

# iC-MZ

## DIFFERENTIAL HALL SWITCH



The iC-MZ is a monolithic integrated circuit with two Hall sensors 2 mm apart that switches in response to a difference in a magnetic field.

When sensing a moving gear or pole wheel, the signal output frequency is proportional to the rotation speed.

On-chip complementary push-pull drivers designed for operating voltages from 4.5 to 36 V are used for digital output and available at pins D, ND. The drivers output characteristics are adapted to match line impedances from 40 to 110  $\Omega$ , thus maintaining signal integrity on long transmission cables.

Additionally, complementary analog outputs for diagnosis purpose are available at pin A, NA.

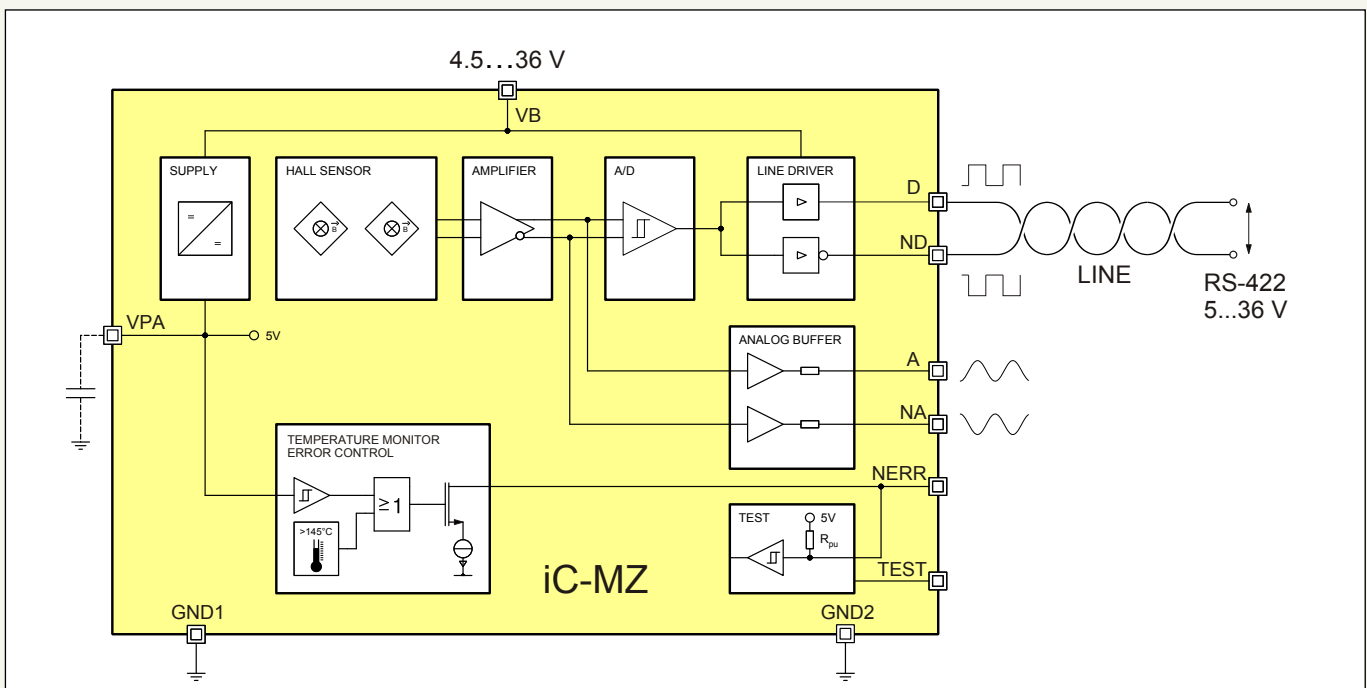
An integrated over-temperature and under-voltage monitor disables the drivers in case of error and activates the open-drain output NERR.

### Features

- Dual Hall sensors with 2 mm pitch
- Magnetic input frequency from DC to 40 kHz
- Additional line driver test mode for diagnosis purpose
- Single supply voltage 4.5 to 36 V
- Complementary push-pull line driver outputs
- Drivers current limited / short circuit proof
- At least 200 mA output current @  $V_B = 24$  V
- Low saturation voltages (< 0.4 V @ 30 mA)
- Driver outputs RS-422 compatible (TIA/EIA-Standard)
- Temperature and undervoltage monitor
- Analog sensor outputs separately available

### Applications

- Gear tooth sensor
- Pole wheel and magnetic tape sensing
- Magnetic incremental encoder
- Proximity switch



# iC-MZ DIFFERENTIAL HALL SWITCH

## Key Specifications

### General

Supply Voltage	4.5 to 36 V
Supply Current (no load)	12 mA max.
Operational Temperature Range	-40 to +125 °C
ESD Susceptibility	1 kV (HBM 100 pF, 1.5 kΩ)

### Magnetic Characteristics

Magnetic Input Frequency	DC to 40 kHz
Common Mode Range	400 kA/m max.
Differential Magnetic Field	120 kA/m max.
Magnetic Hysteresis	4 kA/m typ.

### Line Driver Outputs

Output Current	>200 mA @ $V_B = 24$ V
Output Resistance	75 Ω typ.
Saturation Voltage	<0.4 V @ 30 mA

### Temperature and Undervoltage Monitor

Shutdown Temperature	>145 °C
Restart Temperature	<135 °C
Temperature Hysteresis	10 K typ.
Undervoltage Shutdown	$V_B = 3.2$ V min.

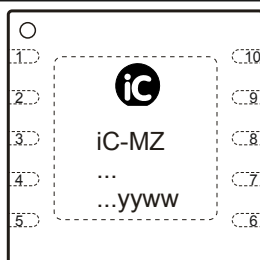
### Analog Outputs

Output Resistance	20 kΩ
Common Mode Voltage	1.8 V
Analog Output Sensitivity	70 mV / (kA/m)

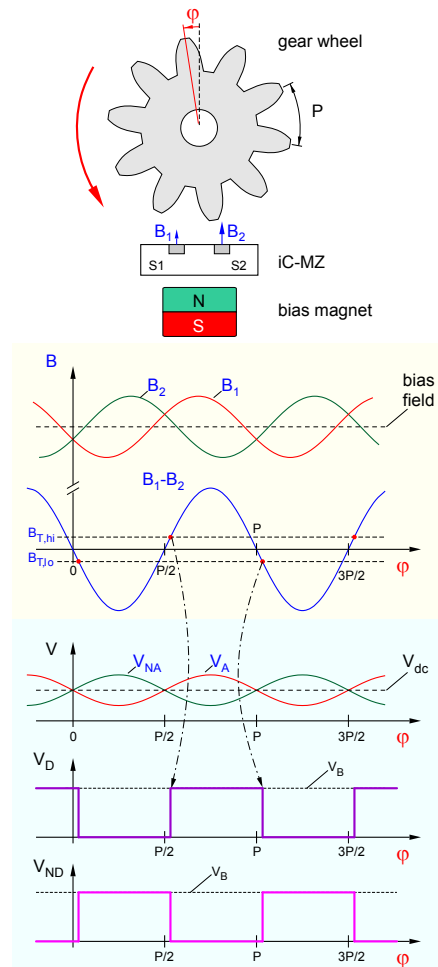
## Pin Functions

No.	Name	Function
1	GND1	Ground
2	D	Switching Output, non-inverted
3	VB	Supply Voltage (+4.5 ... +36 V)
4	ND	Switching Output, inverted
5	GND2	Ground
6	TEST	Line Driver Test
7	NERR	Error Output, open-drain
8	VPA	Internal Supply Voltage
9	NA	Analog Output, inverted
10	A	Analog Output, non-inverted

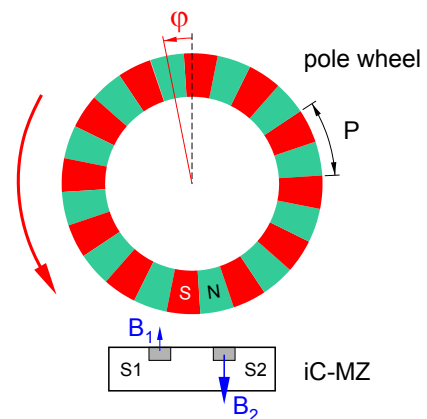
## Pin Configuration DFN10 4x4 mm<sup>2</sup>



## Application: Gear Tooth Sensor



## Application: Pole Wheel Sensor



This tentative information shall not be considered as a guarantee of characteristics. Rights to technical changes reserved.