



TMR角度传感器

TAS系列

碳粉浓度/余量传感器

RoHS对应产品

TAS系列的概要

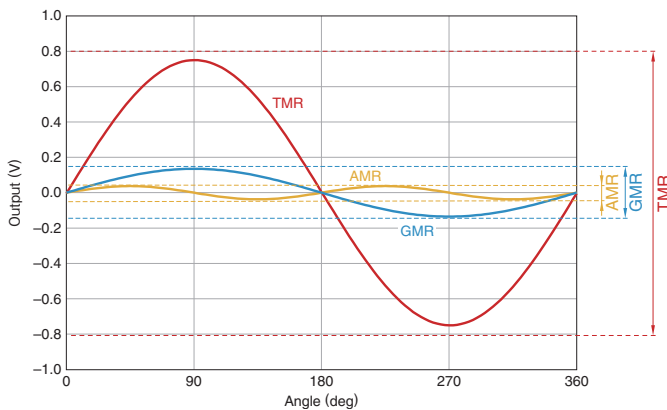
■特点

应用了HDD磁头中培养起来的TMR (Tunnel Magneto Resistance) 技术的角度传感器。

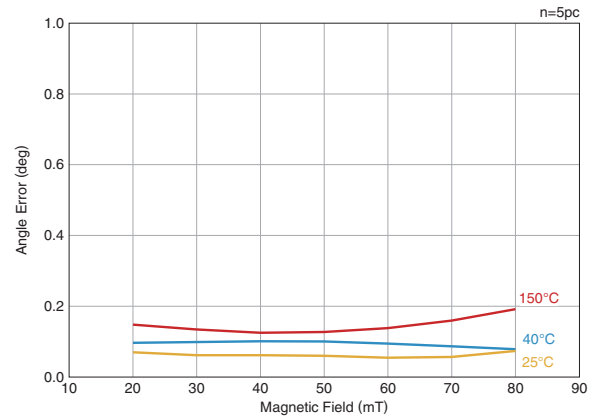
高输出、高精度、老化小，稳定性高。以小型包装实现了划时代的TMR传感器。

- 高输出 1.5Vp-p/3.0Vp-p @5V
- 良好的角度精度 $\pm 0.6\text{deg.}$ (1.5Vp-p 差动输出@5V)、 $\pm 0.8\text{deg.}$ (3.0Vp-p 差动输出@5V)
- 温度漂移小
- 耗电量小
- 可检测 $0\sim 360^\circ$

〈输出波形比较〉 TAS2141-AAAB (1.5Vp-p 差动输出)



〈角度误差图〉 TAS2141-AAAB (1.5Vp-p 差动输出)



AMR 元件的 20 倍、GMR 元件的 6 倍、Hall 元件的 500 倍

■用途

- EPS电机
- 转向角
- 踏板开度、节气门开度
- 无刷电机
- Wiper用电机等

○ RoHS指令对应产品：详细内容查看这里。 <https://product.tdk.com/info/zh/environment/rohs/index.html>

⚠ 为了能够更加正确、安全地使用产品，请务必索取能进一步确认详细特性、规格的采购规格书。
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TAS系列

■型号的命名方法

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
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(2) Typical Application

A	Angle
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(3) Sensor type

S	Sensor only
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(4) Bridge/System

2	2
4	4

(5) Bridge type

1	Full bridge
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(6) Sensor axes

4	XY
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(7) Internal code

0	0
1	1
2	2
3	3

(8) Sensor package

A	TSSOP8
B	TSSOP16

(9) Grade

A	Automotive
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(10) Specials

A	none
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(11) Product internal code

A	1
B	2

■产品阵容

TAS2141-AAAB: 1.5Vp-p 差动输出@5V

TAS2143-AAAA: 3.0Vp-p 差动输出@5V

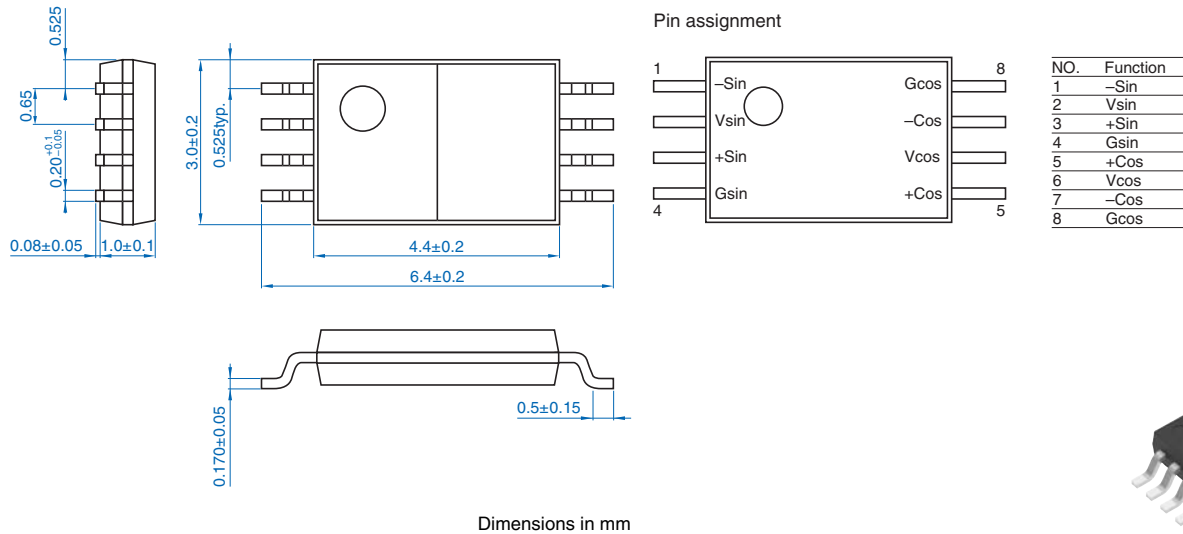
TAS4140-BAAB: 1.5Vp-p 差动输出@5V、(冗余对应)

TAS4142-BAAB: 3.0Vp-p 差动输出@5V、(冗余对应)

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 差动输出 @5V、2 Full Bridge)

形状与尺寸 (TSSOP8)



绝对最大额定

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.

推荐工作条件

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

电气特性

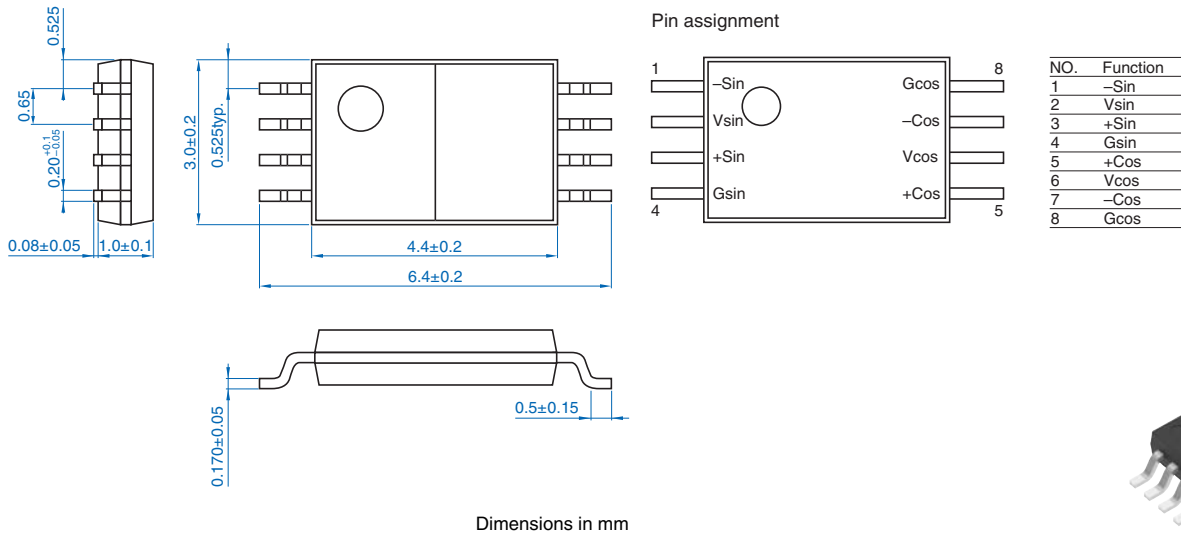
TOPT=25°C, BEXT=30mT, VSIN=2.7 to 5.5V. VCOS=2.7 to 5.5V unless otherwise specified

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 差动输出 @5V、2 Full Bridge)

形状与尺寸 (TSSOP8)



绝对最大额定

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.

推荐工作条件

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

电气特性

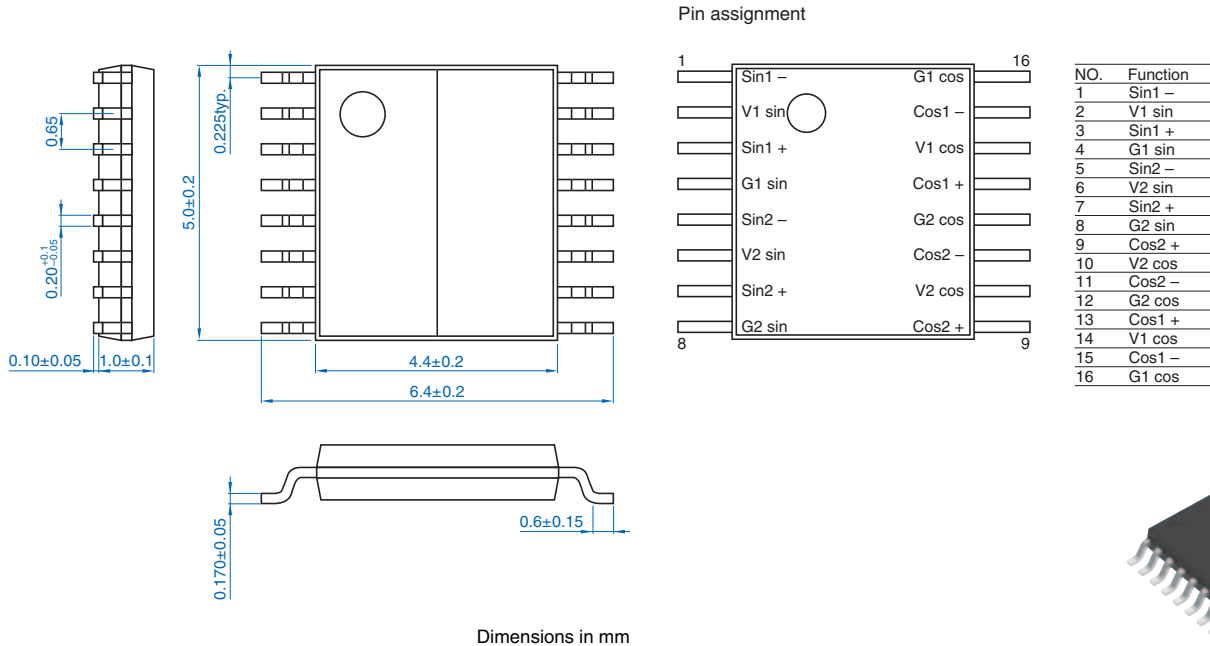
TOPT=25°C, BEXT=30mT, VSIN=2.7 to 5.5V, VCOS=2.7 to 5.5V unless otherwise specified

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	0.54	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
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

TAS4140-BAAB(1.5Vp-p 差动输出 @5V、4 Full Bridge(冗余对应))

形状与尺寸 (TSSOP16)



绝对最大额定

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.

推荐工作条件

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

电气特性

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

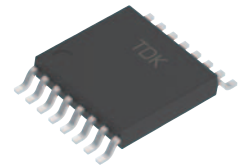
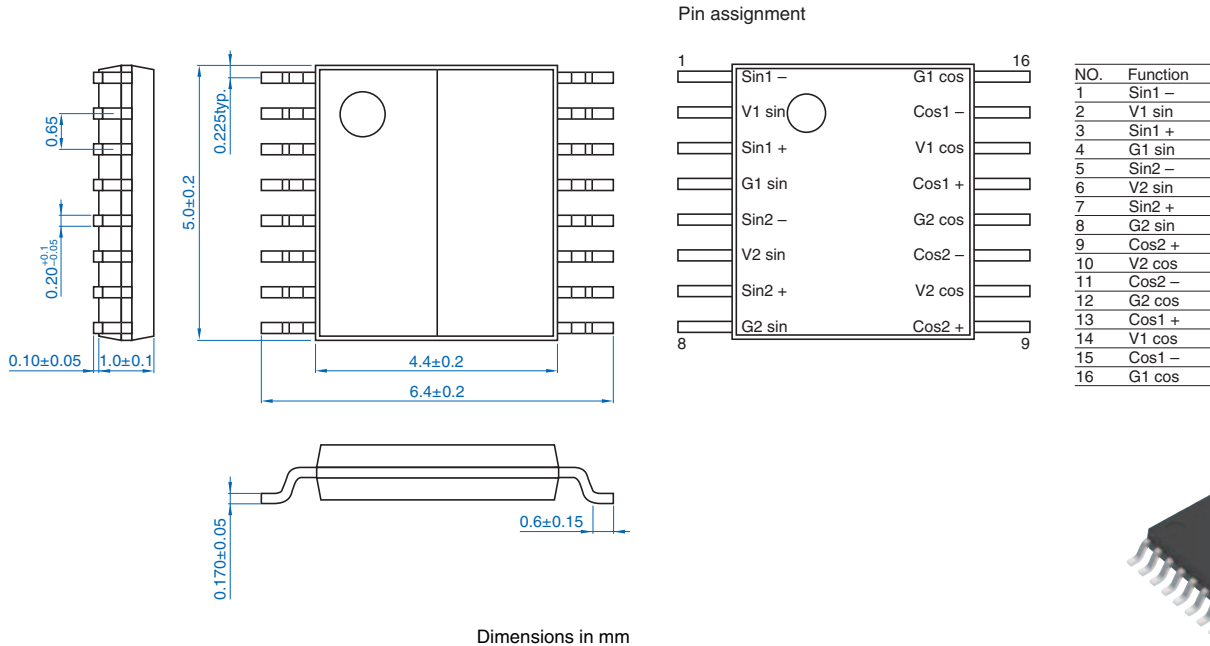
Items	Parameter	Conditions	min.	typ.	max.	Unit
R bridge	Bridge Resistance	T opt=25°C, Hex=30mT	4	5	6	kΩ
V out	Differential Output Voltage Peak to Peak per Vcc	T opt=25°C, Hex=30mT	0.24	0.3	0.36	V/V
Angle Error (After compensation)		T opt=-40°C to 150°C Nominal Magnetic Range: 20mT to 80mT			0.6	deg
Orthogonality		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
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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

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TAS4142-BAAB(3.0Vp-p 差动输出 @5V、4 Full Bridge(冗余对应))

■ 形状与尺寸 (TSSOP16)



■ 绝对最大额定

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T opt	Operating Ambient Temperature		-40		150	°C
T stg	Storage Temperature		-55		150	°C
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■ 推荐工作条件

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