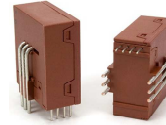


K-No.: 26872

50A 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: 25.07.2017

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	50	A
V_{OUT}	Output voltage @ I_P	$V_{REF} \pm (0.625 * I_P / I_{PN})$	V
V_{OUT}	Output voltage @ $I_P=0A, \vartheta_A=25^\circ C$	$V_{REF} \pm 0.000725$	V
V_{REF}	External Reference voltage range	0 ... 4	V
	Internal Reference voltage	2.5 ± 0.005	V
K_N	Transformation ratio	1...3 : 1400	

Accuracy – Dynamic performance data

		min.	typ.	max.	Unit
$I_{P,max}$	Max. measuring range	± 150			A
X	Accuracy @ $I_{PN}, \vartheta_A = 25^\circ C$			± 0.7	%
ϵ_L	Linearity			± 0.1	%
$V_{OUT}-V_{REF}$	Offset voltage @ $I_P = 0A, \vartheta_A = 25^\circ C$			± 0.725	mV
$\Delta V_O / V_{REF} / \Delta \vartheta$	Temperature drift of V_{OUT} @ $I_P=0A, V_{REF}=2.5V, \vartheta_A$		0.7	7	ppm/ $^\circ C$
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	$^\circ C$
ϑ_S	Ambient storage temperature (acc. to M3101)	-40		85	$^\circ C$
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

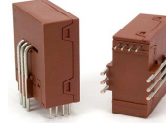
MC-PM: Sn.
check

freig.: BEF
released

K-No.: 26872

50A Current Sensor

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Date: 25.07.2017

Customer: Standard Type

Customers Part no:

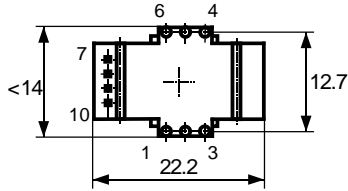
Page 2 of 3

Mechanical outline (mm):

General tolerances DIN ISO 2768-c

Connections:

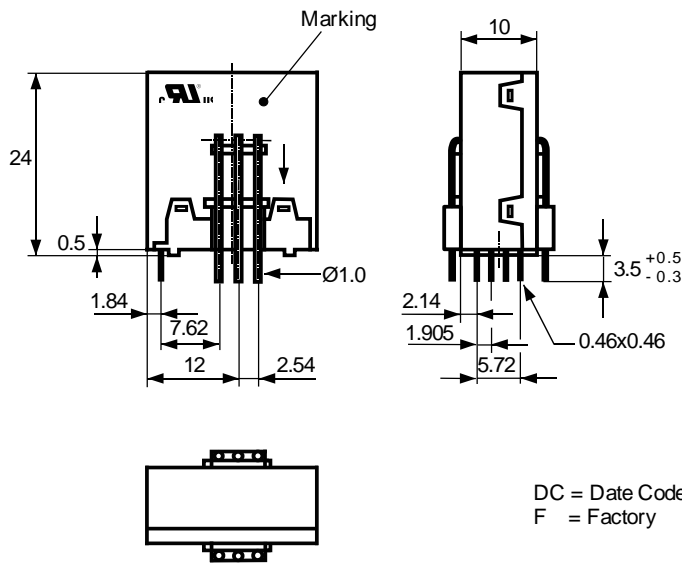
Pin Nr. 1-6: Ø1mm
Pin Nr. 7-10: 0.46 x 0.46mm



Tolerances grid distance
 ± 0.2 mm

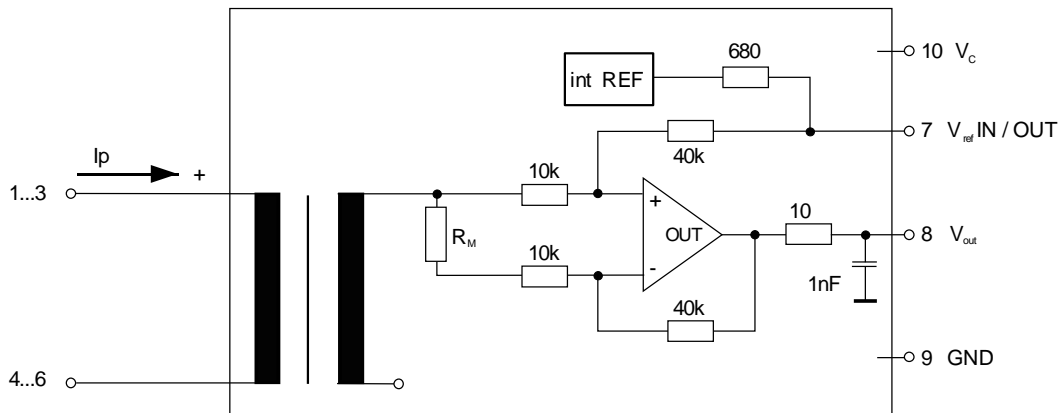
Marking:

VAC
UL-sign 4647-X664
F DC



DC = Date Code [Format YWW]
F = Factory

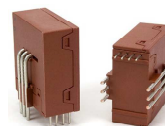
Schematic diagram:



K-No.: 26872

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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	$15mA + I_P \cdot K_N + V_{OUT}/R_L$			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 @ $\vartheta_A = 85^\circ C$			35	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:		2	6	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 $I_P = 10 \times I_{PN}$)			1	mV
$\Delta V_O / \Delta V_C$	Supply voltage rejection ratio			1	mV/V
V_{OSS}	Offsetripple (with 1 MHz-Filter, first order)			35	mV _{PP}
V_{OSS}	Offsetripple (with 100 kHz-Filter, first order)		4		mV _{PP}
V_{OSS}	Offsetripple (with 20 kHz-Filter, first order)		1.5		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			5	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	± 0.725	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.
- 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

Hrg.: R&D-PD NPI
editor

Bearb.: DJ
designer

MC-PM: Sn.
check

freig.: BEF
released