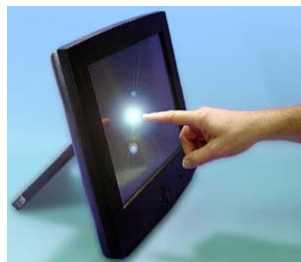




Graphic Display and Touch Screen



Agenda:

- 1) Display Applications
- 2) Graphic LCD
- 3) Type of Graphic LCD
- 4) Interfacing Techniques with Microcontroller
- 5) Converting Image to Suitable Format
- 6) Demo of Graphic LCD
- 7) Touch Screen
- 8) Type of Touch Screen
- 9) Demo Touch Screen
- 10) Webresources
- 11) Development Cycles of these Products



Graphic Display and Touch Screen



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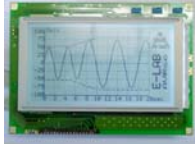
Graphic Display and Touch Screen

Graphic Display

The LCD which have ability for display Images, Animations, Video or Text is called Graphic Display.

Types:

- 1) Monochrome Graphic LCD e.g. (Graphic Display 128 x 64)



- 2) Color or RGB Graphic LCD e.g. (3.2 Graphic Display 320 x 240)



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How Images seen on Graphics Display ?

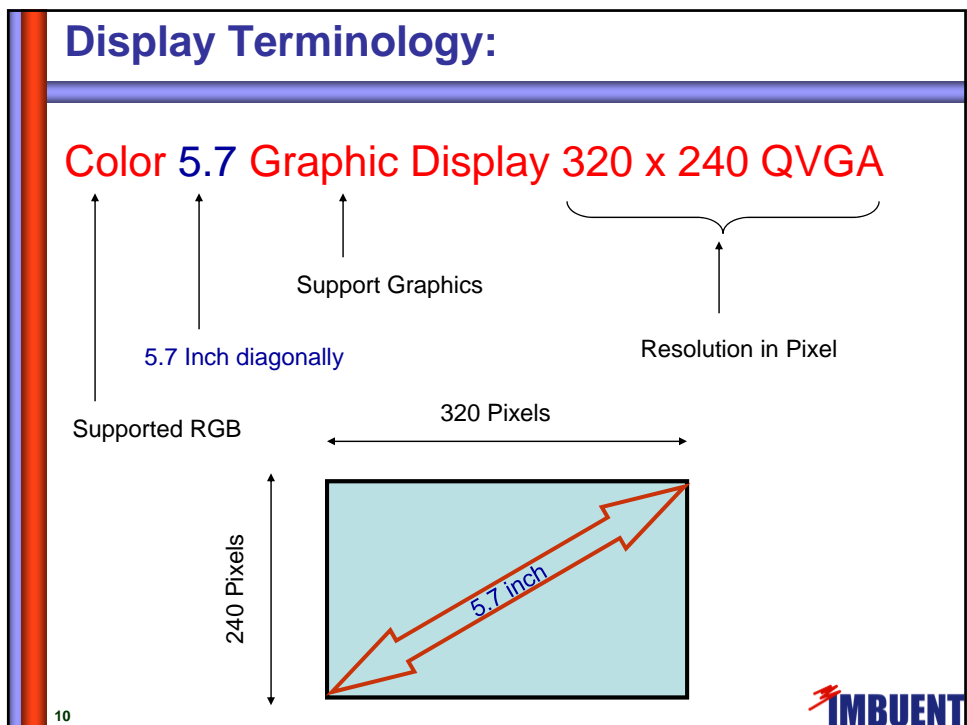
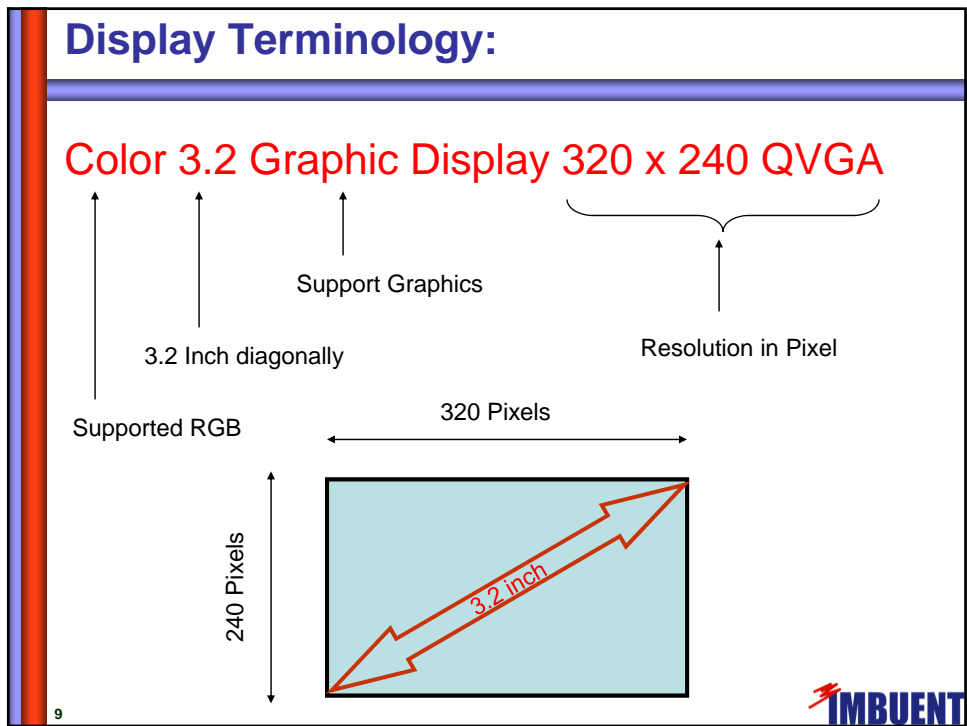
Transmissive (backlight)

Reflective (with ambient or sun light)

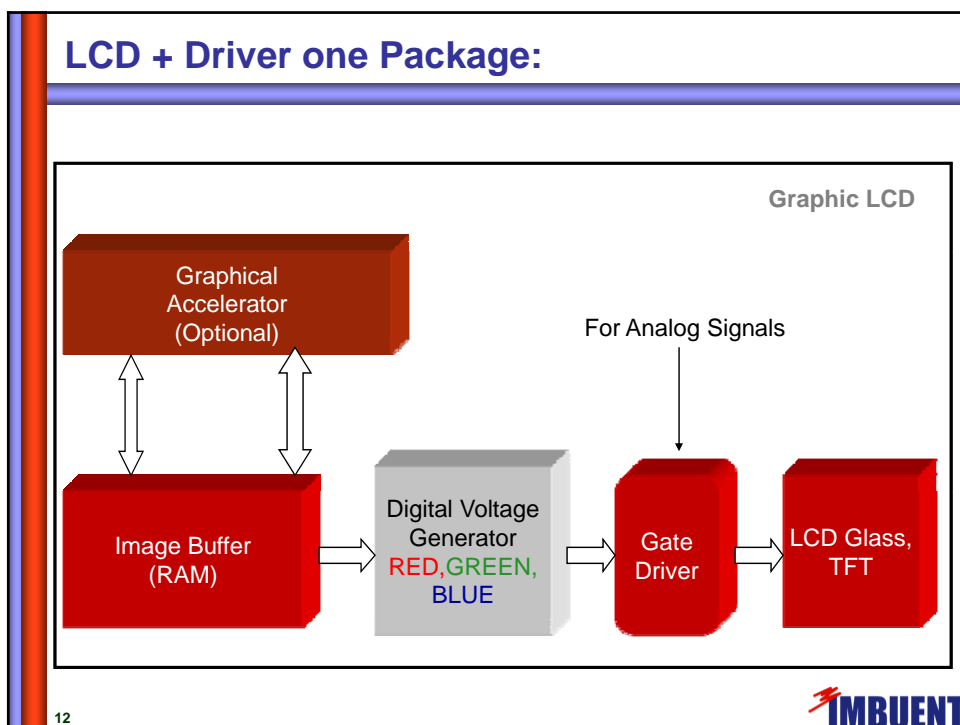
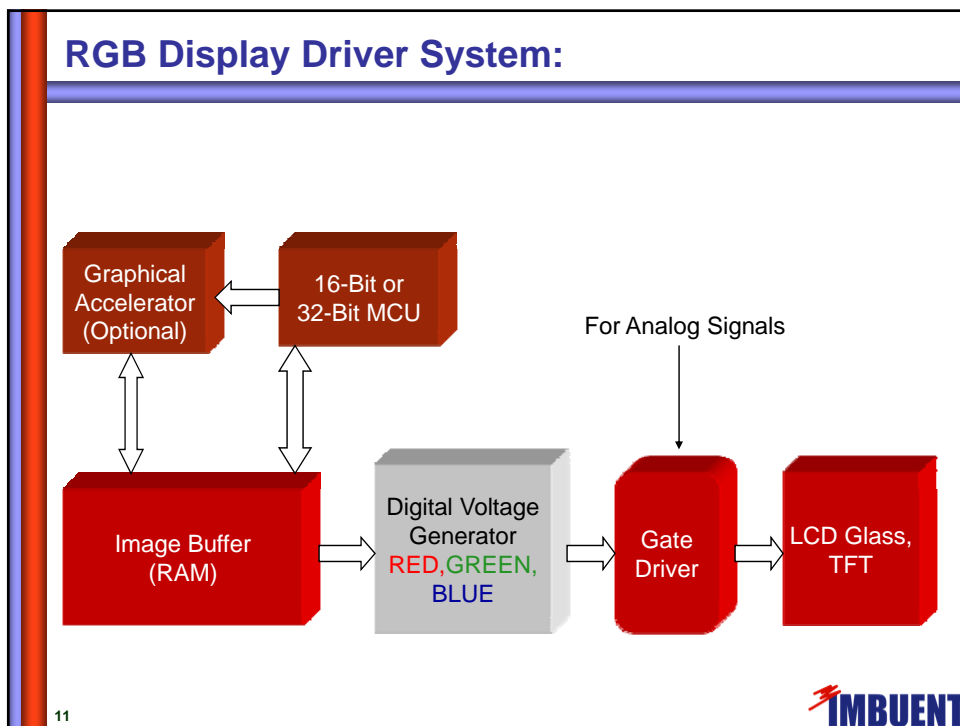
Transflective (Both of above)

8

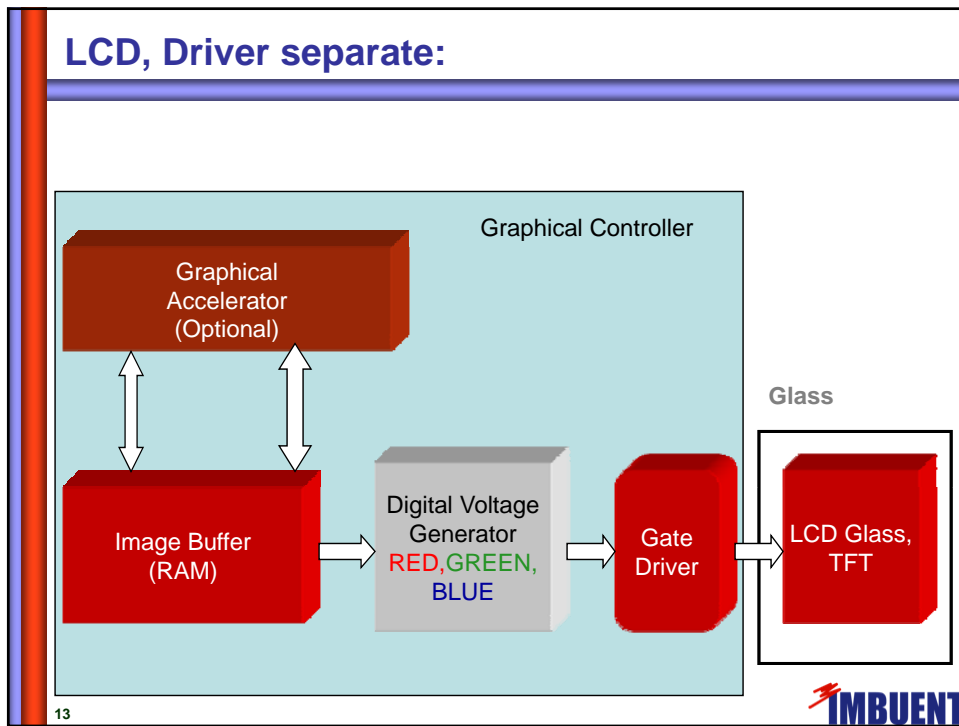
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Graphic Display and Touch Screen



Graphic Display and Touch Screen



Which factor decide Color Support and clarity ?

- 16-Bit Graphic LCD Support

Red=5, Green=5, Blue=5

$2^{16} = 65,536$ Color

- 18-Bit Graphic LCD Support

$2^{18} = 2,62,144$ Colors

Red=6, Green=6, Blue=6

- 24-Bit Graphic LCD Support

$2^{24} = 1,67,77,216$ Colors

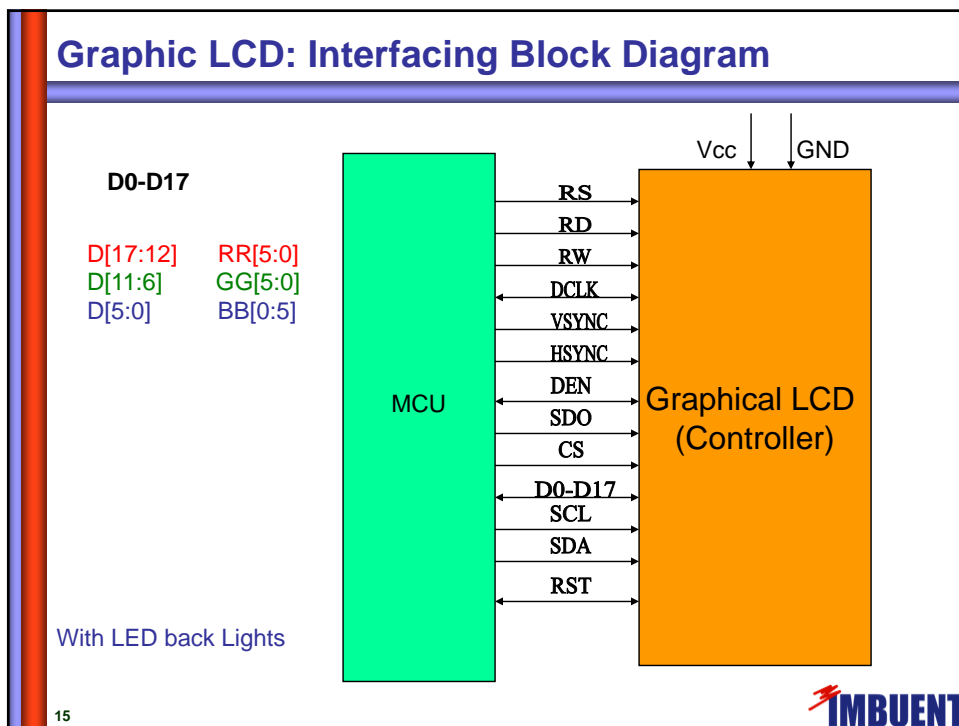
Red=8, Green=8, Blue=8

Physical
Pins of
Graphical
Controller

Go to this Link:

14 http://en.wikipedia.org/wiki/Color_depth and Datasheets





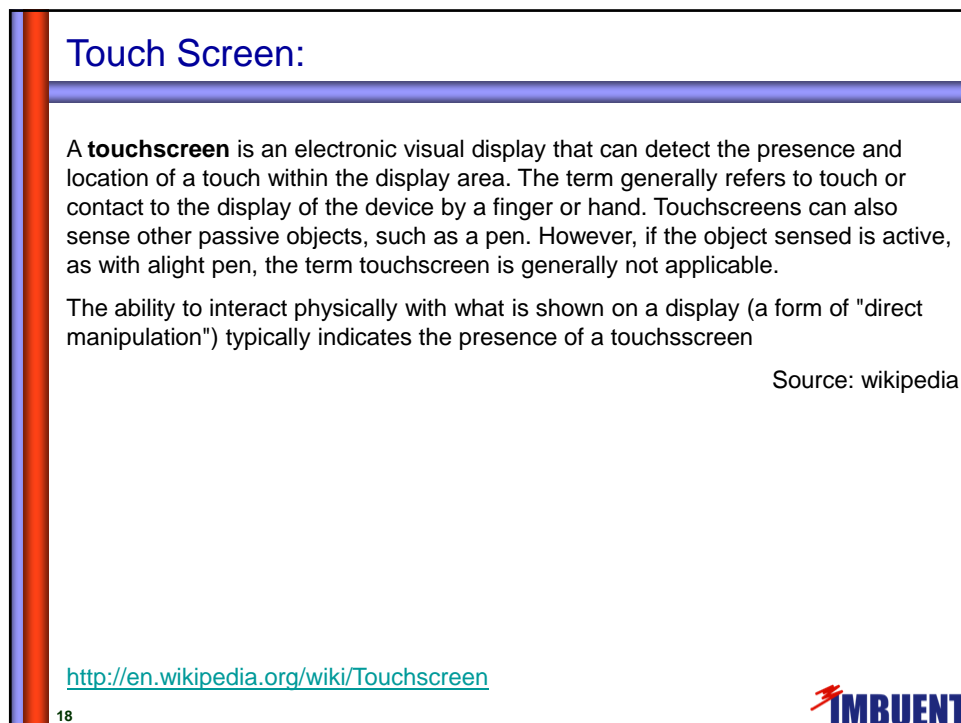
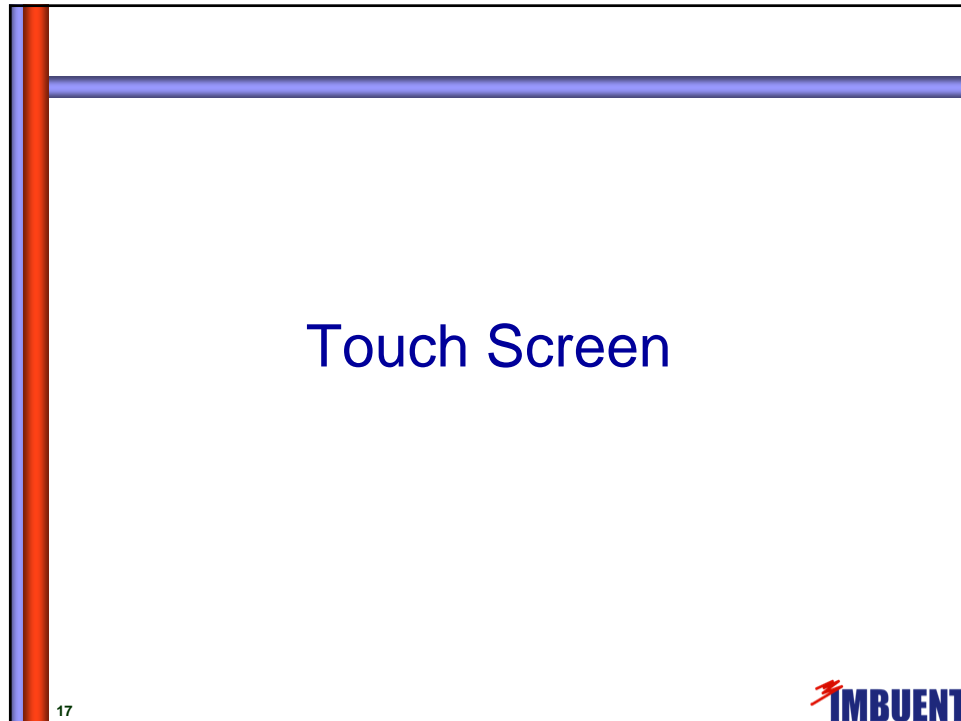
Converting Image to Suitable Format

- Microcontroller understand hex format.
- We want to see Image graphic display.
- Graphic to hex (for microcontroller) and hex to Graphic (for Graphic LCD).

DEMO

IMBUENT logo

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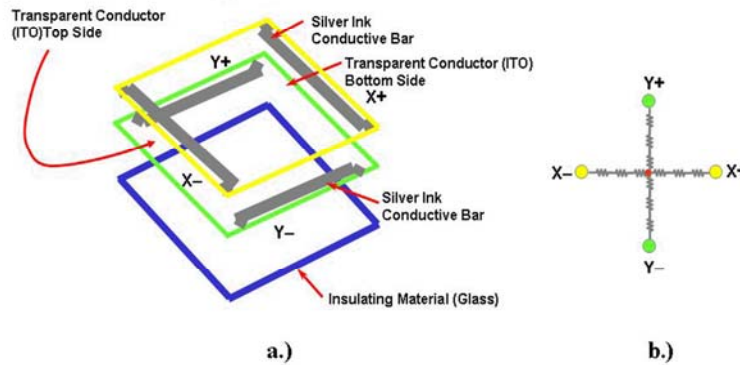
Graphic Display and Touch Screen

The Basics of a Touch Screen (Resistive)

Touch Screen : Equivalent to two resistances

Voltage gradient is voltage divided by the distance between the two points at which the voltage was measured.

By pressing on the screen your making contact between the top and bottom layer. To determine the co-ordinates you read first the x value and then the y value



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Example:

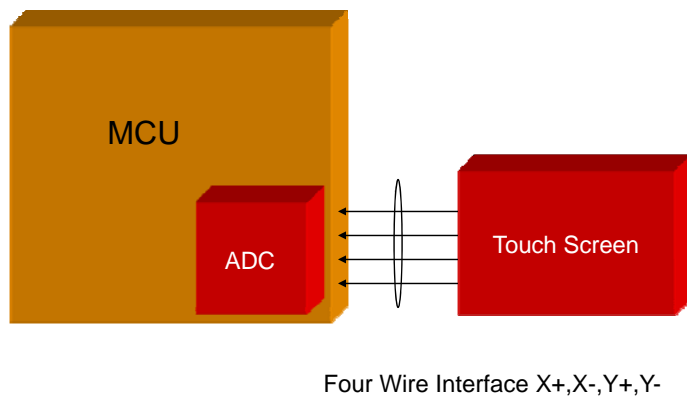
X ₋₄	X ₋₃	X ₋₂	X ₋₁	X ₀	X ₊₁	X ₊₂	X ₊₃	X ₊₄
Y ₃	Y ₃	Y ₃	Y ₃	Y ₃	Y ₃	Y ₃	Y ₃	Y ₃
X ₋₃				X ₀				
Y ₄				Y ₂				
				X ₀	X ₊₁			
				Y ₁	Y ₁			
X ₋₄	X ₋₃	X ₋₂	X ₋₁	X ₀	X ₋₁	X ₋₂	X ₋₃	X ₋₄
Y ₀	Y ₀	Y ₀	Y ₀	Y ₀	Y ₀	Y ₀	Y ₀	Y ₀
				X ₀				
				Y ₋₁				
				X ₀				
				Y ₋₂				
			X ₋₁	X ₀				X ₊₄
			Y ₃	Y ₋₂				Y ₋₃

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Graphic Display and Touch Screen

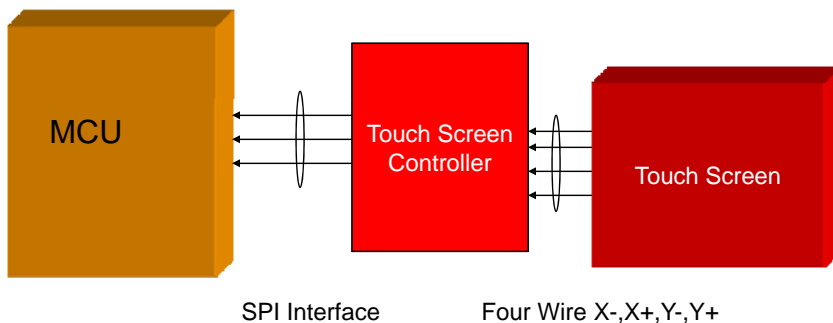
Interfacing Touch Screen Diagram:



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Interfacing Touch Screen Diagram 2:

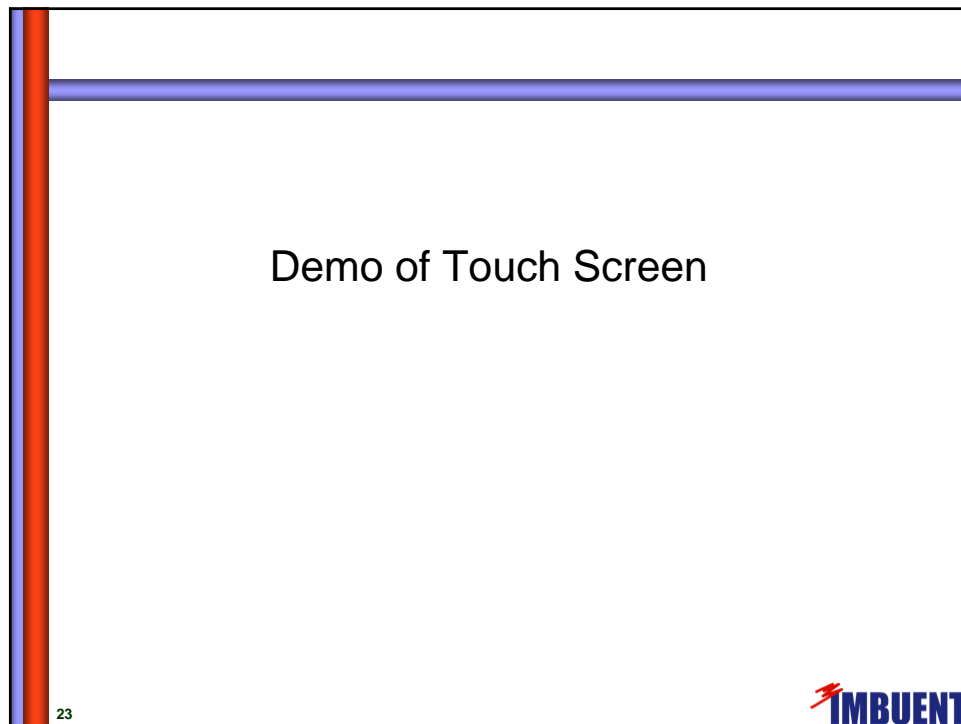


Texas Touch Screen Controller

<http://focus.ti.com/docs/prod/folders/print/ads7846.html>

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Graphic Display and Touch Screen

Graphic LCD MPU

http://www.freescale.com/webapp/sps/site/taxonomy.jsp?modelId=0243024F2A546B

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Graphic LCD MPU

Graphic LCD Product Map

Roll over a block for more information.

MCU Graphic MPU

SVGA

VGA

WVGA

QVGA

6 pin 8 pin 16 pin 20 pin 24/28 pin 32 pin

Package Pin Count

Future Product 3V

25

Graphics Design Resources

http://www.microchip.com/stellent/idcplg?iIdcService=SS_GET_PAGE&modelId=2608&page=1¶m=en532061

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Home Products Design Support Applications Buy/Sample Corporate What's New

Design Resources

- Introduction to Graphic Display
- Functional Overview
- Solutions
- Download and Support
- Development Tools
- Recommended Parts
- Frequently Asked Questions (FAQs) - Design General

Featured Products

- PIC24FJ64GA004 Family
 - Up to 64 KB
 - Up to 44 Pins
- PIC24FJ128GA010 Family
 - Up to 128 KB
 - Up to 100 Pins

Click here to view Microchip's Graphics demo

INTRODUCTION

Welcome to the Microchip Graphics Display Application Design Center.

Graphics displays are gaining popularity in an increasing range of control and user interface applications in markets such as home automation, home appliance, medical and industrial. Examples include security systems, washing machines, cooking ranges, home blood pressure monitors, point-of-sale terminals, test and measurement units. Graphics displays enhance the user experience and provide detailed information with sharper images. Additionally, graphics displays enable technologies such as touch screen, leading to more effective and efficient interfaces to the applications.

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Development Cycle:

- SBC or Development Tools
- Technical Consultation with GLCD Companies
- API or Application Programming Interface
- Good Debugging Tools

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THANK YOU