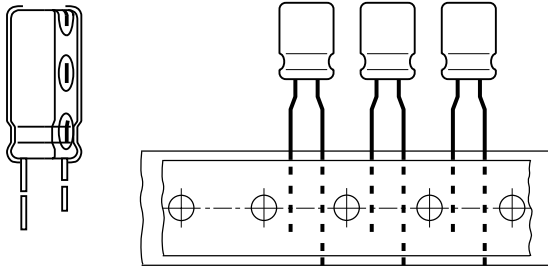


## Aluminum Capacitors Radial Style



Component outlines

**FEATURES**

- Polarized Aluminum electrolytic capacitor
- Small dimensions, high CU product
- Extremely low impedance and  $R_{ESR}$  values
- Very high AC rating
- Extremely long lifetime
- High temperature range


**RoHS  
COMPLIANT**
**APPLICATIONS**

- Industrial electronics, telecommunication systems, audio/video systems
- Highly professional switching power supply units
- Smoothing, filtering
- Portable and mobile units

**QUICK REFERENCE DATA**

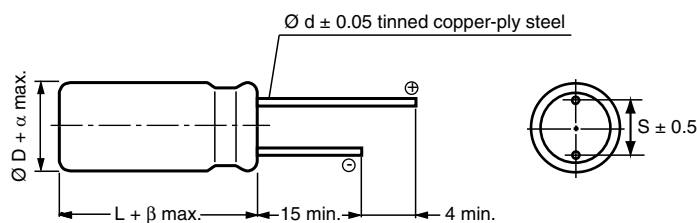
DESCRIPTION	UNIT	VALUE
Nominal case size ( $\varnothing$ D x L)	mm	5 x 11.5 to 16 x 40
Rated capacitance range $C_R$	$\mu$ F	10 to 8200
Capacitance tolerance	%	$\pm 20$
Rated voltage range	V	10 to 63
Category temperature range	$^{\circ}$ C	- 55 to + 105
Endurance test at upper category temperature	h	up to 8000
Based on sectional specification		IEC 60384/EN 130300
Climatic category IEC 60068		55/105/56

**SELECTION CHART FOR  $C_R$ ,  $U_R$  AND RELEVANT NOMINAL CASE SIZES ( $\varnothing$  D x L in mm)**

$C_R$ ( $\mu$ F)	RATED VOLTAGE (V)					
	10	16	25	35	50	63
10	→	→	→	→	→	5 x 11.5
18	→	→	→	→	5 x 11.5	6.3 x 11.5
27	→	→	→	5 x 11.5	-	-
33	→	→	→	→	→	6.3 x 15
39	→	→	5 x 11.5	→	6.3 x 11.5	-
47	→	→	→	→	→	8 x 12
56	→	5 x 11.5	→	6.3 x 11.5	6.3 x 15	10 x 12.5
68	→	→	→	→	8 x 12	8 x 15
82	5 x 11.5	→	6.3 x 11.5	6.3 x 15	8 x 15	8 x 20
100	→	→	→	8 x 12	10 x 16	10 x 20
120	→	6.3 x 11.5	6.3 x 15	8 x 12	10 x 16	10 x 20
150	→	→	8 x 12	→	→	10 x 25
180	6.3 x 11.5	6.3 x 15	10 x 12.5	8 x 15	10 x 20	10 x 30
220	6.3 x 15	→	8 x 15	10 x 16	10 x 25	12.5 x 20
270	→	8 x 12	→	→	→	12.5 x 25
330	8 x 12	8 x 15	8 x 20	10 x 20	12.5 x 20	16 x 20
390	10 x 12.5	→	→	10 x 25	→	12.5 x 30
470	8 x 15	10 x 16	10 x 20	12.5 x 20	12.5 x 25	12.5 x 35

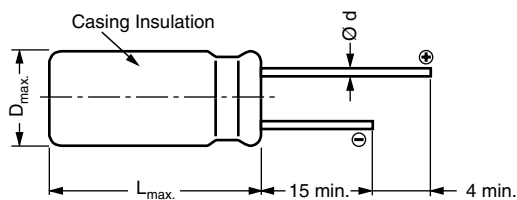
<b>SELECTION CHART FOR C<sub>R</sub>, U<sub>R</sub> AND RELEVANT NOMINAL CASE SIZES (∅ D x L in mm)</b>						
C <sub>R</sub> (μF)	RATED VOLTAGE (V)					
	10	16	25	35	50	63
560	→	→	10 x 25	12.5 x 20	12.5 x 30	12.5 x 40
680	8 x 20	10 x 20	→	12.5 x 25	12.5 x 35	16 x 30
820	→	10 x 25	10 x 30	→	12.5 x 40	16 x 35
1000	10 x 20	→	12.5 x 25	16 x 20	16 x 30	16 x 40
1200	10 x 25	10 x 30	→	12.5 x 35	16 x 35	-
1500	10 x 30	12.5 x 25	12.5 x 30	12.5 x 40	16 x 40	-
1800	12.5 x 20	→	12.5 x 35	16 x 30	-	-
2200	12.5 x 25	16 x 20	12.5 x 40	16 x 35	-	-
2700	12.5 x 30	12.5 x 35	16 x 30	16 x 40	-	-
3300	12.5 x 35	12.5 x 40	16 x 35	-	-	-
3900	12.5 x 40	16 x 30	16 x 40	-	-	-
4700	→	16 x 35	-	-	-	-
5600	16 x 30	16 x 40	-	-	-	-
6800	16 x 35	-	-	-	-	-
8200	16 x 40	-	-	-	-	-

**RADIAL STYLE: DIMENSIONS** in millimeters

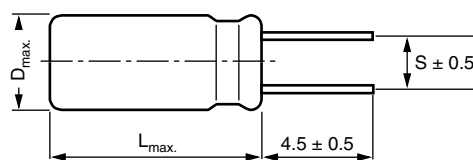


∅ D	5	6.3	8	10	12.5	16	18	22	25
S	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	12.5
∅ d	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0
β	1.5			2.0					
α	0.5							1.0	

**DIMENSIONS** in millimeters **AND AVAILABLE FORMS**



∅ D ≤ 16 long leads MALREKC00...



∅ D ≤ 16 shortened leads MALREKC05...  
(S = 2/2.5/3.5/5/7.5 mm)

**GENERAL NOTE**

- For Standard Packaging Quantity (SPQ) and Minimum Order Quantity (MOQ) please refer to our price list or contact customer service
- For other packaging forms please refer to Vishay Roederstein General Information



Aluminum Capacitors  
Radial Style

Vishay Roederstein

ELECTRICAL DATA	
SYMBOL	DESCRIPTION
$U_R$	rated voltage
$C_R$	rated capacitance at 120 Hz
$\tan \delta$	max. dissipation factor at 120 Hz
$Z$	max. impedance at 100 kHz
$I_R$	rated alternating current (rms) at 100 kHz and upper category temperature

**ORDERING EXAMPLE**

EKC 3300  $\mu$ F/25 V,  $\pm$  20 %, size: 16 x 35 mm

Leads: Long

Ordering code: MALREKC00JU433E00F

Leads: Short

Ordering code: MALREKC05...

**Note**

Unless otherwise specified, all electrical values at  $T_a = 20^\circ\text{C}$ ,  $P = 80$  to  $120$  kPa,  $RH = 45$  to  $75$  %.

ELECTRICAL DATA AND ORDERING INFORMATION							
$U_R$ (V)	$C_R$ 120 Hz ( $\mu$ F)	NOMINAL CASE SIZE $\varnothing D \times L$ (mm)	$\tan \delta$ 120 Hz	$Z$ 100 kHz/20 $^\circ\text{C}$ ( $\Omega$ )	$I_R$ 100 kHz/105 $^\circ\text{C}$ (mA)	WEIGHT (g)	CATALOG NUMBER (LONG LEADS)
10	82	5 x 11.5	0.19	0.75	163	0.50	MALREKC00AB282C00F
	180	6.3 x 11.5	0.19	0.35	273	0.80	MALREKC00BB318C00F
	220	6.3 x 15	0.19	0.25	390	1.20	MALREKC00BF322C00F
	330	8 x 12	0.19	0.17	445	1.00	MALREKC00PT333C00F
	390	10 x 12.5	0.19	0.12	625	1.90	MALREKC00DC339C00F
	470	8 x 15	0.19	0.13	555	1.50	MALREKC00PF347C00F
	680	8 x 20	0.19	0.095	740	2.00	MALREKC00PE368C00F
	1000	10 x 20	0.19	0.062	1040	3.00	MALREKC00DE410C00F
	1200	10 x 25	0.21	0.052	1260	4.00	MALREKC00DG412C00F
	1500	10 x 30	0.21	0.044	1440	4.80	MALREKC00DJ415C00F
	1800	12.5 x 20	0.21	0.046	1340	4.00	MALREKC00FE418C00F
	2200	12.5 x 25	0.23	0.034	1690	4.70	MALREKC00FG422C00F
	2700	12.5 x 30	0.23	0.030	1950	5.40	MALREKC00FJ427C00F
	3300	12.5 x 35	0.25	0.024	2220	5.90	MALREKC00FU433C00F
	3900	12.5 x 40	0.25	0.022	2390	6.40	MALREKC00FK439C00F
	5600	16 x 30	0.29	0.025	2350	8.80	MALREKC00JJ456C00F
	6800	16 x 35	0.31	0.022	2550	10.0	MALREKC00JU468C00F
8200	16 x 40	0.35	0.018	2900	11.0	MALREKC00JK482C00F	
16	56	5 x 11.5	0.16	0.75	163	0.50	MALREKC00AB256D00F
	120	6.3 x 11.5	0.16	0.35	273	0.80	MALREKC00BB312D00F
	180	6.3 x 15	0.16	0.25	390	0.80	MALREKC00BF318D00F
	270	8 x 12	0.16	0.17	445	1.00	MALREKC00PT327D00F
	330	8 x 15	0.16	0.13	555	1.50	MALREKC00PF333D00F
	470	10 x 16	0.16	0.084	825	2.40	MALREKC00DD347D00F
	680	10 x 20	0.16	0.062	1040	3.00	MALREKC00DE368D00F
	820	10 x 25	0.16	0.052	1260	4.00	MALREKC00DG382D00F
	1200	10 x 30	0.18	0.044	1440	4.80	MALREKC00DJ412D00F
	1500	12.5 x 25	0.18	0.034	1690	4.70	MALREKC00FG415D00F
	2200	16 x 20	0.20	0.038	1630	5.80	MALREKC00JE422D00F
	2700	12.5 x 35	0.20	0.024	2220	5.90	MALREKC00FU427D00F
	3300	12.5 x 40	0.22	0.022	2390	6.40	MALREKC00FK433D00F
	3900	16 x 30	0.22	0.025	2350	8.80	MALREKC00JJ439D00F
	4700	16 x 35	0.24	0.022	2550	10.0	MALREKC00JU447D00F
	5600	16 x 40	0.26	0.018	2900	11.0	MALREKC00JK456D00F

**ELECTRICAL DATA AND ORDERING INFORMATION**

$U_R$ (V)	$C_R$ 120 Hz ( $\mu$ F)	NOMINAL CASE SIZE $\varnothing$ D x L (mm)	$\tan \delta$ 120 Hz	Z 100 kHz/20 °C ( $\Omega$ )	$I_R$ 100 kHz/105 °C (mA)	WEIGHT (g)	CATALOG NUMBER (LONG LEADS)
25	39	5 x 11.5	0.14	0.75	163	0.50	MALREKC00AB239E00F
	82	6.3 x 11.5	0.14	0.35	273	0.80	MALREKC00BB282E00F
	120	6.3 x 15	0.14	0.25	390	1.20	MALREKC00BF312E00F
	150	8 x 12	0.14	0.17	445	1.00	MALREKC00PT315E00F
	180	10 x 12.5	0.14	0.12	625	1.90	MALREKC00DC318E00F
	220	8 x 15	0.14	0.13	555	1.50	MALREKC00PF322E00F
	330	8 x 20	0.14	0.095	740	2.00	MALREKC00PE333E00F
	470	10 x 20	0.14	0.062	1040	3.00	MALREKC00DE347E00F
	560	10 x 25	0.14	0.052	1260	4.00	MALREKC00DG356E00F
	820	10 x 30	0.14	0.044	1440	4.80	MALREKC00DJ382E00F
	1000	12.5 x 25	0.14	0.034	1690	4.70	MALREKC00FG410E00F
	1500	12.5 x 30	0.16	0.030	1950	5.40	MALREKC00FJ415E00F
	1800	12.5 x 35	0.16	0.024	2220	5.90	MALREKC00FU418E00F
	2200	12.5 x 40	0.18	0.022	2390	6.40	MALREKC00FK422E00F
	2700	16 x 30	0.18	0.025	2350	8.80	MALREKC00JJ427E00F
	3300	16 x 35	0.20	0.022	2550	10.0	MALREKC00JU433E00F
3900	16 x 40	0.20	0.018	2900	11.0	MALREKC00JK439E00F	
35	27	5 x 11.5	0.12	0.75	163	0.50	MALREKC00AB227F00F
	56	6.3 x 11.5	0.12	0.35	273	0.80	MALREKC00BB256F00F
	82	6.3 x 15	0.12	0.25	390	1.20	MALREKC00BF282F00F
	100	8 x 12	0.12	0.17	445	1.00	MALREKC00PT310F00F
	120	8 x 12	0.12	0.17	445	1.00	MALREKC00PT312F00F
	180	8 x 15	0.12	0.13	555	1.50	MALREKC00PF318F00F
	220	10 x 16	0.12	0.084	825	2.40	MALREKC00DD322F00F
	330	10 x 20	0.12	0.062	1040	3.00	MALREKC00DE333F00F
	390	10 x 25	0.12	0.052	1260	4.00	MALREKC00DG339F00F
	470	12.5 x 20	0.12	0.046	1340	4.00	MALREKC00FE347F00F
	560	12.5 x 20	0.12	0.046	1340	4.00	MALREKC00FE356F00F
	680	12.5 x 25	0.12	0.034	1690	4.70	MALREKC00FG368F00F
	1000	16 x 20	0.12	0.038	1630	5.80	MALREKC00JE410F00F
	1200	12.5 x 35	0.14	0.024	2220	5.90	MALREKC00FU412F00F
	1500	12.5 x 40	0.14	0.022	2390	6.40	MALREKC00FK415F00F
	1800	16 x 30	0.14	0.025	2350	8.80	MALREKC00JJ418F00F
2200	16 x 35	0.16	0.022	2550	10.0	MALREKC00JU422F00F	
2700	16 x 40	0.16	0.018	2900	11.0	MALREKC00JK427F00F	
50	18	5 x 11.5	0.10	1.20	129	0.50	MALREKC00AB218H00F
	39	6.3 x 11.5	0.10	0.54	219	0.80	MALREKC00BB239H00F
	56	6.3 x 15	0.10	0.34	310	1.20	MALREKC00BF256H00F
	68	8 x 12	0.10	0.30	340	1.00	MALREKC00PT268H00F
	82	8 x 15	0.10	0.20	470	1.50	MALREKC00PF282H00F
	100	10 x 16	0.10	0.13	755	2.40	MALREKC00DD310H00F



Aluminum Capacitors  
Radial Style

Vishay Roederstein

<b>ELECTRICAL DATA AND ORDERING INFORMATION</b>							
<b>U<sub>R</sub></b> (V)	<b>C<sub>R</sub></b> 120 Hz (µF)	<b>NOMINAL CASE SIZE</b> Ø D x L (mm)	<b>tan δ</b> 120 Hz	<b>Z</b> 100 kHz/20 °C (Ω)	<b>I<sub>R</sub></b> 100 kHz/105 °C (mA)	<b>WEIGHT</b> (g)	<b>CATALOG NUMBER</b> (LONG LEADS)
50	120	10 x 16	0.10	0.13	755	2.40	MALREKC00DD312H00F
	180	10 x 20	0.10	0.088	945	3.00	MALREKC00DE318H00F
	220	10 x 25	0.10	0.073	1150	4.00	MALREKC00DG322H00F
	330	12.5 x 20	0.10	0.054	1260	4.00	MALREKC00FE333H00F
	470	12.5 x 25	0.10	0.044	1490	4.70	MALREKC00FG347H00F
	560	12.5 x 30	0.10	0.039	1720	5.40	MALREKC00FJ356H00F
	680	12.5 x 35	0.10	0.033	1890	5.90	MALREKC00FU368H00F
	820	12.5 x 40	0.10	0.029	2030	6.40	MALREKC00FK382H00F
	1000	16 x 30	0.10	0.030	2150	8.80	MALREKC00JJ410H00F
	1200	16 x 35	0.12	0.027	2320	10.0	MALREKC00JU412H00F
	1500	16 x 40	0.12	0.024	2540	11.0	MALREKC00JK415H00F
63	10	5 x 11.5	0.10	1.90	103	0.50	MALREKC00AB210J00F
	18	6.3 x 11.5	0.10	1.00	161	0.80	MALREKC00BB218J00F
	33	6.3 x 15	0.10	0.61	233	1.20	MALREKC00BF233J00F
	47	8 x 12	0.10	0.47	274	1.00	MALREKC00PT247J00F
	56	10 x 12.5	0.10	0.27	418	1.90	MALREKC00DC256J00F
	68	8 x 15	0.10	0.34	360	1.50	MALREKC00PF268J00F
	82	8 x 20	0.10	0.21	525	2.00	MALREKC00PE282J00F
	100	10 x 20	0.10	0.16	650	3.00	MALREKC00DE310J00F
	120	10 x 20	0.10	0.16	650	3.00	MALREKC00DE312J00F
	150	10 x 25	0.10	0.13	783	4.00	MALREKC00DG315J00F
	180	10 x 30	0.10	0.10	960	4.80	MALREKC00DJ318J00F
	220	12.5 x 20	0.10	0.11	870	4.00	MALREKC00FE322J00F
	270	12.5 x 25	0.10	0.074	1150	4.70	MALREKC00FG327J00F
	330	16 x 20	0.10	0.085	1100	5.80	MALREKC00JE333J00F
	390	12.5 x 30	0.10	0.068	1280	5.40	MALREKC00FJ339J00F
	470	12.5 x 35	0.10	0.063	1390	5.90	MALREKC00FU347J00F
	560	12.5 x 40	0.10	0.051	1530	6.40	MALREKC00FK356J00F
	680	16 x 30	0.10	0.046	1720	8.80	MALREKC00JJ368J00F
	820	16 x 35	0.10	0.040	1910	10.0	MALREKC00JU382J00F
1000	16 x 40	0.10	0.036	2070	11.0	MALREKC00JK410J00F	

<b>LOW TEMPERATURE BEHAVIOR</b> (at 120Hz)		
<b>IMPEDANCE RATIO</b> Z (T2)/Z (T1)	<b>RATED VOLTAGE</b> (V)	
<b>T2/T1</b>	<b>10 ~ 50</b>	<b>63</b>
- 55 °C/+ 20 °C	3	6

**ADDITIONAL ELECTRICAL DATA**

PARAMETER	CONDITIONS	VALUE
<b>Current</b>		
Leakage current (Test conditions: $U_R$ , 20 °C)	After 2 minutes at $U_R$	$I_{L2} \leq 0.01 \times C_R \times U_R$ or 3 $\mu$ A (whichever is greater)
<b>Resistance</b>		
Equivalent series resistance (ESR)	Calculated from $\tan \delta_{\max}$ .	$ESR = \tan \delta / 2 \pi f C_R$

**MULTIPLIER OF RIPPLE CURRENT ( $I_R$ ) AS A FUNCTION OF FREQUENCY**

FREQUENCY (Hz)	$I_R$ MULTIPLIER				
	10 ~ 180 $\mu$ F	220 ~ 560 $\mu$ F	680 ~ 1800 $\mu$ F	2200 ~ 3900 $\mu$ F	4700 ~ 8200 $\mu$ F
120	0.40	0.50	0.60	0.75	0.85
1000	0.75	0.85	0.87	0.90	0.95
10 000	0.90	0.94	0.95	0.95	0.98
100 000	1.00	1.00	1.00	1.00	1.00

**TEST PROCEDURES AND REQUIREMENTS**

TEST	PROCEDURE (QUICK REFERENCE)	REQUIREMENTS
Load life	$T_{\text{amb}} = 105 \text{ }^\circ\text{C}$ $U_R$ and $I_R$ applied After 2000 hours $\varnothing 5$ , $\varnothing 6.3$ After 3000 hours $\varnothing 8$ After 5000 hours $\varnothing 10$ After 7000 hours $\varnothing 12.5$ After 8000 hours $\varnothing 16$ , $\varnothing 18$	$\Delta C/C$ : $\pm 20 \%$ of initial value $I_L \leq \text{spec. limit}$ $\tan \delta \leq 2 \times \text{spec. limit}$
Shelf life	No voltage applied After 1000 h After test: $U_R$ to be applied for 30 minutes 24 to 48 hours before measurement	$\Delta C/C$ : $\pm 20 \%$ of initial value $I_L \leq \text{spec. limit}$ $\tan \delta \leq 2 \times \text{spec. limit}$



## Disclaimer

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