EiceDRIVER™ gate driver 1EDI3040AS

Single channel isolated IGBT/SiC-MOSFET driver

Order now | Technical documents | Simulation | Family overview | Support

AEC Qualified | RoHS | ISO 26262 compliant

Features

- Coreless transformer technology
- For IGBTs and SiC-MOSFETs
- Fast SPI to customize device behavior and data readout
- CMTI > 150 V/ns
- Reinforced insulation 8 kV peak according to DIN EN IEC 60747-17 and VDE V 0884-17:2021-10
- 5.7 kV rms insulation according to UL 1577
- Powerful output stage for up to 20 A peak current
- Runtime slew rate control via independent outputs controlled by a primary side digital input pin
- Isolated fast and accurate 11-bit SAR-ADC, multiplexed for two external and four internal measurements, supporting
  - Temperature measurements via NTC and temperature sensing diodes
  - High-voltage DC-link measurements
  - Compensated V_{DS} measurements to calculate SiC $R_{DS(ON)}$ for predictive maintenance and sensorless T_j estimation
- Integrated isolated digital I/O channel with hazard voltage warning
- Integrated on-chip temperature measurements
- Integrated flyback controller with best-in-class accuracy (≤ ±2%) plus runtime VCC2 voltage adjustments
- Strong internal and external active Miller clamp option for optimum *dV*/*dt*
- Integrated gate rise-time and fall-time capture to support predictive maintenance
- Integrated real-time power device V_{DS} state monitor
- Integrated safety features:
  - Safety input pins on primary side including shoot-through protection
  - Secondary side ASC input pin
  - Digital configurable DESAT and OCP protection including triggerable self-checks
  - Gate monitoring and output stage monitoring
  - Shoot-through protection
  - Primary supply monitoring UVLO
  - Secondary supply monitoring VCC2, VEE2 for OVLO and UVLO
  - Internal supervision
- ISO 26262 Safety Element out of Context (SEooC) for safety requirements up to ASIL D
- Green Product (RoHS compliant)

Potential applications

- High-end traction inverters for HEV and EV
- High power DC/DC converter

Product validation

Qualified for automotive applications. Product validation according to AEC-Q100.

Description

The EiceDRIVER™ gate driver 1EDI3040AS is a high-voltage galvanic isolated gate driver for IGBTs and SiC-MOSFETs designed for automotive traction inverter applications. The device is based on Infineon's Coreless Transformer (CT) technology, providing reinforced galvanic insulation between low voltage and high voltage domains. The device is designed to drive 600 V, 750 V and 1200 V IGBTs and SiC-MOSFETs directly. Short propagation delays and controlled internal tolerances minimize distortions of the PWM signal.

The device features a split output stage to achieve a slew rate control with an output stage of 20 A peak current capability. In addition, there is an integrated and external Miller clamping available to support highest *dV*/*dT*.

The device has been developed according to ISO 26262 ASIL D. A large panel of safety-related functions supports functional safety requirements at system level as per ISO 26262.

The fast and configurable desaturation protection in combination with the SOFTOFF pin enables the system to use IGBTs and SiC-MOSFETs to its limits for optimum system efficiency.

The device includes an 11-bit SAR-ADC, which can be multiplexed to two output pins to precisely monitor the DC-link voltage and the power semiconductor temperature. Moreover, the ADC also measures voltages at VCC2, VEE2, DESAT input and others. The gate timing capture functionality enables predictive maintenance of the system.

A flyback controller is integrated to support accurate and on-the-fly configurable secondary side supply voltage generation.

Type	Package	Marking
1EDI3040AS	PG-LFDSO-36	1EDI3040AS

Table of contents

1 Block diagram

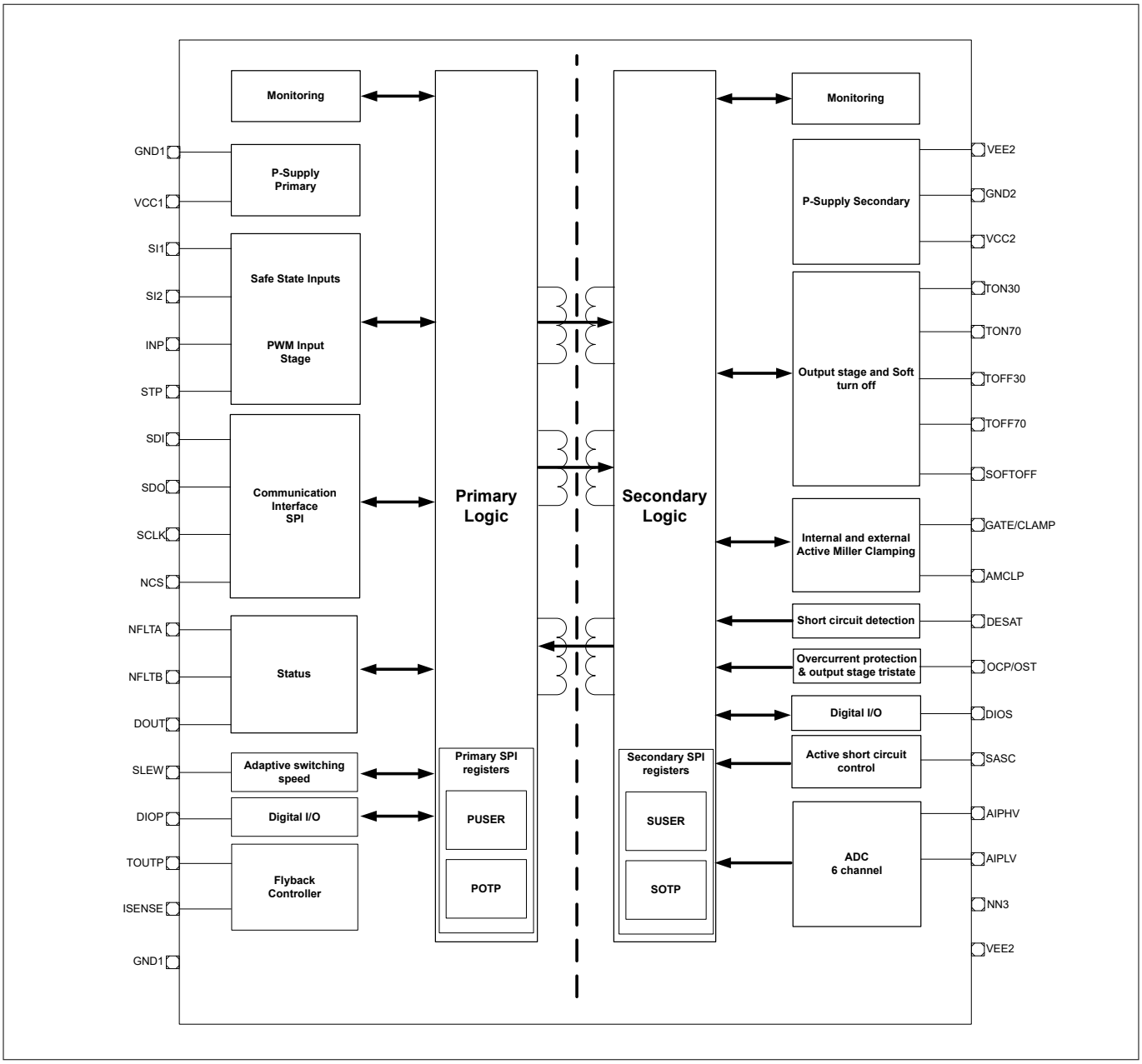

Figure 1 Block diagram

2 Pin configuration

2.1 Pin assignment

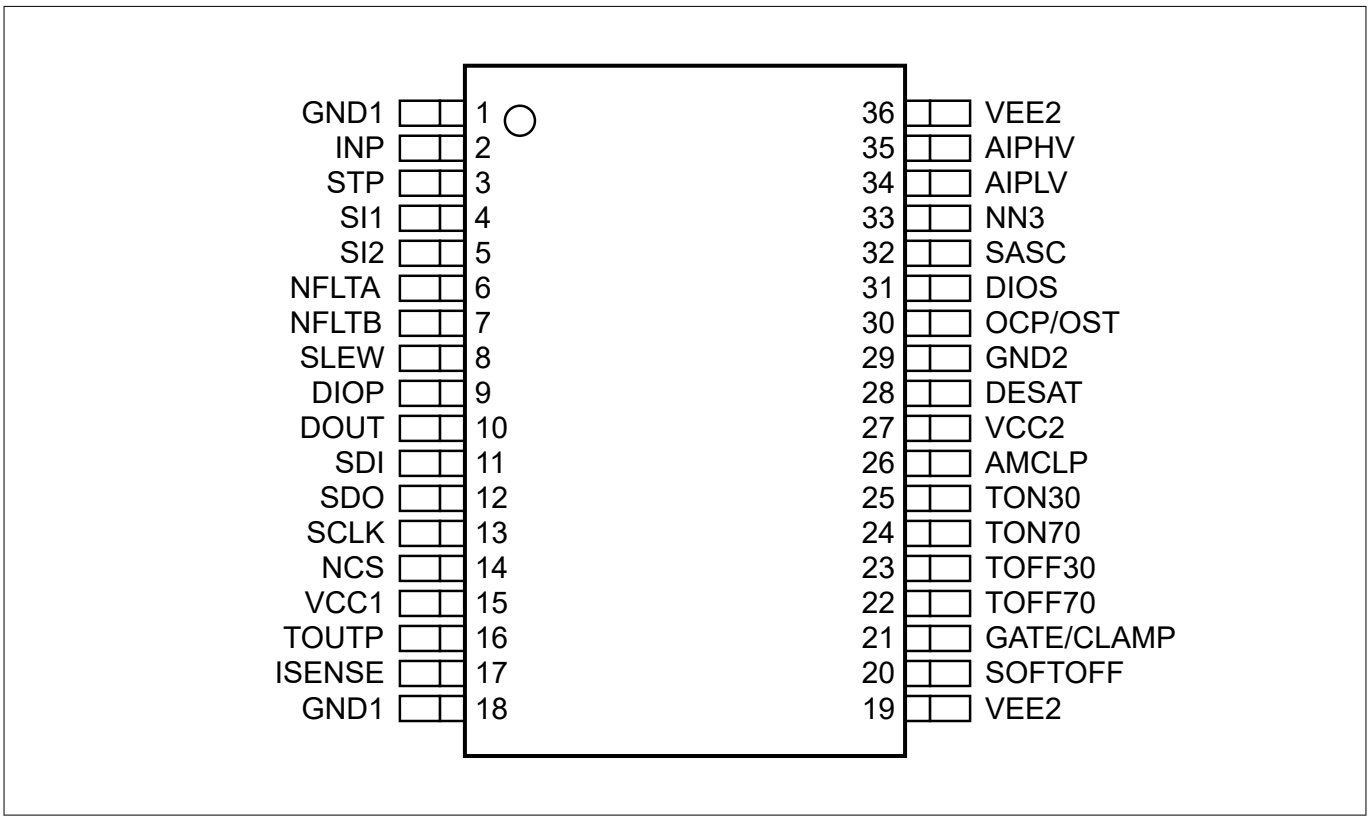

Figure 2 Pin assignment

2.2 Pin definitions and functions

Pin	Name	I/O configuration	Reference	Function
1	GND1	Ground	–	Ground connection of the primary side.
2	INP	Input internal pull-down	GND1	Non-inverting PWM signal of the driver to drive the secondary side output stage voltage.
3	STP	Input internal pull-up	GND1	The inverting PWM signal is used for monitoring the shoot-through protection in a halfbridge topology. Connect to INP of the corresponding gate driver inside a halfbridge topology. If not used, then connect to GND1.
4	SI1	Input internal pull-down	GND1	Safety input to control the output stage via the primary side to achieve a system safe state. Connect to the corresponding SI2 input of another driver in a halfbridge topology.
5	SI2	Input internal pull-down	GND1	Safety input to control the output stage via the primary side to achieve a system safe state. Connect to the corresponding SI1 input of another driver in a halfbridge topology.

2 Pin configuration

Pin	Name	I/O configuration	Reference	Function
6	NFLTA	Open drain output	GND1	Reports configurable events by changing to "low". Connect to VCC1 with an external pull-up resistor.
7	NFLTB	Open drain output	GND1	Reports configurable events by changing to "low". Connect to VCC1 with an external pull-up resistor.
8	SLEW	Input internal pull-down	GND1	Input to control the adjustable switching speed of the output stage.
9	DIOP	Input/output	GND1	Primary side digital I/O communication channel.
10	DOUT	Output	GND1	Digital output of the real-time status monitor for the drain-source voltage or the collector-emitter voltage on the power semiconductor.
11	SDI	Input internal pull-down	GND1	Serial data signal for the SPI.
12	SDO	Output	GND1	Push-pull serial data output for the SPI.
13	SCLK	Input internal pull-down	GND1	Serial clock signal for the SPI.
14	NCS	Input internal pull-up	GND1	Active low chip select signal for the SPI.
15	VCC1	Supply	GND1	5 V power supply for the primary side.
16	TOUTP	Output	GND1	Gate drive signal used for controlling the external logic-level N-channel MOSFET of the flyback converter.
17	ISENSE	Input Internal Pull up	GND1	Current sense signal for the flyback controller. Connect to an external shunt.
18	GND1	Ground	–	Ground connection of the primary side.
19	VEE2	Supply	GND2	Negative power supply for the secondary side.
20	SOFTOFF	Output	VEE2	Output stage with independent safe turn-off resistor. It clamps the voltage to VEE2.
21	GATE/CLAMP	Output	VEE2	Monitors the gate of the power semiconductor. If the threshold V_{CLAMPx} is reached, then it clamps the gate to VEE2.
22	TOFF70	Output	VEE2	Switches the power semiconductor gate to VEE2.
23	TOFF30	Output	VEE2	Switches the power semiconductor gate to VEE2.
24	TON70	Output	VCC2	Switches the power semiconductor gate to VCC2.
25	TON30	Output	VCC2	Switches the power semiconductor gate to VCC2.
26	AMCLP	Output	VEE2	Drives a gate voltage of an external N-channel MOSFET to prevent parasitic turn-on in a half-bridge topology. If not used, then leave it open.
27	VCC2	Supply	GND2	Positive power supply for the secondary side.

2 Pin configuration

Pin	Name	I/O configuration	Reference	Function
28	DESAT	Input Internal pull-up through current source	GND2	Monitors the voltage across the power semiconductor.
29	GND2	Ground	–	Ground connection for the secondary side.
30	OCP/OST	Input Internal pull-down	GND2	The OCP function monitors current through a sense emitter via shunt resistor. The OST function if activated sets the output stage to tristate.
31	DIOS	Input/output	GND2	Secondary digital I/O communication channel.
32	SASC	Input Internal pull-down	GND2	The secondary active short circuit function controls the output voltage of TONx to VCC2.
33	NN3	–	–	Connect to GND2.
34	AIPLV	Input	GND2	Input of the ADC to measure analog signals inside the system.
35	AIPHV	Input	GND2	Input of the ADC to measure analog signals inside the system.
36	VEE2	Supply	GND2	Negative power supply for the secondary side.

3 Application information

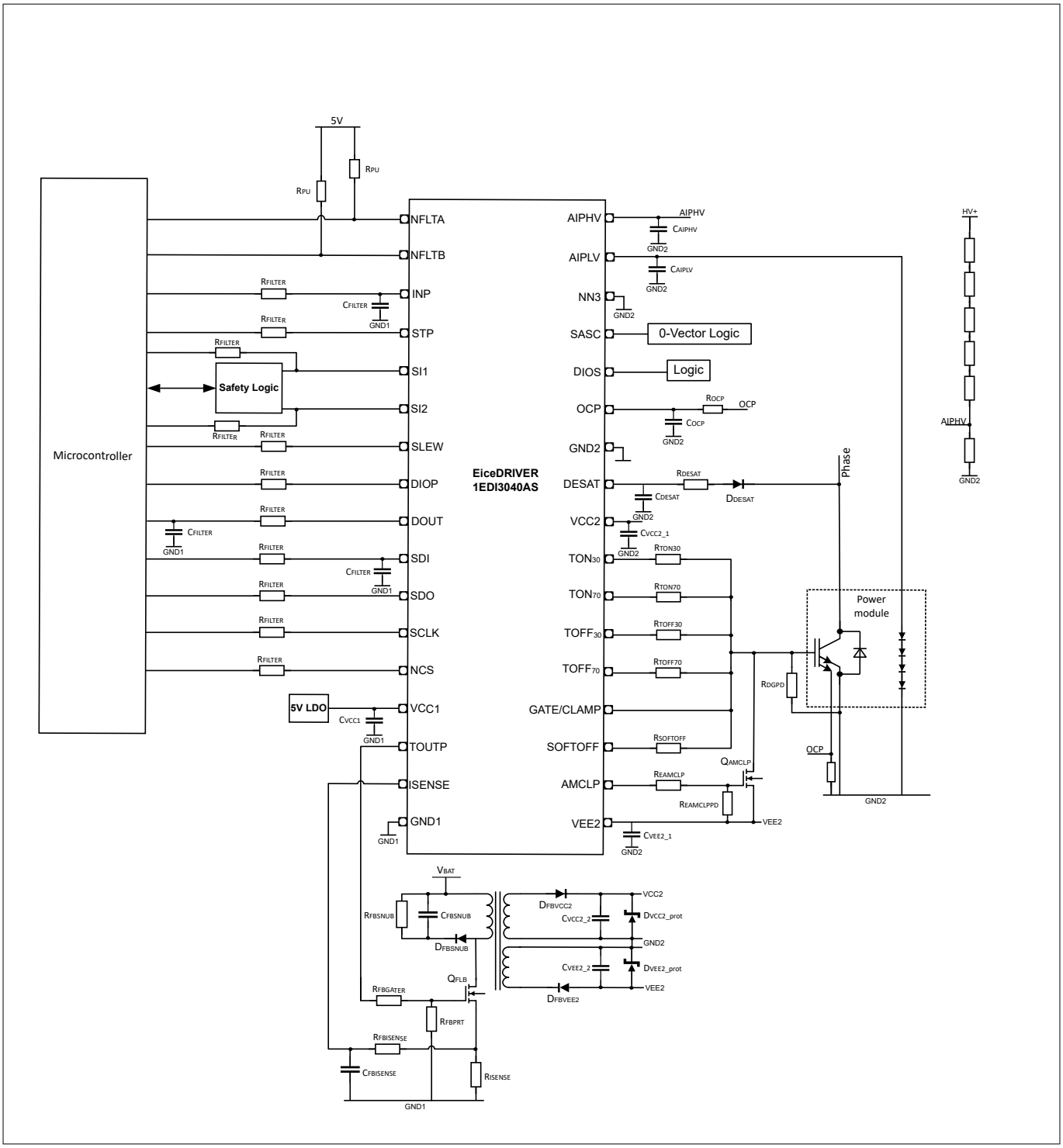

Figure 3 Application information

4 Package information

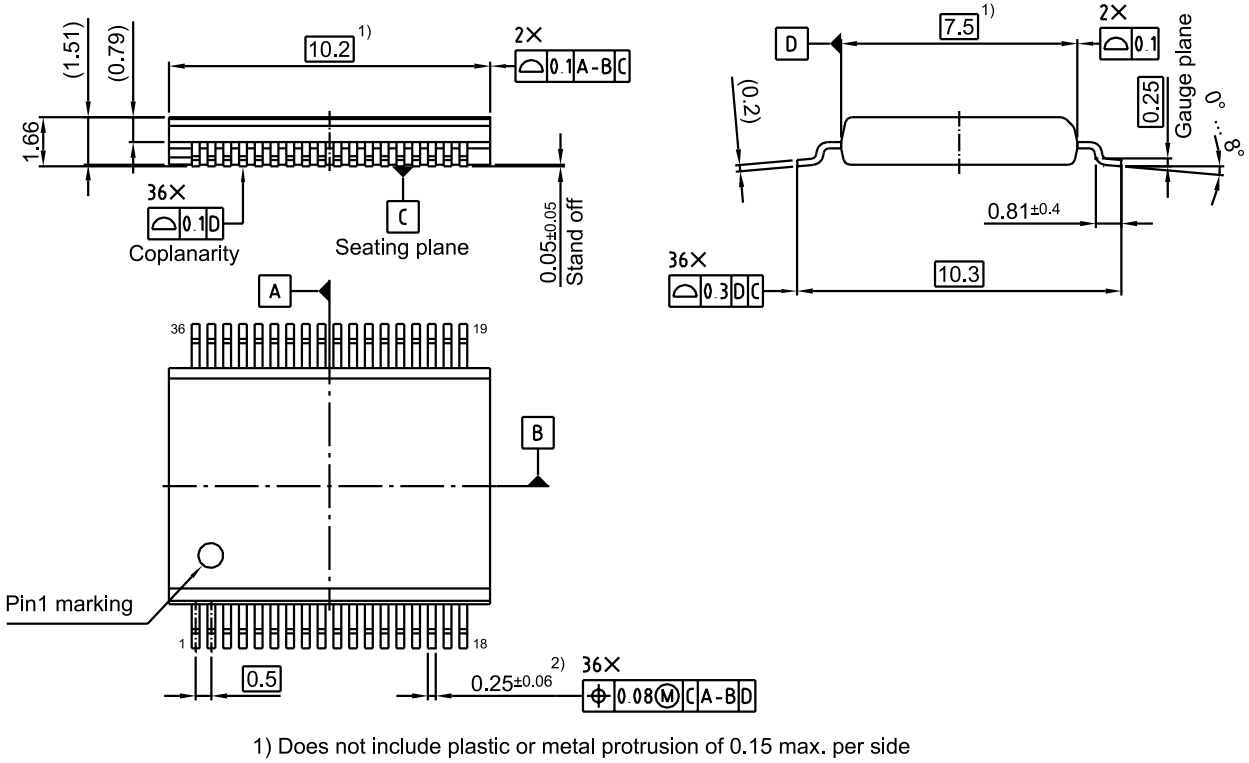

Figure 4 PG-LFDSO-36

Green Product (RoHS compliant)

To meet the world-wide customer requirements for environmentally friendly products and to be compliant with government regulations, the device is available as a Green Product. Green Products are RoHS compliant (Pb-free finish on leads and suitable for Pb-free soldering according to IPC/JEDEC J-STD-020).

Information on packages

For more information on packages, such as recommendations on assembly, refer to www.infineon.com/packages.

Revision history

Revision number	Date of release	Description of changes
1.00	2025-12-17	Product overview available

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Gate Drivers ***category:***

Click to view products by Infineon ***manufacturer:***

Other Similar products are found below :

57.404.7355.5 LY2-US-AC240 LY3-UA-DC24 LZNQ2-US-DC12 60100564 60713816 CS1HCPU63 6150-5001 621A CT-6EP5K OHM(502) 6273 CV500ISB02 M83723/88Y1407N 70.140.1653 7301KZGI MCH3307-TL-E MCH5809-TL-E MCH5815-TL-E MCH6306-TL-E MCH6424-TL-E MCH6616-TL-E 745-3 F39-JA1A 7520-8 7708-15 804001A15M170 MIH202548AH-25.000MHZ-T 804006B02M020 MINICCM8 MJ3P-UA-DC12 MK2EPN-UA-AC24 MK3EP-UA-DC24 813-T MM5 FP102-TL-E FP210-TL-E MP2P-DC24 FSS145-TL-E FSS163-TL-E FSS173-TL-E FSS262-TL-E FTD1011-TL-E 8R4000A18M010 910235 911850 G2R-112S-V-US-AC24 G2U-112P-US-DC12 G5D-11423-T-US-12VDC G7G-1A2-CF-DC12 G8P-1111P-US-DC6