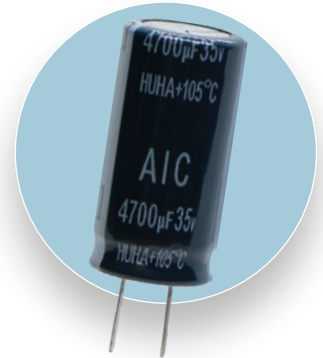


# HUHA · Radial · 3000 h/105 °C

## Standard Performances

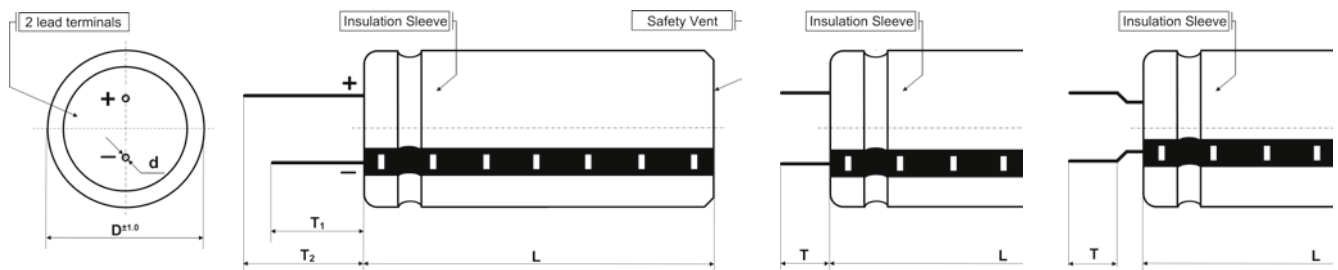
### > Specifications · Spezifikationen

Items	Characteristics
Temperature range	-40 °C ~ + 105 °C for rated voltage 6.3–250 V -25 °C ~ + 105 °C for rated voltage 350–500 V
Capacitance tolerance (at 20 °C)	Standard +/- 20% at 20 °C
Surge voltage	Repetitive max. 30 sec per 6 Minutes, 1000 times
Leakage current max. $I_L$ (20 °C, 1 min)	Refer to the specific item value in product table
Useful life	3000 hours at 105 °C; $I_r, V_r$
Shelf life	1000 hours at 105 °C, $I_r = V_r = 0$
Reference standards	IEC 60384-4
Vibration	0.75 mm, 10...55 Hz, 10 g, 3x2 h
Product Compliance	RoHS, REACH, Conflict Minerals a.o. - refer to p. 14–15



### > Outline Drawings · Bauformen

Refer to page 7 for available terminal shapes and dimensions. · Auf Seite 7 finden Sie die verfügbaren Bauformen und Maße.



### > Product Code · Bestellbezeichnung

**Example:** Series HUHA · 160 V · 220 µF ± 20 % · 16x35.5 mm · Long Lead · without plate

**HUHA**

Series name

**2C**

Capacitance code

The first two digits are significant.  
The last digit indicates the number  
of following zeros in µF.

**221**

Capacitance  
tolerance

M : ± 20 %  
K : ± 10 %  
Q : -10 % +30 %  
R : -0 % +20 %  
L : ± 15 %  
V : -10 % +20 %

**M**

**L**

Terminal code

L: long lead  
C: cut 4.5 mm  
D: cut 4.0 mm  
E: cut 3.5 mm  
F: cut 3.0 mm  
T: Taped

**U S4**

**WPEC**

Outer design code

WPEC: PET sleeve without plate (standard)  
[with plate available on request]

Rated voltage code			
Code	L	Code	L
2C	160V	2G	400V
2K	180V	2P	415V
2D	200V	2X	420V
2E	250V	2W	450V
2V	350V	2H	500V
2J	385V		

Dimension			
Diameter (mm)		Length (mm)	
O	5	S0	< 16
P	6.3	S1	20
Q	8	S2	25–29
R	10	S3	30–34
S	12.5	S4	35–39
U	16	S5	40–44
V	18	S6	45–49
W	20	S7	50
X	22	S8	55
		S9	60

Rated Voltage (Surge Voltage)  $V_r$ [V DC]	Capacitance  $C_r$ [μF]	Ripple Current at 105°C/100Hz $I_r$ [A RMS]	ESR max at 20°C/100Hz [Ω]	Dissipation Factor at 20°C/100Hz Tan δ	Leakage current after 1min at 20°C $I_{leak}$ [mA]	DxL  [mm]	Product Code  # = variable value, see terminal code in the product code
<b>6.3 VDC</b> Code: 0J  Surge Voltage 200 VDC	33	0.105	8.84	0.22	0.003	5x11.5	HUHA0J330M#OS0WPEC
	47	0.120	6.21	0.22	0.003	5x11.5	HUHA0J470M#OS0WPEC
	100	0.130	2.92	0.22	0.01	5x11.5	HUHA0J101M#OS0WPEC
	220	0.180	1.33	0.22	0.01	5x11.5	HUHA0J221M#OS0WPEC
		0.180	1.33	0.22	0.01	6.3x11.5	HUHA0J221M#PS0WPEC
	330	0.220	0.90	0.22	0.02	6.3x11.5	HUHA0J331M#PS0WPEC
		0.250	0.62	0.22	0.03	6.3x11.5	HUHA0J471M#PS0WPEC
	470	0.315	0.62	0.22	0.03	8x11.5	HUHA0J471M#QS0WPEC
		0.435	0.29	0.22	0.06	8x11.5	HUHA0J102M#QS0WPEC
	1 000	0.500	0.29	0.22	0.06	10x12.5	HUHA0J102M#RS0WPEC
		0.765	0.15	0.24	0.14	10x20	HUHA0J222M#RS1WPEC
	2 200	1.000	0.15	0.24	0.14	12.5x20	HUHA0J222M#SS1WPEC
		0.882	0.11	0.26	0.21	10x20	HUHA0J332M#RS1WPEC
	3 300	1.050	0.11	0.26	0.21	12.5x20	HUHA0J332M#SS1WPEC
		1.120	0.08	0.28	0.30	12.5x20	HUHA0J472M#SS1WPEC
	4 700	1.670	0.08	0.28	0.30	16x25	HUHA0J472M#US2WPEC
		1.380	0.06	0.32	0.43	12.5x20	HUHA0J682M#SS1WPEC
	6 800	1.740	0.06	0.32	0.43	16x25	HUHA0J682M#US2WPEC
		1.750	0.05	0.40	0.63	16x25	HUHA0J103M#US2WPEC
	10 000	2.110	0.05	0.40	0.63	16x31.5	HUHA0J103M#US3WPEC
2.040		0.05	0.50	0.95	16x35.5	HUHA0J153M#US4WPEC	
15 000	2.580	0.05	0.50	0.95	18x35.5	HUHA0J153M#VS4WPEC	
	22	0.092	11.50	0.19	0.003	5x11.5	HUHA1A220M#OS0WPEC
33	0.105	7.64	0.19	0.003	5x11.5	HUHA1A330M#OS0WPEC	
47	0.120	5.40	0.19	0.005	5x11.5	HUHA1A470M#OS0WPEC	
100	0.130	2.52	0.19	0.01	5x11.5	HUHA1A101M#OS0WPEC	
220	0.220	1.15	0.19	0.02	6.3x11.5	HUHA1A221M#PS0WPEC	
	0.230	0.76	0.19	0.03	6.3x11.5	HUHA1A331M#PS0WPEC	
330	0.265	0.76	0.19	0.03	8x11.5	HUHA1A331M#QS0WPEC	
	0.315	0.54	0.19	0.05	8x11.5	HUHA1A471M#QS0WPEC	
1 000	0.500	0.25	0.19	0.10	10x12.5	HUHA1A102M#RS0WPEC	
	0.615	0.25	0.19	0.10	10x16	HUHA1A102M#RS0WPEC	
2 200	0.761	0.13	0.21	0.22	10x20	HUHA1A222M#RS1WPEC	
	1.050	0.13	0.21	0.22	12.5x20	HUHA1A222M#SS1WPEC	
3 300	1.010	0.09	0.23	0.33	12.5x20	HUHA1A332M#SS1WPEC	
	1.300	0.09	0.23	0.33	12.5x25	HUHA1A332M#SS2WPEC	
4 700	1.250	0.07	0.25	0.47	12.5x25	HUHA1A472M#SS2WPEC	
	1.740	0.07	0.25	0.47	16x25	HUHA1A472M#US2WPEC	
6 800	1.570	0.06	0.29	0.68	16x25	HUHA1A682M#US2WPEC	
	2.110	0.06	0.29	0.68	16x31.5	HUHA1A682M#US3WPEC	
10 000	1.910	0.05	0.37	1.00	16x35.5	HUHA1A103M#US4WPEC	
	2.580	0.05	0.37	1.00	18x35.5	HUHA1A103M#VS4WPEC	

Additional designs on request · Weitere Designs auf Anfrage

Rated Voltage (Surge Voltage)  $V_r$ [V DC]	Capacitance  $C_r$ [ $\mu$ F]	Ripple Current at 105°C/100Hz $I_r$ [A RMS]	ESR max at 20°C/100Hz [ $\Omega$ ]	Dissipation Factor at 20°C/100Hz $\tan \delta$	Leakage current after 1min at 20°C $I_{leak}$ [mA]	DxL  [mm]	Product Code  # = variable value, see terminal code in the product code	
<b>16 VDC</b> Code: 1C  Surge Voltage 200 VDC	10	0.092	21.22	0.16	0.003	5x11.5	HUHA1C100M#OS0WPEC	
	22	0.105	9.70	0.16	0.004	5x11.5	HUHA1C220M#OS0WPEC	
	33	0.120	6.43	0.16	0.01	5x11.5	HUHA1C330M#OS0WPEC	
	47	0.130	4.52	0.16	0.01	5x11.5	HUHA1C470M#OS0WPEC	
	100	0.150	2.12	0.16	0.16	0.02	5x11.5	HUHA1C101M#OS0WPEC
		0.220	2.12	0.16	0.16	0.02	6.3x11.5	HUHA1C101M#PS0WPEC
	220	0.250	0.97	0.16	0.16	0.04	6.3x11.5	HUHA1C221M#PS0WPEC
		0.290	0.97	0.16	0.16	0.04	8x11.5	HUHA1C221M#QS0WPEC
	330	0.315	0.64	0.16	0.05	8x11.5	HUHA1C331M#QS0WPEC	
	470	0.350	0.45	0.16	0.08	0.08	8x11.5	HUHA1C471M#QS0WPEC
		0.500	0.45	0.16	0.08	0.08	10x12.5	HUHA1C471M#RS0WPEC
	1000	0.610	0.21	0.16	0.16	0.16	10x16	HUHA1C102M#RS0WPEC
		0.825	0.21	0.16	0.16	0.16	10x20	HUHA1C102M#RS1WPEC
	2 200	0.961	0.11	0.18	0.35	0.35	12.5x20	HUHA1C222M#SS1WPEC
		1.300	0.11	0.18	0.35	0.35	12.5x25	HUHA1C222M#SS2WPEC
	3 300	1.200	0.08	0.20	0.53	0.53	12.5x25	HUHA1C332M#SS2WPEC
		1.740	0.08	0.20	0.53	0.53	16x25	HUHA1C332M#US2WPEC
	4 700	1.490	0.06	0.22	0.75	0.75	16x25	HUHA1C472M#US2WPEC
		2.110	0.06	0.22	0.75	0.75	16x31.5	HUHA1C472M#US3WPEC
	6 800	1.830	0.05	0.26	1.09	1.09	16x35.5	HUHA1C682M#US4WPEC
2.580		0.05	0.26	1.09	1.09	18x35.5	HUHA1C682M#VS4WPEC	
<b>25 VDC</b> Code: 1E  Surge Voltage 200 VDC	4.7	0.085	39.51	0.14	0.003	5x11.5	HUHA1E4R7M#OS0WPEC	
	10	0.092	18.60	0.14	0.003	5x11.5	HUHA1E100M#OS0WPEC	
	22	0.105	8.44	0.14	0.01	5x11.5	HUHA1E220M#OS0WPEC	
	33	0.120	5.63	0.14	0.01	5x11.5	HUHA1E330M#OS0WPEC	
	47	0.130	4.00	0.14	0.01	5x11.5	HUHA1E470M#OS0WPEC	
	100	0.220	1.90	0.14	0.03	6.3x11.5	HUHA1E101M#PS0WPEC	
	220	0.315	0.85	0.14	0.06	8x11.5	HUHA1E221M#QS0WPEC	
	330	0.500	0.56	0.14	0.08	10x12.5	HUHA1E331M#RS0WPEC	
	470	0.429	0.40	0.14	0.12	0.12	10x12.5	HUHA1E471M#RS0WPEC
		0.615	0.40	0.14	0.12	0.12	10x16	HUHA1E471M#RS0WPEC
	1 000	0.705	0.19	0.14	0.25	0.25	10x20	HUHA1E102M#RS1WPEC
		1.050	0.19	0.14	0.25	0.25	12.5x20	HUHA1E102M#SS1WPEC
	2 200	1.740	0.10	0.16	0.55	0.55	16x25	HUHA1E222M#US2WPEC
	3 300	1.440	0.07	0.18	0.83	0.83	16x25	HUHA1E332M#US2WPEC
		2.110	0.07	0.18	0.83	0.83	16x31.5	HUHA1E332M#US3WPEC
	4 700	1.880	0.06	0.20	1.18	1.18	16x31.5	HUHA1E472M#US3WPEC
2.580		0.06	0.20	1.18	1.18	18x35.5	HUHA1E472M#VS4WPEC	
<b>35 VDC</b> Code: 1V  Surge Voltage 200 VDC	4.7	0.092	33.90	0.12	0.003	5x11.5	HUHA1V4R7M#OS0WPEC	
	10	0.105	15.92	0.12	0.004	5x11.5	HUHA1V100M#OS0WPEC	
	22	0.120	7.24	0.12	0.01	5x11.5	HUHA1V220M#OS0WPEC	
	33	0.130	4.82	0.12	0.01	5x11.5	HUHA1V330M#OS0WPEC	
	47	0.090	3.39	0.12	0.02	0.02	5x11.5	HUHA1V470M#OS0WPEC
		0.220	3.40	0.12	0.02	0.02	6.3x11.5	HUHA1V470M#PS0WPEC

Additional designs on request · Weitere Designs auf Anfrage

Rated Voltage (Surge Voltage)  $V_r$ [V DC]	Capacitance  $C_r$ [ $\mu$ F]	Ripple Current at 105°C/100Hz $I_r$ [A RMS]	ESR max at 20°C/100Hz [ $\Omega$ ]	Dissipation Factor at 20°C/100Hz Tan $\delta$	Leakage current after 1min at 20°C $I_{leak}$ [mA]	DxL  [mm]	Product Code  # = variable value, see terminal code in the product code	
<b>35 VDC</b> Code: 1V  Surge Voltage 200 VDC	100	0.151	1.59	0.12	0.04	6.3x11.5	HUHA1V101M#PS0WPEC	
		0.315	1.60	0.12	0.04	8x11.5	HUHA1V101M#QS0WPEC	
	220	0.500	0.72	0.12	0.08	10x12.5	HUHA1V221M#RS0WPEC	
		0.384	0.48	0.12	0.12	10x12.5	HUHA1V331M#RS0WPEC	
	330	0.615	0.48	0.12	0.12	10x16	HUHA1V331M#RS0WPEC	
		0.470	0.34	0.12	0.16	10x16	HUHA1V471M#RS0WPEC	
	470	0.825	0.34	0.12	0.16	10x20	HUHA1V471M#RS1WPEC	
		0.857	0.16	0.12	0.35	12.5x20	HUHA1V102M#SS1WPEC	
	1 000	1.300	0.16	0.12	0.35	12.5x25	HUHA1V102M#SS2WPEC	
		1.380	0.09	0.14	0.77	16x25	HUHA1V222M#US2WPEC	
	2 200	2.110	0.09	0.14	0.77	16x31.5	HUHA1V222M#US3WPEC	
		1.780	0.07	0.16	1.16	16x35.5	HUHA1V332M#US4WPEC	
	3 300	2.580	0.07	0.16	1.16	18x35.5	HUHA1V332M#VS4WPEC	
		2.120	0.05	0.18	1.65	18x35.5	HUHA1V472M#VS4WPEC	
	<b>50 VDC</b> Code: 1H  Surge Voltage 200 VDC	0.10	0.010	1327.00	0.10	0.003	5x11.5	HUHA1H0R1M#OS0WPEC
		0.22	0.015	603.00	0.10	0.003	5x11.5	HUHA1H0R2M#OS0WPEC
0.33		0.018	402.00	0.10	0.003	5x11.5	HUHA1H0R3M#OS0WPEC	
0.47		0.023	282.19	0.10	0.003	5x11.5	HUHA1H0R4M#OS0WPEC	
1.0		0.035	133.00	0.10	0.003	5x11.5	HUHA1H1R0M#OS0WPEC	
2.2		0.053	60.29	0.10	0.003	5x11.5	HUHA1H2R2M#OS0WPEC	
3.3		0.065	40.19	0.10	0.003	5x11.5	HUHA1H3R3M#OS0WPEC	
4.7		0.082	28.22	0.10	0.003	5x11.5	HUHA1H4R7M#OS0WPEC	
10		0.100	13.26	0.10	0.01	5x11.5	HUHA1H100M#OS0WPEC	
22		0.125	6.03	0.10	0.01	5x11.5	HUHA1H220M#OS0WPEC	
33		0.090	4.02	0.10	0.02	5x11.5	HUHA1H330M#OS0WPEC	
		0.195	4.02	0.10	0.02	6.3x11.5	HUHA1H330M#PS0WPEC	
47		0.245	2.82	0.10	0.02	6.3x11.5	HUHA1H470M#PS0WPEC	
		0.385	1.33	0.10	0.05	8x11.5	HUHA1H101M#QS0WPEC	
220		0.314	0.60	0.10	0.11	10x12.5	HUHA1H221M#RS0WPEC	
		0.505	0.60	0.10	0.11	10x16	HUHA1H221M#RS0WPEC	
330		0.421	0.40	0.10	0.17	10x16	HUHA1H331M#RS0WPEC	
		0.675	0.40	0.10	0.17	10x20	HUHA1H331M#RS1WPEC	
470		0.895	0.28	0.10	0.24	12.5x20	HUHA1H471M#SS1WPEC	
1 000		1.495	0.13	0.10	0.50	16x25	HUHA1H102M#US2WPEC	
2 200	1.660	0.07	0.12	1.10	16x35.5	HUHA1H222M#US4WPEC		
	2.190	0.07	0.12	1.10	18x35.5	HUHA1H222M#VS4WPEC		
<b>63 VDC</b> Code: 1J  Surge Voltage 200 VDC	4.7	0.074	25.40	0.09	0.003	5x11.5	HUHA1J4R7M#OS0WPEC	
	10	0.095	12.00	0.09	0.01	5x11.5	HUHA1J100M#OS0WPEC	
	22	0.130	5.43	0.09	0.01	6.3x11.5	HUHA1J220M#PS0WPEC	
	33	0.160	4.00	0.09	0.02	6.3x11.5	HUHA1J330M#PS0WPEC	
		0.120	2.54	0.09	0.03	6.3x11.5	HUHA1J470M#PS0WPEC	
	47	0.305	2.54	0.09	0.03	8x11.5	HUHA1J470M#QS0WPEC	
		0.395	1.20	0.09	0.06	10x12.5	HUHA1J101M#RS0WPEC	
	220	0.335	0.54	0.09	0.14	10x16	HUHA1J221M#RS0WPEC	

Additional designs on request · Weitere Designs auf Anfrage

Rated Voltage (Surge Voltage)  $V_r$ [V DC]	Capacitance  $C_r$ [ $\mu$ F]	Ripple Current at 105°C/100Hz $I_r$ [A RMS]	ESR max at 20°C/100Hz [ $\Omega$ ]	Dissipation Factor at 20°C/100Hz $\tan \delta$	Leakage current after 1min at 20°C $I_{leak}$ [mA]	DxL  [mm]	Product Code  # = variable value, see terminal code in the product code
<b>63 VDC Code: 1J</b>  Surge Voltage 200 VDC	220	0.505	0.54	0.09	0.14	10x20	HUHA1J221M#RS1WPEC
	330	0.510	0.36	0.09	0.21	10x20	HUHA1J331M#RS1WPEC
		0.660	0.36	0.09	0.21	12.5x20	HUHA1J331M#SS1WPEC
	470	0.640	0.25	0.09	0.30	12.5x20	HUHA1J471M#SS1WPEC
		0.850	0.25	0.09	0.30	12.5x25	HUHA1J471M#SS2WPEC
	1 000	0.930	0.12	0.09	0.63	16x25	HUHA1J102M#US2WPEC
1.430		0.12	0.09	0.63	16x31.5	HUHA1J102M#US3WPEC	
<b>100 VDC Code: 2A</b>  Surge Voltage 200 VDC	0.47	0.030	226.00	0.08	0.003	5x11.5	HUHA2A0R4M#OS0WPEC
	1.0	0.045	106.10	0.08	0.003	5x11.5	HUHA2A1R0M#OS0WPEC
	2.2	0.060	48.23	0.08	0.003	5x11.5	HUHA2A2R2M#OS0WPEC
	3.3	0.067	32.15	0.08	0.003	5x11.5	HUHA2A3R3M#OS0WPEC
	4.7	0.075	23.00	0.08	0.005	5x11.5	HUHA2A4R7M#OS0WPEC
	10	0.110	11.00	0.08	0.01	6.3x11.5	HUHA2A100M#PS0WPEC
		0.093	4.82	0.08	0.02	6.3x11.5	HUHA2A220M#PS0WPEC
	22	0.165	5.00	0.08	0.02	8x11.5	HUHA2A220M#QS0WPEC
		0.130	3.22	0.08	0.03	8x11.5	HUHA2A330M#QS0WPEC
	33	0.305	3.22	0.08	0.03	10x12.5	HUHA2A330M#RS0WPEC
		0.165	2.26	0.08	0.05	10x12.5	HUHA2A470M#RS0WPEC
	47	0.320	2.30	0.08	0.05	10x16	HUHA2A470M#RS0WPEC
		0.265	1.06	0.08	0.10	10x20	HUHA2A101M#RS1WPEC
	100	0.585	1.10	0.08	0.10	12.5x20	HUHA2A101M#SS1WPEC
		0.440	0.48	0.08	0.22	12.5x25	HUHA2A221M#SS2WPEC
	220	1.120	0.48	0.08	0.22	16x25	HUHA2A221M#US2WPEC
1.290		0.32	0.08	0.33	16x25	HUHA2A331M#US2WPEC	
470	1.350	0.23	0.08	0.47	16x31.5	HUHA2A471M#US3WPEC	
<b>160 VDC Code: 2C</b>  Surge Voltage 200 VDC	0.47	0.012	423.50	0.15	0.05	6.3x11.5	HUHA2C0R4M#PS0WPEC
	1.0	0.018	199.00	0.15	0.06	6.3x11.5	HUHA2C1R0M#PS0WPEC
	2.2	0.026	90.50	0.15	0.08	6.3x11.5	HUHA2C2R2M#PS0WPEC
	3.3	0.028	60.29	0.15	0.09	6.3x11.5	HUHA2C3R3M#PS0WPEC
		0.037	60.30	0.15	0.09	8x11.5	HUHA2C3R3M#QS0WPEC
	4.7	0.034	42.33	0.15	0.12	6.3x11.5	HUHA2C4R7M#PS0WPEC
		0.044	42.33	0.15	0.12	8x11.5	HUHA2C4R7M#QS0WPEC
	10	0.058	19.90	0.15	0.16	8x11.5	HUHA2C100M#QS0WPEC
		0.075	19.90	0.15	0.16	10x12.5	HUHA2C100M#RS0WPEC
	22	0.135	9.05	0.15	0.24	10x16	HUHA2C220M#RS0WPEC
	33	0.175	6.03	0.15	0.31	10x20	HUHA2C330M#RS1WPEC
	47	0.230	4.24	0.15	0.40	12.5x20	HUHA2C470M#SS1WPEC
0.299		1.99	0.15	0.74	12.5x25	HUHA2C101M#SS2WPEC	
100	0.330	2.00	0.15	0.74	16x25.5	HUHA2C101M#US2WPEC	
<b>200 VDC Code: 2D</b>  Surge Voltage 250 VDC	0.47	0.012	423.50	0.15	0.05	6.3x11.5	HUHA2D0R4M#PS0WPEC
	1.0	0.018	199.00	0.15	0.06	6.3x11.5	HUHA2D1R0M#PS0WPEC
	2.2	0.026	90.50	0.15	0.08	6.3x11.5	HUHA2D2R2M#PS0WPEC
	3.3	0.028	60.29	0.15	0.11	6.3x11.5	HUHA2D3R3M#PS0WPEC
		0.037	60.30	0.15	0.11	8x11.5	HUHA2D3R3M#QS0WPEC
	4.7	0.040	42.33	0.15	0.13	8x11.5	HUHA2D4R7M#QS0WPEC

Additional designs on request · Weitere Designs auf Anfrage

Rated Voltage (Surge Voltage)  $V_r$ [V DC]	Capacitance  $C_r$ [ $\mu$ F]	Ripple Current at 105°C/100Hz $I_r$ [A RMS]	ESR max at 20°C/100Hz [ $\Omega$ ]	Dissipation Factor at 20°C/100Hz Tan $\delta$	Leakage current after 1min at 20°C $I_{leak}$ [mA]	DxL  [mm]	Product Code  # = variable value, see terminal code in the product code
<b>200 VDC</b> Code: 2D  Surge Voltage 250 VDC	4.7	0.050	42.33	0.15	0.13	10x12.5	HUHA2D4R7M#RS0WPEC
	10	0.066	19.90	0.15	0.18	10x12.5	HUHA2D100M#RS0WPEC
		0.080	19.90	0.15	0.18	10x16	HUHA2D100M#RS0WPEC
	22	0.135	9.05	0.15	0.28	10x20	HUHA2D220M#RS1WPEC
	33	0.190	6.03	0.15	0.36	12.5x20	HUHA2D330M#SS1WPEC
	47	0.230	4.24	0.15	0.48	12.5x25	HUHA2D470M#SS2WPEC
	100	0.360	1.99	0.15	0.90	16x25.5	HUHA2D101M#US2WPEC
	220	0.525	0.91	0.15	1.86	18x31.5	HUHA2D221M#VS3WPEC
<b>250 VDC</b> Code: 2E  Surge Voltage 300 VDC	0.47	0.012	423.50	0.15	0.05	6.3x11.5	HUHA2E0R4M#PS0WPEC
	1.0	0.018	199.00	0.15	0.07	6.3x11.5	HUHA2E1R0M#PS0WPEC
	2.2	0.023	90.43	0.15	0.10	6.3x11.5	HUHA2E2R2M#PS0WPEC
		0.030	90.50	0.15	0.10	8x11.5	HUHA2E2R2M#QS0WPEC
	3.3	0.043	60.30	0.15	0.12	8x11.5	HUHA2E3R3M#QS0WPEC
		0.043	60.29	0.15	0.12	10x12.5	HUHA2E3R3M#RS0WPEC
	4.7	0.040	42.33	0.15	0.15	8x11.5	HUHA2E4R7M#QS0WPEC
		0.050	42.66	0.15	0.15	10x12.5	HUHA2E4R7M#RS0WPEC
	10	0.090	19.90	0.15	0.20	10x16	HUHA2E100M#RS0WPEC
	22	0.155	9.05	0.15	0.32	12.5x20	HUHA2E220M#SS1WPEC
	33	0.190	6.03	0.15	0.43	12.5x25	HUHA2E330M#SS2WPEC
	47	0.205	4.24	0.15	0.57	12.5x25	HUHA2E470M#SS2WPEC
		0.225	4.24	0.15	0.57	16x25.5	HUHA2E470M#US2WPEC
	100	0.340	1.99	0.15	1.10	16x31.5	HUHA2E101M#US3WPEC
	150	0.405	1.30	0.15	1.60	18x25.5	HUHA2E151M#VS2WPEC
220	0.570	0.90	0.15	2.30	18x36	HUHA2E221M#VS4WPEC	
<b>350 VDC</b> Code: 2V  Surge Voltage 400 VDC	0.47	0.011	565.00	0.15	0.06	6.3x11.5	HUHA2V0R4M#PS0WPEC
	1.0	0.018	265.50	0.15	0.08	8x11.5	HUHA2V1R0M#QS0WPEC
	2.2	0.030	120.58	0.20	0.12	8x11.5	HUHA2V2R2M#QS0WPEC
		0.030	120.60	0.20	0.12	10x12.5	HUHA2V2R2M#RS0WPEC
	3.3	0.036	80.40	0.20	0.15	10x12.5	HUHA2V3R3M#RS0WPEC
		0.045	56.44	0.20	0.17	10x12.5	HUHA2V4R7M#RS0WPEC
	4.7	0.047	56.50	0.20	0.17	10x16	HUHA2V4R7M#RS0WPEC
		0.095	26.53	0.20	0.24	10x20	HUHA2V100M#RS1WPEC
	22	0.130	12.10	0.20	0.41	12.5x20	HUHA2V220M#SS1WPEC
	33	0.180	8.00	0.20	0.56	12.5x25	HUHA2V330M#SS2WPEC
		0.160	8.04	0.20	0.56	16x25.5	HUHA2V330M#US2WPEC
	47	0.330	5.65	0.20	0.76	16x25.5	HUHA2V470M#US2WPEC
100	0.620	3.00	0.20	1.50	18x31.5	HUHA2V101M#VS3WPEC	
<b>400 VDC</b> Code: 2G  Surge Voltage 450 VDC	1.0	0.016	265.26	0.20	0.08	6.3x11.5	HUHA2G1R0M#PS0WPEC
		0.018	265.40	0.20	0.08	8x11.5	HUHA2G1R0M#QS0WPEC
	2.2	0.025	120.58	0.20	0.13	8x11.5	HUHA2G2R2M#QS0WPEC
		0.030	120.60	0.20	0.13	10x12.5	HUHA2G2R2M#RS0WPEC
	3.3	0.035	80.39	0.20	0.15	10x12.5	HUHA2G3R3M#RS0WPEC
		0.040	80.40	0.20	0.15	10x16	HUHA2G3R3M#RS0WPEC
	4.7	0.047	56.80	0.20	0.18	10x12.5	HUHA2G4R7M#RS0WPEC
		0.052	56.44	0.20	0.18	10x16	HUHA2G4R7M#RS0WPEC

Additional designs on request · Weitere Designs auf Anfrage

Rated Voltage (Surge Voltage)  $V_r$ [V DC]	Capacitance  $C_r$ [µF]	Ripple Current at 105°C/100Hz $I_r$ [A RMS]	ESR max at 20°C/100Hz [Ω]	Dissipation Factor at 20°C/100Hz Tan δ	Leakage current after 1min at 20°C $I_{leak}$ [mA]	DxL  [mm]	Product Code  # = variable value, see terminal code in the product code
<b>400 VDC</b> Code: 2G  Surge Voltage 450 VDC	10	0.080	26.50	0.20	0.26	10x16	HUHA2G100M#RS0WPEC
		0.095	26.50	0.20	0.26	10x20	HUHA2G100M#RS1WPEC
		0.120	26.53	0.20	0.26	12.5x20	HUHA2G100M#SS1WPEC
	22	0.150	12.10	0.20	0.45	12.5x25	HUHA2G220M#SS2WPEC
		0.150	12.06	0.20	0.45	16x25.5	HUHA2G220M#US2WPEC
	33	0.180	8.00	0.20	0.63	12.5x25	HUHA2G330M#SS2WPEC
		0.180	8.00	0.20	0.63	16x20	HUHA2G330M#US1WPEC
		0.215	8.10	0.20	0.63	16x25.5	HUHA2G330M#US2WPEC
	47	0.360	5.65	0.20	0.85	16x25.5	HUHA2G470M#US2WPEC
	68	0.470	3.90	0.20	1.19	18x25.5	HUHA2G680M#VS2WPEC
	82	0.575	3.20	0.20	1.41	18x31.5	HUHA2G820M#VS3WPEC
	100	0.675	2.70	0.20	1.70	18x36	HUHA2G101M#VS4WPEC
	120	0.735	2.20	0.20	2.02	18x40	HUHA2G121M#VS5WPEC
	150	0.825	1.80	0.20	2.50	20x41	HUHA2G151M#VS5WPEC
<b>420 VDC</b> Code: 2X  Surge Voltage 500 VDC	1.0	0.016	265.40	0.20	0.08	8x11.5	HUHA2X1R0M#QS0WPEC
		0.019	265.40	0.20	0.08	10x12.5	HUHA2X1R0M#RS0WPEC
	2.2	0.024	120.60	0.20	0.13	8x11.5	HUHA2X2R2M#QS0WPEC
		0.029	120.60	0.20	0.13	10x12.5	HUHA2X2R2M#RS0WPEC
	3.3	0.034	80.40	0.20	0.16	10x12.5	HUHA2X3R3M#RS0WPEC
		0.038	80.40	0.20	0.16	10x16	HUHA2X3R3M#RS0WPEC
	4.7	0.046	56.40	0.20	0.18	10x16	HUHA2X4R7M#RS0WPEC
		0.052	56.50	0.20	0.18	10x20	HUHA2X4R7M#RS1WPEC
	10	0.100	26.50	0.20	0.27	10x20	HUHA2X100M#RS1WPEC
		0.116	26.50	0.20	0.27	12.5x20	HUHA2X100M#SS1WPEC
	22	0.162	12.10	0.20	0.47	12.5x25	HUHA2X220M#SS2WPEC
		0.204	8.00	0.20	0.66	16x20	HUHA2X330M#US1WPEC
	33	0.228	8.00	0.20	0.66	16x25.5	HUHA2X330M#US2WPEC
		0.380	5.60	0.20	0.89	16x31.5	HUHA2X470M#US3WPEC
	47	0.420	4.70	0.20	1.04	16x31.5	HUHA2X560M#US3WPEC
		0.420	4.70	0.20	1.04	18x25.5	HUHA2X560M#VS2WPEC
	68	0.542	3.90	0.20	1.24	16x36	HUHA2X680M#US4WPEC
		0.542	3.90	0.20	1.24	18x31.5	HUHA2X680M#VS3WPEC
	82	0.608	3.20	0.20	1.48	16x40	HUHA2X820M#US5WPEC
		0.608	3.20	0.20	1.48	18x31.5	HUHA2X820M#VS3WPEC
	100	0.713	2.70	0.20	1.78	16x45	HUHA2X101M#US6WPEC
		0.713	2.70	0.20	1.78	18x36	HUHA2X101M#VS4WPEC
	120	0.779	2.20	0.20	2.12	16x50	HUHA2X121M#US7WPEC
		0.779	2.20	0.20	2.12	18x40	HUHA2X121M#VS5WPEC
150	0.874	1.80	0.20	2.62	16x60	HUHA2X151M#US9WPEC	
	0.874	1.80	0.20	2.62	20x41	HUHA2X151M#VS5WPEC	
<b>450 VDC</b> Code: 2W  Surge Voltage 500 VDC	1.0	0.016	265.26	0.20	0.09	8x11.5	HUHA2W1R0M#QS0WPEC
		0.019	265.40	0.20	0.09	10x12.5	HUHA2W1R0M#RS0WPEC
	2.2	0.026	121.00	0.20	0.14	10x12.5	HUHA2W2R2M#RS0WPEC
		0.029	120.60	0.20	0.14	10x16	HUHA2W2R2M#RS0WPEC
	3.3	0.038	80.40	0.20	0.16	10x16	HUHA2W3R3M#RS0WPEC

Additional designs on request · Weitere Designs auf Anfrage

Rated Voltage (Surge Voltage)  $V_r$ [V DC]	Capacitance  $C_r$ [ $\mu$ F]	Ripple Current at 105°C/100Hz $I_r$ [A RMS]	ESR max at 20°C/100Hz [ $\Omega$ ]	Dissipation Factor at 20°C/100Hz Tan $\delta$	Leakage current after 1min at 20°C $I_{leak}$ [mA]	DxL  [mm]	Product Code  # = variable value, see terminal code in the product code
<b>450 VDC</b> Code: 2W  Surge Voltage 500 VDC	3.3	0.042	80.40	0.20	0.16	10x20	HUHA2W3R3M#RS1WPEC
	4.7	0.049	56.50	0.20	0.19	10x16	HUHA2W4R7M#RS0WPEC
		0.054	56.50	0.20	0.19	10x20	HUHA2W4R7M#RS1WPEC
	10	0.120	26.53	0.20	0.28	10x20	HUHA2W100M#RS1WPEC
	22	0.170	12.10	0.20	0.50	12.5x25	HUHA2W220M#SS2WPEC
	33	0.240	8.04	0.20	0.69	16x25.5	HUHA2W330M#US2WPEC
	47	0.400	5.60	0.20	0.95	16x31.5	HUHA2W470M#US3WPEC
		56	0.440	4.70	0.20	1.11	16x31.5
	0.440		4.70	0.20	1.11	18x25.5	HUHA2W560M#VS2WPEC
	68	0.490	4.00	0.20	1.32	16x36	HUHA2W680M#US4WPEC
		0.570	3.90	0.20	1.32	18x31.5	HUHA2W680M#VS3WPEC
	82	0.640	3.20	0.20	1.58	16x40	HUHA2W820M#US5WPEC
		0.640	3.20	0.20	1.58	18x31.5	HUHA2W820M#VS3WPEC
	100	0.750	2.70	0.20	1.90	16x45	HUHA2W101M#US6WPEC
		0.750	2.70	0.20	1.90	18x36	HUHA2W101M#VS4WPEC
	120	0.820	2.20	0.20	2.26	16x50	HUHA2W121M#US7WPEC
		0.820	2.20	0.20	2.26	18x40	HUHA2W121M#VS5WPEC
	150	0.920	1.80	0.20	2.80	16x60	HUHA2W151M#US9WPEC
		0.920	1.80	0.20	2.80	18x46	HUHA2W151M#VS6WPEC
		0.920	1.80	0.20	2.80	20x41	HUHA2W151M#WS5WPEC
180	1.100	1.50	0.20	3.34	22x41	HUHA2W181M#XS5WPEC	
220	1.200	1.20	0.20	4.06	22x45	HUHA2W221M#XS6WPEC	
<b>500 VDC</b> Code: 2H  Surge Voltage 550 VDC C	1.0	0.021	265.40	0.20	0.09	10x12.5	HUHA2H1R0M#RS0WPEC
	2.2	0.035	120.60	0.20	0.14	10x16	HUHA2H2R2M#RS0WPEC
	3.3	0.048	80.40	0.20	0.17	10x20	HUHA2H3R3M#RS1WPEC
	4.7	0.063	56.50	0.20	0.19	12.5x20	HUHA2H4R7M#SS1WPEC
	10	0.120	26.50	0.20	0.30	12.5x25	HUHA2H100M#SS2WPEC
	22	0.180	12.10	0.20	0.54	16x25.5	HUHA2H220M#US2WPEC
	33	0.240	8.00	0.20	0.76	16x31.5	HUHA2H330M#US3WPEC
	47	0.405	5.60	0.20	1.04	18x31.5	HUHA2H470M#VS3WPEC
	56	0.450	4.70	0.20	1.22	16x40	HUHA2H560M#US5WPEC
		0.450	4.70	0.20	1.22	18x31.5	HUHA2H560M#VS3WPEC
	68	0.560	3.90	0.20	1.46	16x45	HUHA2H680M#US6WPEC
		0.560	3.90	0.20	1.46	18x36	HUHA2H680M#VS4WPEC
	82	0.640	3.20	0.20	1.74	16x55	HUHA2H820M#US8WPEC
		0.640	3.20	0.20	1.74	18x40	HUHA2H820M#VS5WPEC
	100	0.800	2.70	0.20	2.10	16x60	HUHA2H101M#US9WPEC
		0.800	2.70	0.20	2.10	18x46	HUHA2H101M#VS6WPEC
		0.800	2.70	0.20	2.10	20x41	HUHA2H101M#WS5WPEC
	120	0.840	2.20	0.20	2.50	22x45	HUHA2H121M#XS6WPEC
	150	0.890	1.80	0.20	3.10	22x45	HUHA2H151M#XS6WPEC

Additional designs on request · Weitere Designs auf Anfrage

## > Ripple Current Multiplier · Wechselstrommultiplikator

Rated Voltage	Capacitance (µF)	50/60	100-120	1k	10k	100k
6.3V–100V	≤ 4.7	0.32	0.40	0.70	0.80	1.00
	10–47	0.40	0.50	0.80	0.90	1.00
	100–220	0.56	0.70	0.90	0.90	1.00
	330–1000	0.64	0.80	0.90	1.00	1.00
	≥ 2200	0.72	0.90	1.00	1.00	1.00
160V–500V	≤ 10	0.80	1.00	1.75	2.00	2.50
	22–56	0.80	1.00	1.60	1.80	2.00
	≥ 68	0.80	1.00	1.30	1.40	1.65

Temperature [°C]		40	45	50	55	60	65	70	75	80	85	90	95	100	105
Multiplier $I_r$ at 100kHz	6.3V–100V	2.20	2.18	2.16	2.13	2.10	2.00	1.93	1.86	1.78	1.70	1.55	1.40	1.25	1.00
	160V–500V	2.00	1.98	1.96	1.93	1.90	1.86	1.80	1.70	1.60	1.50	1.40	1.30	1.20	1.00

## > Impedance Stability · Impedanz Stabilität

Rated Voltage [V]	6.3	10	16	25	35	50	63	100	160	200	250	350	400	420	450	500
$Z_{-25^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$ at 120 Hz	4	3	2					3						6		
$Z_{-40^{\circ}\text{C}} / Z_{+20^{\circ}\text{C}}$ at 120 Hz	8	6	4	3				8			–			–		

## > Life Time Tests and Requirements · Anforderungen Brauchbarkeitsdauer

Life time test	Test procedure	Life time criteria
Endurance test	$T_a = 105^{\circ}\text{C}; V_r, I_r$ applied 2000 hours	$\Delta C/C \leq 20\%$ (of initial value) $\text{Tan}\delta \leq 200\%$ (of specified value) $I_L \leq$ specified value
Useful life	$T_a = 105^{\circ}\text{C}; V_r, I_r$ applied 3000 hours	$\Delta C/C \leq 30\%$ (of initial value) $\text{Tan}\delta < 300\%$ (of specified value) $I_L \leq$ specified value

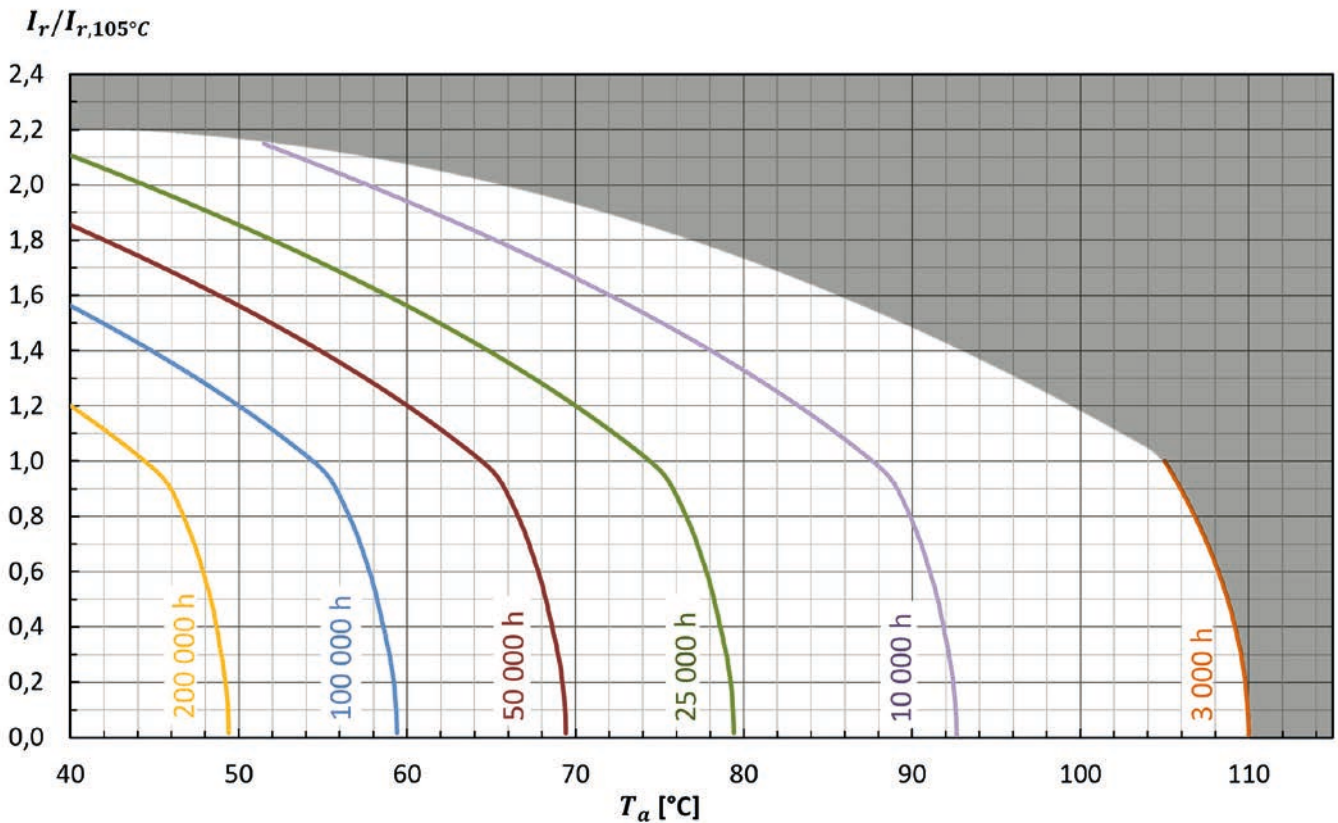
Reference Specification: IEC 60384-4

> Life Time Table and Graph · Brauchbarkeitsdauer – Tabelle und Diagramm

Rated voltage range 6.3V–100V

HUHA	Ripple Current Multiplier I <sub>r</sub> at 100 kHz														
T <sub>a</sub>	1.00	1.10	1.25	1.40	1.55	1.70	1.78	1.86	1.93	2.00	2.10	2.13	2.16	2.18	2.20
40°C	200	200	184	140	103	73	60	49	41	34	26	23	21	20	19
45°C	192	166	130	99	73	52	43	35	29	24	18	17	15	14	
50°C	136	117	92	70	51	37	30	25	21	17	13	12	11		
55°C	96	83	65	49	36	26	21	17	15	12	9	8			
60°C	68	59	46	35	26	18	15	12	10	8	6				
65°C	48	41	33	25	18	13	11	9	7	6					
70°C	34	29	23	17	13	9	8	6	5						
75°C	24	21	16	12	9	6	5	4							
80°C	17	15	11	9	6	5	4								
85°C	12	10	8	6	5	3									
90°C	8	7	6	4	3										
95°C	6	5	4	3											
100°C	4	4	3												
105°C	3														

khrs Max. value limited to 200 000 hours.



## > Life Time Table and Graph · Brauchbarkeitsdauer – Tabelle und Diagramm

Rated voltage range 160V–500V

HUHA	Ripple Current Multiplier $I_r$ at 100kHz														
	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.86	1.90	1.93	1.96	1.98	2.00
40°C	200	200	200	168	140	114	92	73	57	49	44	41	38	36	34
45°C	192	166	142	119	99	81	65	52	41	35	31	29	27	25	
50°C	136	117	100	84	70	57	46	37	29	25	22	21	19		
55°C	96	83	71	60	49	40	33	26	20	17	16	15			
60°C	68	59	50	42	35	29	23	18	14	12	11				
65°C	48	41	35	30	25	20	16	13	10	9					
70°C	34	29	25	21	17	14	12	9	7						
75°C	24	21	18	15	12	10	8	6							
80°C	17	15	13	11	9	7	6								
85°C	12	10	9	7	6	5									
90°C	8	7	6	5	4										
95°C	6	5	4	4											
100°C	4	4	3												
105°C	3														

Max. value limited to 250 000 hours.

