



TMR Angle Sensor

TAS series

TMR Angle Sensors

Product compatible with RoHS directive

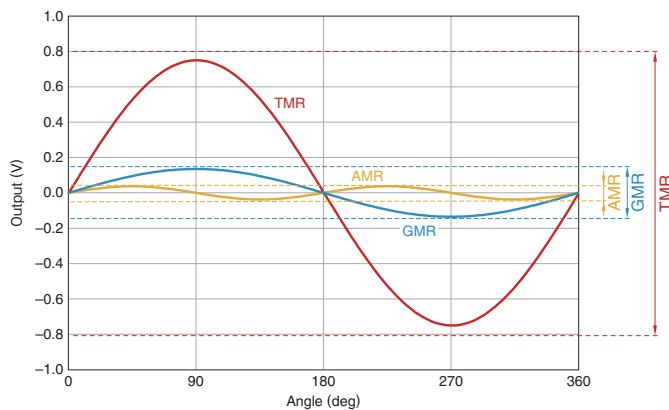
Overview of the TAS series

FEATURES

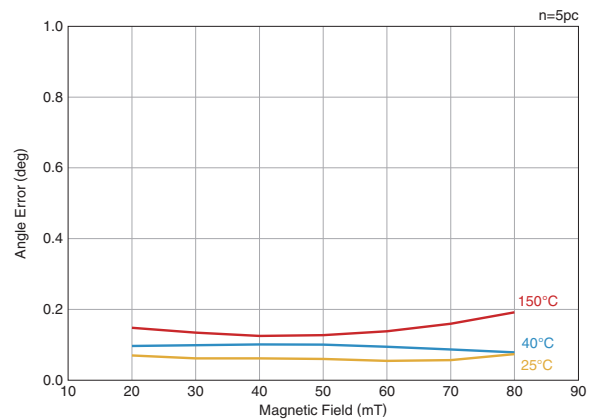
Magnetic Angle Sensor including TMR (Tunnel Magneto-Resistance) based on magnetic record sensing technology in HDD head. High-output, high-accuracy, and high-stability with low aging deterioration. Innovative TMR sensors are available in a compact package.

- High output at 1.5Vp-p/3.0Vp-p @5V
- Good angular accuracy of $\pm 0.6^\circ$. (1.5Vp-p differential output@5V), $\pm 0.8^\circ$. (3.0Vp-p differential output@5V)
- Low temperature drifts
- Low power consumption
- Detections can be made from 0 to 360°

(Output wave pattern comparison) TAS2141-AAAB (1.5Vp-p differential output)



(Angle error graph) TAS2141-AAAB (1.5Vp-p differential output)



20 times the AMR element, 6 times the GMR element, 500 times the Hall element

APPLICATION

- Steering angles
- Pedal opening, throttle valve opening
- Brushless motors
- Motors for wipers, etc.

○ RoHS Directive Compliant Product: See the following for more details. <https://product.tdk.com/info/en/environment/rohs/index.html>

Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. Please note that the contents may change without any prior notice due to reasons such as upgrading.

TAS series

Part Number Construction

| | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|---|-----|-----|------|------|
| T | A | S | 2 | 1 | 4 | 1 | - | A | A | A | B |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | | (8) | (9) | (10) | (11) |

(1) Sensor technology

| | |
|---|-----|
| T | TMR |
|---|-----|

(2) Typical Application

| | |
|---|-------|
| A | Angle |
|---|-------|

(3) Sensor type

| | |
|---|-------------|
| S | Sensor only |
|---|-------------|

(4) Bridge/System

| | |
|---|---|
| 2 | 2 |
| 4 | 4 |

(5) Bridge type

| | |
|---|-------------|
| 1 | Full bridge |
|---|-------------|

(6) Sensor axes

| | |
|---|----|
| 4 | XY |
|---|----|

(7) Internal code

| | |
|---|---|
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |

(8) Sensor package

| | |
|---|---------|
| A | TSSOP8 |
| B | TSSOP16 |

(9) Grade

| | |
|---|------------|
| A | Automotive |
|---|------------|

(10) Specials

| | |
|---|------|
| A | none |
|---|------|

(11) Product internal code

| | |
|---|---|
| A | 1 |
| B | 2 |

PRODUCT LINEUP

TAS2141-AAAB: 1.5Vp-p differential output@5V

TAS2143-AAAA: 3.0Vp-p differential output@5V

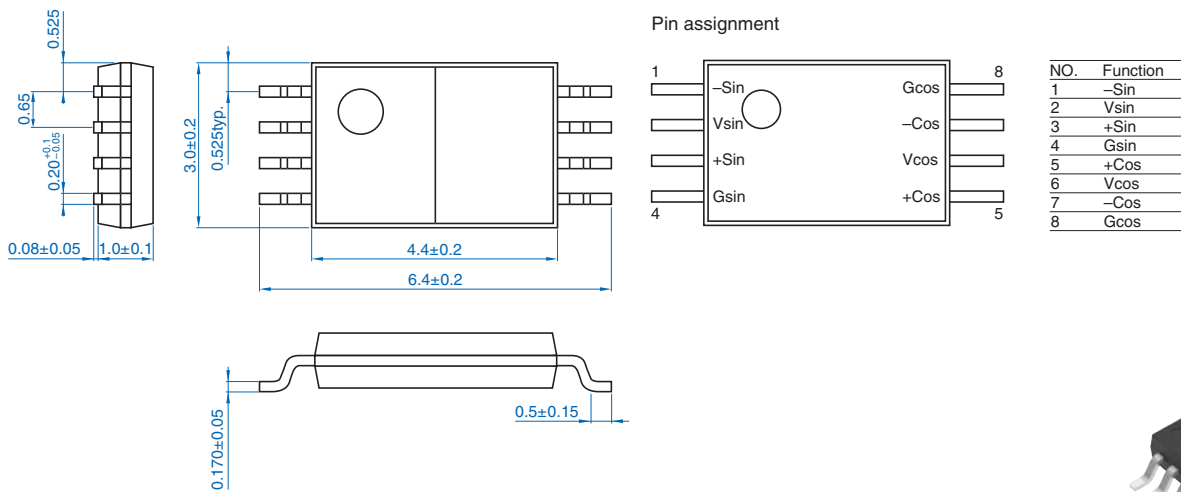
TAS4140-BAAB: 1.5Vp-p differential output@5V, (Corresponding to Redundancy)

TAS4142-BAAB: 3.0Vp-p differential output@5V, (Corresponding to Redundancy)

| Product name | Sensor technology | Typical application | Sensor type | Bridge/System | Bridge type | Sensor axes | Internal code | Sensor package | Grade | Specials | Product internal code |
|--------------|-------------------|---------------------|-------------|---------------|-------------|-------------|---------------|----------------|------------|----------|-----------------------|
| TAS2141-AAAB | TMR | Angle | Sensor only | 2 | Full bridge | XY | 1 | TSSOP8 | Automotive | none | 1 |
| TAS2143-AAAA | TMR | Angle | Sensor only | 2 | Full bridge | XY | 2 | TSSOP8 | Automotive | none | 1 |
| TAS4140-BAAB | TMR | Angle | Sensor only | 4 | Full bridge | XY | 0 | TSSOP16 | Automotive | none | 1 |
| TAS4142-BAAB | TMR | Angle | Sensor only | 4 | Full bridge | XY | 1 | TSSOP16 | Automotive | none | 1 |

TAS2141-AAAB(1.5Vp-p differential output@5V, 2 Full Bridge)

SHAPE & DIMENSIONS (TSSOP8)



Dimensions in mm



ABSOLUTE MAXIMUM RATINGS

| Items | Parameter | Conditions | min. | typ. | max. | Unit |
|----------|---------------------------------|------------|------|------|------|------------------|
| Vcc | Supply Voltage | | | | 6.5 | Volt |
| Hex | External Magnetic field | ≤5min | | | 200 | mT ¹⁾ |
| ESD HBM | ESD tolerance: Human Body Model | | | | 4000 | Volt |
| ESD MM | ESD tolerance: Machine Model | | | | 400 | Volt |
| T opt | Operating Ambient Temperature | | -40 | | 150 | °C |
| T stg | Storage Temperature | | -55 | | 150 | °C |
| T reflow | Reflow Temperature | | | | 260 | °C |

1) 1mT = 795.8A/m.

RECOMMENDED OPERATING CONDITIONS

| Items | Parameter | Conditions | min. | typ. | max. | Unit |
|-------|-------------------------------|------------|------|------|------|------|
| Vcc | Supply Voltage | | 3 | 5 | 5.5 | Volt |
| T opt | Operating Ambient Temperature | | -40 | 25 | 150 | °C |
| Hex | External Magnetic field | | 20 | | 80 | mT |

ELECTRICAL CHARACTERISTICS

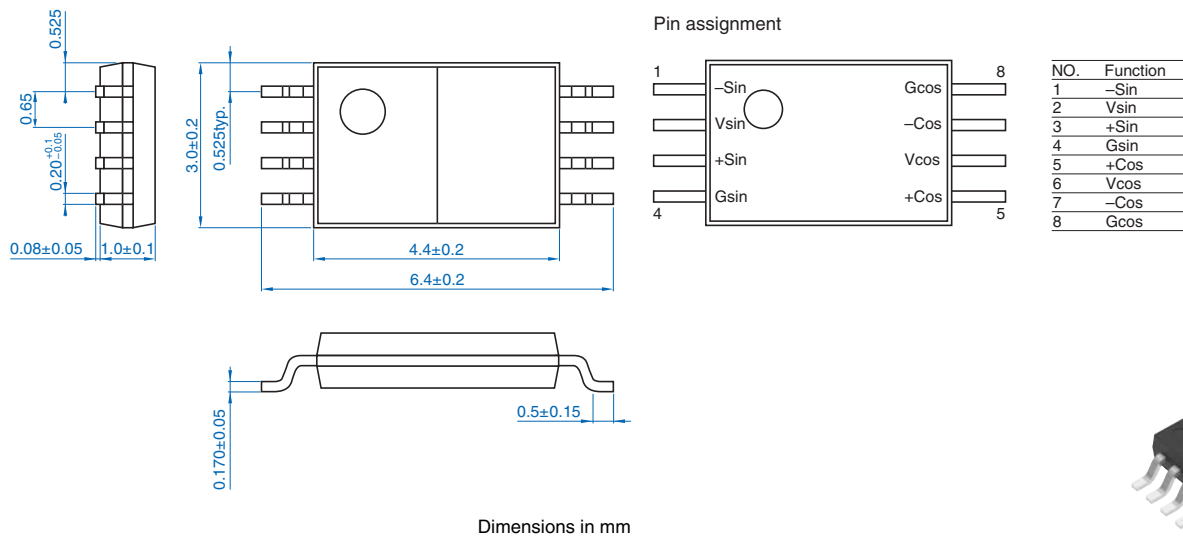
TOPT=25°C, BEXT=30mT, VSIN=2.7 to 5.5V. VCOS=2.7 to 5.5V unless otherwise specified

| Items | Parameter | Conditions | min. | typ. | max. | Unit |
|----------------------------------|---|--|---------------|--------|--------|------|
| R bridge | Bridge Resistance | T opt=25°C, Hex=30mT | 4 | 5 | 6 | kΩ |
| V out | Differential Output Voltage Peak to Peak per Vcc | T opt=25°C, Hex=30mT | 0.24 | 0.3 | 0.36 | V/V |
| Angle Error (After compensation) | | T opt=-40°C to 150°C Nominal Magnetic Range: 20mT to 80mT | | | 0.6 | deg |
| Orthogonality | | T opt=-40°C to 150°C, 20mT to 80mT | 87 | 90 | 93 | deg |
| V offset | Differential Output Offset as an "initial offset" | per supply Voltage, 20mT to 80mT | -5 | — | 5 | mV/V |
| TC output | Temperature Coefficient of Differential Output | T opt=-40°C to 150°C, 20mT to 80mT | -0.135 | -0.115 | -0.095 | %/K |
| TC R bridge | Temperature Coefficient of Bridge Resistance | T opt=-40°C to 150°C, 20mT to 80mT | -0.070 | -0.050 | -0.030 | %/K |
| Hyst. | Hysteresis of Output Voltage | more than Hex=20mT | No Hysteresis | | | |
| k | Amplitude Synchronism ratio | T opt=25°C, Hex=30mT | 97 | 100 | 103 | % |
| Tck | Temperature Coefficient of Amplitude Synchronism | T opt=-40°C to 150°C, 20mT to 80mT | -0.015 | | 0.015 | %/K |

* LT=-40°C., RT=25°C., HT=150°C

TAS2143-AAAA(3.0Vp-p differential output@5V, 2 Full Bridge)

SHAPE & DIMENSIONS (TSSOP8)



ABSOLUTE MAXIMUM RATINGS

| Items | Parameter | Conditions | min. | typ. | max. | Unit |
|----------|---------------------------------|------------|------|------|------|------------------|
| Vcc | Supply Voltage | | | | 6.5 | Volt |
| Hex | External Magnetic field | ≤5min | | | 200 | mT ¹⁾ |
| ESD HBM | ESD tolerance: Human Body Model | | | | 4000 | Volt |
| ESD MM | ESD tolerance: Machine Model | | | | 400 | Volt |
| T opt | Operating Ambient Temperature | | -40 | | 150 | °C |
| T stg | Storage Temperature | | -55 | | 150 | °C |
| T reflow | Reflow Temperature | | | | 260 | °C |

1) 1mT = 795.8A/m.

RECOMMENDED OPERATING CONDITIONS

| Items | Parameter | Conditions | min. | typ. | max. | Unit |
|-------|-------------------------------|------------|------|------|------|------|
| Vcc | Supply Voltage | | 3 | 5 | 5.5 | Volt |
| T opt | Operating Ambient Temperature | | -40 | 25 | 150 | °C |
| Hex | External Magnetic field | | 20 | | 80 | mT |

ELECTRICAL CHARACTERISTICS

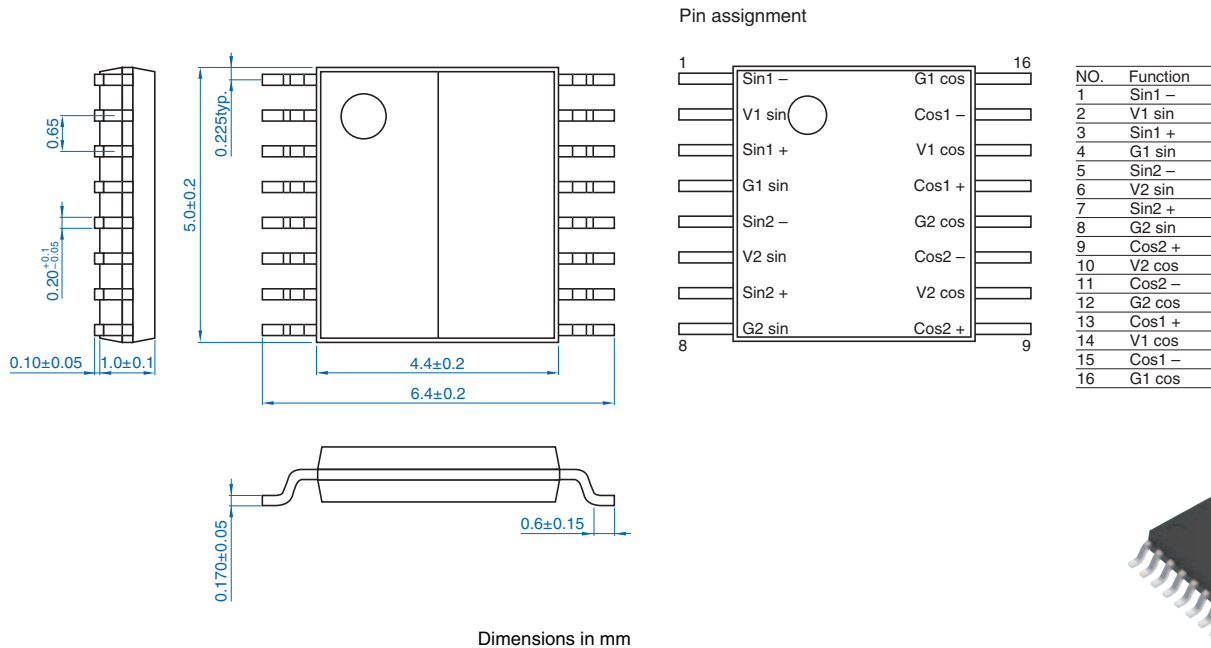
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| Items | Parameter | Conditions | min. | typ. | max. | Unit |
|----------------------------------|---|--|---------------|--------|--------|------|
| R bridge | Bridge Resistance | T opt=25°C, Hex=30mT | 4 | 5 | 6 | kΩ |
| V out | Differential Output Voltage Peak to Peak per Vcc | T opt=25°C, Hex=30mT | 0.54 | 0.6 | 0.67 | V/V |
| Angle Error (After compensation) | | T opt=-40°C to 150°C Nominal Magnetic Range: 20mT to 80mT | | | 0.8 | deg |
| Orthogonality | | T opt=-40°C to 150°C, 20mT to 80mT | 87 | 90 | 93 | deg |
| V offset | Differential Output Offset as an "initial offset" | per supply Voltage, 20mT to 80mT | -5 | — | 5 | mV/V |
| TC output | Temperature Coefficient of Differential Output | T opt=-40°C to 150°C, 20mT to 80mT | -0.115 | -0.095 | -0.075 | %/K |
| TC R bridge | Temperature Coefficient of Bridge Resistance | T opt=-40°C to 150°C, 20mT to 80mT | -0.070 | -0.050 | -0.030 | %/K |
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* LT=-40°C., RT=25°C., HT=150°C

TAS4140-BAAB (1.5Vp-p differential output@5V, 4 Full Bridge(Corresponding to Redundancy))

SHAPE & DIMENSIONS (TSSOP16)



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| Items | Parameter | Conditions | min. | typ. | max. | Unit |
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| T opt | Operating Ambient Temperature | | -40 | | 150 | °C |
| T stg | Storage Temperature | | -55 | | 150 | °C |
| T reflow | Reflow Temperature | | | | 260 | °C |

¹⁾ 1mT = 795.8A/m.

RECOMMENDED OPERATING CONDITIONS

| Items | Parameter | Conditions | min. | typ. | max. | Unit |
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| Vcc | Supply Voltage | | 3 | 5 | 5.5 | Volt |
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| Hex | External Magnetic field | | 20 | | 80 | mT |

ELECTRICAL CHARACTERISTICS

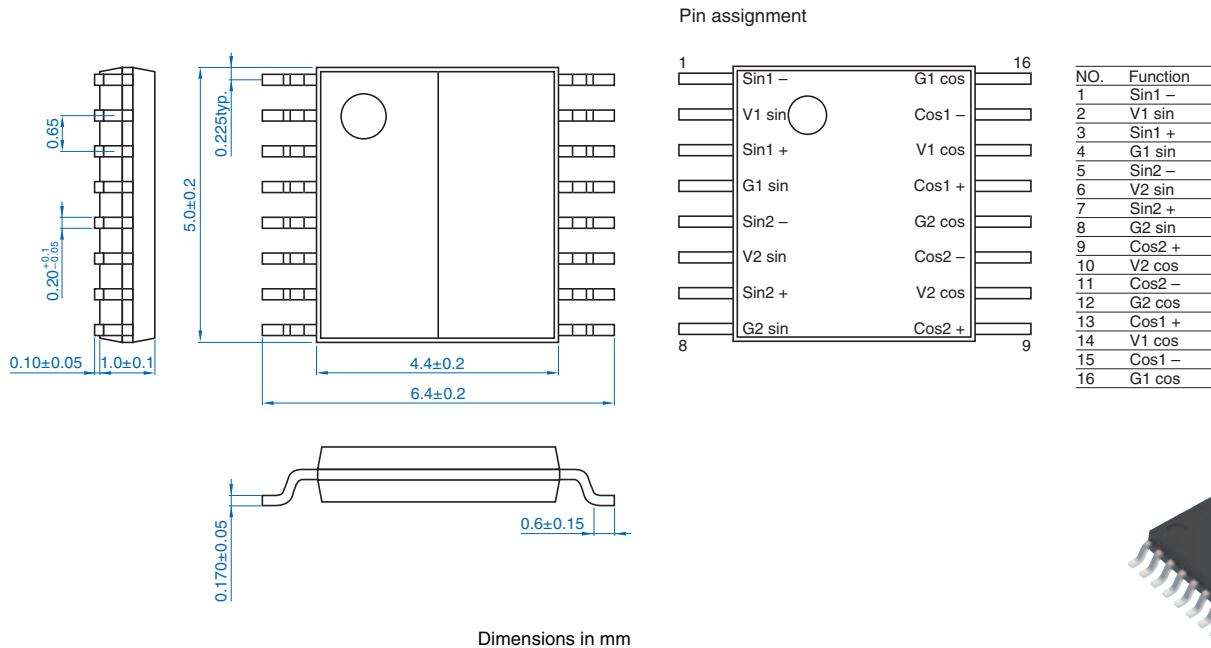
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TAS4142-BAAB (3.0Vp-p differential output@5V, 4 Full Bridge(Corresponding to Redundancy))

SHAPE & DIMENSIONS (TSSOP16)



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Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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