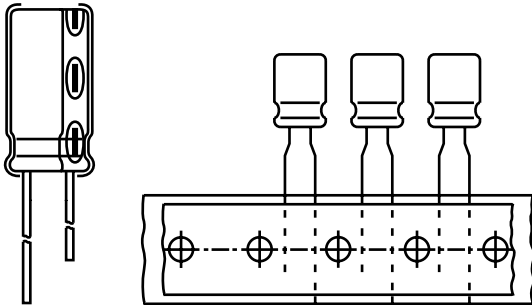




Aluminum Capacitors Radial Style



Component outlines

FEATURES

- Polarized aluminum electrolytic capacitor
- High CU product with miniature dimensions
- Temperature range 85 °C



RoHS
COMPLIANT

APPLICATIONS

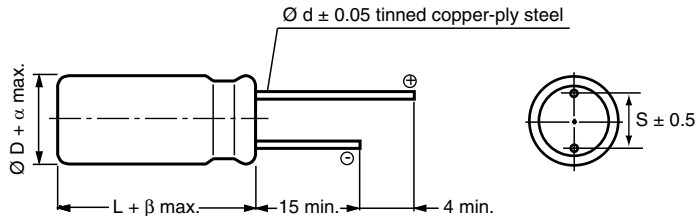
- General uses, audio/video systems, automotive electronics
- Filtering, smoothing, coupling, decoupling
- Small space requirement, high component density
- Portable and mobile units

Obsolete - please refer to: www.vishay.com/doc?28307

QUICK REFERENCE DATA		
DESCRIPTION	UNIT	VALUE
Nominal case size (Ø D x L)	mm	4 x 5 to 8 x 5
Rated capacitance range C _R	µF	0.10 to 220
Capacitance tolerance	%	± 20
Rated voltage range	V	6.3 to 63
Category temperature range	°C	- 40 to 85
Load life	h	2000
Based on sectional specification		IEC 60384-4/EN130300
Climatic category IEC 60068		40/85/56

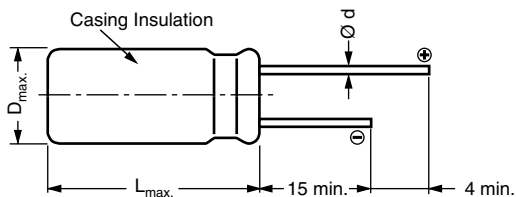
SELECTION CHART FOR C _R , U _R AND RELEVANT NOMINAL CASE SIZE (Ø D x L in mm)							
C _R (µF)	RATED VOLTAGE (V)						
	6.3	10	16	25	35	50	63
0.10	→	→	→	→	→	→	4 x 5
0.15	→	→	→	→	→	→	4 x 5
0.22	→	→	→	→	→	→	4 x 5
0.33	→	→	→	→	→	→	4 x 5
0.47	→	→	→	→	→	→	4 x 5
0.68	→	→	→	→	→	→	4 x 5
1.0	→	→	→	→	→	→	4 x 5
1.5	→	→	→	→	→	→	4 x 5
2.2	→	→	→	→	→	→	4 x 5
3.3	→	→	→	→	→	4 x 5	5 x 5
4.7	→	→	→	→	4 x 5	→	5 x 5
6.8	→	→	→	4 x 5	→	5 x 5	6.3 x 5
10	→	→	4 x 5	→	5 x 5	→	6.3 x 5
15	→	4 x 5	→	5 x 5	→	6.3 x 5	8 x 5
22	4 x 5	→	5 x 5	→	6.3 x 5	→	8 x 5
33	→	5 x 5	→	6.3 x 5	→	8 x 5	-
47	5 x 5	→	6.3 x 5	→	8 x 5	-	-
68	→	→	6.3 x 5	8 x 5	-	-	-
100	6.3 x 5	→	→	8 x 5	-	-	-
150	→	→	8 x 5	-	-	-	-
220	→	8 x 5	-	-	-	-	-

RADIAL STYLE: DIMENSIONS in millimeters

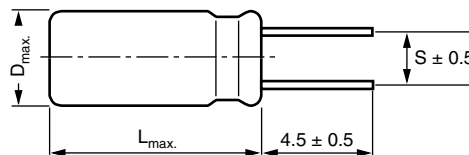


$\varnothing D$	4	5	6.3	8
S	1.5	2.0	2.5	2.5
$\varnothing d$	0.45	0.45	0.45	0.45
β	1.0			1.5
α	0.5			

DIMENSIONS in millimeters **AND AVAILABLE FORMS**



$\varnothing D \leq 8$ long leads MALREKF00...



$\varnothing D \leq 8$ shortened leads MALREKF05...
(S = 1.5/2.0/2.5 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
R_{ESR}	max. equivalent series resistance at 120 Hz
I_R	rated alternating current (RMS) at 120 Hz and

ORDERING EXAMPLE

EKF 47 μ F/35 V, \pm 20 %, size: 8 mm x 5 mm
Leads: Long
Ordering code: MALREKF00PP247F00K

Leads: Short
Ordering code: MALREKF05...

Note:

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

ELECTRICAL DATA AND ORDERING INFORMATION							
U_R (V)	C_R 120 Hz (μ F)	DIMENSIONS $\varnothing D \times L$ (mm)	$\tan \delta$ 120 Hz	R_{ESR} 120 Hz/20 $^\circ\text{C}$ (Ω)	I_R 120 Hz/85 $^\circ\text{C}$ (mA)	WEIGHT (g)	CATALOG NUMBER (Long Leads)
6.3	22	4 x 5	0.24	14.5	37	0.18	MALREKF00MP222B00K
	47	5 x 5	0.24	6.77	63	0.25	MALREKF00AP247B00K
	100	6.3 x 5	0.24	3.18	108	0.34	MALREKF00BP310B00K
10	15	4 x 5	0.20	17.7	34	0.18	MALREKF00MP215C00K
	33	5 x 5	0.20	8.04	58	0.25	MALREKF00AP233C00K
	220	8 x 5	0.20	1.21	208	0.50	MALREKF00PP322C00K
16	10	4 x 5	0.16	21.2	31	0.18	MALREKF00MP210D00K
	22	5 x 5	0.16	9.65	53	0.25	MALREKF00AP222D00K
	47	6.3 x 5	0.16	4.52	91	0.34	MALREKF00BP247D00K
	68	6.3 x 5	0.16	3.12	109	0.34	MALREKF00BP268D00K
	150	8 x 5	0.16	1.41	192	0.50	MALREKF00PP315D00K
25	6.8	4 x 5	0.13	25.4	28	0.18	MALREKF00MP168E00K
	15	5 x 5	0.13	11.5	49	0.25	MALREKF00AP215E00K
	33	6.3 x 5	0.13	5.22	84	0.34	MALREKF00BP233E00K
	68	8 x 5	0.13	2.54	143	0.50	MALREKF00BP268E00K
	100	8 x 5	0.13	1.72	174	0.50	MALREKF00PP310E00K
35	4.7	4 x 5	0.12	33.9	24	0.18	MALREKF00MP147F00K
	10	5 x 5	0.12	15.9	41	0.25	MALREKF00AP210F00K
	22	6.3 x 5	0.12	7.23	72	0.34	MALREKF00BP222F00K
	47	8 x 5	0.12	3.39	124	0.50	MALREKF00PP247F00K
50	3.3	4 x 5	0.09	36.2	24	0.18	MALREKF00MP133H00K
	6.8	5 x 5	0.09	17.6	39	0.25	MALREKF00AP168H00K
	15	6.3 x 5	0.09	7.96	68	0.34	MALREKF00BP215H00K
	33	8 x 5	0.09	3.62	120	0.50	MALREKF00PP233H00K
63	0.10	4 x 5	0.09	1194	4.1	0.18	MALREKF00MP010J00K
	0.15	4 x 5	0.09	796	5.0	0.18	MALREKF00MP015J00K
	0.22	4 x 5	0.09	543	6.1	0.18	MALREKF00MP022J00K
	0.33	4 x 5	0.09	362	7.5	0.18	MALREKF00MP033J00K
	0.47	4 x 5	0.09	254	8.9	0.18	MALREKF00MP047J00K
	0.68	4 x 5	0.09	176	11	0.18	MALREKF00MP068J00K
	1.0	4 x 5	0.09	119	13	0.18	MALREKF00MP110J00K
	1.5	4 x 5	0.09	79.6	16	0.18	MALREKF00MP115J00K
	2.2	4 x 5	0.09	54.3	19	0.18	MALREKF00MP122J00K
	3.3	5 x 5	0.09	36.2	27	0.25	MALREKF00AP133J00K
	4.7	5 x 5	0.09	25.4	33	0.25	MALREKF00AP147J00K
	6.8	6.3 x 5	0.09	17.6	46	0.34	MALREKF00BP168J00K
	10	6.3 x 5	0.09	11.9	56	0.34	MALREKF00BP210J00K
	15	8 x 5	0.09	7.96	81	0.50	MALREKF00PP215J00K
22	8 x 5	0.09	5.43	98	0.50	MALREKF00PP222J00K	

EKF

Vishay Roederstein

Aluminum Capacitors
Radial Style



LOW TEMPERATURE BEHAVIOUR				
IMPEDANCE RATIO Z (T2) / Z (T1)	RATED VOLTAGE (V)			
T2/T1	6.3	10	16	25 ~ 63
- 25 °C/+ 20 °C	4	3	2	2
- 40 °C/+ 20 °C	8	6	4	4

ADDITIONAL ELECTRICAL DATA		
PARAMETER	CONDITIONS	VALUE
Current		
Leakage current (Test conditions: U_R , 20 °C)	after 1 minute at U_R	$I_{L1} \leq 0.01 \times C_R \times U_R$ or 4 μ A (whichever is greater)
Resistance		
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 FOR $U_R \leq 100$ V		
	$C_R \leq 47 \mu F$	$C_R = 68 \mu F$ to $680 \mu F$	$C_R \geq 1000 \mu F$
50	0.75	0.80	0.85
120	1.00	1.00	1.00
300	1.35	1.25	1.10
1000	1.55	1.35	1.15
$\geq 10\ 000$	2.00	1.50	1.15

TEST PROCEDURES AND REQUIREMENTS		
TEST	PROCEDURE (QUICK REFERENCE)	REQUIREMENTS
Load life	$T_{amb} = 85$ °C U_R and I_R applied After 2000 hours	$\Delta C/C: \pm 20$ % of initial value $I_L \leq$ spec. limit $\tan \delta \leq 2 \times$ spec. limit
Shelf life	No voltage applied After 1000 hours After test: U_R to be applied for 30 minutes 24 hours to 48 hours before measurement	$\Delta C/C: \pm 20$ % of initial value $I_L \leq$ spec. limit $\tan \delta \leq 2 \times$ spec. limit



Disclaimer

All product specifications and data are subject to change without notice.

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 herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

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.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.