

## Resin-Coated, Radial-Lead Tantalum Capacitors



### FEATURES

- RoHS Compliant design available
- Flame retardant encapsulation
- Very high temperature range
- Improved humidity class
- Very low leakage current
- Very high CV product
- Very low leakage current
- Very low failure rate
- Preaged under temperature and voltage



**RoHS\***  
COMPLIANT

### MECHANICAL SPECIFICATIONS

**Colour:** Gold

**Laser Marked:** Capacity and voltage in clear text; Plus pole marked, Date code (year/month) according to DIN IEC 62

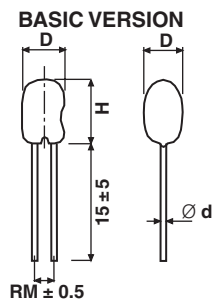
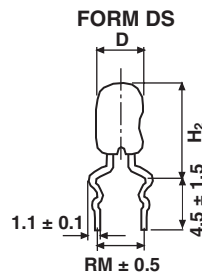
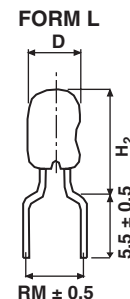
**Leads:** Standard (Tin/Lead), RoHS Compliant (100 % Tin)

Tantalum capacitors with sintered anode and solid semiconductor electrolyte with flame retardant fluidized bed coating. The type ETQW is characterized by very favorable electrical values even at higher ambient temperatures. The capacitor complies with DIN 45910 part 147. This type is also available as a radially taped version.

### ORDERING INFORMATION

| Q1B<br>TYPE             | 685<br>CAPACITANCE                                                                                                                | 603<br>DC VOLTAGE RATING<br>AT + 85 °C                                                                                       | M<br>CAPACITANCE<br>TOLERANCE    | 00<br>LEAD STYLE AND<br>PACKAGING      | D | E3<br>RoHS<br>COMPLIANT                                                                                      |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------|---|--------------------------------------------------------------------------------------------------------------|
| ETQW 1A ....<br>ETQW 6R | Expressed in<br>picofarads. The first two<br>digits are significant<br>figures. The third is the<br>number of zeros<br>following. | Expressed by zeros if<br>needed to complete the<br>3 digit block. A decimal<br>point is indicated by an<br>"0" (603 = 6.3 V) | M = $\pm 20\%$<br>K = $\pm 10\%$ | See Lead styles and<br>packaging table |   | E3 = 100 % tin<br>termination (RoHS<br>compliant design)<br>Blank = SnPb<br>termination<br>(standard design) |

### DIMENSIONS in millimeters



| MODEL    | D MAX. | H MAX. | RM  | $\varnothing D \pm 0.05$ | FORM DS             |    | FORM L              |    |
|----------|--------|--------|-----|--------------------------|---------------------|----|---------------------|----|
|          |        |        |     |                          | H <sub>2</sub> MAX. | RM | H <sub>2</sub> MAX. | RM |
| ETQW - 1 | 4.5    | 7.5    | 2.5 | 0.5                      | 10.5                | 5  | 10.5                | 5  |
| ETQW - 2 | 5.0    | 9.5    | 2.5 | 0.5                      | 12.5                | 5  | 12.5                | 5  |
| ETQW - 3 | 6.0    | 10.5   | 2.5 | 0.5                      | 13.5                | 5  | 13.5                | 5  |
| ETQW - 4 | 6.5    | 11.5   | 2.5 | 0.5                      | 14.5                | 5  | 14.5                | 5  |
| ETQW - 5 | 9.0    | 14.0   | 5.0 | 0.5                      | 17.0                | 5  | -                   | -  |
| ETQW - 6 | 9.5    | 17.0   | 5.0 | 0.5                      | 20.0                | 5  | -                   | -  |

\* Pb containing terminations are not RoHS compliant, exemptions may apply

**STANDARD RATINGS AND CASE CODES**

| C <sub>R</sub><br>μF | RATED VOLTAGE U <sub>R</sub> at + 85 °C |       |      |      |      |      |      |
|----------------------|-----------------------------------------|-------|------|------|------|------|------|
|                      | 3.0 V                                   | 6.3 V | 10 V | 16 V | 25 V | 35 V | 50 V |
| 0.10                 |                                         |       |      |      |      | 1A   | 1A   |
| 0.15                 |                                         |       |      |      |      | 1A   | 1A   |
| 0.22                 |                                         |       |      |      |      | 1A   | 1A   |
| 0.33                 |                                         |       |      |      |      | 1A   | 1B   |
| 0.47                 |                                         |       |      |      |      | 1A   | 1B   |
| 0.68                 |                                         |       |      |      |      | 1A   | 2C   |
| 1.0                  |                                         |       |      |      | 1A   | 1A   | 2D   |
| 1.5                  |                                         |       |      |      | 1A   | 1B   | 2E   |
| 2.2                  |                                         |       |      | 1A   | 1B   | 2C   | 3F   |
| 3.3                  |                                         |       | 1A   | 1B   | 2C   | 2D   | 3G   |
| 4.7                  |                                         | 1A    | 1B   | 2C   | 2D   | 2E   | 4H   |
| 6.8                  | 1A                                      | 1B    | 2C   | 2D   | 2E   | 3F   | 5J   |
| 10                   | 1A                                      | 2C    | 2D   | 2E   | 3F   | 3G   | 5L   |
| 15                   | 1B                                      | 2D    | 2E   | 3F   | 4H   | 5J   | 6M   |
| 22                   | 2C                                      | 2E    | 3F   | 3G   | 5J   | 5L   | 6P   |
| 33                   | 2D                                      | 3F    | 3G   | 4H   | 5K   | 6M   |      |
| 47                   | 2E                                      | 3G    | 4H   | 5K   | 6M   | 6P   |      |
| 68                   | 3F                                      | 4H    | 5J   | 5L   | 6N   |      |      |
| 100                  | 3G                                      | 5J    | 5L   | 6N   |      |      |      |
| 150                  | 4H                                      | 5L    | 6N   | 6R   |      |      |      |
| 220                  | 5J                                      | 6M    | 6P   |      |      |      |      |
| 330                  | 5L                                      | 6P    |      |      |      |      |      |
| 470                  |                                         |       |      |      |      |      |      |

**STANDARD RATINGS**

| C <sub>R</sub><br>(μF)                                                                | CASE<br>CODE | PART NUMBER    | DIMENSIONS     |                |                             |              |             | MAX. DCL<br>AT<br>+ 20 °C,<br>(μA) | MAX. Z AT<br>100 kHz<br>(Ω) | MAX. DF<br>AT 120 Hz<br>+ 20 °C |
|---------------------------------------------------------------------------------------|--------------|----------------|----------------|----------------|-----------------------------|--------------|-------------|------------------------------------|-----------------------------|---------------------------------|
|                                                                                       |              |                | D MAX.<br>(mm) | H MAX.<br>(mm) | H <sub>2</sub> MAX.<br>(mm) | RM<br>± 0.05 | d<br>± 0.05 |                                    |                             |                                 |
| U <sub>R</sub> = 3 V AT + 85 °C, Surge = 3.9 V . . . U <sub>C</sub> = 2 V AT + 125 °C |              |                |                |                |                             |              |             |                                    |                             |                                 |
| 6.8                                                                                   | 1A           | Q1A685003(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 5.4                         | 0.06                            |
| 10.0                                                                                  | 1A           | Q1A106003(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 4.5                         | 0.06                            |
| 15.0                                                                                  | 1B           | Q1B156003(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 3.6                         | 0.06                            |
| 22.0                                                                                  | 2C           | Q2C226003(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.5                                | 2.9                         | 0.06                            |
| 33.0                                                                                  | 2D           | Q2D336003(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.8                                | 2.3                         | 0.06                            |
| 47.0                                                                                  | 2E           | Q2E476003(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 1.1                                | 1.8                         | 0.06                            |
| 68.0                                                                                  | 3F           | Q3F686003(*)_D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 1.6                                | 1.4                         | 0.06                            |
| 100.0                                                                                 | 3G           | Q3G107003(*)_D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 2.4                                | 1.1                         | 0.08                            |
| 150.0                                                                                 | 4H           | Q4H157003(*)_D | 6.5            | 11.5           | 14.5                        | 2.5          | 0.5         | 3.6                                | 0.9                         | 0.08                            |
| 220.0                                                                                 | 5J           | Q5J227003(*)_D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 5.3                                | 0.7                         | 0.08                            |
| 330.0                                                                                 | 5L           | Q5L337003(*)_D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 7.9                                | 0.6                         | 0.08                            |

**Note:**

(1) Insert M for ± 20 % tolerance or K for ± 10 %

\_\_ Lead style and packaging code, see lead style and packaging

**STANDARD RATINGS**

| C <sub>R</sub><br>(μF)                                                                   | CASE<br>CODE | PART NUMBER    | DIMENSIONS     |                |                             |              |             | MAX. DCL<br>AT<br>+ 20 °C,<br>(μA) | MAX. Z AT<br>100 kHz<br>(Ω) | MAX. DF<br>AT 120 Hz<br>+ 20 °C |
|------------------------------------------------------------------------------------------|--------------|----------------|----------------|----------------|-----------------------------|--------------|-------------|------------------------------------|-----------------------------|---------------------------------|
|                                                                                          |              |                | D MAX.<br>(mm) | H MAX.<br>(mm) | H <sub>2</sub> MAX.<br>(mm) | RM<br>± 0.05 | d<br>± 0.05 |                                    |                             |                                 |
| U <sub>R</sub> = 6.3 V AT + 85 °C, Surge = 7.8 V . . . U <sub>C</sub> = 4 V AT + 125 °C  |              |                |                |                |                             |              |             |                                    |                             |                                 |
| 4.7                                                                                      | 1A           | Q1A475603(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 5.4                         | 0.06                            |
| 6.8                                                                                      | 1B           | Q1B685603(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 4.5                         | 0.06                            |
| 10.0                                                                                     | 2C           | Q2C106603(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.5                                | 3.6                         | 0.06                            |
| 15.0                                                                                     | 2D           | Q2D156603(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.8                                | 2.9                         | 0.06                            |
| 22.0                                                                                     | 2E           | Q2E226603(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 1.1                                | 2.3                         | 0.06                            |
| 33.0                                                                                     | 3F           | Q3F336603(*)_D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 1.7                                | 1.8                         | 0.06                            |
| 47.0                                                                                     | 3G           | Q3G476603(*)_D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 2.4                                | 1.7                         | 0.06                            |
| 68.0                                                                                     | 4H           | Q4H686603(*)_D | 6.5            | 11.5           | 14.5                        | 2.5          | 0.5         | 3.4                                | 1.1                         | 0.06                            |
| 100.0                                                                                    | 5J           | Q5J107603(*)_D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 5.0                                | 0.9                         | 0.08                            |
| 150.0                                                                                    | 5L           | Q5L157603(*)_D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 7.6                                | 0.7                         | 0.08                            |
| 220.0                                                                                    | 6M           | Q6M227603(*)_D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 11.1                               | 0.6                         | 0.08                            |
| 330.0                                                                                    | 6P           | Q6P337603(*)_D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 16.6                               | 0.5                         | 0.08                            |
| U <sub>R</sub> = 10 V AT + 85 °C, Surge = 13 V . . . U <sub>C</sub> = 6.3 V AT + 125 °C  |              |                |                |                |                             |              |             |                                    |                             |                                 |
| 3.3                                                                                      | 1A           | Q1A335010(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 5.9                         | 0.06                            |
| 4.7                                                                                      | 1B           | Q1B475010(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 4.5                         | 0.06                            |
| 6.8                                                                                      | 2C           | Q2C685010(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.5                                | 3.6                         | 0.06                            |
| 10.0                                                                                     | 2D           | Q2D106010(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.8                                | 2.9                         | 0.06                            |
| 15.0                                                                                     | 2E           | Q2E156010(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 1.2                                | 2.3                         | 0.06                            |
| 22.0                                                                                     | 3F           | Q3F226010(*)_D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 1.8                                | 1.8                         | 0.06                            |
| 33.0                                                                                     | 3G           | Q3G336010(*)_D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 2.6                                | 1.4                         | 0.06                            |
| 47.0                                                                                     | 4H           | Q4H476010(*)_D | 6.5            | 11.5           | 14.5                        | 2.5          | 0.5         | 3.8                                | 1.1                         | 0.06                            |
| 68.0                                                                                     | 5J           | Q5J686010(*)_D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 5.4                                | 0.9                         | 0.06                            |
| 100.0                                                                                    | 5L           | Q5L107010(*)_D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 8.0                                | 0.7                         | 0.08                            |
| 150.0                                                                                    | 6N           | Q6N157010(*)_D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 12.0                               | 0.6                         | 0.08                            |
| 220.0                                                                                    | 6P           | Q6P227010(*)_D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 17.6                               | 0.5                         | 0.08                            |
| U <sub>R</sub> = 16 V AT + 85 °C, Surge = 20.8 V . . . U <sub>C</sub> = 10 V AT + 125 °C |              |                |                |                |                             |              |             |                                    |                             |                                 |
| 2.2                                                                                      | 1A           | Q1A225016(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 6.3                         | 0.06                            |
| 3.3                                                                                      | 1B           | Q1B335016(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 5.4                         | 0.06                            |
| 4.7                                                                                      | 2C           | Q2C475016(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.6                                | 4.1                         | 0.06                            |
| 6.8                                                                                      | 2D           | Q2D685016(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.9                                | 2.9                         | 0.06                            |
| 10.0                                                                                     | 2E           | Q2E106016(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 1.3                                | 2.3                         | 0.06                            |
| 15.0                                                                                     | 3F           | Q3F156016(*)_D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 1.9                                | 1.8                         | 0.06                            |
| 22.0                                                                                     | 3G           | Q3G226016(*)_D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 2.8                                | 1.4                         | 0.06                            |
| 33.0                                                                                     | 4H           | Q4H336016(*)_D | 6.5            | 11.5           | 14.5                        | 2.5          | 0.5         | 4.2                                | 1.1                         | 0.06                            |
| 47.0                                                                                     | 5K           | Q5K476016(*)_D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 6.0                                | 0.9                         | 0.06                            |
| 68.0                                                                                     | 5L           | Q5L686016(*)_D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 8.7                                | 0.7                         | 0.06                            |
| 100.0                                                                                    | 6N           | Q6N107016(*)_D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 12.8                               | 0.6                         | 0.08                            |
| 150.0                                                                                    | 6R           | Q6R157016(*)_D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 19.2                               | 0.5                         | 0.08                            |
| U <sub>R</sub> = 25 V AT + 85 °C, Surge = 32.5 V . . . U <sub>C</sub> = 16 V AT + 125 °C |              |                |                |                |                             |              |             |                                    |                             |                                 |
| 1.0                                                                                      | 1A           | Q1A105025(*)_D | 4.5            | 7.1            | 10.5                        | 2.5          | 0.5         | 0.5                                | 7.7                         | 0.04                            |
| 1.5                                                                                      | 1A           | Q1A155025(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 6.8                         | 0.04                            |
| 2.2                                                                                      | 1B           | Q1B225025(*)_D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 5.4                         | 0.06                            |
| 3.3                                                                                      | 2C           | Q2C335025(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.7                                | 4.1                         | 0.06                            |
| 4.7                                                                                      | 2D           | Q2D475025(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.9                                | 2.9                         | 0.06                            |
| 6.8                                                                                      | 2E           | Q2E685025(*)_D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 1.4                                | 2.3                         | 0.06                            |
| 10.0                                                                                     | 3F           | Q3F106025(*)_D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 2.0                                | 1.8                         | 0.06                            |
| 15.0                                                                                     | 4H           | Q4H156025(*)_D | 6.5            | 11.5           | 14.5                        | 2.5          | 0.5         | 3.0                                | 1.4                         | 0.06                            |
| 22.0                                                                                     | 5J           | Q5J226025(*)_D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 4.4                                | 1.1                         | 0.06                            |
| 33.0                                                                                     | 5K           | Q5K336025(*)_D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 6.6                                | 0.9                         | 0.06                            |
| 47.0                                                                                     | 6M           | Q6M476025(*)_D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 9.4                                | 0.7                         | 0.06                            |
| 68.0                                                                                     | 6N           | Q6N686025(*)_D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 13.6                               | 0.6                         | 0.06                            |

**Note:**

(\*) Insert M for ± 20 % tolerance or K for ± 10 %

\_ \_ Lead style and packaging code, see lead style and packaging

Resin-Coated, Radial-Leaded  
Tantalum Capacitors

Vishay Sprague

| STANDARD RATINGS                                                                         |              |                  |                |                |                             |              |             |                                    |                             |                                 |
|------------------------------------------------------------------------------------------|--------------|------------------|----------------|----------------|-----------------------------|--------------|-------------|------------------------------------|-----------------------------|---------------------------------|
| C <sub>R</sub><br>(μF)                                                                   | CASE<br>CODE | PART NUMBER      | DIMENSIONS     |                |                             |              |             | MAX. DCL<br>AT<br>+ 20 °C,<br>(μA) | MAX. Z AT<br>100 kHz<br>(Ω) | MAX. DF<br>AT 120 Hz<br>+ 20 °C |
|                                                                                          |              |                  | D MAX.<br>(mm) | H MAX.<br>(mm) | H <sub>2</sub> MAX.<br>(mm) | RM<br>± 0.05 | d<br>± 0.05 |                                    |                             |                                 |
| U <sub>R</sub> = 35 V AT + 85 °C, Surge = 45.5 V . . . U <sub>C</sub> = 23 V AT + 125 °C |              |                  |                |                |                             |              |             |                                    |                             |                                 |
| 0.1                                                                                      | 1A           | Q1A104035(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 34.2                        | 0.04                            |
| 0.15                                                                                     | 1A           | Q1A154035(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 27.0                        | 0.04                            |
| 0.22                                                                                     | 1A           | Q1A224035(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 20.7                        | 0.04                            |
| 0.33                                                                                     | 1A           | Q1A334035(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 16.2                        | 0.04                            |
| 0.47                                                                                     | 1A           | Q1A474035(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 12.6                        | 0.04                            |
| 0.68                                                                                     | 1A           | Q1A684035(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 9.0                         | 0.04                            |
| 1.0                                                                                      | 1A           | Q1A105035(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 7.2                         | 0.04                            |
| 1.5                                                                                      | 1B           | Q1A155035(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 5.9                         | 0.04                            |
| 2.2                                                                                      | 2C           | Q2C225035(*)_ _D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.6                                | 4.5                         | 0.06                            |
| 3.3                                                                                      | 2D           | Q2D335035(*)_ _D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.9                                | 3.2                         | 0.06                            |
| 4.7                                                                                      | 2E           | Q2E475035(*)_ _D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 1.3                                | 2.3                         | 0.06                            |
| 6.8                                                                                      | 3F           | Q3F685035(*)_ _D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 1.9                                | 1.8                         | 0.06                            |
| 10.0                                                                                     | 3G           | Q3G106035(*)_ _D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 2.8                                | 1.4                         | 0.06                            |
| 15.0                                                                                     | 5J           | Q5J156035(*)_ _D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 4.2                                | 1.1                         | 0.06                            |
| 22.0                                                                                     | 5L           | Q5L226035(*)_ _D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 6.2                                | 0.9                         | 0.06                            |
| 33.0                                                                                     | 6M           | Q6M336035(*)_ _D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 9.2                                | 0.7                         | 0.06                            |
| 47.0                                                                                     | 6P           | Q6P476035(*)_ _D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 13.2                               | 0.6                         | 0.06                            |
| U <sub>R</sub> = 50 V AT + 85 °C, Surge = 65 V . . . U <sub>C</sub> = 33 V AT + 125 °C   |              |                  |                |                |                             |              |             |                                    |                             |                                 |
| 0.1                                                                                      | 1A           | Q1A104050(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 34.2                        | 0.04                            |
| 0.15                                                                                     | 1A           | Q1A154050(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 27.0                        | 0.04                            |
| 0.22                                                                                     | 1A           | Q1A224050(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 20.7                        | 0.04                            |
| 0.33                                                                                     | 1B           | Q1B334050(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 16.2                        | 0.04                            |
| 0.47                                                                                     | 1B           | Q1B474050(*)_ _D | 4.5            | 7.5            | 10.5                        | 2.5          | 0.5         | 0.5                                | 12.6                        | 0.04                            |
| 0.68                                                                                     | 2C           | Q2C684050(*)_ _D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.5                                | 9.0                         | 0.04                            |
| 1.0                                                                                      | 2D           | Q2D105050(*)_ _D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.5                                | 7.2                         | 0.04                            |
| 1.5                                                                                      | 2E           | Q2E155050(*)_ _D | 5.0            | 9.5            | 12.5                        | 2.5          | 0.5         | 0.6                                | 5.9                         | 0.04                            |
| 2.2                                                                                      | 3F           | Q3F225050(*)_ _D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 0.9                                | 4.5                         | 0.06                            |
| 3.3                                                                                      | 3G           | Q3G335050(*)_ _D | 6.0            | 10.5           | 13.5                        | 2.5          | 0.5         | 1.3                                | 3.2                         | 0.06                            |
| 4.7                                                                                      | 4H           | Q4H475050(*)_ _D | 6.5            | 11.5           | 14.5                        | 2.5          | 0.5         | 1.9                                | 2.3                         | 0.06                            |
| 6.8                                                                                      | 5J           | Q5J685050(*)_ _D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 2.7                                | 1.8                         | 0.06                            |
| 10.0                                                                                     | 5L           | Q5L106050(*)_ _D | 9.0            | 14.0           | 17.0                        | 5.0          | 0.5         | 4.0                                | 1.4                         | 0.06                            |
| 15.0                                                                                     | 6M           | Q6M156050(*)_ _D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 6.0                                | 1.1                         | 0.06                            |
| 22.0                                                                                     | 6P           | Q6P226050(*)_ _D | 9.5            | 17.0           | 20.0                        | 5.0          | 0.5         | 8.8                                | 0.9                         | 0.06                            |

**Note:**(\*) Insert M for  $\pm$  20 % tolerance or K for  $\pm$  10 %

\_\_ Lead style and packaging code, see lead style and packaging

**PERFORMANCE CHARACTERISTICS**

1. **Climatic Category:** 55/125/56 acc. to IEC
2. **Temperature Range:** - 55 °C up to + 125 °C with linear voltage derating to category voltage UC
3. **Rated Voltage, Category Voltage:** 3 V to 50 V;  
2 V to 33 V
4. **Surge Voltage:** 1.3 times of rated voltage at + 85 °C
5. **Reverse Voltage (Temporary):**  
15 % of the rated DC voltage at + 20 °C  
10 % of the rated DC voltage at + 55 °C  
5 % of the rated DC voltage at + 85 °C
6. **Rated Capacitance:** 0.1 µF to 330 µF
7. **Capacitance Tolerance:** ± 20 %, ± 10 %,
8. **Leakage Current in µA:** Measured at + 20 °C after 5 minutes: ≤ 0.008 x CR x UR or 0.5 µA, whichever is greater
9. **Dissipation Factor:** at 120 Hz and + 20 °C  
See table
10. **Impedance:** Measured at 100 kHz and + 20 °C  
See table.
11. **Permissible AC Voltage Stress:** The highest permissible AC voltage for the respective frequency may be taken from the brochure "General information".
16. **Characteristics at high and low temperatures** (the values shall not exceed the following limits)

The values apply for + 20 °C. For higher temperatures, the values have to be multiplied with the following factors:

| TEMPERATURE | FACTOR |
|-------------|--------|
| + 50 °C     | 0.7    |
| + 85 °C     | 0.5    |
| + 125 °C    | 0.3    |

Intermediate values can be obtained by linear interpolation.

For further notes on AC voltage stress: See general information

12. **Service life:** > 300.000 h <sup>(2)</sup>
13. **Failure percentage:** ≤ 0.3 % within 100 000 h <sup>(2)</sup>
14. **Failure rate (I):** ≤ 0.3 10<sup>-7</sup>/h = ≤ 30 fit <sup>(2)</sup>
15. **Failure criteria:** Catastrophic failure: Short circuit or interruption  
  
**Drift failure:** DC/C > + 5 - 15 %  
Z > 3 times initial limit value  
IR > 5 times initial value + 5 µA

**Note:** <sup>(2)</sup> related to UR, + 40 °C and a circuit resistance of ≥ 3 Ω/V

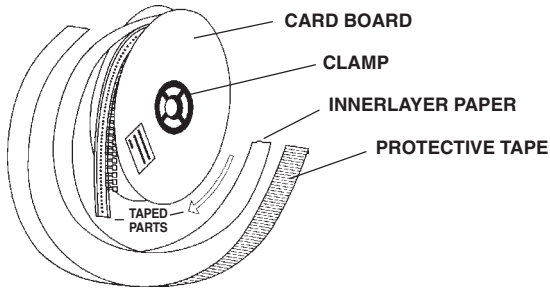
| TEST TEMPERATURE   | - 55 °C | + 20 °C                                                | + 85 °C                                               | + 125 °C                                                             |
|--------------------|---------|--------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------|
| ΔC/C < tanδ        | - 10 %  | -                                                      | + 12 %                                                | + 15 %                                                               |
| ≤ 1.5 µF           | 0.04    | 0.04                                                   | 0.04                                                  | 0.04                                                                 |
| < 10 µF            | 0.06    | 0.06                                                   | 0.06                                                  | 0.06                                                                 |
| < 100 µF           | 0.08    | 0.06                                                   | 0.08                                                  | 0.08                                                                 |
| ≥ 100 µF           | 0.10    | 0.08                                                   | 0.10                                                  | 0.10                                                                 |
| Leakage current IR | -       | ≤ 0.008 x CR x UR<br>or 0.5 µA<br>whichever is greater | ≤ 0.08 x CR x UR<br>or 5.0 µA<br>whichever is greater | ≤ 0.1 x CR x UR<br>or 6.25 µA<br>whichever is greater <sup>(1)</sup> |

**Note:**

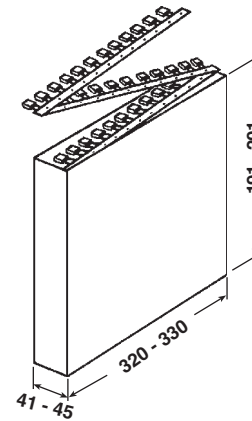
<sup>(1)</sup> Measured at category voltage

## LEAD STYLES AND PACKAGING

REEL PACKING



AMMO PACKAGING (mm)

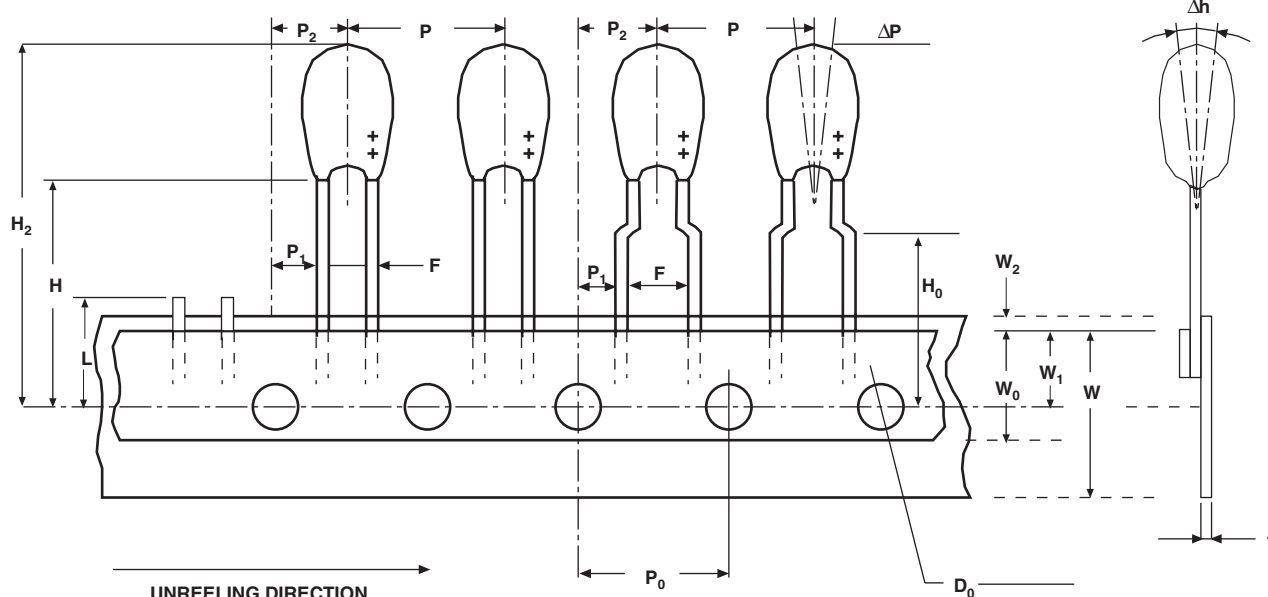


| CASE SIZE | CODE | RM in mm<br>± 0.5 | SPECIFICATION                                       | REMARKS                                                             |
|-----------|------|-------------------|-----------------------------------------------------|---------------------------------------------------------------------|
| 1 - 6     | 00   | 2.5 / 5           | Bulk                                                | Reel with positive pole in tape run direction in front is standard! |
| 1 - 6     | V0   | 5                 | Form DS, Bulk                                       |                                                                     |
| 1 - 4     | W0   | 2.5               | Reel, positive pole in front of unreeling direction |                                                                     |
| 1 - 4     | T0   | 2.5               | Reel, negative pole in front of unreeling direction |                                                                     |
| 1 - 4     | H0   | 2.5               | Ammo                                                |                                                                     |
| 1 - 5     | V2   | 5                 | Reel, positive pole in front of unreeling direction |                                                                     |
| 1 - 5     | R0   | 5                 | Reel, negative pole in front of unreeling direction |                                                                     |
| 1 - 5     | O8   | 5                 | Ammo                                                |                                                                     |
| 1 - 4     | C0   | 5                 | Style "L" Bulk                                      |                                                                     |

| CASE SIZE      | BULK<br>00, V0, C0 | REEL<br>W0, T0, V2, R0 | AMMO<br>H0, O8 |
|----------------|--------------------|------------------------|----------------|
| ETQW 1 A,B     | 500                | 2500                   | 2500           |
| ETQW 2 C,D,E   | 500                | 2000                   | 2000           |
| ETQW 3 F,G     | 500                | 1500                   | 1500           |
| ETQW 4 H       | 500                | 1500                   | 1500           |
| ETQW 5 J,K,L   | 100                | 500                    | 500            |
| ETQW 6 M,N,P,R | 100                | -                      | -              |

**TAPING ACCORDING TO IEC 286-2**

(meets IEC 286-2)



Dimensions for components on tape and tolerances:

| DESIGNATION                         | SYMBOL           | DIMENSIONS (mm)       |
|-------------------------------------|------------------|-----------------------|
| Holding tape width                  | W                | 18.0 (+ 1/- 0.5)      |
| Adhesive tape width                 | W <sub>0</sub>   | Min. 5.0              |
| Distance of components              | P                | 12.7 ± 1              |
| Hole center to component center     | P <sub>2</sub>   | 6.35 ± 1.3            |
| Hole center to lead                 | P <sub>1</sub>   | 5.1/3.8 ± 0.7         |
| Distance of body to hole center     | H <sup>(1)</sup> | 18.0 (+ 2/- 0)        |
| Distance of lead to hole center     | H <sub>0</sub>   | 16.0 ± 0.5            |
| Component upper edge to hole center | H <sub>1</sub>   | Max. 32.0             |
| Adhesive tape location              | W <sub>2</sub>   | Max. 3.0              |
| Hole location                       | W <sub>1</sub>   | 9.0 (+ 0.75/- 0.5)    |
| Distance of holes                   | P <sub>0</sub>   | 12.7 ± 0.3            |
| Hole diameter                       | D <sub>0</sub>   | 4.0 ± 0.3             |
| Lead diameter                       | d                | 0.5 ± 0.05            |
| Component alignment                 | Δh               | Max. ± 2.0            |
| Pitch                               | F                | 2.5/5.0 (+ 0.6/- 0.1) |
| Holding tape thickness              | t                | 0.5 ± 0.2             |
| Component alignment                 | ΔP               | Max. ± 1.3            |
| Length of snipped leads             | L                | Max. 11.0             |

**Note:**<sup>(1)</sup> also available: 16 mm and 20 mm taping according to DIN-IEC 286 part 2



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