



SPECIFICATION

Item no.: T60404-N4646-X682

K-no.: 25156

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: 22.02.2013

Customer: Standard type

Customers Part no.:

Page 1 of 2

Description	Characteristics	Applications
<ul style="list-style-type: none"> Closed loop (compensation) Current Sensor with magnetic field 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 	<p>Mainly used for stationary operation in industrial applications:</p> <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 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} ± (0.625*I _P /I _{PN})	V
V _{out}	Output voltage @ I _P =0, T _A =25°C	V _{Ref} ± 8	mV
V _{Ref}	External Reference voltage range	0...4	V
	Internal Reference voltage	2.5 ±0.005	V
K _N	Turns ratio	1...3 : 2000	

Accuracy – Dynamic performance data

		min.	typ.	max.	Unit
I _{P,max}	Max. measuring range	±51			
X	Accuracy @ I _{PN} , T _A = 25°C		0.7		%
ε _L	Linearity		0.1		%
V _{out} - V _{Ref}	Offset voltage @ I _P =0, T _A = 25°C		±2.21		mV
Δ V _o / V _{Ref} / ΔT	Temperature drift of V _{out} @ I _P =0, V _{Ref} =2,5V, T _A = -40...85°C	2.3	20		ppm/°C
t _r	Response time @ 90% von I _{PN}	300			ns
Δt (I _{P,max})	Delay time at di/dt = 100 A/μs	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		+85	°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 - 6 to Pin 7 – 10)
 Reinforced insulation, Insulation material group 3 b, Pollution degree 2

S _{clear}	Clearance (component without solder pad)	7.4	mm	
S _{creep}	Creepage (component without solder pad)	8.0	mm	
V _{sys}	System voltage overvoltage category 3	RMS	300	V
V _{work}	Working voltage (tabel 7 acc. to EN61800-5-1) overvoltage category 2	RMS	350	V
U _{PD}	Rated discharge voltage	peak value	1037	V

Date	Name	Issue	Amendment
22.02.13	Le	82	Values for clearance and creepage changed from 7 → 7.4 and 7 → 8.0. Temperatur drift from 6 to 2.3. Offset-voltage ± 8 → ± 2.21. Frequency bandwidth from 100 to 200 kHz. Marking with issue(increased). CN-572
Hrsg.: KB-E editor	Bearb: Le. designer	KB-PM: KRe. check	freig.: HS released

Copying of this document, disclosing it to third parties or using the contents there for any purposes without express written authorization by use illegally forbidden
 Any offenders are liable to pay all relevant damages.

K-no.: 25156

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: 22.02.2013

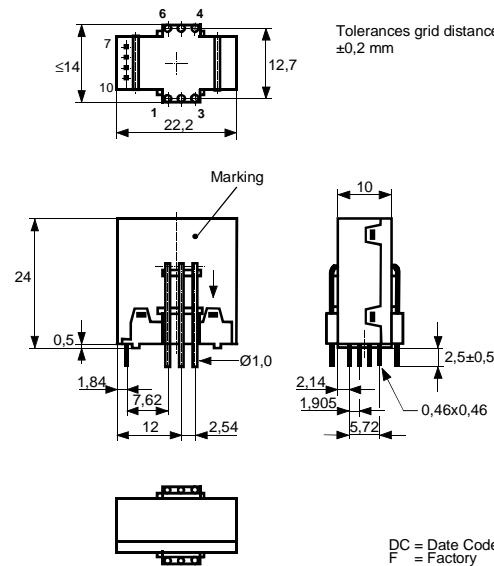
Customer: Standard type

Customers Part no.:

Page 2 of 2

Mechanical outline (mm):

General tolerances DIN ISO 2768-c

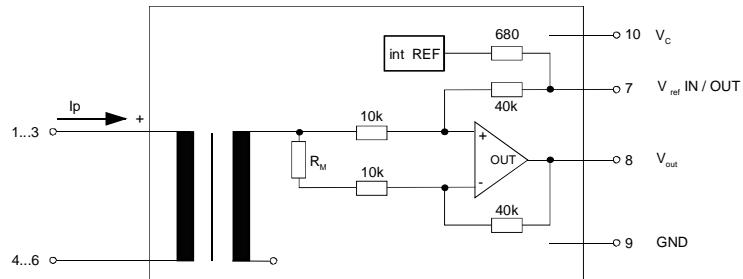


Connections:

 1...6: Ø 1 mm
 7..10: 0,46x0,46 mm

Marking:

VAC
 4646X682-82
 F DC

 DC = Date Code
 F = Factory
Schematic diagram**Possibilities of wiring** (@ T_A = 85°C)

primary windings	primary current RMS	primary current maximal	output voltage RMS	turns ratio	primary resistance	wiring
N _P	I _P [A]	I _{P,max} [A]	V _{out} (I _{PN}) [V]	K _N	R _P [mΩ]	
1	15	±51	2.5±0.625	1:2000	0.33	
2	7.5	±25	2.5±0.625	2:2000	1.5	
3	5	±17	2.5±0.625	3:2000	3	

Temperature of the primary conductor should not exceed 110°C.

Additional information is obtainable on request.

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

Hrsg.: KB-E
editorBearb: Le.
designerKB-PM: KRe.
checkfreig.: HS
released



Additional Information

Item No.: T60404-N4646-X682

K-No.: 25156

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: 22.02.2013

Customer:

Customers Part No.:

Page 1 of 2

Electrical Data

		min.	typ.	max.	Unit
V_{Ctot}	Maximum supply voltage (without function)			6	V
I_c	Supply Current with primary current		$15\text{mA} + I_p \cdot K_N + V_{out}/R_L$		mA
$I_{out,SC}$	Short circuit output current		± 20		mA
R_P	Resistance / primary winding @ $T_A=25^\circ\text{C}$		1		$\text{m}\Omega$
R_S	Secondary coil resistance @ $T_A=85^\circ\text{C}$			67	Ω
$R_{i,Ref}$	Internal resistance of Reference input		670		Ω
$R_i(V_{out})$	Output resistance of V_{out}		1		Ω
R_L	External recommended resistance of V_{out}	1			$\text{k}\Omega$
C_L	External recommended capacitance of V_{out}		500		pF
$\Delta X_{Ti} / \Delta T$	Temperature drift of X @ $T_A = -40 \dots +85^\circ\text{C}$		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 @ $T_A = -40 \dots +85^\circ\text{C}$	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)

$V_{out}(I_p=I_{PN})$ (V)	M3011/6: Output voltage vs. external reference ($I_p=15\text{A}, 40-80\text{Hz}$)	$625 \pm 0.7\%$	mV
$V_{out}-V_{Ref}(I_p=0)$ (V)	M3226: Offset voltage	± 2.21	mV
V_d (V)	M3014: Test voltage, rms, 1 s pin 1 – 6 vs. pin 7 – 10	1.5	kV
V_e (AQL 1/S4)	Partial discharge voltage acc.M3024 (RMS) with V_{vor} (RMS)	1100 1375	V V

Type Testing (Pin 1 - 6 to Pin 7 - 10)

V_w	HV transient test according to M3064 (1,2 μs / 50 μs -wave form)	6	kV	
V_d	Testing voltage to M3014	(5 s)	3	kV
V_e	Partial discharge voltage acc.M3024 (RMS) with V_{vor} (RMS)	1100 1375	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.

Datum	Name	Index	Amendment
22.02.13	Le	82	Date updated.
08.04.08	Le	81	"preliminary" and EN 60721 5K3 delete. ÅA-427
Hrsg.: KB-E editor	Bearb: Le designer	KB-PM: KRe. check	freig.: HS released

Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht ausdrücklich zugestanden. Zu widerhandlungen verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patenterteilung oder GM-Eintragung vorbehalten

Copying of this document, disclosing it to third parties or using the contents there for any purposes without express written authorization by use illegally forbidden.
Any offenders are liable to pay all relevant damages.



Additional Information

Item No.: T60404-N4646-X682

K-No.: 25156

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: 22.02.2013

Customer:

Customers Part No.:

Page 2 of 2

Explanation of several of the terms used in the tablets (in alphabetical order)

t_r: Response time (describe the dynamic performance for the specified measurement range), measured as delay time at I_P = 0,9 · I_{PN} between a rectangular current and the output voltage V_{out} (I_P)

Δt (I_{Pmax}): Delay time (describe the dynamic performance for the rapid current pulse rate e.g short circuit current) measured between I_{Pmax} and the output voltage V_{out}(I_{Pmax}) with a primary current rise of dI_P/dt ≥ 100 A/μs.

V₀: Offset voltage between V_{out} and the rated reference voltage of V_{ref} = 2,5V.
V₀ = V_{out}(0) - 2,5V

U_{PD} Rated discharge voltage (recurring peak voltage separated by the insulation) proved with a sinusoidal voltage V_e
U_{PD} = √2 * V_e / 1,5

V_{vor} Defined voltage is the RMS value of a sinusoidal voltage with peak value of 1,875 * U_{PD} required for partial discharge test in IEC 61800-5-1
V_{vor} = 1,875 * U_{PD} / √2

V_{sys} System voltage RMS value of rated voltage according to IEC 61800-5-1

V_{work} Working voltage voltage according to IEC 61800-5-1 which occurs by design in a circuit or across insulation

V_{0H}: Zero variation of V₀ after overloading with a DC of tenfold the rated value

V_{0L}: Long term drift of V₀ after 100 temperature cycles in the range -40 bis 85 °C.

X: Permissible measurement error in the final inspection at RT, defined by

$$X = 100 \cdot \left| \frac{V_{out}(I_{PN}) - V_{out}(0)}{0,625V} - 1 \right| \%$$

X_{ges}(I_{PN}): Permissible measurement error including any drifts over the temperature range by the current measurement I_{PN}

$$X_{ges} = 100 \cdot \left| \frac{V_{out}(I_{PN}) - 2,5V}{0,625V} - 1 \right| \% \quad \text{or} \quad X_{ges} = 100 \cdot \left| \frac{V_{out}(I_{PN}) - V_{ref}}{0,625V} - 1 \right| \%$$

ε_L: Linearity fault defined by $\varepsilon_L = 100 \cdot \left| \frac{I_P}{I_{PN}} - \frac{V_{out}(I_P) - V_{out}(0)}{V_{out}(I_{PN}) - V_{out}(0)} \right| \%$

This "Additional information" is no declaration of warranty according BGB §443.

Hrsg.: KB-E
editor

Bearb: Le
designer

KB-PM: KRe.
check

freig.: HS
released

Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht ausdrücklich zugestanden. Zu widerhandlungen verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patenterteilung oder GM-Eintragung vorbehalten

Copying of this document, disclosing it to third parties or using the contents there for any purposes without express written authorization by use illegally forbidden.
Any offenders are liable to pay all relevant damages.