

RX600 Series

R20AN0110EJ0100

Rev.1.00

M3S-GRAPHIC-LIB: Graphics library Introduction Guide

Jun 13, 2011

Introduction

This document explains about usage of M3S-GRAPHIC-LIB for the RX Family V.1.00 Release00E (hereafter WGP). WGP is the 2D Graphics Library for embedded system using Renesas microcomputer. WGP is provided as object code and user can add graphics function easily by implementing user program.

Target Device

RX Family

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1. Product Configuration

WGP comprises the following elements.

- M3S-GRAPHIC-LIB V.1.00 Release00E
- M3S-GRAPHIC-LIB V.1.00 Release00E Introduction Guide (this document: r20an0110ej0100_rx_wgplib.pdf)

Product number: ROMRX60GL0010RRC

The following files are copied during the installation process.

Table 1.1 Product Configuration

Installer(setup.exe)	For Windows installer. Installer will show the WGP agreement. if user admits this agreement, installer will copy the WGP files to the path below. C:\Renesas\an_r20an0110ej_rx_wgplib_v100r00
WGP lib (lib)	
rx600bewgp8.lib	RX(big endian) 8bit Color library file ver 2.00
rx600bewgp16.lib	RX(big endian) 16bit Color library file ver 2.00
rx600lewgp8.lib	RX(little endian) 8bit Color library file ver 2.00
rx600lewgp16.lib	RX(little endian) 16bit Color library file ver 2.00
wgp.h	Header file of WGP
wgp_chr.h	Header file of WGP displays characters
wgp_dep.h	Header file of WGP depth color information
Sample program (sample)	
wgp.hws	Project of WGP sample program (High-performance Embedded Workshop)
Document (doc)	
r20uw0076ej0100_wgplib.pdf	User's Manual
r20an0110ej0100_rx_wgplib.pdf	Introduction Guide

2. Library specification

Library specification can be seen in user's manual included in WGP installer. WGP installer can be downloaded in Renesas Electronics Web site.

3. Corresponding MCU

This product corresponds to RX family.
Library file is built with default compile option.

```
- compile option (little endian)
-cpu=rx600 -output=obj="$ (CONFIGDIR)\$(FILELEAF).obj" -nologo
-section=P=PWGP,C=CWGP

- compile option (big endian)
Adding "-endian=big" to default option.
```

4. Development environment

[Host OS]

Windows XP, Windows NT 4.0, Windows 2000, Windows Me, Windows 98, Windows 95

-Requirement items

When user develops, choose newer version than below.

[Software]

-Integrated Development Environment

High Performance Embedded Workshop Version 4.09.00.007

-C compiler

C/C++ compiler package for RX family V.1.01 Release 00

[Debugger]

-Simulator

RX family Simulator Debugger V.1.01.00

5. Sample application

This section explains sample application using simulator.

This products prepares 6 kind of samples, and these samples are HEW project files.

sample 1	drawing line (sample_line.c)
sample 2	drawing rectangle (sample_rect.c)
sample 3	drawing round (sample_round.c)
sample 4	clipping (sample_clip.c)
sample 5	drawing characters (S-JIS) (sample_txt.c)
sample 6	drawing characters (EUC) (sample_txt_euc.c)

Each sample programs have common settings shown below.

- Screen size is 320x240. (width x height)
- Base coordinates of center of screen is (0,0).
 - Upper left is (-160,-120).
 - Upper right is (160,-120).
 - Lower left if (-160,120).
 - Lower right is (160,120).

5.1 sample 1: drawing line

Sample program draws 1 dot line from upper left of screen (-150,-100) to center of screen (0,0).

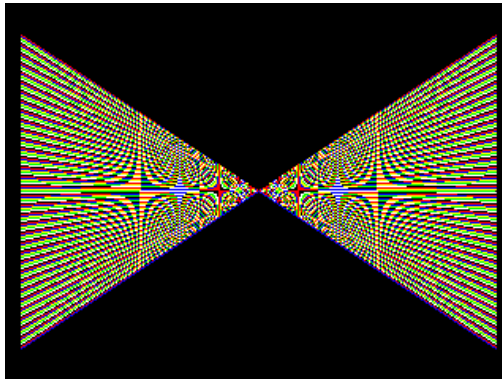
And sample program draws 1 dot line from upper right of screen (150,-100) to center of screen (0,0)

And sample program re-draws line repeatedly by each left and right Y-coordinate +1.

Line colors change by one line drawing, black -> red -> blue -> yellow -> green -> white.

* Base point (0,0) is configurable.

drawing line sample 1

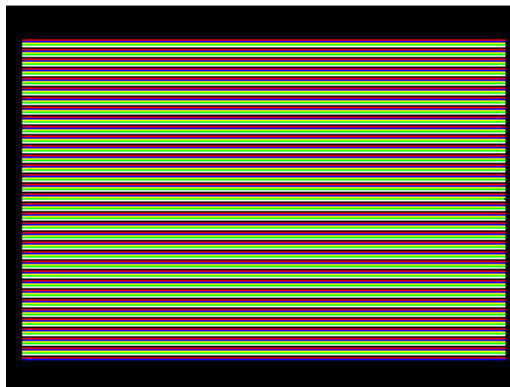


Sample program draws 1 dot line from upper left of screen (-150,-100).to upper right of screen (150,-100)

And sample program re-draws line repeatedly by each left and right Y-coordinate +1.

Line colors change by one line drawing, black -> red -> blue -> yellow -> green -> white.

drawing line sample 2

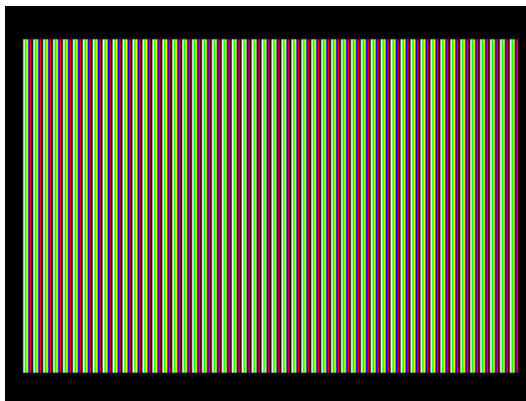


Sample program draws 1 dot line from upper right of screen (150,-100).to lower right of screen (150,100)

And sample program re-draws line repeatedly by each upper and lower X-coordinate -1.

Line colors change by one line drawing, black -> red -> blue -> yellow -> green -> white.

drawing line sample 3



Sample program draws 10 dot line from upper left of screen (-150,-100) to center of screen (0,0).

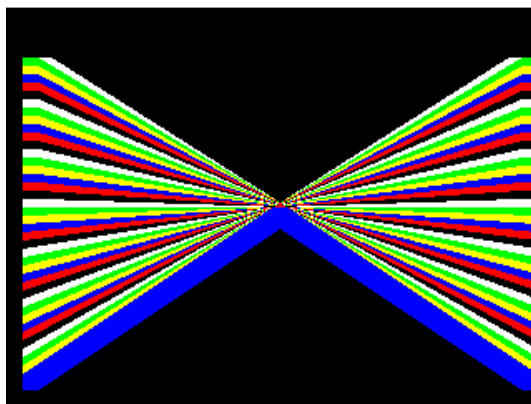
And sample program draws 10 dot line from upper right of screen (150,-100) to center of screen (0,0)

And sample program re-draws line repeatedly by each left and right Y-coordinate +5.

Line colors change by one line drawing, black -> red -> blue -> yellow -> green -> white.

* When WGP draws diagonal line which has some width,, there is some angle of the line can not maintain diagonally.

drawing line sample 4



Sample program draws 10 dot line from upper left of screen (-150,-100).to upper right of screen (150,-100)

And sample program re-draws line repeatedly by each left and right Y-coordinate +5.

Line colors change by one line drawing, black -> red -> blue -> yellow -> green -> white.

drawing line sample 5

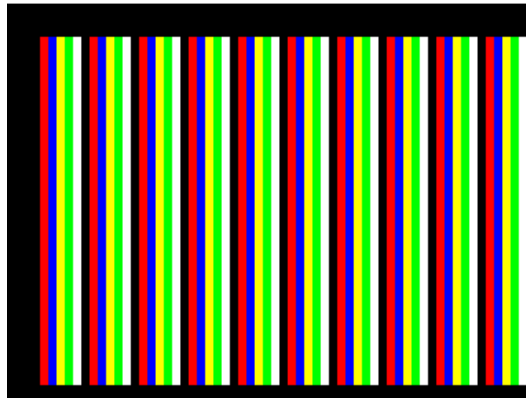


Sample program draws 10 dot line from upper right of screen (150,-100).to lower right of screen (150,100)

And sample program re-draws line repeatedly by each upper and lower X-coordinate -5.

Line colors change by one line drawing, black -> red -> blue -> yellow -> green -> white.

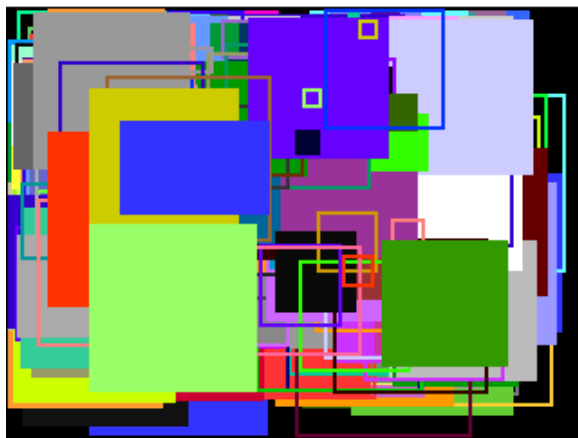
drawing line sample 6



5.2 sample 2: drawing rectangle

Sample program draws rectangle using two patterns. One is frame only, another is fill colors. Drawing place, size, colors are randomize set, and drawing repeatedly 1000 times.

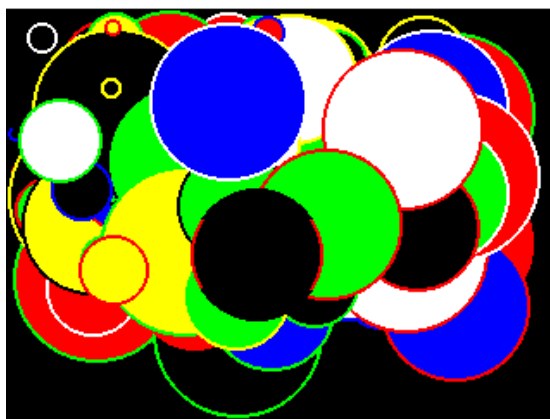
drawing rectangle sample



5.3 sample 3: drawing round

Sample program draws round using two patterns. One is frame only, another is fill colors. Drawing place, size, colors are randomize set, and drawing repeatedly 1000 times.

drawing round sample



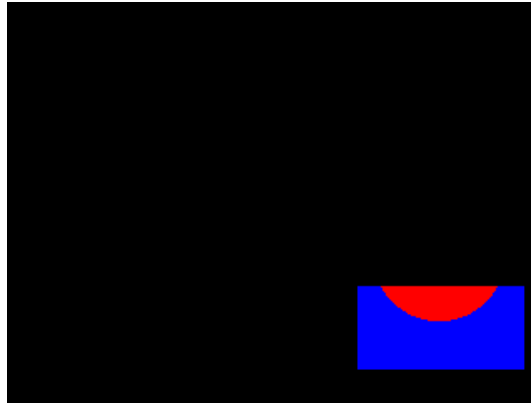
5.4 sample 4: clipping

Sample program set clipping area ((50,50) – (80,80)).

Sample program draws moving round on the clipping area.

Sample program set clipping area color is blue and round color is red.

clipping sample



5.5 sample 5-6: drawing SJIS/EUC characters

Sample program draws characters using SJIS/EUC code. Sample program draws with condition below.

1 byte code

2 byte code

each code that exist together

changes colors by 1 word

changes place of drawing in random

drawing characters



6. ROM/RAM size and stack size

[ROM] : 18190 byte

[RAM] : 0 byte

[stack size of each functions]

Library function	Stack size
_wgp_ini_dsp	4
_wgp_fin_dsp	4
_wgp_ini_env	4
_wgp_dup_env	4
_wgp_set_clp	8
_wgp_set_clr	4
_wgp_get_clr	4
_wgp_mov_org	4
_wgp_set_org	4
_wgp_get_org	4
_wgp_cnv_abs	4
_wgp_cnv_rel	4
_wgp_ini_pat	4
_wgp_set_pts	4
_wgp_fil_pnt	32
_wgp_dra_lin	148
_wgp_dra_lin0	104
_wgp_fil_rec	76
_wgp_fra_rec	48
_wgp_fil_rrc	84
_wgp_fra_rrc	156
_wgp_fra_pol	44
_wgp_fil_pole	108
_wgp_cop_bmp	112
_wgp_rst_bmp	96
_wgp_sav_bmp	144
_wgp_dra_chr	136
_wgp_dra_str	160
_wgp_dra_str16	160
_wgp_set_chc	4
_wgp_dra_txt	164
_wgp_get_twx	32
_wgp_get_txx	32
_wgp_dra_txt_sjis	164
_wgp_get_twx_sjis	32
_wgp_get_txx_sjis	32

7. WGP Section information

Section name	Type	Description
PWGP	program area	library program data
CWGP	constant data area	Initialization designation data

Website and Support

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<http://www.renesas.com/>

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Revision Record

Rev.	Date	Description	
		Page	Summary
1.00	Jun.13.11	—	First edition issued

General Precautions in the Handling of MPU/MCU Products

The following usage notes are applicable to all MPU/MCU products from Renesas. For detailed usage notes on the products covered by this manual, refer to the relevant sections of the manual. If the descriptions under General Precautions in the Handling of MPU/MCU Products and in the body of the manual differ from each other, the description in the body of the manual takes precedence.

1. Handling of Unused Pins

Handle unused pins in accord with the directions given under Handling of Unused Pins in the manual.

- The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

The state of the product is undefined at the moment when power is supplied.

- The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.

In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.

In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

Access to reserved addresses is prohibited.

- The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

After applying a reset, only release the reset line after the operating clock signal has become stable.

When switching the clock signal during program execution, wait until the target clock signal has stabilized.

- When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

5. Differences between Products

Before changing from one product to another, i.e. to one with a different type number, confirm that the change will not lead to problems.

- The characteristics of MPU/MCU in the same group but having different type numbers may differ because of the differences in internal memory capacity and layout pattern. When changing to products of different type numbers, implement a system-evaluation test for each of the products.

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Renesas Electronics Corporation

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Renesas Electronics America Inc.

2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited

1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada
Tel: +1-905-898-5441, Fax: +1-905-898-3220

Renesas Electronics Europe Limited

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-585-100, Fax: +44-1628-585-900

Renesas Electronics Europe GmbH

Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-65030, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.

7th Floor, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100083, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.

Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

Renesas Electronics Hong Kong Limited

Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2886-9318, Fax: +852-2886-9022/9044

Renesas Electronics Taiwan Co., Ltd.

13F, No. 363, Fu Shing North Road, Taipei, Taiwan
Tel: +886-2-8175-9600, Fax: +886-2-8175-9670

Renesas Electronics Singapore Pte. Ltd.

1 HarbourFront Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: +65-6213-0200, Fax: +65-6278-8001

Renesas Electronics Malaysia Sdn.Bhd.

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics Korea Co., Ltd.

11F., Samik Lavied' or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141