SimSurfing
Noise Filter Design Support Tool Plus
Operation Manual

February 2022

Murata Manufacturing Co., Ltd.

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1. Tool Information
1-1. Overview

- What you can do with this tool

With this tool, you can select items from our components suitable for consumer and vehicle-mounted power sources and display recommended items for filter circuits that are components of such configurations, display a graph of insertion loss characteristics, and display the mounting area.

Murata components
Power Inductors (L)
Chip Ferrite Bead (BEAD)
Common Mode Choke Coils (CMCC)
Multilayer Ceramic Capacitors (MLCC)
3-terminal Capacitors (3-Term.C)

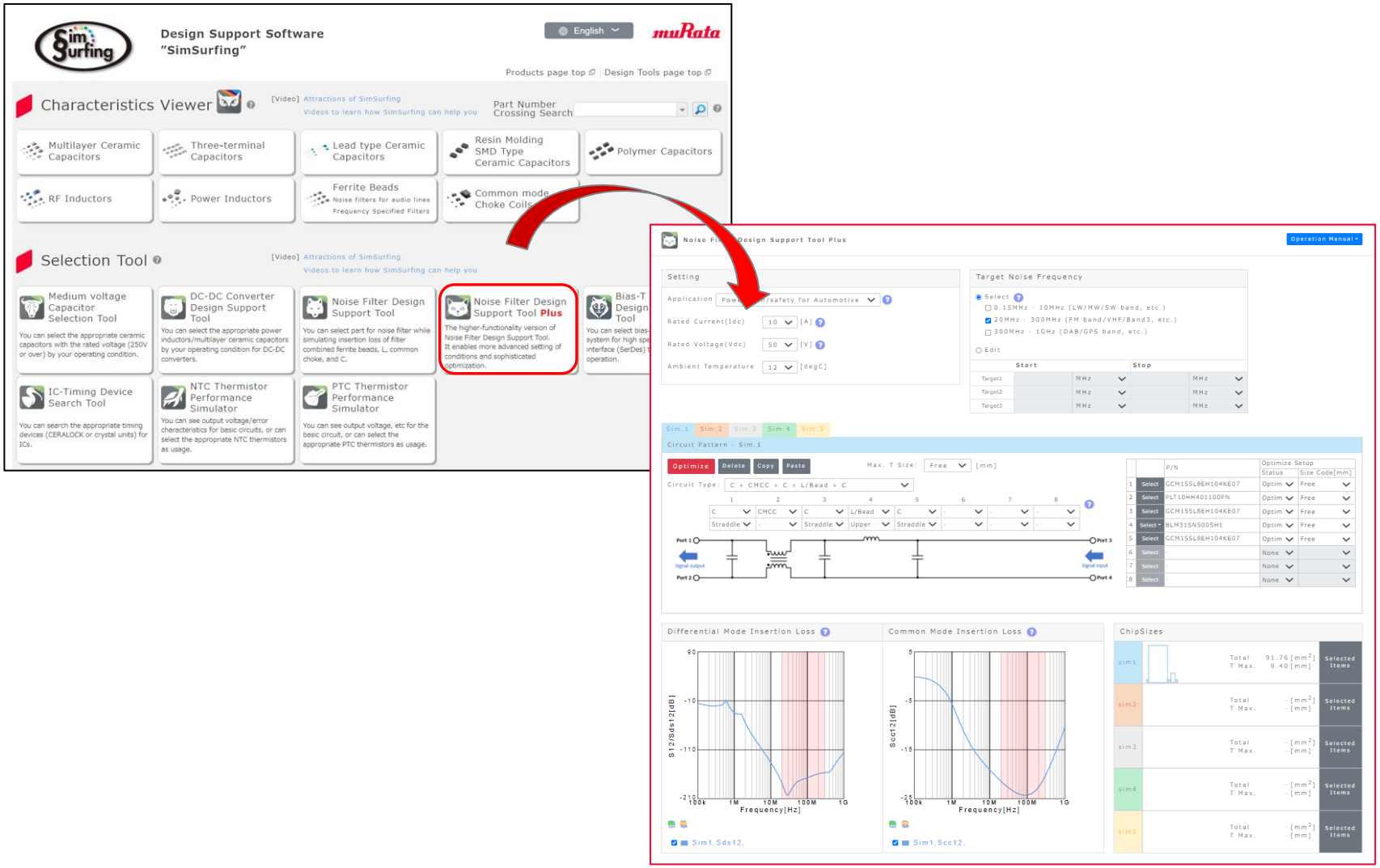
- Features

✓ Select the circuit conditions and insertion loss characteristics that you want to check, and then display the recommended items with the click of a single button.

✓ You can select the frequency range for which you want to reduce noise, filter circuit configuration (up to 8 elements), and items as you like, and then compare and display the insertion loss and mounting area.

1. Tool Information
1-2. Tool start-up and screen layout

- Click [Noise Filter Design Support Tool] on the SimSurfing top page to display the tool window.



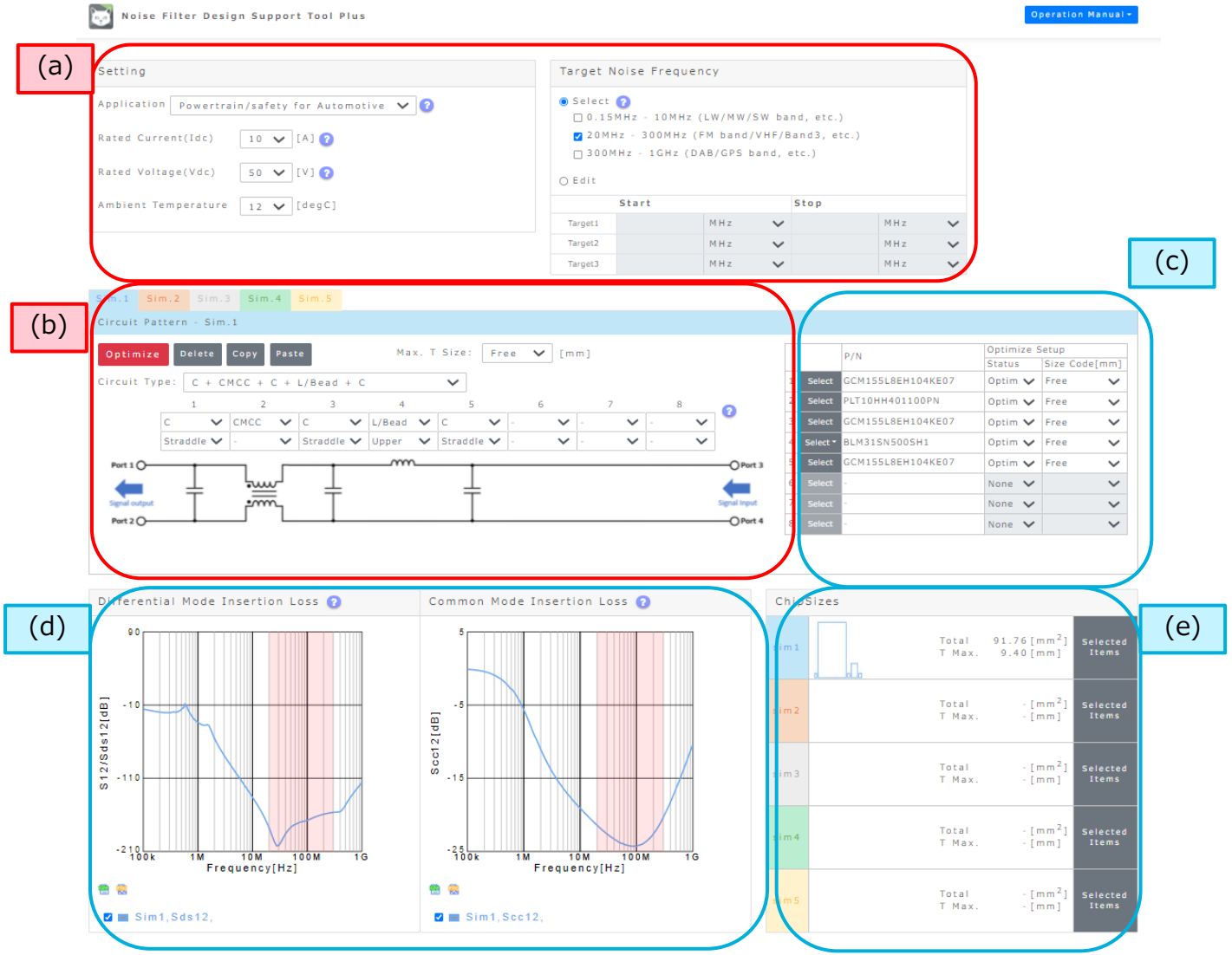
1. Tool Information

1-2. Tool start-up and screen layout

- This tool consists of 5 elements.

Select/Settings
(a) Condition selection
(b) Circuit configuration

Output
(c) Recommended item display
(d) Insertion loss display
(e) Mounting area display



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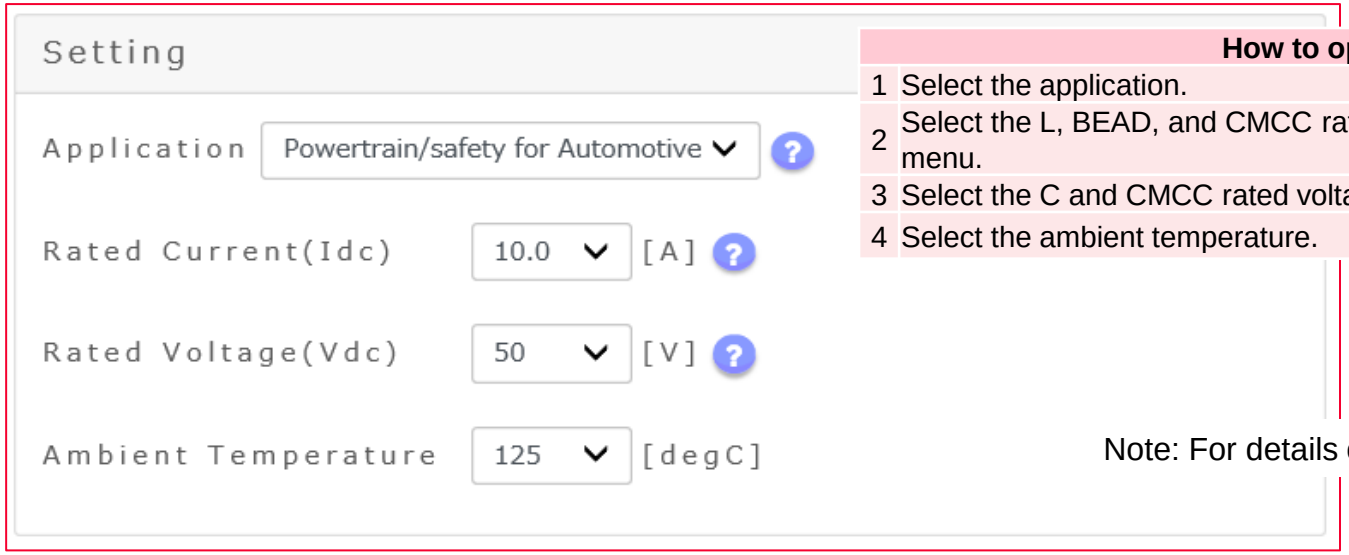
2. Try it Out
2-1. Instructions for each component: 3 steps(1/3)

(a) Condition selection	Select the application, rated current/rated voltage, and target noise frequency band
(b) Circuit configuration	Filter circuit configuration
(c) Item selection	Circuit configuration element item selection
(d) Insertion loss display	Differential mode and common mode (when CMCC is selected) insertion loss graph display

(a) Condition selection

Select conditions using Setting. See the operating instructions.



How to operate	
1	Select the application.
2	Select the L, BEAD, and CMCC rated current from the pull-down menu.
3	Select the C and CMCC rated voltage from the pull-down menu.
4	Select the ambient temperature.

Note: For details on terms, click the ?

2. Try it Out
2-1. Instructions for each component: 3 steps(2/3)

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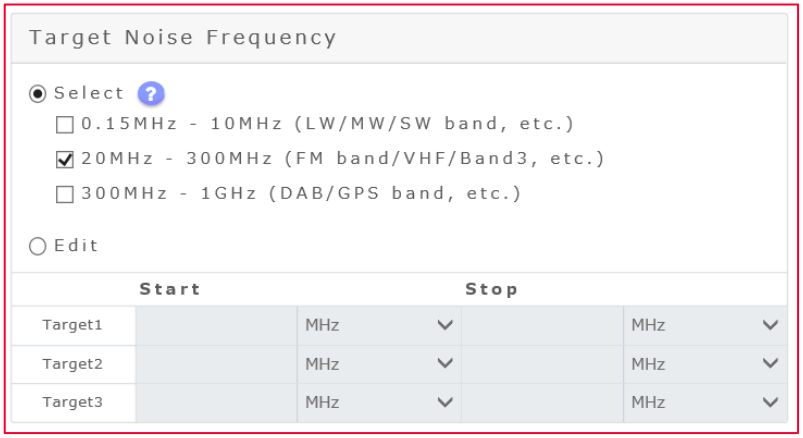
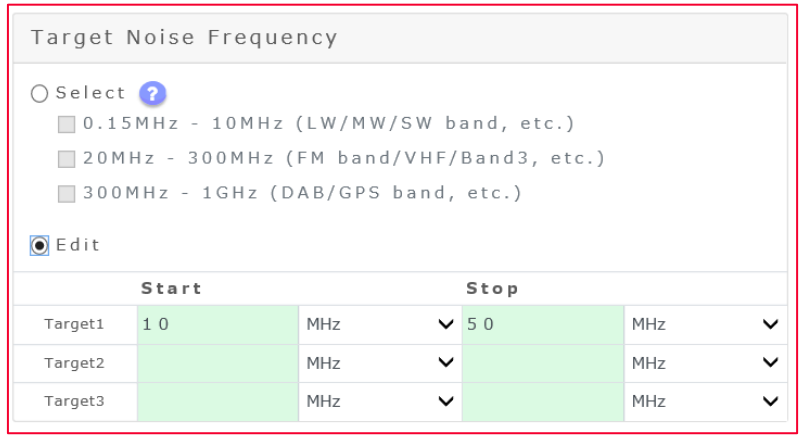
(a) Condition selection

Configure the Target Noise Frequency conditions.
Select [Edit] from the lower section to set your preferred frequency. See the operating instructions.

Note: For details on terms, click the ?



How to operate
Choose [Select] and then select the frequency range you want to check.



How to operate
Select [Edit] to set your preferred frequency.

2. Try it Out
2-1. Instructions for each component: 3 steps(3/3)

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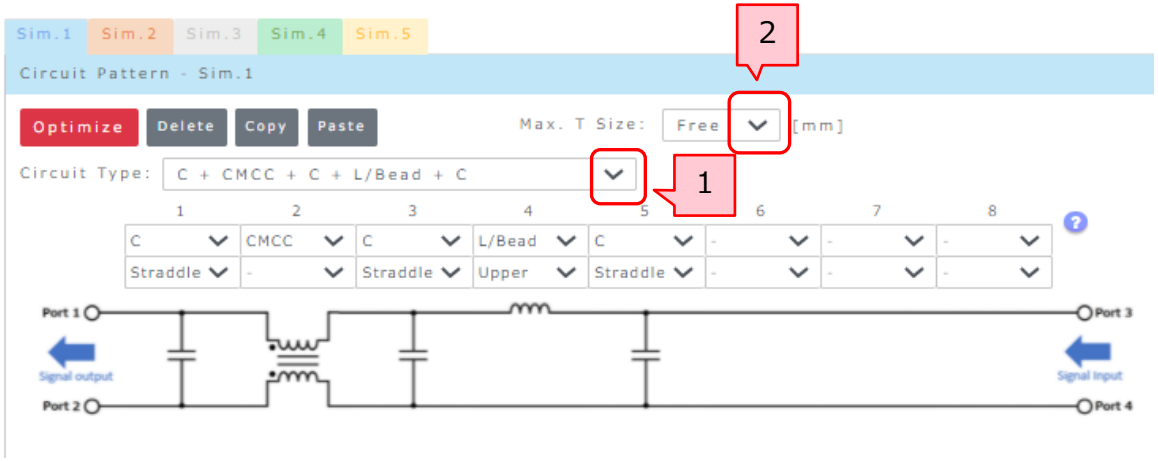
(b) Circuit configuration

Select up to 8 elements from L, BEAD, CMCC, and C to configure the filter circuit for whose insertion loss you want to calculate.

How to operate		
How to configure a new circuit	1	Select your preferred filter configuration from the [Create circuit] pop-up menu. (The filter circuit diagram is automatically displayed below.)
	2	If there are circuit component product height restrictions, you can select from [2 Max. T Size].

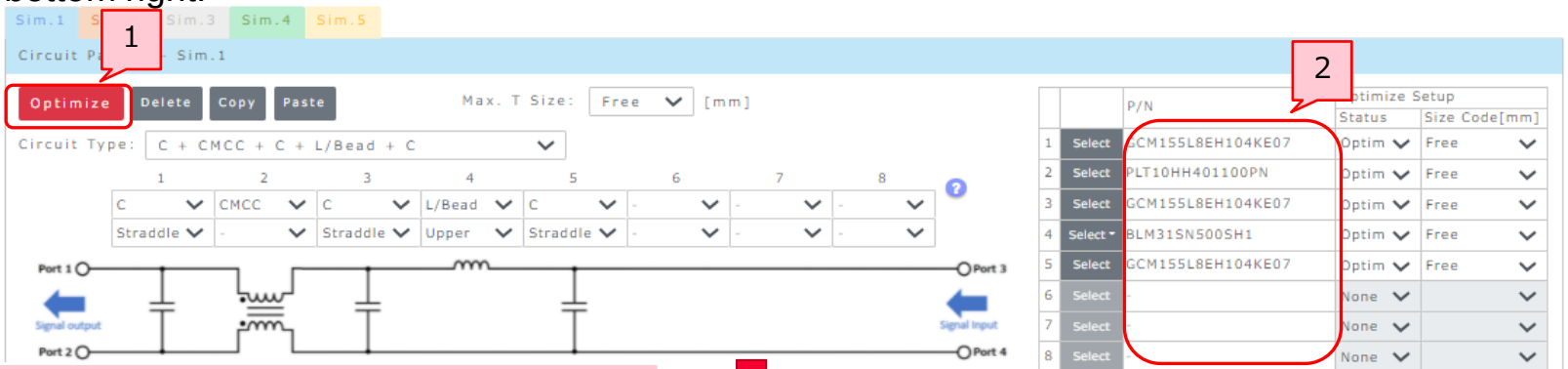


Circuit symbol descriptions	
L	Power Inductors
BEAD	Chip Ferrite Bead
CMCC	Common Mode Choke Coils
C	Multilayer Ceramic Capacitors
3-Term.C	3-terminal Capacitors

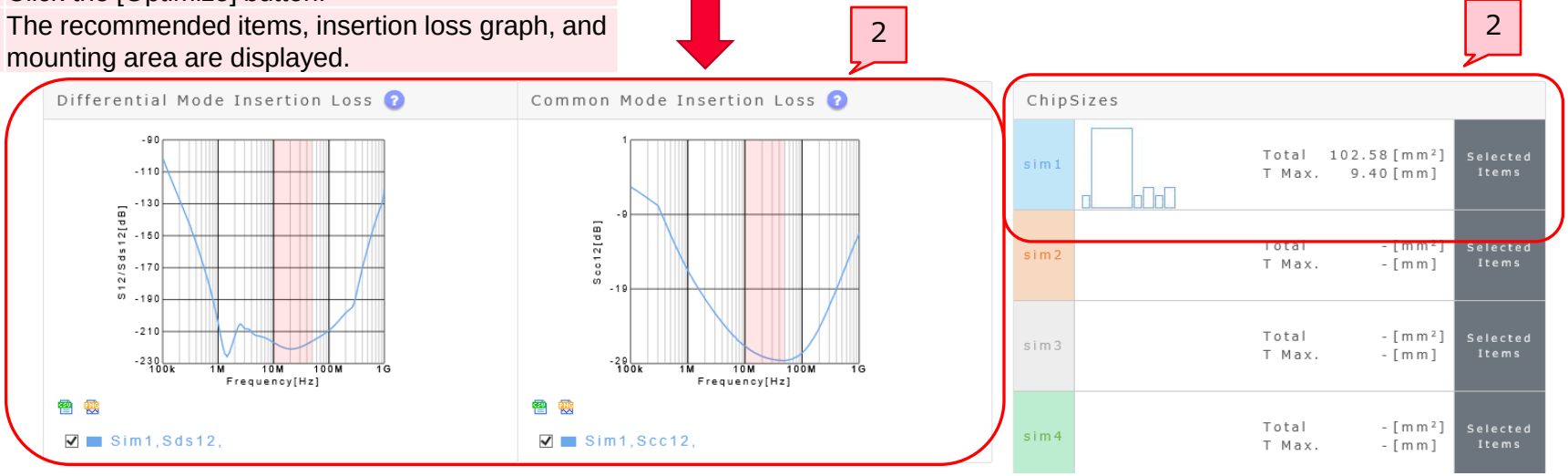
(d) Insertion loss display

The recommended items, insertion loss, and mounting area are calculated from the set/selected circuit configuration.

You can check the detailed specifications of selected items using the [Selected Items] button on the bottom right.



How to operate	
1	Click the [Optimize] button.
2	The recommended items, insertion loss graph, and mounting area are displayed.



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3. Advanced Features

3-1. You can change the number of filter elements and the wire connection method.

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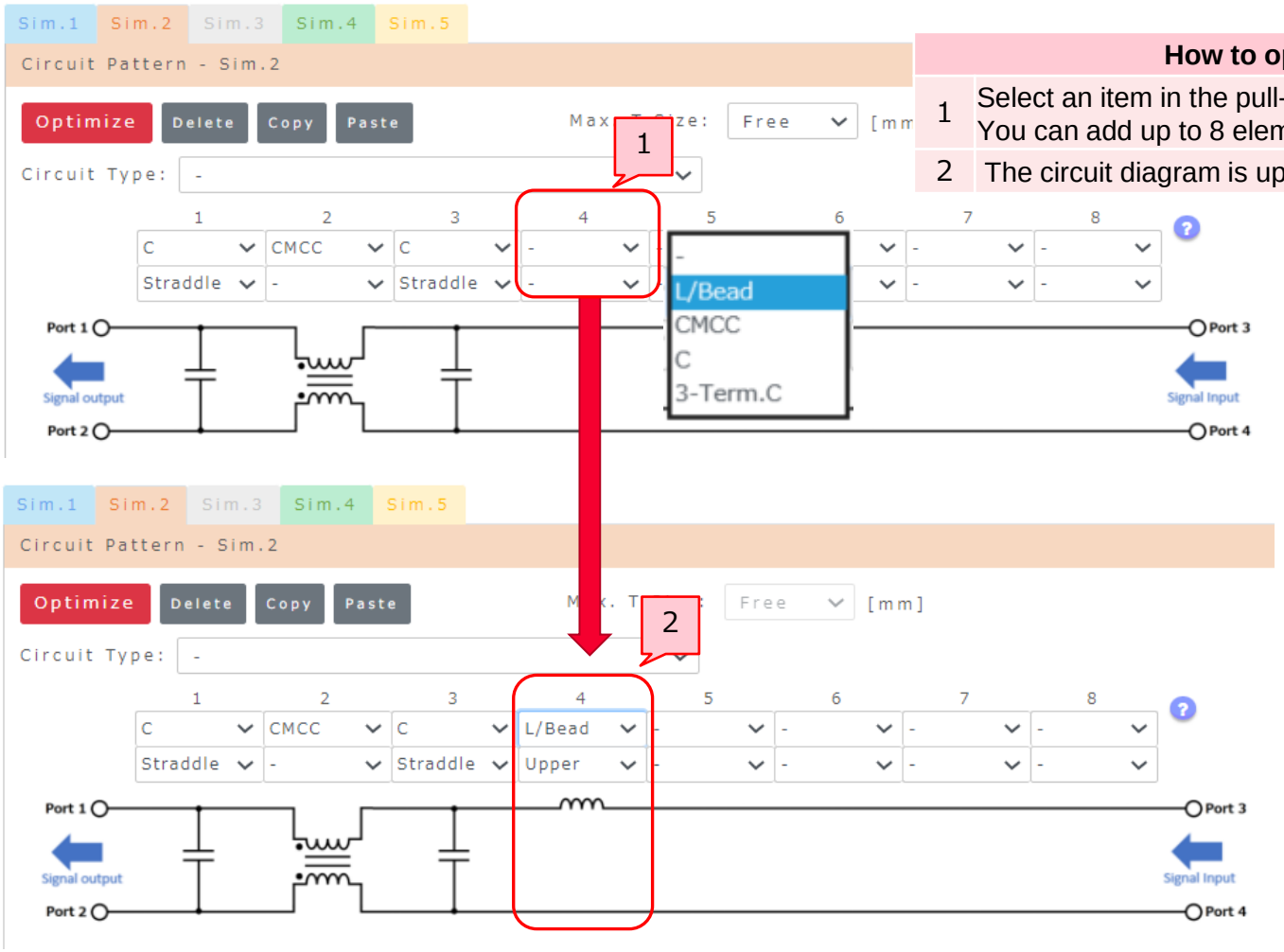
How to change the number of filter elements

You can change the circuit configuration diagram item configuration from the pull-down menu.



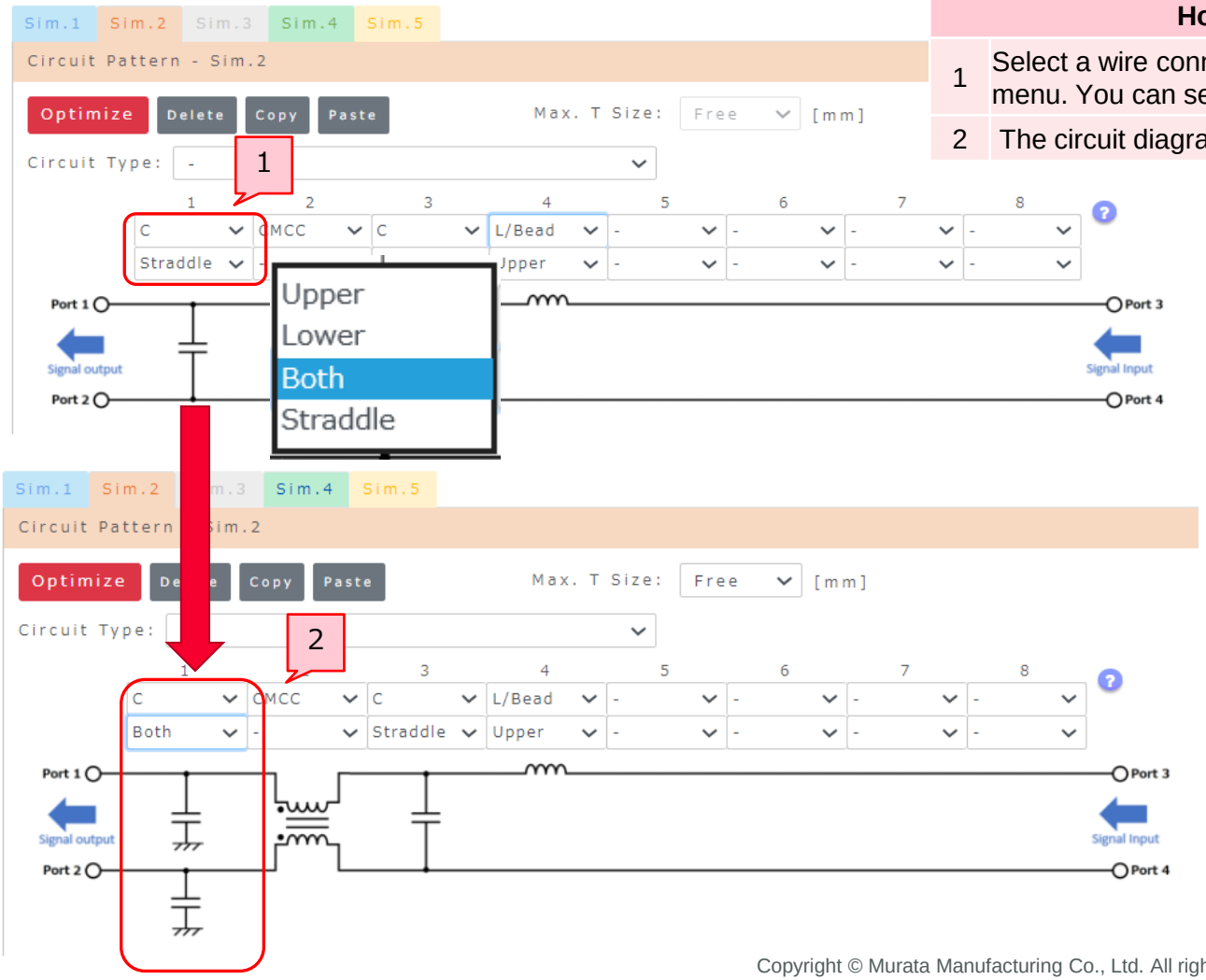
How to operate	
1	Select an item in the pull-down menu. You can add up to 8 elements.
2	The circuit diagram is updated.

3. Advanced Features

3-1. You can change the number of filter elements and the wire connection method.

How to change the number of filter elements

You can change the circuit configuration diagram item configuration.



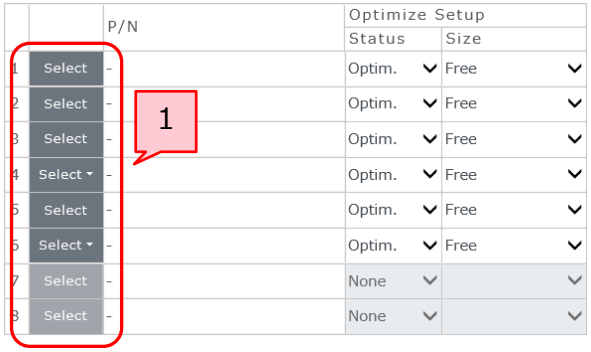
How to operate	
1	Select a wire connection method in the pull-down menu. You can select from 4 types.
2	The circuit diagram is updated.

3. Advanced Features

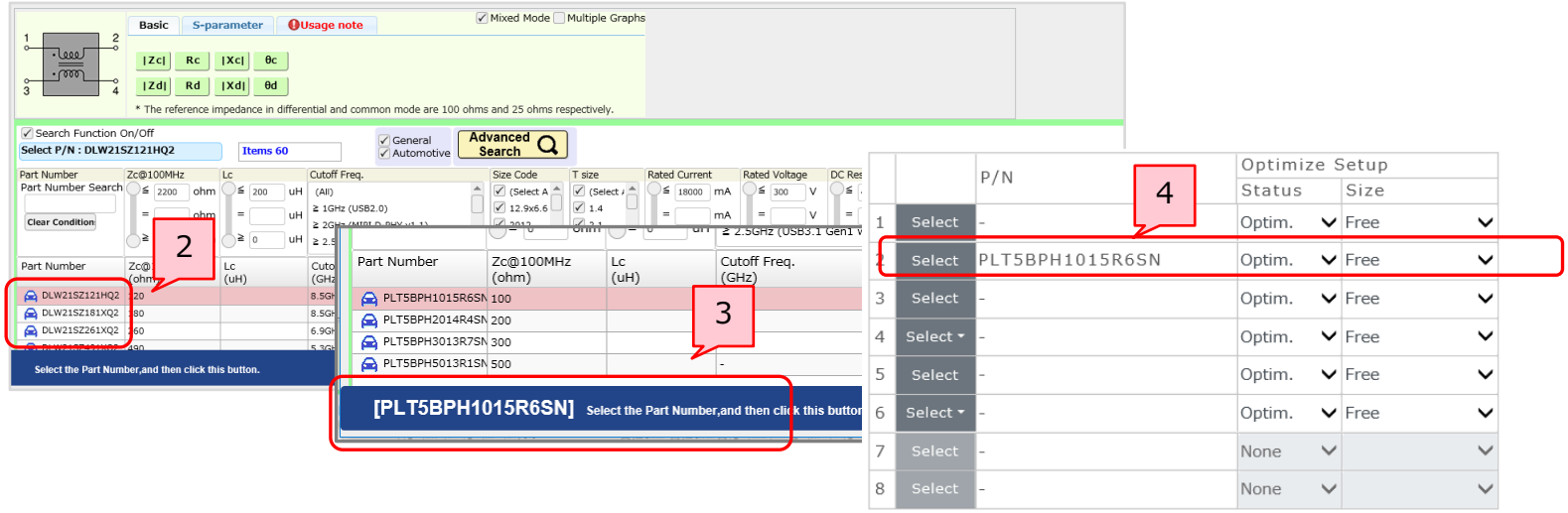
3-2. You can select items as you like.

How to change the selected filter

Selection of items for each element configured in the circuit is handled in mini SimSurfiing. You can select items with specified values and ranges for each electrical characteristic.



How to operate	
1	Click the [Select] button.
2	Select items in the mini SimSurfing pop-up.
3	Click the confirmation bar at the bottom of mini SimSurfing.
4	Close mini SimSurfing and return to the tool window.



3. Advanced Features

3-3. You can fix/remove filters during optimization, and specify the chip size.

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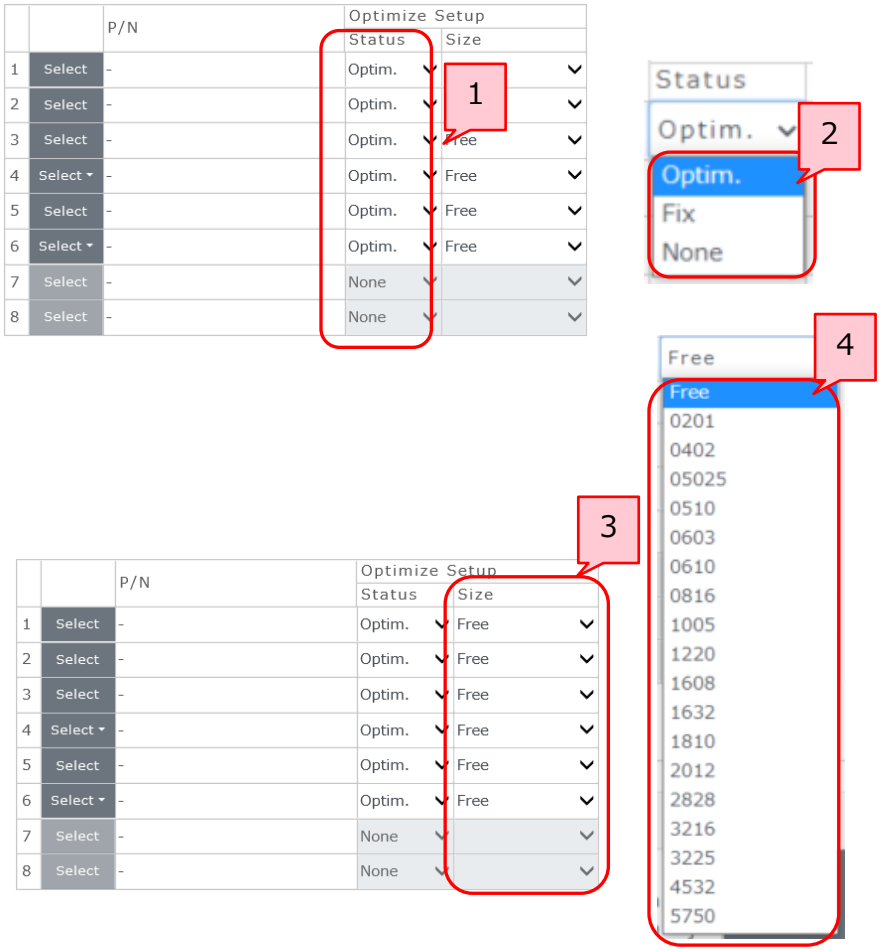
How to fix/remove selection filters and specify the chip size

You can make a selection from the filter list on the right side of the Circuit Pattern column where the circuits are displayed.
Make a selection from the [Status] and [Size] pull-down menus under [Optimize Setup] in the table.



How to operate	
1	Three menus appear in the pull-down menu.
2	Menu Optim.: Displays optimized items Fix: Fix None: No filter

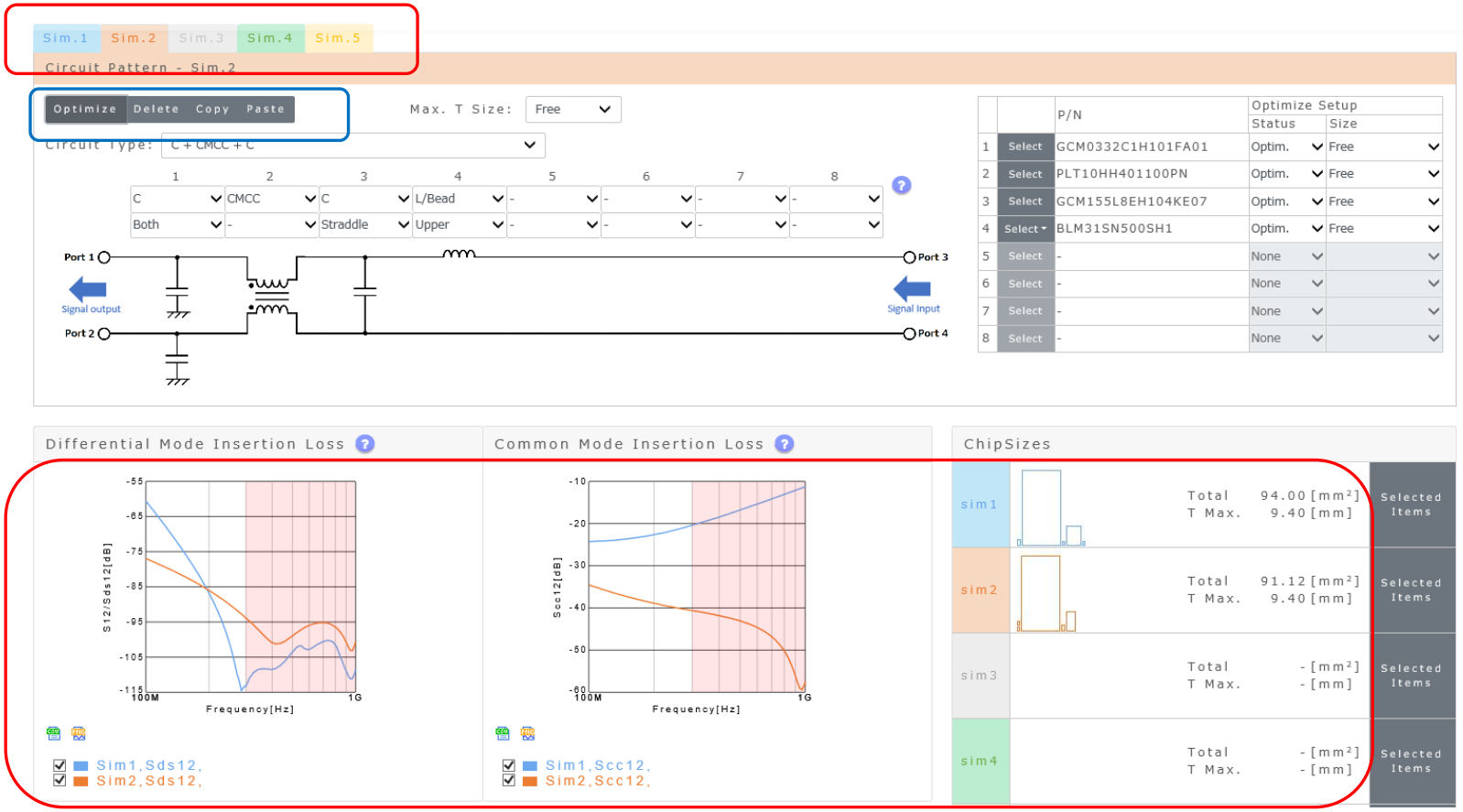
How to operate	
3	Multiple size options appear in the pull-down menu.
4	Menu Free. : Displays user-set items Non-Free: Locked to items of a specified size.

3. Advanced Features

3-4. You can compare multiple circuit configurations.

How to compare multiple circuit conditions

You can compare multiple conditions using the Sim tab.
If conditions are present on multiple tabs, the insertion loss graph and mounting area results are automatically displayed.



Use the [Delete], [Copy], and [Paste] buttons next to [Optimize].

3. Advanced Features

3-5. You can output data.

How to output data

The numerical data CSV output and graph image output buttons can be found at the lower left of insertion loss.
You can output the results by clicking these buttons.