



# ACF700 Series

## 700W / Full Brick

### AC/DC

#### Applications



**3** Years Warranty



#### Features

Full Brick	90~264VAC Input range	700W Active PFC	Long Hold-up Time	-40~100°C Case Temperature	±5% Output Trimming	3000 VAC Insulation	90 % High efficiency
Base plate cooled	OCP	OVP	OTP	SCP	Parallel (option)		

#### Model Number Structure

AC F 700 - 240 S - 700 - PL

Series Name	Package	Watt	Output Voltage (VDC)	Output Quantity	Actual Watt	(optional)
AC series	Full Brick	700	120 : 12	S : Single	Actual Watt	Parallel Mode
			240 : 24			
			280 : 28			
			360 : 36			
			480 : 48			

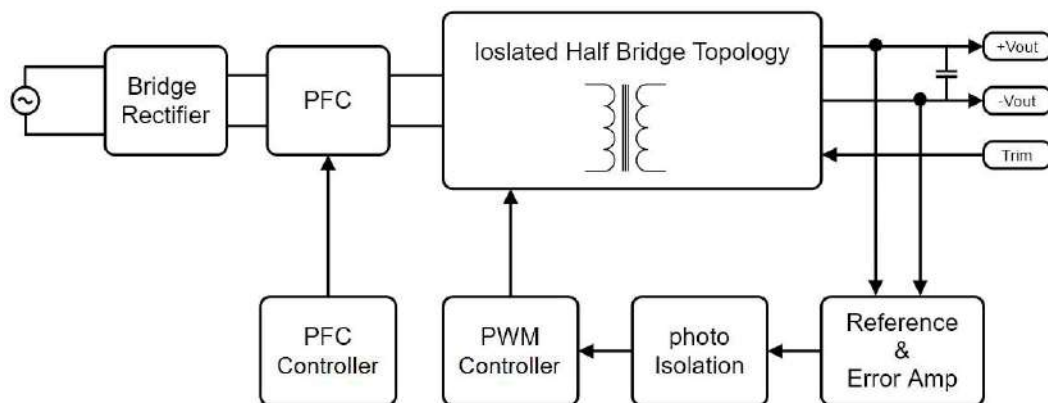
## Model Selection Guide

Typical @ Ta=+25 °C under nominal line voltage conditions unless noted

Model	Input			Output			Efficiency
	Voltage (V)		Current (A)	Voltage	Current	Power	
	Range	Nominal	Full load	(V)	(A)	(W)	Typ.(%)
ACF700-120S-600	90-264	230	3.38	12	50	600	87
ACF700-240S-700	90-264	230	3.38	24	29.17	700	90
ACF700-280S-700	90-264	230	3.38	28	25	700	90
ACF700-360S-700	90-264	230	3.38	36	19.44	700	90
ACF700-480S-700	90-264	230	3.38	48	15.58	700	90

## Description

**AC series - Full Brick 700W converter** is a 700W isolated, regulated ac/dc converter with active PFC in full brick package and long hold-up time setting by external capacitors. It features a high efficiency up to 90%, wide working case temperature range -40~+100°C, no minimum load required, 3kVac reinforced insulation, OVP, OCP, SCP, OTP, etc. These power modules use advanced power processing, control and packaging technologies and are suitable for many applications with harsh environments where wide temperature variation and space limitations, etc.



ACF700 Series Block Diagram

## Electrical Specifications

(Typical @ Ta=+25°C under nominal line voltage conditions unless noted.)

### Input Specifications

Parameter	Notes and Conditions	Min.	Typ.	Max.	Unit
Operating Input Voltage Ranges		90	230	264	VAC
Operating Input Frequency Ranges		47	50/60	63	Hz
Input Current	at 115VAC 100% load at 230VAC 100% load		7.0 3.4		A
Inrush Current	cold start at 230Vac, 25°C	Limited by external components (Thermistor)			
Power Factor	at 115VAC 100% load at 230VAC 100% load		0.99 0.98		
Leakage Current	at 240VAC 60Hz 100% load			0.75	mA

### Output Specifications

Parameter	Notes and Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	100% Load			±1.5	%
Line Regulation	High Line to Low Line			±0.5	%
Load Regulation	10% to 100% Load			±1	%
Output Ripple & Noise Voltage	Bandwidth 20MHz and with 10uF MLCC Output Capacitor			2	%V <sub>pk-pk</sub>
Output Voltage Adjustment Range	adjustable by external resistor			±5	%
Minimum Load		0			A
Hold Up Time	at full load & 115 VAC	Setting by external capacitors between +BC & -BC			
Over Voltage Protection		120		140	%
Over current Protection	Hiccup mode	120		140	%
Short-circuit Protection	Hiccup mode	Auto-Recovery			

## General Specifications & Environmental Specifications

Parameter	Notes and Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	PFC/LLC		100/130		kHz
Storage Temperature Range	All models	-55		125	°C
Over temperature Protection	Auto Recovery		110		°C
Operating Temperature	on aluminum base plate	-40		100	°C
Humidity (non condensing)	All models			95	%
Isolation Voltage	Input to Output		3000		VAC
	Input to Base		1500		VAC
	Output to Base		500		VAC
Calculated MTBF	BellCore-TR-332@ 50°C G.B	1.0			M HR
Weight		230 (8.1)			g (oz.)
Dimensions		4.62" x 2.40" x 0.50" (117.3 x 60.0 x 12.7mm)			
Case Material	Aluminum base with plastic case				

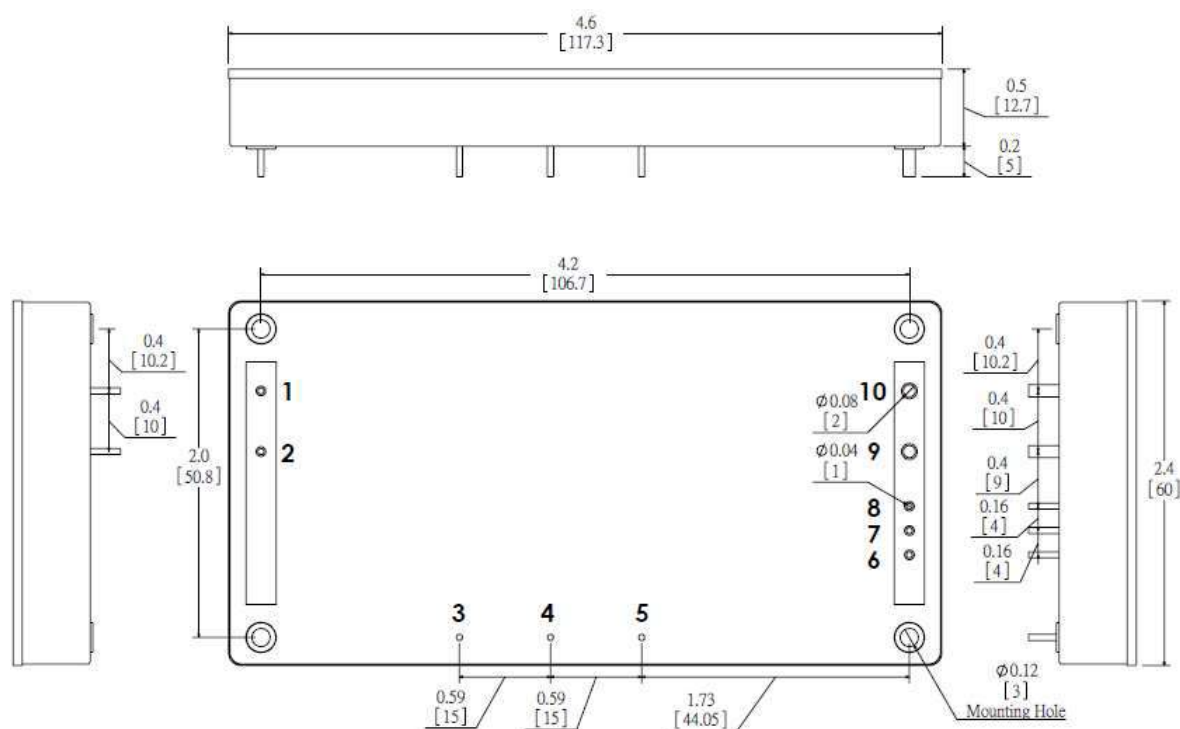
It is recommended to protect the input by fuses or other protection devices.

**Modules could meet EN55022 Class A and Class B standard with external components.**

The information and specifications contained in this data sheet are believed to be correct at time of publication. All specifications are subject to change without notice. No rights under any patent accompany the sale of any such products or information contained herein.

## Mechanical Dimensions & Pin Assignments

### Shape



### Pin Assignments:

Pin#	Function
1	AC1
2	AC2
3	R
4	BC+
5	BC-
6	Trim
7	+S
8	-S
9	+VO
10	-VO

### Note:

Pin Material: Copper Alloy

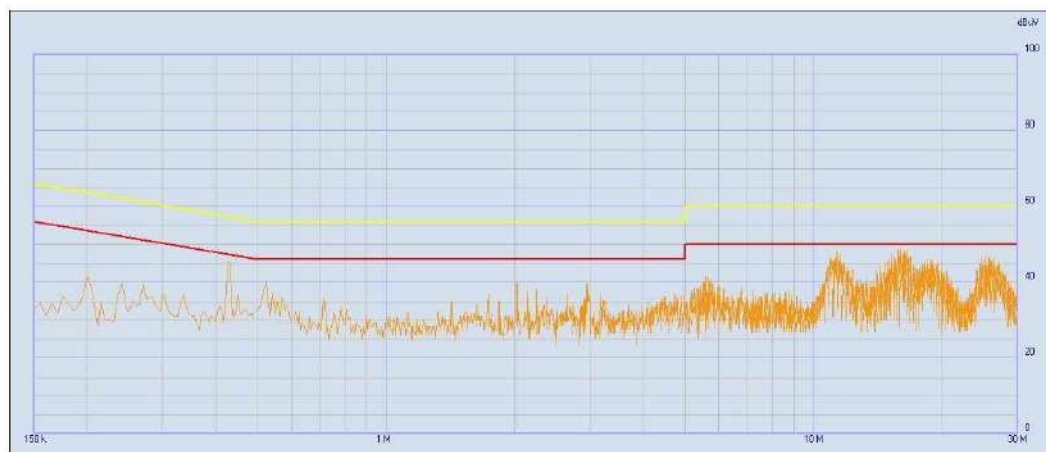
Pin Plating: Gold

Dimensions in inches [mm]

Tolerances: .XX±0.25 [ .X±0.5mm]

## Conducted EMI

Input terminal value (typ.) ACF700-240S-700 @Vin = 230VDC, Iout = 29.17A



The fundamental switching frequency of the module is 100 kHz.

## Characteristic Curves

Testing conditions are at typical input,  $T_a = +25^\circ\text{C}$ , full load (horizontal mount) Unless otherwise indicated

The figures of ACF700-240S-700

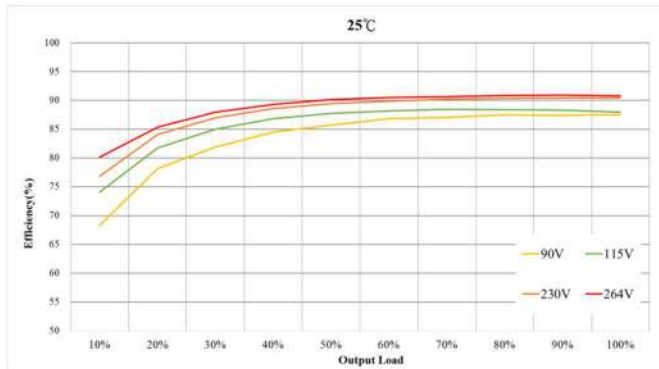


Figure 1 : Efficiency at Minimum, Nominal and Maximum Input Voltages VS. Output Load.

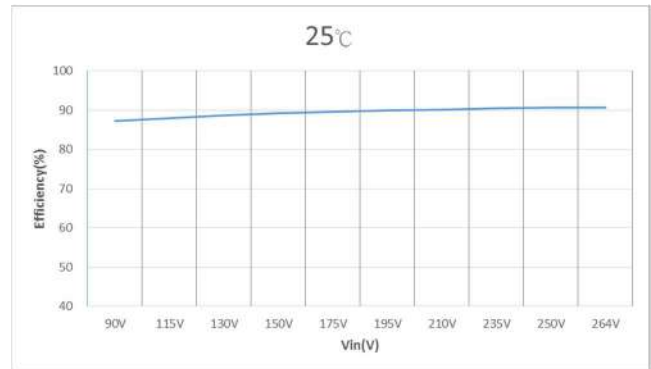


Figure 2 : Efficiency VS. Input Voltages at 100% rated power

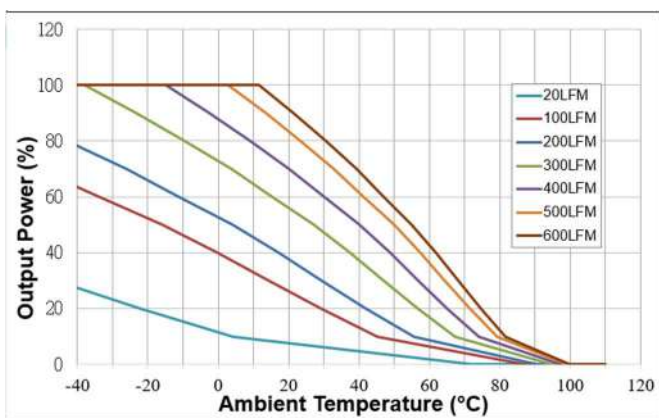


Figure 3 : Ambient Temperature VS. Output Power Derating Curves(Note: 20LFM = Free Air)

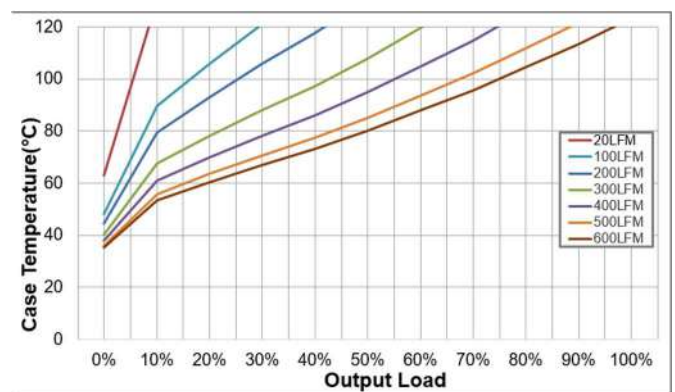


Figure 4 : Case Temperature VS. Output rated Power (Note: 20LFM = Free Air)

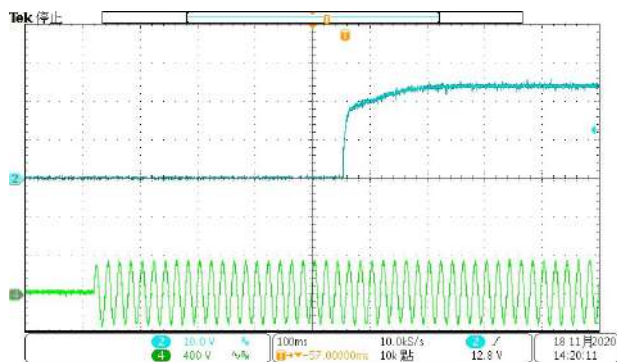


Figure 5 : CH1 = Vout, CH3 = Nominal Input Typical Start-up waveform at Full load.

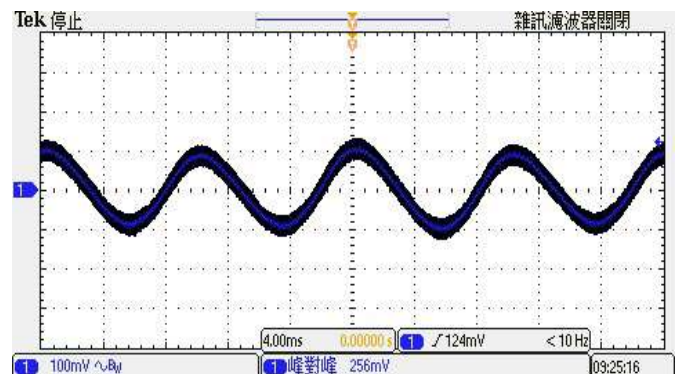


Figure 6 : Output Voltage Ripple & Noise at full load. ( Vin: Typical, With Output Capacitor to add 1uF MLCC )

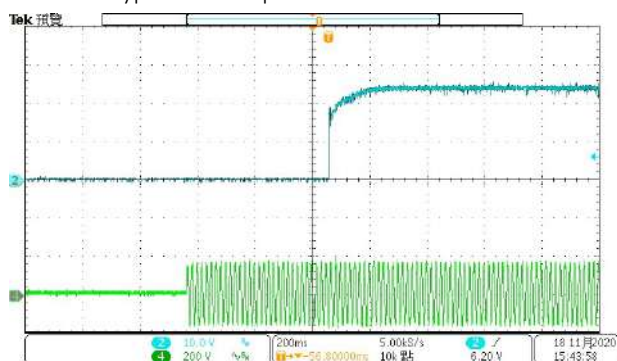


Figure 7 : CH1 = Vout, CH3 = 115V Input Typical Start-up waveform at Full load.

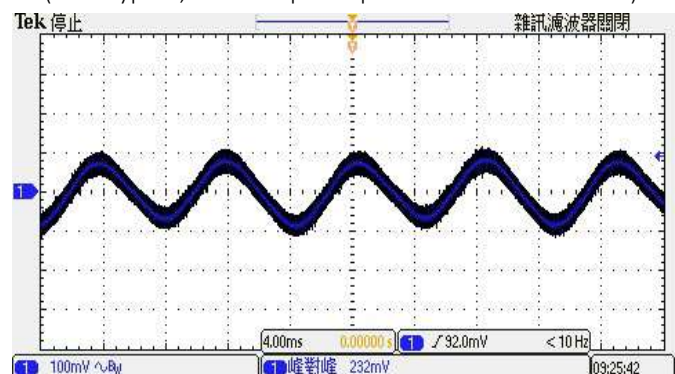


Figure 8 : Output Voltage Ripple & Noise at full load. ( Vin: 115V, With Output Capacitor to add 1uF MLCC )

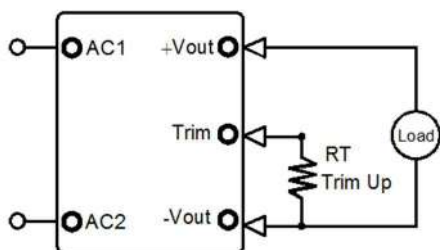


## Trimming Output Voltage – for Single output models

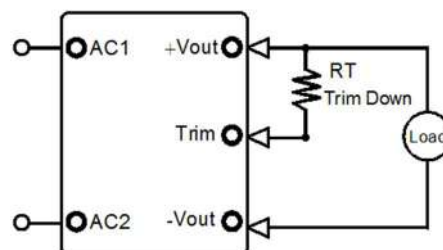
Only the single output converters have a trim function. That allows users to adjust the output voltage from +5% to -5%, please refer to the trim table that follow for details. Adjustments to the output voltage can be used with a simple fixed resistor as shown in Figures 1 and 2. A single fixed resistor can increase or decrease the output voltage depending on its connection.

### Note:

- ✂ Trim adjustments higher than the specified range can have an adverse effect on the converter's performance and are not recommended.
- ✂ If the trim function is not used, leave the trim pin open.



**Figure 1.** Trim Connections To increase Output Voltages Using Fixed Resistors



**Figure 2.** Trim Connections To Decrease Output Voltages Using Fixed Resistors

Vout	Trim up resistor value(KΩ)				
	1%	2%	3%	4%	5%
24	228.91	83.45	34.97	10.73	0.00
28	693.51	246.76	97.84	23.38	0.00
36	545.73	197.87	81.91	23.93	0.00
48	1407.66	537.83	247.89	102.91	0.00

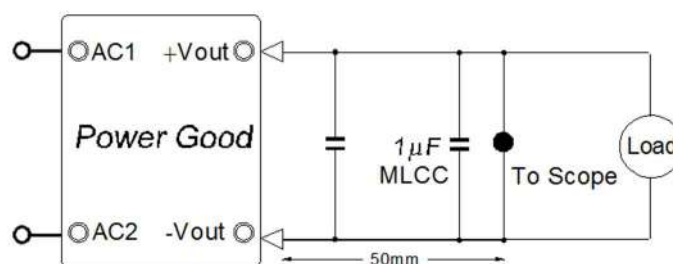
Vout	Trim down resistor value(KΩ)				
	-1%	-2%	-3%	-4%	-5%
24	2419.09	1164.55	746.36	537.27	411.82
28	8806.49	4253.24	2735.50	1976.62	1521.30
36	9054.27	4402.13	2851.42	2076.07	1610.85
48	30796.34	15066.17	9822.78	7201.09	5628.07

### Output Ripple Noise

The two copper strips simulate real-world PCB impedances between the converter and its load. Scope measurements should be made using BNC connectors or the probe ground should be less than 1/2 inch and soldered directly to the fixture.

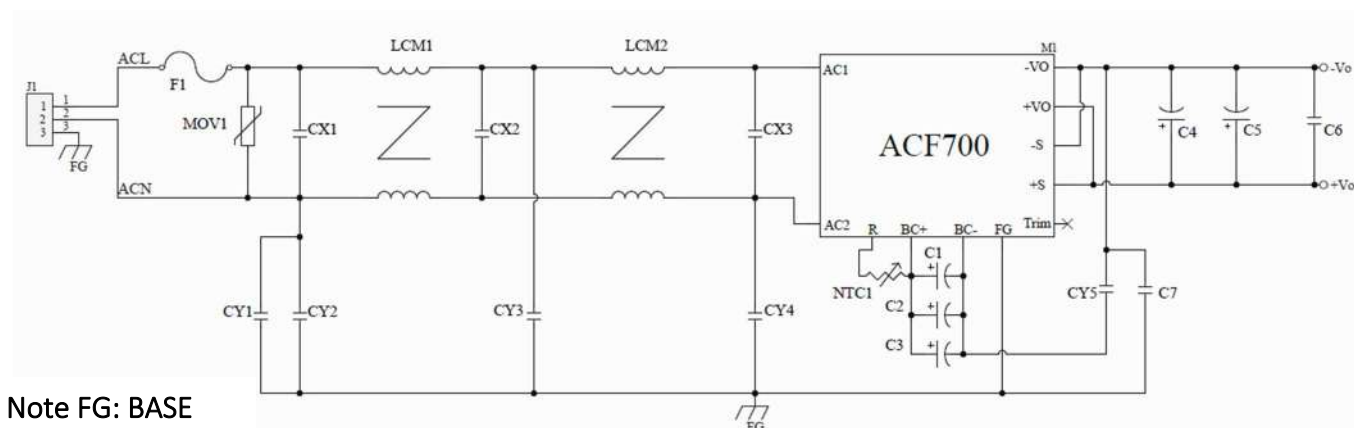
All external capacitors should have appropriate voltage ratings and be located as close to the converter as possible.

Temperature variations for all relevant parameters should be taken into consideration. The most effective combination of external I/O capacitors will be a function of line voltage and source impedance, as well as particular load and layout conditions. See Figure 3.



**Figure 3.** Measuring Output Ripple/Noise (20MHz bandwidth)

## Recommended Circuit Diagram



Note FG: BASE

## Bill of Materials

No.	Sch Symbol	Description	Rating		Manufacturer / Part Number
1	F1	Fuse	5A/250Vac		Littelfuse 39215000000
2	MOV1	Varistor	620V		Thinking TVR10471KSY
3	CX1、CX2 CX3	X Capacitor	0.47uF/310Vac		CHENG TUNG CTX474K310VP15
4	LCM1、LCM2	Common Mode Choke	15mH		ACME A10T16X9.6X6.1C
5	CY1、CY2、CY4	Y Capacitor	2200pF/250Vac		Murata DE1E3KX222MN4AN01F
6	CY3	Y Capacitor	4700pF/250Vac		Murata DE1E3KX472MN4AN01F
7	CY5	Y Capacitor	3300pF/250Vac		Murata DE1E3KX332MB4BN01F
8	NTC1	NTC	10R/5A		Thinking SCK15105MSY
9	C7	General Film Capacitors	0.22uF/1KVdc		Panasonic ECQ-E10224JF
10	C1、C2、C3	PFC boost capacitor	220uF/450Vdc		NIPPON CHEMI-CON EKMR451VSN221MR25S
11	C4	Output Capacitor	12V	2500uF/16V	UPL1C252M1021
			24V	1000uF/35V	UPL1V102M1021
			28V	1000uF/35V	UPL1V102M1021
	C4、C5	Output Capacitor	48V	330uF/63V	UPL1J331M1021
12	C6	Bypass Capacitor	1uF/100Vdc		Murata GRJ31CR72A105ME11L

