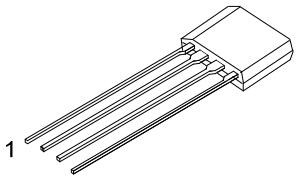
# UH211

**LINEAR INTEGRATED CIRCUIT**

# HIGH SENSITIVITY HALL EFFECT SENSOR IC WITH FG OUTPUT




SIP-4

## ■ DESCRIPTION

The UTC **UH211** is a semiconducting integrated Hall Effect Sensor IC.

It is just like all the hall sensitive Hall Effect Sensors designed to work in the situations which the accurate track is extremely small and the changes in magnetic flux density-changes are generally too small to be operated.

Besides those features shared in all Hall Effect Sensors, **UH211** can apply to various kinds of applications, such as contact-less switches, motion detectors, gear tooth sensors, proximity detectors, and electric communication of DC brushless motors, etc.

## ■ FEATURES

* Hall Sensor On-Chip
* Output Zener Diodes to Clamp the Peak Output Voltage
* Frequency Generation Output
* High Output Sinking Capability (nearly to 400mA)
* High Sensitivity Hall Effect Sensor IC: ±65G

## ■ ORDERING INFORMATION

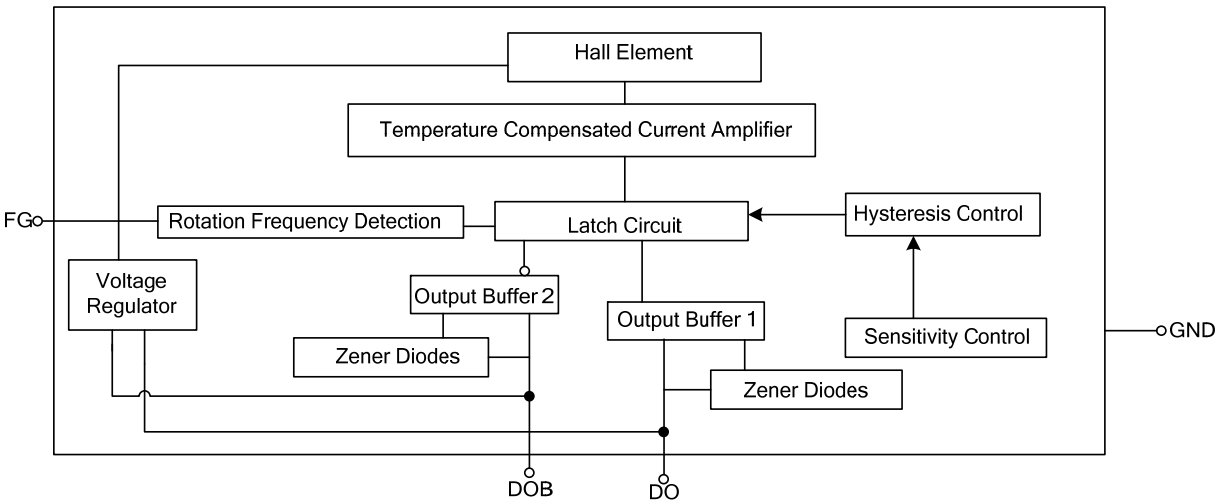
| Ordering Number | | Package | Packing |
|---|---|---|---|
| Lead Free | Halogen Free | | |
| UH211L-G04-K | UH211G-G04-K | SIP-4 | Bulk |

| | |
|---|---|
| UH211L-G04-K<br>(1)Packing Type<br>(2)Package Type<br>(3)Lead Plating | (1) B: Bulk<br>(2) G04: SIP-4<br>(3) G: Halogen Free, L: Lead Free |

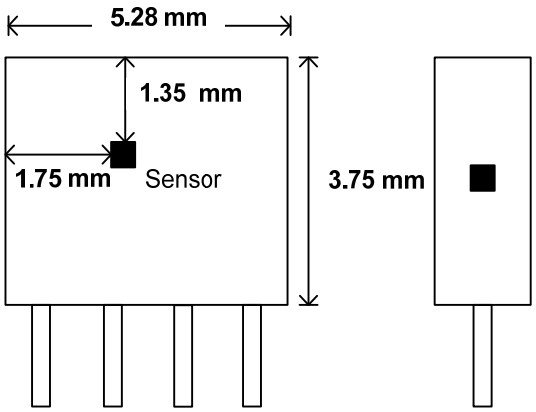
## ■ PIN DESCRIPTION

| PIN NO. | PIN NAME | DESCRIPTION |
|---|---|---|
| 1 | FG | Open collector pin: for rotation frequency detection |
| 2 | DO | Coil output or power input |
| 3 | DOB | Coil output or Power input |
| 4 | GND | IC ground |

## ■ BLOCK DIAGRAM




## ■ SENSOR LOCATIONS



## ABSOLUTE MAXIMUM RATINGS ($T_A$=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNITS |
|---|---|---|---|
| Supply Voltage (DO/DOB Voltage) | $V_{CC}$ | 25 | V |
| FG Pin Off Voltage | $V_{OFF}$ | 25 | V |
| FG Sink Current | $I_{FG}$ | 10 | mA |
| Output Current | $I_{OUT}$ | 500 | mA |
| Power Dissipation | $P_D$ | 500 | mW |
| Junction Temperature | $T_J$ | -20 ~ +150 | °C |
| Storage Temperature | $T_{STG}$ | -65 ~ +150 | °C |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

## ■ RECOMMENDED OPERATING CONDITIONS ($T_A$=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNITS |
|---|---|---|---|
| Supply voltage (DO/DOB Voltage) | $V_{CC}$ | 3.7~20 | V |
| Maximum FG Pin Off Voltage | $V_{OFF}$ | 20 | V |
| Maximum Output Sink Current | $I_{OUT}$ | 400 | mA |
| Maximum FG Sink Current | $I_{FG}$ | 5 | mA |
| Junction Temperature | $T_J$ | -20~ +125 | °C |
| Operating Temperature | $T_{OPR}$ | -20 ~ +85 | °C |

## ■ ELECTRICAL CHARACTERISTICS ($T_A$=25°C,$V_{CC}$=12V, unless otherwise specified)

| PARAMETER | SYMBOL | TESE CONDITIONS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| Output Saturation Voltage | $V_{O(SAT)}$ | $I_{OUT}$ = 400mA | | 700 | 900 | mV |
| Supply Current | $I_{CC}$ | | | 11 | 25 | mA |
| FG OFF Leakage Current | $I_{OFF}$ | | | | 1 | μA |
| FG ON Saturation Voltage | $V_{ON}$ | $I_{FG}$ = 5mA | | 0.2 | 0.4 | V |
| Clamp Output Voltage | $V_{CLAMP}$ | | | 33 | | V |
| Output Rise Time | $t_R$ | $R_L$ = 200Ω, $C_L$ = 10pF | | 0.4 | | μS |
| Output Fall Time | $t_F$ | | | 0.1 | | μS |
| Propagation Delay Time | $t_D$ | | | 2 | | μS |

## ■ MAGNETIC CHARACTERISTICS ($T_A$=25°C, $V_{CC}$=12V unless otherwise specified)

A grade

| PARAMETR | SYMBOL | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| Operate Point | $B_{OP}$ | | 60 | | G |
| Release Point | $B_{RP}$ | | -60 | | G |
| Hysteresis | $B_{HYS}$ | | | 120 | G |

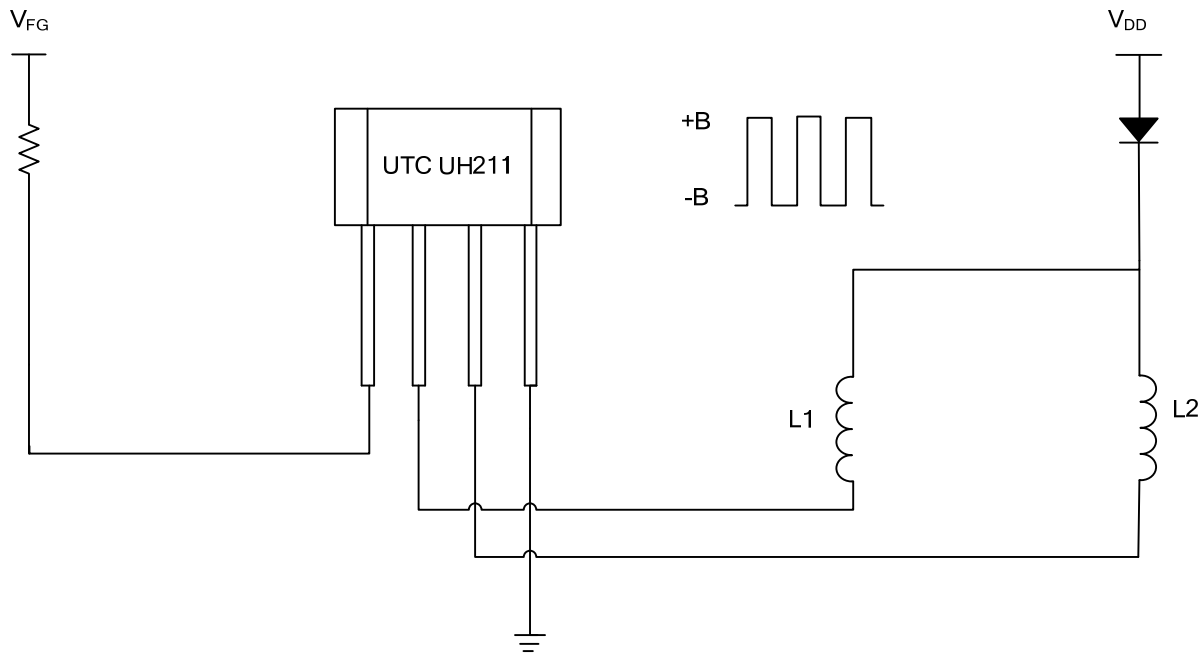
B grade

| PARAMETR | SYMBOL | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| Operate Point | $B_{OP}$ | | 90 | | G |
| Release Point | $B_{RP}$ | | -90 | | G |
| Hysteresis | $B_{HYS}$ | | | 120 | G |

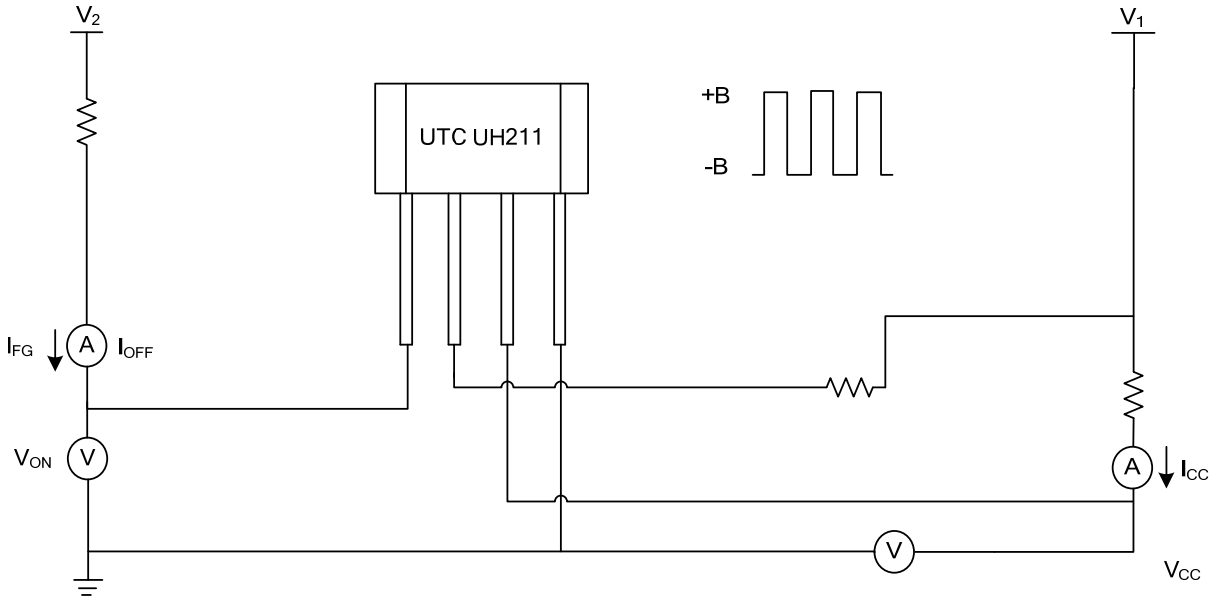
C grade

| PARAMETR | SYMBOL | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| Operate Point | $B_{OP}$ | | 110 | | G |
| Release Point | $B_{RP}$ | | -110 | | G |
| Hysteresis | $B_{HYS}$ | | | 120 | G |

## ■ APPLICATION CIRCUIT




## ■ TEST CIRCUIT




Measure $V_{CC}$,$I_{CC}$ when DO is off. Measure $V_{ON}$,$I_{FG}$ when FG is on. Measure $I_{OFF}$ when FG is off.

■ TYPICAL APPLICATION CIRCUITS ($T_A$ = 25°C,$V_{CC}$ =12V unless otherwise noted)