



UniKL
UNIVERSITI
KUALA LUMPUR

SAB35403

PCB DESIGN

LAB 4

Dual power supply

LECTURER: DR REZAL BIN MOHAMED

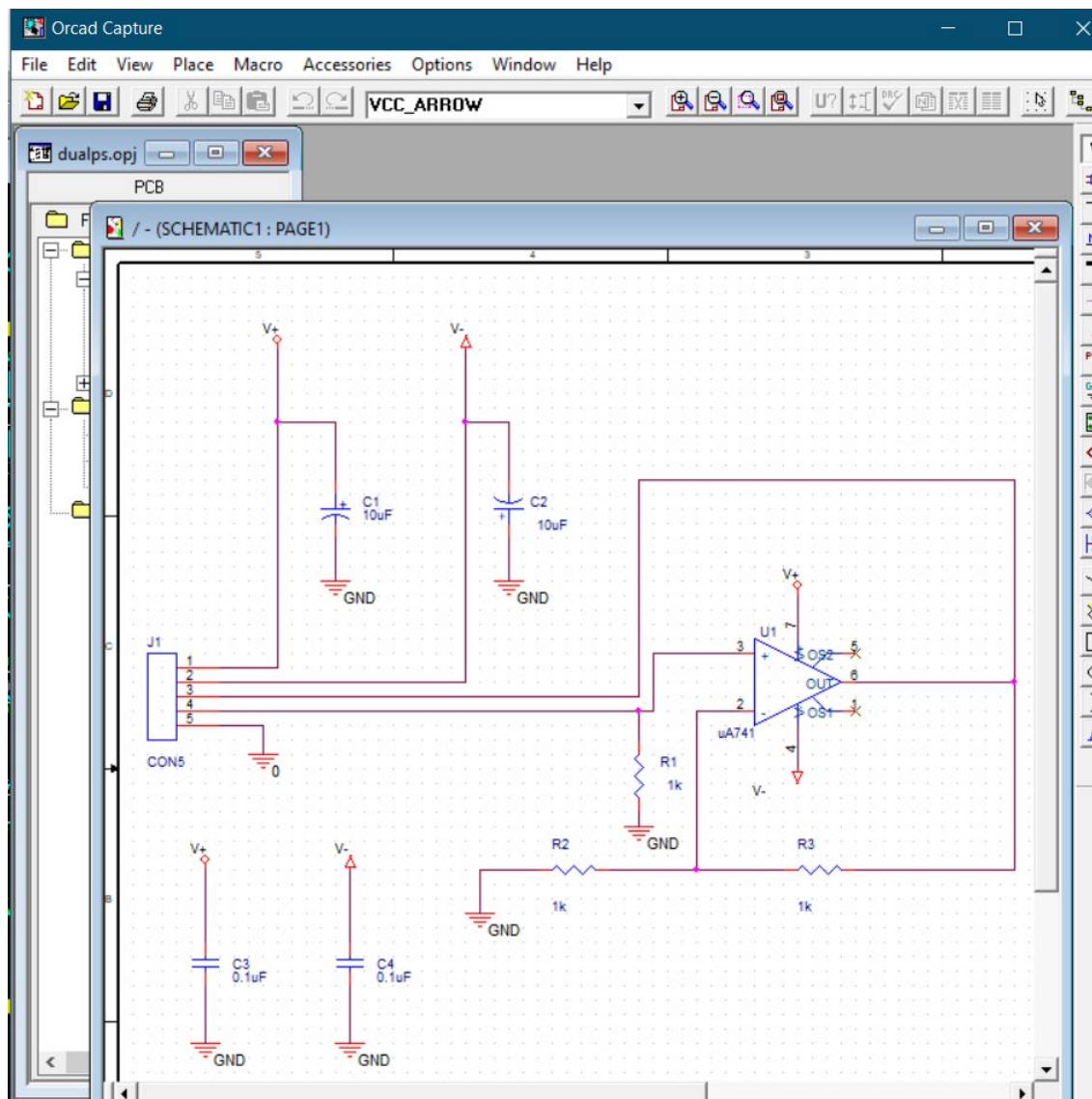
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Objectives

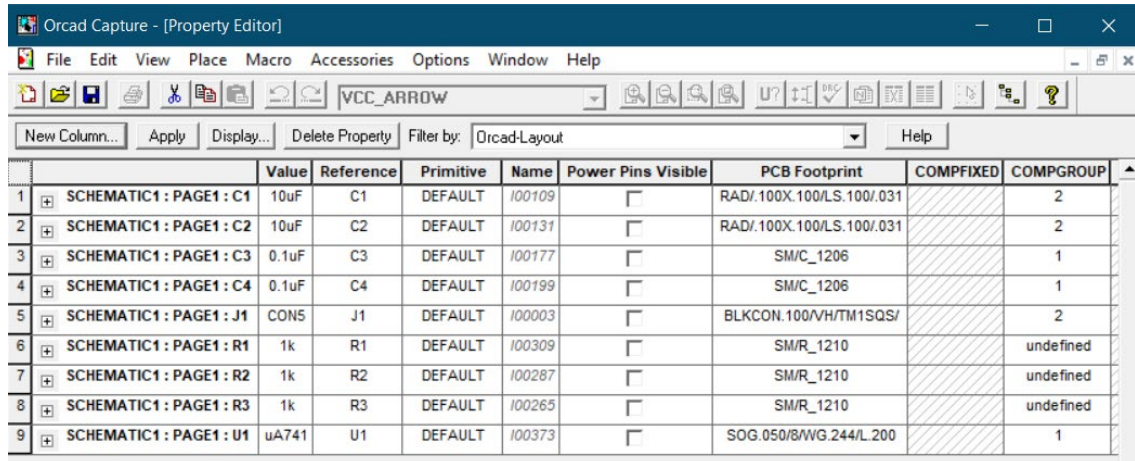
- To design and simulate dual power supply circuit in OrCAD, to represent the complete circuit design
- To Utilize OrCAD's schematic capture tools to represent the complete circuit design, including voltage regulators, filtering components, and feedback mechanisms.
- To Utilize OrCAD's layout tools to represent the footprint, padstack used in pcb board.
- To practically make step-by-step design process, including schematic diagrams, component values, and simulation results.

Simulation result:

1. Schematic circuit



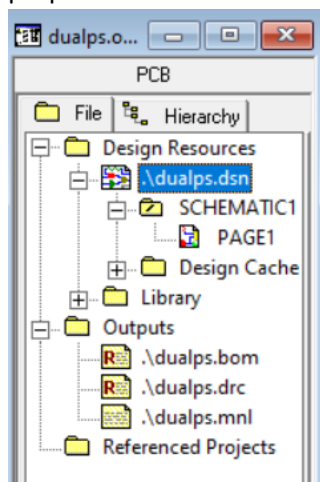
2. Component used and its attributes.



The screenshot shows the 'Orcad Capture - [Property Editor]' window. The title bar includes standard window controls and the text 'Orcad Capture - [Property Editor]'. The menu bar contains 'File', 'Edit', 'View', 'Place', 'Macro', 'Accessories', 'Options', 'Window', and 'Help'. Below the menu bar is a toolbar with various icons. A search bar contains the text 'VCC_ARROW'. Below the toolbar are buttons for 'New Column...', 'Apply', 'Display...', 'Delete Property', and a 'Filter by:' dropdown set to 'Orcad-Layout', followed by a 'Help' button. The main area is a table with the following columns: an index column, a description column, 'Value', 'Reference', 'Primitive', 'Name', 'Power Pins Visible', 'PCB Footprint', 'COMPFIXED', and 'COMPGROUP'.

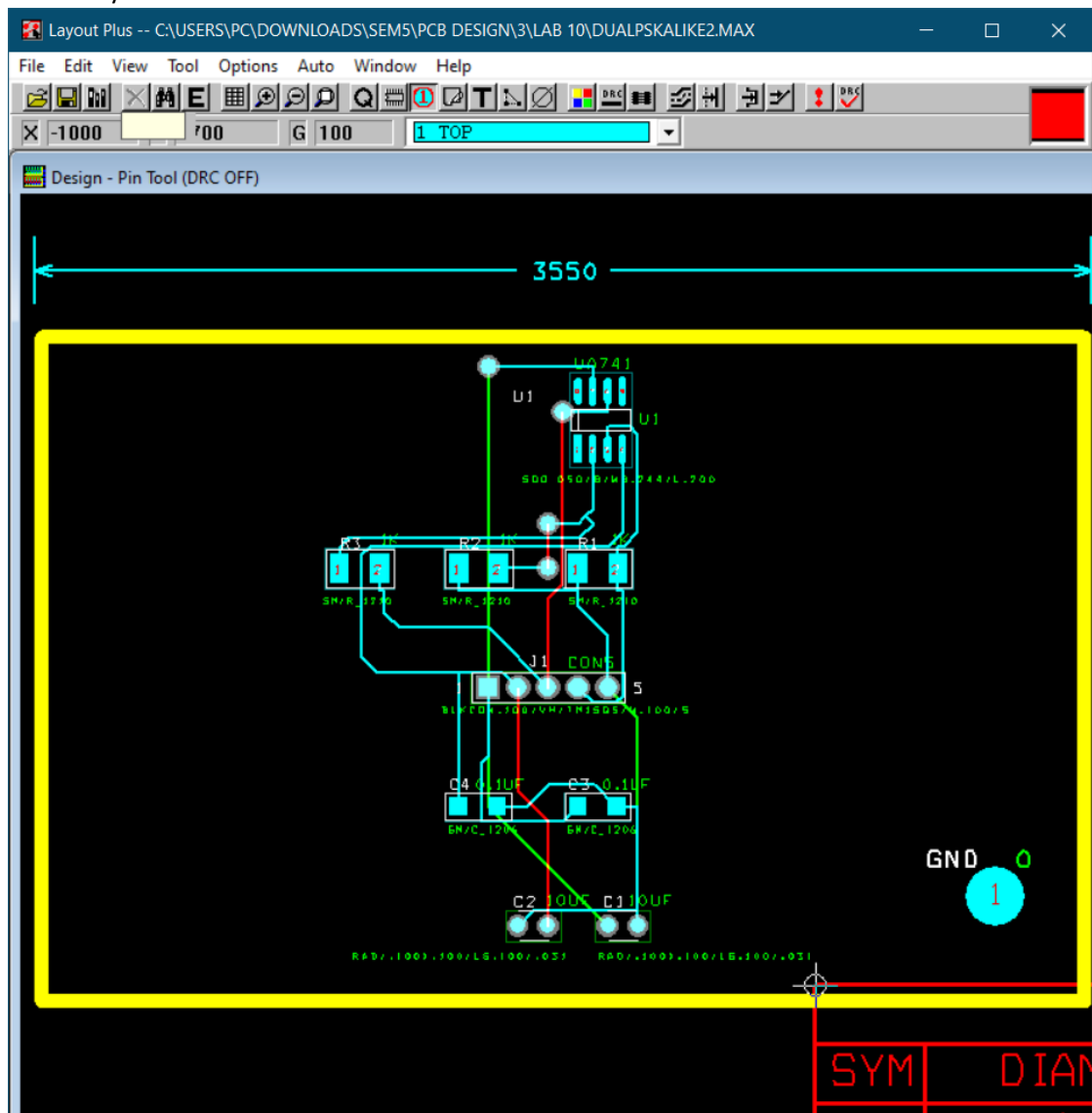
		Value	Reference	Primitive	Name	Power Pins Visible	PCB Footprint	COMPFIXED	COMPGROUP
1	SCHEMATIC1 : PAGE1 : C1	10uF	C1	DEFAULT	/00109	<input type="checkbox"/>	RAD/.100X.100/LS.100/.031		2
2	SCHEMATIC1 : PAGE1 : C2	10uF	C2	DEFAULT	/00131	<input type="checkbox"/>	RAD/.100X.100/LS.100/.031		2
3	SCHEMATIC1 : PAGE1 : C3	0.1uF	C3	DEFAULT	/00177	<input type="checkbox"/>	SM/C_1206		1
4	SCHEMATIC1 : PAGE1 : C4	0.1uF	C4	DEFAULT	/00199	<input type="checkbox"/>	SM/C_1206		1
5	SCHEMATIC1 : PAGE1 : J1	CON5	J1	DEFAULT	/00003	<input type="checkbox"/>	BLKCON.100/VH/TM1SQS/		2
6	SCHEMATIC1 : PAGE1 : R1	1k	R1	DEFAULT	/00309	<input type="checkbox"/>	SM/R_1210		undefined
7	SCHEMATIC1 : PAGE1 : R2	1k	R2	DEFAULT	/00287	<input type="checkbox"/>	SM/R_1210		undefined
8	SCHEMATIC1 : PAGE1 : R3	1k	R3	DEFAULT	/00265	<input type="checkbox"/>	SM/R_1210		undefined
9	SCHEMATIC1 : PAGE1 : U1	uA741	U1	DEFAULT	/00373	<input type="checkbox"/>	SOG.050/8/WG.244/L.200		1

3. Create bill of material, design rule check,MNL AND MAX file and update the component properties.



Layout

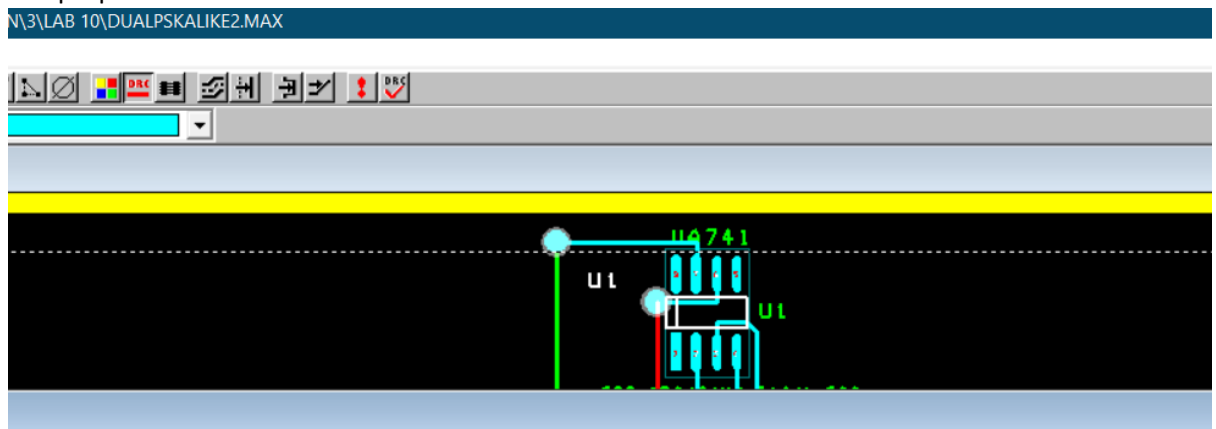
1. Circuit layout



2. Padstack properties viewed from spreadsheet.

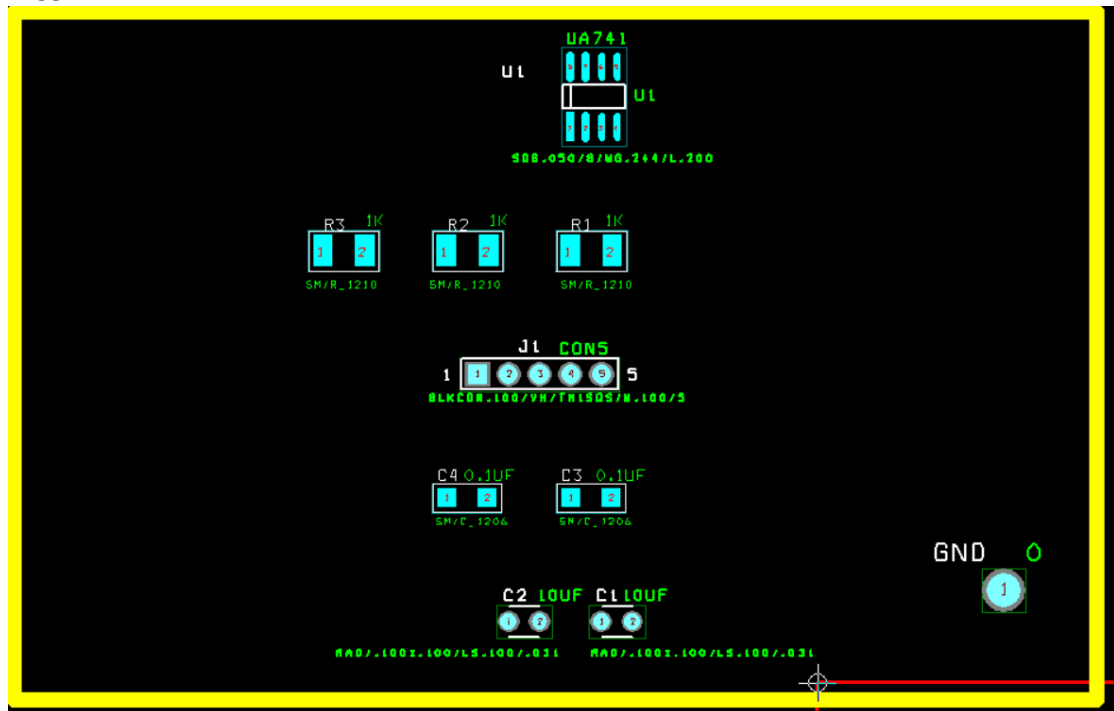
Padstack or Layer Name	Pad Shape	Pad Width	Pad Height	X Offset	Y Offset
VIA1					
TOP	Round	58	58	0	0
BOTTOM	Round	58	58	0	0
GND	Round	78	78	0	0
POWER	Round	78	78	0	0
INNER1	Round	58	58	0	0
INNER2	Round	58	58	0	0
INNER3	Round	58	58	0	0
INNER4	Round	58	58	0	0
INNER5	Round	58	58	0	0
INNER6	Round	58	58	0	0
INNER7	Round	58	58	0	0
INNER8	Round	58	58	0	0
INNER9	Round	58	58	0	0
INNER10	Round	58	58	0	0
INNER11	Round	58	58	0	0
INNER12	Round	58	58	0	0
SMTOP	Round	58	58	0	0
SMBOT	Round	58	58	0	0
SPTOP	Undefined	0	0	0	0
SPBOT	Undefined	0	0	0	0

3. Net properties

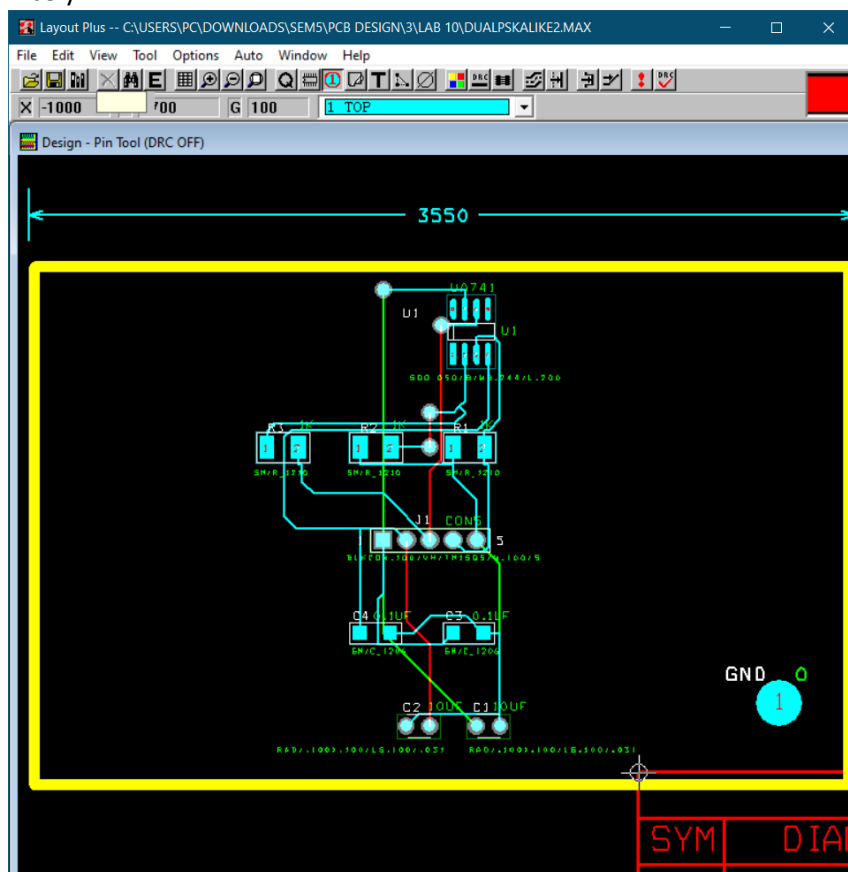


Net Name	Color	Width	Min	Con	Max	Routing Enabled	Share	Weight	Reconn Rule
GND	Yellow	12				No*	Yes	50	Std
N00621	Yellow	12				No	Yes	50	Std
N00726	Yellow	12				No	Yes	50	Std
N00836	Yellow	12				No	Yes	50	Std
V+	Yellow	12				Yes	Yes	50	Std
V-	Yellow	12				Yes	Yes	50	Std

4. Toggle Reconnect mode



5. Click auto from menu > autoroute > board. It will help to autoroute the wire from the board nicely.



6. The footprint can be adjusted if the layout did not simulate the right component.

Reference Designator: C3

Package: CAP_NP

Value: 0.1UF

Footprint...: SM/C_1206

Location

X: -800. Y: 600. Rotation: 0

Group #: 1 Cluster ID: -

Component flags

☐ Fixed ☐ Locked ☐ Key

☐ Non-Electric ☒ Route Enabled ☐ Do Not Rename

OK Help Cancel

Conclusion

In conclusion, the objectives set forth for the design and simulation of a dual power supply circuit using OrCAD software have been successfully achieved. Through a systematic and comprehensive approach, each objective has contributed to the overall understanding of the design process and the capabilities of OrCAD in creating sophisticated electronic circuits.

this lab report successfully achieved its objectives, offering a comprehensive exploration of the dual power supply design process using OrCAD software. The integration of **schematic capture, layout, and simulation tools** showcases the versatility of OrCAD in guiding engineers through the entire design workflow. The acquired insights and documented design process contribute to the broader understanding of electronic circuit design and emphasize the proficiency gained in utilizing OrCAD for practical applications in the field of electrical engineering.