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Introduction

Welcome to PPI's Capacitance Application Program (C.A.P.). This web-based application is intended to aid in a user's selection of PPI's MLCC product line.

Technical Tutorial

Initial Selection

C.A.P. is intended to present data on a selected MLCC, starting with the users desired capacitance **Dimensions**, **Capacitance**, and **Frequency of interest**. The screenshot below shows the initial default page setting. Areas of interest are presented with a Blue Box...

The screenshot displays the PPI Passive Plus Inc. web application interface. The header includes the company logo and contact information: Phone (631) 425 - 0938, Fax (631) 425 - 0847, and Email sales@passiveplus.com. The navigation bar shows links for Home, FAQ, and Log out. The main content area is divided into several sections:

- Dimensions:** A dropdown menu set to "Open Selection".
- Capacitance:** A text input field.
- Highest Desired Operating Frequency:** A text input field.
- Units:** Radio buttons for pF, nF, uF and MHz, GHz.
- Buttons:** "Reset" and "Look up" buttons.
- PPI Part Number:** A table of input fields for various parameters:

ESR (Ω)	Xc (Ω)	FPR	FSR
ESL (nH)	Xl (Ω)	Hor (GHz)	
Q	Z (Ω)	Ver (GHz)	
Ceff (pF)	WVDC (V)		
RMS Current (Amps)			
- Dimensions below are in mils(mm)**: A red text label.
- NO IMAGE AVAILABLE:** A large watermark indicating that no image is available for the selected part.
- Buttons:** "Part Datasheet", "Series Datasheet", and "S-Param" buttons.
- Quote Request:** Two checkboxes: "I'd like a quote for this quantity:" and "I'd like a sample pack sent to me.", each followed by a text input field.
- Buttons:** "Add to Quote List" and "Request Quote/Samples" buttons.

Secondary Filtering

After the initial selection, the user can further filter by **Temperature Coefficient**, **Voltage**, **Tolerance**, **Termination type**, and **Mounting**. In the case below, the user has entered data on PPI's 0603N, 51 pF, with the frequency of interest at 500 MHz...

The screenshot displays the PPI Passive Plus Inc. web application interface. The top navigation bar includes "PassivePlus.com", "Home", "FAQ", and "Log out". The main search area shows "Dimensions: 0603N | .1pF - 100pF | 250V". Below this, the "Capacitance" is set to 51 pF and the "Highest Desired Operating Frequency" is 500 MHz. A "Look up" button is visible.

The "PPI Part Number" is 0603N510FW251. A table of electrical parameters is shown:

ESR (Ω)	0.103	Xc (Ω)	6.241	FPR	FSR	
ESL (nH)	0.102	XI (Ω)	0.319	Hor (GHz)	2.24	2.21
Q	61	Z (Ω)	5.922	Ver (GHz)	N/A	N/A
Ceff (pF)	53.751	WVDC (V)	250			
RMS Current (Amps)	3.11347					

Dimensions below are in mils(mm):

Temperature Coefficient / Case Size: NPO | 0603N. EIA Low ESR Microwave Capacitors. Temp Coefficient: $+0 \pm 30$ ppm/°C. Operating Temp: -55°C to +175°C.


Filtering options:

- Voltage:** 250V | N
- Tolerance:** F (+/- 1%), G (+/- 2%), J (+/- 5%), K (+/- 10%)
- Termination:** W (RoHS Tin Plate)
- Mounting:** Horizontal

Buttons for "Part Datasheet", "Series Datasheet", and "S.Param" are present. A quantity of 0 is entered, and options for "Add to Quote List" and "Request Quote/Samples" are available.

Calculations

Based on the user's selection, C.A.P. will calculate various RF parameters such as **ESR**, **ESL**, **Q**, **Ceff**, **|Xc|**, **|XI|**, **|Z|**, **WVDC**, **RMS Current**, **FPR**, and **FSR**. The user will also be presented with a pictorial, showcasing the dimensions of the selected part...



PassivePlus.com
Home
FAQ
Log out

Dimensions: 0603N | .1pF – 100pF | 250V

Capacitance: Highest Desired Operating Frequency:

pF
 nF
 uF
 MHz
 GHz

Temperature Coefficient / Case Size
NPO | 0603N

EIA Low ESR Microwave Capacitors
Temp Coefficient: ± 30 ppm/°C
Operating Temp: -55°C to +175°C

Voltage
250V N

Tolerance
F (+/- 1%)
G (+/-2%)
J (+/-5%)
K (+/-10%)

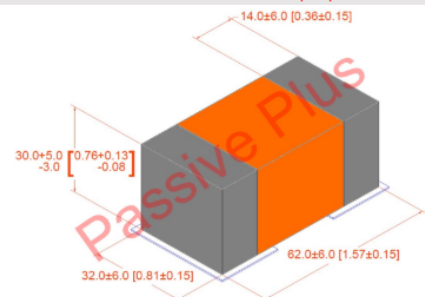
Termination
W (RoHS Tin Plate)

Mounting
Horizontal

PPI Part Number **0603N510FW251**

ESR (Ω)	0.103	Xc (Ω)	6.241	FPR	FSR
ESL (nH)	0.102	XI (Ω)	0.319	Hor (GHz)	2.24 2.21
Q	61	Z (Ω)	5.922	Ver (GHz)	N/A N/A
Ceff (pF)	53.751	WVDC (V)	250		
RMS Current (Amps)	3.11347				

Dimensions below are in mils(mm)



I'd like a quote for this quantity:

I'd like a sample pack sent to me.

Datasheets/S Parameters Screens

Three different options are available to the user; The **Parts Datasheet**, the **Series Datasheet**, and **S-Parameter**. These options lead the user to a series of pop-up windows...

PPI Passive Plus Inc.
RF & Microwave Components

PassivePlus.com Home FAQ Log out

Dimensions: 0603N | .1pF – 100pF | 250V

Capacitance: 51 Highest Desired Operating Frequency: 500

pF nF uF MHz GHz

Reset **Look up**

Temperature Coefficient / Case Size
NPO | 0603N

EIA Low ESR Microwave Capacitors
Temp Coefficient: +0 ± 30 ppm/°C
Operating Temp: -55°C to +175°C

Voltage	Tolerance	Termination	Mounting
250V N	F (+/- 1%) G (+/- 2%) J (+/- 5%) K (+/- 10%)	W (RoHS Tin Plate)	Horizontal

PPI Part Number **0603N510FW251**

ESR (Ω)	0.103	Xc (Ω)	6.241	FPR	FSR
ESL (nH)	0.102	Xl (Ω)	0.319	Hor (GHz)	2.24 2.21
Q	61	Z (Ω)	5.922	Ver (GHz)	N/A N/A
Ceff (pF)	53.751	WVDC (V)	250		
RMS Current (Amps)	3.11347				

Dimensions below are in mils(mm)

Part Datasheet **Series Datasheet** **S-Param**


I'd like a quote for this quantity: 0

I'd like a sample pack sent to me.

Add to Quote List **Request Quote/Samples**

Parts Datasheet

Clicking the Parts Datasheet displays a custom-made page, containing the information put in the user for the frequency of interest, along with the corresponding Insertion Loss, and Return Loss charts. The user can print this page out by right clicking on the window and selecting Print...



March 20, 2019

PPI Part Number	0603N510FW251
Series	0603N
Capacitance (pF)	51
Mounting	Horizontal

ESR (Ω)	0.103	[Xc] (Ω)	6.241
ESL (μH)	0.102	[Xl] (Ω)	0.319
Q	61	[Z] (Ω)	5.922
Ceff (pF)	53.751	WVDC (V)	250
RMS Current (Amps)		3.11347	

Product Features
High Q, High Power, Low ESR/ESL, Low Noise, High Self-Resonance, Ultra-Stable Performance

Product Application
Typical Functional Applications: Tuning, Bypass, Coupling, Feedback, D.C. Blocking and Impedance Matching, Typical Circuit Applications: UHF/Microwave RF Power Amplifiers, Mixers, Oscillators, Low Noise Amplifiers, Filter Networks, Timing Circuits and Delay Lines.

Definitions and Measurement Conditions - FSR
The First Parallel, FSR, is defined as the lowest frequency at which a suckout or notch appears in |S11|. It is generally independent of substrate thickness or dielectric constant, but does depend on capacitor orientation. A horizontal orientation means the capacitor electrode planes are parallel to the plane of the substrate; a vertical orientation means the electrode planes are perpendicular to the substrate.

The measurement conditions are: substrate - Rogers RT/duroid 5880; substrate dielectric constant = 2.20; horizontal mount substrate thickness (mils) = 10; gap in microstrip trace (mils) = 23.7; horizontal mount microstrip trace width (mils) = 30.0; Reference planes at sample edges.

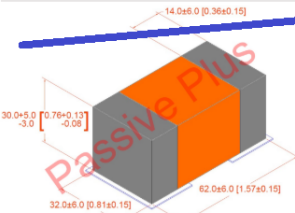
All data has been derived from electrical models created by Modelithics, Inc., a specialty vendor contracted by PPI. The models are derived from measurements on a large number of parts disposed on several different substrates.

Definitions and Measurement Conditions - FSR
For a capacitor in a series configuration, i.e., mounted across a gap in a microstrip trace, with 50-Ohm source and termination resistances, the First Series Resonance, FSR, is defined as the lowest frequency at which the imaginary part of the input impedance, Im[Zin], equals zero when reference planes are not at the sample edges. The FSR shall be considered as undefined ("UND" in FSR value) if, over the measured or model-validated frequency range (a) Im[Zin] never reaches zero; or (b) at frequencies lower than that at which Im[Zin] = 0, Im[Zin] is not monotonic with frequency and/or the real part of the input impedance, Re[Zin], deviates more than once from monotonicity. Should Im[Zin] or the real part of the input impedance, Re[Zin], not be monotonic with frequency at frequencies lower than those at which Im[Zin] = 0, the FSR shall be considered as undefined. FSR is dependent on internal capacitor structure; substrate thickness and dielectric constant; capacitor orientation, as defined alongside the FSR plot; and mounting pad dimensions.

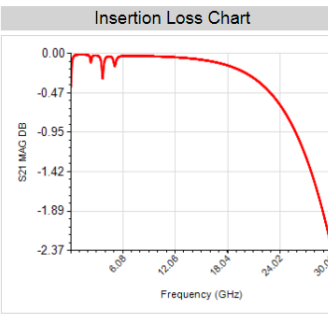
The measurement conditions are: substrate - Rogers RT/duroid 5880; substrate dielectric constant = 2.20; horizontal mount substrate thickness (mils) = 10; gap in microstrip trace (mils) = 23.7; horizontal mount microstrip trace width (mils) = 30.0; Reference planes at sample edges.

All data has been derived from electrical models created by Modelithics, Inc., a specialty vendor contracted by PPI. The models are derived from measurements on a large number of parts disposed on several different substrates.

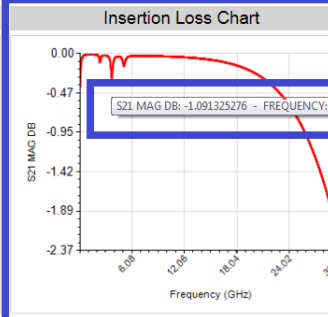
Dimensions below are in mils(mm)



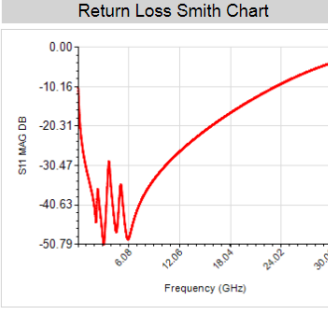
Insertion Loss Chart



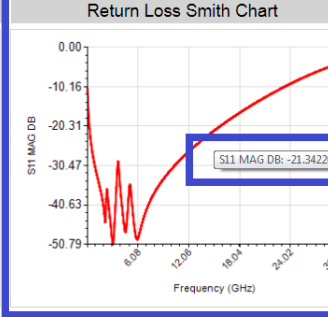
Insertion Loss Chart



Return Loss Smith Chart



Return Loss Smith Chart



Magnitude and Frequency is displayed when mouse pointer is put on the plot

S-Param

This presents the user with a large plot of the Insertion and Return Losses. This screen will also allow the user to download the S-Parameter file, and access information on the mounting and measurement conditions.



Quoting

The lower right section of C.A.P. displays the Quoting interface. When the user has selected a part number (selection noted by the **PPI Part Number** in the upper right section of C.A.P.), you can insert the number of parts desired. The user will then see the page reset, with an update on the request quote button

PassivePlus.com Home FAQ Log out

Dimensions: 0603N | .1pF – 100pF | 250V

Capacitance: 51 Highest Desired Operating Frequency: 500

pF nF uF MHz GHz

Reset **Look up**

Temperature Coefficient / Case Size
 NP0 | 0603N
 EIA Low ESR Microwave Capacitors
 Temp Coefficient: +0 ± 30 ppm/°C
 Operating Temp: -55°C to +175°C

Voltage	Tolerance	Termination	Mounting
250V N	F (+/- 1%) G (+/- 2%) J (+/- 5%) K (+/- 10%)	W (RoHS Tin Plate)	Horizontal

PPI Part Number **0603N510FW251**

ESR (Ω)	0.103	Xc (Ω)	6.241	FPR	FSR
ESL (nH)	0.102	Xl (Ω)	0.319	Hor (GHz)	2.24 2.21
Q	61	Z (Ω)	5.922	Ver (GHz)	N/A N/A
Ceff (pF)	53.751	WVDC (V)	250		
RMS Current (Amps)	3.11347				

Dimensions below are in mils(mm)

Part Datasheet **Series Datasheet** **S-Param**

I'd like a quote for this quantity: 500
 I'd like a sample pack sent to me.

Add to Quote List **Request Quote/Samples**

I'd like a quote for this quantity:
 I'd like a sample pack sent to me.

Add to Quote List **Request Quote/Samples (1)**

The user can send their quote request, after filling out the information presented in the page.

Notes/Issues

If anyone finds any concerns, or has any constructive feedback, do not hesitate to reply. Send all e-mails regarding C.A.P. to sales@passiveplus.com, adding "C.A.P. Feedback" in the subject line.

- Presently we have data on the following series:
 - High Q (>10,000) Capacitors: 0505C/P, 1111C/P, 2225C/P
 - EIA Hi Q Capacitors (Ultra Low ESR): 0201N, 0402N, 0603N, 0708N, 0805N, 1111N
 - Broadband: 01005BB104, 0201BB103, 0201BB104, 0402BB103, 0402BB104, 0805BB103
- The PPI C.A.P. calculator presently accepts input frequencies from 200 MHz to 3000 MHz. Please see future updates. The frequency response range (S2P measurements) is as indicated in their individual touchstone files for the cap selected.
- Clicking the Substrate / Mounting Info in the S-Param Screen may cause issues with user's operating Google Chrome. The user will be notified that a document has downloaded onto their page, which contains the information.