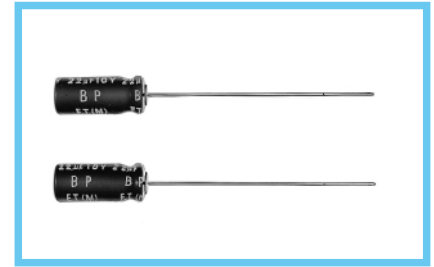
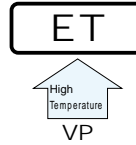


**ET** series Bi-Polarized, Wide Temperature Range



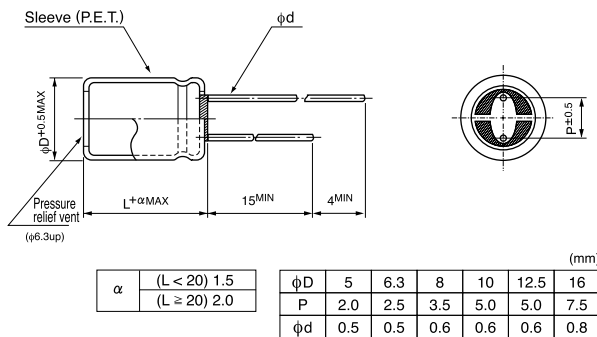
- Bi-polarized series for operations over wide temperature range of  $-55 \sim +105^{\circ}\text{C}$ .
- Adapted to the RoHS directive (2002/95/EC).



## Specifications

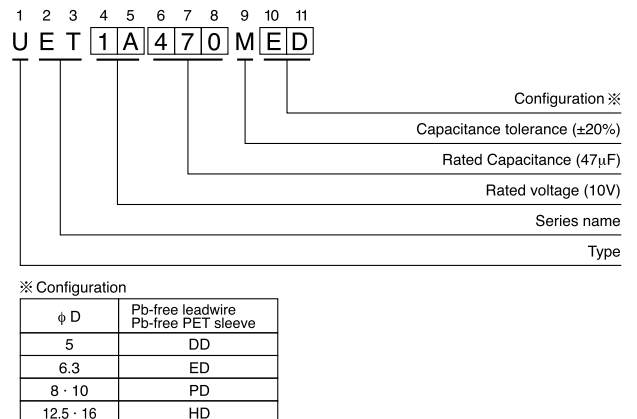
Item	Performance Characteristics																										
Category Temperature Range	$-55 \sim +105^{\circ}\text{C}$																										
Rated Voltage Range	6.3 ~ 100V																										
Rated Capacitance Range	0.47 ~ 1000 $\mu\text{F}$																										
Capacitance Tolerance	$\pm 20\%$ at 120Hz, 20°C																										
Leakage Current	After 5 minutes' application of rated voltage, leakage current is not more than 0.03CV or 3 ( $\mu\text{A}$ ), whichever is greater.																										
tan $\delta$	Measurement frequency : 120Hz, Temperature : 20°C																										
	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>tan <math>\delta</math> (MAX.)</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.09</td> </tr> </table>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	tan $\delta$ (MAX.)	0.24	0.20	0.16	0.16	0.14	0.12	0.10	0.09								
Rated voltage (V)	6.3	10	16	25	35	50	63	100																			
tan $\delta$ (MAX.)	0.24	0.20	0.16	0.16	0.14	0.12	0.10	0.09																			
Stability at Low Temperature	Measurement frequency : 120Hz																										
	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Impedance ratio Z-25°C / Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>ZT / Z20 (MAX.)</td> <td>Z-40°C / Z+20°C</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	Impedance ratio Z-25°C / Z+20°C	4	3	2	2	2	2	2	2	ZT / Z20 (MAX.)	Z-40°C / Z+20°C	8	6	4	4	3	3
Rated voltage (V)	6.3	10	16	25	35	50	63	100																			
Impedance ratio Z-25°C / Z+20°C	4	3	2	2	2	2	2	2																			
ZT / Z20 (MAX.)	Z-40°C / Z+20°C	8	6	4	4	3	3	3																			
Endurance	After 1000 hours' application of rated voltage at 105°C with the polarity inverted every 250 hours, capacitors meet the characteristic requirement listed at right. <table border="1"> <tr> <td>Capacitance change</td> <td>Within <math>\pm 20\%</math> of initial value</td> </tr> <tr> <td>tan <math>\delta</math></td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>Initial specified value or less</td> </tr> </table>	Capacitance change	Within $\pm 20\%$ of initial value	tan $\delta$	200% or less of initial specified value	Leakage current	Initial specified value or less																				
Capacitance change	Within $\pm 20\%$ of initial value																										
tan $\delta$	200% or less of initial specified value																										
Leakage current	Initial specified value or less																										
Shelf Life	After storing the capacitors under no load at 105°C for 1000 hours, and after performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they will meet the specified value for endurance characteristics listed above.																										
Marking	Printed with white color letter on black sleeve.																										

## Radial Lead Type



• Please refer to page 21 about the end seal configuration.

## Type numbering system (Example : 10V 47 $\mu\text{F}$ )



## Dimensions

Cap. ( $\mu\text{F}$ )	V	6.3		10		16		25		35		50		63		100	
		Code	OJ	1A	1C	1E	1V	1H	1J	2A							
0.47	R47											5 × 11	8			5 × 11	10
1	010											5 × 11	12			5 × 11	15
2.2	2R2											5 × 11	18			6.3 × 11	22
3.3	3R3											5 × 11	22	6.3 × 11	26	8 × 11.5	32
4.7	4R7							5 × 11	23	5 × 11	25	6.3 × 11	29	6.3 × 11	31	8 × 11.5	39
10	100				5 × 11	42	6.3 × 11	51	6.3 × 11	55	8 × 11.5	68	10 × 12.5	82	10 × 16	96	10 × 20
22	220				5 × 11	42	6.3 × 11	51	6.3 × 11	55	8 × 11.5	68	10 × 12.5	82	10 × 16	96	10 × 20
33	330	5 × 11	46	6.3 × 11	57	6.3 × 11	63	8 × 11.5	79	10 × 12.5	89	10 × 16	107	10 × 20	129	12.5 × 20	164
47	470	6.3 × 11	61	6.3 × 11	67	8 × 11.5	89	10 × 12.5	100	10 × 12.5	111	10 × 20	146	10 × 20	157	12.5 × 25	200
100	101	8 × 11.5	104	10 × 12.5	125	10 × 12.5	139	10 × 16	164	10 × 20	196	12.5 × 25	264	12.5 × 25	275	16 × 25	304
220	221	10 × 12.5	168	10 × 16	204	10 × 20	279	12.5 × 25	336	12.5 × 25	364	16 × 25	443	16 × 31.5	486		
330	331	10 × 16	229	10 × 20	275	12.5 × 20	346	12.5 × 25	414	16 × 25	493	16 × 31.5	593				
470	471	10 × 20	300	12.5 × 20	371	12.5 × 25	460	16 × 25	543	16 × 25	586						
1000	102	12.5 × 25	550	16 × 25	668	16 × 25	746	16 × 31.5	871								

Case size  $\phi D \times L$  (mm) | Rated ripple

Rated Ripple (mArms) at 105°C 120Hz

## Frequency coefficient of rated ripple current

Cap. ( $\mu\text{F}$ )	Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz ~
~ 47		0.75	1.00	1.35	1.57	2.00
100 ~ 470		0.80	1.00	1.23	1.34	1.50
1000		0.85	1.00	1.10	1.13	1.15

Please refer to page 21, 22, 23 about the formed or taped product spec.  
Please refer to page 3 for the minimum order quantity.