

## XtremeSense™ TMR Current Sensor with High dV/dt Immunity and Common-Mode Field Rejection

### FEATURES AND BENEFITS

- High operating 500 kHz bandwidth for fast control loops or where high-speed currents are monitored
- High performance for optimized energy applications
  - Ratiometric operation
  - Differential sensing rejects common-mode fields
  - No magnetic hysteresis
- 3.3 V or 5 V supply voltage variants
- Low 1 mΩ primary conductor resistance for low power dissipation and high-inrush current capability
- Optimized for high dV/dt applications
- UL 62368-1 (edition 3) certification (pending), highly isolated compact surface mount packages
- High-withstand surge power ratings
- Wide operating temperature, -40°C to 125°C
- Available in SOIC-8 (CT4022) and SOICW-16 (CT4032) packages
- AEC-Q100 Grade 1, automotive qualified (-A variants only)

### DESCRIPTION

The CT4022/32 is a highly linear, XtremeSense™ TMR-based current sensor. The tunneling magnetoresistive (TMR) sensor is differential, which enables common-mode field rejection to cancel out stray magnetic fields. The primary conductor resistance is only 1 mΩ, which enables the sensor to withstand high inrush current and to minimize power loss. The current applied to the pin of the primary conductor generates an internal differential magnetic field. The TMR sensor provides a proportional voltage to the differential magnetic field while rejecting common-mode stray magnetic fields.

The pins of the primary conductive path and the sensor leads are galvanically isolated. This enables high-side current sensing without the need for additional isolation techniques.

The CT4022/32 is offered in an industry-standard 8-pin small-outline integrated circuit (SOIC) package (CT4022) and a 16-pin wide SOIC (SOICW) package (CT4032). Both packages are green and RoHS compliant. The small and low-profile footprint are well-suited for space-constrained applications.

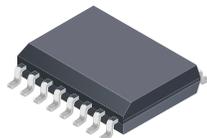
### PACKAGE

8-pin SOIC (SOIC-8)



Not to scale

16-pin SOICW (SOICW-16)



Not to scale

### APPLICATIONS

- Motor control
- Power inverters
- Uninterruptible power supply (UPS), switched-mode power supply (SMPS), and telecom power supply
- Consumer and enterprise electronics

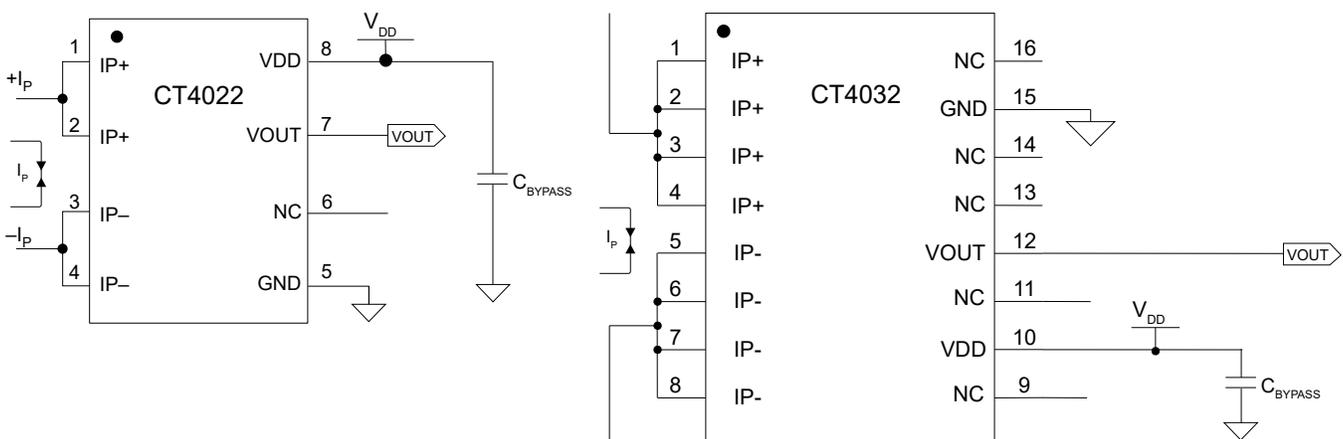


Figure 1: Typical Application Circuit of CT4022 (left) and CT4032 (right)

The CT4022/32 outputs an analog signal,  $V_{OUT}$ , that varies linearly with the primary current,  $I_P$ , within the specified ranges.

# CT4022 and CT4032

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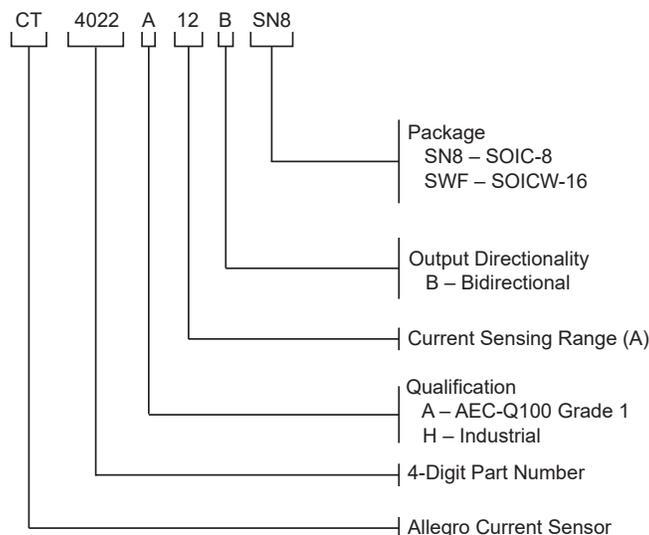
## SELECTION GUIDE

Part Number	Current Sensing Range (A)	Sensitivity (mV/A)		Quiescent Voltage Output $V_{QVO}$ (V)		Optimized Temperature Range $T_A$ (°C)	Packing
		$V_{DD} = 3.3\text{ V}$	$V_{DD} = 5\text{ V}$	$V_{DD} = 3.3\text{ V}$	$V_{DD} = 5\text{ V}$		
<b>CT4022 (SOIC-8 PACKAGE)</b>							
<b>-A VARIANT [1][2]</b>							
CT4022-A12BSN8	±12	110	166.7	1.65	2.5	-40 to 125	2000 pieces per 13-inch reel
CT4022-A24BSN8	±24	55	83.3				
CT4022-A40BSN8	±40	33	50				
CT4022-A50BSN8	±50	26.4	40				
CT4022-A65BSN8	±65	20.3	30.8				
<b>-H VARIANT</b>							
CT4022-H12BSN8	±12	110	166.7	1.65	2.5	-40 to 125	2000 pieces per 13-inch reel
CT4022-H24BSN8	±24	55	83.3				
CT4022-H40BSN8	±40	33	50				
CT4022-H50BSN8	±50	26.4	40				
CT4022-H65BSN8	±65	20.3	30.8				
<b>CT4032 (SOICW-16 PACKAGE)</b>							
<b>-A VARIANT [1][2]</b>							
CT4032-A20BSWF	±20	66	100	1.65	2.5	-40 to 125	1000 pieces per 13-inch reel
CT4032-A40BSWF	±40	33	50				
CT4032-A50BSWF	±50	26.4	40				
CT4032-A65BSWF	±65	20.3	30.8				

[1] Automotive flow available October 2025

[2] AEC-Q100 Grade 1, automotive grade (-A variants only).

## PART NAMING SPECIFICATION



## PACKAGE OUTLINE DRAWING

### For Reference Only – Not for Tooling Use

(reference Allegro DWG-0000385, Rev. 2 or JEDEC MS-012AA)

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

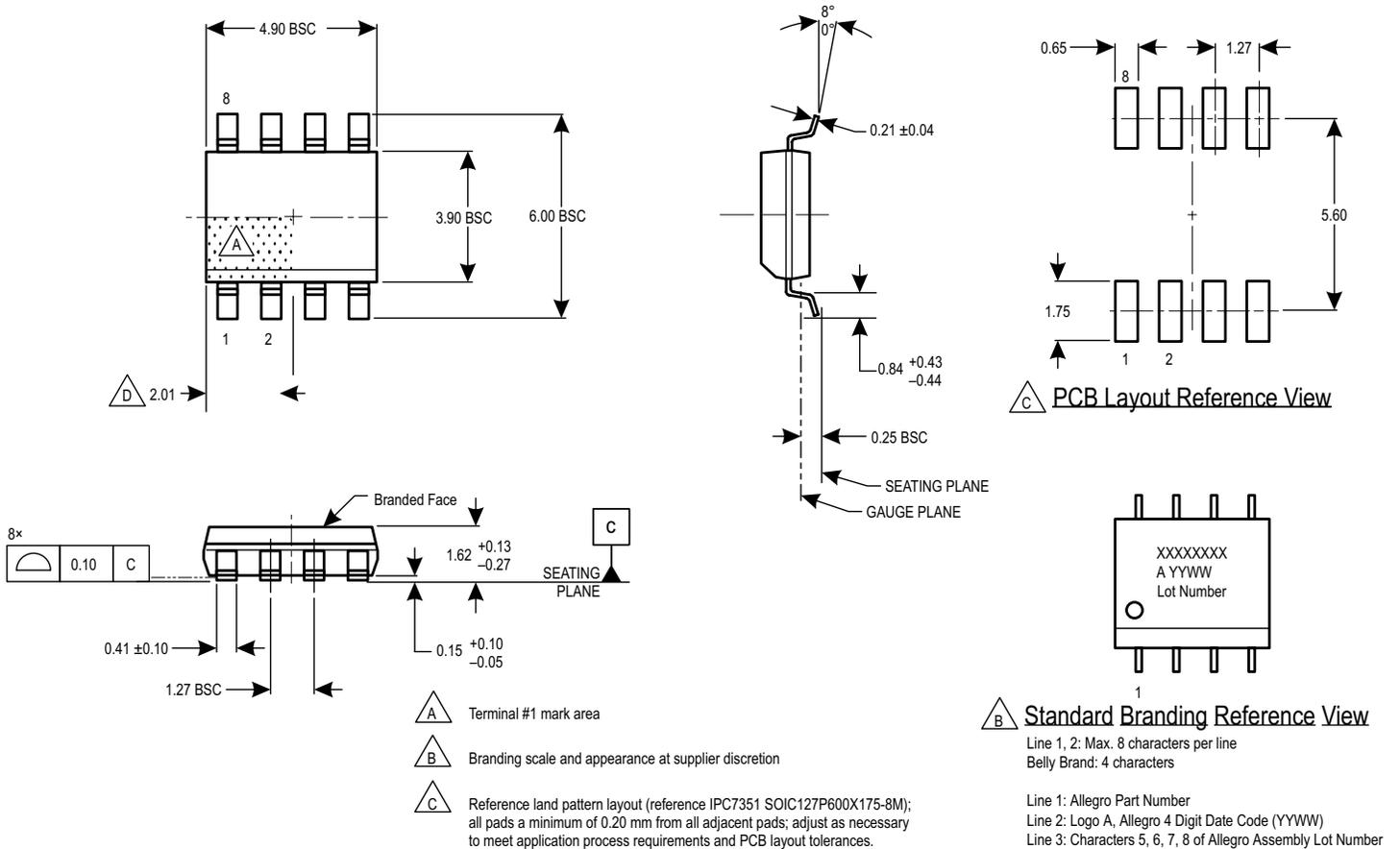


Figure 2: SOIC-8 Package Drawing and Dimensions

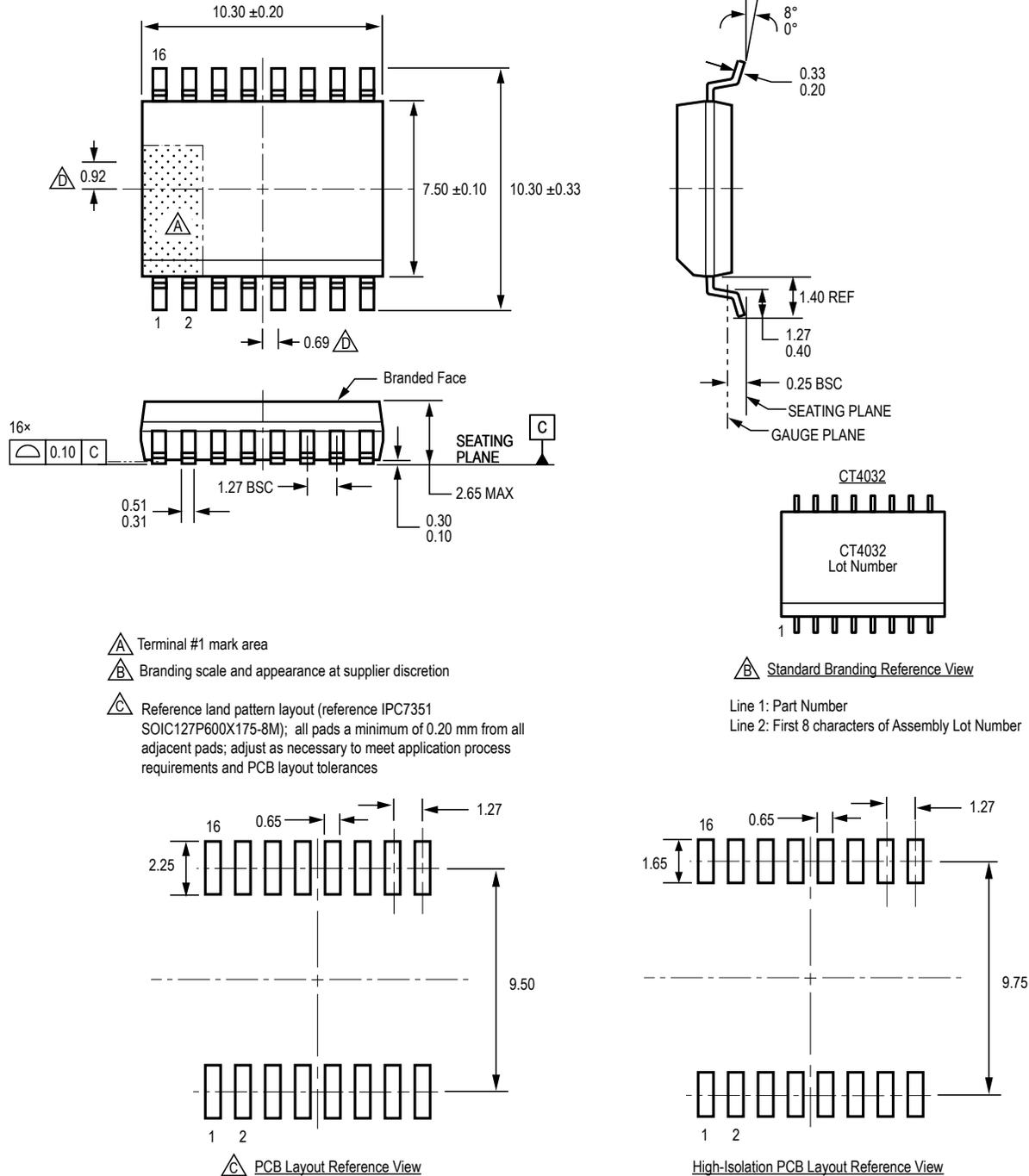
### For Reference Only – Not for Tooling Use

(Reference MS-013AA)

Dimensions in millimeters

Dimensions exclusive of mold flash, gate burrs, and dambar protrusions

Exact case and lead configuration at supplier discretion within limits shown



**Figure 3: SOICW-16 Package Drawing and Dimensions**

### Revision History

Number	Date	Description
–	March 18, 2025	Initial release
1	March 25, 2025	Changed Features and Benefits (page 1), Absolute Maximum Ratings table (page 3), Isolation tables (page 3 and 4), Pinout Diagrams (page 5) and Performance Characteristics tables (page 8 to 16).
2	March 27, 2025	Updated selection guide (page 2)

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