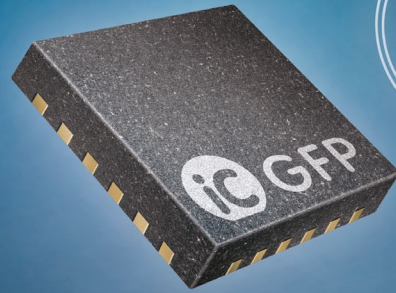


iC-GFP IO-Link Slave Transceiver



Description

iC-GFP is a fully COM3 compliant IO-Link slave transceiver IC with two independent switching channels which enables digital sensors to drive peripheral elements, such as programmable logic controllers (PLC) and relays, for example.

The output switches can be configured for push-pull, high-side or low-side operation. A synchronized mode permits both channels to work as one or in antivalent mode. The switches are designed for high drive currents of up to 200mA, are current limited, and also short-circuit-proof in that they shut down with excessive temperature or overload.

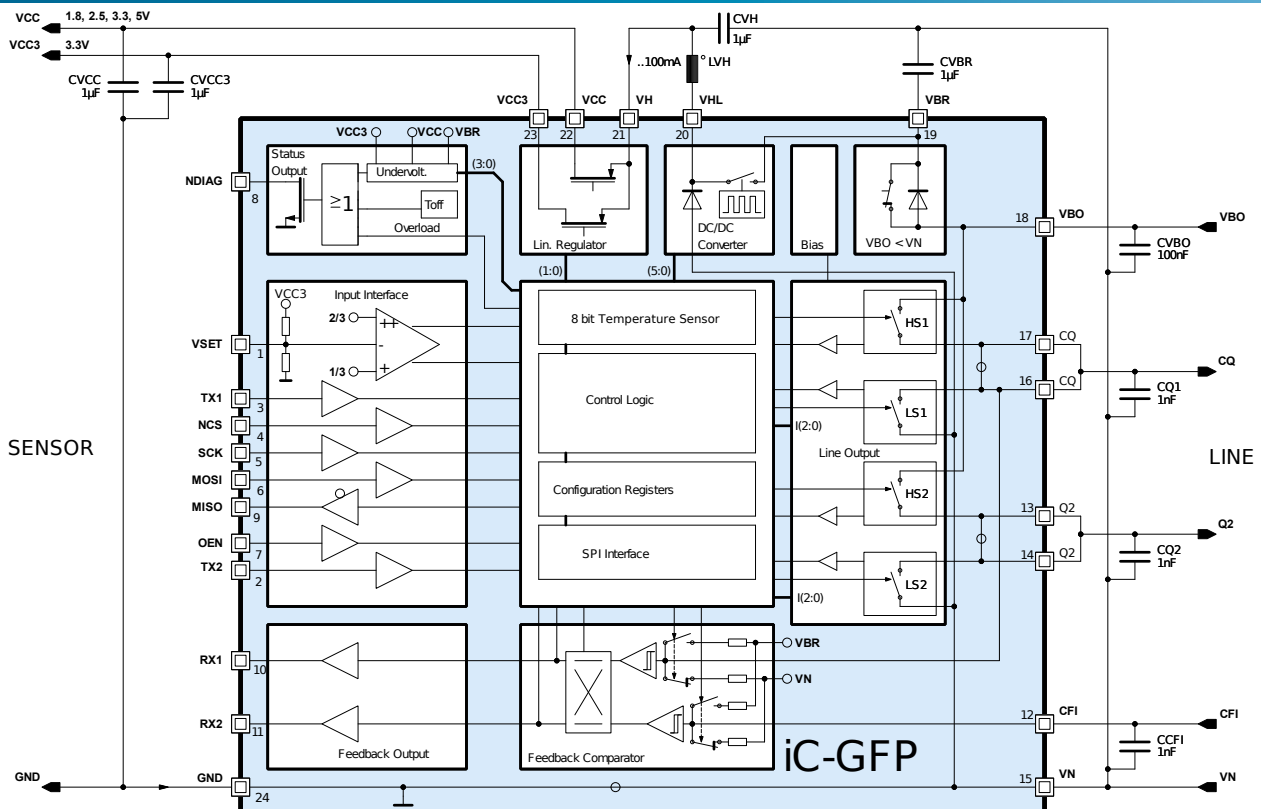
Applications

- IO-Link slaves
- Proximity switches
- Light barriers

Features

- COM3 compliant IO-Link slave transceiver
- Two bidirectional channels, configurable for high-side, low-side and push-pull operation
- Parallel connection of both channels possible
- Channels can be inverted for antivalent output
- Output current of up to 200 mA per channel
- Programmable current limit
- Line side protected against reverse polarity
- Configuration via SPI interface with secured data transmission
- Wide supply voltage range of 4.5 to 36V
- Two feedback channels supporting IO-Link wake-up
- Switching converter and linear regulators with 5/3.3/2.5/1.8V
- On-chip digital temperature sensor
- Status alert output with excess temperature, overload and undervoltage
- Driver shutdown on errors

Block Diagram



iC-GFP

IO-Link Slave Transceiver

Functional Details

The overload protection is accomplished in a way so that capacitive loads can be switched with low repeat rates without the protective circuitry cutting in. In the event of excess temperature an error message is generated immediately.

The iC-GFP performs a self-diagnostic function and signals events and errors at the open-collector output, NDIAG. The output switches are shut down in case of errors.

To avoid error signalling during power-up, the output switches remain at high impedance for ca. 50ms.

The iC acts as an SPI slave and allows function configuration via secured register access. It also features diagnostic registers and supports IO-Link wake-up at pin CFI or CQ which generate interrupt signals at pin NDIAG.

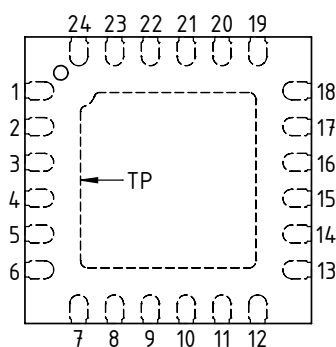
The pins on the 24V line side of the sensor interface (VBO, CQ, Q2, VN and CFI) are protected against reverse polarity. This makes any external reverse polarity protection diodes superfluous.

iC-GFP features an integrated switching converter which generates voltages VCC (5, 3.3, 2.5, 1.8V, selectable) and VCC3 (3.3V) with the aid of two downstream linear regulators.

The switching regulator comes equipped with a spread spectrum oscillator to reduce interferences.

A digital thermometer provides a system temperature register readable by the MCU.

Pin Configuration QFN24-4x4



Key Specifications

General

Permissible Supply Voltage (Referenced to VN)	4.5 to 36V
Supply Current in VBO (No load, VH connected to VBR, I(CQ) = I(Q2) = 0, CQ/Q2 switched on)	6.5 mA max.

Switches CQ, Q2

Saturation Voltage at CQ, Q2 vs. VN I() = 200 mA I() = 100 mA I() = 50 mA I() = 10 mA	1.8V max. 1.3V max. 0.9V max. 0.3V max.
Short-Circuit Current in CQ, Q2 "low" "mid" "high"	55 to 110 mA 110 to 190 mA 210 to 310 mA
Slew Rate (switch off -> on) VBO = 30V, CI = 2.2 nF "slow" "fast"	45V/μs max. min. 60V/μs

Pin Functions

No.	Name	Function
1	VSET	Voltage Configuration for VCC
2	TX2	Input Channel 2
3	TX1	Input Channel 1
4	NCS	SPI Chip Select
5	SCK	SPI Clock
6	MOSI	SPI Master Output Slave Input
7	OEN	Output Enable Input
8	NDIAG	Diagnostic Output
9	MISO	SPI Master Input Slave Output
10	RX1	Feedback Channel Output 1
11	RX2	Feedback Channel Output 2
12	CFI	Feedback Channel Input 2
13, 14	Q2	Output Channel 2
15	VN	Ground
16, 17	CQ	I/O Channel 1
18	VBO	Power Supply
19	VBR	Power Supply for switching converter
20	VHL	Switching Converter Inductance
21	VH	Input Linear Regulators
22	VCC	5/3.3/2.5/1.8V Sensor Supply
23	VCC3	3.3 V Sensor Supply
24	GND	Sensor Ground