

# Filter Simulator Operation Manual

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# Overview, Operating Environment, Installation

## Overview

You can use this tool to simulate how much attenuation can be obtained from T type, Pi type or L type filter consisting of TAIYO YUDEN capacitors, inductors and ferrite beads. The simulation result is useful for reference to select TAIYO YUDEN capacitors, inductors and ferrite beads.

## Operating Environment

CPU : 1GHz or above  
RAM : 1GBytes or above  
OS : Windows 7, 8, 8.1, 10 (32/64 bit)  
Display Resolution : 1024 x 768 or above

## Installation

Unzip TYFilterSim\_e.zip downloaded from Taiyo Yuden Web site, then put TYFilterSim\_e.exe, and TYFilterSim.dsm extracted from TYFilterSim\_e.zip to the appropriate folder together.

# Operation Summary

Double click the installed TYFilterSim\_e.exe, then the operating panel will appear like the figure below. The overall operations are as follows.

(1) Filter Type: T type, PI type, L type

(2) Parts Selection: Target Part: C, Classification: High Value Multilayer Ceramic Capacitors(Hig, Kind of Parts: Capacitor, Size: 1.0 x 0.5, Capacitance: 330 pF, Item Name: UMK105BJ331KV

(3) R1: 50 Ohm, R2: 50 Ohm

(4) Graph Label Display Option: Display, Not Display

L1 Impedance: BK1005HS800

L2 Impedance: BK1005HS800

C Impedance: UMK105BJ331KV

Attenuation: L1: BK1005HS800, L2: BK1005HS800, C: UMK105BJ331KV

(1) Select the filter type.

(2) Select items to use in the filter.

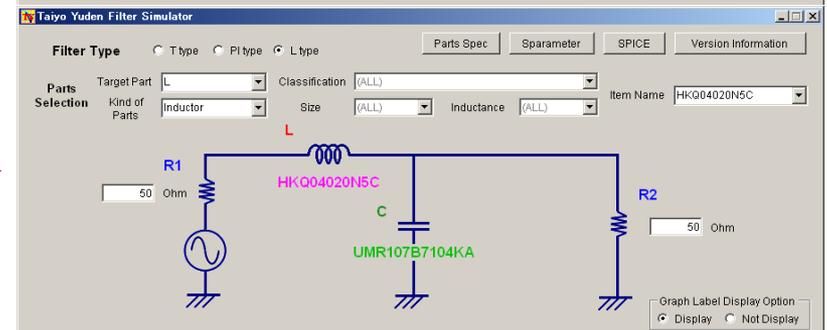
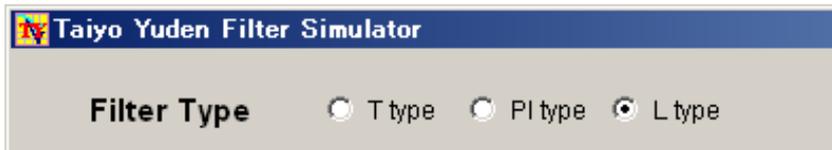
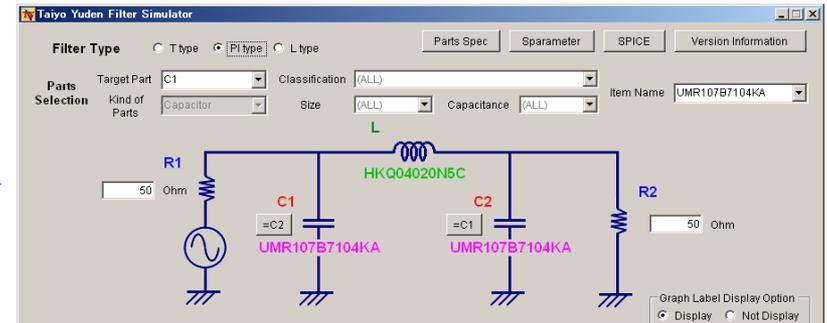
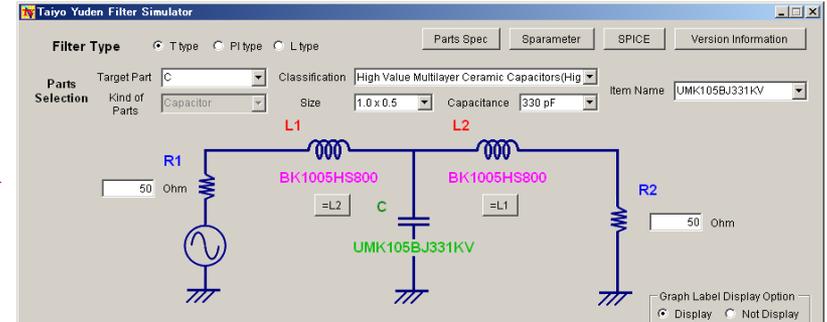
(3) Set the Impedance at input/output of the filter.

(4) Expand and/or save the simulated chart, etc.

\* This application automatically calculates the attenuation data every time you select the item. Therefore, there is no "Simulation Start" button in this application.

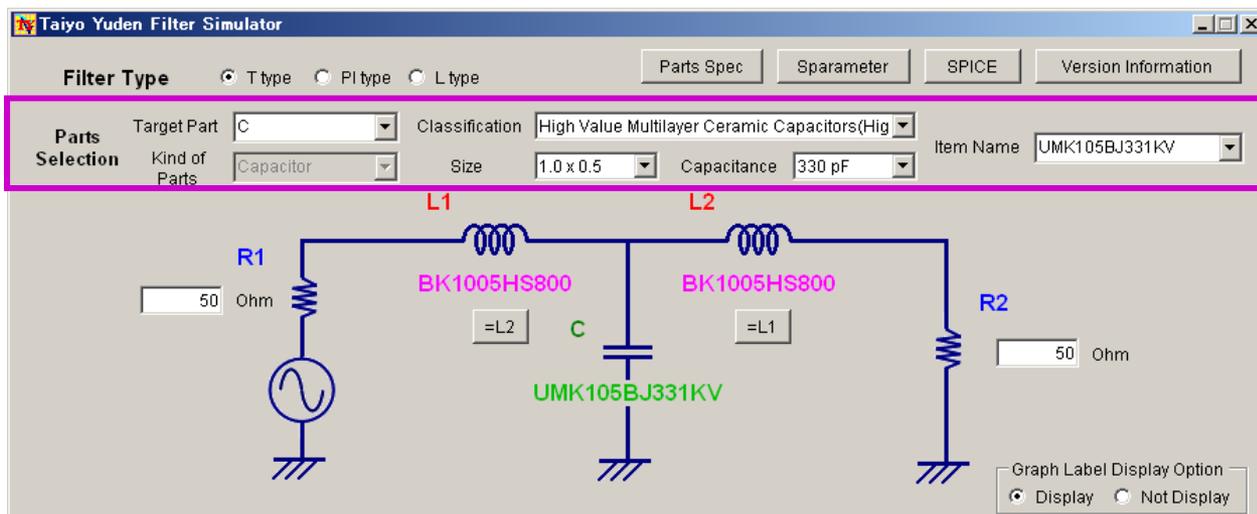
# Operation (Selecting the Filter Type)

Select the filter type from T, Pi, L type using the button of the Filter Type corner at the upper left.



# Operation (Selecting Items)

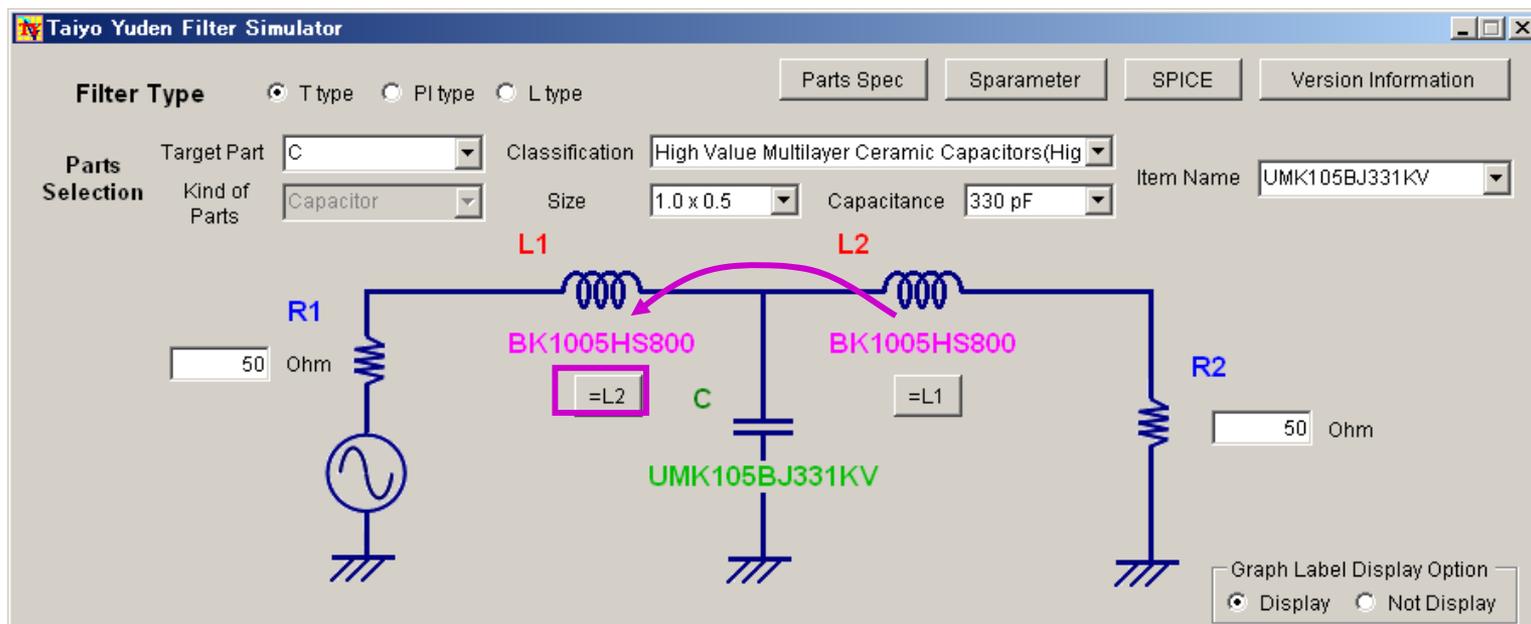
Select items to insert in Capacitor and Inductor section in the filter circuit from the Parts Selection panel.



- |  |   |
|--|---|
| Target Part                            | : Select the section to insert the item.  |
| Kind of Parts                          | : Select which part should be inserted in inductor section in the circuit, inductor or ferrite bead. This function is effective only in case that L, L1 or L2 is selected in the Target Part. |
| Classification                         | : Select the appropriate product classification to focus on the items to search.  |
| Size                                   | : Specify the part size to focus on the items to search.  |
| Capacitance<br>(Inductance, Impedance) | : Specify the characteristic value of the part to focus on the items to search.   |
| Item Name                              | : Select the item to insert in the section you chose in the Target Part panel.  |

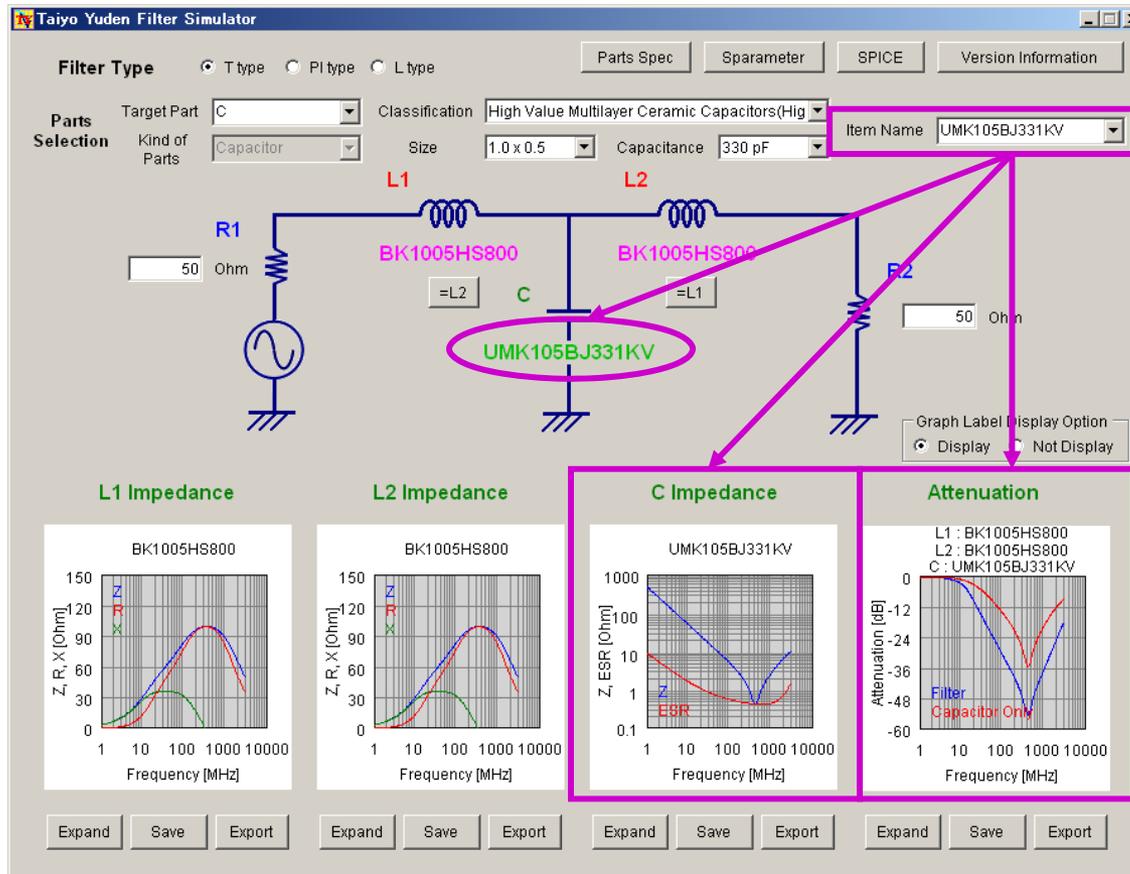
# Operation (Selecting Items)

In case of T type or PI type filter, you can select the same item as the other side by pressing "=L1", "=L2", "=C1" or "=C2" button in the circuit.



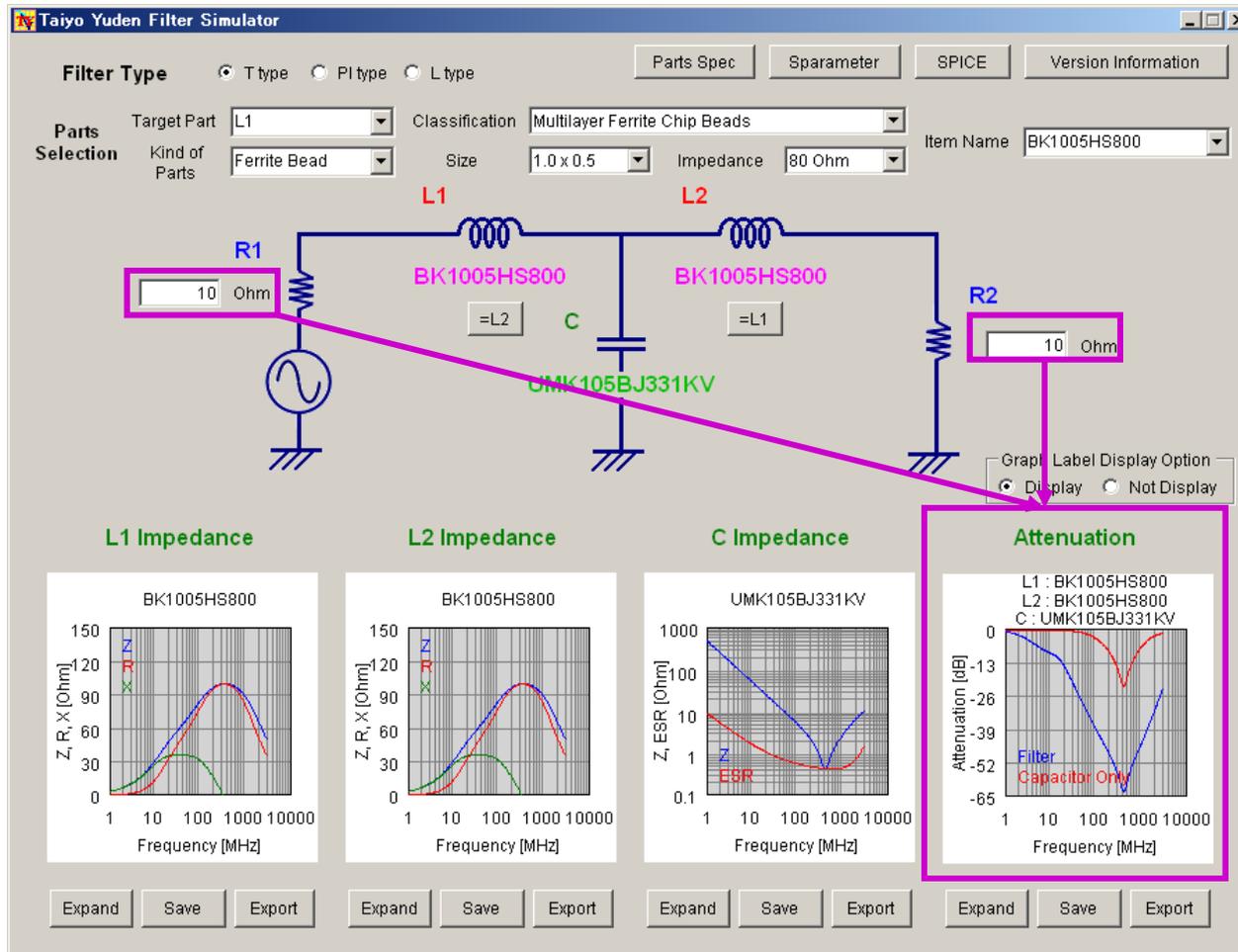
# Operation (Selecting Items)

When you select the item in the Item Name panel, the item to insert in the section specified in the Target Part panel is determined, and the selected item name appears in the specified section in the circuit. In addition, the simulation quickly begins as soon as the item is selected, then the Impedance and Attenuation chart of currently selected items are displayed on the bottom of this application window.



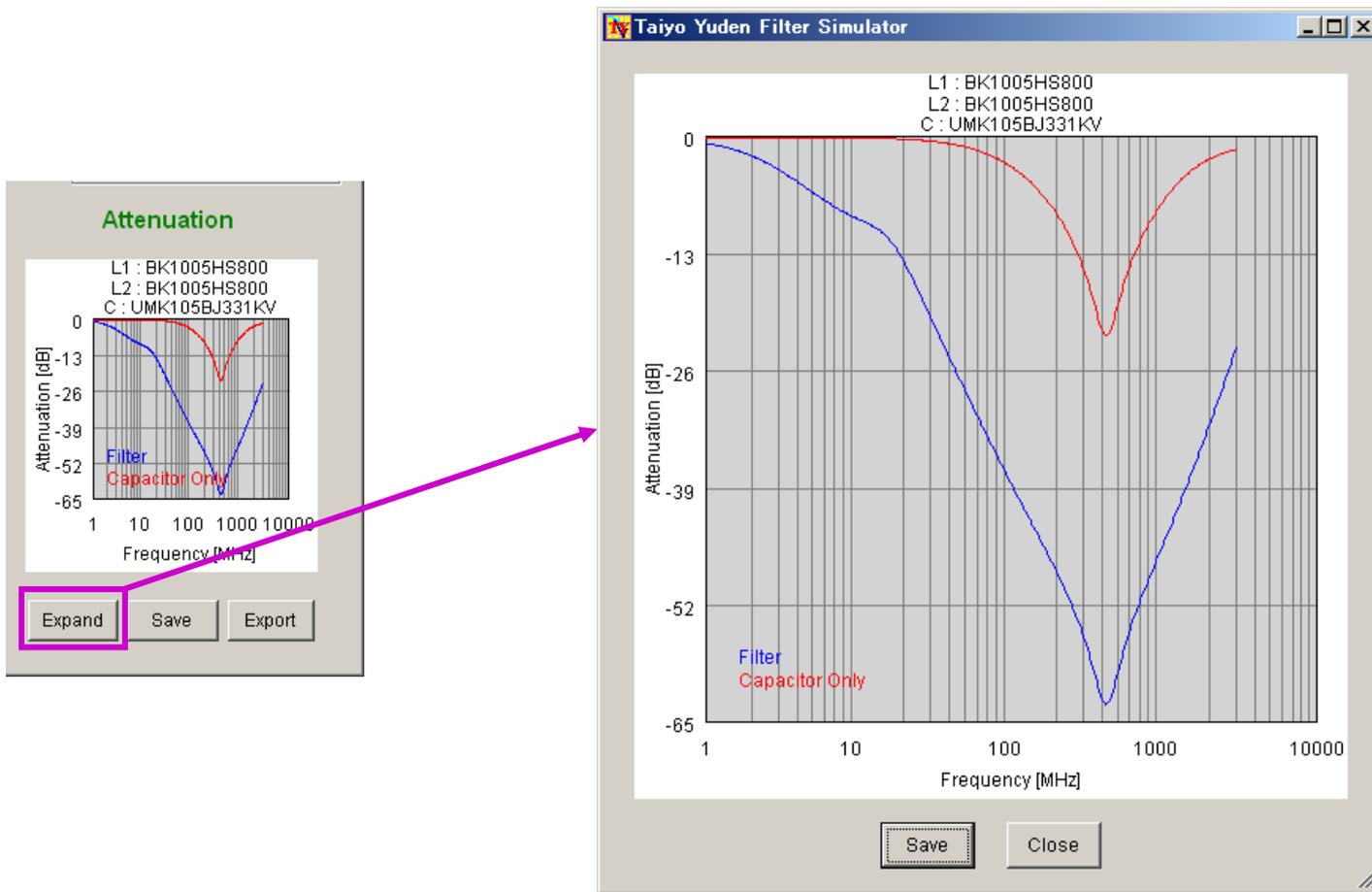
# Operation (Setting the Impedance)

Specify the impedance of input/output of the filter (R1, R2) by directly inputting the value. After inputting the impedance value, the attenuation is automatically and quickly calculated and the result is displayed on the chart at the bottom of the window.



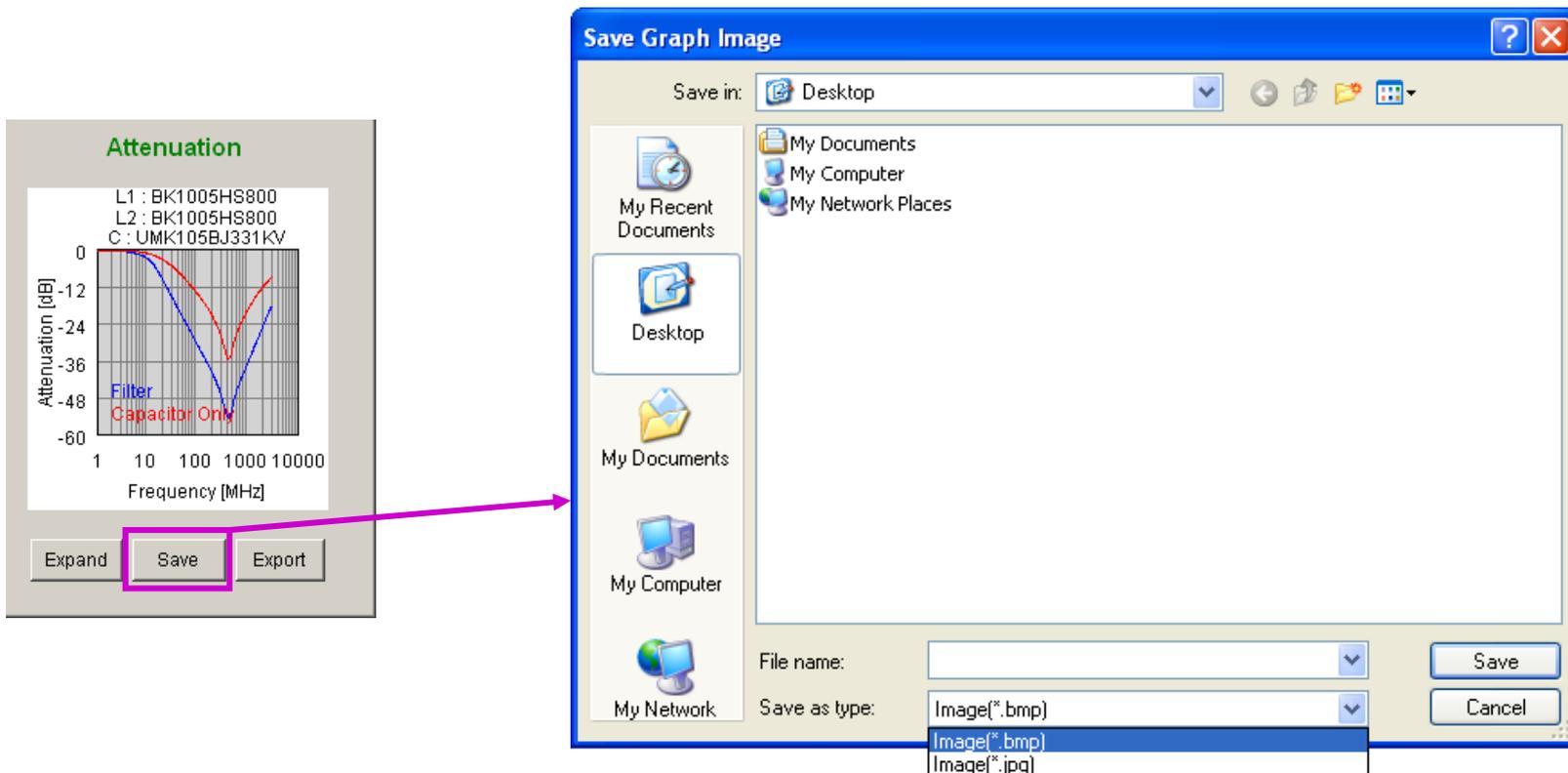
# Operation (Expanding and Saving Charts etc.)

The displayed charts can be expanded on the other window by pressing the "Expand" button. You can adjust the chart size by dragging the lower right section of the window.



# Operation (Expanding and Saving Charts etc.)

The chart image can be saved to the bitmap or jpeg file by pressing the "Save" button below the chart. You can do the same operation on the window of the expanded chart explained in Page 10.



# Operation (Expanding and Saving Charts etc.)

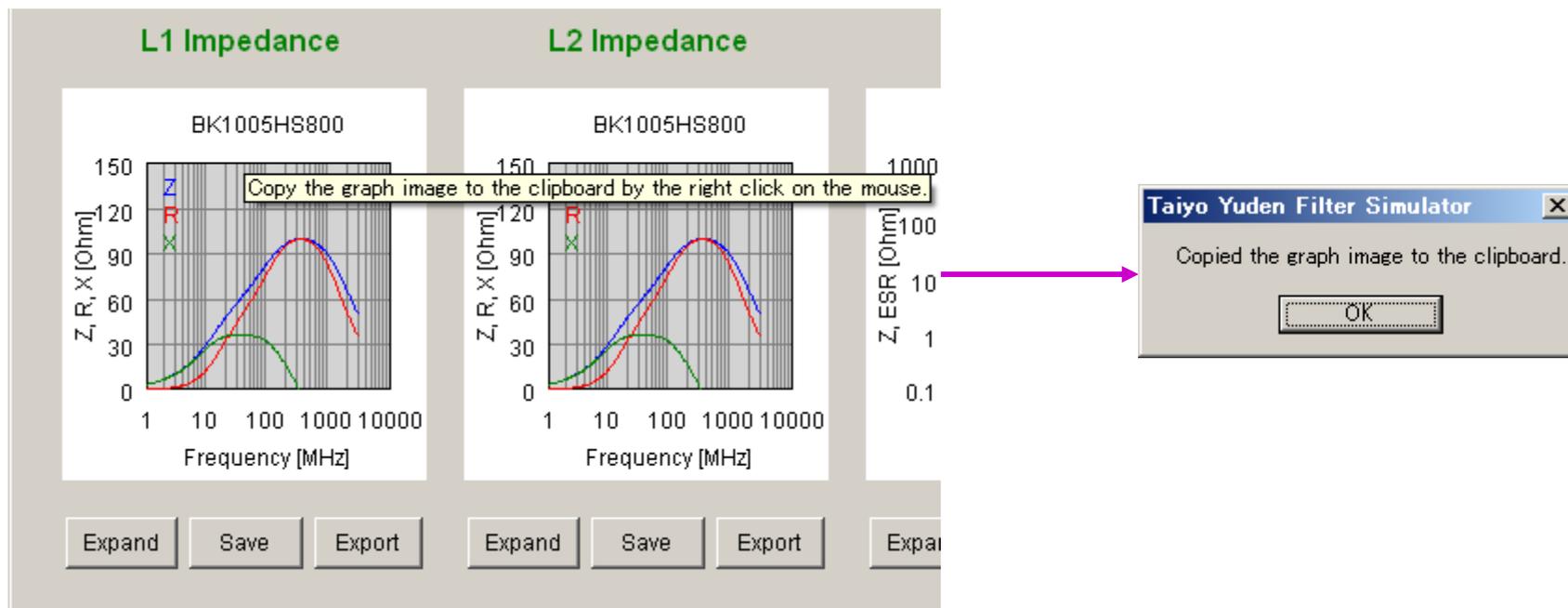
You can export the numerical data of the chart to a csv file by pressing "Export" button below the chart.

The image illustrates the process of exporting chart data. On the left, the 'Attenuation' chart shows two curves: 'Filter' (blue) and 'Capacitor Only' (red). The chart parameters are: L1: BK1005HS800, L2: BK1005HS800, C: UMK105BJ331KV. Below the chart are 'Expand', 'Save', and 'Export' buttons. A pink arrow points from the 'Export' button to the 'Save Graph Data' dialog box in the center. The dialog box shows the save location as 'Desktop' and the file type as 'Data (\*.csv)'. A second pink arrow points from the dialog box to the 'a.csv' file on the right, which contains the following data:

	A	B	C	D	E	F
1	Simulation Results generated by Taiyo Yuden Filter Simulator					
2	!					
3	! Attenuation Data of T type Filter					
4	!					
5	! L1 : BK1005HS800					
6	! L2 : BK1005HS800					
7	! C : UMK105BJ331KV					
8	!					
9	! R1 : 10 Ohm					
10	! R2 : 10 Ohm					
11	!					
12	Frequency	Attenuation	Attenuation(Capacitor Only)[dB]			
13	1	-0.66075	-0.00194			
14	1.020218	-0.68396	-0.00199			
15	1.040844	-0.7073	-0.00204			
16	1.061887	-0.73214	-0.0021			
17	1.083356	-0.75711	-0.00216			
18	1.105259	-0.78365	-0.00222			
19	1.127605	-0.81032	-0.00227			
20	1.150402	-0.83867	-0.00234			

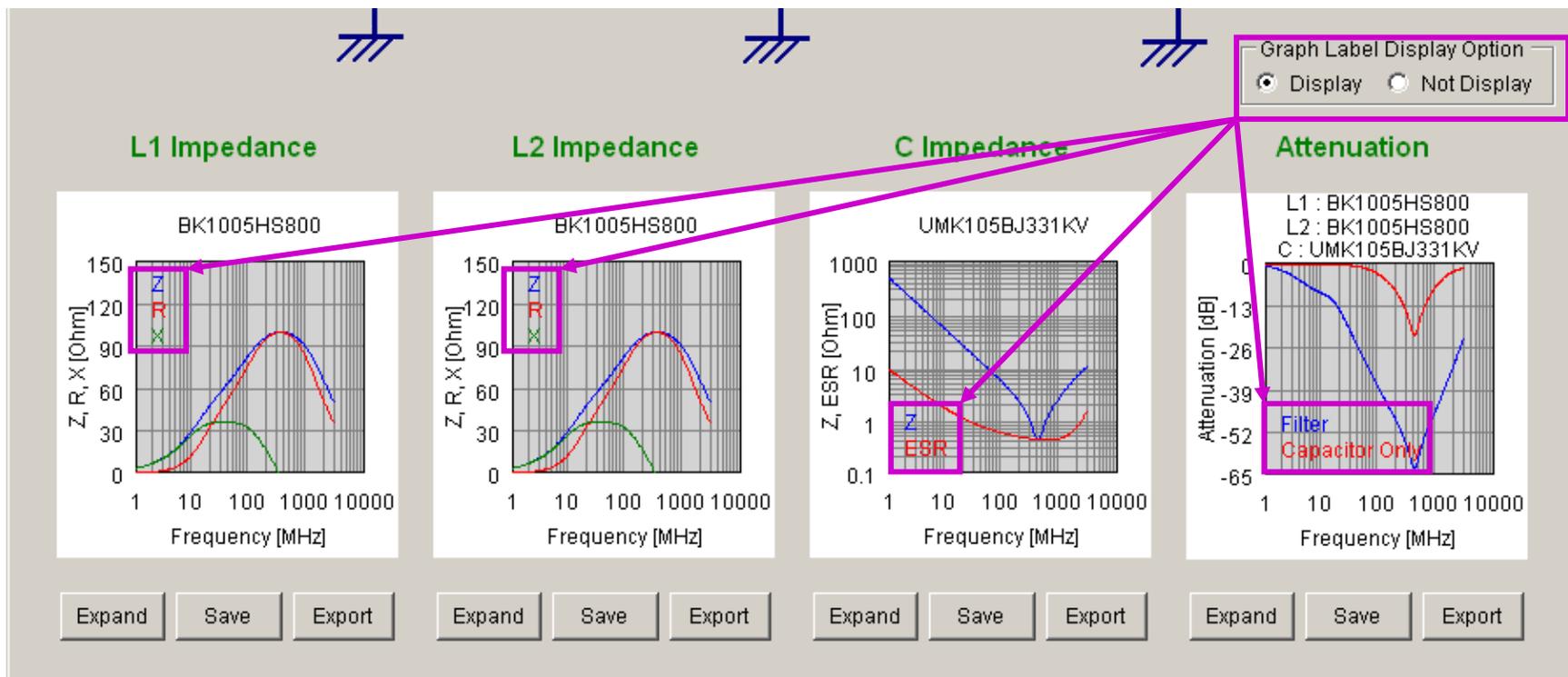
# Operation (Expanding and Saving Charts etc.)

You can copy the chart image to the clipboard by the right click on the mouse with the mouse pointer on the chart. You can do the same operation on the window of the expanded chart.



# Operation (Expanding and Saving Charts etc.)

You can select the graph label display on/off in "Graph Label Display Option" section.



# Operation (Others)

You can confirm the detailed information of selected items on the other window by pressing the "Parts Spec" button at the upper right of the main window. You can also save the parts information to a text file by pressing the "Save" button on the parts info window.

The image displays a workflow in the Taiyo Yuden Filter Simulator. The main window shows the 'Parts Spec' button highlighted. An arrow points from this button to a 'Parts Info' window. In this window, the 'Save' button is highlighted, with an arrow pointing to a 'Save Description' dialog box. From the dialog, an arrow points to a Notepad window containing the saved text data.

**Main Window (Taiyo Yuden Filter Simulator):**

- Filter Type:  T type,  PI type,  L type
- Parts Selection: Target Part: C, Classification: High Value Multilayer Ceramic Capacitors(Hig), Kind of Parts: Capacitor, Size: 1.0 x 0.5, Capacitance: 330 pF, Item Name: UMK105BJ331KV
- Buttons: Parts Spec, Sparameter, SPICE, Version Information

**Parts Info Window:**

**FerriteBeads**

Itemname : BK1005HS800-T  
Impedance at 100MHz : 80 Ohm  
DC Resistance(max) : 0.1 Ohm  
Rated Current : 700 mA,  
Case Size : 1.0 x 0.5 / 0.039 x 0.02 [mm/inch]  
Thickness : 0.5 / 0.02 [mm/inch]  
Web Link : [TY-COMPAS Product Page](#)

**Capacitor**

Itemname : UMK105BJ331KV-F  
Capacitance : 330 pF  
Rated Voltage : 50V  
TCC : B / X5R  
Case Size : 1.0 x 0.5 / 0.039 x 0.02 [mm/inch]  
Thickness : 0.5 / 0.02 [mm/inch]  
Web Link : [TY-COMPAS Product Page](#)

Buttons: Save, Close

**Save Description Dialog:**

Save in: Desktop

File name:

Save as type: Data Text(\*.txt)

Buttons: Save, Cancel

**Notepad Window:**

**FerriteBeads**

Itemname : BK1005HS800  
Impedance at 100MHz : 80 Ohm  
DC Resistance(max) : 0.1 Ohm  
Rated Current : 700 mA,  
Case Size : 1.0 x 0.5 / 0.039 x 0.02 [mm/inch]  
Thickness : 0.5 / 0.02 [mm/inch]

**Capacitor**

Itemname : UMK105BJ331KV  
Capacitance : 330 pF  
Rated Voltage : 50V  
TCC : B / X5R  
Case Size : 1.0 x 0.5 / 0.039 x 0.02 [mm/inch]  
Thickness : 0.5 / 0.02 [mm/inch]

# Operation (Others)

When you connect to the internet, you can view the more detailed information of the part on TY-COMPAS page by clicking “TY-COMPAS Product Page” link on the parts info window.

**TAIYO YUDEN Filter Simulator**

**FerriteBeads**

Itemname : BK1005HS800-T  
Impedance at 100MHz : 80 Ohm  
DC Resistance(max) : 0.1 Ohm  
Rated Current : 700 mA,  
Case Size : 1.0 x 0.5 / 0.039 x 0.02 [mm/inch]  
Thickness : 0.5 / 0.02 [mm/inch]  
Web Link : [TY-COMPAS Product Page](#)

**FerriteBeads**

Itemname : BK1005HS800-T  
Impedance at 100MHz : 80 Ohm  
DC Resistance(max) : 0.1 Ohm  
Rated Current : 700 mA,  
Case Size : 1.0 x 0.5 / 0.039 x 0.02 [mm/inch]  
Thickness : 0.5 / 0.02 [mm/inch]  
Web Link : [TY-COMPAS Product Page](#)

**Capacitor**

Itemname : UMK105BJ331KV-F  
Capacitance : 330 pF  
Rated Voltage : 50V  
TCC : B / X5R  
Case Size : 1.0 x 0.5 / 0.039 x 0.02 [mm/inch]  
Thickness : 0.5 / 0.02 [mm/inch]  
Web Link : [TY-COMPAS Product Page](#)

Save Close

UMK105BJ331KV-F | CERAMIC CAPACITORS | TAIYO YUDEN CO., LTD. - Internet Explorer

http://ds.yuden.co.jp/TYCOMPAS/or/detail.do?productNo=UMK105BJ331KV-F&dataUnit=M

UMK105BJ331KV-F | CER...

ファイル(E) 編集(E) 表示(V) お気に入り(A) ツール(T) ヘルプ(H)

**TY-COMPAS**  
(Taiyo Yuden COMPONENT Assist System)

Select Region Version info PRECAUTIONS FOR USE

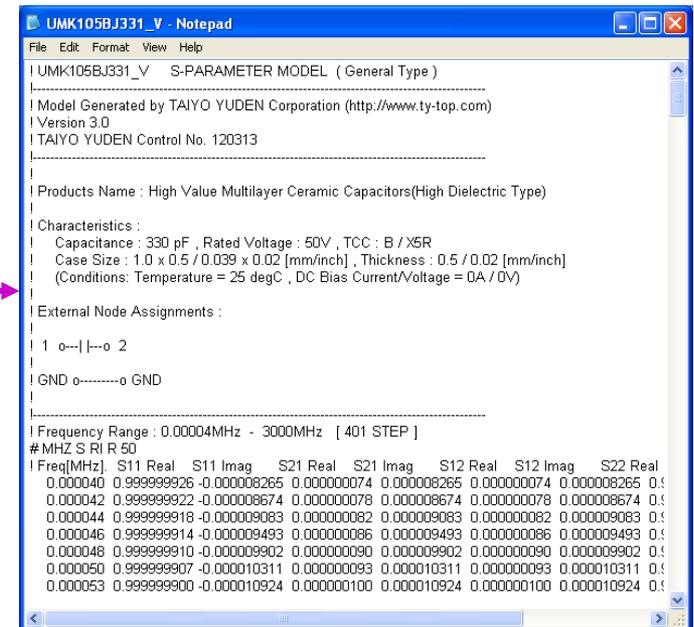
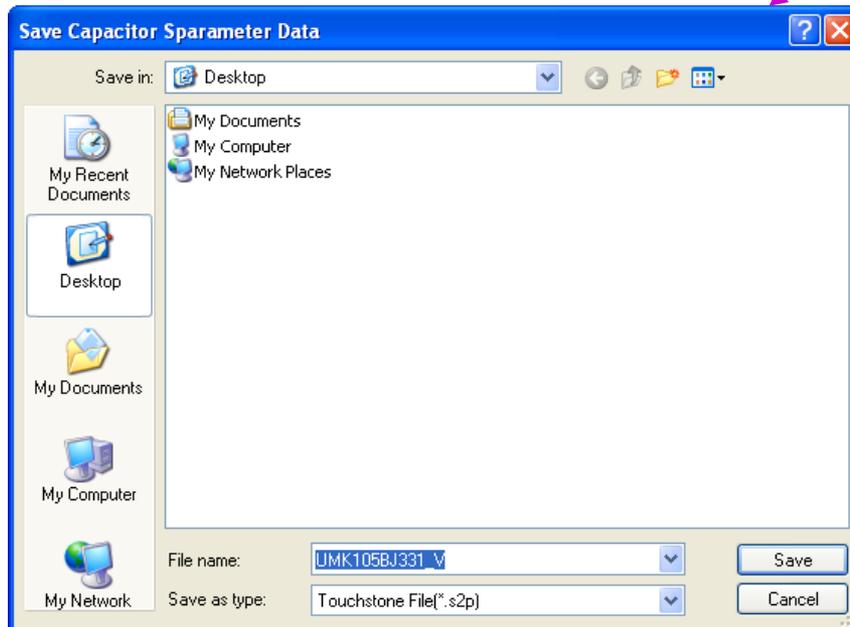
### UMK105BJ331KV-F

CERAMIC CAPACITORS [High Value Multilayer Ceramic Capacitors (High dielectric type)]

Specifications	Appearance	To Higher Specification																																								
<table border="1"><tr><td>Status</td><td>Mass Production</td></tr><tr><td>Capacitance</td><td>330 pF ± 10 %</td></tr><tr><td>Case Size (EIA/JIS)</td><td>0402/1005</td></tr><tr><td>Rated Voltage</td><td>50 V</td></tr><tr><td>tanδ (max)</td><td>2.5 %</td></tr><tr><td>Temperature Characteristic (EIA)</td><td>X5R</td></tr><tr><td>Operating Temp. Range (EIA)</td><td>-55 to +85 °C</td></tr><tr><td>Temperature Characteristic (JIS)</td><td>B</td></tr><tr><td>Operating Temp. Range (JIS)</td><td>-25 to +85 °C</td></tr><tr><td>High Temperature Loading (% Rated Voltage)</td><td>200 %</td></tr><tr><td>Insulation Resistance (min)</td><td>10 GΩ</td></tr><tr><td>Dimension L</td><td>1.0 ±0.05 mm</td></tr><tr><td>Dimension W</td><td>0.5 ±0.05 mm</td></tr><tr><td>Dimension T</td><td>0.5 ±0.05 mm</td></tr><tr><td>Dimension e</td><td>0.25 ±0.10 mm</td></tr><tr><td>RoHS2 Compliance (10 subst.)</td><td>Yes</td></tr><tr><td>REACH Compliance (181 subst.)</td><td>Yes</td></tr><tr><td>IEC62474 (Ver. D15.00) Compliance</td><td>Yes</td></tr><tr><td>Halogen Free</td><td>Yes</td></tr><tr><td>Soldering</td><td>Reflow</td></tr></table>	Status	Mass Production	Capacitance	330 pF ± 10 %	Case Size (EIA/JIS)	0402/1005	Rated Voltage	50 V	tanδ (max)	2.5 %	Temperature Characteristic (EIA)	X5R	Operating Temp. Range (EIA)	-55 to +85 °C	Temperature Characteristic (JIS)	B	Operating Temp. Range (JIS)	-25 to +85 °C	High Temperature Loading (% Rated Voltage)	200 %	Insulation Resistance (min)	10 GΩ	Dimension L	1.0 ±0.05 mm	Dimension W	0.5 ±0.05 mm	Dimension T	0.5 ±0.05 mm	Dimension e	0.25 ±0.10 mm	RoHS2 Compliance (10 subst.)	Yes	REACH Compliance (181 subst.)	Yes	IEC62474 (Ver. D15.00) Compliance	Yes	Halogen Free	Yes	Soldering	Reflow		<p>Smaller</p> <p>Hi-Temp. Lower</p> <p>Hi-Cap.</p>
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<b>Features</b>	<p>Monolithic structure provides higher reliability.</p> <p>A wide range of capacitance values available in standard case sizes.</p> <p>The use of nickel as electrode material and plating processing improve the solderability and heat resistance characteristics. It also prevents migration and raises the level of reliability.</p> <p>Low equivalent series resistance(ESR) provides superior noise absorption characteristics.</p>																																									
<b>Applications</b>																																										

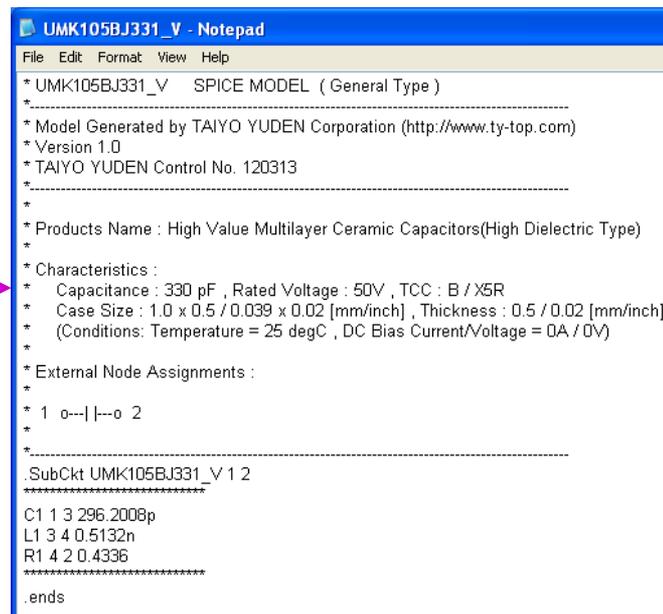
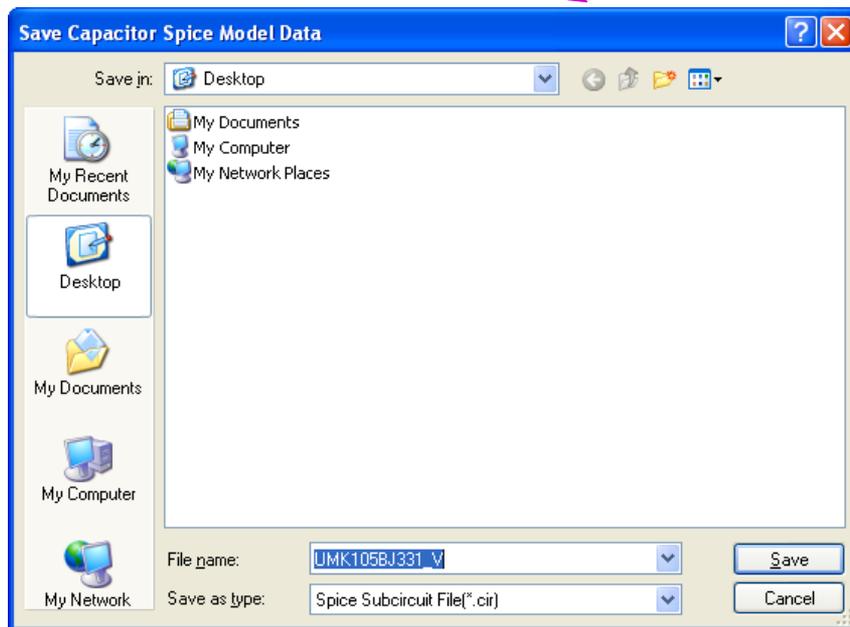
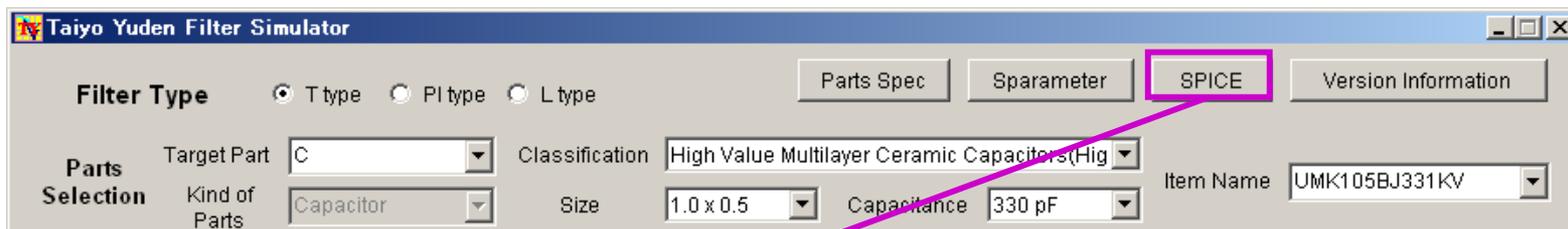
# Operation (Others)

You can export S parameter data of selected items to a touchstone file by pressing "Sparameter" button at the upper right of the main window.



# Operation (Others)

You can export SPICE Subcircuit model data of selected items to a file by pressing "SPICE" button at the upper right of the main window.



# Operation (Others)

You can confirm the version information of this application by pressing the "Version Information" button at the upper right of the main window.

