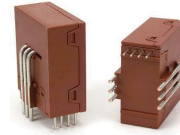


K-No.: 26872

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: 04.02.2022

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/°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 (acc. to M3101)	-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

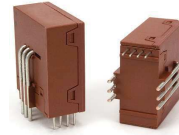
Date	Name	Issue	Amendment
04.02.2022	NSch.	81	Applicable documents change on sheet 3. „The color of the plastic material... added. Minor change

Hrg.: R&D-PD NPI editor	Bearb.: DJ designer	MC-PM: Sn. check	freig.: SB released
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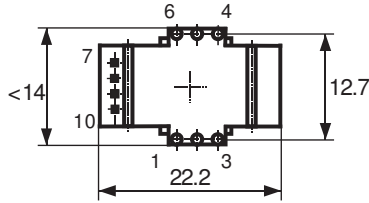
Customers Part no:

Page 2 of 3

Mechanical outline (mm):

General tolerances DIN ISO 2768-c

Connections:

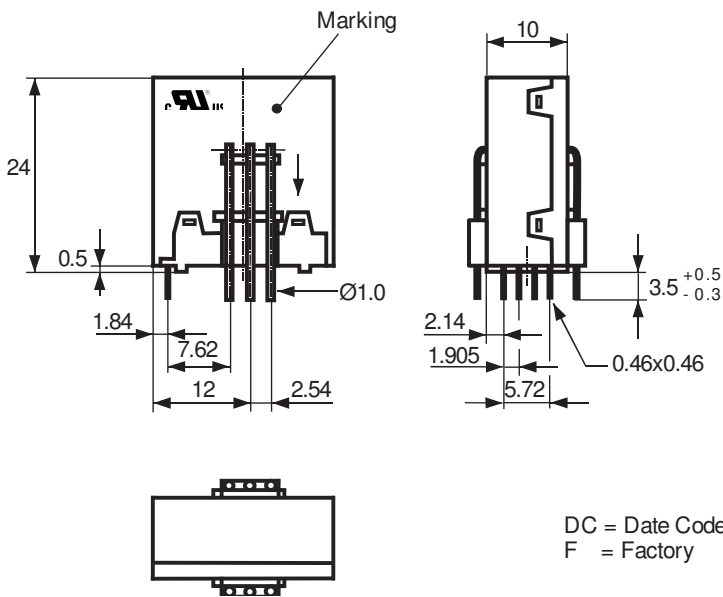


Tolerances grid distance
 ± 0.2 mm

Pin Nr. 1-6: $\varnothing 1$ mm
Pin Nr. 7-10: 0.46 x 0.46mm

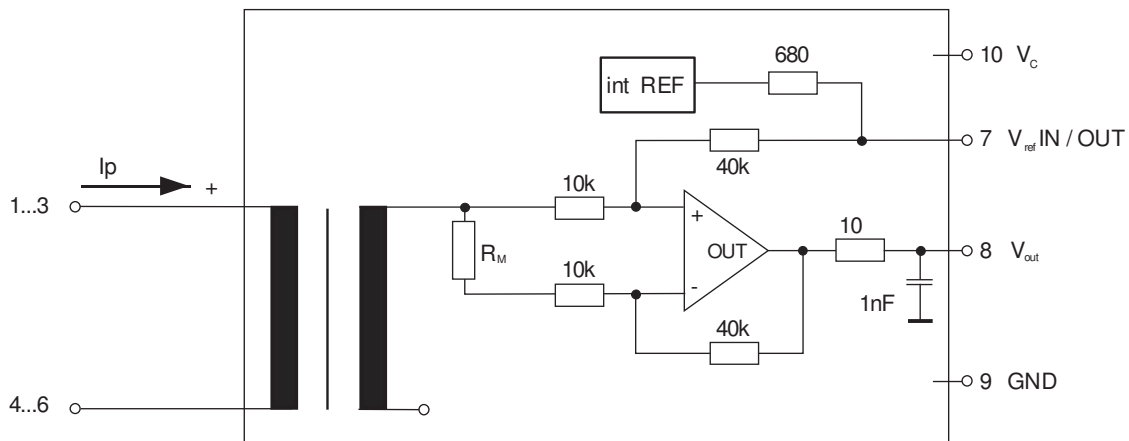
Marking:

VAC
UL-sign 4647-X664
F DC



DC = Date Code [Format YWW]
F = Factory

Schematic diagram:



Hrg.: R&D-PD NPI
editor

Bearb.: DJ
designer

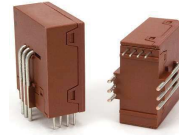
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Page 3 of 3

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)

\hat{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
- The color of the plastic material is not specified and the current sensor can be supplied in different colors (e.g. brown, black, white, natural). This has no effect on the specifications or UL approval

Hrg.: R&D-PD NPI
editor

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designer

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check

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