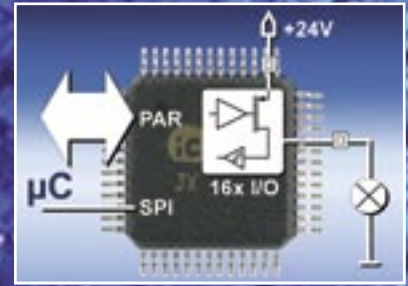


iC-JX

16-FOLD 24 V HIGHSIDE DRIVER WITH μ C INTERFACE



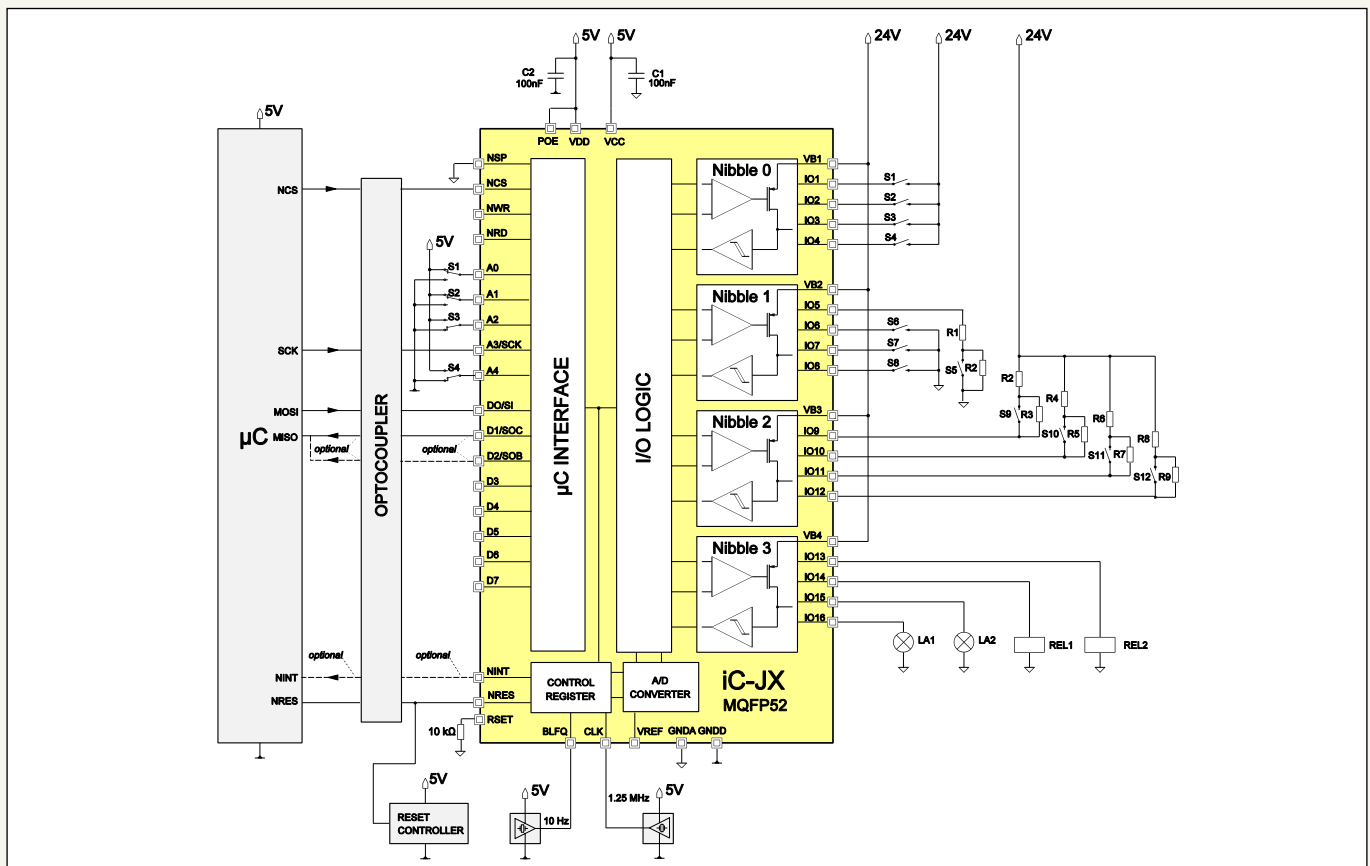
iC-JX is a bidirectional I/O device with 16 ports arranged in 4 nibbles; the ports of each nibble can be configured as inputs or as highside driver output stages. Each output stage is capable of driving 150 mA continuously or 500 mA in pulse operation. The integrated active clamp circuit permits the use of inductive loads, such as relays or solenoids.

Applications

- I/O port for industrial 24 V applications with μ C interface
- Readout of switches and sensors
- Diagnosis of loads and input sources
- Lamp switches with diagnostic features
- Driver for inductive loads such as relays, solenoids and motors
- Security and surveillance systems

Features

- 16 bidirectional input/output stages at 24 V (12..30 V)
- Input/output mode programmable in 4-channel blocks
- Short-circuit-proof highside drivers with diagnosis function
- 500 mA pulse and 150 mA permanent load driving capability
- Active clamp circuit for use with inductive loads
- Load diagnosis for driver current, output voltage and impedance (cable fractures, load resistance and short circuits)
- Pull-up/Pull-down current sources (0.2, 0.6, 2 mA) configurable
- 10-bit A/D converter for sensing and diagnosis measurement
- Safety features: voltage and ground monitor, temperature sensor with warning and shutdown features, power output enable
- Programmable interrupt generation with event storage
- Variable digital filters for the debouncing of I/O signals
- Fast 8-bit parallel or serial SPI-compatible μ C interface



iC-JX 16-FOLD 24 V HIGHSIDE DRIVER



I/O stages with an input function can record logic levels at 24 V where the programmable current source either defines the level for open inputs or supplies a bias current for external switch contacts. Connecting safety circuits with integrated serial/parallel resistors up to the device also enables leakage currents and short circuits to be pinpointed. The contact status can be read out using the microcontroller interface.

The 10-bit A/D converter provides chip temperature data, voltages at the I/O stages, driver stage output currents, supply voltages VB1 to VB4 and an internal band-gap reference voltage.

For load diagnosis the stages can be biased with programmable pull-up/pull-down current sources ($\pm 0, \pm 0.2, \pm 0.6, \pm 2$ mA). This feature can be used to monitor input devices, such as switches or sensors, or to detect variations in output loads due to overheating or malfunction (with a broken filament in a lamp, for example).

Pin Functions

No.	Name	Function
1	NRD	I Not Read Enable
2	NWR	I Not Write Enable
3	NCS	I Not Chip Select
4	VCC	Supply Voltage (analog, 3...5.5 V)
5	NSP	I Mode Select Input (high: Parallel, low: SPI)
6	GNDA	Ground (analog)
7	RSET	I Resistor Setting (10 kΩ optional)
8, 9	A3, A1	I Address Bus
10...13	D7, D5, D3, D1	B Data Bus
14	POE	I Power Output Enable
15	GNDA	Ground (analog)
16, 17	IO16, IO15	B I/O Stages
18	VB4	Supply Voltage for I/O Stages 13...16
19...22	IO14... IO11	B I/O Stages
23	VB3	Supply Voltage for I/O Stages 9...12
24, 25	IO10, IO9	B I/O Stages
26	GNDA	Ground (analog)
27	NINT	O Not Interrupt
28...31	D0, D2, D4, D6	B Data Bus
32, 33, 34	A0, A2, A4	I Address Bus
35	VDD	Supply Voltage (logic, 3...5.5 V)
36	NRES	I Not Reset
37	BLFQ	I Blink Frequency
38	GNDD	Ground (logic)
39	CLK	I Clock (optional)
40	GNDA	Ground (analog)
41, 42	IO1, IO2	B I/O Stages
43	VB1	Supply Voltage for I/O Stages 1...4
44...47	IO3, IO4, IO5, IO6	B I/O Stages
48	VB2	Supply Voltage for I/O Stages 5...8
49, 50	IO7, IO8	B I/O Stages
51	GNDA	Ground (analog)
52	VREF	I Ext. Reference Voltage (optional)
Pin Functions in SPI Mode (NSP = low)		
3	NCS	I Not Chip Select
8	SCK	I Serial Clock
9	A1	I Device ID Bit 1
13	SOC	O Serial Out Chain
28	SI	I Serial In
29	SOB	O Serial Out Bus
32	A0	I Device ID Bit 0
33	A2	I Select Chain / Bus
34	A4	I Enable Interrupt Report SOC/SOB

Key Specifications

General	
Supply Voltage Vcc, Vdd (Logic)	3...5.5 V
Supply Current I (Vcc) + I (Vdd)	13 mA max.
Supply Voltages VB _y (y = 1...4)	12...30 V
ESD Susceptibility (HBM 100 pF, 1.5 kΩ)	2 kV (all pins) 4 kV (IO 1...16)
Operational Temperature Range	0 to 70 °C (-40 to +85 °C on request)

Output Stages (IO 1...16)

Saturation Voltage @ 150 mA @ 15 mA	600 mV max. 200 mV max.
Clamp Voltage @ -150 mA	-14 V
Overcurrent for Interrupt Message	800 mA
Slew Rate high/low	> 5 V/μs
Output Level Detection (high, low)	VB-5 V, 6.7 V

Input Stages (IO 1...16)

Input High Level Detection	82 % VB
Input Low Level Detection	66 % VB
Input Debouncing Filter Time	12 μs to 5.7 ms @ f(CLK) = 1.25 MHz

Pin Configuration MQFP52

