

**K-no.: 26020**
**15 A Current Sensor for 5V- Supply Voltage**

 For electronic current measurement:  
 DC, AC, pulsed, mixed ..., with a galvanic  
 isolation between primary circuit  
 (high power) and secondary circuit  
 (electronic circuit)

**Date: 05.02.2014**
**Customer: Standard type**
**Customers Part no.:**
**Page 1 of 2**
**Description**

- Closed loop (compensation)
- Current Sensor with magnetic field 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
- Uninterruptible Power Supplies (UPS)

**Electrical data – Ratings**

$I_{PN}$	Primary nominal r.m.s. current	15	A
$V_{out}$	Output voltage @ $I_P$	$V_{Ref} \pm (0.625 \cdot I_P / I_{PN})$	V
$V_{out}$	Output voltage @ $I_P=0, T_A=25^\circ C$	$V_{Ref} \pm 0.00225$	V
$V_{Ref}$	External Reference voltage range	0...4	V
	Internal Reference voltage	$2.5 \pm 0.005$	V
$K_N$	Turns ratio	1...4 : 2000	

**Accuracy – Dynamic performance data**

		min.	typ.	max.	Unit
$I_{P,max}$	Max. measuring range	±51			
X	Accuracy @ $I_{PN}, T_A=25^\circ C$	0.7			%
$\epsilon_L$	Linearity	0.1			%
$V_{out} - V_{Ref}$	Offset voltage @ $I_P=0, T_A=25^\circ C$	±2.21			mV
$\Delta V_o / V_{Ref} / \Delta T$	Temperature drift of $V_{out}$ @ $I_P=0, V_{Ref}=2,5V, T_A=-40...85^\circ C$	2.3	20		ppm/°C
$t_r$	Response time @ 90% von $I_{PN}$	300			ns
$\Delta t (I_{P,max})$	Delay time at $di/dt = 100 A/\mu s$	200			ns
f	Frequency bandwidth	DC...200			kHz

**General data**

		min.	typ.	max.	Unit
$T_A$	Ambient operating temperature	-40		+85	°C
$T_S$	Ambient storage temperature	-40		+105	°C
m	Mass		12		g
$V_C$	Supply voltage	4.75	5	5.25	V
$I_C$	Current consumption		15		mA

 Constructed and manufactured and tested in accordance with EN 61800-5-1 (Pin 1 – 4 to Pin 5 – 12)  
 Reinforced insulation, Insulation material group 1, Pollution degree 2

$S_{clear}$	Clearance (component without solder pad)	9.6			mm
$S_{creep}$	Creepage (component without solder pad)	10.6			mm
$V_{sys}$	System voltage overvoltage category 3	RMS		600	V
$V_{work}$	Working voltage	RMS		1060	V
$U_{PD}$	Rated discharge voltage	peak value		1320	V

 Note: "According UL 508: Max. potential difference = 600 V<sub>A</sub>"

Date	Name	Issue	Amendment
05.02.14	Ga.	83	Marking changed acc to UL-specification. 4646X762-82 → 4646-X762-83. CN-923
24.05.13	Ga.	82	Schematic diagram: Iout changed to Vout on Pin2. Mechanical outline: size 1.84 added. Lapidary change

Hrsg.: KB-E editor	Bearb: Le designer	KB-PM: Ga. check	freig.: HS released
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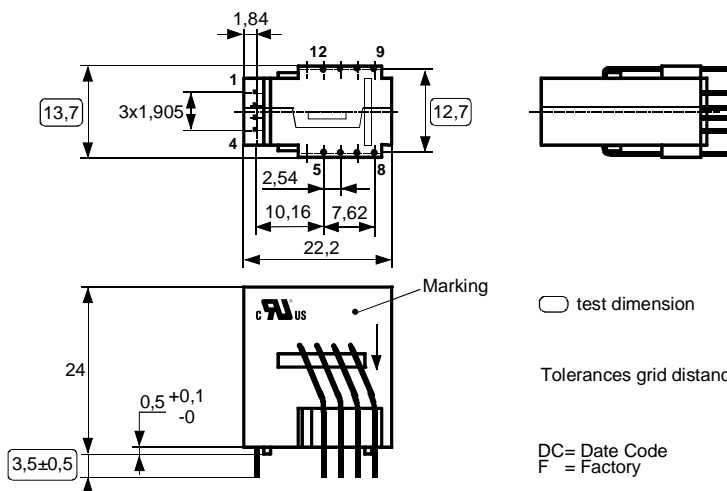
Customers Part no.:

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**Mechanical outline (mm):**

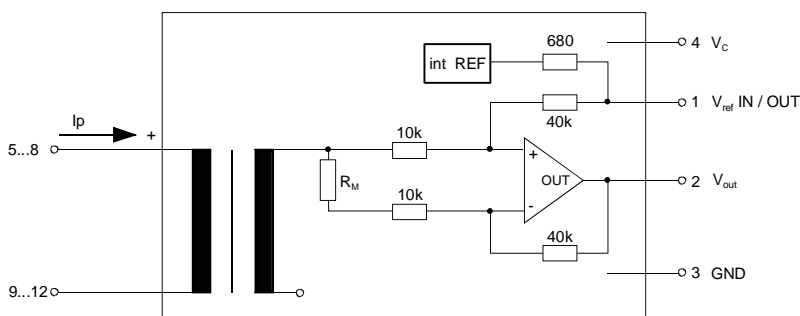
General tolerances DIN ISO 2768-c

Connections:

 1...4: 0,46\*0,46 mm  
 5..12: Ø 1 mm


Marking:

**VAC** UL-sign  
 4646-X762-83  
 F DC

**Schematic diagram**

**Possibilities of wiring** (@ TA = 85°C)

primary windings	primary current RMS	primary current maximal	output voltage RMS	turns ratio	primary resistance	wiring
$N_p$	$I_p$ [A]	$\hat{I}_{p,max}$ [A]	$V_{out}(I_{PN})$ [V]	$K_N$	$R_p$ [mΩ]	
1	15	±51	2.5±0.625	1:2000	0.25	
2	7,5	±25	2.5±0.625	2:2000	1.0	
4	3,75	±12,5	2.5±0.625	4:2000	4	

Operating temperature of the current sensor and the primary conductor must not exceed 105°C.

Additional information is obtainable on request.

This specification is no declaration of warranty acc. BGB §443 dar.

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**15 A Current Sensor for 5V-Supply Voltage**

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

**Date:** 05.02.2014

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**Customers Part No.:**
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**Electrical Data**

		min.	typ.	max.	Unit
$V_{Ctot}$	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 / primary winding @ $T_A=25^\circ C$		1		mΩ
$R_S$	Secondary coil resistance @ $T_A=85^\circ C$			67	Ω
$R_{i,Ref}$	Internal resistance of Reference input		670		Ω
$R_{is}(V_{out})$	Output resistance of $V_{out}$			1	Ω
$R_L$	External recommended resistance of $V_{out}$	1			kΩ
$C_L$	External recommended capacitance of $V_{out}$			500	pF
$\Delta X_{Ti}/\Delta T$	Temperature drift of X @ $T_A = -40 \dots +85^\circ C$			40	ppm/K
$\Delta V_0 = \Delta(V_{out} - V_{Ref})$	Sum of any offset drift including:		3,5	10	mV
$V_{0t}$	Longtermdrift of $V_0$		2		mV
$V_{0T}$	Temperature drift von $V_0$ @ $T_A = -40 \dots +85^\circ C$		2		mV
$V_{0H}$	Hysteresis of $V_{out}$ @ $I_p=0$ (after an overload of $10 \times I_{PN}$ )			3	mV
$\Delta V_0/\Delta V_C$	Supply voltage rejection ratio			1	mV/V
$V_{oss}$	Offsetripple (with 1 MHz- filter first order)			30	mV
$V_{oss}$	Offsetripple (with 100 kHz- filter first order)		4	8	mV
$V_{oss}$	Offsetripple (with 20 kHz- filter first order)		1,2	2	mV
$C_k$	Maximum possible coupling capacity (primary – secondary)		5	10	pF
	Mechanical stress according to M3209/3			30g	
	Settings: 10 – 2000 Hz, 1 min/Oktave, 2 hours				

**Inspection** (Measurement after temperature balance of the samples at room temperature; SC = significant characteristic)

$V_{out}(I_p=I_{PN})$	(V)	M3011/6:	Output voltage vs. external reference ( $I_p=15A$ , 40-80Hz)	625±0,7%	mV (SC)
$V_{out}-V_{Ref}(I_p=0)$	(V)	M3226:	Offset voltage	± 2.21	mV
$V_d$	(V)	M3014:	Test voltage, rms, 1 s pin 1 – 4 vs. pin 5 – 12	1.8	kV
$V_e$	(AQL 1/S4)		Partial discharge voltage acc.M3024 (RMS) with $V_{vor}$ (RMS)	1400 1750	V V

**Type Testing** (Pin 1 - 4 to Pin 5 - 12)

$V_W$			HV transient test according to M3064 (1,2 μs / 50 μs-wave form)	8	kV
$V_d$			Testing voltage to M3014	(5 s)	3.6 kV
$V_e$			Partial discharge voltage acc.M3024 (RMS) with $V_{vor}$ (RMS)	1400 1750	V V

**Applicable documents**

 Current direction: A positive output current appears at point  $I_S$ , by primary current in direction of the arrow.  
 Housing and bobbin material UL-listed: Flammability class 94V-0.  
 Enclosures according to IEC529: IP50.

Further standards UL 508 file E317483, category NMTR2 / NMTR8

Datum	Name	Index	Amendment
05.02.14	Ga.	83	Date updated.
24.05.13	Ga.	82	$V_{ctot}$ changed from 6V to 7V. Lapidary change.

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