



GRAPHICS ENGINE


YAMAHA

CREATING 'KANDO' TOGETHER

YGV641 VC1N

Cutting-edge GDC with Sprite Architecture

Master of Animating

Fully-featured animations are possible for a simple system enabled by this GDC.

Experience the cutting-edge "easiness yet quality" display technology accomplished by the Yamaha's proprietary

sprite-based control mechanism and graphics data compression method.

Feel the new "norm" for yourself.

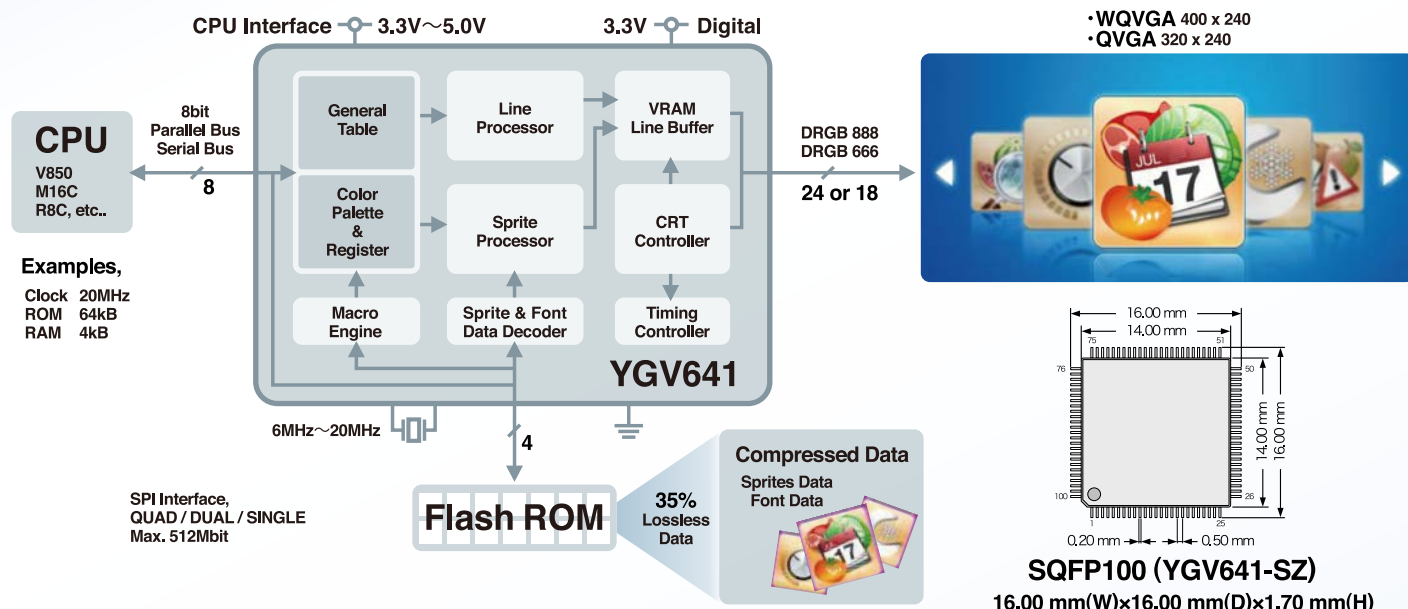
APPLICATIONS

- ▶ Washing Machines
- ▶ Microwaves
- ▶ Rice Cookers
- ▶ Refrigerators
- ▶ Health-care and Medical Equipment
- ▶ FA equipment
- ▶ Automotives

Features Summary

- ▶ Sprite-based drawing architecture enables to implement GUI with only several bytes of control data.
- ▶ 341 Sprites per screen at maximum are displayed simultaneously
- ▶ Animation of 24 bit full color at 60 fps is supported.
- ▶ Graphics data is compressed approximately to 1/3 to reduce memory size drastically.
- ▶ Adobe Flash can be used for authoring graphic contents.

APPLICATION DIAGRAM



Various features for rich expression

Each sprite is associated with a twelve-byte attribute data that defines its position, scaling, rotation, transparency, colors, and all the other features. A macro command execution engine is available to control these attribute data making it possible to animate them at 60 fps easily. The macro command engine is triggered by a host CPU as well as macro command stored in Flash ROM to further reduce a host MCU load.



Alpha-Blending Between Layers

Pixel-by-pixel blending controls

Clipping (Masking)

Sprites, Texts, or Lines can be used as masks

Animation

Macro Commands allow complicated animations easily

Authoring Supports

Data authored in Adobe Flash® format can be converted for use in Yamaha-supplied authoring tool.

SPRITES

Number of Sprite

Up to 341 per frame



Size

512 dot

8

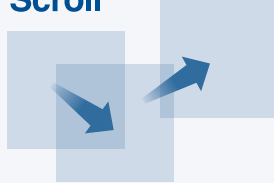
8dot /Step

512 dot

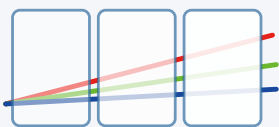
Scaling



Scroll



Alpha-blending



Color Palettes

1024 colors

selectable from;

64 sets of 16-color palette

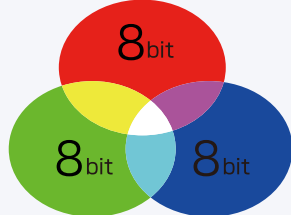
16 sets of 64-color palette

4 sets of 256-color palette

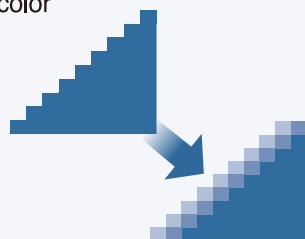
Flexible configuration

Colors

Supports 2-, 16-, 64-,
256-color palette out of 24-bit RGB
Or 16-, 18-, 24-bit RGB True color



Anti-aliasing



TEXTS

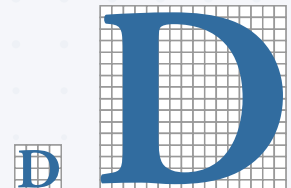
Up to 1,948 letters per frame

Up to 64 characters per field

Font Size

From 1×1 to 64×64 in pixel

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
1,948 letters
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ



Font Rendering

Supports proportional
font and kerning

Windows-Web Design

Windows-Web Design

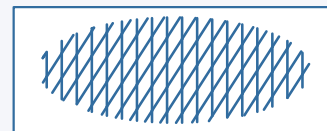
Anti-aliasing Font Data

Support 4- or 2-bit/pixel format

LINES

Up to 510 lines per screen

Direct draw by specifying its
start and end point coordinates



32,768-color RGB

1- to 16-dot width per line



Anti-aliasing

