| VACUUMSCHMELZE | Specification | Item no.: T60404-N4647-X763 |
|---|---|---|

| K-No.: 26832 | **6A Current Sensor**<br>For the electronic measurement of currents:<br>DC, AC, pulsed, mixed with a galvanic Isolation between the primary circuit (high power) and the secondary circuit (electronic circuit) |  | Date: 12.09.2017 |
|---|---|---|---|

| 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 | 6 | A |
| $V_{OUT}$ | Output voltage @ $I_P$ | $V_{REF}$ ± (0.625*$I_P$/$I_{PN}$) | V |
| $V_{OUT}$ | Output voltage @ $I_P$=0A, $\vartheta_A$=25°C | $V_{REF}$ ± 0.0053 | V |
| $V_{REF}$ | External Reference voltage range | 0 … 4 | V |
| | Internal Reference voltage | 2.5 ± 0.005 | V |
| $K_N$ | Transformation ratio | 1…4 : 2000 | |

## Accuracy – Dynamic performance data

| | | min. | typ. | max. | Unit |
|---|---|---|---|---|---|
| $I_{P,max}$ | Max. measuring range | ±20 | | | A |
| X | Accuracy @ $I_{PN}$, $\vartheta_A$ = 25°C | | | 0.7 | % |
| $\varepsilon_L$ | Linearity | | | 0.1 | % |
| $V_{OUT}$-$V_{REF}$ | Offset voltage @ $I_P$ = 0A, $\vartheta_A$ = 25°C | | | ±5.3 | mV |
| $\Delta V_O/V_{REF}/\Delta T$ | Temperature drift of $V_{OUT}$ @ $I_P$=0A, $V_{REF}$=2.5V, $\vartheta_A$ | | 6 | 30 | ppm/°C |
| $t_r$ | Response time | | 0.3 | | µs |
| $t_{ra}$ | Reaction time | | 0.2 | | µs |
| $f_{BW}$ | Frequency bandwidth | DC..200 | | | kHz |

## General data

| | | | | | |
|---|---|---|---|---|---|
| $\vartheta_A$ | Ambient operation temperature | -40 | | 85 | °C |
| $\vartheta_S$ | 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) | 9.6 | | | mm |
| [1)]$s_{creep}$ | Creepage (component without solder pad) | 10.6 | | | mm |
| [1)]$U_{sys}$ | System voltage *determines impulse voltage acc. table 7 | | | 600 | $V_{RMS}$ |
| [1)]$U_{AC}$ | Working voltage *acc. table 10 | | | 1000 | $V_{RMS}$ |
| [1)]$U_{PD}$ | Rated discharge voltage *acc. table 24 with $U_{PD} = U_{AC} * \sqrt{2}$ | | | 1414 | $V_{PEAK}$ |
| | max. Potential Difference acc. to UL 508 | | | 600 | $V_{RMS}$ |

1) Constructed and manufactured and tested in accordance with IEC 61800-5-1:2007 (primary to secondary) Reinforced insulation, Insulation material group 1, Pollution degree 2, Overvoltage category III

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 Vout during the stress.

| Date | Name | Issue | Amendment |
|---|---|---|---|
| 12.09.2017 | SB | 81 | Mechanical outline changed: Tolerances grid distance +/- 0.25mm added. CN-17-293 |
| | | | |

| Hrg.: R&D-PD NPI editor | Bearb.: DJ designer | | MC-PM: Sn. check | | | freig.: BEF released |
|---|---|---|---|---|---|---|

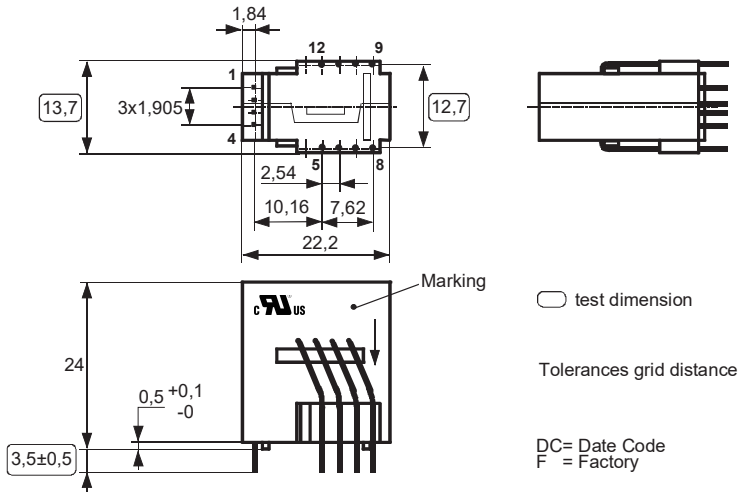
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**Mechanical outline (mm):** General tolerances DIN ISO 2768-c




test dimension

Tolerances grid distance ±0,25mm

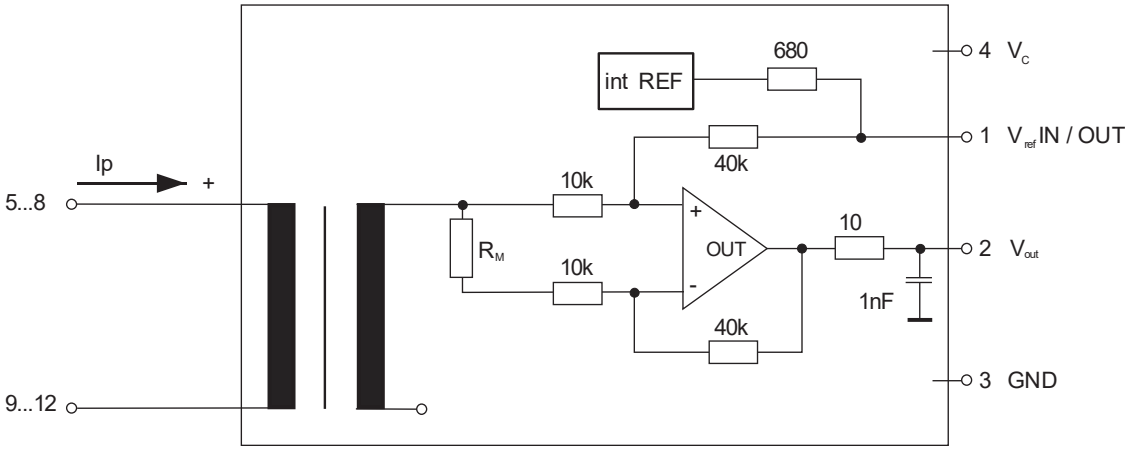
DC= Date Code
F = Factory

Connections:

Pin Nr. 5-12: Ø1mm
Pin Nr. 1-4: 0.46 x 0.46mm

Marking:
UL-sign 4647-X763
F DC

**Schematic diagram:**




| Hrg.: R&D-PD NPI<br>editor | Bearb.: DJ<br>designer | | MC-PM: Sn.<br>check | | | freig.: BEF<br>released |
|---|---|---|---|---|---|---|

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K-No.: 26832

**6A 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: 12.09.2017

Customer: Standard type | Customers Part no: | 

**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°C | | 1 | | mΩ |
| $R_S$ | Secondary coil resistance @ $\vartheta_A$ = 85°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 | | | kΩ |
| $C_L$ | External recommended capacitance of $V_{OUT}$ | | | 1 | nF |
| $X_{Ti}$ / ΔT | Temperature drift of X @ $\vartheta_A$ = -40°C ... 85°C | | | 40 | ppm/K |
| $\Delta V_O$=Δ($V_{OUT}$-$V_{REF}$) | Sum of any offset drift including: | | 5 | 15 | mV |
| $V_{Ot}$ | Long term drift of $V_O$ | | 3 | | mV |
| $V_{OT}$ | Temperature drift of $V_O$ @ $\vartheta_A$ = -40°C…85°C | | 3 | | mV |
| $V_{OH}$ | Hysteresis of $V_{OUT}$ @ $I_P$ = 0A (caused by $I_P$ = 10 x $I_{PN}$) | | | 7.5 | mV |
| $\Delta V_O/\Delta V_C$ | Supply voltage rejection ratio | | | 1 | mV/V |
| $v_{OSS}$ | Offsetripple (with 1 MHz-Filter, first order) | | | 45 | $mV_{PP}$ |
| $v_{OSS}$ | Offsetripple (with 100 kHz-Filter, first order) | | 8 | 15 | $mV_{PP}$ |
| $v_{OSS}$ | Offsetripple (with 20 kHz-Filter, first order) | | 3 | 5 | $mV_{PP}$ |
| $C_k$ | Maximum possible coupling capacity (primary - secondary) | | | 10 | 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 ± 0.7% | mV |
| $V_O$ | (100%) M3226: | Offset voltage | ±5.3 | mV |
| $U_d$ | (100%) M3014: | Test voltage, 1s | 1.8 | $kV_{RMS}$ |
| $U_{PDE}$<br>$U_{PDE}$*1.875 | (AQL 1/S4)<br>M3024: | Partial discharge voltage (extinction) | 1.5<br>1.875 | $kV_{RMS}$ |

**Type testing:** (Precondition acc. to M3236)

| | | | | |
|---|---|---|---|---|
| $\hat{U}_W$ | M3064 | HV transient test 1.2µs / 50µs-Waveform | 8 | kV |
| $U_d$ | M3014 | Test voltage (5s) | 3.6 | $kV_{RMS}$ |
| $U_{PDE}$<br>$U_{PDE}$*1.875 | M3024 | Partial discharge voltage (extinction) | 1.5<br>1.875 | $kV_{RMS}$ |

**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.
- 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: Sn. check | | | freig.: BEF released |
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