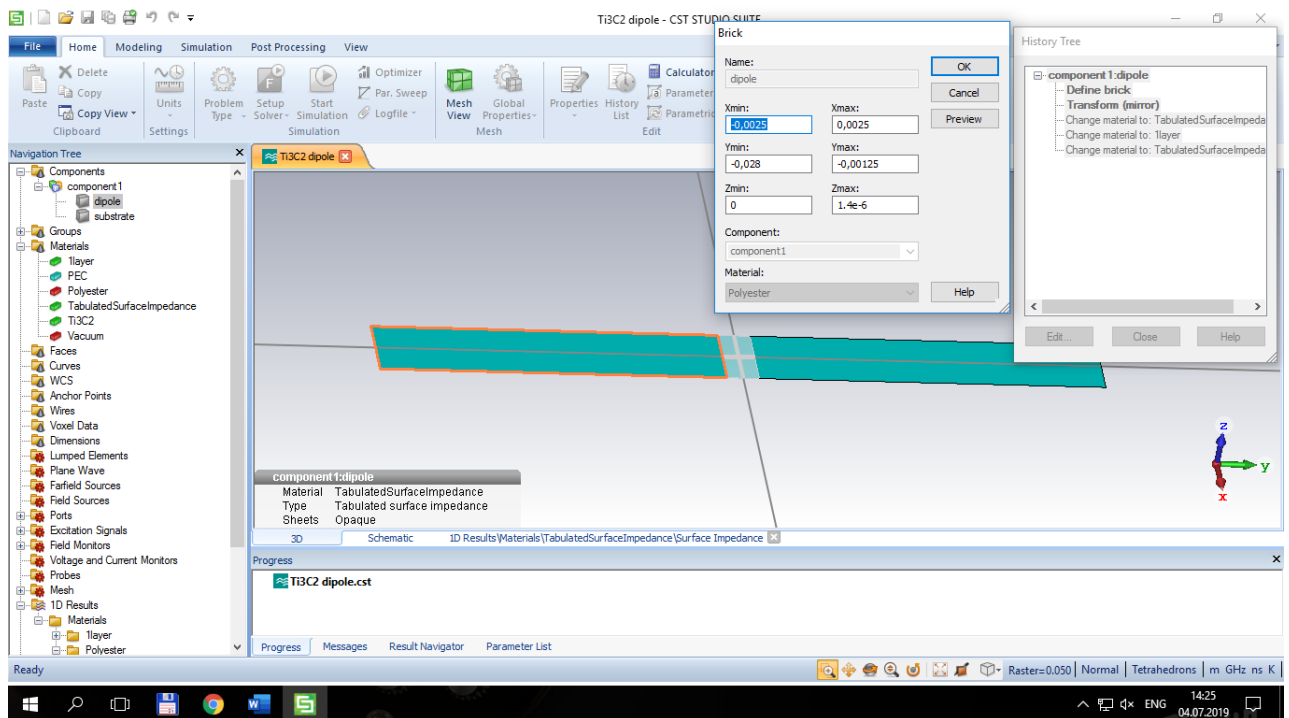
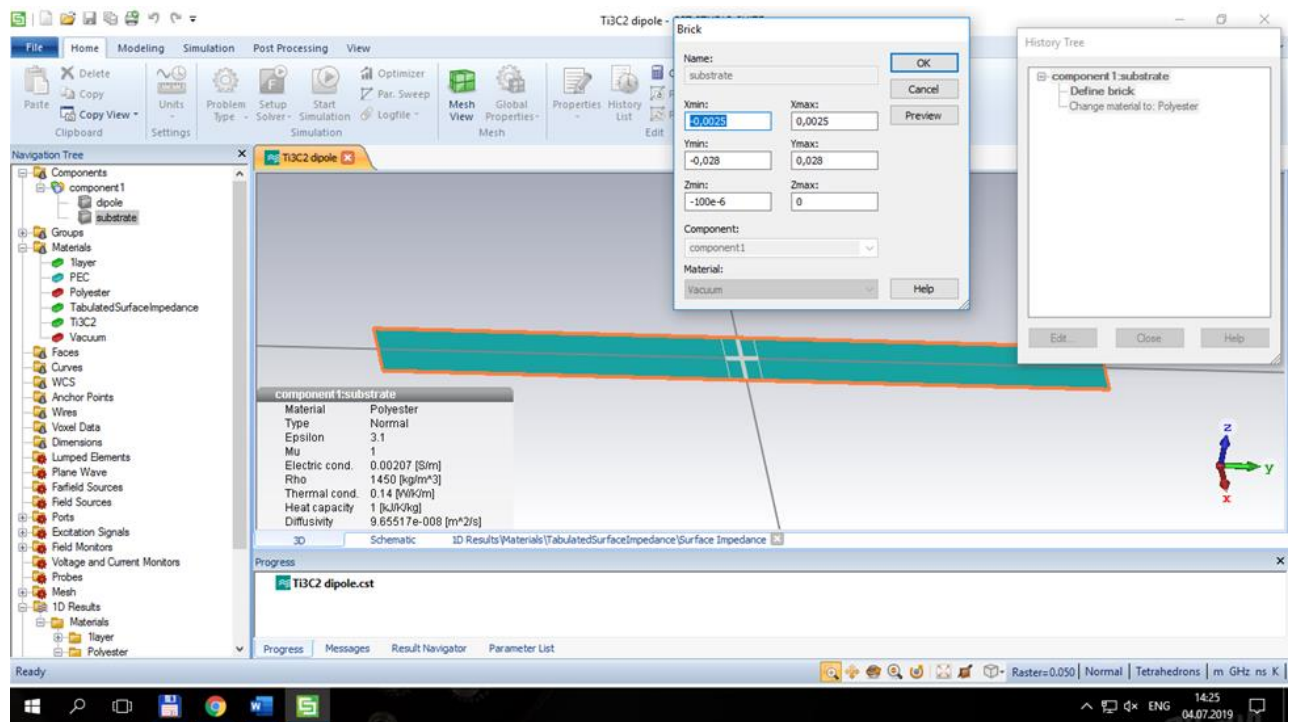
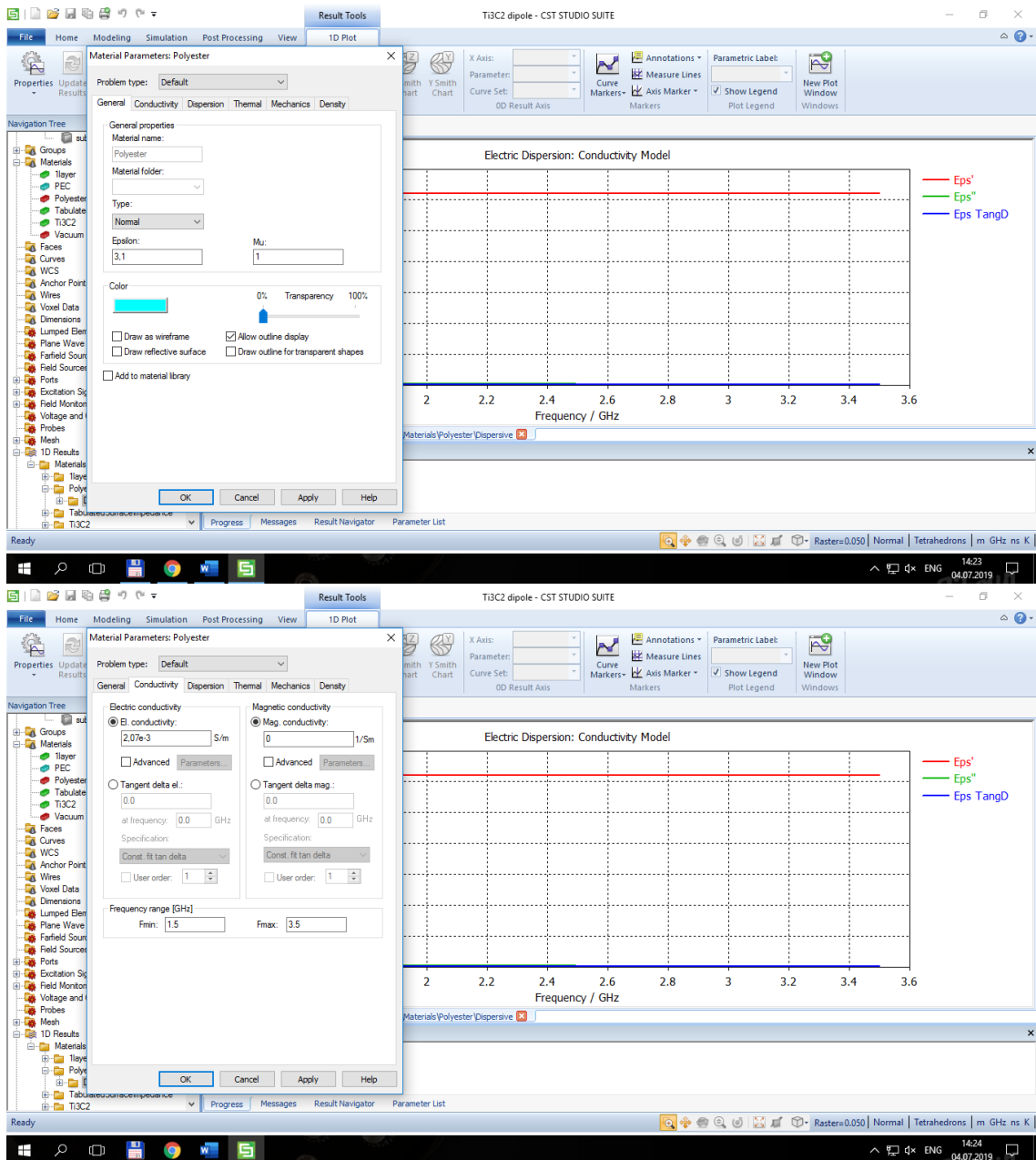


## The dimensions:





# PET substrate:



# The creating the surface impedance model of Ti3C2-layer:

The image shows the CST Studio Suite interface with the 'Tabulated Surface Impedance (Broadband)' dialog box open. The dialog box is divided into several sections: General Settings, Special Settings, Outer Layer(s), Inner Layer, and Cross Section.

**General Settings:**

- Material folder: [Empty]
- Material name: TabulatedSurfaceImpedance
- Number of frequency samples: 21
- Error limit for data fit: 0.03

**Special Settings:**

- Configuration: One layer
- Surface roughness model: Hammerstad-Jensen
- Enforce causality (experimental): ☐
- For DC resistance: Width-to-height ratio of total cross section: 10
- Coated side walls: ☐

**Outer Layer(s):**

- Thickness1 [m]: 0
- Conductivity1 [S/m]: 4.1e7
- Mu\_r1 (function of F): 1
- DeltaRMS1 [um]: 0
- Sphere radius [um]: 0.5
- Number of spheres: 70
- Hexagonal area [um^2]: 100

**Inner Layer:**

- Thickness2 [m]: 1.4e-6
- Conductivity2 [S/m]: 1.4e5
- Mu\_r2 (Function of F): 1
- DeltaRMS2 [um]: 0
- Sphere radius [um]: 0.5
- Number of spheres: 70
- Hexagonal area [um^2]: 100

**Cross Section:**

Diagram showing a cross-section of the material with parameters  $\kappa_1$ ,  $\mu_{r1}$ , and  $\Delta_1$ . The diagram is labeled 'thickness 2'.

**Legend:**

- $\kappa_1$ : conductivity
- $\mu_{r1}$ : relative permeability
- $\Delta_1$ : RMS of surface roughness

**Result Tools:**

The Result Tools window shows the 'Tabulated Surface Impedance' dialog box. The 'Surface impedance' section is active, showing the fitting scheme as 'nth order' and the error limit as 0.03. The 'Used order' is 0. The 'Error' is 1.356e-008. The 'Details...' button is visible.

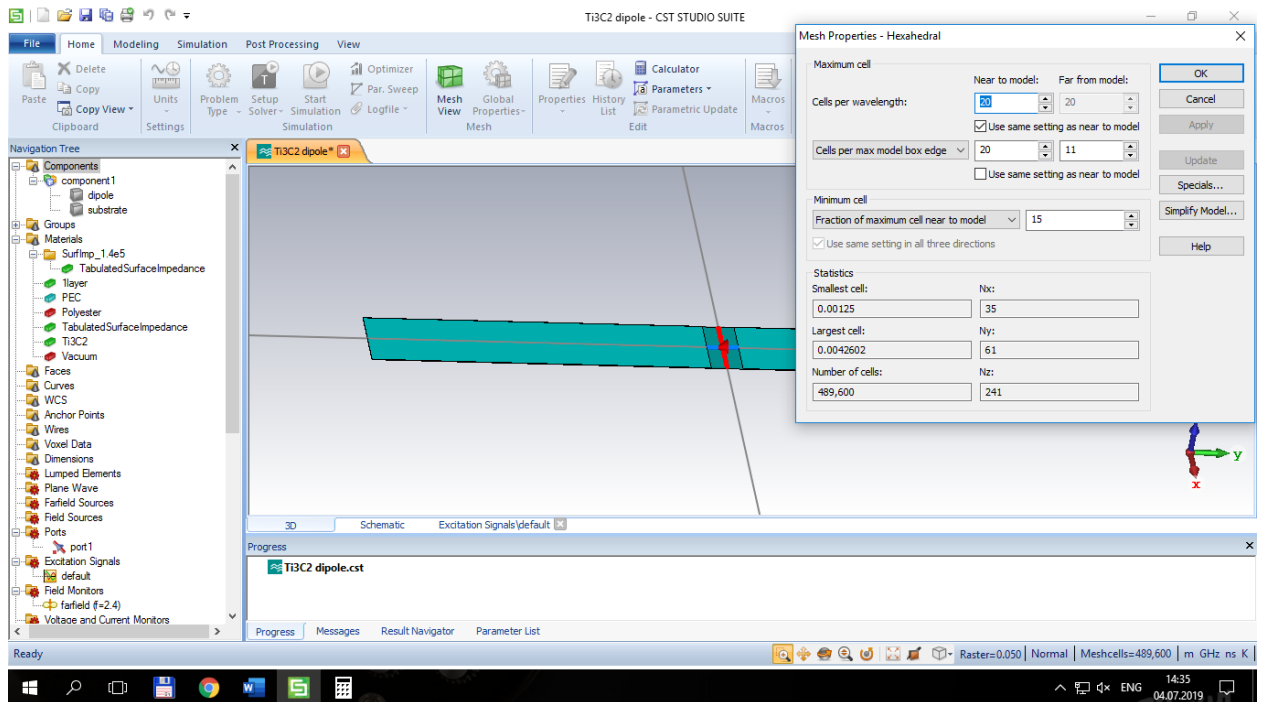
**Table of Surface Impedance Data:**

Freq. [GHz]	Resistance [Ohm/sq]	Reactance [Ohm/sq]	Weight
1.5	11.22448999083772	2.51226293127438E-03	1
1.6	11.2244899238715	2.6797471256268E-03	1
1.7	11.2244899403655	2.84723131979625E-03	1
1.8	11.2244899578591	3.01471551373034E-03	1
1.9	11.2244899763523	3.1821997074255E-03	1
2	11.2244899958452	3.34968390089418E-03	1
2.1	11.2244900163377	3.51716809410707E-03	1
2.2	11.2244900378298	3.68465228704906E-03	1
2.3	11.2244900603216	3.85213647970684E-03	1
2.4	11.224490083813	4.0196206720724E-03	1
2.5	11.224490108304	4.1871048641422E-03	1
2.6	11.2244901337947	4.35458905586827E-03	1
2.7	11.224490160285	4.52207324727905E-03	1
2.8	11.2244901877749	4.68955743833543E-03	1
2.9	11.2244902162645	4.85704162905076E-03	1
3	11.2244902457537	5.02452581939128E-03	1
3.1	11.2244902762425	5.1920100933922E-03	1

**Plot:**

The plot shows the surface impedance (Z') and reactance (Z'') versus frequency. The legend indicates: Z' (Data list) in red, Z' (Fit) in green, Z'' (Data list) in blue, and Z'' (Fit) in orange. The x-axis ranges from 3.2 to 3.6 GHz.

# The mesh:



## The results:

