

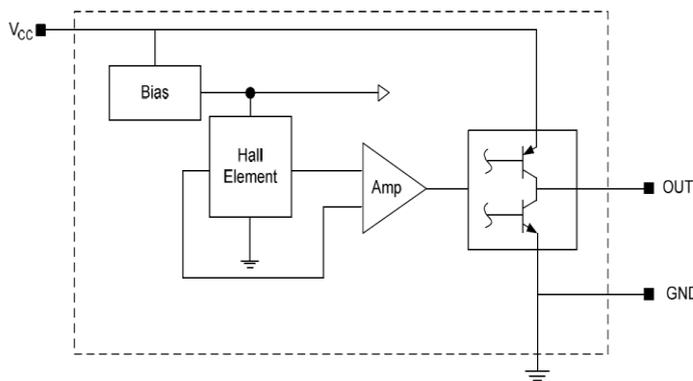
|   |                                 |   |
|---|---------------------------------|---|
|  | <b>Cosemitech</b>               | <b>CH601</b>  |
|   | <b>Automotive Product Group</b> | <small>This is advanced information on a new product now in development or undergoing evaluation. Details are subject to change without notice and Cosemitech assumes no obligation for future manufacture of this product. Contact Cosemitech for the latest status.</small> |

**Draft Datasheet REV 0.4**

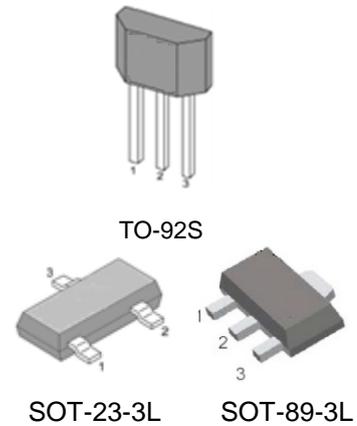
**FEATURES and FUNCTIONAL DIAGRAM**

- Power consumption of 4 mA at 5 VDC for energy efficiency
- Single Current Sinking or Current Sourcing Output
- Linear output for circuit design flexibility
- Ratiometric Rail to Rail Linear Output
- Precise Sensitivity and Temperature Compensation
- Wide Operating Voltage Range: Supply Voltage 3.0~15V
- Sensitivity at 5V:  
1.5mV/Gauss (CH601)
- Specified Operating Temperature Range: From -40°C~150°C
- Responds to either positive or negative gauss
- Quad Hall sensing element for stable output
- Lead Free Package: Flat TO-92, SOT-89-3L, SOT-23-3L
- High ESD Protection
- RoHS Compliant  
2011/65/EU

**Functional Block Diagram**



**PACKAGE**



**APPLICATIONS**

Automotive, Industrial, Home, appliances,  
 Current sensing  
 Speed Detection  
 Position Detection  
 Magnetic Encoder  
 Solid-State Switch  
 Ferrous metal sensing  
 Liquid level sensing  
 Vibration sensing  
 Weight sensing

**DESCRIPTION**

The CH601 is high performance ratiometric linear hall effect sensor, produced with Bipolar technology; it is high performance small versatile linear Hall-effect devices which are operated by the magnetic field from a permanent magnet or an electromagnet. The ratiometric output voltage is set by the supply voltage and varies in proportion to the strength of the magnetic field. The CH601 family has a quiescent output voltage that is 50% of the supply voltage.

The integrated circuitry provides increased temperature stability and sensitivity. The CH601 provide high accuracy and temperature compensation. The linear hall sensors have an operating temperature range from -40 to +150°C, appropriate for home appliances, industrial and automotive environments. They respond to either South or North pole.

|   |                                 |   |
|---|---------------------------------|---|
|  | <b>Cosemitech</b>               | <b>CH601</b>  |
|   | <b>Automotive Product Group</b> | <small>. This is advanced information on a new product now in development or undergoing evaluation. Details are subject to change without notice and Cosemitech assumes no obligation for future manufacture of this product. Contact Cosemitech for the latest status.</small> |

**Draft Datasheet REV 0.4**

## Table of Contents

|   |   |
|---|---|
| 1. Product Family Members.....            | 3 |
| 2. Pin Definitions and Descriptions ..... | 3 |
| 3. Absolute Maximum Ratings .....         | 3 |
| 4. ESD Protections .....                  | 4 |
| 5. Function Description .....             | 4 |
| 6. Magnetic Activation .....              | 4 |
| 7. Transfer Characteristics.....          | 4 |
| 8. Parameters Specification.....          | 5 |
| 9. Typical Application Circuit .....      | 5 |
| 10. Package Information .....             | 6 |

|   |                                 |   |
|---|---------------------------------|---|
|  | <b>Cosemitech</b>               | <b>CH601</b>  |
|   | <b>Automotive Product Group</b> | <small>This is advanced information on a new product now in development or undergoing evaluation. Details are subject to change without notice and Cosemitech assumes no obligation for future manufacture of this product. Contact Cosemitech for the latest status.</small> |

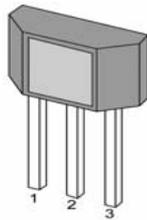
**Draft Datasheet REV 0.4**

## 1. Product Family Members

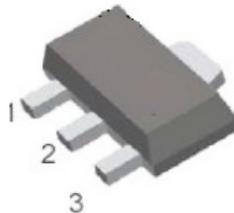
| Part Number | Marking ID | Description   |
|-------------|------------|---|
| CH601ATB    | C601       | Linear Hall sensor IC, flat, TO-92S package, bulk packing (1000 units per bag)        |
| CH601AER    | C601       | Linear Hall sensor IC, SOT-89-3L package, tape and reel packing (1000 units per reel) |
| CH601ASR    | C601       | Linear Hall sensor IC, SOT-23-3L package, tape and reel packing (3000 units per reel) |

## 2. Pin Definitions and Descriptions

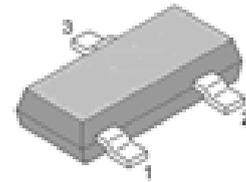
| TO-92S (T) | SOT-89-3L (E) | SOT-23-3L (E) | Name | Type   | Function           |
|------------|---------------|---------------|------|--------|--------------------|
| 1          | 1             | 1             | VDD  | Supply | Supply Voltage pin |
| 2          | 2             | 3             | GND  | Ground | Ground pin         |
| 3          | 3             | 2             | OUT  | Output | Output pin         |



**TO-92S**



**SOT-89-3L**



**SOT-23-3L**

## 3. Absolute Maximum Ratings

| Parameter                     | Symbol    | Min      | Max  | Units |
|-------------------------------|-----------|----------|------|-------|
| Supply Voltage                | $V_{DD}$  | -        | 15   | V     |
| VDD Reverse Voltage $V_{DD}$  | $V_{RDD}$ | -        | -0.3 | V     |
| Output Voltage                | $V_{OUT}$ | -0.3     | 15   | V     |
| Output Current                | $I_{OUT}$ | -        | 5    | mA    |
| Operating Ambient Temperature | $T_A$     | -40      | 150  | °C    |
| Storage Temperature           | $T_S$     | -50      | 150  | °C    |
| Junction temperature          | $T_J$     | -50      | 165  | °C    |
| Magnetic Flux                 | B         | No Limit |      | Gauss |

Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

## 4. ESD Protections

| Parameter              | Value   | Unit |
|------------------------|---------|------|
| All pins <sup>1)</sup> | +/-6000 | V    |
| All pins <sup>2)</sup> | +/-400  | V    |
| All pins <sup>3)</sup> | +/-1000 | V    |

1) HBM (human body mode, 100pF, 1.5 kohm ) according to MIL-STD-883H Method 3015.8

2) MM (Machine Mode C=200pF, R=0Ω) according to JEDEC EIA/JESD22-A115

3) CDM (charged device mode) according to JEDEC EIA/JESD22-C101F

### 5. Function Description

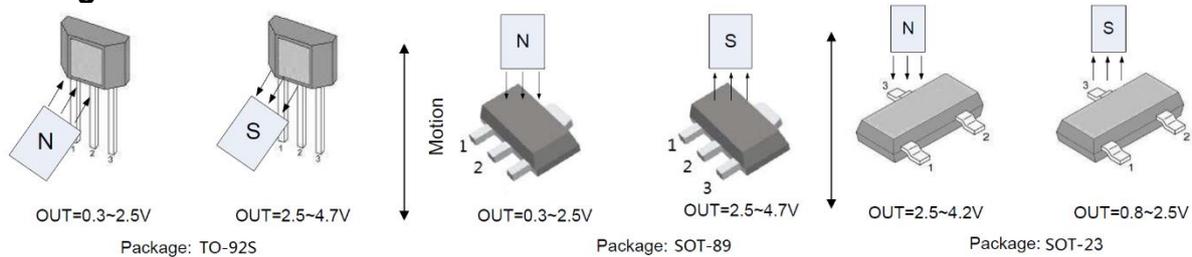
The CH601 family MRL (Miniature Ratiometric Linear) sensors are small, versatile linear Hall effect devices which are operated by the magnetic field from a permanent magnet or an electromagnet. The ratiometric output voltage is set by the supply voltage and varies in proportion to the strength of the magnetic field.

The integrated circuitry provides increased temperature stability, sensitivity and temperature compensation. These linear position sensors have an operating temperature range of -40°C to +150°C, appropriate for industrial and automotive environments. They respond to either positive or negative gauss, monitoring either or both magnetic poles.

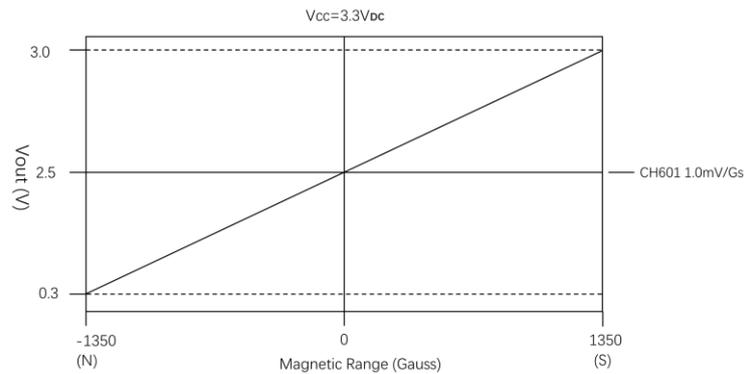
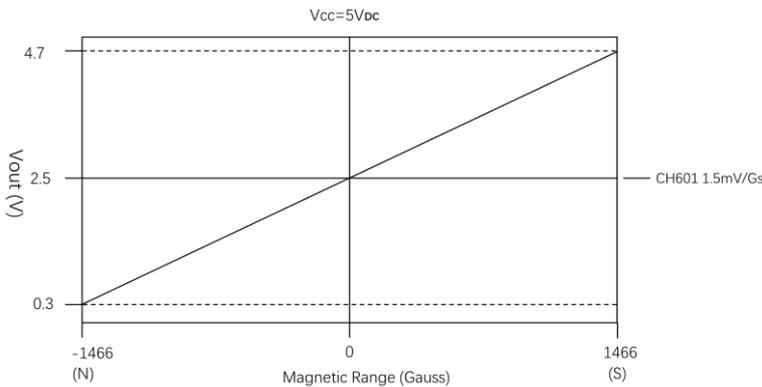
The quad Hall sensing element minimizes the effects of mechanical or thermal stress on the output. The product providing a robust design over a wide temperature range. Rail-to-rail operation (over full voltage range) provides a more usable signal for higher accuracy.

The CH601 family has a typical sinking or sourcing output of 1.5 mA continuous, uses 4 mA of supply current at 5.0 volts and 25°C, and provides predictable performance over the full temperature range. The CH601 family Series sensors have wider null and sensitivity tolerances.

### 6. Magnetic Activation



### 7. Transfer Characteristics



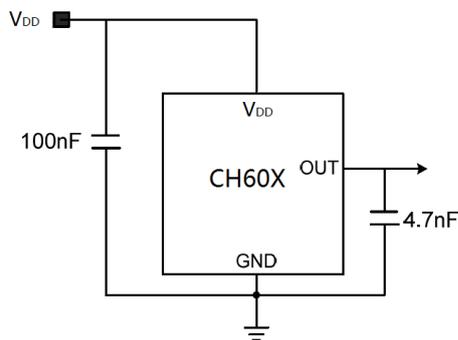
|   |                                 |   |
|---|---------------------------------|---|
|  | <b>Cosemitech</b>               | <b>CH601</b>  |
|   | <b>Automotive Product Group</b> | <small>This is advanced information on a new product now in development or undergoing evaluation. Details are subject to change without notice and Cosemitech assumes no obligation for future manufacture of this product. Contact Cosemitech for the latest status.</small> |

**Draft Datasheet REV 0.4**

### 8. Parameters Specification (At $V_{DD}=5V$ , $T_A = -40\text{ }^\circ\text{C}$ to $150\text{ }^\circ\text{C}$ except where otherwise specified.)

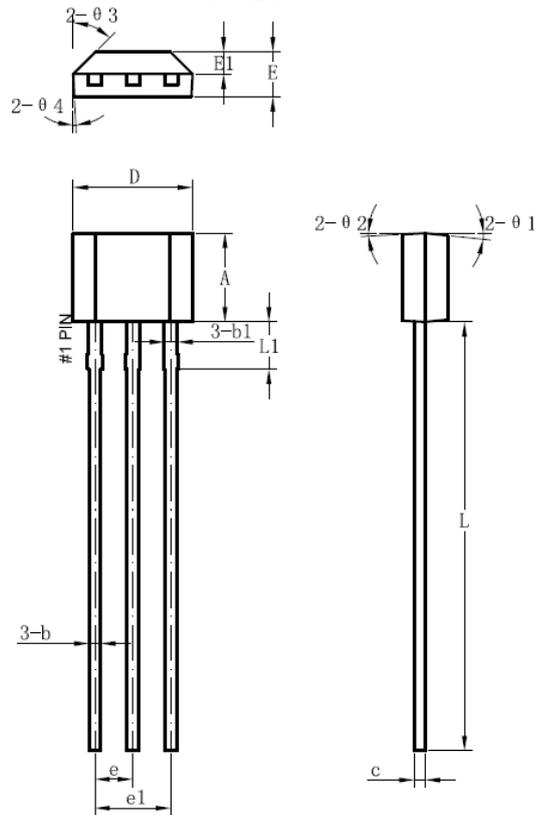
| Symbol        | Parameter                       | Test Condition   | Min   | Typ      | Max   | Units   |
|---------------|---------------------------------|--|-------|----------|-------|---------|
| $V_{DD}$      | Supply voltage                  | $-40\text{ }^\circ\text{C}$ to $150\text{ }^\circ\text{C}$       | 3.0   | 5.0      | 15    | V       |
| $I_{DD}$      | Supply Current                  | $B=0$  |       | 3        | 6.5   | mA      |
| $V_H$         | Output voltage                  | $B \geq +1100\text{ Gs}$   |       |          | 0.4   | V       |
| $V_L$         |                                 | $B \leq -1100\text{ Gs}$   | 4.7   |          |       | V       |
| $V_{NULL}$    | Quiescent Voltage               | $B=0$ at $25\text{ }^\circ\text{C}$ and $V_{DD}=5V$              | 2.425 | 2.5      | 2.575 | V       |
|               |                                 | $B=0$ at $25\text{ }^\circ\text{C}$ and $V_{DD}=3.3V$            | 1.585 | 1.65     | 1.715 | V       |
| $I_{SINK}$    | Sink Current                    | $V_{DD}=3.3V$ $T_A=25\text{ }^\circ\text{C}$                     | 1.2   |          |       | mA      |
| $I_{SINK}$    |                                 | $V_{DD}=5V$ $T_A=25\text{ }^\circ\text{C}$                       | 2.0   |          |       | mA      |
| $I_{SOURCE}$  | Source Current                  | $V_{DD}=3.3V$ $T_A=25\text{ }^\circ\text{C}$                     | 0.8   |          |       | mA      |
| $I_{SOURCE}$  |                                 | $V_{DD}=5V$ $T_A=25\text{ }^\circ\text{C}$                       | 1     |          |       | mA      |
| $V_N$         | Output Referred Noise(CH601)    | $T_A = 25\text{ }^\circ\text{C}$ , $CL = 0.1\text{ }\mu\text{F}$ |       | 5        |       | mV(p-p) |
| $L_{IN}$      | Linearity                       |  | -5    |          | 5     | %       |
| $V_{NULL}(T)$ | Delta $V_{null}$ as temperature |  | -5    |          | 5     | %       |
| $V_{NULL}(V)$ | Ratiometry, $V_{null}$          |  | -5    |          | 5     | %       |
| $SENS(T)$     | Delta Sens as temperature       |  |       | $\pm 10$ |       | %       |
| $S_{ENS}$     | Sensitivity(CH601)              | $T_A=25\text{ }^\circ\text{C}$ , $V_{DD}=5V$                     | 1.2   | 1.5      | 1.8   | mV/Gs   |
| $S_{ENS}$     | Sensitivity(CH601)              | $T_A=25\text{ }^\circ\text{C}$ , $V_{DD}=3.3V$                   | 0.8   | 1        | 1.2   | mV/Gs   |
| $B+$<br>$B-$  | Magnetic Range (CH601)          | $T_A=25\text{ }^\circ\text{C}$ , $V_{DD}=5V$                     |       | 1466     |       | Gauss   |
|               |                                 |  |       | -1466    |       | Gauss   |
| $B+$<br>$B-$  | Magnetic Range (CH601)          | $T_A=25\text{ }^\circ\text{C}$ , $V_{DD}=3.3V$                   |       | 1350     |       | Gauss   |
|               |                                 |  |       | -1350    |       | Gauss   |

### 9. Typical Application Circuit



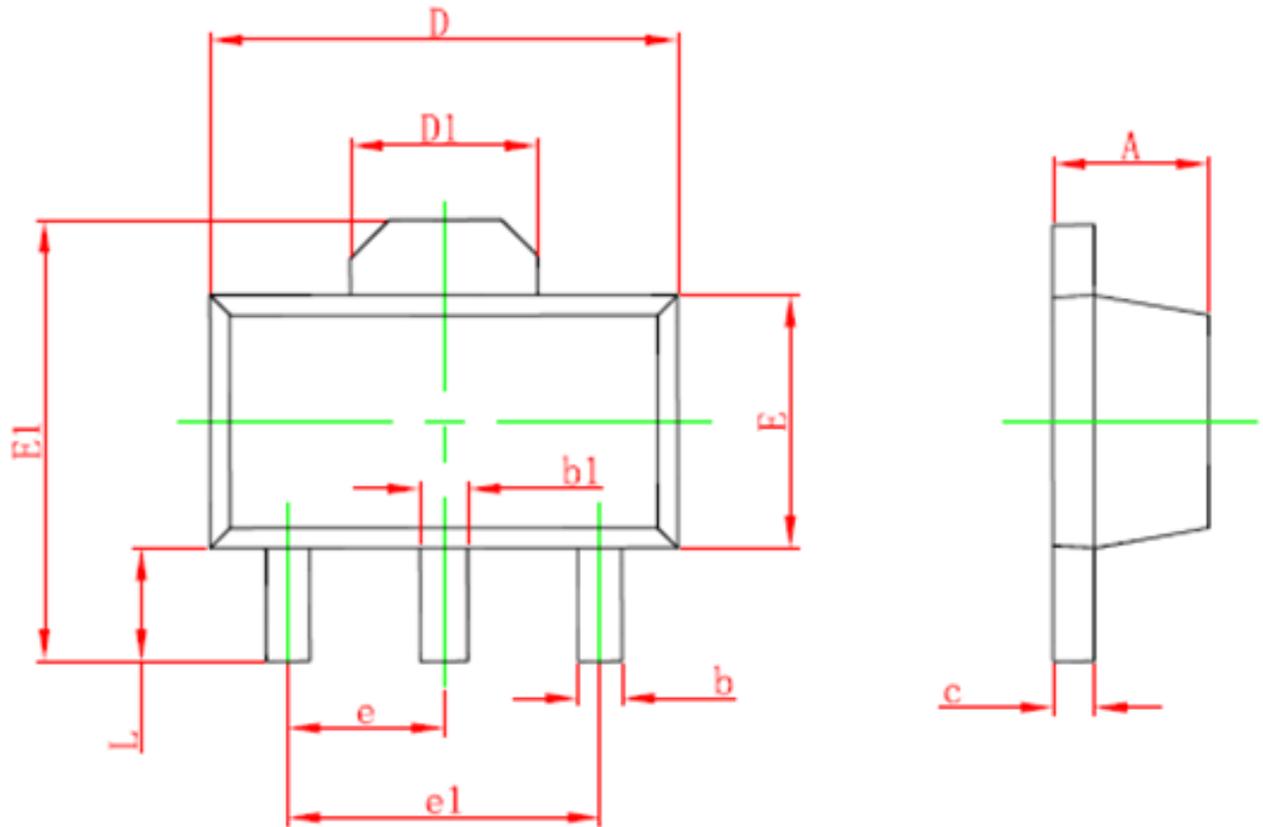
10. Package Information:

Package Designator  
TO-92S



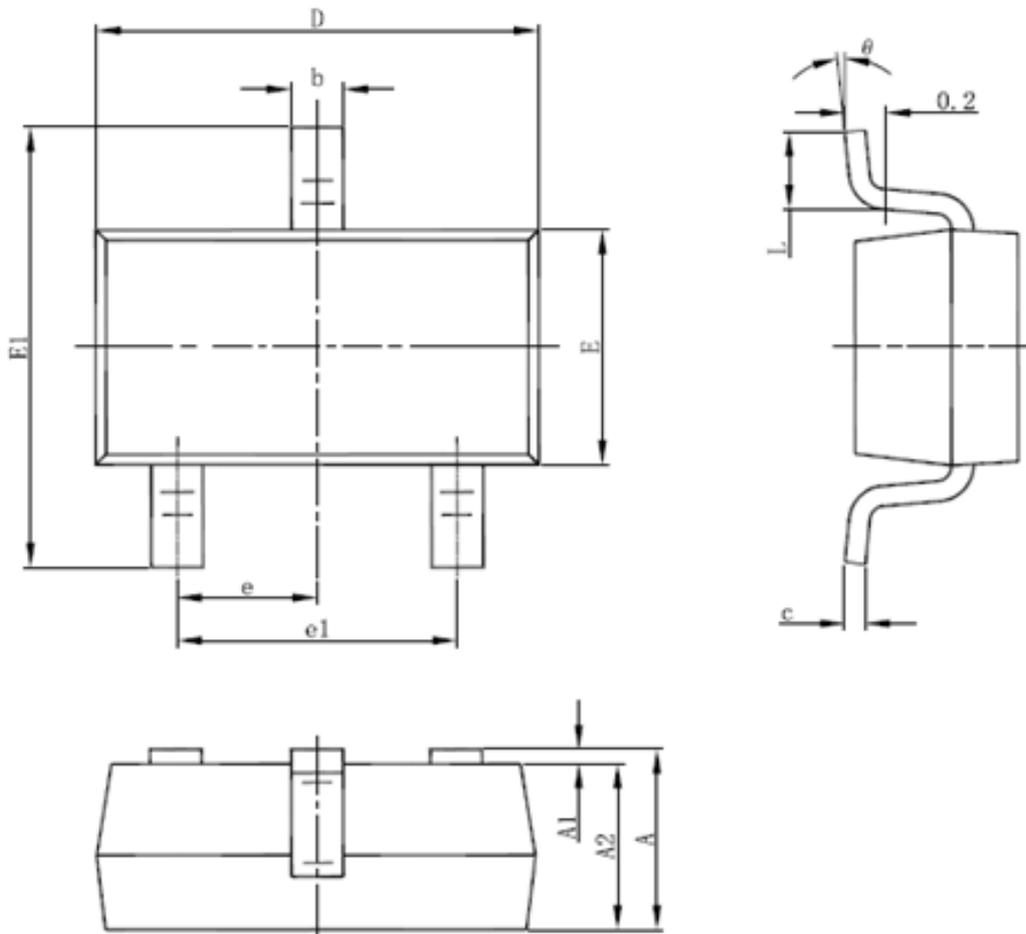
| Symbol     | Dimensions in Millimeters |      |      |
|------------|---------------------------|------|------|
|            | Min.                      | Typ. | Max. |
| A          | 2.9                       | 3    | 3.1  |
| b          | 0.35                      | 0.39 | 0.56 |
| b1         |                           | 0.44 |      |
| c          | 0.36                      | 0.38 | 0.51 |
| D          | 3.9                       | 4    | 4.1  |
| E          | 1.42                      | 1.52 | 1.62 |
| E1         |                           | 0.75 |      |
| e          |                           | 1.27 |      |
| e1         |                           | 2.54 |      |
| L          | 13.5                      | 14.5 | 15.5 |
| L1         |                           | 1.6  |      |
| $\theta 1$ |                           | 6°   |      |
| $\theta 2$ |                           | 3°   |      |
| $\theta 3$ |                           | 45°  |      |

**PACKAGE DESIGNATOR**  
**SOT-89-3L**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.400                     | 1.600 | 0.055                | 0.063 |
| b      | 0.320                     | 0.520 | 0.013                | 0.020 |
| b1     | 0.400                     | 0.580 | 0.016                | 0.023 |
| c      | 0.350                     | 0.440 | 0.014                | 0.017 |
| D      | 4.400                     | 4.600 | 0.173                | 0.181 |
| D1     | 1.550 REF.                |       | 0.061 REF.           |       |
| E      | 2.300                     | 2.600 | 0.091                | 0.102 |
| E1     | 3.940                     | 4.250 | 0.155                | 0.167 |
| e      | 1.500 TYP.                |       | 0.060 TYP.           |       |
| e1     | 3.000 TYP.                |       | 0.118 TYP.           |       |
| L      | 0.900                     | 1.200 | 0.035                | 0.047 |

**PACKAGE DESIGNATOR**  
SOT-23-3L



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min                       | Max   | Min                  | Max   |
| A        | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1       | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2       | 1.050                     | 1.150 | 0.041                | 0.045 |
| b        | 0.300                     | 0.500 | 0.012                | 0.020 |
| c        | 0.100                     | 0.200 | 0.004                | 0.008 |
| D        | 2.820                     | 3.020 | 0.111                | 0.119 |
| E        | 1.500                     | 1.700 | 0.059                | 0.067 |
| E1       | 2.650                     | 2.950 | 0.104                | 0.116 |
| e        | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1       | 1.800                     | 2.000 | 0.071                | 0.079 |
| L        | 0.300                     | 0.600 | 0.012                | 0.024 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |

|   |                                 |   |
|---|---------------------------------|---|
|  | <b>Cosemitech</b>               | <b>CH601</b>  |
|   | <b>Automotive Product Group</b> | <small>This is advanced information on a new product now in development or undergoing evaluation. Details are subject to change without notice and Cosemitech assumes no obligation for future manufacture of this product. Contact Cosemitech for the latest status.</small> |

**Draft Datasheet REV 0.4**

Information furnished is believed to be accurate and reliable. However, Cosemitech assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Cosemitech. Specification mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. Cosemitech products are not authorized for use as critical components in life support devices or systems without express written approval of Cosemitech.

The Cosemitech logo is a registered trademark of Cosemitech

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Board Mount Hall Effect/Magnetic Sensors](#) category:*

*Click to view products by [Cosemitech](#) manufacturer:*

Other Similar products are found below :

[HGPRDT005A](#) [AH277AZ4-AG1](#) [AV-10379](#) [AV-10448](#) [SS41C](#) [AH1894-Z-7](#) [TLE4917](#) [50017859-003](#) [TY-13101](#) [TLE4976L](#) [SS85CA](#)  
[BU52002GUL-E2](#) [BU52003GUL-E2](#) [AH277AZ4-BG1](#) [TLE49614MXTSA1](#) [AH211Z4-AG1](#) [AH3360-FT4-7](#) [TLE4941-1](#) [SS460S-](#)  
[100SAMPLE](#) [50065820-03](#) [AH374-P-A](#) [AH3372-P-B](#) [AH1806-P-A](#) [TLE49595UFXHALA1](#) [SS460P-T2](#) [AH1913-W-7](#) [AH3373-P-B](#)  
[TLE9852QXXUMA1](#) [TLE5046ICAKLRHALA1](#) [AH1903-FA-EVM](#) [AH49FNTR-EVM](#) [AH8502-FDC-EVM](#) [AH3774-P-EVM](#)  
[TLE4998S3XALA1](#) [TLE5011FUMA1](#) [TLE5027CE6747HAMA1](#) [TLE5109A16E1210XUMA1](#) [TLI4966GHTSA1](#) [TLI4906KHTSA1](#)  
[MA710GQ-P](#) [S-57K1NBL2A-M3T2U](#) [S-57P1NBL9S-M3T4U](#) [S-576ZNL2B-L3T2U](#) [S-576ZNL2B-A6T8U](#) [S-57P1NBL0S-M3T4U](#) [S-](#)  
[57A1NSL1A-M3T2U](#) [S-57K1RBL1A-M3T2U](#) [S-57P1NBH9S-M3T4U](#) [S-57P1NBH0S-M3T4U](#) [S-57A1NSH1A-M3T2U](#)