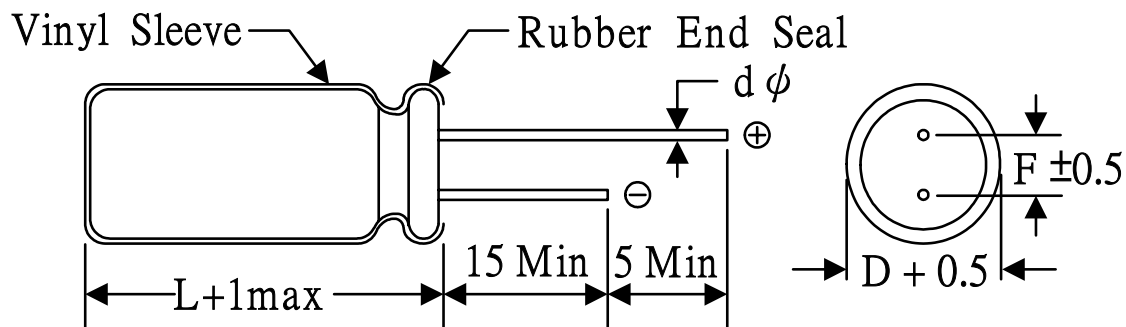


## S5 Type

Super miniature, Single-ended lead aluminum electrolytic capacitors for the rated voltage up to 50 V.

Moderate cost , rugged construction and small dimension than ss type are important feature of S5 TYPE capacitors. S5 type has very small sizes (4X5, 5X5, 6X5,8X5) can cover the current needs , which has the high quality and high performance for application to 105°C.

Diagram of Dimensions (Unit = mm)



<b>D <math>\phi</math></b>	<b>4.0</b>	<b>5.0</b>	<b>6.0</b>	<b>8.0</b>
<b>F</b>	<b>1.5</b>	<b>2.0</b>	<b>2.5</b>	<b>3.5</b>
<b>d <math>\phi</math></b>	<b>0.45</b>			<b>0.5</b>

## PERFORMANCE CHARACTERISTICS

### Feature

- . Working voltage range : 4 to 50V
- . Operating temp. range : -40 to +105°C
- . Rate capacitance range : 0.1 to 470uF
- . Capacitance tolerance : -20 to +20%
- . DC leakage current (uA) : 0.01CV or 3uA, whichever is greater  
( Measurements shall be made after a 2 minute charge at rated working voltage)
- . Dissipation factor : at 120 Hz, 20°C

WV(V) 4 6.3 10 16 25 35 50

-----  
DF(%) 35 24 20 17 15 12 10

- . Load Life (1000 hrs, at rated temperature)
  - Capacitance change ..... : within 20% of initial value
  - Dissipation factor .. .. : not exceed 200% of specified value
  - Leakage current ..... : not exceed the specified value
- . Shelf Life (500 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

S5 016 M 0047 A 5 F - 0505

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- : : : : : : : : : : ...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 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.

## 1.2.1 Temperature characteristics (@ 120Hz)

At -40(-25) °C , impedance rating shall be no more than the following table.

Working Voltage(WV)	6.3	10	16	25	35	50
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Z -25°C / Z +20°C	4	3	2	2	2	2
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Z -40°C / Z +20°C	8	6	4	4	3	3
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## 2. Mechanical Characteristics

## 2.1 Lead Pull test

Capacitor leads shall withstand a steady pull of 0.5 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 +-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, 4 1/2 minutes off, for 1000 successive test cycles at 20°C.(see the following table)

*PERFORMANCE CHARACTERISTICS (continued)*

Rated Voltage 6.3 10 16 25 35 50

-----  
Surge Voltage 8 13 20 32 44 63

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 96 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 1000 hours 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 500 hours at 105°C with no voltage applied, the capacitance shall not decrease to less than 80% of the capacitance at 20°C and dissipation factor shall meet the specified values 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

uF \ Frequency.    50   120   300   1K   10K~100K (Hz)

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0.1~47	0.75	1	1.2	1.3	1.5
100~330	0.75	1	1.1	1.15	1.2

## 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.

Table 1-1 S5 Type, Standard Ratings and Catalog Number (Life: 105°C,1000Hr.)

Catalog Number	Capacitance ( $\mu$ F)	Rated Voltage (V.DC)	Size (mm)	Leakage Current ( $\mu$ A)	Dissipation Factor (Tan $\delta$ )	Ripple 105°C 120 Hz (mA)
			D X L			
S5004M0022B1F-0405	22	4	4X5	3	0.35	20
S5004M0022A1F-0405	22	4	4X5	3	0.35	20
S5004M0022AZF-0405	22	4	4X5	3	0.35	20
S5004M0022A5F-0405	22	4	4X5	3	0.35	20
S5004M0033B1F-0405	33	4	4X5	3	0.35	25
S5004M0033A1F-0405	33	4	4X5	3	0.35	25
S5004M0033AZF-0405	33	4	4X5	3	0.35	25
S5004M0033A5F-0405	33	4	4X5	3	0.35	25
S5004M0047B2F-0505	47	4	5X5	3	0.35	30
S5004M0047A2F-0505	47	4	5X5	3	0.35	30
S5004M0047AZF-0505	47	4	5X5	3	0.35	30
S5004M0047A5F-0505	47	4	5X5	3	0.35	30
S5004M0100BZF-0605	100	4	6.3X5	4	0.35	50
S5004M0100AZF-0605	100	4	6.3X5	4	0.35	50
S5004M0100A5F-0605	100	4	6.3X5	4	0.35	50
S5004M0220BZF-0605	220	4	6.3X5	8.8	0.35	70
S5004M0220AZF-0605	220	4	6.3X5	8.8	0.35	70
S5004M0220A5F-0605	220	4	6.3X5	8.8	0.35	70
S5004M0330B3F-0805	33	4	8X5	13.2	0.35	110
S5004M0330A3F-0805	33	4	8X5	13.2	0.35	110
S5004M0330A5F-0805	33	4	8X5	13.2	0.35	110
S5006M0010B1F-0405	10	6	4X5	3	0.24	18
S5006M0010A1F-0405	10	6	4X5	3	0.24	18
S5006M0010AZF-0405	10	6	4X5	3	0.24	18
S5006M0010A5F-0405	10	6	4X5	3	0.24	18
S5006M0022B1F-0405	22	6	4X5	3	0.24	28
S5006M0033B1F-0405	33	6	4X5	3	0.24	33
S5006M0033A1F-0405	33	6	4X5	3	0.24	33
S5006M0033AZF-0405	33	6	4X5	3	0.24	33
S5006M0033A5F-0405	33	6	4X5	3	0.24	33
S5006M0047B1F-0405	47	6	4X5	3	0.24	35
S5006M0047A1F-0405	47	6	4X5	3	0.24	35
S5006M0047AZF-0405	47	6	4X5	3	0.24	35
S5006M0047A5F-0405	47	6	4X5	3	0.24	35
S5006M0047B2F-0505	47	6	5X5	3	0.24	45
S5006M0047A2F-0505	47	6	5X5	3	0.24	45
S5006M0047AZF-0505	47	6	5X5	3	0.24	45
S5006M0047A5F-0505	47	6	5X5	3	0.24	45
S5006M0100B2F-0505	100	6	5X5	6.3	0.24	55
S5006M0100A2F-0505	100	6	5X5	6.3	0.24	55
S5006M0100AZF-0505	100	6	5X5	6.3	0.24	55
S5006M0100A5F-0505	100	6	5X5	6.3	0.24	55
S5006M0100BZF-0605	100	6	6.3X5	6.3	0.24	70

Table 1-2 S5 Type, Standard Ratings and Catalog Number (Life: 105°C,1000Hr.)

Catalog Number	Capacitance ( $\mu$ F)	Rated Voltage (V.DC)	Size (mm)	Leakage Current ( $\mu$ A)	Dissipation Factor (Tan $\delta$ )	Ripple 105°C 120 Hz (mA)
			D X L			
S5006M0100AZF-0605	100	6	6.3X5	6.3	0.24	70
S5006M0100A5F-0605	100	6	6.3X5	6.3	0.24	70
S5006M0220BZF-0605	220	6	6.3X5	13.8	0.24	90
S5006M0220AZF-0605	220	6	6.3X5	13.8	0.24	90
S5006M0220A5F-0605	220	6	6.3X5	13.8	0.24	90
S5006M0330B3F-0805	330	6	8X5	20.8	0.24	115
S5006M0330A3F-0805	330	6	8X5	20.8	0.24	115
S5006M0330A5F-0805	330	6	8X5	20.8	0.24	115
S5006M0470B3F-0805	470	6	8X5	29.61	0.24	100
S5006M0470A3F-0805	470	6	8X5	29.61	0.24	100
S5006M0470A5F-0805	470	6	8X5	29.61	0.24	100
S5010M0010B1F-0405	10	10	4X5	3	0.20	20
S5010M0010A1F-0405	10	10	4X5	3	0.20	20
S5010M0010AZF-0405	10	10	4X5	3	0.20	20
S5010M0010A5F-0405	10	10	4X5	3	0.20	20
S5010M0022B2F-0505	22	10	5X5	3	0.20	33
S5010M0022A2F-0505	22	10	5X5	3	0.20	33
S5010M0022AZF-0505	22	10	5X5	3	0.20	33
S5010M0022A5F-0505	22	10	5X5	3	0.20	33
S5010M0033B1F-0405	33	10	4X5	3.3	0.20	34
S5010M0033A1F-0405	33	10	4X5	3.3	0.20	34
S5010M0033AZF-0405	33	10	4X5	3.3	0.20	34
S5010M0033A5F-0405	33	10	4X5	3.3	0.20	34
S5010M0033B2F-0505	33	10	5X5	3.3	0.20	41
S5010M0033A2F-0505	33	10	5X5	3.3	0.20	41
S5010M0033AZF-0505	33	10	5X5	3.3	0.20	41
S5010M0033A5F-0505	33	10	5X5	3.3	0.20	41
S5010M0047B2F-0505	47	10	5X5	4.7	0.20	46
S5010M0047A2F-0505	47	10	5X5	4.7	0.20	46
S5010M0047AZF-0505	47	10	5X5	4.7	0.20	46
S5010M0047A5F-0505	47	10	5X5	4.7	0.20	46
S5010M0068BZF-0605	68	10	6.3X5	6.8	0.20	54
S5010M0068AZF-0605	68	10	6.3X5	6.8	0.20	54
S5010M0068A5F-0605	68	10	6.3X5	6.8	0.20	54
S5010M0100BZF-0605	100	10	6.3X5	10	0.20	80
S5010M0100AZF-0605	100	10	6.3X5	10	0.20	80
S5010M0100A5F-0605	100	10	6.3X5	10	0.20	80
S5016M4R70B1F-0405	4.7	16	4X5	3	0.16	20
S5016M4R70A1F-0405	4.7	16	4X5	3	0.16	20
S5016M4R70AZF-0405	4.7	16	4X5	3	0.16	20
S5016M4R70A5F-0405	4.7	16	4X5	3	0.16	20
S5016M0010B1F-0405	10	16	4X5	3	0.16	23
S5016M0010A1F-0405	10	16	4X5	3	0.16	23

Table 1-3 S5 Type, Standard Ratings and Catalog Number (Life: 105°C,1000Hr.)

Catalog Number	Capacitance ( $\mu$ F)	Rated Voltage (V.DC)	Size (mm)	Leakage Current ( $\mu$ A)	Dissipation Factor (Tan $\delta$ )	Ripple 105°C 120 Hz (mA)
			D X L			
S5016M0010AZF-0405	10	16	4X5	3	0.16	23
S5016M0010A5F-0405	10	16	4X5	3	0.16	23
S5016M0022B1F-0405	22	16	4X5	3.5	0.16	29
S5016M0022A1F-0405	22	16	4X5	3.5	0.16	29
S5016M0022AZF-0405	22	16	4X5	3.5	0.16	29
S5016M0022A5F-0405	22	16	4X5	3.5	0.16	29
S5016M0022B2F-0505	22	16	5X5	3.5	0.16	37
S5016M0022A2F-0505	22	16	5X5	3.5	0.16	37
S5016M0022AZF-0505	22	16	5X5	3.5	0.16	37
S5016M0022A5F-0505	22	16	5X5	3.5	0.16	37
S5016M0033B2F-0505	33	16	5X5	5.3	0.16	44
S5016M0033A2F-0505	33	16	5X5	5.3	0.16	44
S5016M0033AZF-0505	33	16	5X5	5.3	0.16	44
S5016M0033A5F-0505	33	16	5X5	5.3	0.16	44
S5016M0033BZF-0605	33	16	6X5	5.3	0.16	49
S5016M0033AZF-0605	33	16	6X5	5.3	0.16	49
S5016M0033A5F-0605	33	16	6X5	5.3	0.16	49
S5016M0047B2F-0505	47	16	5X5	7.5	0.16	54
S5016M0047A2F-0505	47	16	5X5	7.5	0.16	54
S5016M0047AZF-0505	47	16	5X5	7.5	0.16	54
S5016M0047A5F-0505	47	16	5X5	7.5	0.16	54
S5016M0047BZF-0605	47	16	6.3X5	7.5	0.16	58
S5016M0047AZF-0605	47	16	6.3X5	7.5	0.16	58
S5016M0047A5F-0605	47	16	6.3X5	7.5	0.16	58
S5016M0100BZF-0605	100	16	6.3X5	16	0.16	85
S5016M0100AZF-0605	100	16	6.3X5	16	0.16	85
S5016M0100A5F-0605	100	16	6.3X5	16	0.16	85
S5025M4R70B1F-0405	4.7	25	4X5	3	0.14	16
S5025M4R70A1F-0405	4.7	25	4X5	3	0.14	16
S5025M4R70AZF-0405	4.7	25	4X5	3	0.14	16
S5025M4R70A5F-0405	4.7	25	4X5	3	0.14	16
S5025M0010B1F-0405	10	25	4X5	3	0.14	20
S5025M0010A1F-0405	10	25	4X5	3	0.14	20
S5025M0010AZF-0405	10	25	4X5	3	0.14	20
S5025M0010A5F-0405	10	25	4X5	3	0.14	20
S5025M0010B2F-0505	10	25	5X5	3	0.14	27
S5025M0022BZF-0605	22	25	6.3X5	5.5	0.14	42
S5025M0022AZF-0605	22	25	6.3X5	5.5	0.14	42
S5025M0022A5F-0605	22	25	6.3X5	5.5	0.14	42
S5025M0033B2F-0505	33	25	5X5	8.3	0.14	45
S5025M0033A2F-0505	33	25	5X5	8.3	0.14	45
S5025M0033AZF-0505	33	25	5X5	8.3	0.14	45



Table 1-4 S5 Type, Standard Ratings and Catalog Number (Life: 105°C,1000Hr.)

Catalog Number	Capacitance (μF)	Rated Voltage (V.DC)	Size (mm)	Leakage Current (μA)	Dissipation Factor (Tan δ )	Ripple 105°C 120 Hz (mA)
			D X L			
S5025M0033A5F-0505	33	25	5X5	8.3	0.14	45
S5025M0033BZF-0605	33	25	6.3X5	8.3	0.14	53
S5025M0033AZF-0605	33	25	6.3X5	8.3	0.14	53
S5025M0033A5F-0605	33	25	6.3X5	8.3	0.14	53
S5025M0047B2F-0505	47	25	5X5	11.8	0.14	55
S5025M0047A2F-0505	47	25	5X5	11.8	0.14	55
S5025M0047AZF-0505	47	25	5X5	11.8	0.14	55
S5025M0047A5F-0505	47	25	5X5	11.8	0.14	55
S5025M0047BZF-0605	47	25	6.3X5	11.8	0.14	65
S5025M0047AZF-0605	47	25	6.3X5	11.8	0.14	65
S5025M0047A5F-0605	47	25	6.3X5	11.8	0.14	65
S5025M0100B3F-0805	100	25	8X5	25	0.14	90
S5025M0100A3F-0805	100	25	8X5	25	0.14	90
S5025M0100A5F-0805	100	25	8X5	25	0.14	90
S5035M4R70B1F-0405	4.7	35	4X5	3	0.12	18
S5035M4R70A1F-0405	4.7	35	4X5	3	0.12	18
S5035M4R70AZF-0405	4.7	35	4X5	3	0.12	18
S5035M4R70A5F-0405	4.7	35	4X5	3	0.12	18
S5035M0010B2F-0505	10	35	5X5	3.5	0.12	30
S5035M0010A2F-0505	10	35	5X5	3.5	0.12	30
S5035M0010AZF-0505	10	35	5X5	3.5	0.12	30
S5035M0010A5F-0505	10	35	5X5	3.5	0.12	30
S5035M0022BZF-0605	22	35	6.3X5	7.7	0.12	48
S5035M0022AZF-0605	22	35	6.3X5	7.7	0.12	48
S5035M0022AZF-0605	22	35	6.3X5	7.7	0.12	48
S5035M0047B3F-0805	47	35	8X5	16.45	0.12	85
S5035M0047A3F-0805	47	35	8X5	16.45	0.12	85
S5035M0047A5F-0805	47	35	8X5	16.45	0.12	85
S5035M0047A7F-0805	47	35	8X5	16.45	0.12	85
S5050M0R10B1F-0405	0.1	50	4X5	3	0.12	1
S5050M0R10A1F-0405	0.1	50	4X5	3	0.12	1
S5050M0R10AZF-0405	0.1	50	4X5	3	0.12	1
S5050M0R10A5F-0405	0.1	50	4X5	3	0.12	1
S5050M0R22B1F-0405	0.22	50	4X5	3	0.10	2
S5050M0R22A1F-0405	0.22	50	4X5	3	0.10	2
S5050M0R22AZF-0405	0.22	50	4X5	3	0.10	2
S5050M0R22A5F-0405	0.22	50	4X5	3	0.10	2
S5050M0R33B1F-0405	0.33	50	4X5	3	0.10	3
S5050M0R33A1F-0405	0.33	50	4X5	3	0.10	3
S5050M0R33AZF-0405	0.33	50	4X5	3	0.10	3
S5050M0R33A5F-0405	0.33	50	4X5	3	0.10	3
S5050M0R47B1F-0405	0.47	50	4X5	3	0.10	4
S5050M0R47A1F-0405	0.47	50	4X5	3	0.10	4
S5050M0R47AZF-0405	0.47	50	4X5	3	0.10	4
S5050M1R00B1F-0405	1	50	4X5	3	0.10	9

Table 1-5 S5 Type, Standard Ratings and Catalog Number (Life: 105°C,1000Hr.)

Catalog Number	Capa- citan- ce ( $\mu$ F)	Rated Voltage (V.DC)	Size (mm)	Leakage Current ( $\mu$ A)	Dissipation Factor (Tan $\delta$ )	Ripple
			D X L			105°C 120 Hz (mA)
S5050M1R00A1F-0405	1	50	4X5	3	0.10	9
S5050M1R00AZF-0405	1	50	4X5	3	0.10	9
S5050M1R00A5F-0405	1	50	4X5	3	0.10	9
S5050M2R20B1F-0405	2.2	50	4X5	3	0.10	13
S5050M2R20A1F-0405	2.2	50	4X5	3	0.10	13
S5050M2R20AZF-0405	2.2	50	4X5	3	0.10	13
S5050M2R20A5F-0405	2.2	50	4X5	3	0.10	13
S5050M3R30B1F-0405	3.3	50	4X5	3	0.10	17
S5050M3R30A1F-0405	3.3	50	4X5	3	0.10	17
S5050M3R30AZF-0405	3.3	50	4X5	3	0.10	17
S5050M3R30A5F-0405	3.3	50	4X5	3	0.10	17
S5050M4R70B1F-0405	4.7	50	4X5	3	0.10	17
S5050M4R70A1F-0405	4.7	50	4X5	3	0.10	17
S5050M4R70AZF-0405	4.7	50	4X5	3	0.10	17
S5050M4R70A5F-0405	4.7	50	4X5	3	0.10	17
S5050M4R70B2F-0505	4.7	50	5X5	3	0.10	20
S5050M4R70A2F-0505	4.7	50	5X5	3	0.10	20
S5050M4R70AZF-0505	4.7	50	5X5	3	0.10	20
S5050M4R70A5F-0505	4.7	50	5X5	3	0.10	20
S5050M0010BZF-0605	10	50	6.3X5	5	0.10	33
S5050M0010AZF-0605	10	50	6.3X5	5	0.10	33
S5050M0010A5F-0605	10	50	6.3X5	5	0.10	33
S5050M0022BZF-0605	22	50	6.3X5	11	0.10	55
S5050M0022AZF-0605	22	50	6.3X5	11	0.10	55
S5050M0022A5F-0605	22	50	6.3X5	11	0.10	55

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