

K-No.: 26904

100 A Current Sensor

For the electronic measurement of currents:
DC, AC, pulsed, mixed with a galvanic Isolation
between the primary circuit (high power) and the
secondary circuit (electronic circuit)



Date: 05.03.2018

Customer: Standard Type

Customers Part no:

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Description

- Closed loop (compensation)
Current Sensor with magnetic probe
- Printed circuit board mounting
- Casing and materials UL-listed

Characteristics

- excellent accuracy
- very low offset current
- very low temperature dependency and offset current drift
- very low hysteresis of offset current
- short response time
- wide frequency bandwidth
- compact design
- reduced offset ripple

Applications

Mainly used for stationary operation in industrial applications:

- AC variable speed drives and servo motor drives
- static converters for DC motor drives
- Battery supplied applications
- Switched Mode Power Supplies (SMPS)
- Power supplies for welding applications
- Uninterruptable Power Supplies (UPS)

Electrical data - Ratings

I_{PN}	Primary nominal RMS current	100	A
V_{OUT}	Output voltage @ I_{PN}	$V_{REF} \pm (0.625 \cdot I_P / I_{PN})$	V
V_{OUT}	Output voltage @ $I_P=0A$, $\vartheta_A=25^\circ C$	$V_{REF} \pm 0.001$	V
V_{REF}	External Reference voltage range	0 ... 4	V
	Internal Reference voltage	2.5 ± 0.005	V
K_N	Transformation ratio	1...2 : 1100	

Accuracy – Dynamic performance data

		min.	typ.	max.	Unit
$I_{P,max}$	Max. measuring range	± 270			A
X	Accuracy @ I_{PN} , $\vartheta_A=25^\circ C$			± 0.7	%
ϵ_L	Linearity			± 0.1	%
$V_{OUT}-V_{REF}$	Offset voltage @ $I_P=0A$, $\vartheta_A=25^\circ C$			± 1.0	mV
$\Delta V_O / V_{REF} / \Delta \vartheta$	Temperature drift of V_{OUT} @ $I_P=0A$, $V_{REF}=2.5V$, ϑ_A		3	10	ppm/°C
t_r	Response time		<1		μs
t_{ra}	Reaction time		<1		μs
$f_{BW} (-3dB)$	Frequency bandwidth	DC...100			kHz

General data

ϑ_A	Ambient operation temperature	-40		85	°C
ϑ_S	Ambient storage temperature (acc. to M3101)	-40		85	°C
m	Mass		59		g
V_C	Supply voltage	4.75	5	5.25	V
I_C	Supply current at $I_P = 0A$ and RT		15		mA

$^1)S_{clear}$	Clearance (component without solder pad)	8			mm
$^1)S_{creep}$	Creepage (component without solder pad)	8			mm
$^1)U_{sys}$	System voltage			600	V_{RMS}
$^1)U_{AC}$	Working voltage			1000	V_{RMS}
$^1)U_{PD}$	Rated discharge voltage			1414	V_{PEAK}
According to UL 508: max. potential difference					600 V_{AC}

¹⁾Constructed and manufactured and tested in accordance with IEC 61800-5-1:2007 (primary to secondary)
Basic insulation, Insulation material group 1, Pollution degree 2, Overvoltage category III

Date	Name	Issue	Amendment
05.03.2018	KRe.	81	UL508 – certification granted. CN-18-043

Hrg.: R&D-PD NPI editor	Bearb.: DJ designer	MC-PM: KRe. check	freig.: Pr. released
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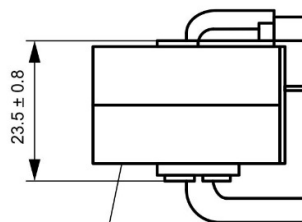
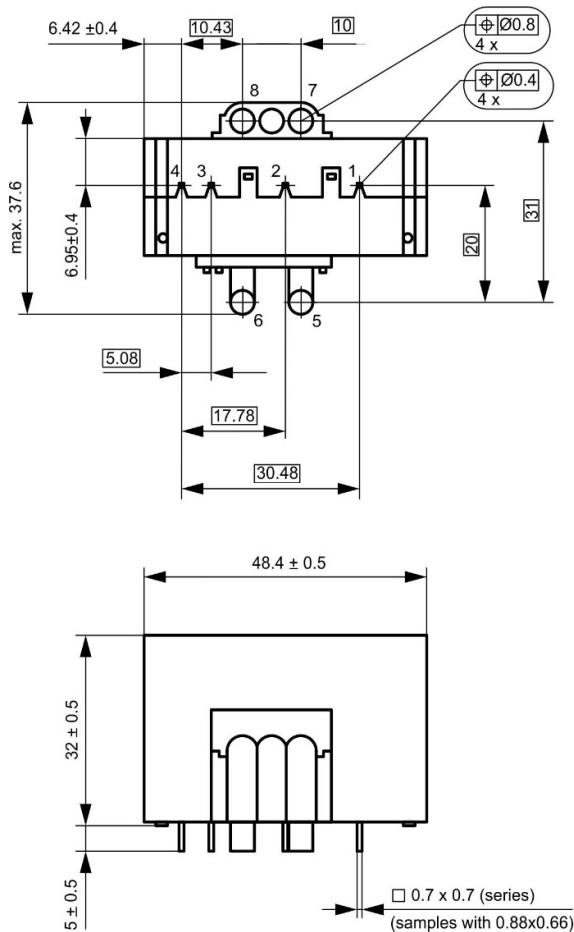
Customer: Standard Type

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Mechanical outline (mm):

General tolerances DIN ISO 2768-c



Marking

○ Prüfmaß
(test dimension)

Connections:
Pins 1-4: 0.88mm x 0.66mm
Pins 5-8: Ø4.5mm

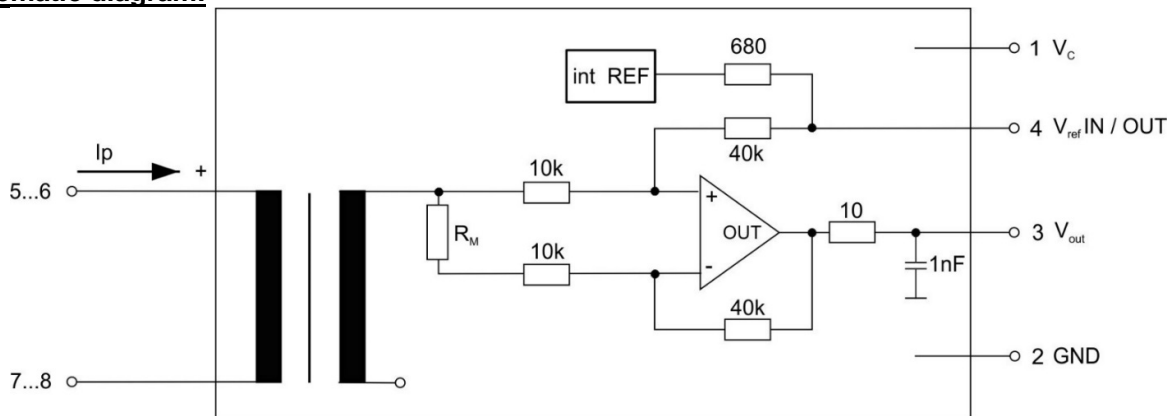
Marking:

UL-sign 4647-X261
F DC

F: Factory
DC: Datecode

Datecode Format: [YWW]
Example: J04: 2017, Week 4

Schematic diagram:




Hrg.: R&D-PD NPI
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Electrical data: (investigate by a type checking)		min.	typ.	max.	Unit
$V_{C,tot}$	maximum supply voltage (without function)			6	V
I_C	Supply Current with primary current	$15mA + I_P * K_N + V_{OUT}/R_L$			mA
$I_{OUT,SC}$	Short circuit output current		± 20		mA
R_S	Secondary coil resistance @ $\vartheta_A = 85^\circ C$			15	Ω
R_P	Primary wire resistance @ $\vartheta_A = 25^\circ C$		0.07		m Ω
$R_{i,REF}$	Internal resistance of Reference output		680		Ω
$R_{i,Vout}$	Output resistance of V_{OUT}		10		Ω
R_L	External recommended resistance of V_{OUT}	1			k Ω
C_L	External recommended capacitance of V_{OUT}			500	pF
$X_{Ti} / \Delta\vartheta$	Temperature drift of X @ $\vartheta_A = -40^\circ C \dots 85^\circ C$			40	ppm/ $^\circ C$
$\Delta V_O = \Delta(V_{OUT} - V_{REF})$	Sum of any offset drift including:		2	5	mV
V_{Ot}	Long term drift of V_O		1		mV
V_{OT}	Temperature drift of V_O @ $\vartheta_A = -40^\circ C \dots 85^\circ C$		1		mV
V_{OH}	Hysteresis of V_{OUT} @ $I_P = 0A$ (caused by $I_P = 10 \times I_{PN}$)		0.4	0.8	mV
$\Delta V_O / \Delta V_C$	Supply voltage rejection ratio		0.1		mV/V
V_{OSS}	Offsetripple (with 1 MHz-Filter, first order)		8	20	mV _{PP}
V_{OSS}	Offsetripple (with 100 kHz-Filter, first order)		4		mV _{PP}
V_{OSS}	Offsetripple (with 20 kHz-Filter, first order)		2		mV _{PP}
C_k	Coupling capacity (primary - secondary)		10		pF
	Mechanical stress according to M3209/3 Settings: 10-2000Hz, 1min/oct, 2 hours		2		g

Routine-Tests: (Measurement after temperature balance of the samples at room temperature, SC=significant characteristic)

$V_{OUT} (SC)$	(100%) M3011/6:	Output voltage	$625 \pm 0.7\%$	mV
$V_{OUT} - V_{REF}$	(100%) M3226:	Offset voltage	± 1.0	mV
U_d	(100%) M3014:	Test voltage, 1s	1.8	kV _{RMS}
U_{PDE}	(AQL 1/S4) M3024:	Partial discharge voltage (extinction)	1.5	kV _{RMS}
$U_{PD} * 1.875$			1.875	

Type-Tests: (Precondition acc. to M3236)

\hat{U}_W	HV transient test acc. to M3064 (1.2 μs / 50 μs) 5 pulses \rightarrow polarity +, 5 pulses \rightarrow polarity -		6	kV _{PEAK}
U_d	Test voltage acc. to M3014	(5s)	3.6	kV _{RMS}
U_{PDE}	Partial discharge voltage (extinction)		1.5	kV _{RMS}
$U_{PD} * 1.875$	acc. to M3024		1.875	

- Other instructions:**
- Current direction: A positive output voltage vs. V_{REF} appears at point V_{OUT} , if primary current flows in direction of the arrow sign on Sensor package.
 - Temperature of the primary conductor should not exceed 105 $^\circ C$.
 - Housing and bobbin material UL-listed: Flammability class 94V-0.
 - Further standards: UL 508 file E317483, category NMTR2 / NMTR8

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