

## AC Line Rated Disc Capacitors

### Class X1, 760 V<sub>AC</sub>, Class Y1, 500 V<sub>AC</sub>



#### FEATURES

- Complying with IEC 60384-14, 3<sup>rd</sup> edition
- High reliability
- Vertical (inline) kinked or straight leads
- Material categorization:  
For definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available

#### APPLICATIONS

- X1, Y1 according to IEC 60384-14.3
- Across-the-line
- Line by-pass
- Antenna coupling

#### DESIGN

The capacitors consist of a ceramic disc both sides of which are silver-plated. Connection leads are made of tinned copper having a diameter of 0.6 mm.

The capacitors may be supplied with vertical (inline) kinked leads having a lead spacing of 10.0 mm and 12.5 mm. Encapsulation is made of flammable resistant epoxy resin in accordance with "UL 94 V-0".

| QUICK REFERENCE DATA       |                |                |                |                |                |                |
|----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| DESCRIPTION                | CLASS X1 (U2J) | CLASS X1 (Y5S) | CLASS X1 (Y5U) | CLASS Y1 (U2J) | CLASS Y1 (Y5S) | CLASS Y1 (Y5U) |
| Voltage (V <sub>AC</sub> ) | 760            |                |                | 500            | 250            | 500            |
| Min. Capacitance (pF)      | 10             | 33             | 470            | 10             | 33             | 470            |
| Max. Capacitance (pF)      | 22             | 330            | 4700           | 22             | 330            | 4700           |
| Mounting                   | Through hole   |                |                |                |                |                |

#### OPERATING TEMPERATURE RANGE

- 40 °C to + 125 °C

#### TEMPERATURE CHARACTERISTICS

See Ordering Information table

#### CLIMATIC CATEGORY

40/125/21 according to EN 60068-1

#### COATING

According to UL 94 V-0

Epoxy resin, isolating, flame retardant

#### APPROVALS

ENEC VDE (DE1-32019)

UL 60384-14 file E183844

CSA 22.2

#### PACKAGING

Bulk, tape and reel, taped ammpack

#### CAPACITANCE RANGE

10 pF to 4700 pF

#### RATED VOLTAGE U<sub>R</sub>

IEC 60384-14.3 and UL 60384-14:

(X1): 760 V<sub>AC</sub>, 50 Hz

(Y1): 500 V<sub>AC</sub>, 50 Hz

#### TEST VOLTAGE

Component test (100 %):

4000 V<sub>AC</sub>, 50 Hz, 2 s

Random sampling test (destructive test):

4000 V<sub>AC</sub>, 50 Hz, 60 s

Voltage proof of coating (destructive test):

4000 V<sub>AC</sub>, 50 Hz, 60 s

#### INSULATION RESISTANCE

10 000 MΩ minimum

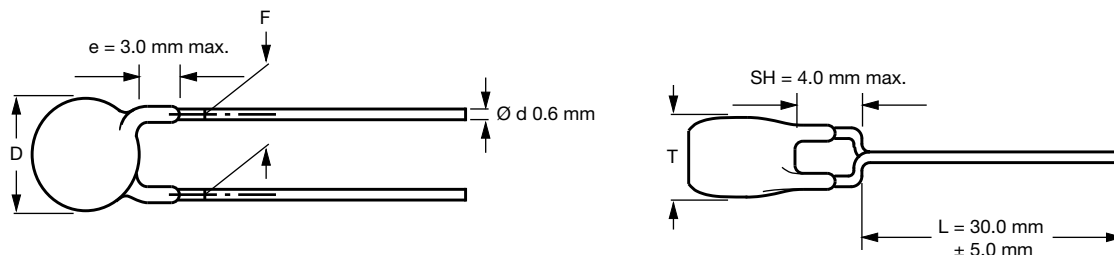
#### TOLERANCE OF CAPACITANCE

± 20 % (code M); ± 10 % (code K)

#### DISSIPATION FACTOR

2.5 % maximum

## DIMENSIONS



Capacitors with 10.0 mm and 12.5 mm lead spacing

## ORDERING INFORMATION

| C<br>(pF) | TOL.<br>(%)       | TEMP.<br>COEFFICIENT | BODY<br>DIAMETER<br>D <sub>MAX.</sub><br>(mm) | BODY<br>THICKNESS<br>T <sub>MAX.</sub><br>(mm) | LEAD<br>SPACING<br>F<br>(mm) | CLEAR TEXT CODE                                                        |                       |                   |                   |
|-----------|-------------------|----------------------|-----------------------------------------------|------------------------------------------------|------------------------------|------------------------------------------------------------------------|-----------------------|-------------------|-------------------|
|           |                   |                      |                                               |                                                |                              | 15 <sup>TH</sup> DIGIT:<br>T = REEL; U = AMMO; 3 = BULK <sup>(1)</sup> |                       |                   |                   |
|           |                   |                      |                                               |                                                |                              | RoHS COMPLIANT                                                         | RoHS AND HALOGEN-FREE |                   |                   |
| 10        | ± 10              | U2J (N750)           | 8.0                                           | 5.0                                            | 10.0                         | VY1100K31U2JQ6*V0                                                      | VY1100K31U2JG6*V0     |                   |                   |
| 15        |                   |                      |                                               |                                                |                              | VY1150K31U2JQ6*V0                                                      | VY1150K31U2JG6*V0     |                   |                   |
| 22        |                   |                      |                                               |                                                |                              | VY1220K31U2JQ6*V0                                                      | VY1220K31U2JG6*V0     |                   |                   |
| 33        |                   |                      |                                               |                                                |                              | VY1330K31Y5SQ6*V0                                                      | VY1330K31Y5SG6*V0     |                   |                   |
| 47        |                   |                      |                                               |                                                |                              | VY1470K31Y5SQ6*V0                                                      | VY1470K31Y5SG6*V0     |                   |                   |
| 68        |                   | Y5S (2C3)            |                                               |                                                |                              | VY1680K31Y5SQ6*V0                                                      | VY1680K31Y5SG6*V0     |                   |                   |
| 100       |                   |                      |                                               |                                                |                              | VY1101K31Y5SQ6*V0                                                      | VY1101K31Y5SG6*V0     |                   |                   |
| 150       |                   |                      |                                               |                                                |                              | VY1151K31Y5SQ6*V0                                                      | VY1151K31Y5SG6*V0     |                   |                   |
| 220       |                   |                      |                                               |                                                |                              | VY1221K31Y5SQ6*V0                                                      | VY1221K31Y5SG6*V0     |                   |                   |
| 330       |                   |                      |                                               |                                                |                              | VY1331K31Y5SQ6*V0                                                      | VY1331K31Y5SG6*V0     |                   |                   |
| 470       | ± 20              | Y5U (2E3)            | VY1471M31Y5UQ6*V0                             | VY1471M31Y5UG6*V0                              |                              |                                                                        |                       |                   |                   |
| 680       |                   |                      | VY1681M31Y5UQ6*V0                             | VY1681M31Y5UG6*V0                              |                              |                                                                        |                       |                   |                   |
| 1000      |                   |                      | VY1102M35Y5UQ6*V0                             | VY1102M35Y5UG6*V0                              |                              |                                                                        |                       |                   |                   |
| 1500      |                   |                      | VY1152M41Y5UQ6*V0                             | VY1152M41Y5UG6*V0                              |                              |                                                                        |                       |                   |                   |
| 2200      |                   |                      | VY1222M47Y5UQ6*V0                             | VY1222M47Y5UG6*V0                              |                              |                                                                        |                       |                   |                   |
| 3300      |                   |                      | VY1332M59Y5UQ6*V0                             | VY1332M59Y5UG6*V0                              |                              |                                                                        |                       |                   |                   |
| 3900      |                   |                      | VY1392M61Y5UQ6*V0                             | VY1392M61Y5UG6*V0                              |                              |                                                                        |                       |                   |                   |
| 4700      |                   |                      | VY1472M63Y5UQ6*V0                             | VY1472M63Y5UG6*V0                              |                              |                                                                        |                       |                   |                   |
| 10        |                   |                      | ± 10                                          | U2J (N750)                                     | 8.0                          | 5.0                                                                    | 12.5                  | VY1100K31U2JQ6*VX | VY1100K31U2JG6*VX |
| 15        |                   |                      |                                               |                                                |                              |                                                                        |                       | VY1150K31U2JQ6*VX | VY1150K31U2JG6*VX |
| 22        | VY1220K31U2JQ6*VX | VY1220K31U2JG6*VX    |                                               |                                                |                              |                                                                        |                       |                   |                   |
| 33        | VY1330K31Y5SQ6*VX | VY1330K31Y5SG6*VX    |                                               |                                                |                              |                                                                        |                       |                   |                   |
| 47        | VY1470K31Y5SQ6*VX | VY1470K31Y5SG6*VX    |                                               |                                                |                              |                                                                        |                       |                   |                   |
| 68        | Y5S (2C3)         | VY1680K31Y5SQ6*VX    |                                               | VY1680K31Y5SG6*VX                              |                              |                                                                        |                       |                   |                   |
| 100       |                   | VY1101K31Y5SQ6*VX    |                                               | VY1101K31Y5SG6*VX                              |                              |                                                                        |                       |                   |                   |
| 150       |                   | VY1151K31Y5SQ6*VX    |                                               | VY1151K31Y5SG6*VX                              |                              |                                                                        |                       |                   |                   |
| 220       |                   | VY1221K31Y5SQ6*VX    |                                               | VY1221K31Y5SG6*VX                              |                              |                                                                        |                       |                   |                   |
| 330       |                   | VY1331K31Y5SQ6*VX    |                                               | VY1331K31Y5SG6*VX                              |                              |                                                                        |                       |                   |                   |
| 470       | ± 20              | Y5U (2E3)            | VY1471M31Y5UQ6*VX                             | VY1471M31Y5UG6*VX                              |                              |                                                                        |                       |                   |                   |
| 680       |                   |                      | VY1681M31Y5UQ6*VX                             | VY1681M31Y5UG6*VX                              |                              |                                                                        |                       |                   |                   |
| 1000      |                   |                      | VY1102M35Y5UQ6*VX                             | VY1102M35Y5UG6*VX                              |                              |                                                                        |                       |                   |                   |
| 1500      |                   |                      | VY1152M41Y5UQ6*VX                             | VY1152M41Y5UG6*VX                              |                              |                                                                        |                       |                   |                   |
| 2200      |                   |                      | VY1222M47Y5UQ6*VX                             | VY1222M47Y5UG6*VX                              |                              |                                                                        |                       |                   |                   |
| 3300      |                   |                      | VY1332M59Y5UQ6*VX                             | VY1332M59Y5UG6*VX                              |                              |                                                                        |                       |                   |                   |
| 3900      |                   |                      | VY1392M61Y5UQ6*VX                             | VY1392M61Y5UG6*VX                              |                              |                                                                        |                       |                   |                   |
| 4700      |                   |                      | VY1472M63Y5UQ6*VX                             | VY1472M63Y5UG6*VX                              |                              |                                                                        |                       |                   |                   |

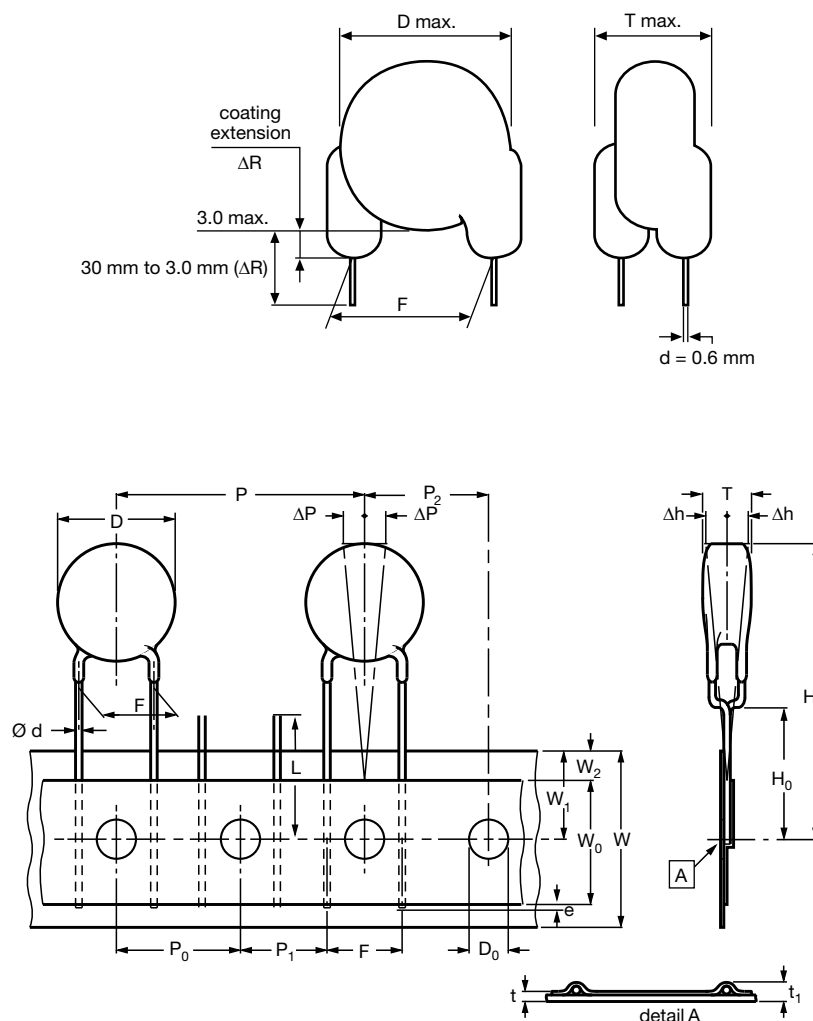
### Notes

- Straight leads are available on request
- Coating extension DR valid for straight leads only
- On request available: ± 10 % tolerance
- <sup>(1)</sup> 15<sup>th</sup> digit of the clear text code number to be completed with the packaging code

| PACKAGING          |           |                                     |                      |      |      |
|--------------------|-----------|-------------------------------------|----------------------|------|------|
| CAPACITANCE VALUE  | SIZE CODE | BODY DIAMETER<br>$D_{MAX.}$<br>(mm) | PACKAGING QUANTITIES |      |      |
|                    |           |                                     | BULK                 | REEL | AMMO |
| 10 pF to 2200 pF   | 31 to 47  | 12.0                                | 1000                 | 500  | 750  |
| 3300 pF to 4700 pF | 51 to 63  | 16.0                                | 500                  | 500  | 750  |

**Note**

- The capacitors are supplied in bulk packaging (cardboard boxes), in tape on reel in ammopack

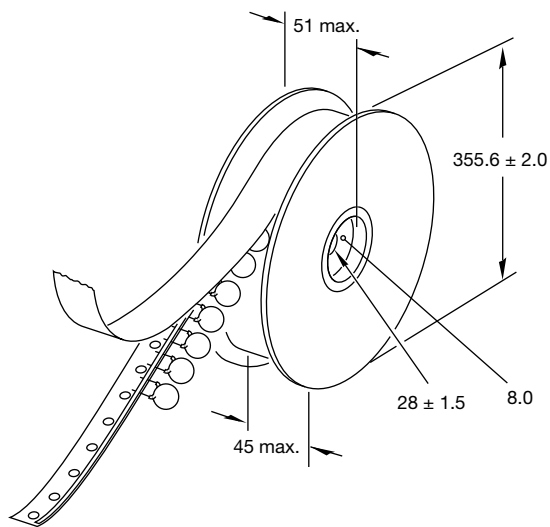
**STRAIGHT LEADS**


Lead spacing 10.0 mm and 12.5 mm, sprocket hole pitch 25.04 mm for lead spacing

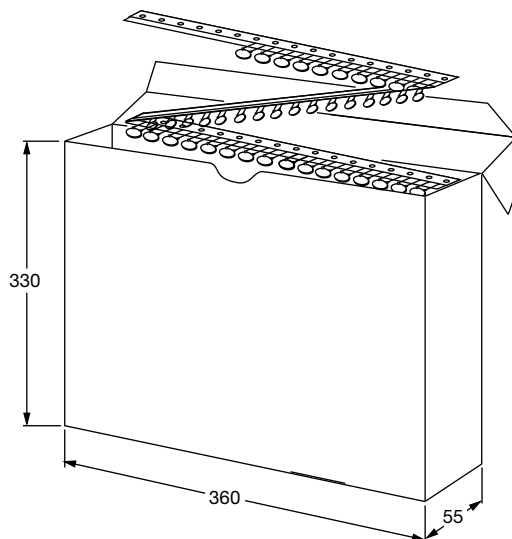
| DIMENSIONS OF TAPE            |                                              |                          |
|-------------------------------|----------------------------------------------|--------------------------|
| SYMBOL                        | PARAMETER                                    | DIMENSIONS (mm)          |
|                               |                                              | FIG. 2                   |
| D <sup>(1)</sup>              | Body diameter                                | 16.0 max.                |
| d                             | Lead diameter                                | 0.6 ± 0.05               |
| P                             | Pitch of component                           | 25.4 ± 1                 |
| P <sub>0</sub> <sup>(2)</sup> | Pitch of sprocket hole                       | 12.7 ± 0.3               |
| P <sub>1</sub> <sup>(3)</sup> | Distance, hole center to lead                | 7.7 or 6.4 ± 1.0         |
| P <sub>2</sub> <sup>(3)</sup> | Distance, hole to center of component        | 12.7 ± 1.5               |
| F                             | Lead spacing                                 | 10.0 or 12.5 + 0.6/- 0.4 |
| Δh                            | Average deviation across tape                | ± 1.0 max.               |
| ΔP                            | Average deviation in direction of reeling    | ± 1.0 max.               |
| W                             | Carrier tape width                           | 18.0 + 1/- 0.5           |
| W <sub>0</sub>                | Hold-down tape width                         | 5.0 min.                 |
| W <sub>1</sub>                | Position of sprocket hole                    | 9.0 + 0.75/- 0.5         |
| W <sub>2</sub>                | Distance of hold-down tape                   | 3.0 max.                 |
| H <sub>1</sub>                | Maximum component height                     | 40.0                     |
| H <sub>0</sub>                | Height to seating plane (for kinked leads)   | 16.0 ± 0.5               |
| H <sub>0</sub>                | Height to seating plane (for straight leads) | 20.0 ± 0.5               |
| L                             | Length of cut leads                          | 11.0 max.                |
| l                             | Length of lead protrusion                    | 1.0 max.                 |
| D <sub>0</sub>                | Diameter of sprocket hole                    | 4.0 ± 0.2                |
| t                             | Total tape thickness                         | 0.9 max.                 |

**Notes**

- (1) See Ordering Information table  
(2) Cumulative pitch error: ± 1 mm/20 pitches  
(3) Obliquity maximum 3°

**REEL AND TAPE DATA** in millimeters


Reel with capacitors on tape



Ammopack with capacitors on tape

## STANDARD RECOGNITION

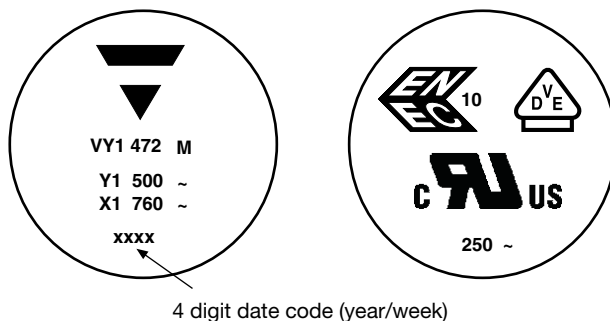
IEC 60384 - 14/3<sup>rd</sup> issue (2005) - Safety tests

UL 1414 - Across-the-line, antenna-coupling and line-by-pass component

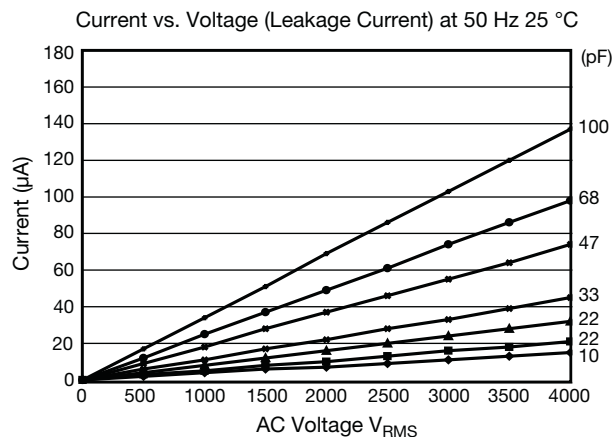
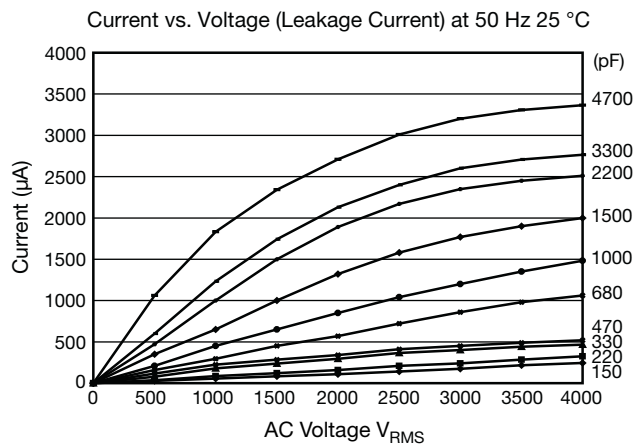
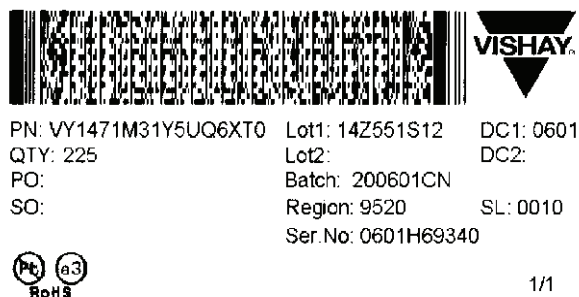
CSA C22.2 - Across-the-line, line to ground and antenna isolation capacitor

CQC - China Quality Certification Center-Safety Tests

## MARKING: 2 SIDES (EXAMPLE)



## LABEL (EXAMPLE)



### Note

- The capacitors meet the essential requirements of "EIA 198". Unless stated otherwise all electrical values apply at an ambient temperature of 25 °C ± 3 °C, at normal atmospheric conditions.



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.