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: | Page 1 of 3

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, ϑ_A=25°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}, ϑ_A=25°C			±0.7	%
ε_L	Linearity			±0.1	%
V_{OUT}-V_{REF}	Offset voltage @ I_P=0A, ϑ_A=25°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

		min.	typ.	max.	Unit
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

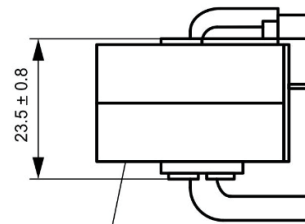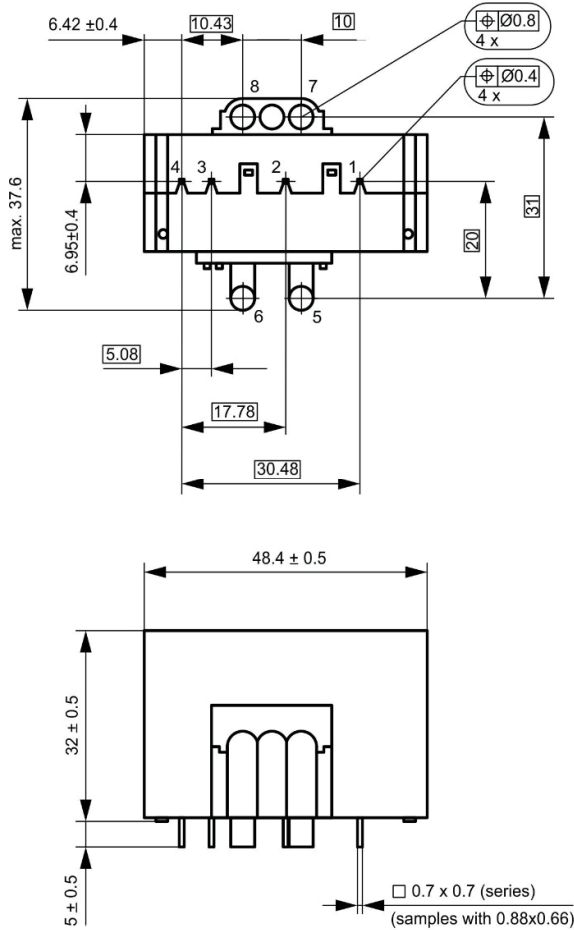| K-No.: 26904 | **100 A Current Sensor** For the electronic measurement of currents: DC, AC, pulsed, mixed with a galvanic Isolation between the primary circuit (high power) and the secondary circuit (electronic circuit) | | Date: 05.03.2018 |

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Mechanical outline (mm):

General tolerances DIN ISO 2768-c

6.42 ±0.4
10.43
10
⌖ Ø0.8 4 x
⌖ Ø0.4 4 x

8   7
4 3   2   1
max. 37.6
6.95±0.4
31
20
23.5 ± 0.8
5.08
6   5
17.78
30.48

Marking

48.4 ± 0.5
32 ± 0.5
5 ± 0.5

◯ Prüfmaß (test dimension)

□ 0.7 x 0.7 (series) (samples with 0.88x0.66)

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:
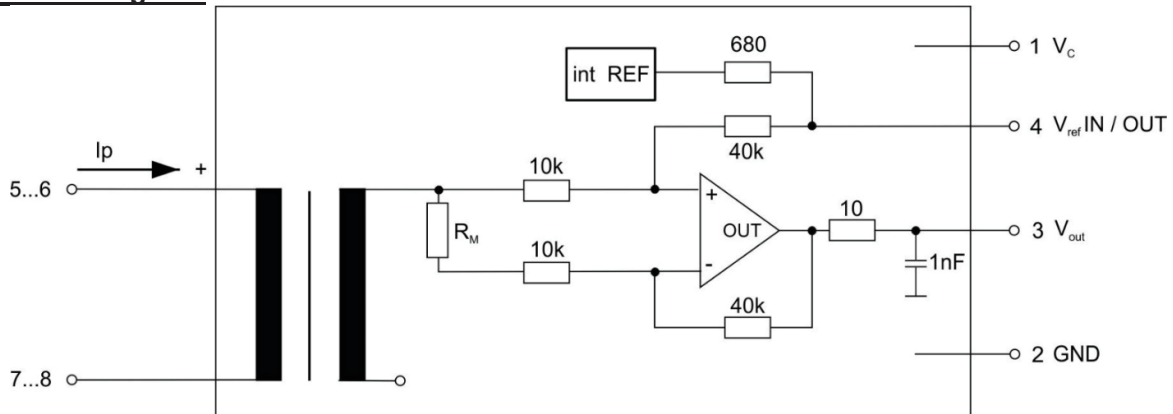
int REF
680
1 V_c
40k
4 V_{ref} IN / OUT
I_p +
5...6
10k
R_M
10k
OUT
10
3 V_{out}
1nF
40k
2 GND
7...8

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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		$15mA + I_P \cdot K_N + V_{OUT}/R_L$		mA
$I_{OUT,SC}$	Short circuit output current		±20		mA
R_S	Secondary coil resistance @ ϑ_A = 85°C			15	Ω
R_P	Primary wire resistance @ ϑ_A = 25°C		0.07		mΩ
$R_{i,REF}$	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			kΩ
C_L	External recommended capacitance of V_{OUT}			500	pF
$X_{Ti} / \Delta\vartheta$	Temperature drift of X @ ϑ_A = -40°C ... 85°C			40	ppm/°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 @ ϑ_A = -40°C … 85°C		1		mV
V_{OH}	Hysteresis of V_{OUT} @ I_P=0A (caused by I_P = 10 x 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)

				Unit
V_{OUT} (SC)	(100%) M3011/6:	Output voltage	625 ± 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} U_{PD}*1.875	(AQL 1/S4) M3024:	Partial discharge voltage (extinction)	1.5 1.875	kV_{RMS}

Type-Tests: (Precondition acc. to M3236)

				Unit
$Û_W$	HV transient test acc. to M3064 (1.2µs / 50µs) 5 pulses ➔ polarity +, 5 pulses ➔ polarity -		6	kV_{PEAK}
U_d	Test voltage acc. to M3014	(5s)	3.6	kV_{RMS}
U_{PDE} U_{PD}*1.875	Partial discharge voltage (extinction) acc. to M3024		1.5 1.875	kV_{RMS}

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°C.
- Housing and bobbin material UL-listed: Flammability class 94V-0.
- Further standards: UL 508 file E317483, category NMTR2 / NMTR8

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