

XtremeSense™ 2D TMR Angle Sensor

FEATURES AND BENEFITS

- High precision TMR
- Contactless 0° to 360° angle sensor IC with single-ended analog sine and cosine outputs.
- Dual half-bridge TMR network (TSSOP-8).
- ASIL-Compliant: ASIL D safety element out-of-context (SEooC) developed in accordance with ISO 26262, when used as specified in the safety manual and once assessment is completed
- Supply voltage: 1.0 to 5.5 V.
- Operating magnetic field: 200 to 900 G.
- Operating temperature: -40°C to 150°C
- AEC-Q100 Grade 0



APPLICATIONS

- Angular measurements
- Rotary and angular sensors
- BLDC motors

PACKAGE: 8-LEAD TSSOP (SUFFIX LE)



Not to scale

DESCRIPTION

The A33204 is a 2D angle sensor with a dual half-bridge configuration using XtremeSense™ 2D tunnel magneto-resistance (TMR) technology. The operating magnetic field for this 2D sensor is 200 G to 900 G with an extended range up to 1200 G. The sensitive axes of the TMR elements are orthogonal to each other, providing a 90° phase separation between the sine and cosine outputs. This phase separation is inherently independent of magnet pole spacing and air gap.

The A33204 was developed in accordance with ISO 26262 as a hardware safety element out of context with ASIL D capability (pending assessment) for use in automotive safety-related systems when integrated and used in the manner prescribed in the applicable safety manual and datasheet.

The A33204 is available as a dual half-bridge in an 8-lead TSSOP package. This package is lead (Pb) free with 100% matte-tin lead frame plating. The A33204 is AEC-Q100 grade 0 qualified.

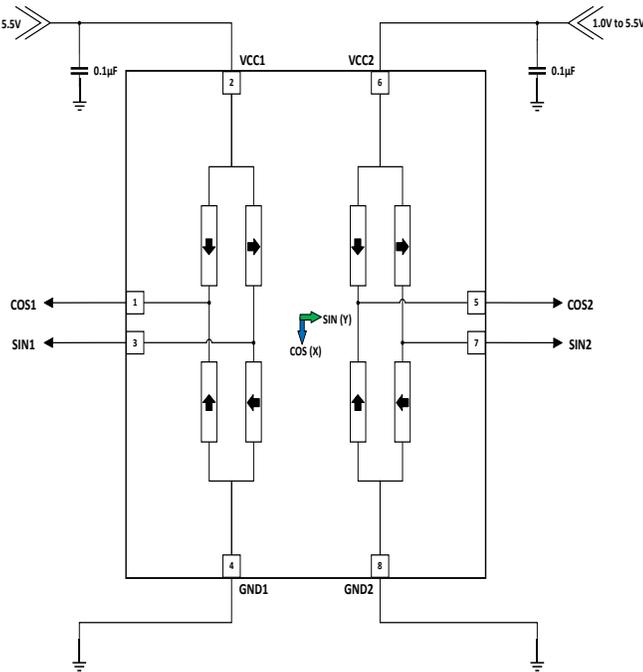


Figure 1: A33204 Typical Application Diagram

SPECIFICATIONS

SELECTION GUIDE

Part Number	Number of Half-bridges	Number of Analog Outputs	Automotive Grade	Target ASIL Rating [1]	Package [2]	Packing
A33204LLEATR	2	4	Grade 0	ASIL D	8-lead TSSOP	4000 pieces per 13 inch reel

[1] Pending Assessment.

[2] Contact Allegro for other package or output polarity options.



SINGLE-ENDED OUTPUT SIGNAL

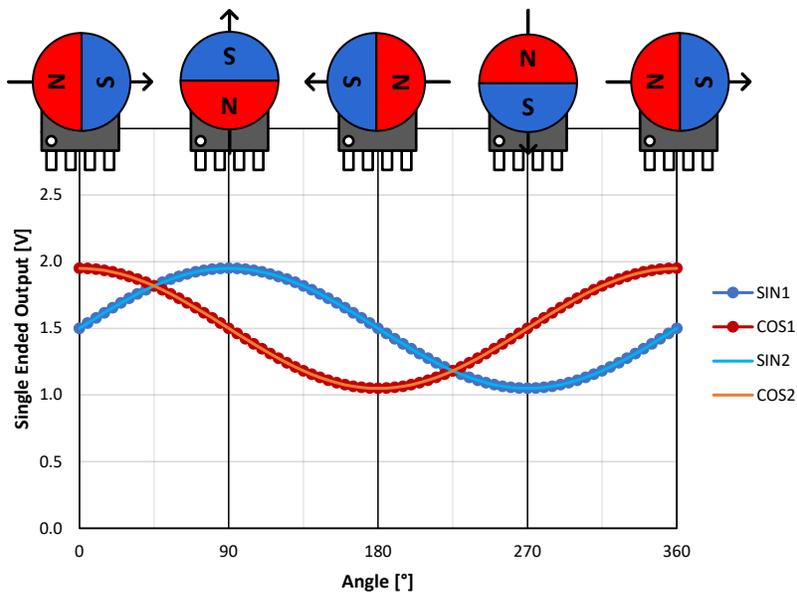


Figure 2: Nominal A33204 Single-Ended Output versus Position, $V_{CC} = 3\text{ V}$

PINOUT DIAGRAM AND TERMINAL LIST

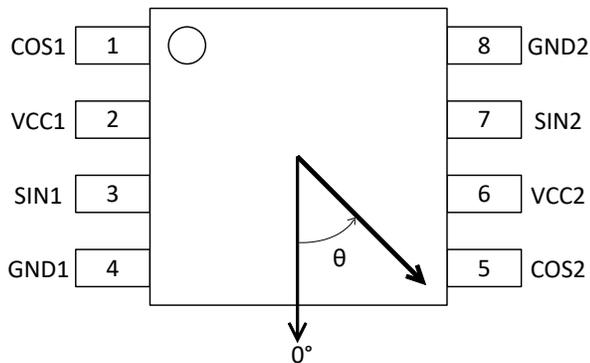


Figure 3: TSSOP-8 Top-Down View

Terminal List

Number	Name	Function
1	COS1	Cosine Output, Half-Bridge 1
2	VCC1	Supply Voltage, Half-Bridge 1
3	SIN1	Sine Output, Half-Bridge 1
4	GND1	Ground, Half-Bridge 1
5	COS2	Cosine Output, Half-Bridge 2
6	VCC2	Supply Voltage, Half-Bridge 2
7	SIN2	Sine Output, Half-Bridge 2
8	GND2	Ground, Half-Bridge 2.

PACKAGE OUTLINE DRAWING
For Reference Only – Not for Tooling Use

(Reference Allegro DWG-0000381, Rev. 1 and JEDED MO-153AA)
 Dimensions in millimeters - NOT TO SCALE
 Dimensions exclusive of mold flash, gate burrs, and dambar protrusions
 Exact case and lead configuration at supplier discretion within limits shown

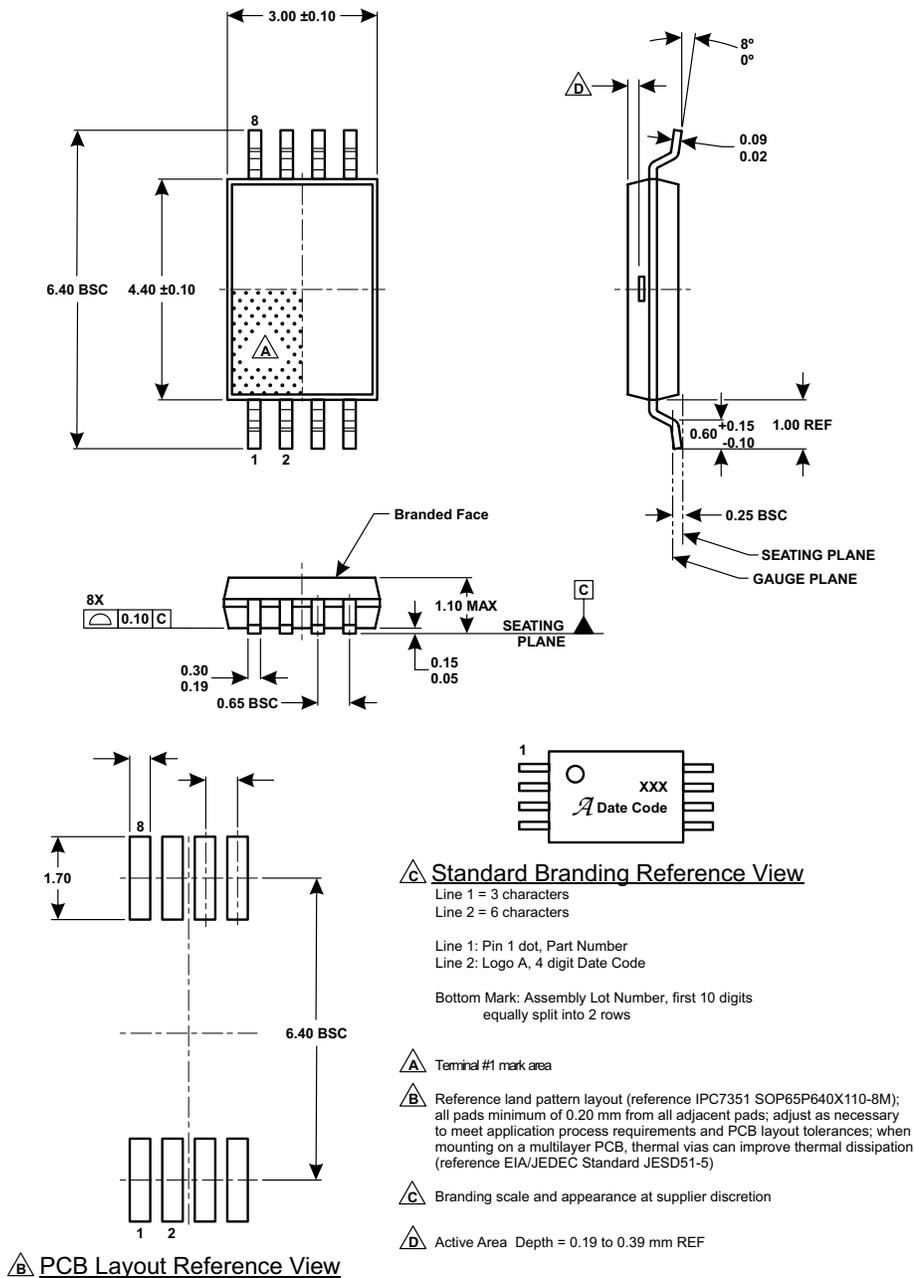


Figure 4: TSSOP-8 Package (Suffix LE)

REVISION HISTORY

Number	Date	Description
–	March 25, 2026	Initial release
1	March 26, 2026	Initial release to Allegro website

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