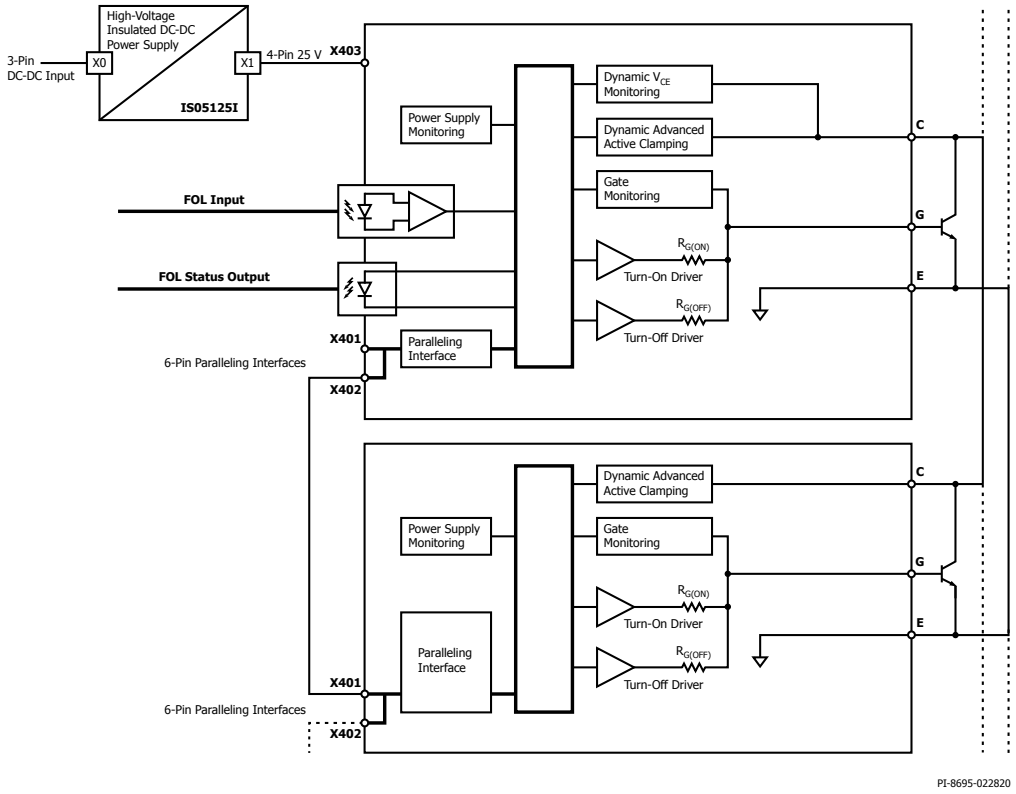
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		25		V
Supply current 1SP0340V2M0 @ f_{IN} = 0 Hz		180		mA
Output power (1SP0340V2M0)		2.8		W
Gate voltage		±15		V
Peak output current (gate current)	-35		+35	A
Switching frequency (f_S [1])	0		30	kHz
Duty cycle	0		100	%
Operating temperature	-40		+85	°C

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

Application Circuit (1SP0340 and ISO5125I)



Fiberoptic links are used to electrically isolate the command and status feedback signals

Ordering Information

	V-Type (Master)	D-Type (Slave)
Type designation plus	1SP0340V2M0-xx	1SP0340D2S0-xx
xx: Voltage basic type	4500 V = 45	
or xx: Specific module type	e.g., FZ1200R45HL3	
Module package	IHV 130 / 140; 190 / 140	
DC-DC converter	ISO5125I-xx (xx: 4500 V = 45; 6500 V = 65; 10000 V = 100; 12000 V = 120)	
Input signal interface	Versatile FOL input / output	N/A
On-board connector	HFBR-2522ETZ / 1522ETZ	N/A
Bus interface		
Connecting cable	MBC61-xxx-0 (xxx = 030, 050, 070, 110)	
Power supply		
Connecting cable driver / ISO	MBC41-xxx-0 (xxx = 035, 045, 070, 110)	
Connecting cable ISO / user board	MBC31-100-0	

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SCALE™-2 Plug-and-Play IGBT Gate Driver 1SP0335 and DC-DC Converter ISO5125I



Single-Channel Plug-and-Play Gate Driver for 3.3 kV to 6.5 kV with Separate Power Supply Unit for IGBT Modules in High-Voltage (10.2 kV) Package

Applications

- Railway main inverters
- Railroad power supplies
- High Voltage DC transmission systems (HVDC)
- Flexible AC transmission systems (FACTS)
- Medium and high-voltage drives
- Industrial motor drives

Certification

- Creepage and clearances according to IEC 60077-1
- UL compliant

Key Features

- Single-channel plug-and-play gate driver
- Fiberoptic interfaces
- +15 V (regulated) / -10 V gate driving
- Direct paralleling of IGBTs
- Supports two-level and multi-level topologies
- Dynamic IGBT short-circuit protection
- Dynamic Advanced Active Clamping (DAAC)
- Supply undervoltage lockout
- Easy mounting directly onto the IGBT
- Extremely reliable, long service life
- External DC-DC converter ISO5125I necessary

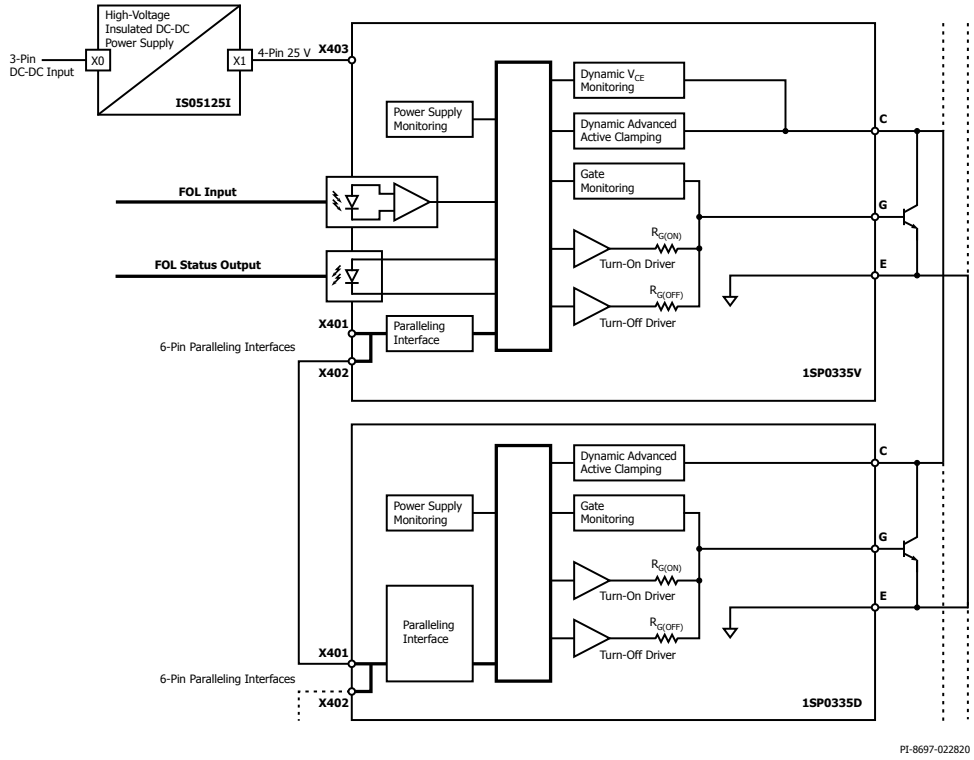
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage		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_S [1])	0		30	kHz
Duty cycle	0		100	%
Operating temperature	-40		+85	°C

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

Application Circuit (1SP0335 and DC-DC ISO5125I)



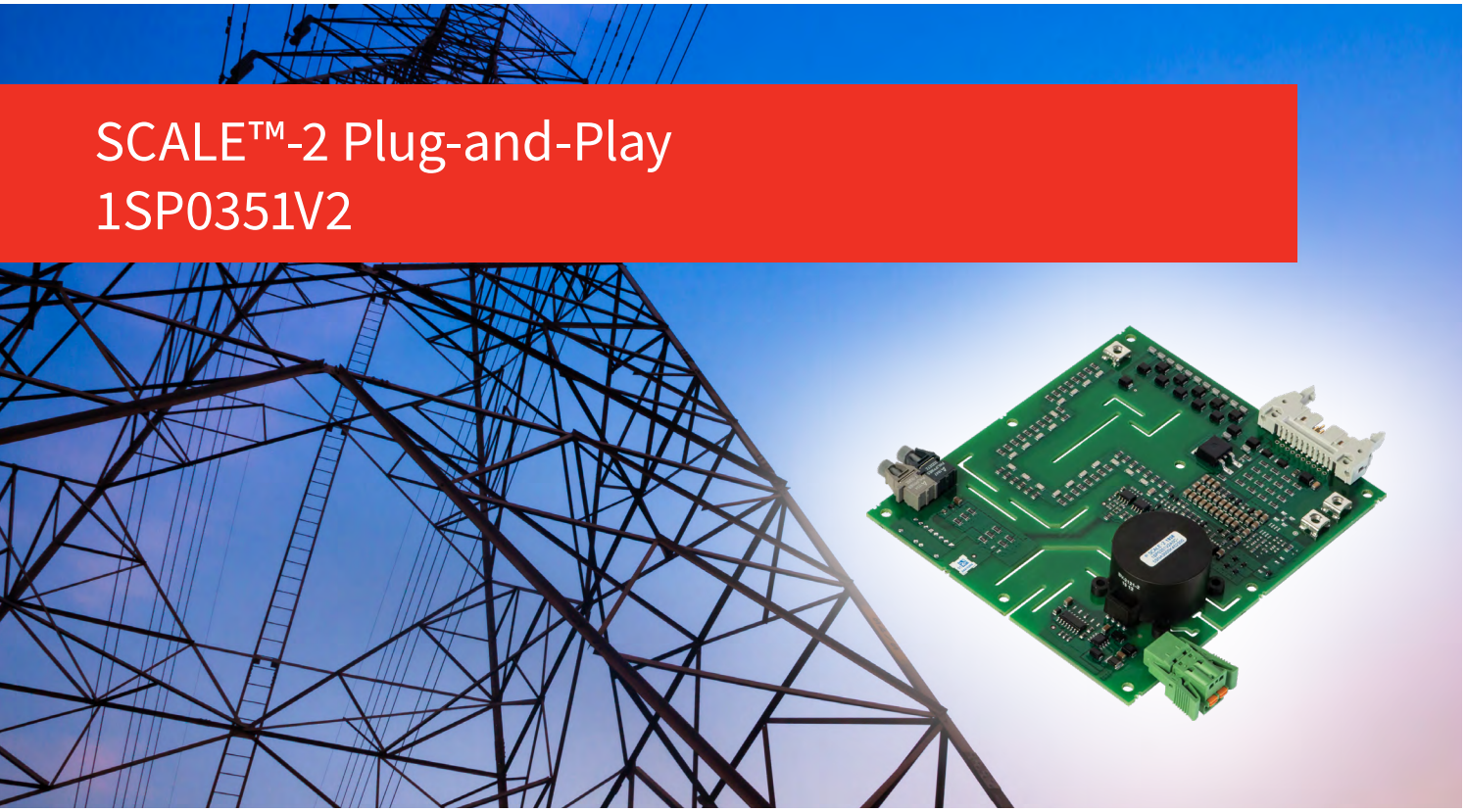
Ordering Information

	V-Type (Master)	S-Type (Master)	D-Type (Slave)
Type designation plus	1SP0335V2M1-xx [1]	1SP0335S2M1-xx [1]	1SP0335D2S1-xx [1]
xx: Voltage basic type	3300 V=33 / 4500 V=45 / 6500 V=65		
or xx: Specific module type	e.g., FZ1200R45HL3		
Module package	IHV 130 / 140; 190 / 140		
DC-DC converter	ISO5125I-xx (xx: 4500 V = 45; 6500 V = 65; 10000 V = 100; 12000 V = 120)		
Input signal interface	Versatile FOL input / output	ST FOL input / output	N/A
On-board connector	HFBR-2522ETZ / 1522ETZ	HFBR-2412Z / 1412Z	N/A
Bus interface			
Connecting cable	MBC61-xxx-0 (xxx = 030, 050, 070, 110)		
Power supply			
Connecting cable driver / ISO	MBC41-xxx-0 (xxx = 035, 045, 070, 110)		
Connecting cable ISO / user board	MBC31-100-0		

[1] Also available with conformal coating. Please refer to the "Conformal Coating for Gate Drivers" section in this catalog.

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SCALE™-2 Plug-and-Play 1SP0351V2



Single-Channel Plug-and-Play Gate Driver for 4500 V Press Pack IGBT and IEGT

Applications

- High Voltage DC transmission systems (HVDC)
- Railway main inverters
- STATCOM
- Medium voltage drive

Certification

- Creepage and clearances according to IEC standards

Key Features

- Single-channel gate driver
- Compact autonomous plug-and-play solution
- Suitable for Press Pack and modules
- Fiberoptic interface
- +15 V / -10 V gate driving
- Regulated gate voltage
- IGBT/IEGT short-circuit protection and over-current protecion
- Dynamic Advanced Active Clamping (DAAC)
- Built-in isolated and regulated DC-DC converter
- DC-DC overload monitoring

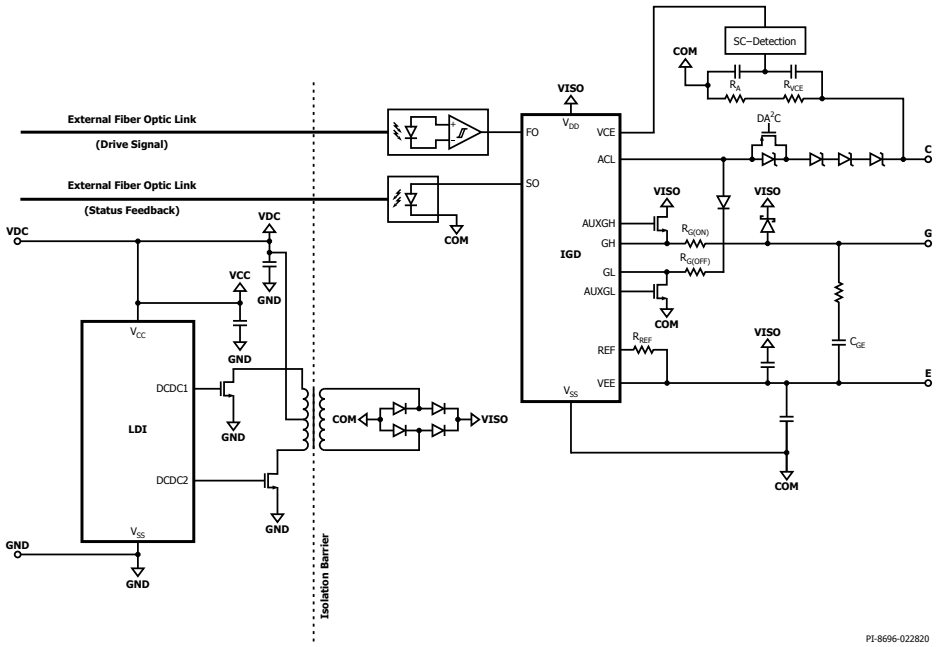
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Key Data Overview

Parameter	Min	Typical	Max	Unit
Nominal supply voltage	0	15	16	V
Supply current @ f_{IN} = 0 Hz		TBD		mA
Supply current, full load		nn		mA
Output power		3		W
Gate voltage		+15 / -10		V
Peak output current (gate current)	-50		+50	A
Switching frequency (f_S [1])			2	kHz
Test voltage	10200			V_{RMS}
Creepage distance on PCB primary-secondary	45			mm
Clearance distance primary-secondary	25			mm
Test voltage	10200			$V_{ISO,PS}$
Partial discharge extinction voltage (3.3 kV versions)	5400			V_{PEAK}
Operating temperature	-40		+85	°C

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

Application Circuit (1SP0351V2xx)



Ordering Information

Part Number	Type Designation	Description
1SP0351V2A	1SP0351V2A0C-xx[1]	For StakPak IGBT modules
1SP0351V2B	1SP0351V2B0C-xx[1]	For StakPak IGBT modules
1SP0351V2C	1SP0351V2C0C-xx[1]	For Press Pack and IHV modules
1SP0351V2D	1SP0351V2D0C-xx[1]	For Press Pack and IHV modules

DC-DC Converter ISO5125I for SCALE™-2 Plug-and-Play Gate Drivers



For 3.3 kV to 6.5 kV SCALE-2 Plug-and-Play Gate Drivers

Electrical Insulation And Power Supply with ISO5125I

The ISO5125I is a single-channel isolated DC-DC converter suitable as a power supply for IGBT drivers up to 6.5 kV. It complements Power Integrations' 1SP0335 and 1SP0340 high voltage plug-and-play gate drivers. Its output power of 5 W enables switching frequencies up to 5 kHz. It enables IGBTs drivers in the 3.3 kV to 6.5 kV voltage range to be implemented in two-level, three-level and multi-level inverter topologies.

The driver unit is mounted directly onto the IGBT module by means of three screws. The power supply unit ISO5125I is designed as a separate module, to be attached close to the IGBT. For parallel-connected drivers, only one power supply is needed per switch.

Applications

- Railway main inverters
- Railroad power supplies
- STATCOM
- High Voltage DC transmission systems (HVDC)
- Flexible AC transmission systems (FACTS)
- Medium and high-voltage drives
- Industrial motor drives

Key Features

- Operating voltage up to 12 kV peak
- Dielectric test voltage up to 18 kVAC
- Creepage distance 60 mm
- Output power 5 W
- Reliable, long service life
- Outstanding coupling capacitance 4 pF

Part Number	Type Designation	Description
ISO5125I	ISO5125I-xx xx	45 = 4500 V; 65 = 6500 V; 100 = 10000 V; 120 = 12000 V

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Application Notes



For better understanding and easier design with SCALE™ gate drivers, Power Integrations offers detailed application notes with test data, PCB layout references, topology application suggestions and other useful information.

- Typical application failures
- EMI requirements
- Clearance and creepage distances for PCB
- External implementation guidance

Key Application Notes

AN-1001: IGBT and SiC MOSFET Drivers Correctly Calculated

This application note describes the calculation of gate driver performance figures required for a given application. The values derived from this application note serve as a basis for selecting the most appropriate driver.

AN-1101: Application with SCALE™-2 and SCALE-2+ Gate Driver Cores

This application note highlights important design rules and helps to speed up development time by showing detailed examples about how to successfully design IGBT drivers for industrial and railway applications. Considered SCALE driver cores are: 2SC0108T, 2SC0435T, 2SC0650P and 1SC2060P.

AN-1301: Do's and Don'ts with SCALE-2 Gate Drivers

This application note highlights important points that must be considered when using SCALE-2 driver cores, as well as plug-and-play drivers (complements Application Note AN-1101).

AN-1601: Controlling SiC MOSFET Power Switches with SCALE-2 and SCALE-2+ Gate Drivers Cores and SCALE-iDriver Gate Driver ICs

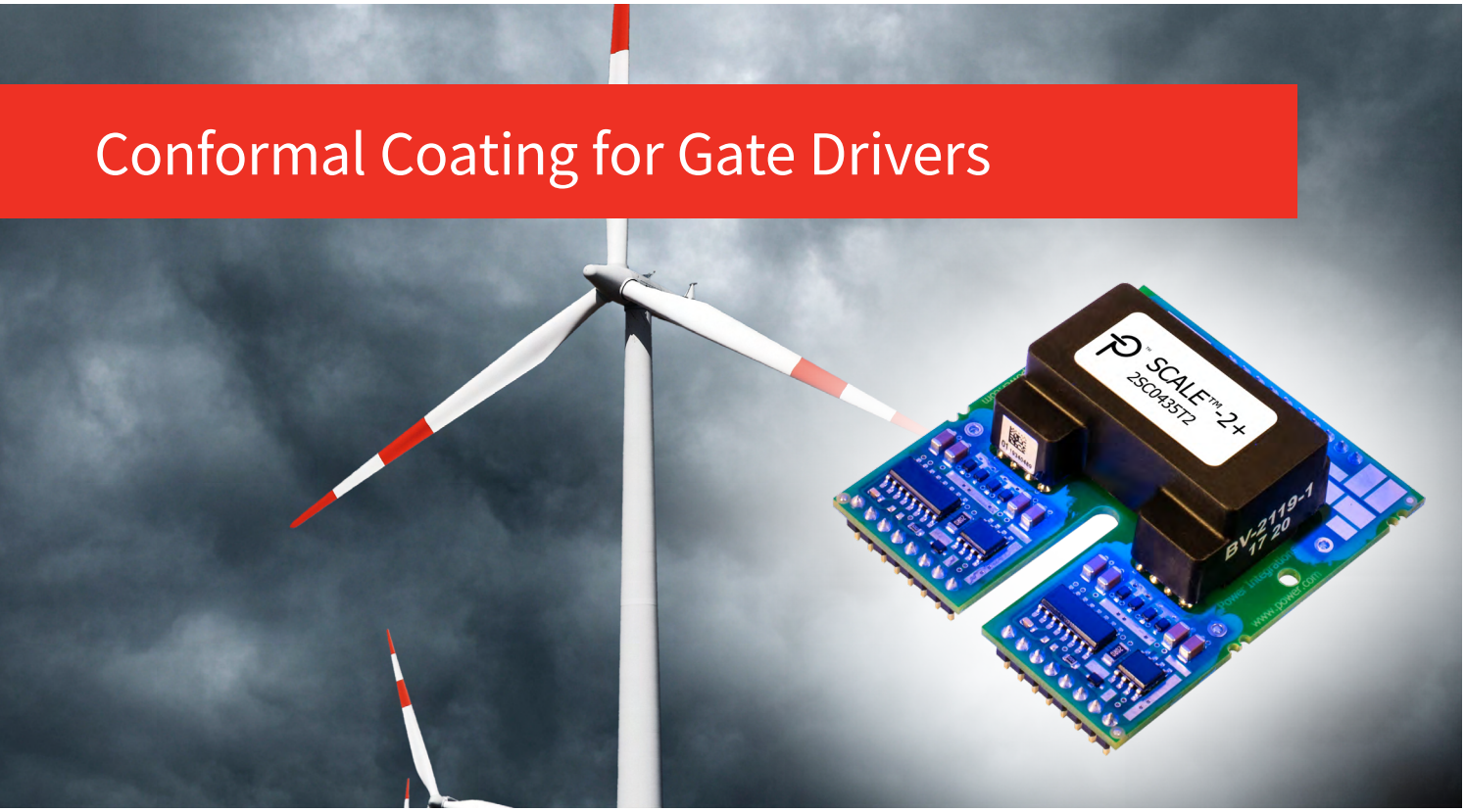
This application note discusses procedures to use SCALE gate drivers with SiC MOSFET switches.

More Application Notes available for download here:

gate-driver.power.com/design-support/application-notes

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Conformal Coating for Gate Drivers



In-Line Conformal Coating Enhances Reliability and Protection

Applications

- Offshore and onshore wind parks
- Railway main and auxiliary inverters
- High Voltage DC transmission systems (HVDC)
- Photovoltaic inverters
- Medium voltage drives in mining and oil and gas industry

Qualification

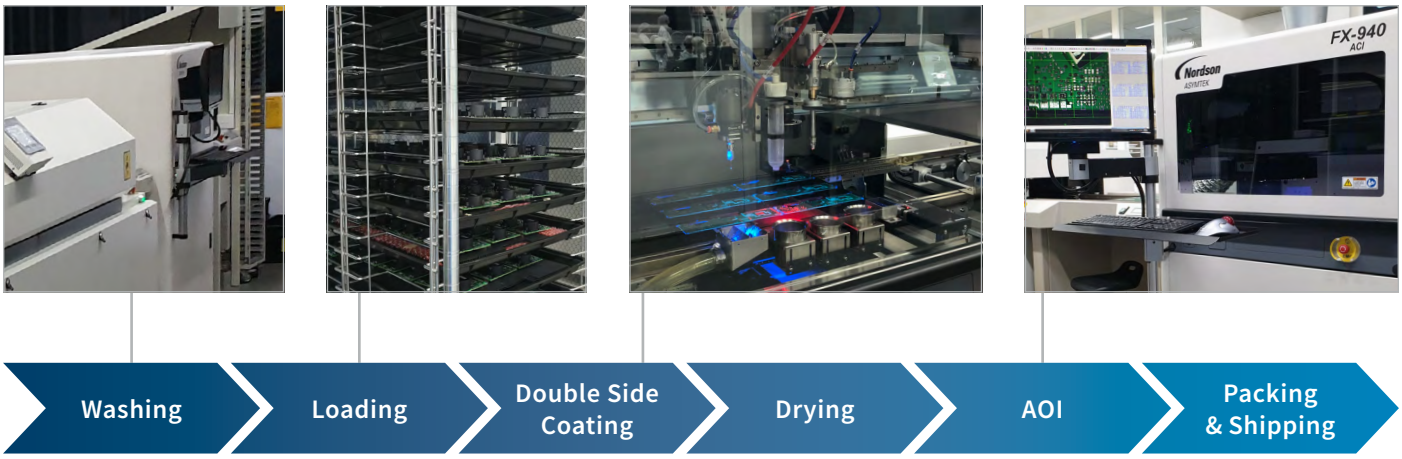
- Qualification is based on tests in accordance with IEC 60068-2-xx
- Vibration (sinusoidal) test parameters according to IEC 60068-2-6:2008-10
- Shock test parameters according to IEC 60068-2-27:2010-02
- Damp heat, steady-state test parameters according to IEC 60068-2-78:2012-10
- Cold test parameters according to IEC 60068-2-1:2007-03
- Dry heat test parameters according to IEC 60068-2-2:2007-07
- Thermal cycle test parameters according to IEC 60068-2-14:2009-01
- Salt mist test parameters according to IEC 60068-2-11

Key Features

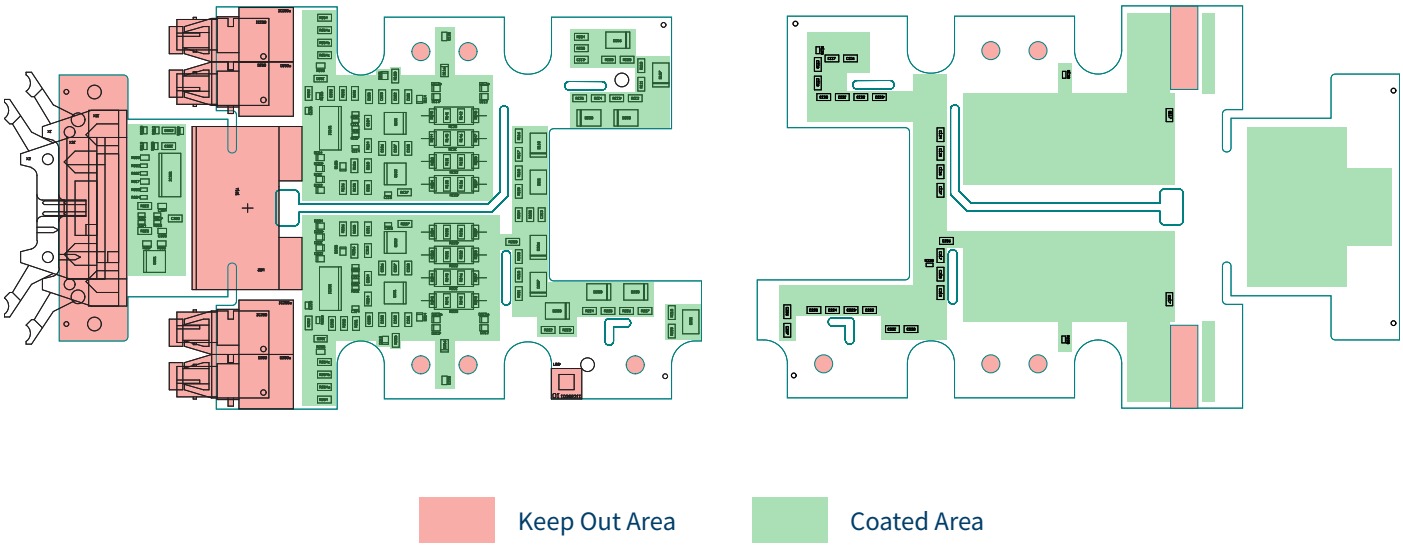
- Reduced total cost of ownership and streamlined production
- Internal solutions and specialized subcontractors become obsolete
- Full conformal coating qualification with testing in accordance with IEC 60068-2 standards
- Controlled process with 100% automatic optical inspection at end-of-line
- SCALE™-2+ gate driver cores retain UL recognition
  - E321757 for UL 508C (NMMS2/8)
  - E346491 for UL 60950-1C (NWGQ2/8)
- Extended warranty available with conformal coating

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Conformal Coating – In-Line Process Flow



Typical Coated and Keep Out Areas (2SP0320V2Ax-xxxx)



Ordering Information

Part Number	Part Number	Part Number
2SC0106T2A1C-12 (1)	2SP0115T2A0C-xxxx (2)	2SC0115T2A0C-12
2SC0108T2F1C-17 (1)	2SP0115T2B0C-xxxx (2)	2SD300C17A2C
2SC0108T2G0C-17 (1)	2SP0115T2C0C-xxxx (2)	2SD300C17A3C
2SC0108T2H0C-17 (1)	1SP0335V2M1C-xxxx (2)	2SC0535T2A1C-33
2SC0108T2D0C-12 (1)	1SP0335S2M1C-xxxx (2)	2SC0535T2G0C-33
2SC0435T2F1C-17	1SP0335D2S1C-xxxx (2)	1SP0635V2M1C-xxxx
2SC0435T2G1C-17 (1)	1SC0450E2B0C-xx	1SP0635S2M1C-xxxx
2SC0435T2H0C-17 (1)	1SC0450V2B0C-xx	2SP0320T2A0C-xxxx
Other Products On Request		

Burn-In for Gate Drivers



Enhanced Field Reliability

Applications

- Mission-critical and high reliability systems
- Transportation
- Electrical generation and transmission

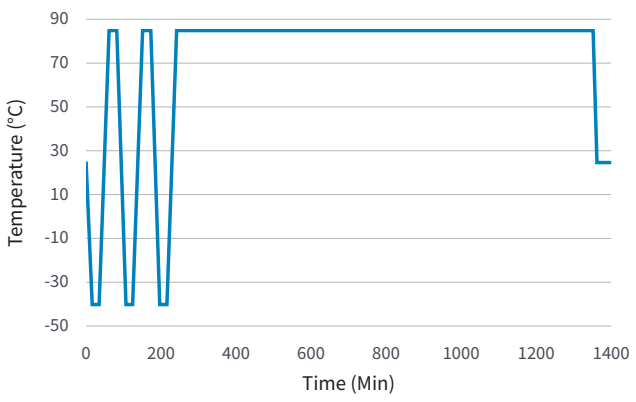
Burn-In Process

- 100% production test
- Burn-in profile
  - 23 hour burn-in cycle
  - Controlled oven profile
    - Three cycles -40 °C to +85 °C (258 minutes)
    - 1092 minute dwell-time at 85 °C
    - 30 minute off-time at 25 °C
    - Customer-specific burn-in profile on request

Key Features

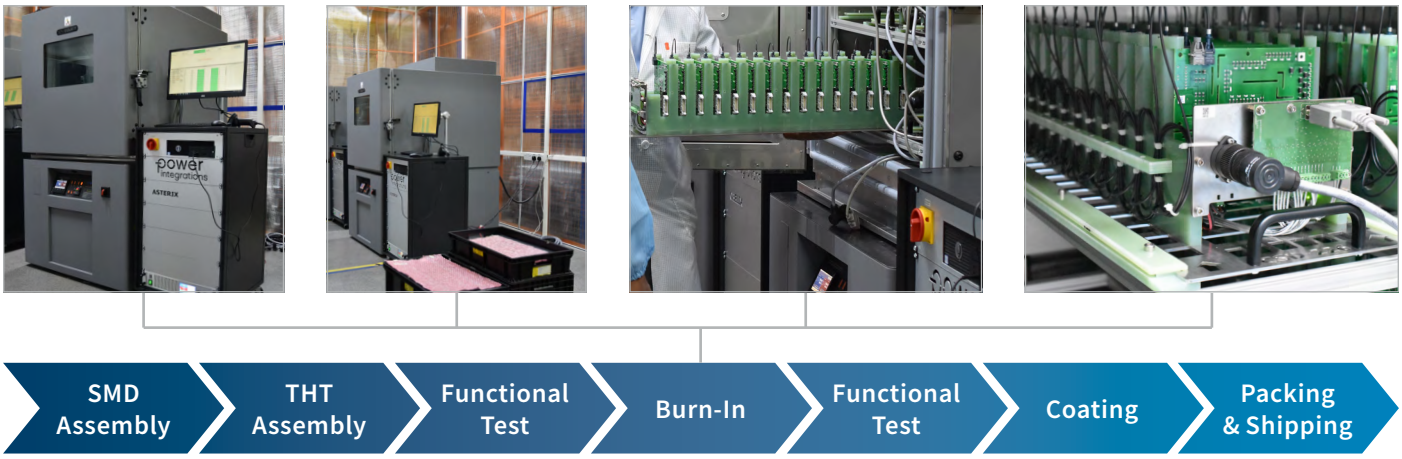
- Reduces total cost of ownership and streamlines production
- Eliminates challenges posed by in-house solutions and removes the need for specialized subcontractors
- Reduces failure rate by up to 15 PPM
- Extended warranty available with burn-in

Burn-In Profile



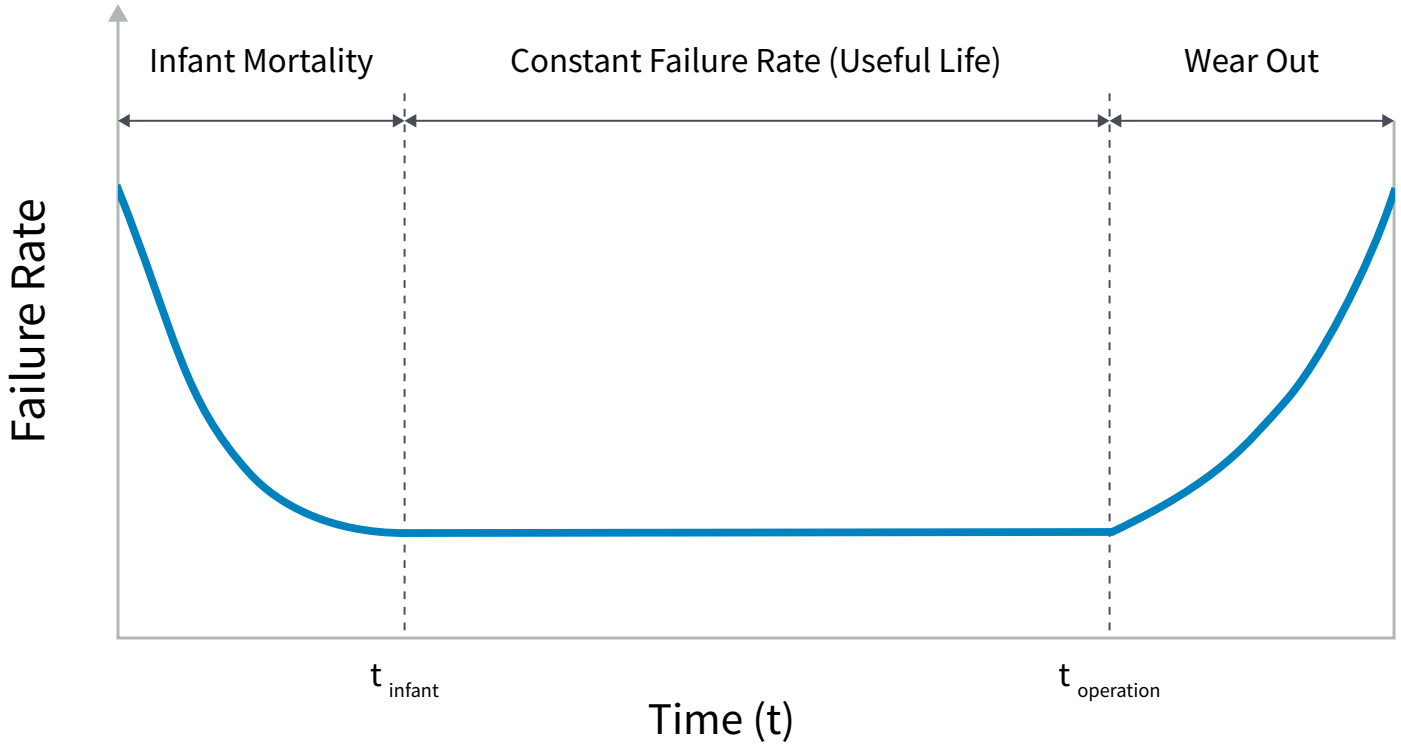
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Burn-In – In-Line Process Flow



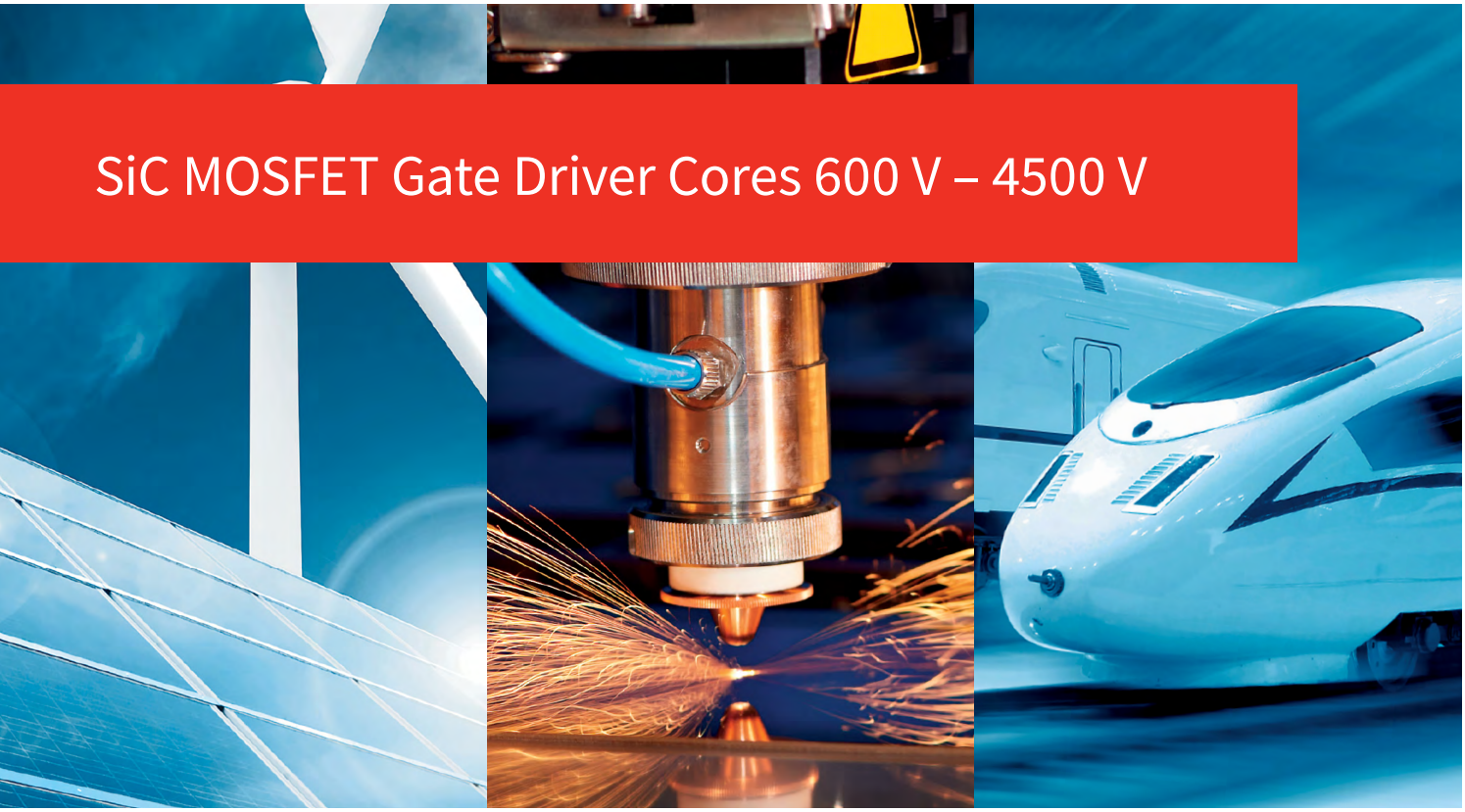
Increase Reliability

Power Integrations gate driver products for demanding applications with >100,000 hour operating lifetime.
Burn-in test eliminates infant mortality improving system reliability and reducing maintenance challenges.



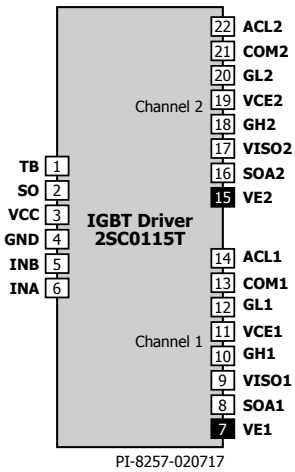
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SiC MOSFET Gate Driver Cores 600 V – 4500 V

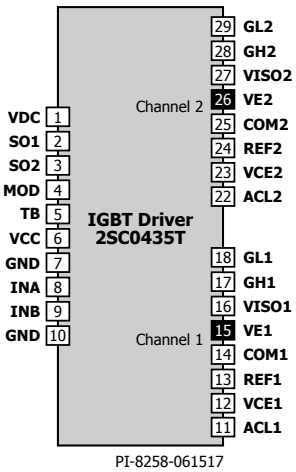


Key Features

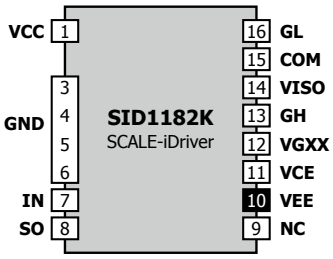
- Variable gate voltage by VEE circuit 0 V – 25 V, 0 V – 10 V = 28 V
- ≤2 µs short-circuit response time
- High output current capability
- High isolation capability
- Advance active clamping with dv / dt feedback
- High switching frequency up to 500 kHz
- SiC MOSFET breakdown voltage up to 4.5 kV
- High MTBF / low FITrate
- Broad portfolio
- Suitable for all SiC MOSFET designs
- Application defaults by request



PI-8257-020717



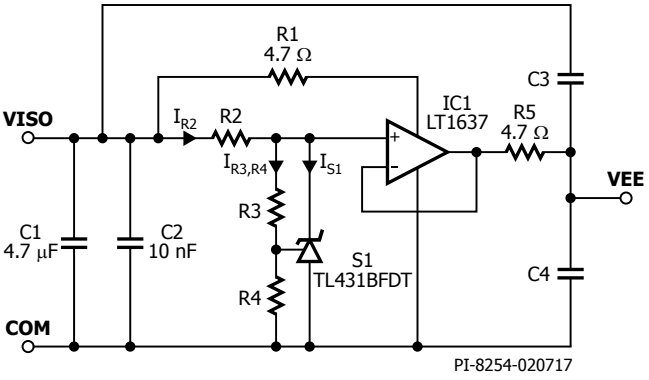
PI-8258-061517



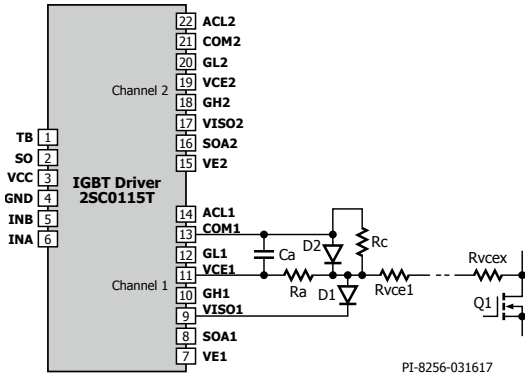
PI-8259-020717

Pinning of SCALE™ gate driver cores 2SC0115T, 2SC0435T, and driver IC SID1182K with marked VEx / VEE pins

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VEE-Regulator for SiC MOSFET switches with regulated positive rail



Modified setting for SiC MOSFET short-circuit detection

Gate Driver Cores



2SC0115T2A0-12



2SC0435T2xx-17



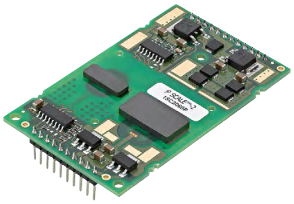
2SC0535T2xx-33



2SC0635T2A1-45



2SC0650P2x0-17



1SC2060P2A0-17

Application Note AN-1601

Application Note AN-1601

Controlling SiC MOSFET Power Switches with SCALE-2 and SCALE-2+ Gate Drivers Cores

Controlling SiC MOSFET Power Switches with SCALE™-2 and SCALE-2+ Gate Driver Cores

Besides driving conventional Si-based power devices like IGBTs and MOSFETs, which require turn-on and turn-off gate voltages of 15 V / -10 V and 10 V through 20 V / 0 V respectively, SCALE-2 and SCALE-2+ gate driver cores are also able to drive SiC MOSFET power switches. However, SiC switches often require turn-on and turn-off voltage levels which are different from those required by Si-based devices.

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SCALE-iFlex™ Isolated Master Control (IMC), Module Adapted Gate Driver (MAG)



Full Galvanic Reinforced Isolation Gate Driver for 1700 V and 3300 V High-Power Dual IGBT Modules

Applications

- Wind power inverters
- Photovoltaic inverters
- Railway main and auxiliary inverters
- Industrial motor drives
- Other industrial applications

Certification

- Reinforced insulation in accordance with EN-50124-1, IEC 61800-5-1 and UL 61800-5-1

Key Features

- Optimized for driving up to 4 power modules in parallel
- Electrical primary-side interface with reinforced isolation
- Optimized for paralleling of up to 4 power modules
- Wide input supply voltage range +15 V to +48 V
- -40 °C to +85 °C operating ambient temperature
- Short-circuit protection with Advanced Soft Shut Down (ASSD)
- NTC temperature sensing with reinforced isolated
- DC-link voltage measurement with reinforced isolated (up to 3300 V)

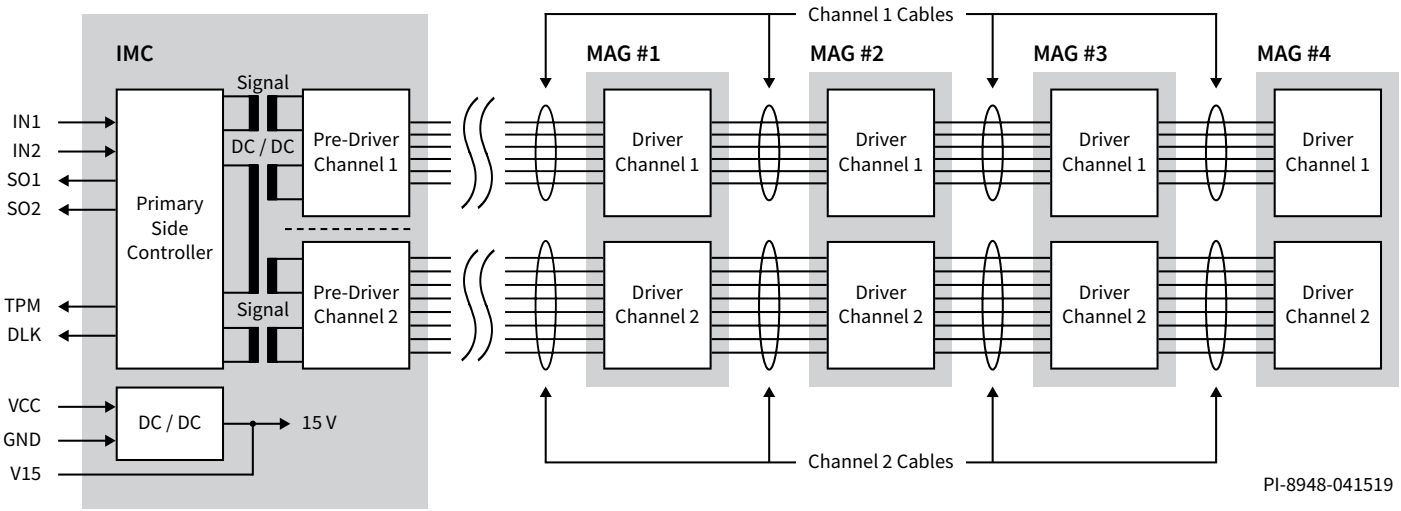
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Key Data Overview (1.7 kV – 3.3 kV, Electrical Interface)

Isolated Master Control (IMC) Parameter	Min	Max	Unit
Primary-side supply voltage (V_{VCC})		50.4	V
Switching frequency (f_S)		25	kHz
Gate output power per channel ($P_{IMC(GX)}$)		4	W
Common-mode transient immunity		50	kV/µs
Test voltage primary to secondary ($V_{ISO(PS)}$)	10800		VRMS
Test voltage secondary to secondary ($V_{ISO(SS)}$)	6700		VRMS

Module Adapted Gate Driver (MAG) Parameter	Min	Max	Unit
Gate output power per channel ($P_{MAG(X)}$)		1	W
Gate peak current ($I_{GATE(PK)}$)		20	A

SCALE-iFlex Functional Description



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Drawings

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Notes

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ac-dc converters led drivers gate drivers motor drivers

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