



瞬態熱響應  
EX2.標準LED散熱分析  
(擬自然對流分析)

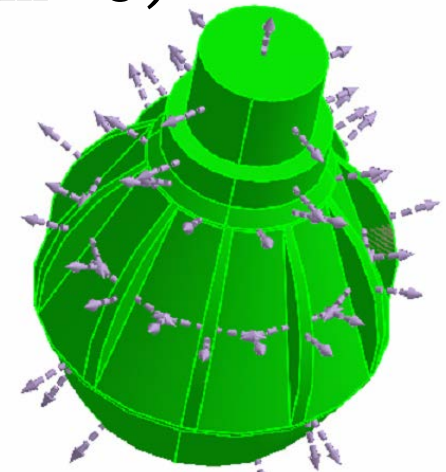
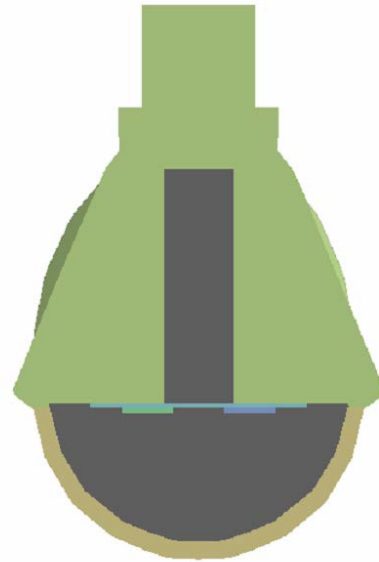
Simple, but Everything.

---

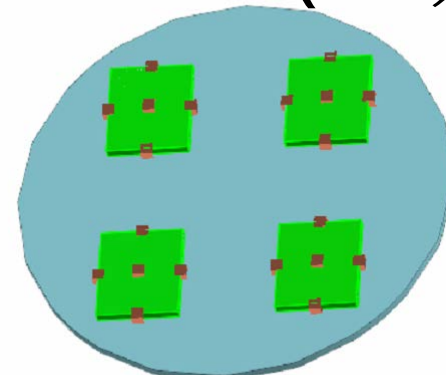
環境溫度: 26 °C  
 空氣熱對流係數:  $5 \times 10^{-5}$  (W/mm<sup>2</sup> °C)



瞬態-熱



熱對流  
(LED外表面)



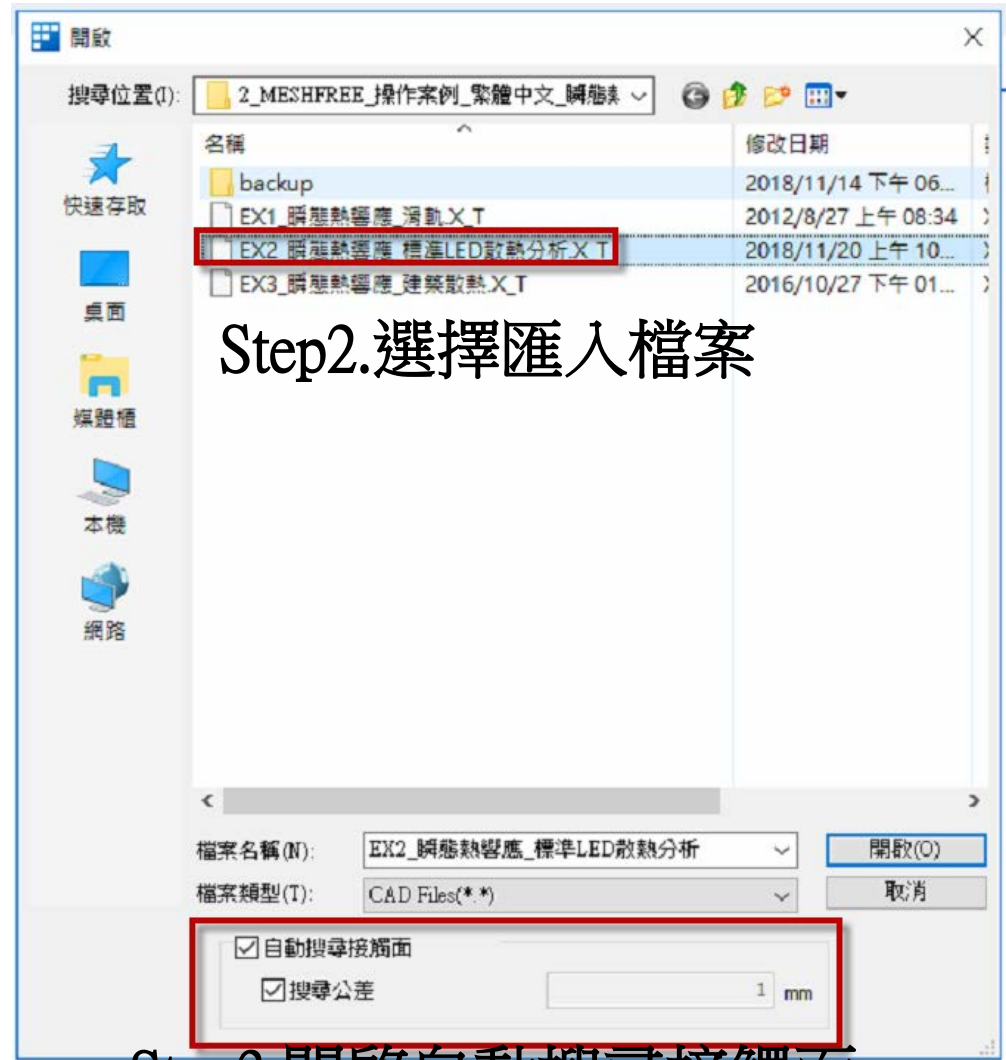
Chip發熱10 Watt  
(散熱分析取60%效率)



## Step1.匯入3D 模型

## MeshFree支援各類CAD 格式

Parasolid (9 - 29) Files (\*.x\_t;\*.xmt\_txt;\*.x\_b;\*.xmt\_bin)  
 ACIS (R1 - 2017 1.0) Files (\*.sat;\*.sab;\*.asat;\*.asab)  
 STEP (AP203, AP214, AP242) Files (\*.stp;\*.step)  
 IGES (Up to 5.3) Files (\*.igs;\*.iges)  
 Pro-E (16 - Creo 3.0) Files (\*.prt;\*.prt.\*;\*.asm;\*.asm.\*)  
 CATIA V4 (CATIA 4.1.9 - 4.2.4) Files (\*.model;\*.exp;\*.session)  
 CATIA V5 (V5R8 - V5-6R2016) Files (\*.CATPart;\*.CATProduct)  
 Solid Works (98 - 2017) Files (\*.sldprt;\*.sldasm)  
 Unigraphics (11 - NX11) Files (\*.prt)  
 Inventor Part (V6 - V2017) Files (\*.ipt)  
 Inventor Assembly (V11 - V2017) Files (\*.iam)  
 Solid Edge (V18 - ST9) Files (\*.par;\*.asm;\*.psm)

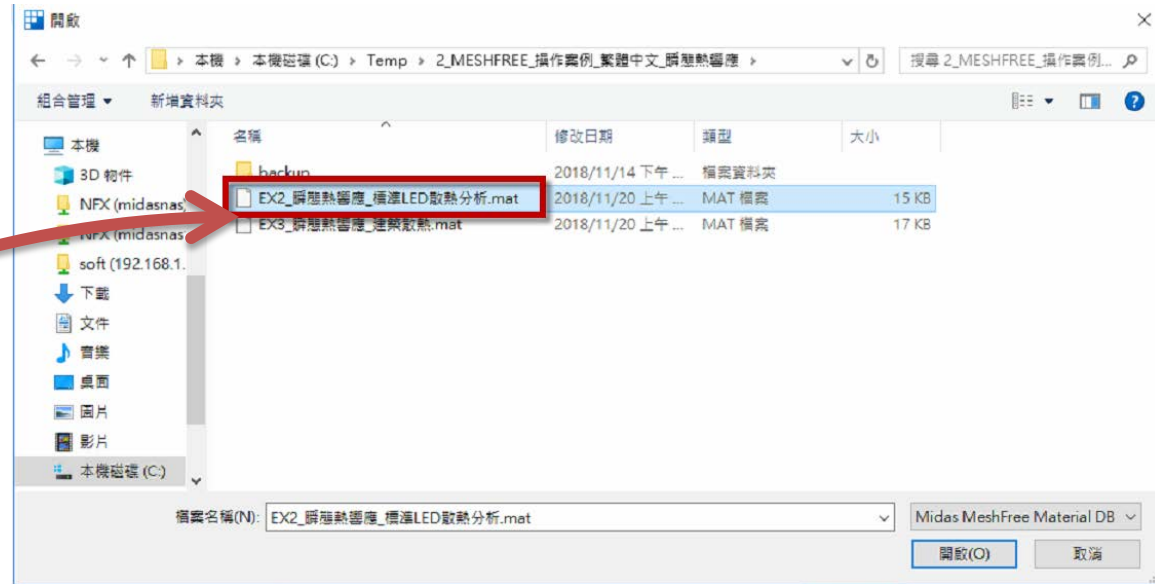
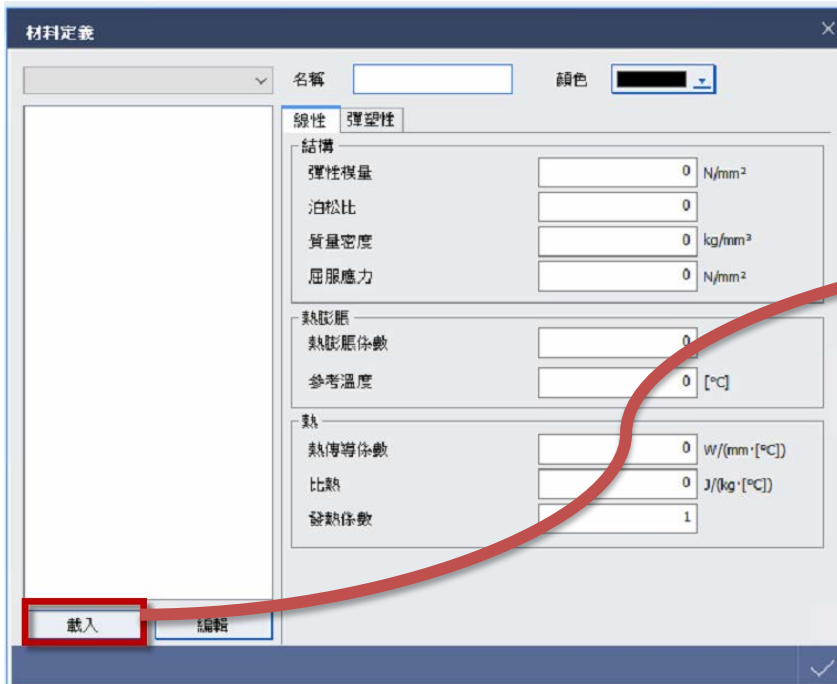


## Step2.選擇匯入檔案

## Step3.開啓自動搜尋接觸面

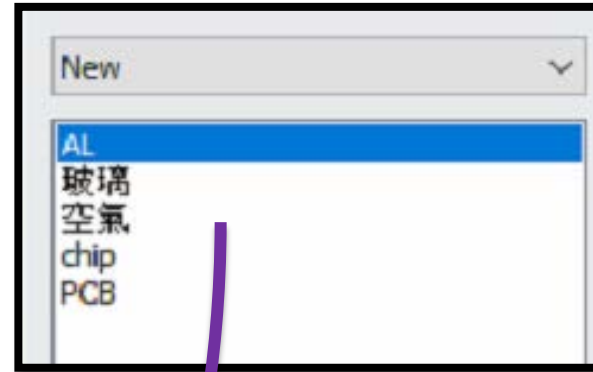


## 選擇匯入材料檔 EX2\_瞬態熱響應\_標準LED散熱分析.mat





下拉選項-NEW

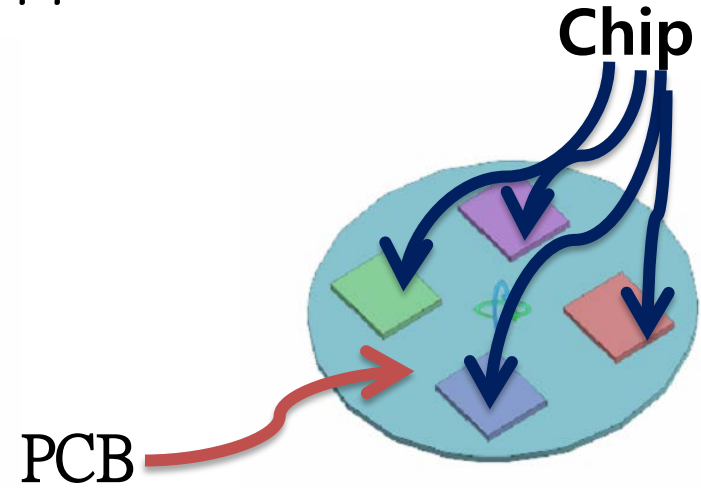
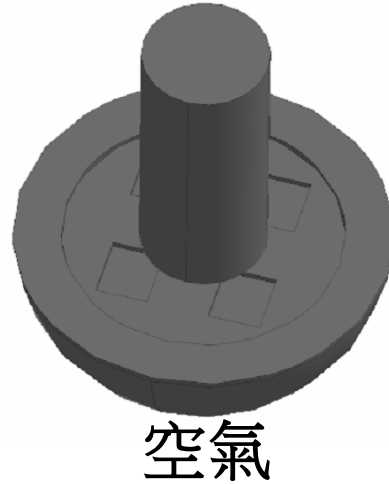


分別新增到材料模型樹





## 依照圖示分別指定材料



| 模型                                  |            | 材料   | 顏色 |
|-------------------------------------|------------|------|----|
| 模型設置                                |            |      |    |
| 幾何 (9)                              |            |      |    |
| <input type="checkbox"/>            | Body(3)    | 空氣   |    |
| <input type="checkbox"/>            | Body(2)    | 空氣   |    |
| <input type="checkbox"/>            | Lamp_Cover | 玻璃   |    |
| <input checked="" type="checkbox"/> | PCB        | PCB  |    |
| <input checked="" type="checkbox"/> | CHIP4      | chip |    |
| <input checked="" type="checkbox"/> | CHIP3      | chip |    |
| <input checked="" type="checkbox"/> | CHIP2      | chip |    |
| <input checked="" type="checkbox"/> | CHIP1      | chip |    |
| <input type="checkbox"/>            | Lamp       | AL   |    |



模型樹會顯示指定的材料



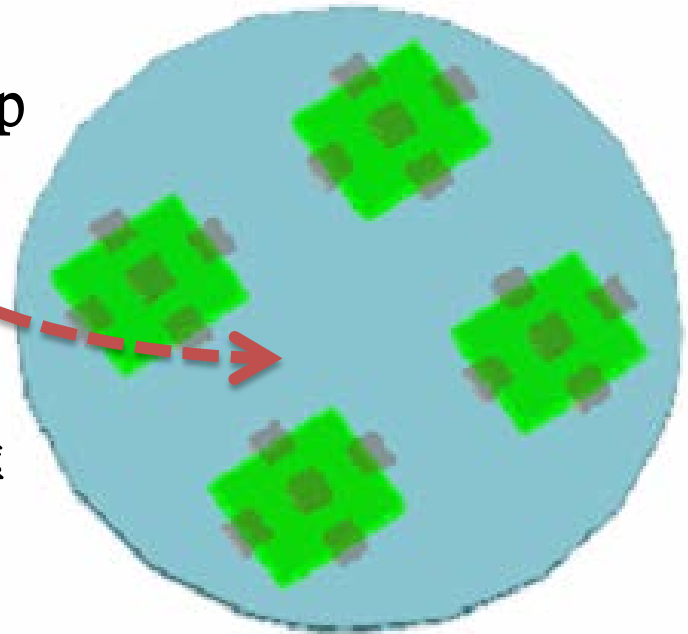
載荷

註:熱源 = 發熱熱量/體積 = 10Watt/Chip體積



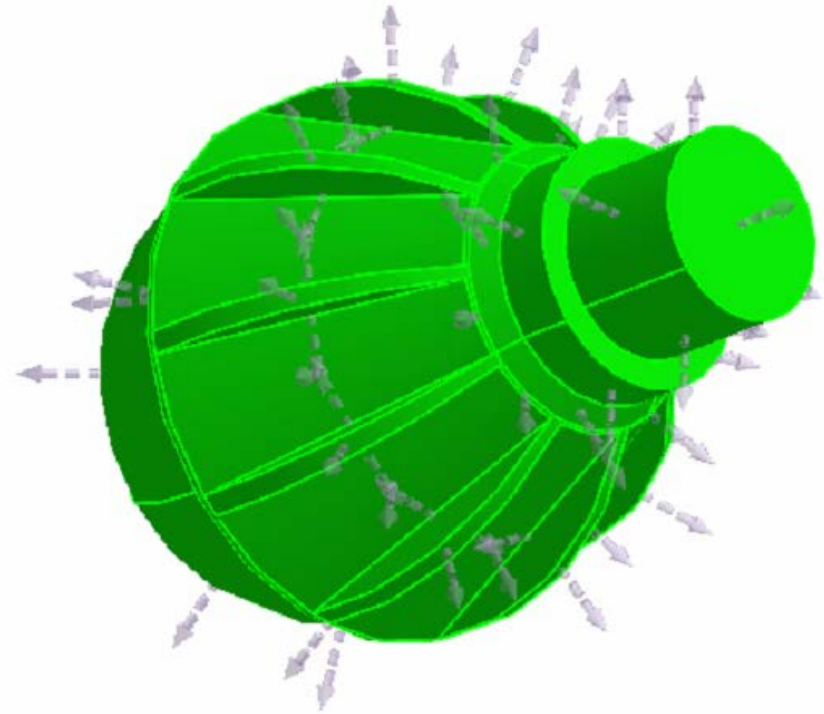
框選Chip

散熱分析取60%效率





環境溫度: 26 °C  
 空氣熱對流係數:  $5 \times 10^{-5}$  (W/mm<sup>2</sup> °C)



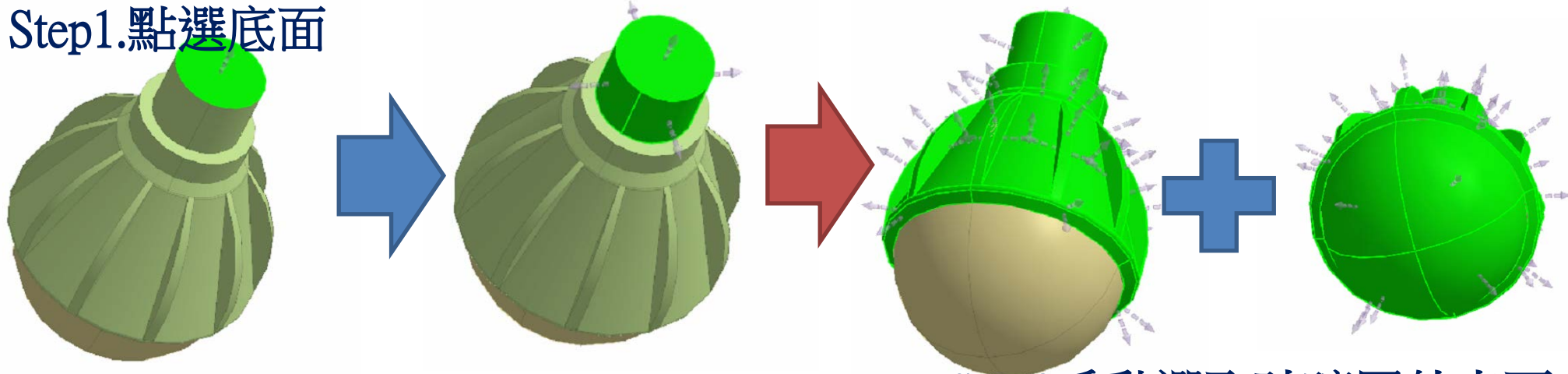
補充: 特徵選取方式參考下頁





Step2自動搜尋相鄰面(連續點選)

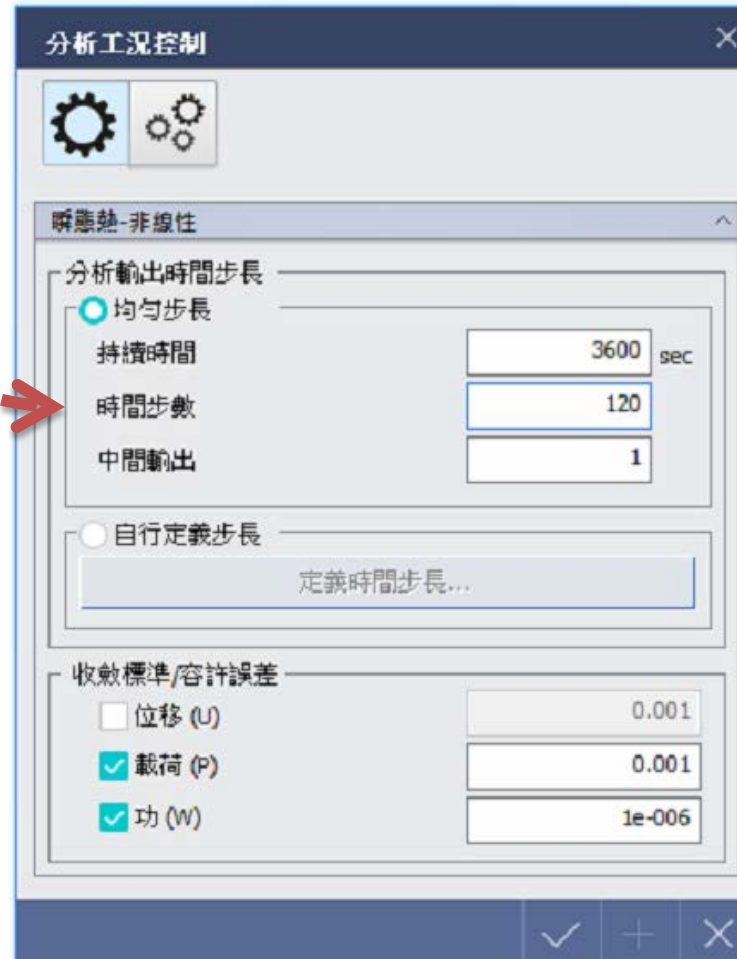
Step1.點選底面

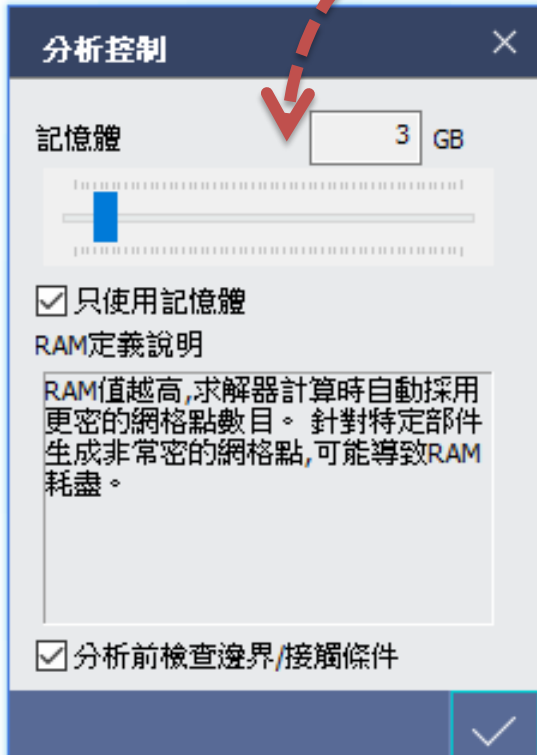


Step3手動選取玻璃罩外表面



1. 計算1小時(3600sec)
2. 等分成120次計算(每30 sec計算一次)





記憶體大小  
1.計算速度  
2.分析準確性

# 匯出計算資訊

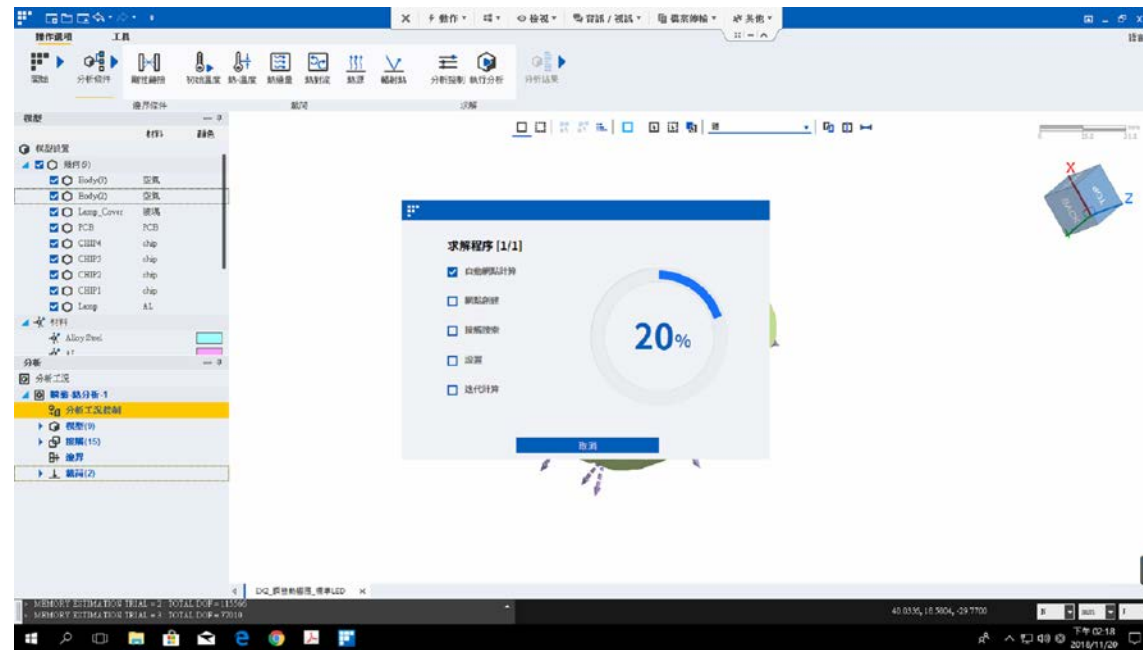
Export Mec File

49%

匯出幾何數據...

取消

# 進行求解



The screenshot displays the MIDAS MeshFree software interface. On the left, a tree view shows the model setup with components like Body(3), Lamp\_Cover, PCB, and various CHIPs. The main workspace shows a 3D model of a device with a blue circular progress indicator indicating 80% completion of the solution process. A pop-up window titled '求解程序 [1/1]' (Solution Program [1/1]) lists the following steps: 自動網點計算 (Automatic Meshing), 網點創建 (Mesh Creation), 接觸搜索 (Contact Search), 設置 (Settings), and 迭代計算 (Iterative Calculation). To the right, a graph titled 'Maximum Temperature vs. Global Time' shows the temperature rising from approximately -500 to 1500 over a time period of 0 to 3000. The bottom status bar shows the current coordinates (40.0336, 10.5804, -29.7700) and the date/time (2018/11/20, 下午 02:19).





分析結果

分析結果數值查詢

結果座標: 44.5519, 13.8673, 59.184

| 顯示                                  | 位置                | 值            |
|-------------------------------------|-------------------|--------------|
| <input checked="" type="checkbox"/> | 8.25, 9.36, -0.94 | 4.86932e+001 |
| <input checked="" type="checkbox"/> | 11, -14.8, -0.94  | 4.80326e+001 |
| <input checked="" type="checkbox"/> | -10.2, -17, 46.6  | 3.19001e+001 |

分析步

多分析步結果表

多分析步結果圖

分析步: 結果

- Transient Heat Transfer : INCR=0 (TIME=0.000e+000)
- Transient Heat Transfer : INCR=1 (TIME=3.000e+001)
- Transient Heat Transfer : INCR=2 (TIME=6.000e+001)
- Transient Heat Transfer : INCR=3 (TIME=9.000e+001)
- Transient Heat Transfer : INCR=4 (TIME=1.200e+002)
- Transient Heat Transfer : INCR=5 (TIME=1.500e+002)
- Transient Heat Transfer : INCR=6 (TIME=1.800e+002)
- Transient Heat Transfer : INCR=7 (TIME=2.100e+002)

