

YAGEO Corporation

Date: 04/15/2009

Aluminum Electrolytic Capacitors

File : 2060

Engineering Bulletin for SH Type

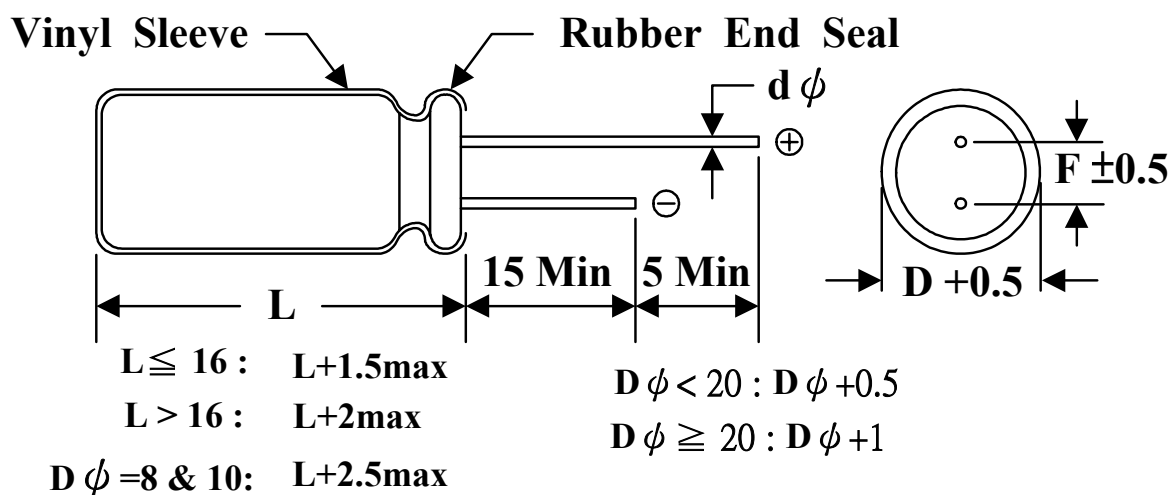
Page: 1/25

SH Type

+105°C Single-ended lead aluminum electrolytic capacitors for the rated voltage up to 450 V.

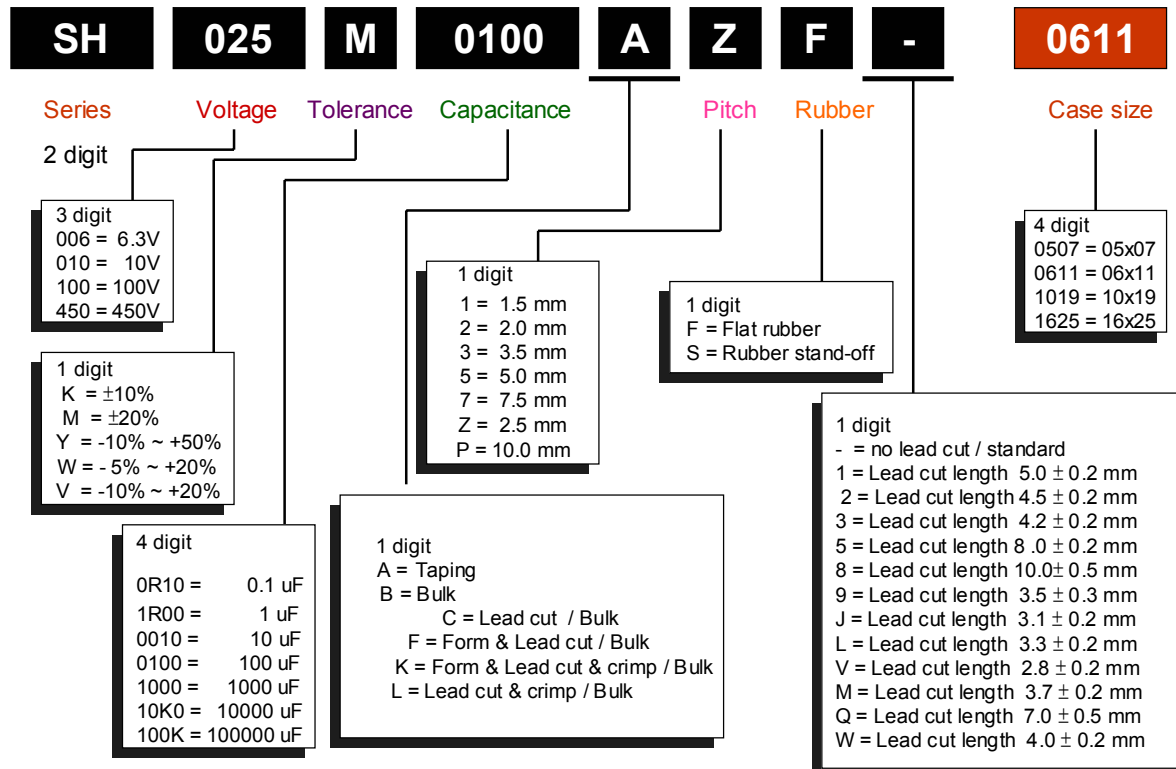
- Long life for 105°C, 2000 hrs, suited for high quality and high reliability demander.
- High CV product, the dimension are as same as SEK series for under 100WV.

Diagram of Dimensions (Unit = mm)



D ϕ	5.0	6.0	8.0	10.0	12.0	13.0	16.0	18.0	22.0
F	2.0	2.5	3.5	5.0			7.5		10.0
d ϕ	0.5			0.6			0.8		0.8

YAGEO Radial Type E-Cap Ordering Code



PERFORMANCE CHARACTERISTICS

Feature

- . Working voltage range : 6.3 to 100V ! 160 to 450V
 - . Operating temp. range : -40 to 105°C ! -25°C to +105°C
 - . Rate capacitance range : 0.47 to 15000uF ! 0.47 to 470uF
 - . Capacitance tolerance : -20 to +20% ! -20 to +20%
 - . DC leakage current (uA) : 0.01CV+3 ! 0.03CV+10
- (Measurements shall be made after a 2 minute charge at rated working voltage, @ 20°C)
- . Dissipation factor : at 120 Hz, 20°C

WV(V)	6.3	10	16	25	35	50	63	100	160-250	350-450
DF(%)	26	22	18	16	14	12	10	10	15	20

For capacitor whose capacitance exceeds 1000 uF, the value of DF(%) is increased by 2% for every addition of 1000 uF.

- . Load Life (105°C, 2000 hrs.)
 - Capacitance change : within 20% of initial value
 - Dissipation factor : not exceed 200% of specified value
 - Leakage current : not exceed the specified value

- . Shelf Life (1000 hrs, no voltage applied)
 - Capacitance change : within 20% of initial value
 - Dissipation factor : not exceed 200% of specified value
 - Leakage current : not exceed the specified value

Catalog Numbering

SH	016	M	1000	A	5	S	-	1019	
--	---	-	----	-	-	-	-	----	
:	:	:	:	:	:	:	:		Case size
:	:	:	:	:	:	:	:		Lead cut
:	:	:	:	:	:	:	:	...	Rubber
:	:	:	:	:	:	:	:	...	Pitch
:	:	:	:	:	:	:	:	...	Package Code
:	:	:	:	:	:	:	:	...	Capacitance. This expressed in microfarads
:	:	:	:	:	:	:	:	...	Capacitance tolerance
:	:	:	:	:	:	:	:	...	DC voltage rating. This is expressed in volt.
:	:	:	:	:	:	:	:	...	YAGEO type number. This identifies the basic capacitor design

PERFORMANCE CHARACTERISTICS (continued)

1. General Characteristics

1.1 Marking

Capacitors shall be marked with YAGEO mark ; rated capacitance ; rated DC working voltage range. and the date code of manufacture. The cathode lead will be identified with minus signs (-) on the side of the case.

1.2 Operating Temperature Range

These capacitors are designed to operate over a temperature range of -40°C to +105°C, for the rated voltage up to 450 V.

1.2.1 At -40°C, capacitors shall retain at least 70% of their original 20°C measured capacitance. At +85°C. capacitance shall increase to no more than 120% of their original 20°C measured capacitance.

1.2.2 At -40(-25) °C, impedance shall increase to no more than the following table.

TEMPERATURE CHARACTERISTIC (@ 120Hz)

Working Voltage (WV)	6.3	10	16	25	35-100	160-250	315-450
----------------------	-----	----	----	----	--------	---------	---------

Impedance Z-25°C/ Z+20°C	4	3	2	2	2	4	4
--------------------------	---	---	---	---	---	---	---

Impedance Z-40°C/ Z+20°C	8	6	4	3	3	6	8
--------------------------	---	---	---	---	---	---	---

1.3 Vent Test (applies only to those capacitors with vents.)

During and after the applicable test below (1.3.1 or 1.3.2.) there shall be no explosion, flash, flame or expulsion of particles of the core or container. In addition, the case shall not be expelled from the core.

If the capacitor under test is a multisection unit, this test shall apply to the input section only.

1.3.1 AC Test. Capacitors with DC Rating Over 100 Volts

The capacitor under test shall be connected to a 120 volt MS 60Hz, 100 ampere service through a 30 ampere thermal breaker and a 0.5 ohm, low inductance, series resistor. The capacitor shall be connected to this circuit for 5 minutes after the initial setting of the breaker or until the breaker has opened 3 times. If the breaker opens, it shall be reset not sooner than 30 seconds nor longer than 60 seconds from the time it opened.

1.3.2 DC Test. Capacitors with DC Rating 100 Volts or Less

Both of the following tests shall be performed, but on separate test units.

1.3.2.1 Forward Bias Test.

The capacitor under test shall be connected to a DC power supply that has sufficient voltage to supply a constant direct current of 500 milliamperes with the positive terminal of the capacitor connected to the positive supply terminal and the negative capacitor terminal connected to the negative supply terminal. The constant current shall be maintained until (1) the capacitor vents, (2) 300 seconds have elapsed, or (3) the capacitor under test open circuits.

PERFORMANCE CHARACTERISTICS (continued)

1.3.2.2 Reverse Bias Test.

The capacitor under test shall be connected to a power supply with sufficient voltage to provide a constant direct current of 500 milliamperes when the positive capacitor terminal is connected to the negative supply terminal and the negative capacitor terminal to the positive supply terminal. The constant current shall be maintained until (1) the capacitor vents, (2) 300 seconds have elapsed, or (3) The capacitor open circuits.

2. Mechanical Characteristics

2.1 Lead Pull test

Capacitor leads shall withstand a steady pull of 1 Kg applied axially to the leads for 5 seconds.

3. Electrical Characteristics

3.1 Standard Test Conditions

Unless otherwise specified all tests shall be performed at, or referred to, an ambient temperature of 20°C and a relative humidity not greater than 50%.

3.2 Capacitance and Dissipation Factor

Measurements shall be made on a capacitance bridge capable of $\pm 2\%$ accuracy on capacitance and dissipation factor measurements. Measurements shall be made at 120 Hz The RMS value of the AC measuring voltage shall not exceed 1.0 volt.

3.3 Leakage Current

3.3.1 Pre-conditioning. Rated working voltage shall be applied to capacitors for a minimum period of 15 minutes duration at least 24 hours and not more than 48 hours before test.

3.3.2 Test. Measurements shall be made after a 2 minute charge at rated working voltage at 20°C with an application of a steady source of power. Such as a regular power supply, with a 1000 ohm resistance to limit the charging current, connected in series with each capacitor under test.

3.4 Surge Voltage

The surge DC rating is the maximum voltage to which the capacitor should be subjected under any conditions. This includes transients and peak ripple at the highest line voltage.

3.4.1 Capacitors, connected in series with 1000 ohm resistors, shall withstand the surge test voltage applied at the rated of 1/2 minute on, 5 1/2 minutes off, for 1000 successive test cycles at 20°C.(see the following table)

Rated Voltage	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
Surge Voltage	8	13	20	32	44	63	79	125	200	250	300	400	450	500

PERFORMANCE CHARACTERISTICS (continued)

3.4.2 After the test, the capacitors shall meet the requirement specified in the following table.

Test	Value after test
Leakage Current	Not more than the initial value specified
Capacitance Change	More than 85% of the value before test
Dissipation Factor	Not more than 175% of the initial value specified

3.5 Humidity Test

Capacitors shall be subjected to a temperature of 40 $\pm$ 2°C at a relative humidity of 90-95% for a period of 500 hours, then air dried for 1 hour. Following this conditioning, capacitors shall meet the specified requirements for dissipation factor and DC leakage current, and the capacitance value shall not change more than 10%.

4. Life And Reliability Test

4.1 Life Test

4.1.1 Rated voltage shall be applied to the capacitors for a period of 2000 hours with maximum ripple current while units are maintained at an ambient temperature of +105°C.

4.1.2 Capacitors shall then be removed from the test chamber and return to room temperature.

4.1.3 The capacitance shall then be measured in accordance with section 3.2 It shall not decrease to less than 80% of the capacitance at 20°C, measured prior to the test, nor shall it increase to more than 120% of the original 20°C value.

4.1.4 The dissipation factor shall be measured in accordance with section 3.2 The dissipation factor shall not exceed 200% of the specified value.

4.1.5 At the conclusion of the test, the leakage current shall not exceed the initial DC leakage current requirement. Measurements shall be made in accordance with section 3.3

4.2 Shelf Test

After storage for 1000 hours at 105°C with no voltage applied, the capacitance change within 20% of initial value at 20°C and dissipation factor shall meet the initial requirements of section 4.1.4; the DC leakage current, measured in accordance with section 3.3, shall not exceed 200% of the specified value for the capacitor.

GUIDE TO APPLICATION

1. Maximum Ripple Current

1.1 Maximum rms. ripple current at 105°C 120 Hz is given in the table 1.

1.2 When capacitors are operated at temperatures other than 105°C, and frequency other than 120 Hz, the maximum rms. ripple currents must be multiplied by the factors shown in below table.

COMPENSATION FACTOR OF RIPPLE CURRENT VERSUS FREQUENCY

WV.	CAP(uF)	50	120	300	1K	10K-100K (Hz)

6.3-100V Below - 68 μ F		0.75	1	1.3	1.57	2.00
6.3-100V 69 - 470 μ F		0.80	1	1.23	1.34	1.50
6.3-100V 471 - 22000 μ F		0.85	1	1.10	1.13	1.15
160-450V All Cap(μ F)		0.80	1	1.25	1.40	1.60

2. Ripple voltage

Ripple voltage must not exceed the following:

The sum of the DC voltage plus the AC ripple voltage must not exceed the rated DC voltage. The DC voltage plus the peak AC voltage must not cause a voltage reversal more than 1.5 volts.

3. Insulating

General types of aluminum electrolytic capacitors are covered with a vinyl sleeve or the like. And this sleeve is used for marking. When the internal element or the container is needed to be insulated, capacitors specially designed for insulation requirement are recommended to be used.

4. Soldering

4-1 When soldering a printed circuit board with various components, too high soldering temperature or too long dipping times may cause secondary shrinking of the sleeve which unnecessarily exposes the container. Soldering is allowed to performed at less than 260°C for less than 10 seconds.

4-2 Soldering may melt or break the sleeve,if the sleeve is contacted with circuit patterns. To avoid this trouble, the capacitors are recommended to be slightly apart from the circuit boards.

GUIDE TO APPLICATION (continued)

5. Vent

The capacitors are provided with a pressure resistive controlled safety vent formed on the bottom of the container. The vent is designed to rupture in the event that higher internal pressure is developed by circuit malfunction or capacitor miss-use.

6. High Altitude

These capacitors are capable of withstanding in transit conditions where storage temperature may range from -40°C to +105°C and the altitude may reach 200,000 feet.

7. Cleaning agents

Halogenated hydrocarbon cleaning solvents are not recommended for use in cleaning capacitors supplied with exposed end seals. Where cleaning with a halogenated solvent is desired, capacitors should be ordered with a Epoxy-coated end seal.

8. Others

- (1) All Yageo capacitors comply to RoHS(Restriction of Hazardous Substances) requirements where Chromium (Cr+6), Cadmium(Cd), Mercury(Hg), Lead (pb), Polybrominated biphenyls(PBBs) and Polybrominated biphenyl/diphenyl ethers (PBBEs/PBDEs) have not been detected [lower than MDL (Method Detection Limit)] per SGS certification test report.
- (2) Satisfied characteristic JIS C 5101
- (3) Aluminum Electrolytic Capacitors may be damaged by corrosion which is caused by any halogenated hydrocarbon solvents. Please let us know in advance the solvent name and conditions for your PCB cleaning.

Table 1-1 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (μ F)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (μ A)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (mA)
SH006M0100B2F-0511	100	6.3	5X11	9	0.26	100
SH006M0100A2F-0511	100	6.3	5X11	9	0.26	100
SH006M0100AZF-0511	100	6.3	5X11	9	0.26	100
SH006M0100A5F-0511	100	6.3	5X11	9	0.26	100
SH006M0150B2F-0511	150	6.3	5X11	13	0.26	120
SH006M0150A2F-0511	150	6.3	5X11	13	0.26	120
SH006M0150AZF-0511	150	6.3	5X11	13	0.26	120
SH006M0150A5F-0511	150	6.3	5X11	13	0.26	120
SH006M0220BZF-0611	220	6.3	6.3X11	17	0.26	165
SH006M0220AZF-0611	220	6.3	6.3X11	17	0.26	165
SH006M0220A5F-0611	220	6.3	6.3X11	17	0.26	165
SH006M0330BZF-0611	330	6.3	6.3X11	24	0.26	161
SH006M0330AZF-0611	330	6.3	6.3X11	24	0.26	161
SH006M0330A5F-0611	330	6.3	6.3X11	24	0.26	161
SH006M0330B3F-0811	330	6.3	8X11	24	0.26	200
SH006M0330A3F-0811	330	6.3	8X11	24	0.26	200
SH006M0330A5F-0811	330	6.3	8X11	24	0.26	200
SH006M0470BZF-0611	470	6.3	6.3X11	33	0.26	225
SH006M0470AZF-0611	470	6.3	6.3X11	33	0.26	225
SH006M0470A5F-0611	470	6.3	6.3X11	33	0.26	225
SH006M0470B3F-0811	470	6.3	8X11	33	0.26	280
SH006M0470A3F-0811	470	6.3	8X11	33	0.26	280
SH006M0470A5F-0811	470	6.3	8X11	33	0.26	280
SH006M0680B5S-1012	680	6.3	10X12	46	0.26	320
SH006M0680A5S-1012	680	6.3	10X12	46	0.26	320
SH006M1000B5S-1012	1000	6.3	10X12	66	0.26	470
SH006M1000A5S-1012	1000	6.3	10X12	66	0.26	470
SH006M1500B5S-1015	1500	6.3	10X15	98	0.26	600
SH006M1500A5S-1015	1500	6.3	10X15	98	0.26	600
SH006M2200B5S-1320	2200	6.3	13X20	142	0.28	930
SH006M2200A5S-1320	2200	6.3	13X20	142	0.28	930
SH006M3300B5S-1320	3300	6.3	13X20	211	0.30	1100
SH006M3300A5S-1320	3300	6.3	13X20	211	0.30	1100
SH006M4700B7F-1625	4700	6.3	16X25	299	0.32	1320
SH006M4700A7F-1625	4700	6.3	16X25	299	0.32	1320
SH006M6800B7F-1625	6800	6.3	16X25	431	0.36	1490
SH006M6800A7F-1625	6800	6.3	16X25	431	0.36	1490
SH006M10K0B7F-1632	10000	6.3	16X32	633	0.44	1830
SH006M15K0B7F-1836	15000	6.3	18X36	948	0.54	2280
SH010M0047B2F-0511	47	10	5X11	8	0.22	75
SH010M0068B2F-0511	68	10	5X11	10	0.22	80
SH010M0068A2F-0511	68	10	5X11	10	0.22	80
SH010M0068AZF-0511	68	10	5X11	10	0.22	80
SH010M0068A5F-0511	68	10	5X11	10	0.22	80

Table 1-2 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (Mf)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (Ma)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (Ma)
SH010M0100B2F-0511	100	10	5X11	13	0.22	110
SH010M0100A2F-0511	100	10	5X11	13	0.22	110
SH010M0100AZF-0511	100	10	5X11	13	0.22	110
SH010M0100A5F-0511	100	10	5X11	13	0.22	110
SH010M0150BZF-0611	150	10	6.3X11	18	0.22	130
SH010M0150AZF-0611	150	10	6.3X11	18	0.22	130
SH010M0150A5F-0611	150	10	6.3X11	18	0.22	130
SH010M0220BZF-0611	220	10	6.3X11	25	0.22	180
SH010M0220AZF-0611	220	10	6.3X11	25	0.22	180
SH010M0220A5F-0611	220	10	6.3X11	25	0.22	180
SH010M0330B3F-0811	330	10	8X11	36	0.22	255
SH010M0330A3F-0811	330	10	8X11	36	0.22	255
SH010M0330A5F-0811	330	10	8X11	36	0.22	255
SH010M0470B3F-0811	470	10	8X11	50	0.22	305
SH010M0470A3F-0811	470	10	8X11	50	0.22	305
SH010M0470A5F-0811	470	10	8X11	50	0.22	305
SH010M0680B5S-1012	680	10	10X12	71	0.22	420
SH010M0680A5S-1012	680	10	10X12	71	0.22	420
SH010M1000B3F-0815	1000	10	8X15	103	0.22	477
SH010M1000A3F-0815	1000	10	8X15	103	0.22	477
SH010M1000A5F-0815	1000	10	8X15	103	0.22	477
SH010M1000B5S-1015	1000	10	10X15	103	0.22	570
SH010M1000A5S-1015	1000	10	10X15	103	0.22	570
SH010M1000B5S-1012	1000	10	10X12	103	0.22	490
SH010M1000A5S-1012	1000	10	10X12	103	0.22	490
SH010M1500B5S-1019	1500	10	10X19.5	153	0.22	750
SH010M1500A5S-1019	1500	10	10X19.5	153	0.22	750
SH010M2200B5S-1320	2200	10	13X20	223	0.24	1010
SH010M2200A5S-1320	2200	10	13X20	223	0.24	1010
SH010M2200B5S-1019	2200	10	10X19.5	223	0.24	800
SH010M2200A5S-1019	2200	10	10X19.5	223	0.24	800
SH010M3300B5S-1325	3300	10	13X25	333	0.26	1220
SH010M3300A5S-1325	3300	10	13X25	333	0.26	1220
SH010M4700B7F-1625	4700	10	16X25	473	0.28	1410
SH010M4700A7F-1625	4700	10	16X25	473	0.28	1410
SH010M6800B7F-1632	6800	10	16X32	683	0.32	1610
SH010M10K0B7F-1836	10000	10	18X36	1003	0.40	1980
SH016M0010B2F-0511	10	16	5X11	5	0.18	44
SH016M0010A2F-0511	10	16	5X11	5	0.18	44
SH016M0010AZF-0511	10	16	5X11	5	0.18	44
SH016M0010A5F-0511	10	16	5X11	5	0.18	44
SH016M0033B2F-0511	33	16	5X11	8	0.18	70
SH016M0033A2F-0511	33	16	5X11	8	0.18	70
SH016M0033AZF-0511	33	16	5X11	8	0.18	70
SH016M0033A5F-0511	33	16	5X11	8	0.18	70
SH016M0047B2F-0511	47	16	5X11	11	0.18	85

Table 1-3 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (Mf)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (Ma)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (Ma)
SH016M0047A2F-0511	47	16	5X11	11	0.18	85
SH016M0047AZF-0511	47	16	5X11	11	0.18	85
SH016M0047A5F-0511	47	16	5X11	11	0.18	85
SH016M0068B2F-0511	68	16	5X11	14	0.18	100
SH016M0068A2F-0511	68	16	5X11	14	0.18	100
SH016M0068AZF-0511	68	16	5X11	14	0.18	100
SH016M0068A5F-0511	68	16	5X11	14	0.18	100
SH016M0100B2F-0511	100	16	5X11	19	0.18	115
SH016M0100A2F-0511	100	16	5X11	19	0.18	115
SH016M0100AZF-0511	100	16	5X11	19	0.18	115
SH016M0100A5F-0511	100	16	5X11	19	0.18	115
SH016M0100BZF-0611	100	16	6.3X11	19	0.18	135
SH016M0100AZF-0611	100	16	6.3X11	19	0.18	135
SH016M0100A5F-0611	100	16	6.3X11	19	0.18	135
SH016M0150B3F-0811	150	16	8X11	27	0.18	180
SH016M0150A3F-0811	150	16	8X11	27	0.18	180
SH016M0220B3F-0811	220	16	8X11	38	0.18	235
SH016M0220A3F-0811	220	16	8X11	38	0.18	235
SH016M0220BZF-0611	220	16	6.3X11	38	0.18	180
SH016M0220AZF-0611	220	16	6.3X11	38	0.18	180
SH016M0220A5F-0611	220	16	6.3X11	38	0.18	180
SH016M0330B3F-0811	330	16	8X11	56	0.18	315
SH016M0330A3F-0811	330	16	8X11	56	0.18	315
SH016M0330A5F-0811	330	16	8X11	56	0.18	315
SH016M0330B5S-1012	330	16	10X12	56	0.18	285
SH016M0330A5S-1012	330	16	10X12	56	0.18	285
SH016M0470B3F-0811	470	16	8X11	78	0.18	315
SH016M0470A3F-0811	470	16	8X11	78	0.18	315
SH016M0470A5F-0811	470	16	8X11	78	0.18	315
SH016M0470B5S-1012	470	16	10X12	78	0.18	395
SH016M0470A5S-1012	470	16	10X12	78	0.18	395
SH016M0680B5S-1015	680	16	10X15	112	0.18	530
SH016M0680A5S-1015	680	16	10X15	112	0.18	530
SH016M1000B5S-1015	1000	16	10X15	163	0.18	600
SH016M1000A5S-1015	1000	16	10X15	163	0.18	600
SH016M1000B5S-1019	1000	16	10X19.5	163	0.18	700
SH016M1000A5S-1019	1000	16	10X19.5	163	0.18	700
SH016M1500A5S-1019	1500	16	10X19.5	240	0.18	705
SH016M1500B5S-1320	1500	16	13X20	243	0.18	860
SH016M1500A5S-1320	1500	16	13X20	243	0.18	860
SH016M2200B5S-1320	2200	16	13X20	355	0.20	991
SH016M2200A5S-1320	2200	16	13X20	355	0.20	991
SH016M2200B5S-1325	2200	16	13X25	355	0.20	1150
SH016M2200A5S-1325	2200	16	13X25	355	0.20	1150
SH016M3300B5S-1325	3300	16	13X25	355	0.22	1150

Table 1-4 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capacitance (μ F)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (μ A)	Dissipation Factor ($\tan \delta$)	Ripple 105°C 120 Hz (mA)
SH016M3300A5S-1325	3300	16	13X25	355	0.22	1150
SH016M3300B7F-1625	3300	16	16X25	531	0.22	1350
SH016M3300A7F-1625	3300	16	16X25	531	0.22	1350
SH016M4700B7F-1625	4700	16	16X25	755	0.24	1330
SH016M4700A7F-1625	4700	16	16X25	755	0.24	1330
SH016M4700B7F-1632	4700	16	16X32	755	0.24	1560
SH016M6800B7F-1836	6800	16	18X36	1091	0.28	1790
SH025M0010B2F-0511	10	25	5X11	6	0.16	43
SH025M0010A2F-0511	10	25	5X11	6	0.16	43
SH025M0010AZF-0511	10	25	5X11	6	0.16	43
SH025M0010A5F-0511	10	25	5X11	6	0.16	43
SH025M0022B2F-0511	22	25	5X11	9	0.16	60
SH025M0022A2F-0511	22	25	5X11	9	0.16	60
SH025M0022AZF-0511	22	25	5X11	9	0.16	60
SH025M0022A5F-0511	22	25	5X11	9	0.16	60
SH025M0033B2F-0511	33	25	5X11	11	0.16	75
SH025M0033A2F-0511	33	25	5X11	11	0.16	75
SH025M0033AZF-0511	33	25	5X11	11	0.16	75
SH025M0033A5F-0511	33	25	5X11	11	0.16	75
SH025M0047B2F-0511	47	25	5X11	15	0.16	90
SH025M0047A2F-0511	47	25	5X11	15	0.16	90
SH025M0047AZF-0511	47	25	5X11	15	0.16	90
SH025M0047A5F-0511	47	25	5X11	15	0.16	90
SH025M0068BZF-0611	68	25	6.3X11	20	0.16	125
SH025M0068AZF-0611	68	25	6.3X11	20	0.16	125
SH025M0068A5F-0611	68	25	6.3X11	20	0.16	125
SH025M0100BZF-0611	100	25	6.3X11	28	0.16	145
SH025M0100AZF-0611	100	25	6.3X11	28	0.16	145
SH025M0100A5F-0611	100	25	6.3X11	28	0.16	145
SH025M0150B3F-0811	150	25	8X11	41	0.16	200
SH025M0150A3F-0811	150	25	8X11	41	0.16	200
SH025M0150A5F-0811	150	25	8X11	41	0.16	200
SH025M0220B3F-0811	220	25	8X11	58	0.16	200
SH025M0220A3F-0811	220	25	8X11	58	0.16	200
SH025M0220A5F-0811	220	25	8X11	58	0.16	200
SH025M0220B5S-1012	220	25	10X12	58	0.16	250
SH025M0220A5S-1012	220	25	10X12	58	0.16	250
SH025M0330B5S-1012	330	25	10X12	86	0.16	355
SH025M0330A5S-1012	330	25	10X12	86	0.16	355
SH025M0470B5S-1012	470	25	10X12	121	0.16	400
SH025M0470A5S-1012	470	25	10X12	121	0.16	470
SH025M0470B5S-1015	470	25	10X15	121	0.16	470
SH025M0470A5S-1015	470	25	10X15	121	0.16	470
SH025M0680B5S-1019	680	25	10X19.5	173	0.16	650

Table 1-5 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (Mf)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (Ma)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (Ma)
SH025M0680A5S-1019	680	25	10X19.5	173	0.16	650
SH025M1000B5S-1019	1000	25	10X19.5	253	0.16	700
SH025M1000A5S-1019	1000	25	10X19.5	253	0.16	700
SH025M1000B5S-1320	1000	25	13X20	253	0.16	855
SH025M1000A5S-1320	1000	25	13X20	253	0.16	855
SH025M1500B5S-1325	1500	25	13X25	378	0.16	1020
SH025M1500A5S-1325	1500	25	13X25	378	0.16	1020
SH025M2200B7F-1625	2200	25	16X25	553	0.18	1230
SH025M2200A7F-1625	2200	25	16X25	553	0.18	1230
SH025M3300B7F-1632	3300	25	16X32	828	0.20	1450
SH025M4700B7F-1836	4700	25	18X36	1178	0.22	1690
SH035M0010B2F-0511	10	35	5X11	7	0.14	44
SH035M0010A2F-0511	10	35	5X11	7	0.14	44
SH035M0010AZF-0511	10	35	5X11	7	0.14	44
SH035M0010A5F-0511	10	35	5X11	7	0.14	44
SH035M0015B2F-0511	15	35	5X11	8	0.14	50
SH035M0015A2F-0511	15	35	5X11	8	0.14	50
SH035M0015AZF-0511	15	35	5X11	8	0.14	50
SH035M0015A5F-0511	15	35	5X11	8	0.14	50
SH035M0022B2F-0511	22	35	5X11	11	0.14	65
SH035M0022A2F-0511	22	35	5X11	11	0.14	65
SH035M0022AZF-0511	22	35	5X11	11	0.14	65
SH035M0022A5F-0511	22	35	5X11	11	0.14	65
SH035M0033B2F-0511	33	35	5X11	15	0.14	85
SH035M0033A2F-0511	33	35	5X11	15	0.14	85
SH035M0033AZF-0511	33	35	5X11	15	0.14	85
SH035M0033A5F-0511	33	35	5X11	15	0.14	85
SH035M0047BZF-0611	47	35	6.3X11	19	0.14	115
SH035M0047BZF-0611	47	35	6.3X11	19	0.14	115
SH035M0047A5F-0611	47	35	6.3X11	19	0.14	115
SH035M0056BZF-0611	56	35	6.3X11	22	0.16	120
SH035M0056AZF-0611	56	35	6.3X11	22	0.16	120
SH035M0056A5F-0611	56	35	6.3X11	22	0.16	120
SH035M0068B3F-0811	68	35	8X11	27	0.14	130
SH035M0068A3F-0811	68	35	8X11	27	0.14	130
SH035M0068A5F-0811	68	35	8X11	27	0.14	130
SH035M0100BZF-0611	100	35	6.3X11	38	0.14	150
SH035M0100AZF-0611	100	35	6.3X11	38	0.14	150
SH035M0100A5F-0611	100	35	6.3X11	38	0.14	150
SH035M0100B3F-0811	100	35	8X11	38	0.14	190
SH035M0100A3F-0811	100	35	8X11	38	0.14	190
SH035M0100A5F-0811	100	35	8X11	38	0.14	190
SH035M0150B5S-1012	150	35	10X12	56	0.14	240
SH035M0150A5S-1012	150	35	10X12	56	0.14	240

Table 1-6 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (μ F)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (μ A)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (mA)
SH035M0220B3F-0811	220	35	8X11	80	0.14	253
SH035M0220A3F-0811	220	35	8X11	80	0.14	253
SH035M0220A5F-0811	220	35	8X11	80	0.14	253
SH035M0220B5S-1012	220	35	10X12	80	0.14	315
SH035M0220A5S-1012	220	35	10X12	80	0.14	315
SH035M0330B5S-1012	330	35	10X12	119	0.14	380
SH035M0330A5S-1012	330	35	10X12	119	0.14	380
SH035M0330B5S-1015	330	35	10X15	119	0.14	440
SH035M0330A5S-1015	330	35	10X15	119	0.14	440
SH035M0470B5S-1015	470	35	10X15	168	0.14	440
SH035M0470A5S-1015	470	35	10X15	168	0.14	440
SH035M0470B5S-1019	470	35	10X19.5	168	0.14	460
SH035M0470A5S-1019	470	35	10X19.5	168	0.14	460
SH035M0470B5S-1320	470	35	13X20	168	0.14	580
SH035M0470A5S-1320	470	35	13X20	168	0.14	580
SH035M0680B5S-1320	680	35	13X20	241	0.14	730
SH035M0680A5S-1320	680	35	13X20	241	0.14	730
SH035M1000B5S-1320	1000	35	13X20	353	0.14	857
SH035M1000A5S-1320	1000	35	13X20	353	0.14	857
SH035M1000B5S-1325	1000	35	13X25	353	0.14	995
SH035M1000A5S-1325	1000	35	13X25	353	0.14	995
SH035M1500B7F-1625	1500	35	16X25	528	0.14	1110
SH035M1500A7F-1625	1500	35	16X25	528	0.14	1110
SH035M2200B7F-1625	2200	35	16X25	773	0.16	1236
SH035M2200A7F-1625	2200	35	16X25	773	0.16	1236
SH035M2200B7F-1632	2200	35	16X32	773	0.16	1450
SH035M3300B7F-1636	3300	35	16X36	1158	0.18	1477
SH035M3300B7F-1836	3300	35	18X36	1158	0.18	1660
SH050M0R10B2F-0511	0.1	50	5X11	3	0.12	3
SH050M0R10A2F-0511	0.1	50	5X11	3	0.12	3
SH050M0R10AZF-0511	0.1	50	5X11	3	0.12	3
SH050M0R10A5F-0511	0.1	50	5X11	3	0.12	3
SH050M0R22B2F-0511	0.22	50	5X11	3	0.12	5
SH050M0R22A2F-0511	0.22	50	5X11	3	0.12	5
SH050M0R22AZF-0511	0.22	50	5X11	3	0.12	5
SH050M0R22A5F-0511	0.22	50	5X11	3	0.12	5
SH050M0R47B2F-0511	0.47	50	5X11	3	0.12	7
SH050M0R47A2F-0511	0.47	50	5X11	3	0.12	7
SH050M0R47AZF-0511	0.47	50	5X11	3	0.12	7
SH050M0R47A5F-0511	0.47	50	5X11	3	0.12	7
SH050M1R00B2F-0511	1	50	5X11	3.5	0.12	12
SH050M1R00A2F-0511	1	50	5X11	3.5	0.12	12
SH050M1R00AZF-0511	1	50	5X11	3.5	0.12	12
SH050M1R00A5F-0511	1	50	5X11	3.5	0.12	12

Table 1-7 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (μ F)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (μ A)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (mA)
SH050M2R20B2F-0511	2.2	50	5X11	4	0.12	18
SH050M2R20A2F-0511	2.2	50	5X11	4	0.12	18
SH050M2R20AZF-0511	2.2	50	5X11	4	0.12	18
SH050M2R20A5F-0511	2.2	50	5X11	4	0.12	18
SH050M3R30B2F-0511	3.3	50	5X11	5	0.12	25
SH050M3R30A2F-0511	3.3	50	5X11	5	0.12	25
SH050M3R30AZF-0511	3.3	50	5X11	5	0.12	25
SH050M3R30A5F-0511	3.3	50	5X11	5	0.12	25
SH050M4R70B2F-0511	4.7	50	5X11	5	0.12	30
SH050M4R70A2F-0511	4.7	50	5X11	5	0.12	30
SH050M4R70AZF-0511	4.7	50	5X11	5	0.12	30
SH050M4R70A5F-0511	4.7	50	5X11	5	0.12	30
SH050M6R80B2F-0511	6.8	50	5X11	6	0.12	30
SH050M6R80A5F-0511	6.8	50	5X11	6	0.12	30
SH050M6R80AZF-0511	6.8	50	5X11	6	0.12	30
SH050M6R80A5F-0511	6.8	50	5X11	6	0.12	30
SH050M0010B2F-0511	10	50	5X11	8	0.12	50
SH050M0010A2F-0511	10	50	5X11	8	0.12	50
SH050M0010AZF-0511	10	50	5X11	8	0.12	50
SH050M0010A5F-0511	10	50	5X11	8	0.12	50
SH050M0015B2F-0511	15	50	5X11	11	0.12	50
SH050M0015A2F-0511	15	50	5X11	11	0.12	50
SH050M0015AZF-0511	15	50	5X11	11	0.12	50
SH050M0015A5F-0511	15	50	5X11	11	0.12	50
SH050M0022B2F-0511	22	50	5X11	14	0.12	75
SH050M0022A2F-0511	22	50	5X11	14	0.12	75
SH050M0022AZF-0511	22	50	5X11	14	0.12	75
SH050M0022A5F-0511	22	50	5X11	14	0.12	75
SH050M0033BZF-0611	33	50	6.3X11	20	0.12	105
SH050M0033AZF-0611	33	50	6.3X11	20	0.12	105
SH050M0033A5F-0611	33	50	6.3X11	20	0.12	105
SH050M0047BZF-0611	47	50	6.3X11	27	0.12	101
SH050M0047AZF-0611	47	50	6.3X11	27	0.12	101
SH050M0047A5F-0611	47	50	6.3X11	27	0.12	101
SH050M0047B3F-0811	47	50	8X11	27	0.12	125
SH050M0047A3F-0811	47	50	8X11	27	0.12	125
SH050M0047A5F-0811	47	50	8X11	27	0.12	125
SH050M0068B3F-0811	68	50	8X11	37	0.12	159
SH050M0068A3F-0811	68	50	8X11	37	0.12	159
SH050M0068A5F-0811	68	50	8X11	37	0.12	159
SH050M0100B3F-0811	100	50	8X11	53	0.12	169
SH050M0100A3F-0811	100	50	8X11	53	0.12	169
SH050M0100A5F-0811	100	50	8X11	53	0.12	169
SH050M0100B5S-1012	100	50	10X12	53	0.12	210

Table 1-8 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capacitance (μ F)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (μ A)	Dissipation Factor ($\tan \delta$)	Ripple 105°C 120 Hz (mA)
SH050M0100A5S-1012	100	50	10X12	53	0.12	210
SH050M0150B5S-1012	150	50	10X12	78	0.12	289
SH050M0150A5S-1012	150	50	10X12	78	0.12	289
SH050M0220B5S-1012	220	50	10X12	113	0.12	346
SH050M0220A5S-1012	220	50	10X12	113	0.12	346
SH050M0220B5S-1015	220	50	10X15	113	0.12	400
SH050M0220A5S-1015	220	50	10X15	113	0.12	400
SH050M0330B5S-1320	330	50	13X20	168	0.12	600
SH050M0330A5S-1320	330	50	13X20	168	0.12	600
SH050M0330B5S-1019	330	50	10X19.5	168	0.12	535
SH050M0330A5S-1019	330	50	10X19.5	168	0.12	535
SH050M0470B5S-1019	470	50	10X19.5	238	0.12	560
SH050M0470A5S-1019	470	50	10X19.5	238	0.12	560
SH050M0470B5S-1320	470	50	13X20	238	0.12	730
SH050M0470A5S-1320	470	50	13X20	238	0.12	730
SH050M0680B5S-1325	680	50	13X25	343	0.12	860
SH050M0680A5S-1325	680	50	13X25	343	0.12	860
SH050M1000B7F-1625	1000	50	16X25	503	0.12	1110
SH050M1000A7F-1625	1000	50	16X25	503	0.12	1110
SH050M1500B7F-1632	1500	50	16X32	753	0.12	1350
SH050M2200B7F-1636	2200	50	16X36	1103	0.14	1360
SH050M2200B7F-1836	2200	50	18X36	1103	0.14	1530
SH063M0R47B2F-0511	0.47	63	5X11	3	0.10	8
SH063M0R47A2F-0511	0.47	63	5X11	3	0.10	8
SH063M0R47AZF-0511	0.47	63	5X11	3	0.10	8
SH063M0R47A5F-0511	0.47	63	5X11	3	0.10	8
SH063M1R00B2F-0511	1	63	5X11	4	0.10	12
SH063M1R00A2F-0511	1	63	5X11	4	0.10	12
SH063M1R00AZF-0511	1	63	5X11	4	0.10	12
SH063M1R00A5F-0511	1	63	5X11	4	0.10	12
SH063M2R20B2F-0511	2.2	63	5X11	4	0.10	20
SH063M2R20A2F-0511	2.2	63	5X11	4	0.10	20
SH063M2R20AZF-0511	2.2	63	5X11	4	0.10	20
SH063M2R20A5F-0511	2.2	63	5X11	4	0.10	20
SH063M3R30B2F-0511	3.3	63	5X11	5	0.10	27
SH063M3R30A2F-0511	3.3	63	5X11	5	0.10	27
SH063M3R30AZF-0511	3.3	63	5X11	5	0.10	27
SH063M3R30A5F-0511	3.3	63	5X11	5	0.10	27
SH063M4R70B2F-0511	4.7	63	5X11	6	0.10	34
SH063M4R70A2F-0511	4.7	63	5X11	6	0.10	34
SH063M4R70AZF-0511	4.7	63	5X11	6	0.10	34
SH063M4R70A5F-0511	4.7	63	5X11	6	0.10	34
SH063M6R80B2F-0511	6.8	63	5X11	7	0.10	37
SH063M6R80A2F-0511	6.8	63	5X11	7	0.10	37
SH063M6R80AZF-0511	6.8	63	5X11	7	0.10	37
SH063M6R80A5F-0511	6.8	63	5X11	7	0.10	37

Table 1-9 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (μ F)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (μ A)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (mA)
SH063M0010B2F-0511	10	63	5X11	9	0.10	55
SH063M0010A2F-0511	10	63	5X11	9	0.10	55
SH063M0010AZF-0511	10	63	5X11	9	0.10	55
SH063M0100A5F-0511	10	63	5X11	9	0.10	55
SH063M0015B2F-0511	15	63	5X11	12	0.10	65
SH063M0015A2F-0511	15	63	5X11	12	0.10	65
SH063M0015AZF-0511	15	63	5X11	12	0.10	65
SH063M0015A5F-0511	15	63	5X11	12	0.10	65
SH063M0022BZF-0611	22	63	6.3X11	17	0.10	90
SH063M0022AZF-0611	22	63	6.3X11	17	0.10	90
SH063M0022A5F-0611	22	63	6.3X11	17	0.10	90
SH063M0330B3F-0811	33	63	8X11	24	0.10	110
SH063M0033A3F-0811	33	63	8X11	24	0.10	110
SH063M0033A5F-0811	33	63	8X11	24	0.10	110
SH063M0047B3F-0811	47	63	8X11	33	0.10	155
SH063M0047A3F-0811	47	63	8X11	33	0.10	155
SH063M0047A5F-0811	47	63	8X11	33	0.10	155
SH063M0068B5S-1012	68	63	10X12	46	0.10	198
SH063M0068A5S-1012	68	63	10X12	46	0.10	198
SH063M0100B5S-1012	100	63	10X12	66	0.10	260
SH063M0100A5S-1012	100	63	10X12	66	0.10	260
SH063M0150B5S-1015	150	63	10X15	98	0.10	330
SH063M0150A5S-1015	150	63	10X15	98	0.10	330
SH063M0220A5S-1019	220	63	10X19.5	142	0.10	465
SH063M0220A5S-1019	220	63	10X19.5	142	0.10	465
SH063M0330B5S-1320	330	63	13X20	211	0.10	650
SH063M0330A5S-1320	330	63	13X20	211	0.10	650
SH063M0470B5S-1235	470	63	12X35	299	0.10	840
SH063M0470A5S-1235	470	63	12X35	299	0.10	840
SH063M0470B5S-1320	470	63	13X20	299	0.10	800
SH063M0470A5S-1320	470	63	13X20	299	0.10	800
SH063M0470B5S-1325	470	63	13X25	299	0.10	800
SH063M0470A5S-1325	470	63	13X25	299	0.10	800
SH063M0680B7F-1625	680	63	16X25	431	0.10	1000
SH063M0680A7F-1625	680	63	16X25	431	0.10	1000
SH063M1000B7F-1625	1000	63	16X25	633	0.10	1023
SH063M1000A7F-1625	1000	63	16X25	633	0.10	1023
SH063M1000B7F-1632	1000	63	16X32	633	0.10	1200
SH063M1500B7F-1636	1500	63	16X36	948	0.10	1450
SH063M2200B7F-1845	2200	63	18X45	2964	0.16	1800
SH100M0R47B2F-0511	0.47	100	5X11	4	0.10	10
SH100M0R47A2F-0511	0.47	100	5X11	4	0.10	10
SH100M0R47AZF-0511	0.47	100	5X11	4	0.10	10
SH100M0R47A5F-0511	0.47	100	5X11	4	0.10	10
SH100M1R00B2F-0511	1	100	5X11	4	0.10	15
SH100M1R00A2F-0511	1	100	5X11	4	0.10	15

Table 1-10 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (Mf)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (μ A)	Dissipation Factor ($\tan \delta$)	Ripple 105°C 120 Hz (mA)
SH100M1R00AZF-0511	1	100	5X11	4	0.10	15
SH100M1R00A5F-0511	1	100	5X11	4	0.10	15
SH100M2R20B2F-0511	2.2	100	5X11	5	0.10	22
SH100M2R20A2F-0511	2.2	100	5X11	5	0.10	22
SH100M2R20AZF-0511	2.2	100	5X11	5	0.10	22
SH100M2R20A5F-0511	2.2	100	5X11	5	0.10	22
SH100M3R30B2F-0511	3.3	100	5X11	6	0.10	29
SH100M3R30A2F-0511	3.3	100	5X11	6	0.10	29
SH100M3R30AZF-0511	3.3	100	5X11	6	0.10	29
SH100M3R30A5F-0511	3.3	100	5X11	6	0.10	29
SH100M4R70B2F-0511	4.7	100	5X11	8	0.10	37
SH100M4R70A2F-0511	4.7	100	5X11	8	0.10	37
SH100M4R70AZF-0511	4.7	100	5X11	8	0.10	37
SH100M4R70A5F-0511	4.7	100	5X11	8	0.10	37
SH100M6R80B2F-0511	6.8	100	5X11	10	0.10	46
SH100M6R80A2F-0511	6.8	100	5X11	10	0.10	46
SH100M6R80AZF-0511	6.8	100	5X11	10	0.10	46
SH100M6R80A5F-0511	6.8	100	5X11	10	0.10	46
SH100M0010BZF-0611	10	100	6.3X11	13	0.10	65
SH100M0010AZF-0611	10	100	6.3X11	13	0.10	65
SH100M0010A5F-0611	10	100	6.3X11	13	0.10	65
SH100M0015B3F-0811	15	100	8X11	18	0.10	82
SH100M0015A3F-0811	15	100	8X11	18	0.10	82
SH100M0015A5F-0811	15	100	8X11	18	0.10	82
SH100M0022B3F-0811	22	100	8X11	25	0.10	115
SH100M0022A3F-0811	22	100	8X11	25	0.10	115
SH100M0022A5F-0811	22	100	8X11	25	0.10	115
SH100M0033B5S-1012	33	100	10X12	36	0.10	160
SH100M0033A5S-1012	33	100	10X12	36	0.10	160
SH100M0047B5S-1015	47	100	10X15	50	0.10	210
SH100M0047A5S-1015	47	100	10X15	50	0.10	210
SH100M0068B5S-1019	68	100	10X19.5	71	0.10	241
SH100M0068A5S-1019	68	100	10X19.5	71	0.10	241
SH100M0100B5S-1019	100	100	10X19.5	103	0.10	309
SH100M0100A5S-1019	100	100	10X19.5	103	0.10	309
SH100M0100B5S-1320	100	100	13X20	103	0.10	385
SH100M0100A5S-1320	100	100	13X20	103	0.10	385
SH100M0150B5S-1325	150	100	13X25	153	0.10	414
SH100M0150A5S-1325	150	100	13X25	153	0.10	414
SH100M0220B5S-1325	220	100	13X25	223	0.10	495
SH100M0220A5S-1325	220	100	13X25	223	0.10	495
SH100M0220B7F-1625	220	100	16X25	223	0.10	590
SH100M0220A7F-1625	220	100	16X25	223	0.10	590
SH100M0330B7F-1625	330	100	16X25	333	0.10	720
SH100M0330A7F-1625	330	100	16X25	333	0.10	720
SH100M0470B7F-1632	470	100	16X32	473	0.10	875

Table 1-11 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (μ F)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (μ A)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (Ma)
SH100M0680B7F-1636	680	100	16X36	683	0.10	1200
SH160M0R47A2F-0511	0.47	160	5X11	12	0.15	12
SH160M0R47A2F-0511	0.47	160	5X11	12	0.15	12
SH160M0R47AZF-0511	0.47	160	5X11	12	0.15	12
SH160M0R47A5F-0511	0.47	160	5X11	12	0.15	12
SH160M1R00B2F-0511	1	160	5X11	15	0.15	17
SH160M1R00A2F-0511	1	160	5X11	15	0.15	17
SH160M1R00AZF-0511	1	160	5X11	15	0.15	17
SH160M1R00A5F-0511	1	160	5X11	15	0.15	17
SH160M2R20BZF-0611	2.2	160	6.3X11	21	0.15	25
SH160M2R20AZF-0611	2.2	160	6.3X11	21	0.15	25
SH160M2R20A5F-0611	2.2	160	6.3X11	21	0.15	25
SH160M3R30BZF-0611	3.3	160	6.3X11	25.84	0.15	29
SH160M3R30BZS-0611	3.3	160	6.3X11	25.84	0.15	29
SH160M3R30AZF-0611	3.3	160	6.3X11	25.84	0.15	29
SH160M3R30A5F-0611	3.3	160	6.3X11	25.84	0.15	29
SH160M3R30B3F-0811	3.3	160	8X11	26	0.15	36
SH160M3R30A3F-0811	3.3	160	8X11	26	0.15	36
SH160M3R30A5F-0811	3.3	160	8X11	26	0.15	36
SH160M4R70BZF-0611	4.7	160	6.3X11	33	0.15	34
SH160M4R70AZF-0611	4.7	160	6.3X11	33	0.15	34
SH160M4R70A5F-0611	4.7	160	6.3X11	33	0.15	34
SH160M4R70B3F-0811	4.7	160	8X11	33	0.15	43
SH160M4R70A3F-0811	4.7	160	8X11	33	0.15	43
SH160M4R70A5F-0811	4.7	160	8X11	33	0.15	43
SH160M6R80B5S-1012	6.8	160	10X12	43	0.15	54
SH160M6R80A5S-1012	6.8	160	10X12	43	0.15	54
SH160M0010B5S-1012	10	160	10X12	58	0.15	70
SH160M0010A5S-1012	10	160	10X12	58	0.15	70
SH160M0015B5S-1015	15	160	10X15	82	0.15	90
SH160M0015A5S-1015	15	160	10X15	82	0.15	90
SH160M0022B5S-1019	22	160	10X19.5	116	0.15	130
SH160M0022A5S-1019	22	160	10X19.5	116	0.15	130
SH160M0033B5S-1320	33	160	13X20	168	0.15	180
SH160M0033A5S-1320	33	160	13X20	168	0.15	180
SH160M0047B5S-1325	47	160	13X25	236	0.15	250
SH160M0047A5S-1325	47	160	13X25	236	0.15	250
SH160M0068B5S-1325	68	160	13X25	336	0.15	270
SH160M0068A5S-1325	68	160	13X25	336	0.15	270
SH160M0100B7F-1625	100	160	16X25	490	0.15	390
SH160M0100A7F-1625	100	160	16X25	490	0.15	390
SH160M0150B7F-1632	150	160	16X32	730	0.15	435
SH160M0220B7F-1636	220	160	16X36	1056	0.15	700
SH160M0330B7F-1840	330	160	18X40	1594	0.15	850
SH160M0470BPF-2240	470	160	22X40	2266	0.15	980
SH200M0R47B2F-0511	0.47	200	5X11	13	0.15	12

Table 1-12 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (Mf)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (Ma)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (Ma)
SH200M0R47A2F-0511	0.47	200	5X11	13	0.15	12
SH200M0R47AZF-0511	0.47	200	5X11	13	0.15	12
SH200M0R47A5F-0511	0.47	200	5X11	13	0.15	12
SH200M1R00BZF-0611	1	200	6.3X11	16	0.15	17
SH200M1R00AZF-0611	1	200	6.3X11	16	0.15	17
SH200M1R00A5F-0611	1	200	6.3X11	16	0.15	17
SH200M2R20BZF-0611	2.2	200	6.3X11	23	0.15	25
SH200M2R20AZF-0611	2.2	200	6.3X11	23	0.15	25
SH200M2R20A5F-0611	2.2	200	6.3X11	23	0.15	25
SH200M3R30B3F-0811	3.3	200	8X11	30	0.15	36
SH200M3R30A3F-0811	3.3	200	8X11	30	0.15	36
SH200M3R30A5F-0811	3.3	200	8X11	30	0.15	36
SH200M4R70B5S-1012	4.7	200	10X12	38	0.15	50
SH200M4R70A5S-1012	4.7	200	10X12	38	0.15	50
SH200M6R80B5S-1012	6.8	200	10X12	51	0.15	60
SH200M6R80A5S-1012	6.8	200	10X12	51	0.15	60
SH200M0010B5S-1012	10	200	10X12	70	0.15	69
SH200M0010A5S-1012	10	200	10X12	70	0.15	69
SH200M0010B5S-1015	10	200	10X15	70	0.15	80
SH200M0010A5S-1015	10	200	10X15	70	0.15	80
SH200M0015B5S-1019	15	200	10X19.5	100	0.15	110
SH200M0015A5S-1019	15	200	10X19.5	100	0.15	110
SH200M0022B5S-1015	22	200	10X15	142	0.15	140
SH200M0022A5S-1015	22	200	10X15	142	0.15	140
SH200M0022B5S-1019	22	200	10X19.5	142	0.15	150
SH200M0022A5S-1019	22	200	10X19.5	142	0.15	150
SH200M0033B5S-1320	33	200	13X20	208	0.15	160
SH200M0033A5S-1320	33	200	13X20	208	0.15	160
SH200M0033B5S-1325	33	200	13X25	208	0.15	190
SH200M0033A5S-1325	33	200	13X25	208	0.15	190
SH200M0047B5S-1320	47	200	13X20	292	0.15	220
SH200M0047A5S-1320	47	200	13X20	292	0.15	220
SH200M0047B5S-1325	47	200	13X25	292	0.15	260
SH200M0047A5S-1325	47	200	13X25	292	0.15	260
SH200M0068B7F-1620	68	200	16X20	418	0.15	242
SH200M0068A7F-1620	68	200	16X20	418	0.15	242
SH200M0068B7F-1625	68	200	16X25	418	0.15	280
SH200M0068A7F-1625	68	200	16X25	418	0.15	280
SH200M0100B7F-1632	100	200	16X32	610	0.15	400
SH200M0150B7F-1636	150	200	16X36	910	0.15	450
SH200M0220B7F-1836	220	200	18X36	1330	0.15	675
SH200M0220B7F-1840	220	200	18X40	1330	0.15	750
SH200M0330B7F-1840	330	200	18X40	1990	0.15	780
SH200M0330BPF-2240	330	200	22X40	1990	0.15	920
SH200M0470B7F-1845	470	200	18X45	2830	0.15	800
SH200M0470BPF-2240	470	200	22X40	2830	0.15	810

Table 1-13 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (Mf)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (Ma)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (Ma)
SH250M0R47B2F-0511	0.47	250	5X11	14	0.15	12
SH250M0R47A2F-0511	0.47	250	5X11	14	0.15	12
SH250M0R47AZF-0511	0.47	250	5X11	14	0.15	12
SH250M0R47A5F-0511	0.47	250	5X11	14	0.15	12
SH250M1R00BZF-0611	1	250	6.3X11	18	0.15	17
SH250M1R00AZF-0611	1	250	6.3X11	18	0.15	17
SH250M1R00A5F-0611	1	250	6.3X11	18	0.15	17
SH250M2R20BZF-0611	2.2	250	6.3X11	27	0.15	23
SH250M2R20AZF-0611	2.2	250	6.3X11	27	0.15	23
SH250M2R20A5F-0611	2.2	250	6.3X11	27	0.15	23
SH250M2R20B3F-0811	2.2	250	8X11	27	0.15	29
SH250M2R20A3F-0811	2.2	250	8X11	27	0.15	29
SH250M2R20A5F-0811	2.2	250	8X11	27	0.15	29
SH250M3R30B3F-0811	3.3	250	8X11	35	0.15	34
SH250M3R30A3F-0811	3.3	250	8X11	35	0.15	34
SH250M3R30A5F-0811	3.3	250	8X11	35	0.15	34
SH250M3R30B5S-1012	3.3	250	10X12	35	0.15	42
SH250M3R30A5S-1012	3.3	250	10X12	35	0.15	42
SH250M4R70B3F-0811	4.7	250	08X11	45	0.15	41
SH250M4R70A3F-0811	4.7	250	08X11	45	0.15	41
SH250M4R70A5F-0811	4.7	250	08X11	45	0.15	41
SH250M4R70B5S-1019	4.7	250	10X19.5	45	0.15	60
SH250M4R70A5S-1019	4.7	250	10X19.5	45	0.15	60
SH250M4R70B5S-1012	4.7	250	10X12	45	0.15	52
SH250M4R70A5S-1012	4.7	250	10X12	45	0.15	52
SH250M6R80B5S-1325	6.8	250	13X25	61	0.15	94
SH250M6R80A5S-1325	6.8	250	13X25	61	0.15	94
SH250M6R80B5S-1012	6.8	250	10X12	61	0.15	62
SH250M6R80A5S-1012	6.8	250	10X12	61	0.15	62
SH250M0010B5S-1015	10	250	10X15	85	0.15	75
SH250M0010A5S-1015	10	250	10X15	85	0.15	75
SH250M0010B5S-1019	10	250	10X19.5	85	0.15	88
SH250M0010A5S-1019	10	250	10X19.5	85	0.15	88
SH250M0015B5S-1320	15	250	13X20	122	0.15	120
SH250M0015A5S-1320	15	250	13X20	122	0.15	120
SH250M0022B5S-1320	22	250	13X20	175	0.15	130
SH250M0022A5S-1320	22	250	13X20	175	0.15	130
SH250M0022B5S-1325	22	250	13X25	175	0.15	155
SH250M0022A5S-1325	22	250	13X25	175	0.15	155
SH250M0033B5S-1325	33	250	13X25	258	0.15	200
SH250M0033A5S-1325	33	250	13X25	258	0.15	200
SH250M0047B5S-1325	47	250	13X25	362	0.15	228
SH250M0047A5S-1325	47	250	13X25	362	0.15	228
SH250M0047B7F-1625	47	250	16X25	362	0.15	270
SH250M0047A7F-1625	47	250	16X25	362	0.15	270
SH250M0068B7F-1632	68	250	16X32	520	0.15	300

Table 1-14 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (μ F)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (μ A)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (Ma)
SH250M0100B7F-1636	100	250	16X32	520	0.15	300
SH250M0100B7F-1632	100	250	16X32	760	0.15	372
SH250M0100B7F-1836	100	250	18X36	760	0.15	440
SH250M0150B7F-1840	150	250	18X40	760	0.15	600
SH250M0220BPF-2240	220	250	22X40	1660	0.15	800
SH350M0R47BZF-0611	0.47	350	6.3X11	15	0.20	14
SH350M0R47AZF-0611	0.47	350	6.3X11	15	0.20	14
SH350M0R47A5F-0611	0.47	350	6.3X11	15	0.20	14
SH350M1R00BZF-0611	1	350	6.3X11	20	0.20	15
SH350M1R00AZF-0611	1	350	6.3X11	20	0.20	15
SH350M1R00A5F-0611	1	350	6.3X11	20	0.20	15
SH350M1R00B3F-0811	1	350	8X11	21	0.20	20
SH350M1R00A3F-0811	1	350	8X11	21	0.20	20
SH350M1R00A5F-0811	1	350	8X11	21	0.20	20
SH350M2R20B5S-1012	2.2	350	10X12	33	0.20	35
SH350M2R20A5S-1012	2.2	350	10X12	33	0.20	35
SH350M3R30B5S-1015	3.3	350	10X15	45	0.20	47
SH350M3R30A5S-1015	3.3	350	10X15	45	0.20	47
SH350M4R70B5S-1012	4.7	350	10X12	59	0.20	43
SH350M4R70A5S-1012	4.7	350	10X12	59	0.20	43
SH350M4R70B5S-1015	4.7	350	10X15	59	0.20	55
SH350M4R70A5S-1015	4.7	350	10X15	59	0.20	55
SH350M6R80B5S-1019	6.8	350	10X19.5	81	0.20	65
SH350M6R80A5S-1019	6.8	350	10X19.5	81	0.20	65
SH350M0010B5S-1019	10	350	10X19.5	115	0.20	76
SH350M0010A5S-1019	10	350	10X19.5	115	0.20	76
SH350M0010B5S-1015	10	350	10X15	115	0.20	65
SH350M0010A5S-1015	10	350	10X15	115	0.20	65
SH350M0010B5S-1320	10	350	13X20	115	0.20	95
SH350M0010A5S-1320	10	350	13X20	115	0.20	95
SH350M0015B5S-1320	15	350	13X20	168	0.20	140
SH350M0015A5S-1320	15	350	13X20	168	0.20	140
SH350M0022B5S-1320	22	350	13X20	241	0.20	125
SH350M0022A5S-1320	22	350	13X20	241	0.20	125
SH350M0022B7F-1625	22	350	16X25	241	0.20	165
SH350M0022A7F-1625	22	350	16X25	241	0.20	165
SH350M0033B7F-1620	33	350	16X20	356	0.20	150
SH350M0033A7F-1620	33	350	16X20	356	0.20	150
SH350M0033B7F-1632	33	350	16X32	356	0.20	195
SH350M0033B7F-1816	33	350	18X36	356	0.20	148
SH350M0047B7F-1636	47	350	16X36	503	0.20	210
SH350M0047B7F-1836	47	350	18X36	503	0.20	240
SH350M0068B7F-1836	68	350	18X36	724	0.20	320
SH350M0100B7F-1840	100	350	18X40	1060	0.20	300
SH350M0100BPF-2240	100	350	22X40	1060	0.20	360
SH350M0150BPF-2240	150	350	22X40	1585	0.20	480

Table 1-15 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (Mf)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (Ma)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (Ma)
SH400M0R47BZF-0611	0.47	400	6.3X11	16	0.20	14
SH400M0R47AZF-0611	0.47	400	6.3X11	16	0.20	14
SH400M0R47A5F-0611	0.47	400	6.3X11	16	0.20	14
SH400M1R00BZF-0611	1	400	6.3X11	22	0.20	15
SH400M1R00BZF-0611	1	400	6.3X11	22	0.20	15
SH400M1R00A5F-0611	1	400	6.3X11	22	0.20	15
SH400M1R00B3F-0811	1	400	8X11	22	0.20	20
SH400M1R00A3F-0811	1	400	8X11	22	0.20	20
SH400M1R00A5F-0811	1	400	8X11	22	0.20	20
SH400M2R20B3F-0811	2.2	400	8X11	36	0.20	28
SH400M2R20A3F-0811	2.2	400	8X11	36	0.20	28
SH400M2R20A5F-0811	2.2	400	8X11	36	0.20	28
SH400M2R20B5S-1012	2.2	400	10X12	36	0.20	35
SH400M2R20A5S-1012	2.2	400	10X12	36	0.20	35
SH400M3R30B5S-1012	3.3	400	10X12	50	0.20	42
SH400M3R30A5S-1012	3.3	400	10X12	50	0.20	42
SH400M3R30B5S-1015	3.3	400	10X15	50	0.20	49
SH400M3R30A5S-1015	3.3	400	10X15	50	0.20	49
SH400M4R70A3F-0811	4.7	400	8X11	66.4	0.20	40
SH400M4R70B3F-0811	4.7	400	8X11	66.4	0.20	40
SH400M4R70A5F-0811	4.7	400	8X11	66.4	0.20	40
SH400M4R70A5S-1012	4.7	400	10X12	50	0.20	66.4
SH400M4R70B5S-1012	4.7	400	10X12	50	0.20	66.4
SH400M4R70B5S-1015	4.7	400	10X15	66	0.20	57
SH400M4R70A5S-1015	4.7	400	10X15	92	0.20	67
SH400M6R80B5S-1015	6.8	400	10X15	92	0.20	67
SH400M6R80A5S-1015	6.8	400	10X15	92	0.20	67
SH400M0010B5S-1019	10	400	10X19.5	130	0.20	75
SH400M0010A5S-1019	10	400	10X19.5	130	0.20	75
SH400M0010B5S-1320	10	400	13X20	130	0.20	97
SH400M0010A5S-1320	10	400	13X20	130	0.20	97
SH400M0015B5S-1325	15	400	13X25	190	0.20	145
SH400M0015A5S-1325	15	400	13X25	190	0.20	145
SH400M0022B5S-1320	22	400	13X20	274	0.20	120
SH400M0022A5S-1320	22	400	13X20	274	0.20	120
SH400M0022B5S-1325	22	400	13X25	274	0.20	140
SH400M0022A5S-1325	22	400	13X25	274	0.20	140
SH400M0022B7F-1620	22	400	16X20	274	0.20	147
SH400M0022A7F-1620	22	400	16X20	274	0.20	147
SH400M0022B7F-1625	22	400	16X25	274	0.20	170
SH400M0022A7F-1625	22	400	16X25	274	0.20	170
SH400M0033B7F-1620	33	400	16X20	406	0.20	164
SH400M0033A7F-1620	33	400	16X20	406	0.20	164
SH400M0033B7F-1625	33	400	16X25	406	0.20	190
SH400M0033A7F-1625	33	400	16X25	406	0.20	190
SH400M0033B7F-1632	33	400	16X32	406	0.20	230

Table 1-16 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- cittance (μ F)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (μ A)	Dissipation Factor ($\tan \delta$)	Ripple 105°C 120 Hz (Ma)
SH400M0047B7F-1632	47	400	16X32	574	0.20	250
SH400M0047B7F-1825	47	400	18X25	574	0.20	243
SH400M0047B7F-1625	47	400	16X25	574	0.20	200
SH400M0047A7F-1625	47	400	16X25	574	0.20	200
SH400M0047B7F-1836	47	400	18X36	574	0.20	300
SH400M0068B7F-1825	68	400	18X25	826	0.20	310
SH400M0068B7F-1836	68	400	18X36	826	0.20	325
SH400M0082B7F-1832	82	400	18X32	994	0.20	310
SH400M0082B7F-1830	82	400	18X30	994	0.20	286
SH400M0100B7F-1830	100	400	18X30	1210	0.20	250
SH400M0100B7F-1832	100	400	18X32	1210	0.20	260
SH400M0100B7F-1836	100	400	18X36	1210	0.20	290
SH400M0100BPF-2240	100	400	22X40	1210	0.20	365
SH400M0120B7F-1836	120	400	18X36	1240	0.10	320
SH400M0120B7F-1832	120	400	18X32	1450	0.10	289
SH400M0120BV911832	120	400	18X32	1450	0.10	289
SH400M0120B7F-1840	120	400	18X40	1450	0.10	350
SH400M0150BPF-2240	150	400	22X40	1810	0.20	465
SH400M0220BPF-2240	220	400	22X40	2650	0.20	650
SH450M0R47BZF-0611	0.47	450	6.3X11	16	0.20	16
SH450M0R47AZF-0611	0.47	450	6.3X11	16	0.20	16
SH450M0R47A5F-0611	0.47	450	6.3X11	16	0.20	16
SH450M1R00B3F-0811	1	450	8X11	24	0.20	22
SH450M1R00A3F-0811	1	450	8X11	24	0.20	22
SH450M1R00A5F-0811	1	450	8X11	24	0.20	22
SH450M2R20B5S-1012	2.2	450	10X12	40	0.20	37
SH450M2R20A5S-1012	2.2	450	10X12	40	0.20	37
SH450M3R30B5S-1012	3.3	450	10X12	55	0.20	42
SH450M3R30A5S-1012	3.3	450	10X12	55	0.20	42
SH450M3R30B5S-1015	3.3	450	10X15	55	0.20	51
SH450M3R30A5S-1015	3.3	450	10X15	55	0.20	51
SH450M4R70B5S-1015	4.7	450	10X15	74	0.20	59
SH450M4R70A5S-1015	4.7	450	10X15	74	0.20	59
SH450M6R80B5S-1320	6.8	450	13X20	102	0.20	69
SH450M6R80A5S-1320	6.8	450	13X20	102	0.20	69
SH450M0010B5S-1019	10	450	10X19.5	145	0.20	72
SH450M0010A5S-1019	10	450	10X19.5	145	0.20	72
SH450M0010B5S-1320	10	450	13X20	145	0.20	85
SH450M0010A5S-1320	10	450	13X20	145	0.20	85
SH450M0010B5S-1325	10	450	13X25	145	0.20	99
SH450M0010A5S-1325	10	450	13X25	145	0.20	99
SH450M0015B7F-1625	15	450	16X25	212	0.20	150
SH450M0015A7F-1625	15	450	16X25	212	0.20	150
SH450M0022B7F-1625	22	450	16X25	307	0.20	145
SH450M0022A7F-1625	22	450	16X25	307	0.20	145
SH450M0022B7F-1632	22	450	16X32	307	0.20	175

Table 1-17 SH Type, Standard Ratings and Catalog Number

Catalog Number	Capa- citan- ce (Mf)	Rated Voltage (V.DC)	Size (mm) D X L	Leakage Current (Ma)	Dissipation Factor (Tan δ)	Ripple 105°C 120 Hz (Ma)
SH450M0033B7F-1632	33	450	16X32	456	0.20	211
SH450M0033B7F-1836	33	450	18X36	456	0.20	250
SH450M0047B7F-1832	47	450	18X32	645	0.20	300
SH450M0047B7F-1840	47	450	18X40	645	0.20	350
SH450M0068BPF-2240	68	450	22X40	928	0.20	380
SH450M0120BPF-2240	120	450	22X40	326	0.20	440
SH450M0150BPF-2240	150	450	22X40	407	0.20	470

Yageo Corporation
3F, 233-1, Pao Chiao Rd.,
Hsin Tien, Taipei, Taiwn

Tel: 886.2.2917.7555
Fax: 886.2.2917.3789