SURFACE MOUNT TYPE

Series: ACHM

RoHS Compliant

FEATURES

- Low impedance (40 to 60% less than ACHZ series)
- Miniaturization (30 to 50% less than ACHZ series)
- Life time: 2000 to 5000 hours at 105°C

OPTIONS

- -V = Anti-vibration
- -R = High temperature reflow solder
- -L = Long life 5000 hours
- -P = RoHS Compliance

HOW TO ORDER

ACHM - VRL	336	M	100	G	T	-P
TYPE	CAPACITANCE	TOLERANCE	VOLTAGE	CASE CODE	PACKAGING	
AC V = Anti-Vibration	Expressed in pF.	M = 20%	Expressed		T = Tape & Reel	-P = RoHS Compliance
ACH R = High Temperature Reflow	First two digits are		Volts (dc)			
ACHE L = Long Life - 5000 hours	significant figures.		6.3			
ACHL	Third digit denotes		10			
ACHM	number of zeros.		16			
ACHV			25			
ACHZ			35			
ACU			50			
BCHL			63			
			100			

SPECIFICATIONS

Category temp.range	-55 to +105°C
Rated W.V. Range	6.3 to 100 V. DC
Nominal Cap. Range	3.3 to 6800 µF
Capacitance Tolerance	±20% (120 Hz/+20°C)
Leakage Current	1=0.01 CV or 3 (µA) (whichever is greater) after 2 minutes application of rated working voltage at +20°C

Dissipation Factor (tan δ)

Add 0.02 per 1000 µF for products of 1000 µF or more (120 Hz/+20°C)

W.V. (V.DC)	6.3	10	16	25	35	50	63	80	100
tan δ (max)	0.26	0.19	0.16	0.14	0.12	0.10	0.08	0.08	0.07

(120 Hz/+20°C)

Endurance

After the life test with DC rated working voltage at +105±2°C for 2000 hours (ø4~ø10), 5000 hours (ø12.5~ø18) the capacitors shall meet the limits specified below. Post-test requirements at +20°C.

Capacitance Change	± 30% of initial measured value
D.F. (tan δ)	≤ 200% of initial specified value
DC Leakage Current	≤ initial specified value

Shelf Life

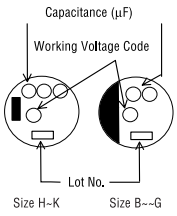
After storage for 1000 hours at +105±2°C with no voltage applied and then being stabilized at +20°C, capacitors shall meet the limits specified in "Endurance".

Resistance to Soldering Heat

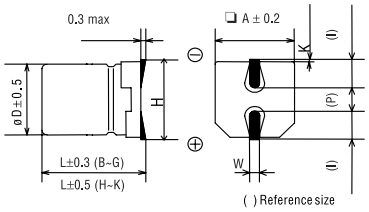
After reflow soldering (refer to Application guidelines) and then being stabilized at +20°C, capacitor shall meet the following limits.

Capacitance Change	±10% of initial measured value
D.F (tan δ)	≤ Initial specified value
DC Leakage Current	≤ initial specified value

MARKING



DIMENSIONS in mm (not to scale)



Size Code	øD	L	A	H	*I	W	*P	K
B	4.0	5.8	4.3	5.5MAX	1.8	0.65±0.1	1.0	$0.35^{+0.15}_{-0.20}$
C	5.0	5.8	5.3	6.5MAX	2.2	0.65±0.1	1.5	$0.35^{+0.15}_{-0.20}$
D	6.3	5.8	6.6	7.8MAX	2.6	0.65±0.1	1.8	$0.35^{+0.15}_{-0.20}$
D2	6.3	7.7	6.6	7.8MAX	2.6	0.65±0.1	1.8	$0.35^{+0.15}_{-0.20}$
E	8.0	6.2	8.3	9.5MAX	3.4	0.65±0.1	2.2	$0.35^{+0.15}_{-0.20}$
F	8.0	10.2	8.3	10.0MAX	3.4	0.90±0.3	3.1	0.70±0.2
G	10.0	10.2	10.3	12.0MAX	3.5	0.90±0.3	4.6	0.70±0.2
H	12.5	13.5	13.5	15.0MAX	4.7	0.90±0.3	4.4	0.70±0.3
J	16	16.5	17.0	19.0MAX	5.5	1.2±0.3	6.7	0.70±0.3
K	18	16.5	19.0	21.0MAX	6.7	1.2±0.3	6.7	0.70±0.3

*Just for reference (mm)

CASE SIZE

Cap (µF) \ W.V. (V)	6.3 (0J)	10 (1A)	16 (1C)	25 (1E)	35 (1V)	50 (1H)	63 (1J)	80 (1K)	100 (2A)
3.3	–	–	–	–	–	–	–	C	–
4.7	–	–	–	–	B	B	C	D	–
10	–	–	B	B	C(B)	D(C)	D	D2,E	–
22	B	B	C(B)	C	C	D	D2,E	F	F
33	–	C(B)	–	D(C)	D	D2,E	F	F	G
47	C(B)	–	D(C)	D	D	D2,E	F	G	H
68	–	–	D	D	D2	–	G	H	H
100	D(C)	–	D	D2,E	D2,F	F	G	H	J
150	–	D	D2	F	F	G	H	H	J
220	D	D2,E	D2,E	F	F	G	H	–	K
330	D2,E	F	F	F	G	H	–	J	K
470	F	F	F	G	H	–	J	K	
680	–	F	G	–	H	J	K	–	–
1000	F	G	–	H	–	J	–	–	–
1500	G	–	H	–	J	–	–	–	–
2200	–	H	–	J	–	–	–	–	–
3300	H	–	J	K	–	–	–	–	–
4700	–	J	K	–	–	–	–	–	–
6800	J	K	–	–	–	–	–	–	–

STANDARD PRODUCTS

Case size						Specification		Part No.
WV (V)	Cap. (±20%) (µF)	Dia. (mm)	Length (mm)	Size Code	Tan δ (120kHz) (+20°C)	Ripple Current (100kHz) (+105°C) (mA)	IMP./ESR (100kHz) (+20°C) (Ω)	
6.3	22	4	5.8	B	0.26	90	1.35	ACHM226M6.3BT
	47	4	5.8	B	0.26	90	1.35	ACHM476M6.3BT
	47	5	5.8	C	0.26	160	0.7	ACHM476M6.3CT
	100	5	5.8	C	0.26	160	0.7	ACHM107M6.3CT
	100	6.3	5.8	D	0.26	240	0.36	ACHM107M6.3DT
	220	6.3	5.8	D	0.26	240	0.36	ACHM227M6.3DT
	330	6.3	7.7	D2	0.26	280	0.34	ACHM337M6.3D2T
	330	8	6.2	E	0.26	300	0.26	ACHM337M6.3ET
	470	8	10.2	F	0.26	600	0.16	ACHM477M6.3FT
	1000	8	10.2	F	0.26	600	0.16	ACHM108M6.3FT
	1500	10	10.2	G	0.26	850	0.08	ACHM158M6.3GT
	3300	12.5	13.5	H	0.3	1100	0.06	ACHM338M6.3HT
	6800	16	16.5	J	0.36	1800	0.035	ACHM688M6.3JT
10	22	4	5.8	B	0.19	90	1.35	ACHM226M10BT
	33	4	5.8	B	0.19	90	1.35	ACHM336M10BT
	33	5	5.8	C	0.19	160	0.7	ACHM336M10CT
	150	6.3	5.8	D	0.19	240	0.36	ACHM157M10DT
	220	6.3	7.7	D2	0.19	280	0.34	ACHM227M10D2T
	220	8	6.2	E	0.19	300	0.26	ACHM227M10ET
	330	8	10.2	F	0.19	600	0.16	ACHM337M10FT
	470	8	10.2	F	0.19	600	0.16	ACHM477M10FT
	680	8	10.2	F	0.19	600	0.16	ACHM687M10FT
	1000	10	10.2	G	0.19	850	0.08	ACHM108M10GT
	2200	12.5	13.5	H	0.21	1100	0.06	ACHM228M10HT
	4700	16	16.5	J	0.25	1800	0.035	ACHM478M10JT
	6800	18	16.5	K	0.29	2060	0.033	ACHM688M10KT
16	10	4	5.8	B	0.16	90	1.35	ACHM106M16BT
	22	4	5.8	B	0.16	90	1.35	ACHM226M16BT
	22	5	5.8	C	0.16	160	0.7	ACHM226M16CT
	47	5	5.8	C	0.16	160	0.7	ACHM476M16CT
	47	6.3	5.8	D	0.16	240	0.36	ACHM476M16DT
	68	6.3	5.8	D	0.16	240	0.36	ACHM686M16DT
	100	6.3	5.8	D	0.16	240	0.36	ACHM107M16DT
	150	6.3	7.7	D2	0.16	280	0.34	ACHM157M16D2T
	220	6.3	7.7	D2	0.16	280	0.34	ACHM227M16D2T
	220	8	6.2	E	0.16	300	0.26	ACHM227M16ET
	330	8	10.2	F	0.16	600	0.16	ACHM337M16FT
	470	8	10.2	F	0.16	600	0.16	ACHM477M16FT
	680	10	10.2	G	0.16	850	0.08	ACHM687M16GT
	1500	12.5	13.5	H	0.16	1100	0.06	ACHM158M16HT
	3300	16	16.5	J	0.2	1800	0.035	ACHM338M16JT
	4700	18	16.5	K	0.22	2060	0.033	ACHM478M16KT
25	10	4	5.8	B	0.14	90	1.35	ACHM106M25BT
	22	5	5.8	C	0.14	160	0.7	ACHM226M25CT
	33	5	5.8	C	0.14	160	0.7	ACHM336M25CT
	33	6.3	5.8	D	0.14	240	0.36	ACHM336M25DT
	47	6.3	5.8	D	0.14	240	0.36	ACHM476M25DT
	68	6.3	5.8	D	0.14	240	0.36	ACHM686M25DT
	100	6.3	7.7	D2	0.14	280	0.34	ACHM107M25D2T
	100	8	6.2	E	0.14	300	0.26	ACHM107M25ET
	150	8	10.2	F	0.14	600	0.16	ACHM157M25FT
	220	8	10.2	F	0.14	600	0.16	ACHM227M25FT
	330	8	10.2	F	0.14	600	0.16	ACHM337M25FT
	470	10	10.2	G	0.14	850	0.08	ACHM477M25GT
	1000	12.5	13.5	H	0.14	1100	0.06	ACHM108M25HT
	2200	16	16.5	J	0.16	1800	0.035	ACHM228M25JT
	3300	18	16.5	K	0.18	2060	0.033	ACHM338M25KT

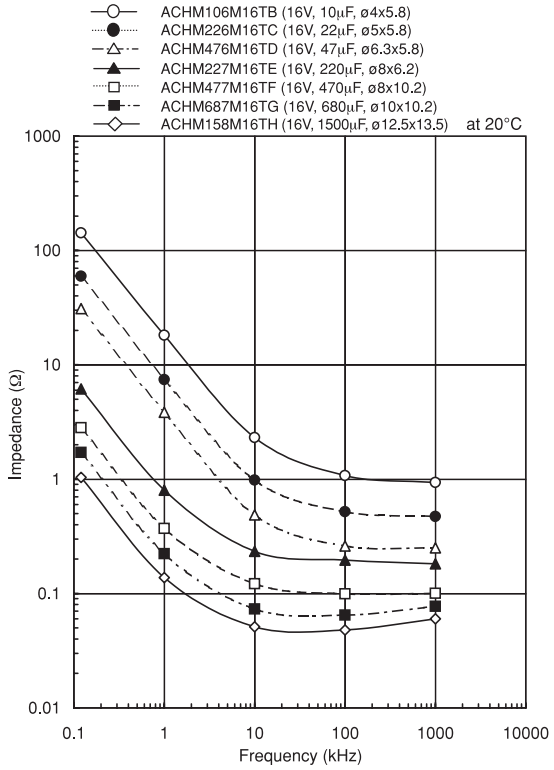
The taping dimensions are explained on page 43 of our catalog. High temperature Load Life test: 105°C 1000h.

Case size						Specification		Part No.
WV (V)	Cap. (±20%) (µF)	Dia. (mm)	Length (mm)	Size Code	Tan δ (120kHz) (+20°C)	Ripple Current (100kHz) (+105°C) (mA)	IMP./ESR (100kHz) (+20°C) (Ω)	
35	4.7	4	5.8	B	0.12	90	1.35	ACHM475M35BT
	10	4	5.8	B	0.12	90	1.35	ACHM106M35BT
	10	5	5.8	C	0.12	160	0.7	ACHM106M35CT
	22	5	5.8	C	0.12	160	0.7	ACHM226M35CT
	33	6.3	5.8	D	0.12	240	0.36	ACHM336M35DT
	47	6.3	5.8	D	0.12	240	0.36	ACHM476M35DT
	68	6.3	7.7	D2	0.12	280	0.34	ACHM686M35D2T
	100	6.3	7.7	D2	0.12	280	0.34	ACHM107M35D2T
	100	8	10.2	F	0.12	600	0.16	ACHM107M35FT
	150	8	10.2	F	0.12	600	0.16	ACHM157M35FT
	220	8	10.2	F	0.12	600	0.16	ACHM227M35FT
	330	10	10.2	G	0.12	850	0.08	ACHM337M35GT
	470	12.5	13.5	H	0.12	1100	0.06	ACHM477M35HT
	680	12.5	13.5	H	0.12	1100	0.06	ACHM687M35HT
	1500	16	16.5	J	0.12	1800	0.035	ACHM158M35JT
50	4.7	4	5.8	B	0.1	60	2.9	ACHM475M50BT
	10	5	5.8	C	0.1	85	1.52	ACHM106M50CT
	10	6.3	5.8	D	0.1	165	0.88	ACHM106M50DT
	22	6.3	5.8	D	0.1	165	0.88	ACHM226M50DT
	33	6.3	7.7	D2	0.1	195	0.68	ACHM336M50D2T
	33	8	6.2	E	0.1	195	0.68	ACHM336M50ET
	47	6.3	7.7	D2	0.1	195	0.68	ACHM476M50D2T
	47	8	6.2	E	0.1	195	0.68	ACHM476M50ET
	100	8	10.2	F	0.1	350	0.34	ACHM107M50FT
	150	10	10.2	G	0.1	670	0.18	ACHM157M50GT
	220	10	10.2	G	0.1	670	0.18	ACHM227M50GT
	330	12.5	13.5	H	0.1	900	0.12	ACHM337M50HT
	680	16	16.5	J	0.1	1610	0.073	ACHM687M50JT
	1000	16	16.5	J	0.1	1610	0.073	ACHM108M50JT
63	4.7	5	5.8	C	0.08	50	3	ACHM475M63CT
	10	6.3	5.8	D	0.08	80	1.5	ACHM106M63DT
	22	6.3	7.7	D2	0.08	120	1.2	ACHM226M63D2T
	22	8	6.2	E	0.08	120	1.2	ACHM226M63ET
	33	8	10.2	F	0.08	250	0.65	ACHM336M63FT
	47	8	10.2	F	0.08	250	0.65	ACHM476M63FT
	68	10	10.2	G	0.08	400	0.35	ACHM686M63GT
	100	10	10.2	G	0.08	400	0.35	ACHM107M63GT
	150	12.5	13.5	H	0.08	800	0.16	ACHM157M63HT
	220	12.5	13.5	H	0.08	800	0.16	ACHM227M63HT
	470	16	16.5	J	0.08	1410	0.082	ACHM477M63JT
	680	18	16.5	K	0.08	1690	0.08	ACHM687M63KT
80	3.3	5	5.8	C	0.08	25	5	ACHM335M80CT
	4.7	6.3	5.8	D	0.08	40	3	ACHM475M80DT
	10	6.3	7.7	D2	0.08	60	2.4	ACHM106M80D2T
	10	8	6.2	E	0.08	60	2.4	ACHM106M80ET
	22	8	10	F	0.08	130	1.3	ACHM226M80FT
	33	8	10	F	0.08	130	1.3	ACHM336M80FT
	47	10	10	G	0.08	200	0.7	ACHM476M80GT
	68	12.5	13.5	H	0.08	500	0.32	ACHM686M80HT
	100	12.5	13.5	H	0.08	500	0.32	ACHM107M80HT
	150	12.5	13.5	H	0.08	500	0.32	ACHM157M80HT
	330	16	16.5	J	0.08	793	0.17	ACHM337M80JT
	470	18	16.5	K	0.08	917	0.153	ACHM477M80KT
100	22	8	10.2	F	0.07	130	1.3	ACHM226M100FT
	33	10	10.2	G	0.07	200	0.7	ACHM336M100GT
	47	12.5	13.5	H	0.07	500	0.32	ACHM476M100HT
	68	12.5	13.5	H	0.07	500	0.32	ACHM686M100HT
	100	16	16.5	J	0.07	793	0.17	ACHM107M100JT
	150	16	16.5	J	0.07	793	0.17	ACHM157M100JT
	220	18	16.5	K	0.07	917	0.153	ACHM227M100KT
	330	18	16.5	K	0.07	917	0.153	ACHM337M100KT

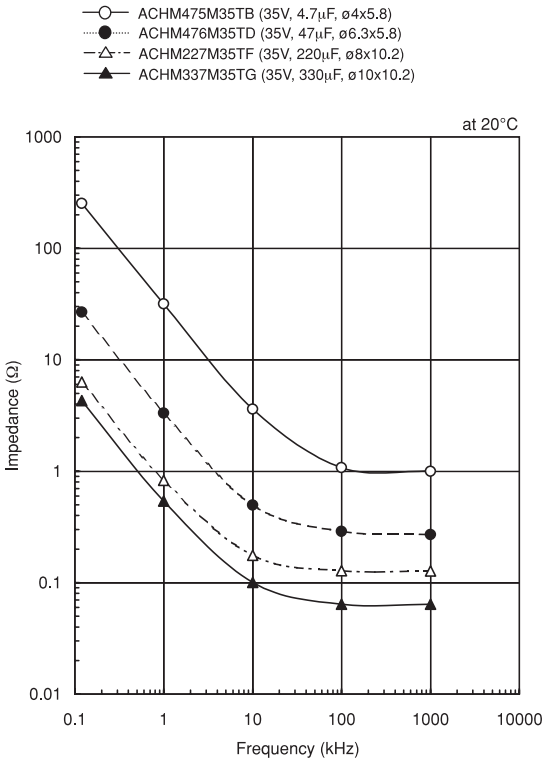
Tan δ = at 120Hz/+20°C
Impedance/ESR = at 100kHz/+20°C
Ripple current = at 100kHz/+105°C

FREQUENCY CHARACTERISTICS (IMPEDANCE)

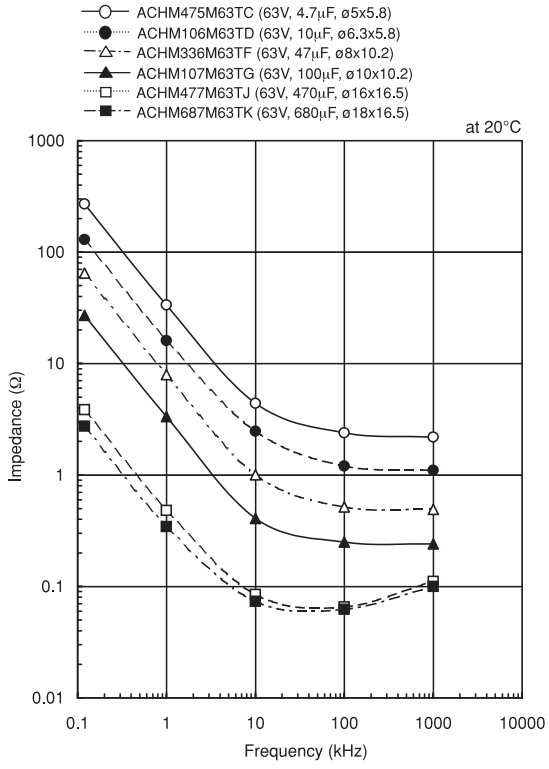
16WV



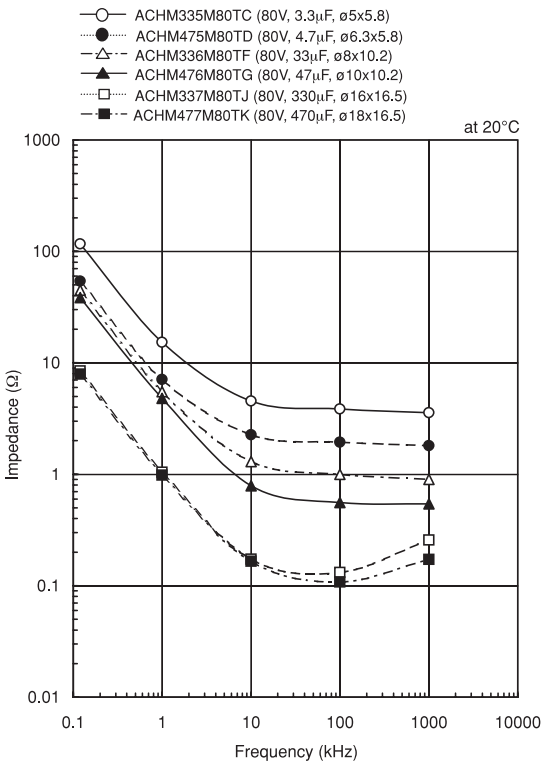
35WV



63WV

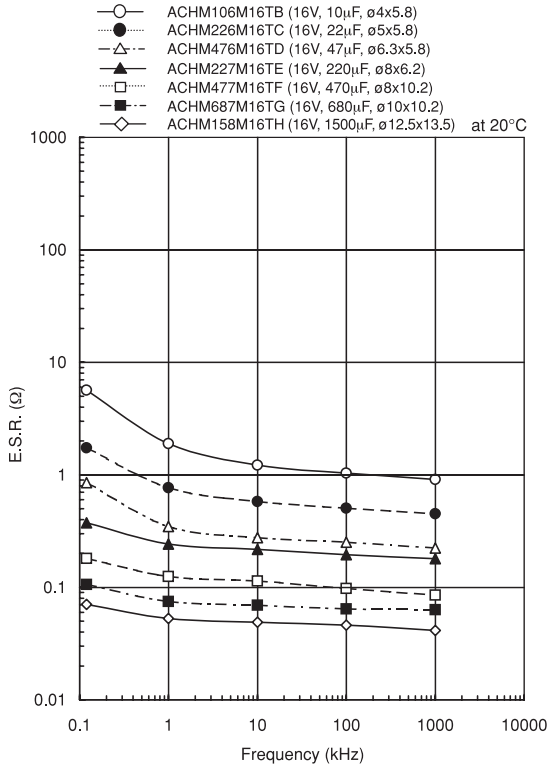


80WV

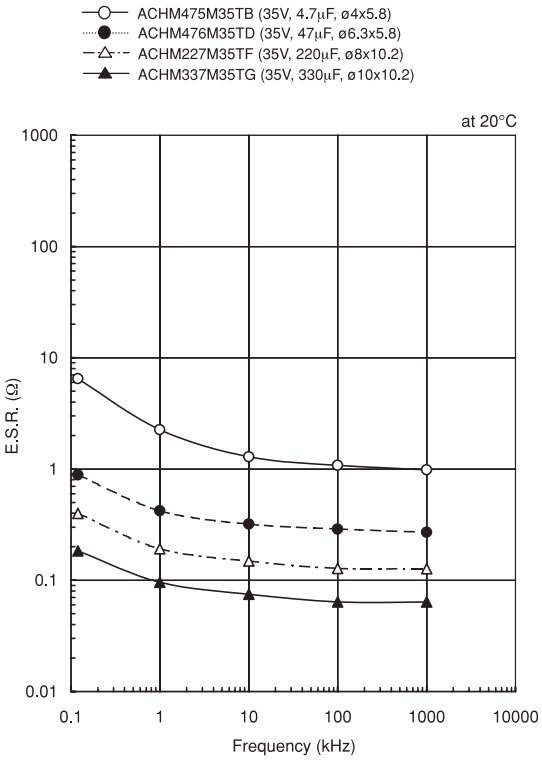


FREQUENCY CHARACTERISTICS (ESR)

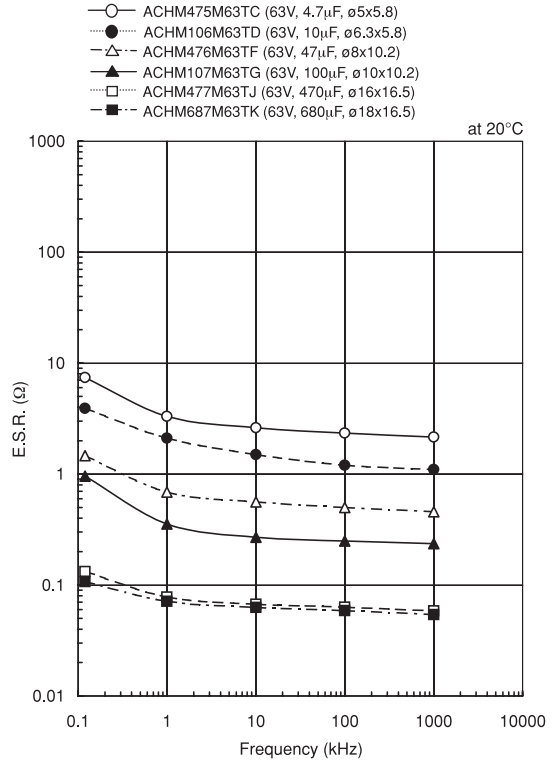
16WV



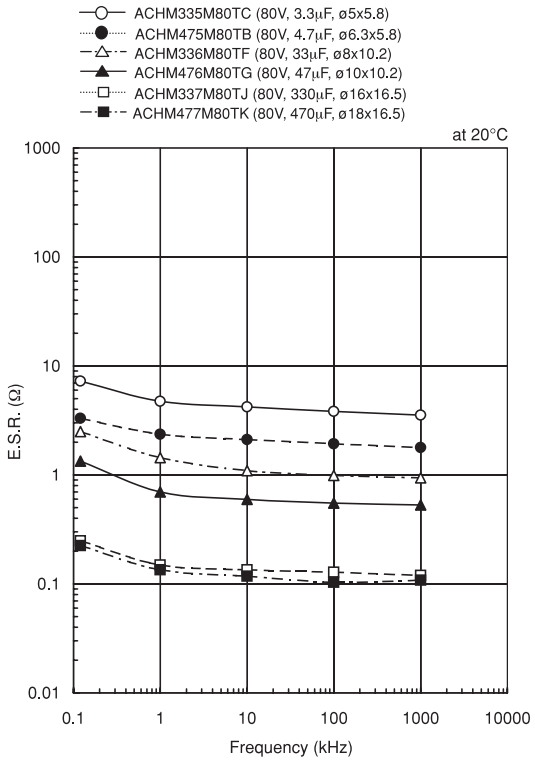
35WV



63WV

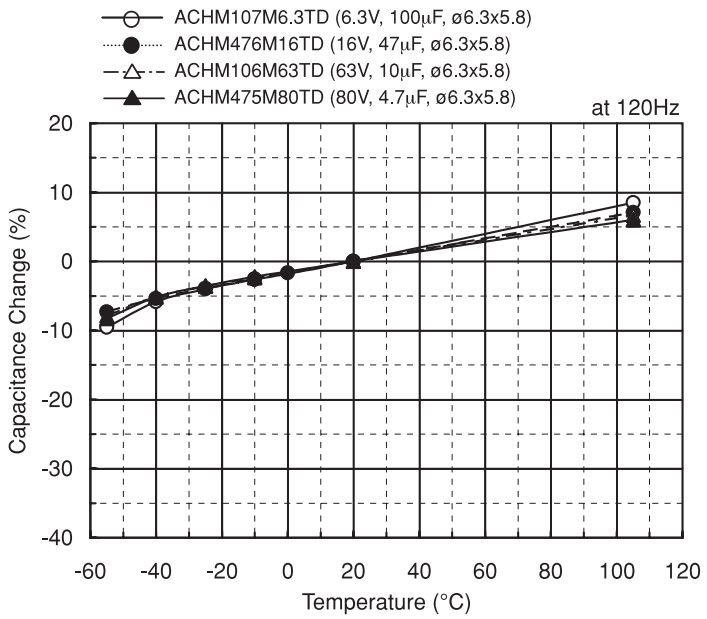


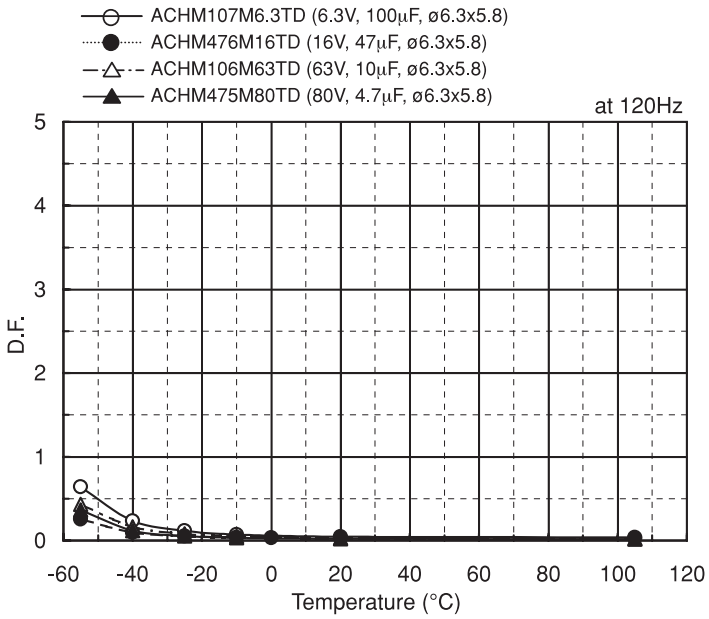
80WV



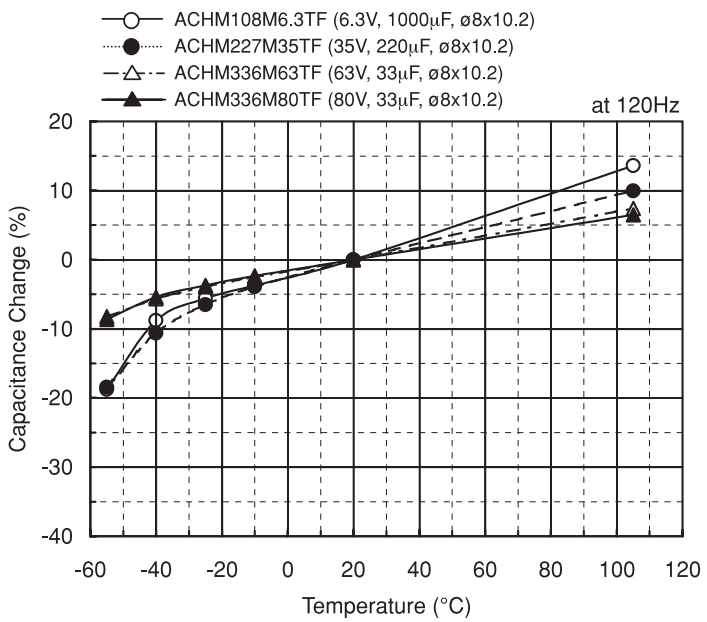
TEMPERATURE CHARACTERISTICS

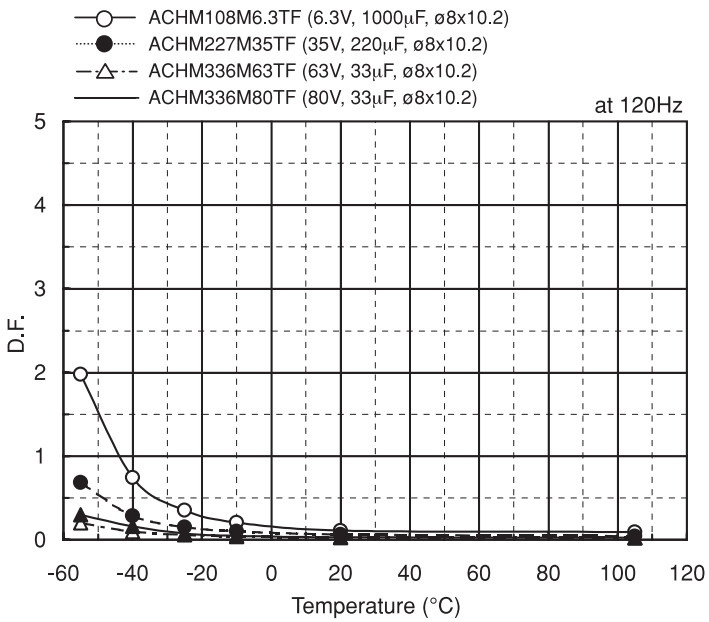
Ø6.3 X 5.8



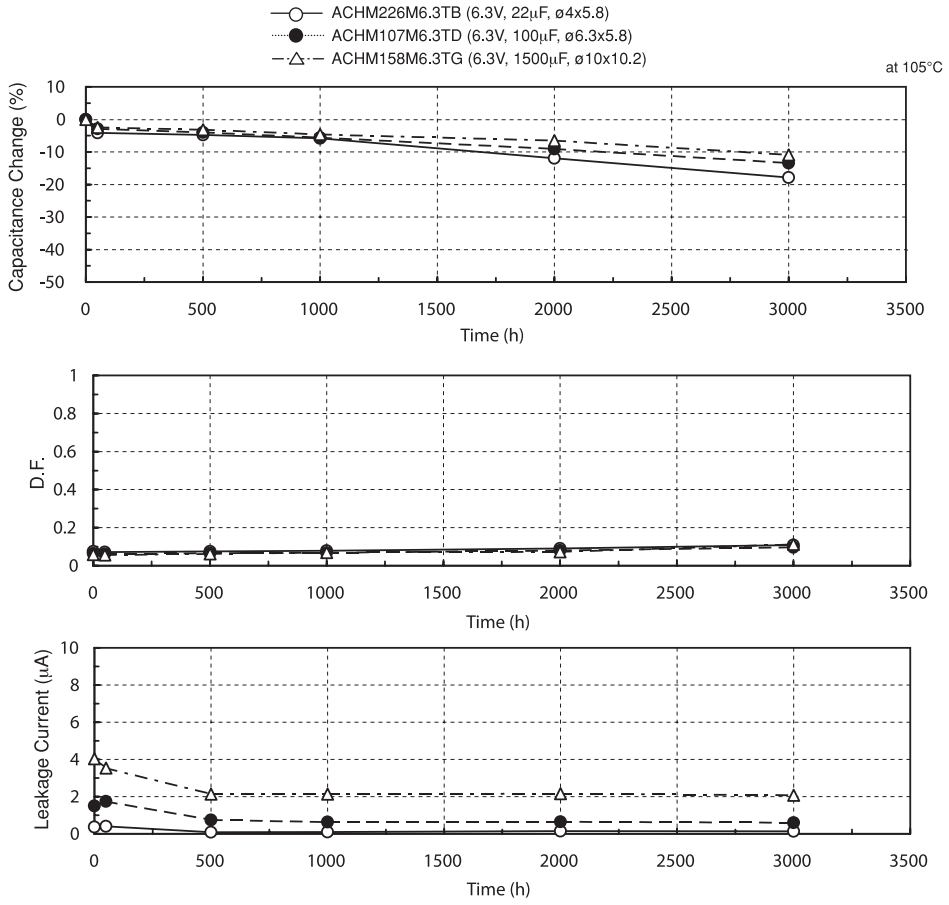


Ø8 X 10.2



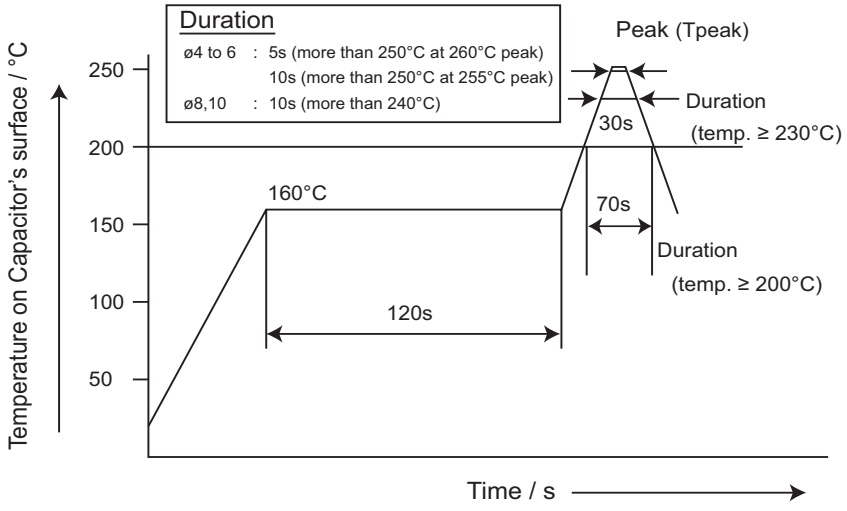


LOAD LIFE



HIGH TEMPERATURE REFLOW SOLDERING (-R)

At reflow soldering, the temperature at surface of the capacitor shall not exceed the allowable range described below. Tentative FKA for CE-E-VFKA 01



	Peak temp. Tpeak	Duration	Duration (temp. ≥ 230°C)	Duration (temp. ≥ 200°C	Times
ø 4 to 6 (B,C,D)	260°C (255°C)	temp. ≥ 250°C 5 s (10 s)	30 s	70 s	2
ø 8,10 (E,F,G)	245°C	temp.≥ 240°C 10 s	30 s	70 s	2

*For B, C, D and D8 size, our recommended reflow condition is either of two conditions.
(1) Peak 260°C, 5s (more than 250°C)
(2) Peak 255°C, 10s (more than 250°C)

Remark
For reflow, use thermal condition system such as infrared reduction (IR) or hot blast.
Vapor phase soldering systems (VPS) are not recommended.