

Model: S0126 housing
from datasheet of Philips Transistor BD135/BD137/BD139 <http://www.kitsandparts.com/BD139-16.pdf> ,
page 5.

Zoom in and out: use mouse wheel without clicking on the mouse wheel.
If you click the mouse wheel, you will be able to turn the objekt.
Clicking the left mouse button will lock your position again.

If you click into the plain surface with your right mouse button, will give you a possibility to choose some basic geometrical models.

Choose a cube.

If you had choosen a basic geometrical model now, you can choose it for work at the "Geometrie Graph" window for "duplicate, Delete, Rename".

At the right side of the line, you can show or hide this model.

At the left side of the line, you can mark this objekt red.

Mark your Objekt red there.

If there is no "Geometrie Graph" window, you can get one by choosing "Window" from the upper scroll down menue, and then choose "Geometrie Graph".

If you click into the plain surface with your right mouse button, will give you a possibility to choose some manipulation methods.

From the manipulation list, choose "Scale Uniform"(works with all axis the same). Now you can scale the cube by using the mouse wheel.

Remark: You will have a possibility to choose some basic geometrical models again by clicking the right mouse button, if no object is marked at the "Geometrie Graph" window.

But vor precise scaling, hit <tab>. Now you will have a possibility for a direct numeric input, which is more precise. Engeneers like this method, but artists hate them.

Choose 50%. We want a "unit cube". The created one is one unit in all axis, so its edge length is two, but we want a edge length of one.

Once again, a click to the right mouse button shows us the manipulation box. Choose Vertex Colour. Then choose coulour (here blue).

From the Outliner Window choose "Default", click right, then "Edit Material" There you can choose colour and material properties.

(Ambient, Specular, Emission.)

Click left into the colourfield beside the bar.

Now set Opacity to 1.

Now choose the desired surfaces from the "Geometrie Graph" window of your objekt body. They have to light red.

From the upper tool-bar you can choose, wether you want to choose points, edges, daces ore hole bodys.

At the "outliner" window click right and then choose "Assign to Selection"

About axis orientation:

+Z is up, -Z down right into the board.

+X pints to the right and +Y straight forward, if you look onto the text at a transistor body.

Now we have a black/blue uniti cube.

From the datasheet we read, the the body of our transistor is mostli a cuboid, with a height of 10,5-11,1mm, 7,2-7,8mm wide and a thickness of 2,3-2,7mm.

For getting conservative results from the tolerances, we choose here the bigger values.

Therefor we have to change our unit cube to 1110% at height (Z-Axis), broad 780% (X-axis) and 270% (y-axis) at thickness.

Once again, we choose the hole cube at the Geometrie Graph window.

Then a right click for the manipulation box.

Now choose "Scale Axis" and then the x-axis. Theoretical you could scale now free by using the mouse wheel, but for being precise, we hit <tab> and get a box for direct numeric input. insert 1110% to get 11,1mm.

Also do this with the y-axis (270%) and the x-axis (780%).

About creating a mounting hole of the transistor body.

For this, we choose the edges from the tool-bar above. Then mark all four long edges of the body. You have to turn the body for this.

Edges, who can get marked, light up green, if you got near to them, marked edges are red, and edges, who can get unmarked, will light orange, if you get near to them.

To lighten your work, you can switch to a wire frame sight. At the Geometrie Graph windows, choose the wire frame cube at the right side.

Now again right clicking into the main window comes to the manipulation box. For the choosen edges we use "cut" and at a follow menu "two2 for two equal parts. The choosen edges are cutted into halves now. The marking method has changed from edges to vertex/points, and the new created vertexes at the cutpoints are marked red allready, just as we like.

Therefore we can go direkt into the manipulatin box (by clicking right into the main window). Choose "connect". The vertexes will now connected by new edges.

Now choose this new edges at the front and backside of the body, and also the paralell edges at the upper end (+Z) of the cuboid.

again choose "cut" from the manipulation box, but then "three" for cutting into three equal pieces. From the manipulation box choose again "connect".

The width of this new stripe will give us the diameter (worst case 3mm) for the mounting hole at the body. Therefore we have to bring it to 3 units.

First you disarm all vertexes, and then again mark a single vertex of this stripe.

At the mainwindow at the upper left corner you can see the coordintes of this vertex: 1,3 (X), -1,35 (y) and 0,0 (Z).

For symmetrical reasons the 0,0 of the z-axis are ok, and all other values, too. For symmetrical reasons the opposite Vertex will also be 1,3 units away to the opposite side of the origin. This will lead to a total width of 2,6. But we will need 3. Therefore the vertex has to be moved 0,2 units to +x, and the opposite vertex 0,2 units to the -x direction.

But we will not move only the vertexes, but the hole edges.

so we unmark the vertexes and mark the both edges, who should be moved to the +X axis direction.

We klick right into the main window to get the manipulation box. There we choose "move" and then "x" for moving in x-axis direction.

for a precise movement, we press the <tab> button. Into the box, we write 0.2 (zero-point-two). Use point, NOT comma. If we use a comma, the program will behave strange.

We do the same for the opposite two edges, but with -0.2 (Minus-zero-point-two), for negative x direction.

The reason is, to get the outer quadrath for the circle of the hole. So we have to add interconnections to the edges of the stripe.

We do this bei first cut them into three equal pieces. So we choose again "cut" and "3" vor all four edges. following again "connect".

The middle of the hole at the transistorbody should be 3,6-3,9 units away from the upper edge. With a desired diameter of 3 units the upper point of the hole should be 2,25 units, and the lower point of the hole should be 5,25 units away from the upper edge of the transistor body. In this way, we have to move the edges.

By marking some single vertexes, we can get al positions. z: 5,55 units for the upper edge of the transistor body, 3,7 units for upper limit of the hole, and 1,85 units for lower limit of the hole. No we do some additions and subtractions. at last, we have to move the upper limit of the hole 0,4 units to negative z-axis, and the lower limit of the hole 1,55 units to negative z-axis.

After doing this, we check the actual position by marking the vertexes. We get 3,3 and 0,3 units at z-axis. The difference is 3, just wat we want.

Now we first unmark all vertexes and edges, and choose faces from the upper Toolbar. With this, we now mark the both outer quadraths at the front- and backside of the transistor body. With a right mouse klick, we get our manipulation box, where we choose "smooth". The outer quadraths now have becom polygons. We use "smooth" again, for getting a better circle shaped face. We let this two faces marked. At the manipulation box we now choose "intrude", and can get a hole by moving the mouse. There will stay some odd things and strange artefacts, we will not bother, because they vanish inside the body. At last, we unmark all marks and the wire frame, and look at the transistor body.

This transistorbody is now ready at his shape, but he has to be aligned in z and Y axis direction. From the datashed we can read (with outbalancing the tolerances), that the zero position is shifted by 0,375 units to negative y-axis direction against the zero position of the footprint.

for z-axis, we will work with the really free hypothesis, that the underside of the transistorbody will be about 5,55 units (just half the body height) above the footprint zero origin.. Therevore our body has to be moved 11,1 units to positive z direction.

This move we will do again with the "move" manipulation method.

Now we unmark all, and click with the right mouse button into the mainwindow to get the menue for the basic models. again we choose a cube.

This cube will be shown at the geometrie graph window. There we click it with the right mouse button, and rename it "Pin2". Then we mark the whole pin, choose "scale uniform2 at the manipulation menu, hit <tab> and insert 50%, and than we hit enter. So we we got "Pin2" as an uniti cube with a edge length of one.

We mark the whole surface of the pin, and click into the mainwindow with the right mousebutton and get the manipulation menu. We choose vertex colour, than we choose the colour, here a light turquoise.

Than we go to the Outliner window and click "default" with the right mouse button. Than > Edit Material > Colour and properties (Ambient, Specular, Emission.) Now click left into the colourfield beside the bar. Set "Opacity" to 1. then mark "Pin2" at the geometrie graph window. Go to the outliner window. There click "default" with the right mouse button and then hit "Assign to Selection".

After smoothing out the tolerances, that the connection pins have a rectangular profile. 0,525 mm at y-axis direction and 0,765 mm at x-axis direction. The length of the pins is given to 15-16mm by the datasheet. But it will be usefull, to reduce the length to about 8mm.

Because we equal here wings3d units and mm, we will scale the x-axis direction to 800%, the y-axis to 52,5% and the z-axis to 76,5%.

This will be done with the scaling axis toll drom the manipulation box.

The lower side of the Transistor body is at z 5,55 units, but the upper side of Pin2 at z 4. Therefore we have to shift Pin2 1,55 units into positive z direction. Therefore choose Pin2 complete, choose the move toll, choose z, hit <tab>, insert 1.55 (one-point-five-five, NO COMMA) and than <enter>. Now the upside of the pin will fit the underside of the transistor body.

At the datasheet we can see, that are small lateral noses at the pin, which are not documeted with the exeption that they are 2,54mm at maximum beneath the underside of the transistor body. So create and place them by visual judgement.

So we choose the wire frame view for pin2, and mark all four long side edges. Then cutting them into three equal parts by using the cut tool. at once, interconnect the new vertexes with the connect tool. Now there are to new rings of edges around the pin. We move the upper pin toward the transistorbody, until it is 0,5 units apart from the body. Then we do the same with the lower ring, and move them upward to a distance two units beneath the transistor body.

Mark the surfaces of the so defined noses. From the manipulation box choose "Extrude", and than "normal" (which means orthogonal to the surface at this case). To extrude means here, to pull out the marked surfaces. We do this by hitting <tab>. Now we inert 0.5 (zero-point-five). Now we have the noses.

Up to now, we have only a transistor body with the middle pin 2. But we need pin 1 and 3 too. so we click at pin2 with the right mouse button at the geometrie graph. Then we choose duplicate. We do this twice. at the geomerie graph window we see now two copys of pin2. we rename them to "Pin1" and "Pin3" by clicking to them with the right mouse button at the geometrie graph window and choosing "rename".

This both two new pins yet invisible, because they are hidet complete inside Pin2. We have to shift them to there positions. from the Datasheet we got a lateral distance of the pins (middle to middle of 2,29mm. That is also the value in units, we have to shift the pins.

Pin1 with 2,29 units to negative x-axis direction, and Pin3 2,29 units to positive x-axis direction. Therefore mark the pins separatly one after another and shift them with the move toll from the manipulation box. Again we use <tab> and numerical insert method.