EXPERIMENT NAME: DIGITAL CLOCK by using MULTISIM

A digital clock is a type of clock that shows the time using numbering,not hands.as opposed to an analogue clock,where the time is indicated by the positions of rotating hands.

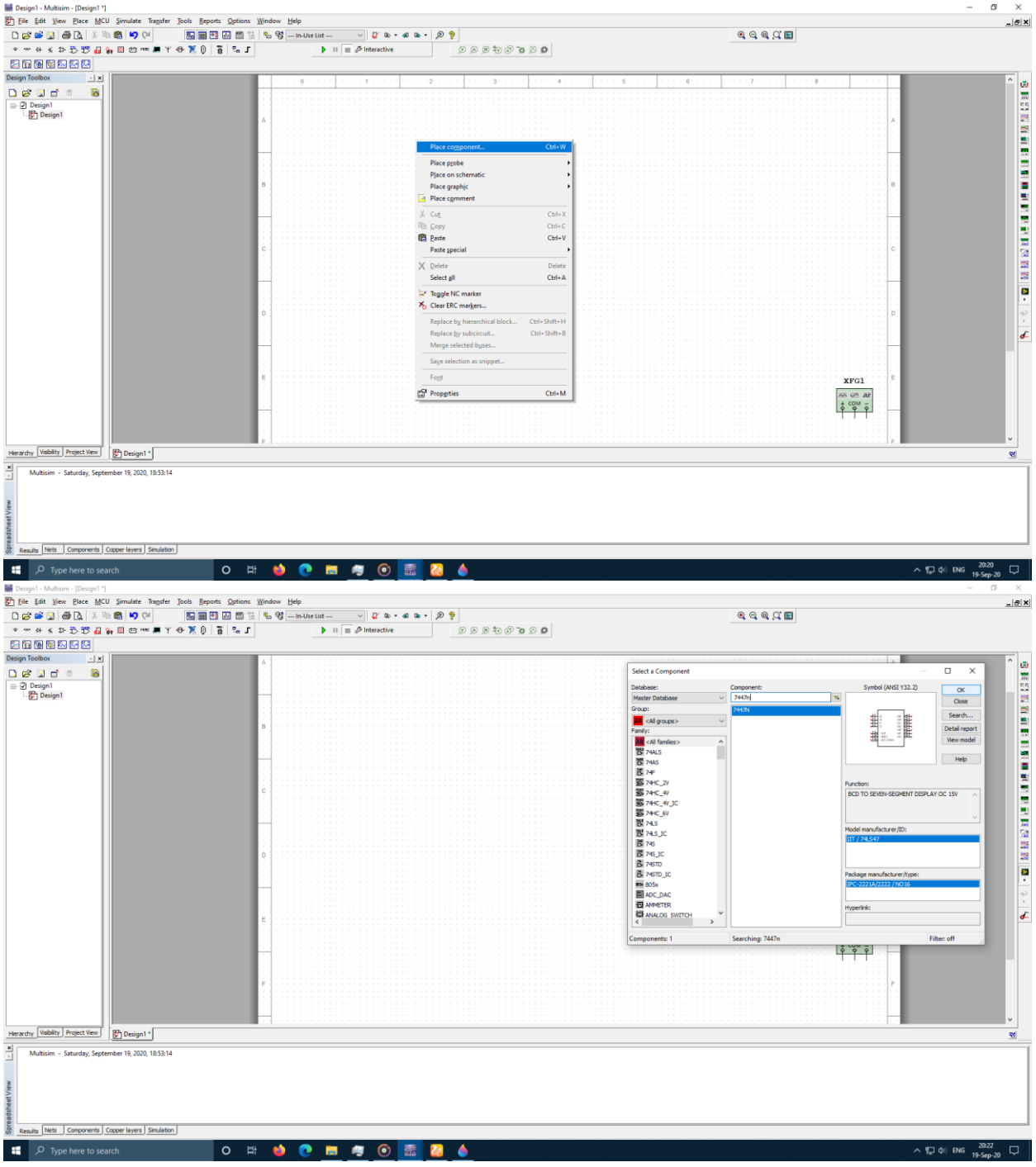
Total 6 digit is used to display the time,so we need 6 seven segment display and 6 decade counter etc. 2 digits are use for second,2 digits are use for minute and 2 digits are display the hour .

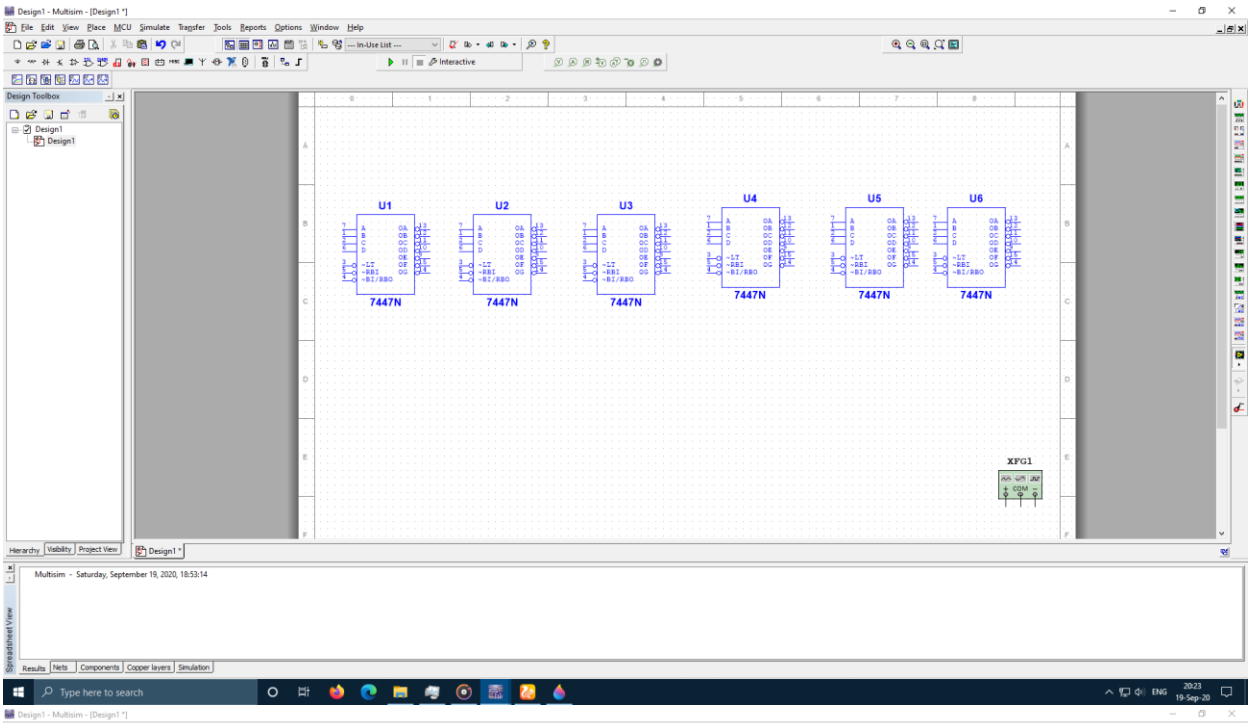
To create a circuit diagram of digital clock ,we need 8 type component . These are

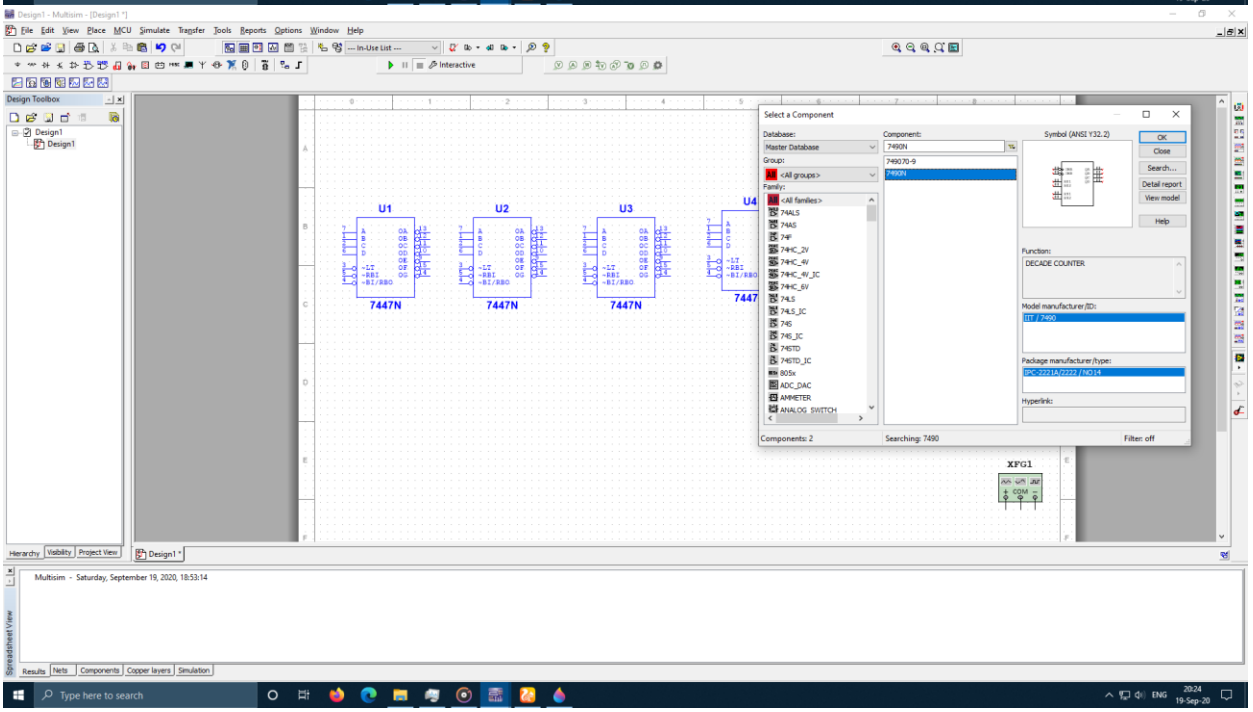
1. BCD to seven segment display decoder -7447N (6)
2. DECADE COUNTER -7490N(6)
3. Function generator to control the speed(1)
4. Or gate (2)
5. Seven segment display ,common anode.to show the number.(6)
6. Push button DPST(2)
7. Ground (2)
8. Vcc(2)

Here is the simulation process of digital circuit diagram by using multisim software.The simulation process is described with sequentially .

Function Generator is taken from the right side of the multisim software.




Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
U1
U2
U3
U4
U5
U6
7447N
XFG1
Design1 *
Multisim - Saturday, September 19, 2020, 18:53:14
Results Nets Components Copper layers Simulation
Type here to search
ENG
20:23
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
U1
U2
U3
7447N
Select a Component
Database:
Master Database
Component:
7490N
Symbol (ANSI Y32.2)
Group:
<All groups>
Family:
74LS
74S
74F
74HC_2V
74HC_4V
74HC_4V_IC
74HC_6V
74LS
74LS_IC
74S
74S_IC
74STD
74STD_IC
8051
ADC_DAC
AMMETER
ANALOG_SWITCH
OK
Close
Search...
Detail report
View model
Help
Function:
DECADE COUNTER
Model manufacturer/ID:
TI / 7490
Package manufacturer/type:
DIP-C22/A/2222 / ND14
Hyperlink:
Components: 2
Searching: 7490
Filter: off
XFG1
Design1 *
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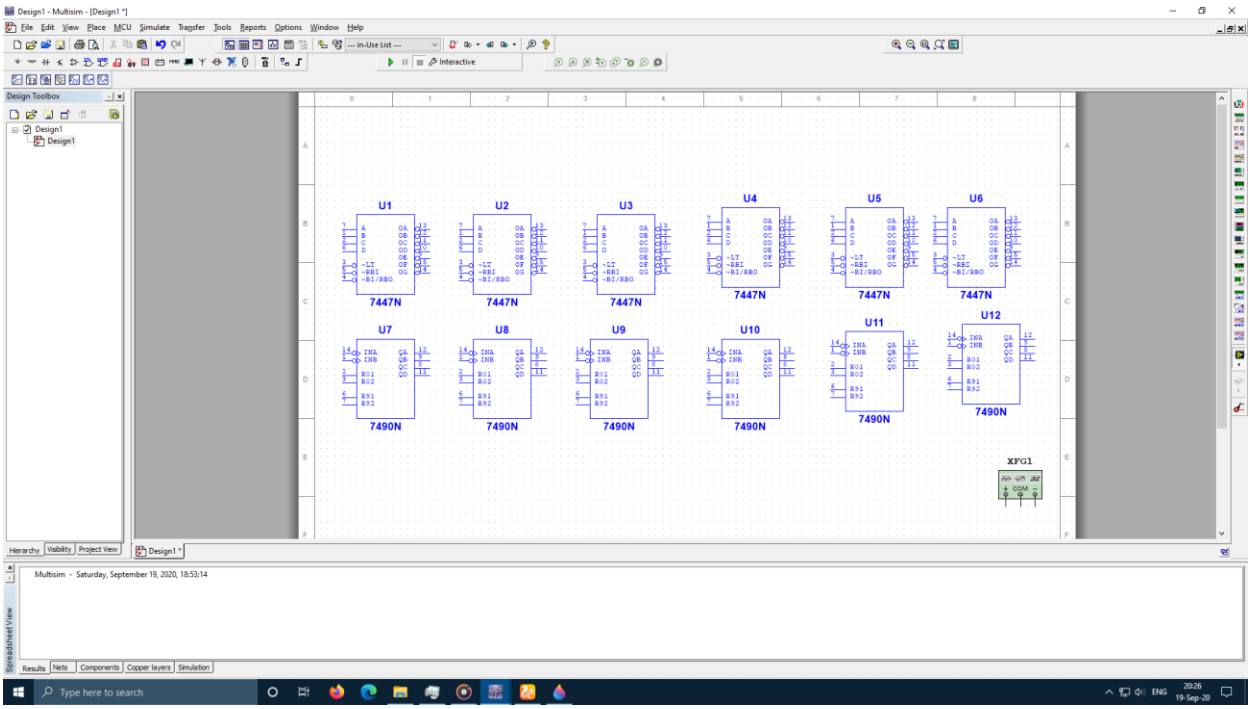
Results Nets Components Copper layers Simulation
Type here to search
ENG
20:24
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
U1
U2
U3
U4
U5
U6
7447N
U7
U8
U9
U10
U11
U12
7490N
XFG1
Hierarchy Visibility Project View
Design1 *
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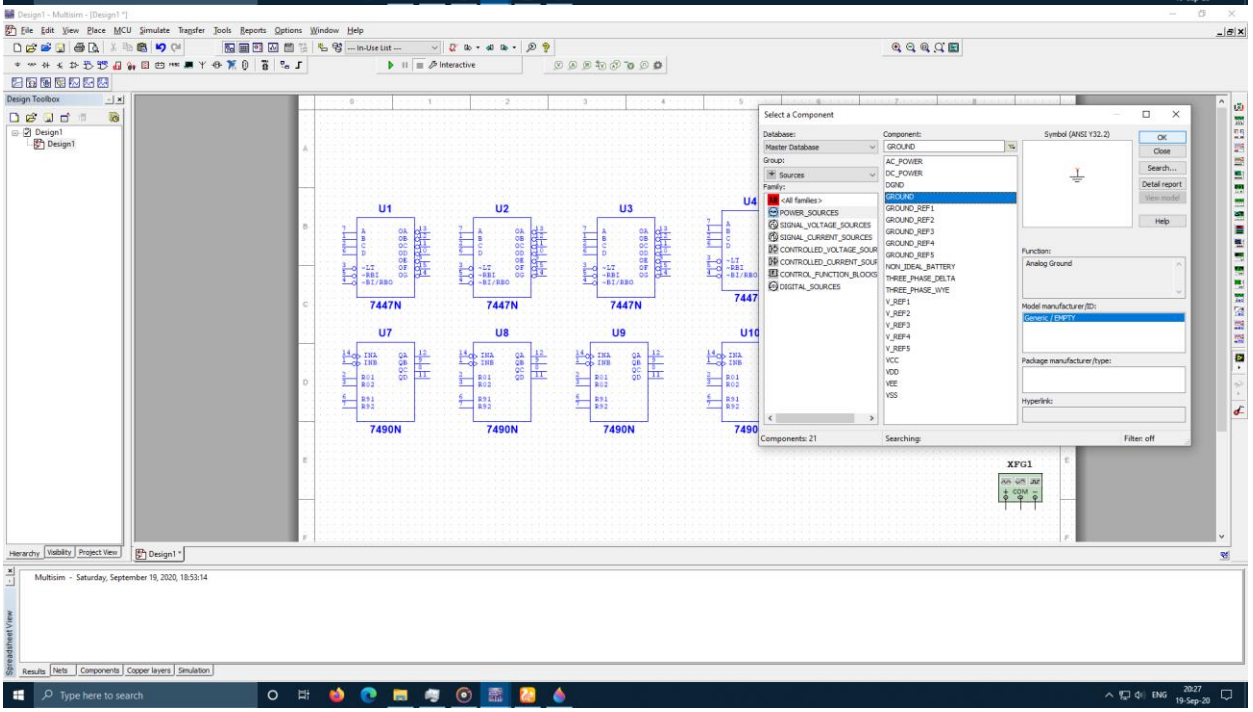
Spreadsheet View
Results Nets Components Copper layers Simulation
Type here to search
ENG
20:26
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
Select a Component
Database:
Master Database
Component:
GROUND
Group:
Sources
Family:
<All families>
POWER_SOURCES
SIGNAL_VOLTAGE_SOURCES
SIGNAL_CURRENT_SOURCES
CONTROLLED_VOLTAGE_SOUR
CONTROLLED_CURRENT_SOUR
CONTROL_FUNCTION_BLOCKS
DIGITAL_SOURCES
AC_POWER
DC_POWER
DGND
GROUND
GROUND_REF1
GROUND_REF2
GROUND_REF3
GROUND_REF4
GROUND_REF5
NON_IDEAL_BATTERY
THREE_PHASE_DELTA
THREE_PHASE_WYE
V_REF1
V_REF2
V_REF3
V_REF4
V_REF5
VCC
VDD
VEE
VSS
Symbol (ANSI Y32.2)
OK
Close
Search...
Detail report
View model
Help
Function:
Analog Ground
Model manufacturer/ID:
Generic / EMPTY
Package manufacturer/type:
Hyperlink:
Components: 21
Searching:
Filter: off
U1
U2
U3
U4
U7
U8
U9
U10
7447N
7490N
XFG1
Hierarchy Visibility Project View
Design1 *
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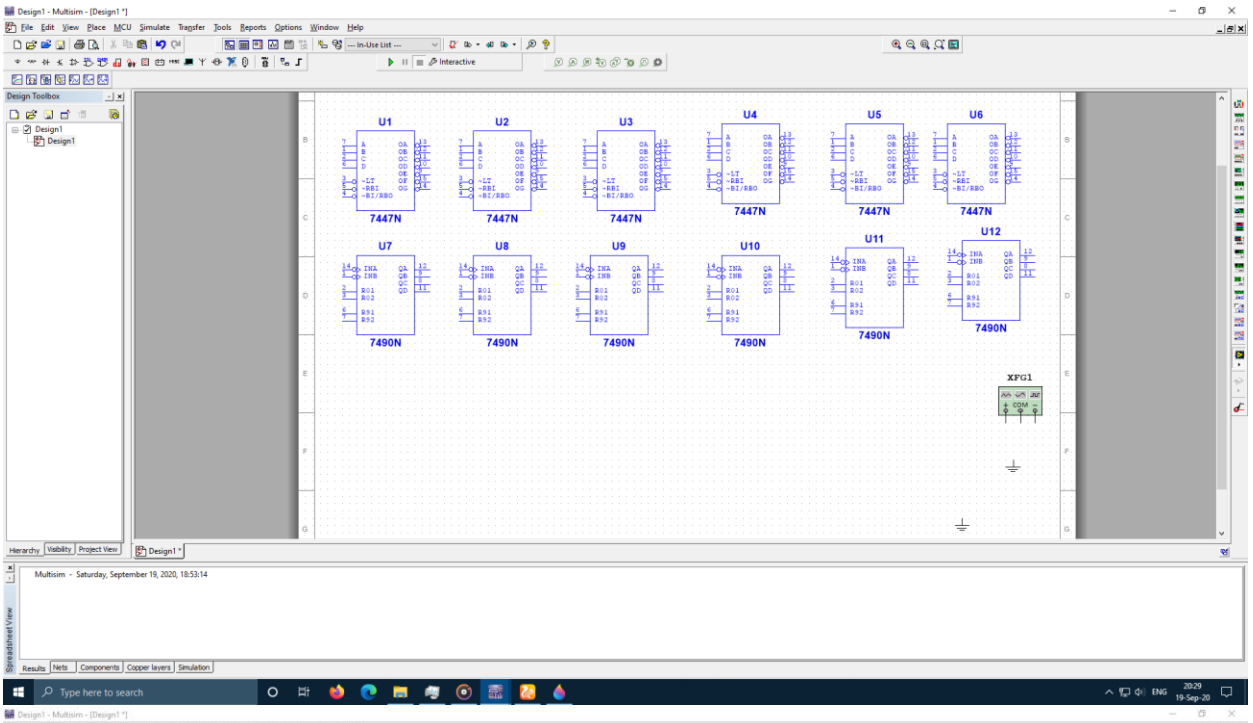
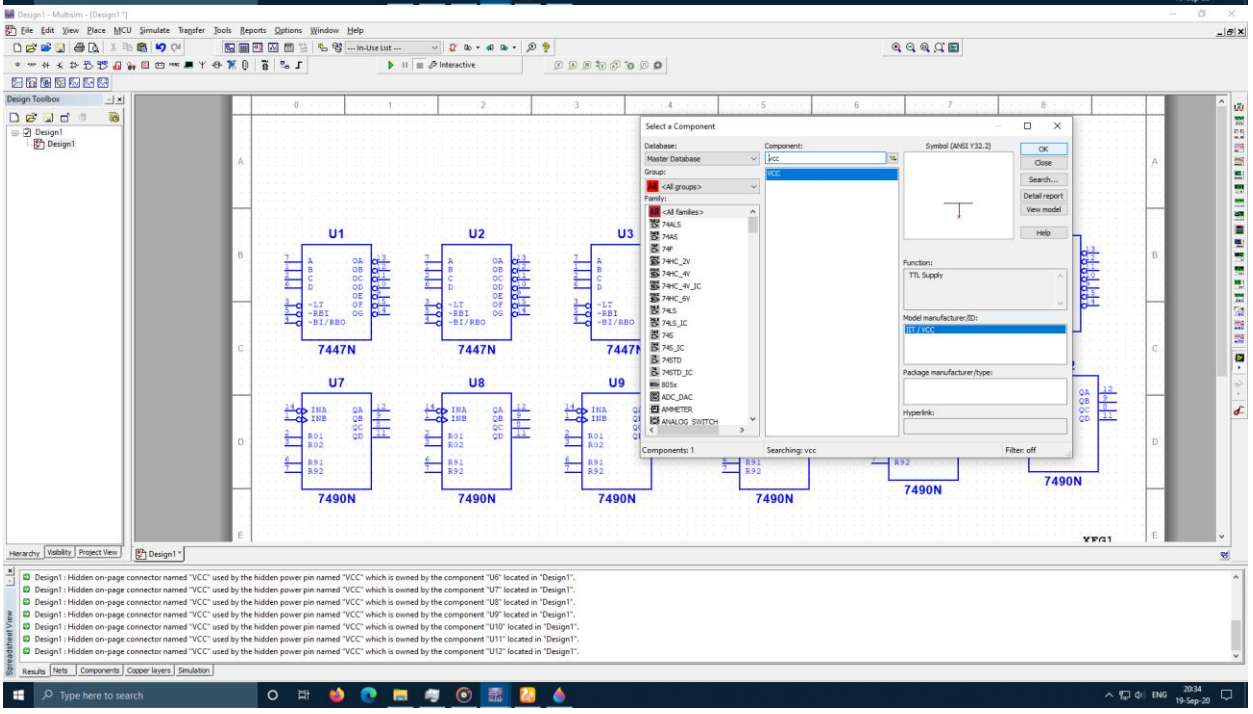
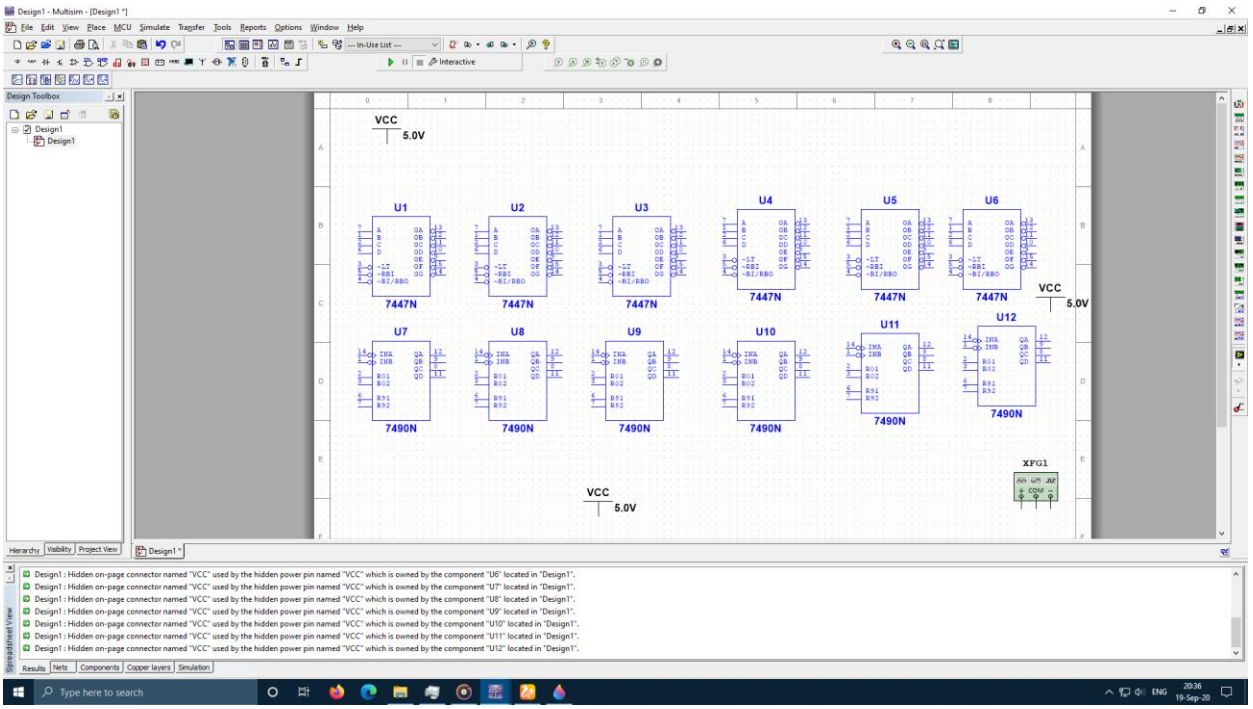
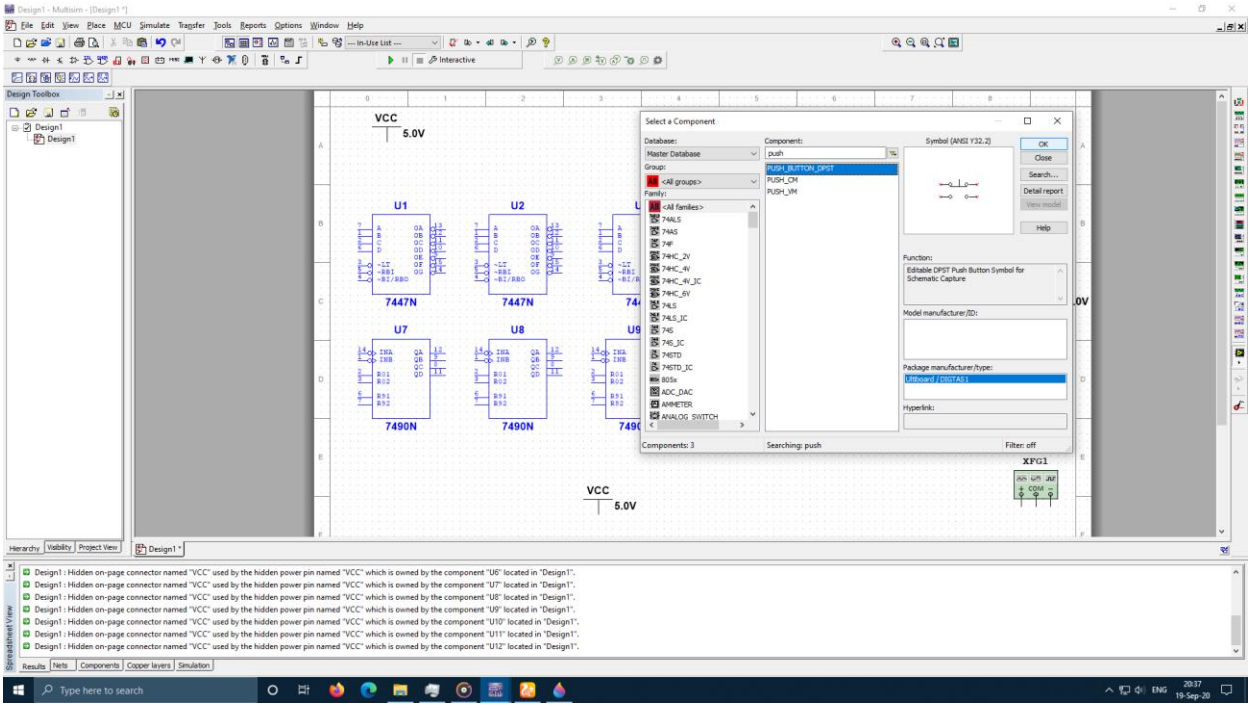
Spreadsheet View
Results Nets Components Copper layers Simulation
Type here to search
ENG
20:27
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
U1
U2
U3
U4
U5
U6
7447N
U7
U8
U9
U10
U11
U12
7490N
XFG1
Multisim - Saturday, September 19, 2020, 18:53:14
Results Nets Components Copper layers Simulation
Type here to search
ENG
20:29
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Select a Component
Database:
Master Database
Component:
vcc
VCC
Symbol (ANSI Y32.2)
OK
Close
Search...
Detail report
View model
Help
Group:
Family:
Function:
TTL Supply
Model manufacturer/ID:
Package manufacturer/type:
Hyperlink:
Components: 1
Searching: vcc
Filter: off
U1
U2
U3
U7
U8
U9
7447N
7490N
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U6" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U7" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U8" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U9" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U10" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U11" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U12" located in "Design1".
Results Nets Components Copper layers Simulation
Type here to search
ENG
20:34
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
VCC
5.0V
U1
U2
U3
U4
U5
U6
7447N
U7
U8
U9
U10
U11
U12
7490N
XFG1
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U6" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U7" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U8" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U9" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U10" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U11" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U12" located in "Design1".
Results Nets Components Copper layers Simulation
Type here to search
ENG
20:36
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
VCC
5.0V
U1
U2
7447N
U7
U8
7490N
XFG1
Select a Component
Database:
Master Database
Component:
push
Symbol (ANSI Y32.2)
Group:
<All groups>
Family:
<All families>
74ALS
74AS
74F
74HC_2V
74HC_4V
74HC_4V_JC
74HC_6V
74LS
74LS_JC
74S
74S_JC
74STD
74STD_JC
805x
ADC_DAC
AMMETER
ANALOG_SWITCH
PUSH_BUTTON_DPST
PUSH_CM
PUSH_VM
OK
Close
Search...
Detail report
View model
Help
Function:
Editable DPST Push Button Symbol for Schematic Capture
Model manufacturer/ID:
Package manufacturer/type:
Hyperlink:
Components: 3
Searching: push
Filter: off
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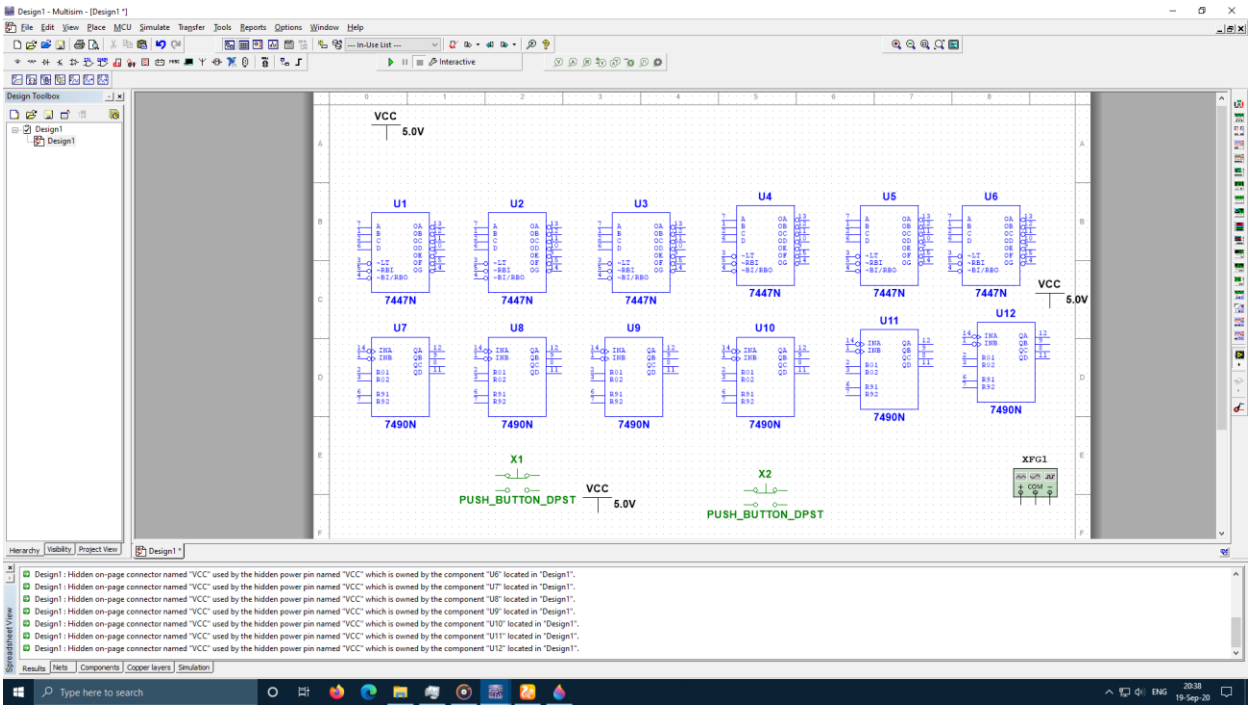
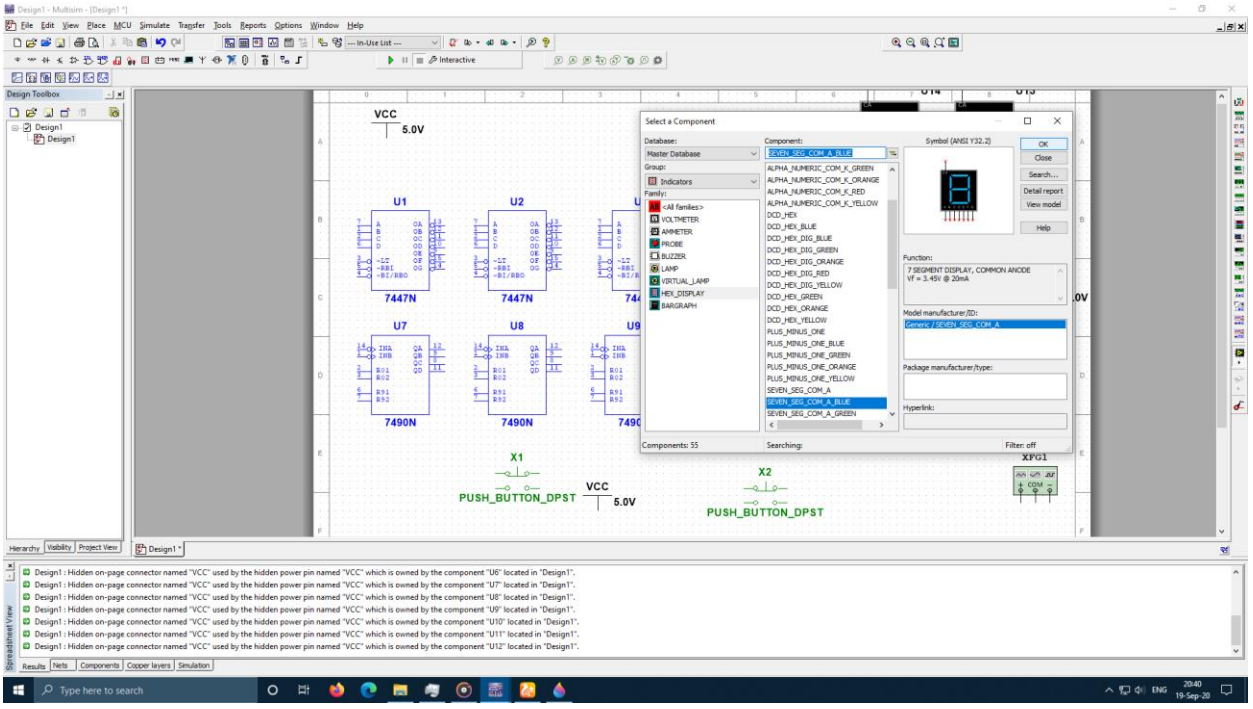
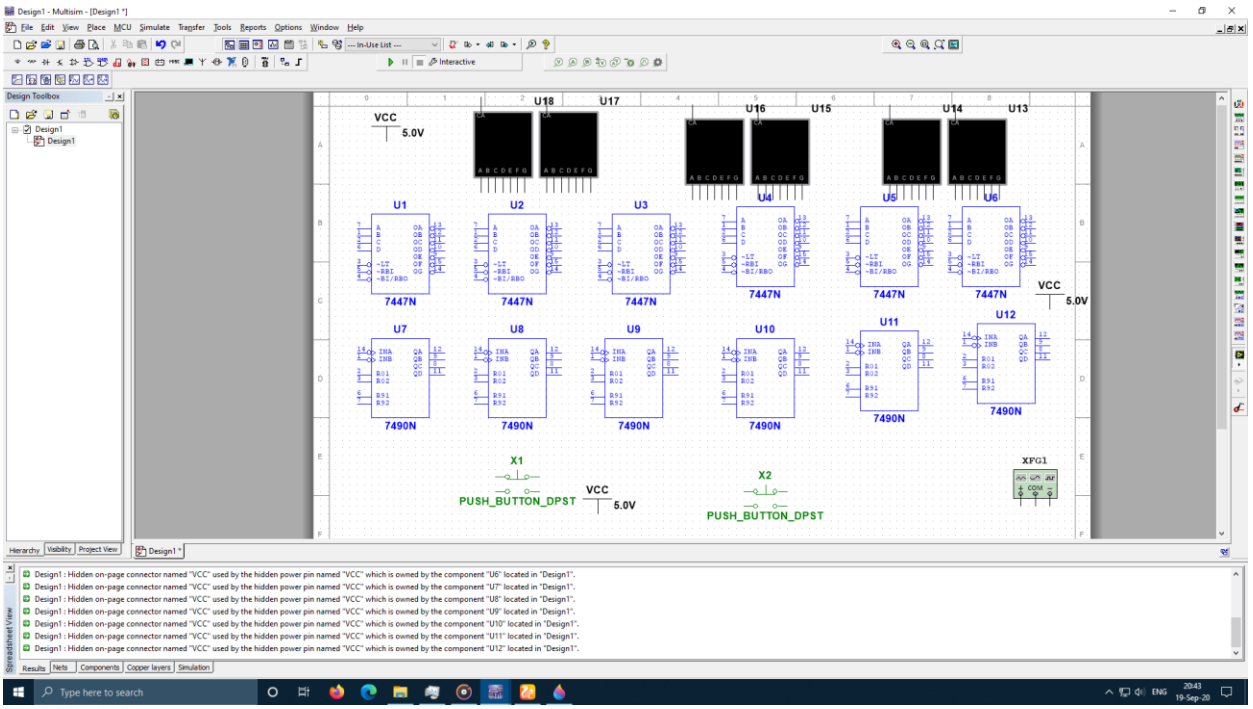
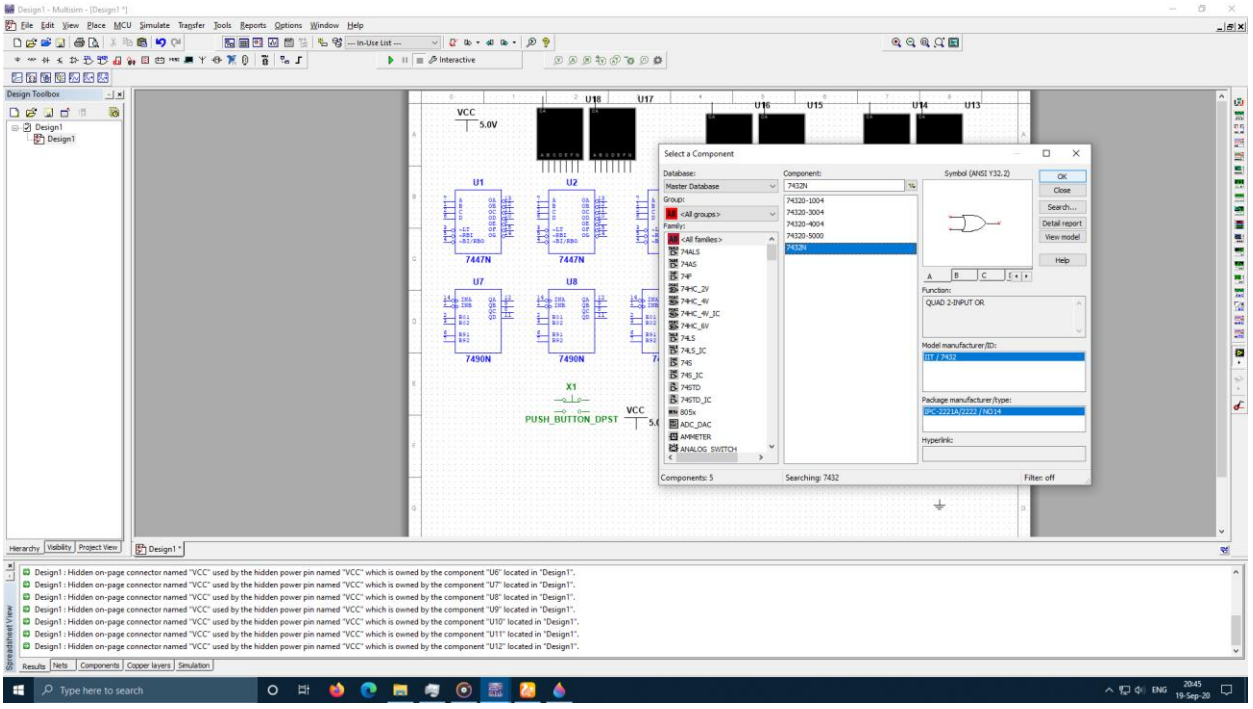
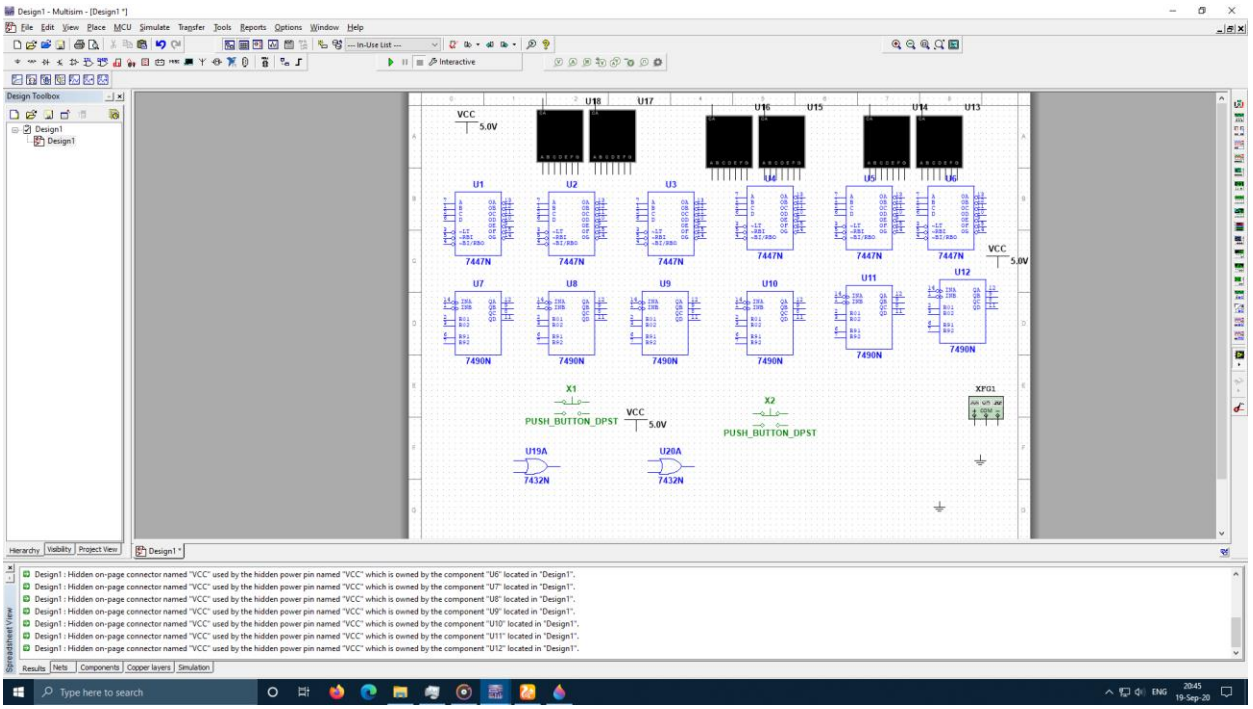
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U9" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U10" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U11" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U12" located in "Design1".
Results Nets Components Copper layers Simulation
Type here to search
ENG
20:37
19-Sep-20

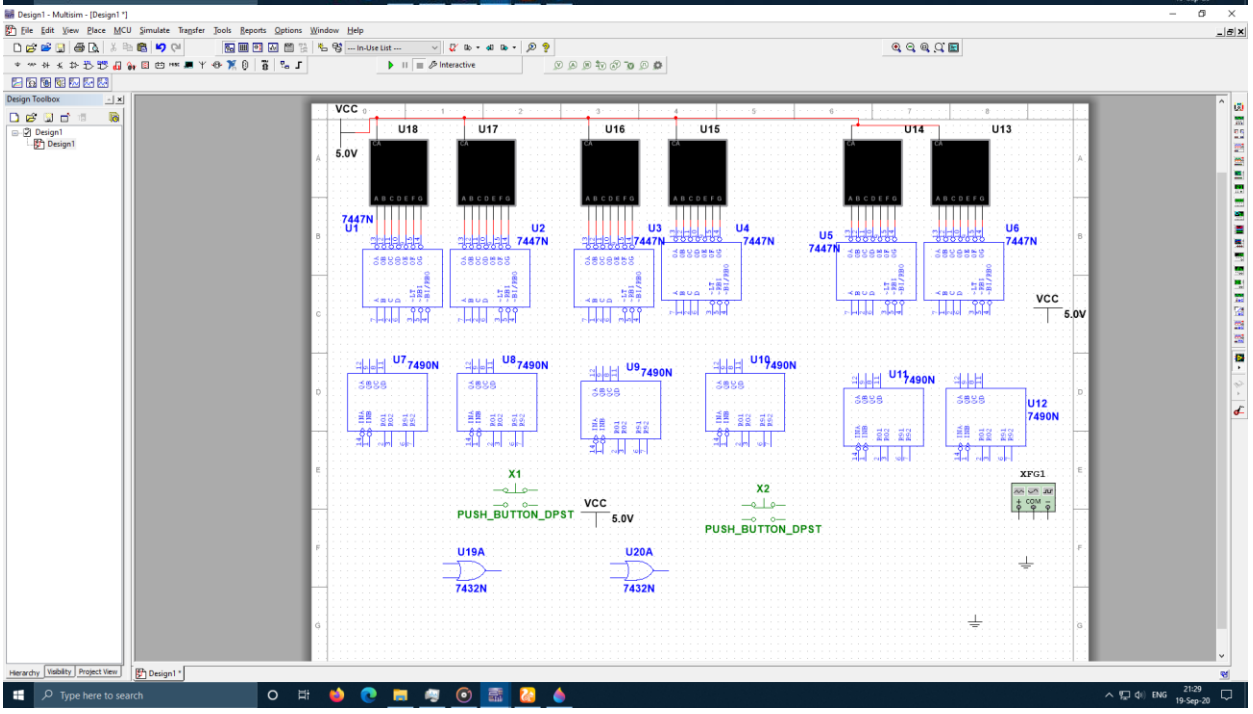

Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
VCC
5.0V
U1
U2
U3
U4
U5
U6
7447N
U7
U8
U9
U10
U11
U12
7490N
X1
PUSH_BUTTON_DPST
X2
XFG1
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U6" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U7" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U8" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U9" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U10" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U11" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U12" located in "Design1".
Type here to search
ENG
20:38
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
VCC
5.0V
U1
U2
U7
U8
U9
7447N
7490N
X1
PUSH_BUTTON_DPST
X2
XFG1
Select a Component
Database:
Master Database
Component:
SEVEN_SEG_COM_A_BLUE
Group:
Indicators
Family:
<All families>
VOLTMETER
AMMETER
PROBE
BUZZER
LAMP
VIRTUAL_LAMP
HEX_DISPLAY
BARGRAPH
ALPHA_NUMERIC_COM_K_GREEN
ALPHA_NUMERIC_COM_K_ORANGE
ALPHA_NUMERIC_COM_K_RED
ALPHA_NUMERIC_COM_K_YELLOW
DCD_HEX
DCD_HEX_BLUE
DCD_HEX_DIG_BLUE
DCD_HEX_DIG_GREEN
DCD_HEX_DIG_ORANGE
DCD_HEX_DIG_RED
DCD_HEX_DIG_YELLOW
DCD_HEX_GREEN
DCD_HEX_ORANGE
DCD_HEX_YELLOW
PLUS_MINUS_ONE
PLUS_MINUS_ONE_BLUE
PLUS_MINUS_ONE_GREEN
PLUS_MINUS_ONE_ORANGE
PLUS_MINUS_ONE_YELLOW
SEVEN_SEG_COM_A
SEVEN_SEG_COM_A_BLUE
SEVEN_SEG_COM_A_GREEN
Symbol (ANSI Y32.2)
OK
Close
Search...
Detail report
View model
Help
Function:
7 SEGMENT DISPLAY, COMMON ANODE
Vf = 3.45V @ 20mA
Model manufacturer/ID:
Generic / SEVEN_SEG_COM_A
Package manufacturer/type:
Hyperlink:
Components: 55
Searching:
Filter: off
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U6" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U7" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U8" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U9" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U10" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U11" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U12" located in "Design1".
Type here to search
ENG
20:40
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
VCC
5.0V
U18
U17
U16
U15
U14
U13
U1
U2
U3
U4
U5
U6
7447N
U7
U8
U9
U10
U11
U12
7490N
X1
PUSH_BUTTON_DPST
X2
XFG1
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U6" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U7" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U8" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U9" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U10" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U11" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U12" located in "Design1".
Type here to search
ENG
20:43
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
VCC
5.0V
U18
U17
U16
U15
U14
U13
U1
U2
7447N
U7
U8
7490N
X1
PUSH_BUTTON_DPST
Select a Component
Database:
Master Database
Component:
7432N
Symbol (ANSI Y32.2)
Group:
<All groups>
Family:
<All families>
74ALS
74AS
74F
74HC_2V
74HC_4V
74HC_4V_IC
74HC_6V
74LS
74LS_IC
74S
74S_IC
74STD
74STD_IC
805x
ADC_DAC
AMMETER
ANALOG_SWITCH
74320-1004
74320-3004
74320-4004
74320-5000
7432N
OK
Close
Search...
Detail report
View model
Help
Function:
QUAD 2-INPUT OR
Model manufacturer/ID:
IIT / 7432
Package manufacturer/type:
DIP-2221A/2222 / NO14
Hyperlink:
Components: 5
Searching: 7432
Filter: off
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U6" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U7" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U8" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U9" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U10" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U11" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U12" located in "Design1".
Type here to search
ENG
20:45
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
VCC
5.0V
U18
U17
U16
U15
U14
U13
U1
U2
U3
U4
U5
U6
7447N
U7
U8
U9
U10
U11
U12
7490N
X1
PUSH_BUTTON_DPST
X2
PUSH_BUTTON_DPST
XFG1
U19A
U20A
7432N
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U6" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U7" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U8" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U9" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U10" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U11" located in "Design1".
Design1 : Hidden on-page connector named "VCC" used by the hidden power pin named "VCC" which is owned by the component "U12" located in "Design1".
Results
Nets
Components
Copper layers
Simulation
Type here to search
ENG
20:45
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
Design1
VCC
5.0V
U18
U17
U16
U15
U14
U13
U1
U2
U3
U4
U5
U6
7447N
U7
U8
U9
U10
U11
U12
7490N
X1
PUSH_BUTTON_DPST
X2
PUSH_BUTTON_DPST
XFG1
U19A
U20A
7432N
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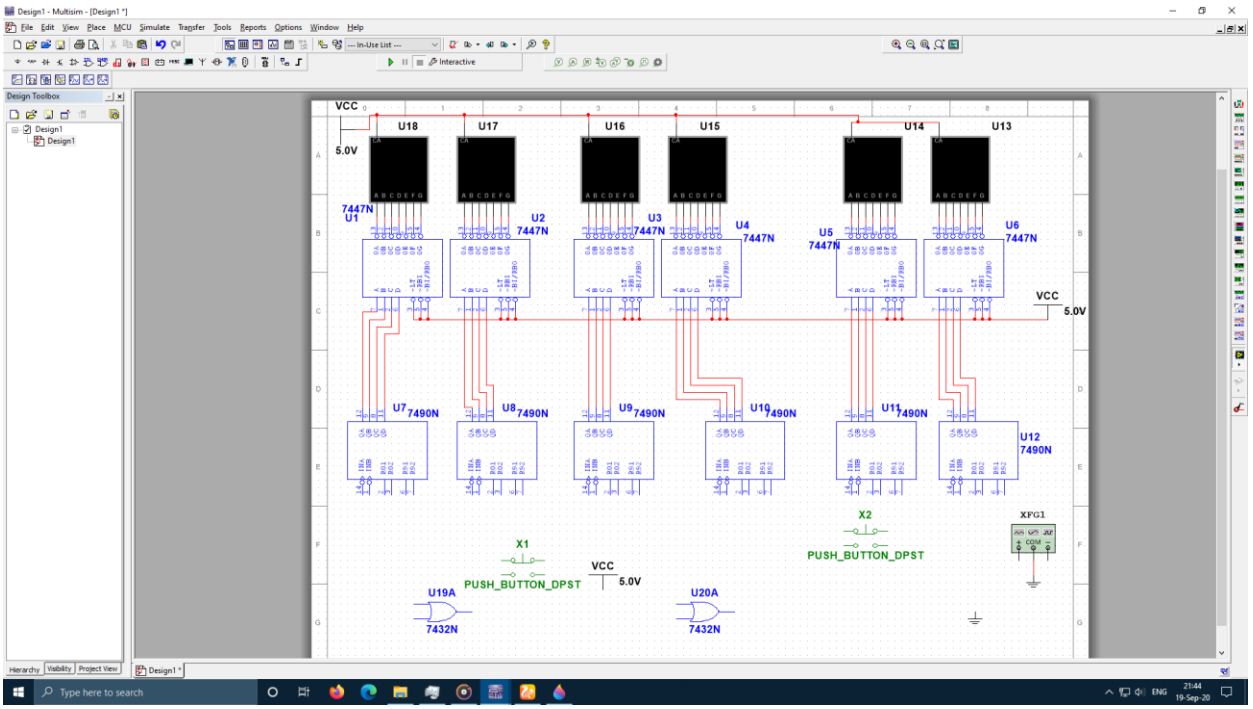
ENG
21:29
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
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5.0V
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U4
U5
U6
U7 7490N
U8 7490N
U9 7490N
U10 7490N
U11 7490N
U12 7490N
X1
PUSH_BUTTON_DPST
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XPG1
U19A
U20A
7432N
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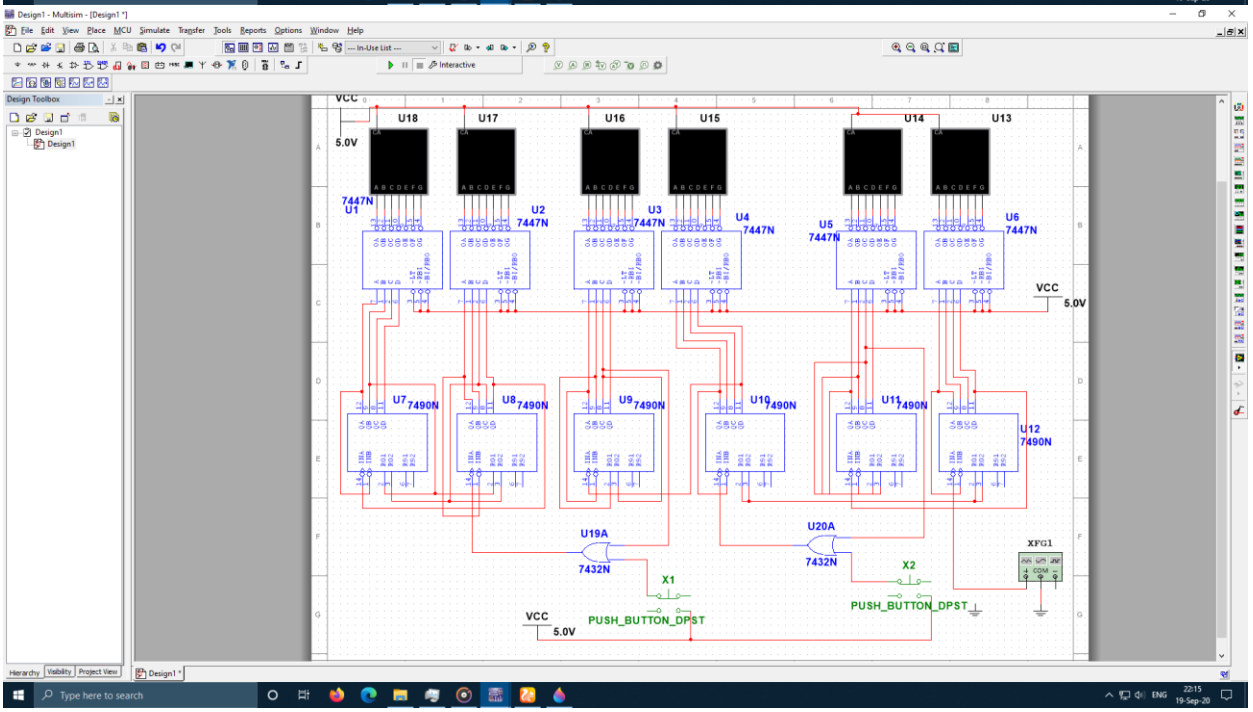
21:44
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
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U10 7490N
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U12 7490N
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XPG1
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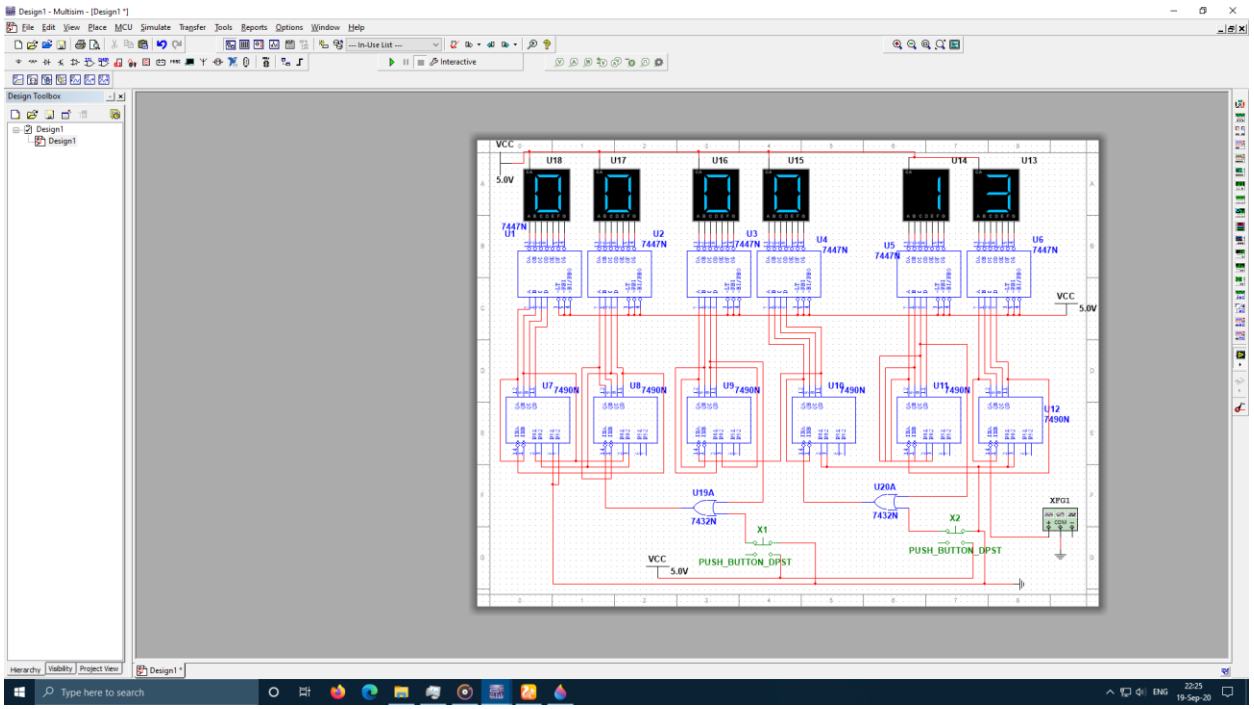
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
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U20A
7432N
X1
X2
XPG1
PUSH_BUTTON_DPST
Hierarchy
Visibility
Project View
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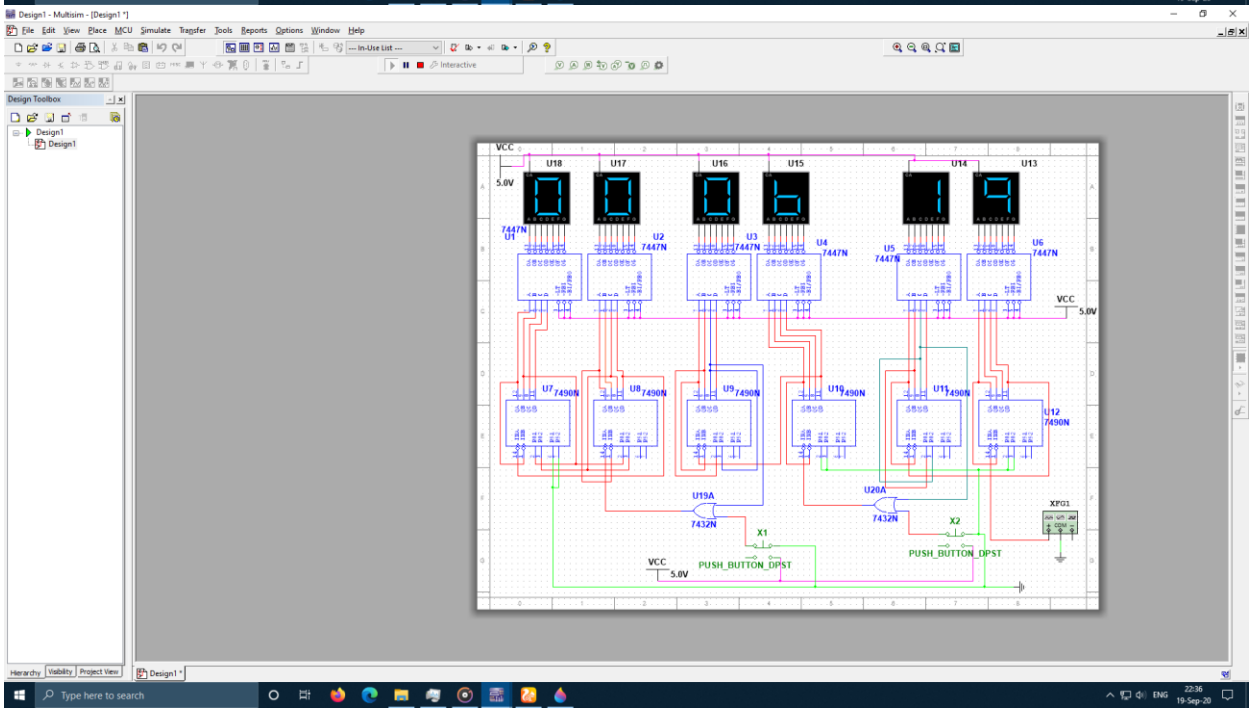
ENG
22:25
19-Sep-20


Design1 - Multisim - [Design1 *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
Design Toolbox
Design1
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U8 7490N
U9 7490N
U10 7490N
U11 7490N
U12 7490N
U19A
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U20A
7432N
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XPG1
PUSH_BUTTON_DPST
Hierarchy
Visibility
Project View
Type here to search
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22:36
19-Sep-20