

Features:

- MX887D with 64 times faster sampling
- Omni polar (switches with N or S pole)
- 2.5 to 5.5 Volt Operation
- Simple Digital Output Interfacing
Open Drain
- Ultra Low Offset Canceling Amplifiers Provide Sensitive, Accurate, Stable Switching Points and Immunity to Mechanical Stress
- Solid State Circuitry
- Operating Temperature Range: -40°C to 100°C
- RoHS Compliant TSOT-23 3 Lead Package

General Description

The MX8871D integrated Hall-Effect switch targets battery operating voltages from 2.5V to 5.5V. On-chip power management circuitry reduces the effective average current to just 125µA at 3.0 V_{SUPPLY}.

The switch output will turn “on” when either a north or south magnetic pole is applied. The absence of a magnetic field will turn the switch into a high impedance “off” state.

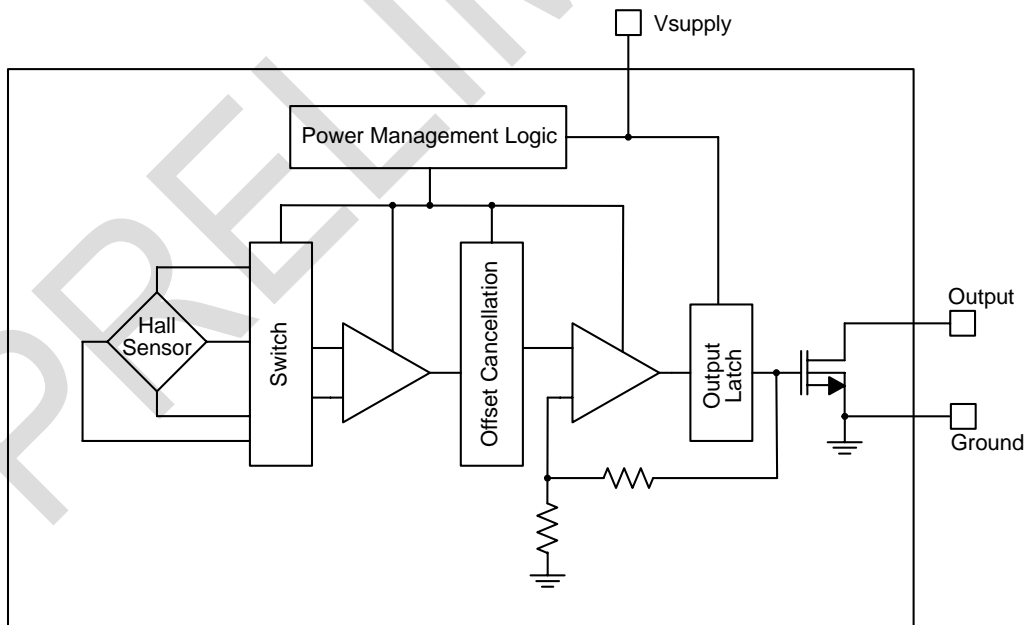
Ordering Information

| Part No. | Description | Qty |
|-------------|------------------------|------|
| MX8871DHTTR | TSOT-23 3L Tape & Reel | 3000 |

Applications:

- White Goods
- Automotive
- Security Systems
- High Reliability Reed Switch Replacement

Functional Block Diagram



Pin Description

| Pin No. | Pin Name | Description |
|---------|----------|--------------------------|
| 1 | VSUPPLY | 2.5 to 5.5 Volt |
| 2 | OUT | Open Drain N-Channel FET |
| 3 | GROUND | Ground |

Circuit Description

The MX8871D Hall-Effect Switch consists of a Hall element, small signal amplifier, latch, and n-channel open drain MOSFET driver. Offset cancellation rejects errors in signal stages and the influence of mechanical stress on the Hall element. This technique together with a precision threshold generator and comparator produce highly accurate magnetic switch points. The Hall element is activated for a fraction of an operating cycle, then latched in that sample state for the remainder of the period. By using this technique, reduced power consumption is achieved.

Electrical Characteristics

Over operating voltage and temperature range unless otherwise noted.

| Parameter | Condition | Min | Typ | Max | Unit |
|------------------------|-----------------------------------|-----|------|-----|---------|
| Supply Voltage | | 2.5 | | 5.5 | V |
| Output Leakage Current | $V_{OUT} = 5.5V, BRPN < B < BRPS$ | | <1.0 | 1.0 | μA |
| Output On Voltage | $I_{OUT} = 1mA, V_{DD} = 3.0V$ | | 50 | 100 | mV |
| Awake Time | | | | 80 | μS |
| Period | | | | 1.2 | mS |
| Duty Cycle | | | 6 | | % |
| Supply Current | Awake (enabled) | | | 2.0 | mA |
| | Asleep (disabled) | | | 8.0 | μA |
| | Average (Calculated) | | 125 | | μA |
| ESD | Human Body Model | 2 | | | kV |

- Notes: 1. Operating and release points will vary with supply voltage.
 2. BOPX = operating point (output turns ON); BRPX = release point (output turns OFF).
 3. Typical Data is at $T_A = 25^\circ C$ and $V_{SUPPLY} = 3.0V$.

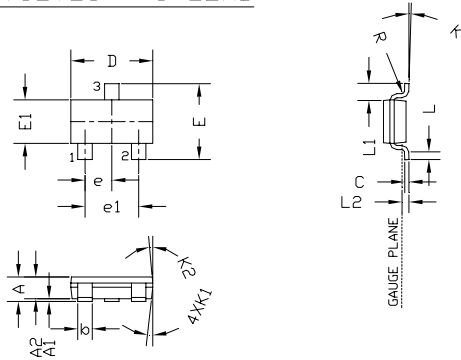
Magnetic Characteristics

Over operating voltage and temperature range unless otherwise noted.

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|------------------|--------|----------------------------|-----|-----|-----|------|
| Operating Points | BOPS | South pole to branded side | | | 60 | G |
| | BOPN | North pole to branded side | -60 | | | G |
| Release Points | BRPS | South pole to branded side | 6 | | | G |
| | BRPN | North pole to branded side | | | -6 | G |
| Hysteresis | BHYS | $ BOPX - BRPX $ | | 5 | | G |

- Notes: 1. As use here, negative flux densities are defined as less than zero (algebraic convention) and -50G is less than +10G.
 2. BOPX = operating point (output turns ON); BRPX = release point (output turns OFF).
 3. Typical Data is at $T_A = 25^\circ C$ and $V_{SUPPLY} = 3.0V$.

TSOT23 - 3 LEAD



3. PACKAGE TOP MAY BE SMALLER THAN PACKAGE BOTTOM. DIMENSIONS D AND E1 ARE DETERMINED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY EXCLUDING MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN TOP AND BOTTOM OF THE PLASTIC BODY.
2. DIMENSION "E" DOES NOT INCLUDE INTER-LEAD FLASH OR PROTRUSIONS. INTER-LEAD FLASH AND PROTRUSION SHALL NOT EXCEED .006" (0.15MM) PER SIDE.
1. DIMENSION "D" DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS AND GATE BURRS SHALL NOT EXCEED .004 IN. (0.10MM) PER SIDE.

NOTES: (UNLESS OTHERWISE SPECIFIED)

| DIM. | DIMENSIONS | | | | | |
|------|------------|-------|-------|------------|------|------|
| | INCH | | | MILLIMETER | | |
| | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. |
| A | 0.030 | - | 0.035 | 0.75 | - | 0.90 |
| A1 | 0.000 | - | 0.004 | 0.00 | - | 0.10 |
| A2 | 0.028 | 0.030 | 0.031 | 0.70 | 0.75 | 0.80 |
| b | 0.014 | - | 0.020 | 0.35 | - | 0.51 |
| c | 0.004 | - | 0.010 | 0.10 | - | 0.25 |
| D | 0.110 | 0.114 | 0.118 | 2.80 | 2.90 | 3.00 |
| E | 0.102 | 0.110 | 0.118 | 2.60 | 2.80 | 3.00 |
| E1 | 0.059 | 0.063 | 0.067 | 1.50 | 1.60 | 1.70 |
| e | 0.0374 BSC | | | 0.95 BSC | | |
| e1 | 0.0748 BSC | | | 1.90 BSC | | |
| L | 0.015 | - | - | 0.37 | - | - |
| L1 | 0.0236 REF | | | 0.60 REF | | |
| L2 | 0.0098 BSC | | | 0.25 BSC | | |
| y | - | - | 0.004 | - | - | 0.10 |
| R | 0.004 | - | - | 0.10 | - | - |
| K | 0° | - | 8° | 0° | - | 8° |
| K1 | 7° NOM | | | 7° NOM | | |
| K2 | 5° NOM | | | 5° NOM | | |

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