

# CTS-CS-CAX

## Clamp-On Non-Intrusive Current Sensor Module

### Features

- Low hysteresis
- High Permeability
- Hall-Sensor Measurement
- High Linearity up to 200 A
- Temperature Range: 10 to 85 °C
- Low Offset drift <5 mV
- Low Sensitivity drift <1 %
- DC and AC (30 kHz)
- Snap-Fit installation
- Non-intrusive sensing
- Small Size, Lightweight
- Excellent output linearity



### Applications

- IoT
- Industrial
- E-metering
- Photovoltaic

### Description

The CTS-CS-CAX is an analog open loop current sensor module designed for non-intrusive and isolated measurement of electric currents. Thanks to the clamp-on design, the contactless current sensor can be safely installed without the need to interrupt or cut the cable. The module consists of a PCB including Melexis IMC-Hall<sup>®</sup> planar current sensor, CTS-CS-CXX Clamp-On shield and the necessary components to straightforwardly install and operate.

Supplied with a DC voltage of 5V, the module provides a linear analog output voltage between 500 mV and 4500 mV as a function of the primary input current. Thanks to its properties, CTS-CS-CAX offers an excellent linearity error, below 0.5 %FS. Thanks to the integrated Melexis IMC-Hall<sup>®</sup> current sensor, the sensor module provides excellent offset as low as  $\pm 5$  mV and sensitivity drift of 1 % over full temperature range.

Applications include DC and AC current sensing up to 30 kHz, motor control, battery monitoring, charge control, white goods, and many more.



## Ordering Information

Manufacturer part number	Product	Description	Typical Sensitivity
361-99-004-050	CTS-CS-CAX-10-050	Clamp on sensor with 50A rating (up to 10mm busbar size)	40.00 mV/A
361-99-004-101	CTS-CS-CAX-10-100	Clamp on sensor with 100A rating (up to 10mm busbar size)	20.00 mV/A
361-99-004-201	CTS-CS-CAX-10-200	Clamp on sensor with 200A rating (up to 10mm busbar size)	10.00 mV/A
361-99-003-025	CTS-CS-CAX-04-025	Clamp on sensor with 25A rating (up to 4mm busbar size)	80.00 mV/A
361-99-003-050	CTS-CS-CAX-04-050	Clamp on sensor with 50A rating (up to 4mm busbar size)	40.00 mV/A
361-99-003-075	CTS-CS-CAX-04-075	Clamp on sensor with 75A rating (up to 4mm busbar size)	26.66 mV/A

For high volume application, contact us for a different sensitivity requirement.

## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Positive Supply Voltage	$V_{DD}$	+10	V
Reverse Supply Voltage	$V_{DDREV}$	-0.3	V
Positive Output Voltage	$V_{OUT}$	+10	V
Reverse Output Voltage	$V_{OUTREV}$	-0.3	V
Positive Output Current	$I_{OUT}$	+50	mA
Reverse Output Current	$I_{OUTREV}$	-50	mA
Ambient Temperature	$T_A$	10 to 85 °C	°C
ESD Human Body Model	$ESD_{HBM}$	2	kV

IMPORTANT: exceeding the absolute maximum ratings may cause permanent damage to the sensor module. Exposure to absolute maximum-rated conditions for extended periods of time may affect sensor module reliability.



## Specifications – Magnetic material for CTS-CS-CAX-10 & CTS-CS-CAX-04

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Nominal Supply Voltage	$V_{DD}$	-	4.5	5	5.5	V
Supply Current	$I_{DD}$	No output load	9	12.5	15	mA
Output Resistive Load	$R_L$	For high linearity	10	25	200	k $\Omega$
Linear Output Range	$V_{OUTLIN}$	$R_L \geq 10k\Omega$	10	-	90	% $V_{DD}$
Broken GND Ouptut Level	-	$R_L \geq 10k\Omega, V_{DD} = 5V$	96	-	100	% $V_{DD}$
Broken VDD Ouptut Level	-	$R_L \geq 10k\Omega, V_{DD} = 5V$	0	-	4	% $V_{DD}$
Output Quiescent Voltage	$V_{OQ}$	$R_L \geq 10k\Omega, V_{DD} = 5V$	-	50	-	% $V_{DD}$

## Analog Accuracy Specification for CTS-CS-CAX-10 & CTS-CS-CAX-04

Parameter	Symbol	Typ.	Max.	Unit
Thermal Offset Drift	$\Delta^T V_{OQ}$	$T_A = 0$ to $85^\circ\text{C}$	$\pm 5$	mV
Thermal Sens. Drift	$\Delta^T S$	$T_A = 0$ to $85^\circ\text{C}$	$\pm 1$	%S
RMS Output Noise	$N_{RMS}$	NOISE FILTER=0	8	mV <sub>RMS</sub>
VOQ Ratiometry	$\Delta^R V_{OQ}$	$V_{DD} = 5V \pm 5\%$	$\pm 0.4$	% $V_{OQ}$
Sensitivity Ratiometry	$\Delta^R S$	$V_{DD} = 5V \pm 5\%$	$\pm 0.4$	% $V_{OQ}$

Operating conditions  $T_A = 10$  to  $+85^\circ\text{C}$ ,  $V_{DD} = 5V \pm 10\%$ , unless otherwise specified.

## Timing Specification for CTS-CS-CAX-10 & CTS-CS-CAX-04

Parameter	Symbol	Condition	Typ.	Unit
Refresh Rate	$T_{RR}$	-	1	$\mu\text{s}$
Step Response Time	$T_R$	-	2	$\mu\text{s}$
Bandwidth	BW	-	30	kHz

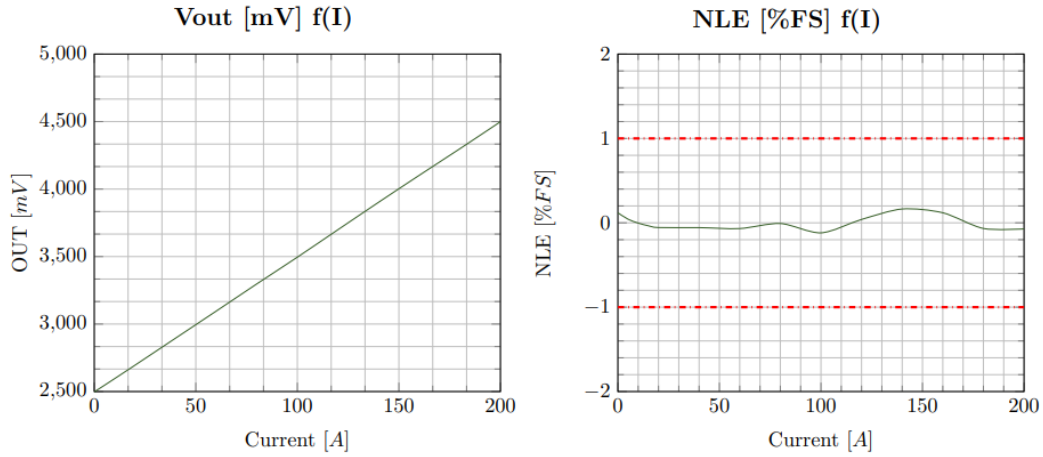
Operating conditions  $T_A = 10$  to  $+85^\circ\text{C}$ ,  $V_{DD} = 5V \pm 10\%$ , unless otherwise specified.

## Application Diagram

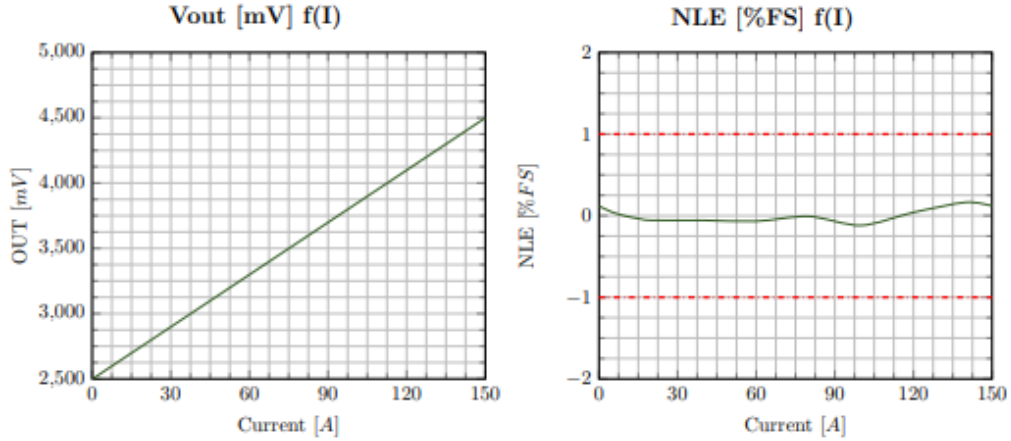




Typical Performance  
CTS-CS-CAX-10



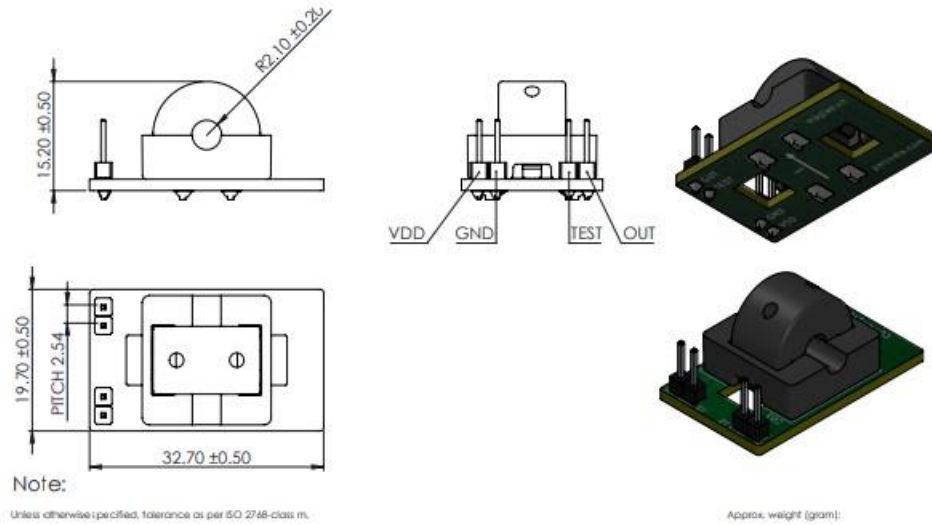
Typical Performance  
CTS-CS-CAX-04





## Dimensions CTS-CS-CAX-04

Dimensions are expressed in [mm]



## Dimensions CTS-CS-CAX-10

Dimensions are expressed in [mm]

