

# iC-MJ

## Low-Power Hall Sensor

### Description

iC-MJ is a magnetic field sensor for determining the absolute field strength. The output proceeds in three conditions: positive, negative, or below the switching threshold which is adjustable for high and low sensitivity. By applying the supply voltage, an initial measurement is running after a short start-up phase (regardless of the selected mode), which results will be displayed at the outputs OUT1 and OUT2 after no more than 30  $\mu$ s. This is followed by an energy-saving rest period when only the outputs and the internal timing generator remain active. After the rest period, a new measurement is performed and the outputs adjusted to the result. This process is repeated as long as the supply voltage is supplied. The automatic process can be switched: the field strength measurement can proceed either permanently, i.e. without rest period, or individually triggered by an external trigger pulse. The switching hysteresis is depending on the latest initial state. Depending on that, successive measurements are evaluated.

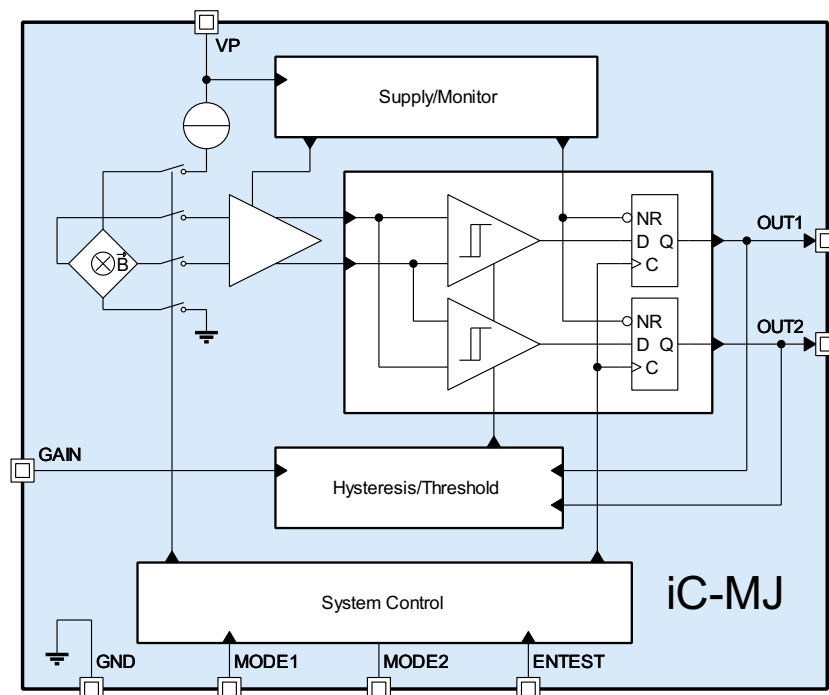
### Features

- Hall sensor for absolute evaluation of magnetic field strength
- Pulsed cyclic measurements (interrupted), permanently, or triggered
- Sensitivity adjustable in two stages
- Digital measurement value output in three conditions: field strength is positive, negative, or close to zero
- Very short measurement time < 30  $\mu$ s
- Very small power consumption (< 45  $\mu$ A in pulsed mode)
- Wide operating voltage range from 2.3 to 5.5V
- Operational Temperature -40 to +125  $^{\circ}$ C

### Applications

- Position sensors
- Battery-operated revolution counters
- Safety-related controls

### Block Diagram



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### Key Specifications

#### General

Supply Voltage	2.3 to 5.5V	
Supply Current (avg.)	$\leq 500 \mu\text{A}$ (continuous mode) $\leq 45 \mu\text{A}$ (pulse mode) $\leq 100 \text{nA}$ (waiting phase in trigger mode)	
Operational Temperature	-40 to +125 °C	
Magnetic Thresholds (typ.)		
GAIN = high	20 mT (on)	9 mT (off)
GAIN = low	48 mT (on)	35 mT (off)
Output Driving Capability		
Output Current	$\geq 2 \text{mA}$	
Saturation Voltages	$\leq 0.4 \text{V}$ at $\pm 0.75 \text{mA}$	

### Operating Characteristics

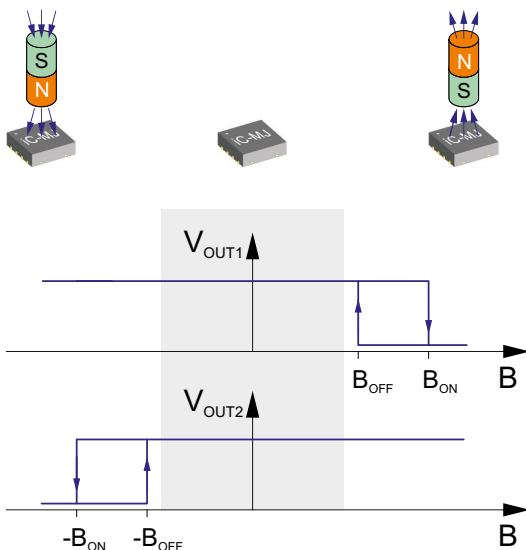
#### Operation Modes

MODE1	MODE2	Description
0	0	pulsed mode
0	1	continuous mode
0	1 → 0	triggered mode (on falling edge)

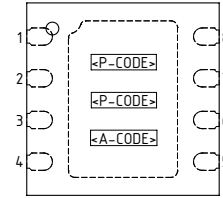
#### Output States

OUT1	OUT2	Description
0	0	low supply voltage or start-up phase
0	1	positive field
1	0	negative field
1	1	no field (below threshold)

### Switching Diagram



### Pin Configuration DFN8-3x3



### Pin Functions

No.	Name	Function
1	ENTEST	Start test mode
2	MODE1	Measurement mode, internal/triggered
3	VP	2.3 to 5.5V supply voltage
4	OUT1	Output 1
5	OUT2	Output 2
6	GND	Ground
7	GAIN	Sensitivity adjustment
8	MODE2	Measurement mode, pulsed/continuous, trigger input
	BP	Backside paddle

### Dimensions (mm)

