# Surge arrester

## Stacked surge arresters

| | |
|---|---|
| **Series/Type:** | **LN8A-A1400DC-5** |
| **Ordering code:** | **B88069X1003xxxx** |
| Date: | 2020-06-16 |
| Version: | 15 |

© TDK Electronics AG 2020. Reproduction, publication and dissemination of this publication, enclosures hereto and the information contained therein without TDK Electronics' prior express consent is prohibited.

### Features

- Fast response time
- High current rating
- Stable performance over life
- Very low capacitance
- High insulation resistance
- Excellent SMD handling
- RoHS-compatible

### Applications

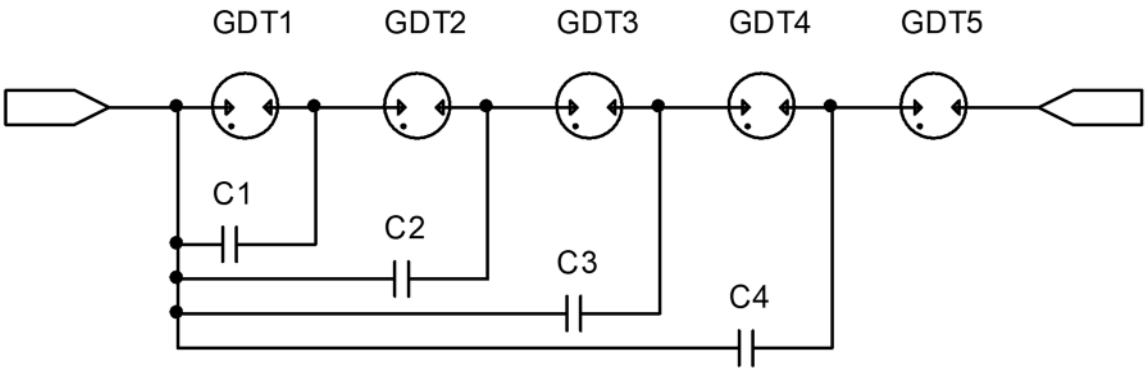
- DC power supply protection 60 V

| **Electrical specifications** | | Arrester only | w. capacitors[2] | Unit |
|---|---|---|---|---|
| DC spark-over voltage [1] | | 1400<br>±30 | < 1250 | V<br>% |
| Front of wave spark-over voltage at 6 kV, 1.2/50 µs<br>- initial<br>- after service life | | <br>< 2300<br>< 3000 | <br>< 900<br>< 1500 | <br>V<br>V |
| DC operating voltage [3] | | 60<br>±20 | | $V_{DC}$<br>% |
| Service life | | | | |
| 10 operations [5× (+) & 5× (–)] | 8/20 µs | 20 | | kA |
| 10 operations [5× (+) & 5× (–)] | 10/350 µs | 4 | | kA |
| 100 operations [50× (+) & 50× (–)] | 10/350 µs | 500 | | A |
| 300 operations (+/– alternating polarity) | 10/1000 µs | 100 | | A |
| Insulation resistance at 100 $V_{DC}$ | | > 10 | | GΩ |
| Capacitance at 1 MHz | | < 1 | | pF |
| Weight | | ~ 5.5 | | g |
| Operation and storage temperature | | –40 ... +125 | | °C |
| Climatic category (IEC 60068-1) | | 40/125/21 | | |
| Marking, black positive | | **YY**<br>**60DC**<br>YY - Year of production<br>60DC - DC operating voltage | | |
| Certifications | | UL 1449 (E319264) | | |

1) At delivery AQL 0.65 level II, DIN ISO 2859
2) Refer to circuit diagram on page 3
3) DC current source 30 A

Terms in accordance with IEC 61643-11.

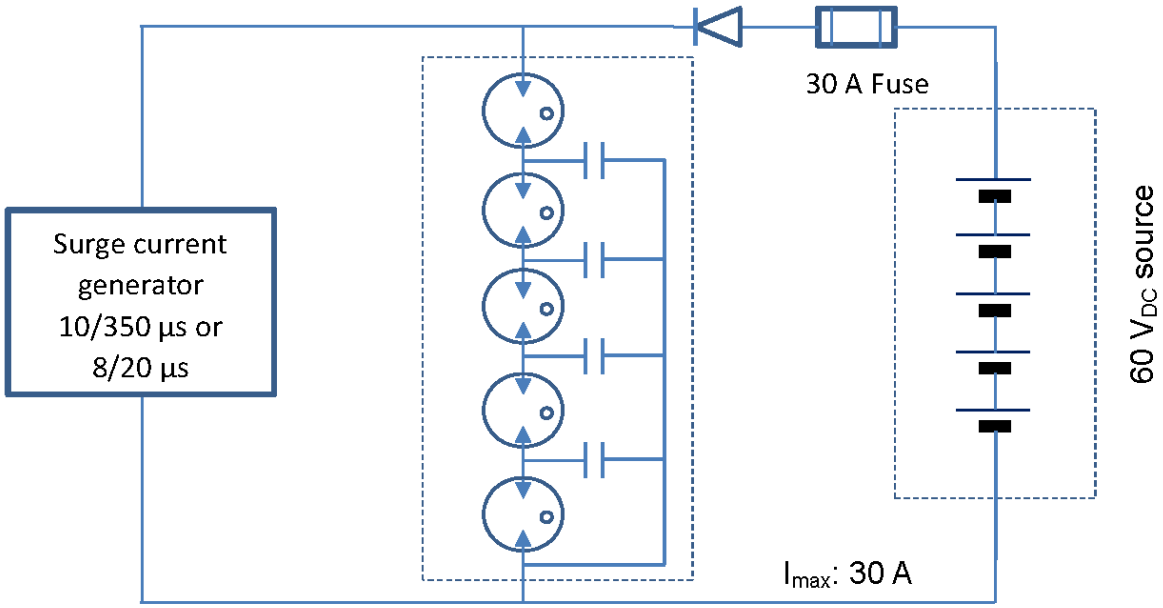
**Circuit diagram (C1 to C4 = each capacitor 100 pF to 470 pF)**



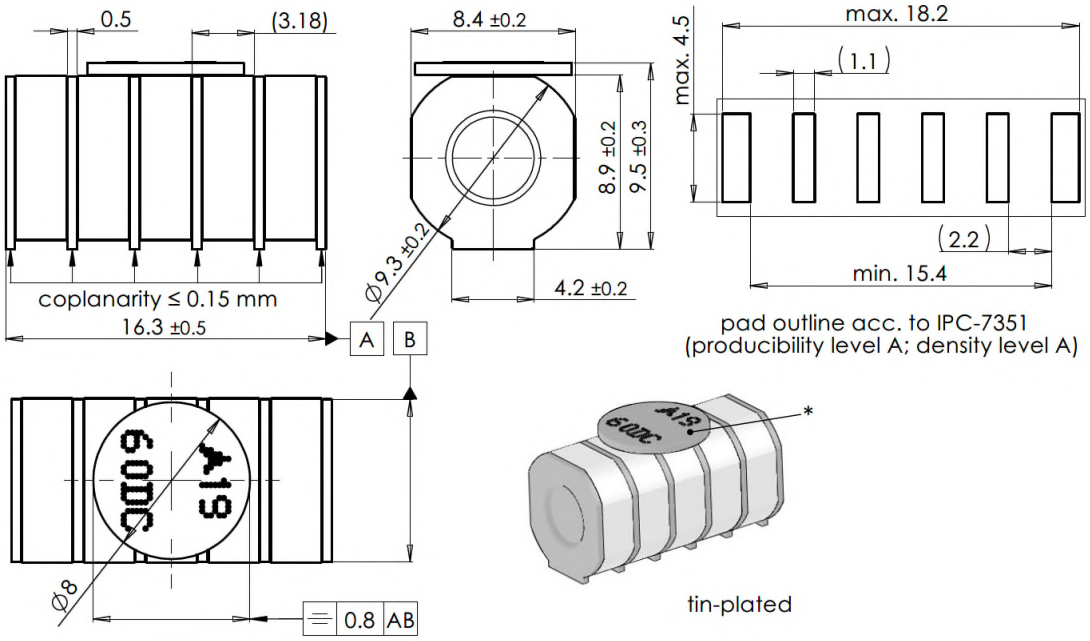

Recommended capacitor: TDK C4520X7R3D471K130KA

**Test circuit**

10/350 µs or 8/20 µs circuit



## Dimensional drawing in mm



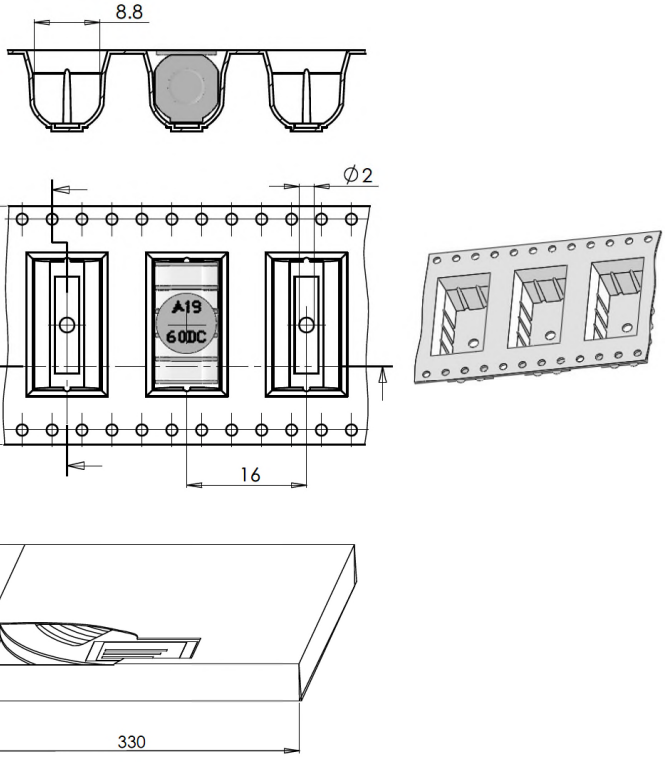

* - for pick and place, dimension of suction nozzle should be smaller than disc

## Ordering code and packing advice

*B88069X1003**T302** = 300 pcs. on SMD-tape & reel*

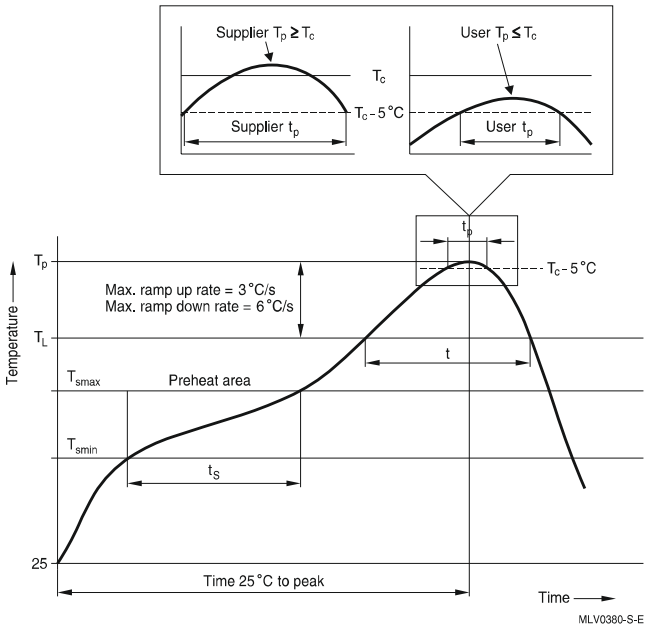
*B88069X1003**T252** = 250 pcs. on SMD-tape & reel*

SMD-tape according to IEC 60286-3



## Soldering parameter

Reflow soldering




| Reflow profile features | | Sn- Pb eutectic assembly | Pb-free assembly |
|---|---|---|---|
| Preheat and soak<br>- Temperature min<br>- Temperature max<br>- Time | <br>$T_{smin}$<br>$T_{smax}$<br>$t_{smin}$ to $t_{smax}$ | <br>100 °C<br>150 °C<br>60 ... 120 s | <br>150 °C<br>200 °C<br>60 ... 180 s |
| Average ramp-up rate | $T_{smax}$ to $T_p$ | max. 3 °C/ s | max. 3 °C/ s |
| Liquidous temperature<br>Time at liquidous | $T_L$<br>$t_L$ | 183 °C<br>60 ... 150 s | 217 °C<br>60 ... 150 s |
| Peak package body temperature *, Classification temperature ** | $T_p$, $T_C$ | 220 ... 235 °C ** | 245 ... 260 °C ** |
| Time ($t_p$) ** within 5 °C of the specified classification temperature ($T_C$) | | 20 s *** | 30 s *** |
| Average ramp-down rate | $T_p$ to $T_{smax}$ | max. 6 °C/ s | max. 6 °C/ s |
| Time 25 °C to peak temperature | | max. 6 min | max. 8 min |

* = Tolerance for peak profile temperature ($T_p$) is defined as a supplier minimum and a user maximum.
** = For details please refer to JEDEC J-STD-020D.
*** = Tolerance for time at peak profile temperature ($t_p$) is defined as a supplier minimum and a user maximum.

Surface mounted components (SMD) may exhibit a temporary increase in the DC spark-over voltage after the solder reflow process. The components will recover within 24 hours. There is no quality defect nor change in protection levels during the temporary change in DC spark-over voltage.

## Cautions and warnings

- The follow current must be limited (see test circuit) so that the arrester can be properly extinguished when the surge has decayed. The arrester might otherwise heat up and ignite adjacent components.
- If the contacts of the surge arresters are defective, current load can cause sparks and loud noises.
- Surge arresters may become hot in the event of longer periods of current stress (burn risk). In the event of overload the connectors may fail or the component may be destroyed.
- Do not operate surge arresters in power supply networks, whose maximum operating voltage exceeds the minimum spark-over voltage of the surge arresters.
- Surge arresters must be handled with care and must not be dropped.
- Do not continue to use damaged surge arresters.
- The shown SMD pad dimensions represent a safe way to mount the arrester and are a recommendation of the manufacturer. During the reflow process it must be assured that no solder material reduces the insulation distance between the pads below the arrester.
- SMD surge arresters should be soldered within 24 month after shipment.

## Display of ordering codes for TDK Electronics products

The ordering code for one and the same product can be represented differently in data sheets, data books, other publications, on the company website, or in order-related documents such as shipping notes, order confirmations and product labels. **The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products**. Detailed information can be found on the Internet under www.tdk-electronics.tdk.com/orderingcodes.

## Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application.** As a rule we are either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether a product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified.** In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet (www.tdk-electronics.tdk.com/material). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order.

   We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available. The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.
6. Unless otherwise agreed in individual contracts, **all orders are subject to our General Terms and Conditions of Supply.**
7. **Our manufacturing sites serving the automotive business apply the IATF 16949 standard.** The IATF certifications confirm our compliance with requirements regarding the quality management system in the automotive industry. Referring to customer requirements and customer specific requirements (“CSR”) TDK always has and will continue to have the policy of respecting individual agreements. Even if IATF 16949 may appear to support the acceptance of unilateral requirements, we hereby like to emphasize that **only requirements mutually agreed upon can and will be implemented in our Quality Management System.** For clarification purposes we like to point out that obligations from IATF 16949 shall only become legally binding if individually agreed upon.

## Important notes

8. The trade names EPCOS, CeraCharge, CeraDiode, CeraLink, CeraPad, CeraPlas, CSMP, CTVS, DeltaCap, DigiSiMic, ExoCore, FilterCap, FormFit, LeaXield, MiniBlue, MiniCell, MKD, MKK, ModCap, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, PowerHap, PQSine, PQvar, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, ThermoFuse, WindCap, XieldCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at www.tdk-electronics.tdk.com/trademarks.

Release 2020-05

# Unikeyic Electronics

Global Electronic Components Distributor

Click to view pricing, inventory, delivery, and lifecycle information:

## TDK:

B82559A7682A024 CGA4J2X8R1H104M125AA FA24C0G1H333JNU00 FHV-5AN MLG1005S2N4BTD25 MLG1005S0N8BTD25 MLG1005S68NJTD25 B82422A1562J100 B82496C3220G000 B82559A3292A025 B65884E0012D001 B82477D4333M900 C3225C0G2A683J230AA MMZ1005S601ETD25 B88069X5600S102 MLF1608D68NMTA00 MMZ1608S102ATA00 MLG1005S7N5JTD25 CGA2B1X7R1C683M050BC CGA2B3X7R1H473K050BD FHV-153AN B32024A3105M000 B32683A1223J000 B84111A0000A030 C3216X7R2A224K115AE CGA2B1C0G2A681J050BC B32654A6335K000 B59886C0120A070 FG26X7R2J103KNT00 SPM3012T-R47M-LR