

K-No.: 26810	15A 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: 26.07.2017
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Description	Characteristics	Applications
<ul style="list-style-type: none"> Closed loop (compensation) Current Sensor with magnetic probe Printed circuit board mounting Casing and materials UL-listed 	<ul style="list-style-type: none"> 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 	Mainly used for stationary operation in industrial applications: <ul style="list-style-type: none"> 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	15	A
V_{OUT}	Output voltage @ I_P	$V_{REF} \pm (0.625 * I_P / I_{PN})$	V
V_{OUT}	Output voltage @ $I_P=0A, \vartheta_A=25^\circ C$	$V_{REF} \pm 0.00221$	V
V_{REF}	External Reference voltage range	0 ... 4	V
	Internal Reference voltage	2.5 ± 0.005	V
K_N	Transformation ratio	1...3 : 2000	

Accuracy – Dynamic performance data		min.	typ.	max.	Unit
$I_{P,max}$	Max. measuring range	± 51			A
X	Accuracy @ $I_{PN}, \vartheta_A = 25^\circ C$			0.7	%
ϵ_L	Linearity			0.1	%
$V_{OUT}-V_{REF}$	Offset voltage @ $I_P = 0A, \vartheta_A = 25^\circ C$			± 2.21	mV
$\Delta V_O / V_{REF} / \Delta \vartheta$	Temperature drift of V_{OUT} @ $I_P=0A, V_{REF}=2.5V, \vartheta_A$		2.3	20	ppm/°C
t_r	Response time		0.3		μs
t_{ra}	Reaction time at $di/dt = 100 A/\mu s$		0.2		μs
f	Frequency bandwidth	DC...200			kHz

General data					
ϑ_A	Ambient operation temperature	-40		85	°C
ϑ_S	Ambient storage temperature	-40		85	°C
m	Mass		12		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)	7.4			mm
$^1)S_{creep}$	Creepage (component without solder pad)	8.0			mm
$^1)U_{sys}$	System voltage *overvoltage category 3			300	V_{RMS}
$^1)U_{AC}$	Working voltage *acc. table 7, overvoltage category 2			650	V_{RMS}
$^1)U_{PD}$	Rated discharge voltage			1320	V_{PEAK}
	According to UL 508: max. potential difference			600	V_{AC}

¹⁾Constructed and manufactured and tested in accordance with EN 61800-5-1:2003 (primary to secondary)
 Reinforced insulation, Insulation material group 1, Pollution degree 2

The current sensor passed the EMI susceptibility tests (vertical and horizontal, one direction) according to the standard 61000-4-3:2010 at 20V/m, 80%AM@1kHz over the frequency range of 80MHz to 1000MHz, level a) with <2% variation of the V_{out} during the stress.

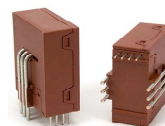
Date	Name	Issue	Amendment
		81	

Hrg.: R&D-PD NPI editor	Bearb.: DJ designer	MC-PM: Su check	freig.: BEF released
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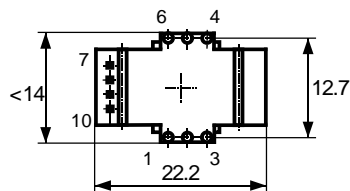
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Mechanical outline (mm):

General tolerances DIN ISO 2768-c

Connections:

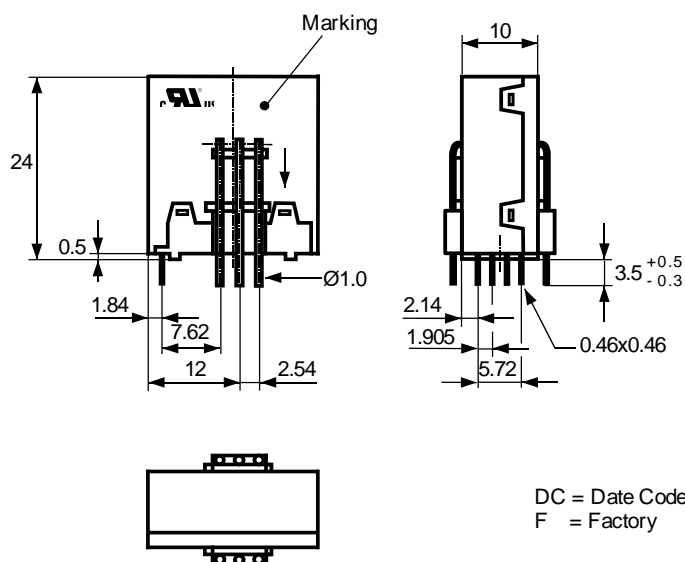
Pin Nr. 1-6: Ø1mm
Pin Nr. 7-10: 0.46 x 0.46mm



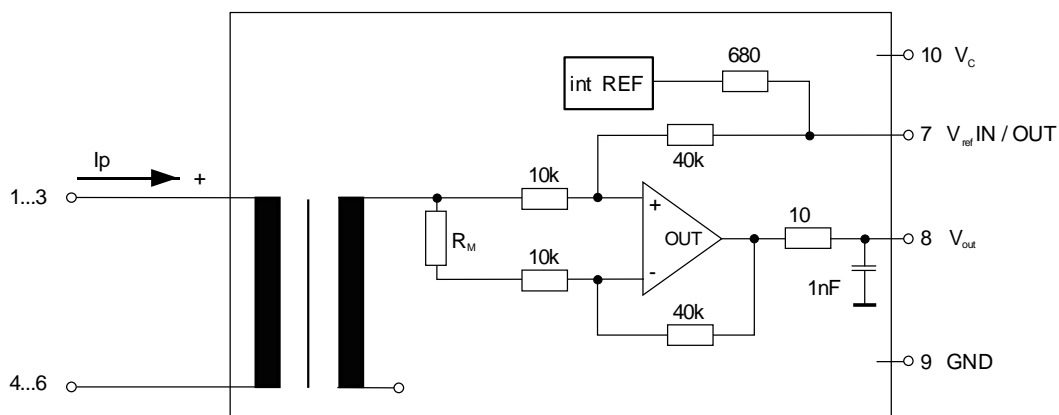
Tolerances grid distance
±0.2 mm

Marking:

VAC
UL-sign 4647-X662
F DC



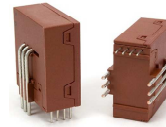
Schematic diagram:



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Electrical data: (investigate by a type checking)

		min.	typ.	max.	Unit
$V_{C,tot}$	maximum supply voltage (without function)			7	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_P	Resistance per primary winding @ $\vartheta_A = 25^\circ C$		1		m Ω
R_S	Secondary coil resistance @ $\vartheta_A = 85^\circ C$			67	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}			1	nF
$X_{Ti} / \Delta\vartheta$	Temperature drift of X @ $\vartheta_A = -40^\circ C \dots 85^\circ C$			40	ppm/K
$\Delta V_O = \Delta(V_{OUT} - V_{REF})$	Sum of any offset drift including:		3.5	10	mV
V_{Ot}	Long term drift of V_O		2		mV
V_{OT}	Temperature drift of V_O @ $\vartheta_A = -40^\circ C \dots 85^\circ C$		2		mV
V_{OH}	Hysteresis of V_{OUT} @ $I_P = 0A$ (caused by $I_P = 10 \times I_{PN}$)			3	mV
$\Delta V_O / \Delta V_C$	Supply voltage rejection ratio			1	mV/V
V_{OSS}	Offsetripple (with 1 MHz-Filter, first order)			30	mV _{PP}
V_{OSS}	Offsetripple (with 100 kHz-Filter, first order)		6	10	mV _{PP}
V_{OSS}	Offsetripple (with 20 kHz-Filter, first order)		4	7	mV _{PP}
C_k	Maximum possible coupling capacity (primary - secondary)		5		pF
	Mechanical stress according to M3209/3 Settings: 10-2000Hz, 1min/oct, 2 hours			30	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	± 2.21	mV
U_d	(100%) M3014:	Test voltage, 1s	1.5	kV _{RMS}
U_{PDE}	(AQL 1/S4) M3024:	Partial discharge voltage (extinction)	1.4	kV _{RMS}
$U_{PD} * 1.875$			1.75	

Type-Tests: (Precondition acc. to M3236)

\dot{U}_W	HV transient test acc. to M3064 (1.2 μ s / 50 μ s-Waveform)	6	kV
U_d	Test voltage acc. to M3014	(5s) 3	kV _{RMS}
U_{PDE}	Partial discharge voltage (extinction) acc. to M3024	1.4	kV _{RMS}
$U_{PD} * 1.875$		1.75	

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.
- Constructed, manufactured and tested in accordance with IEC 61800-5-1:2007
- Temperature of the primary conductor should not exceed 105°C.
- Housing and bobbin material UL-listed: Flammability class 94V-0.

Hrg.: R&D-PD NPI
editor

Bearb.: DJ
designer

MC-PM: Su
check

freig.: BEF
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