RT Font

RICOH
imagine. change.

Low-data-volume font
appropriate for embedding
(approx. 1/3 of TrueType Font)

What is RT Font?

Among scalable fonts, in contrast to TrueType Fonts, RT Font features low data volume, making it suitable for embedding.

RT Font is in our company's own original format so there isn't compatibility with the fonts of other companies.
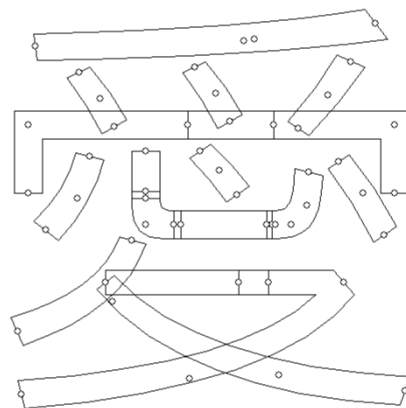
Low data volume structure

TrueType Fonts use the full outline of characters, but RT Font characters are configured with elements (parts).
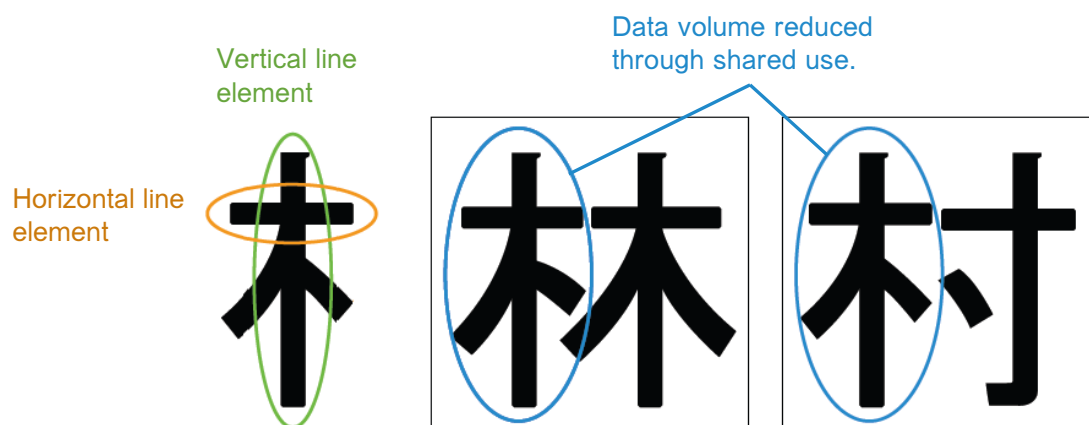
With TrueType Font   With RT Font
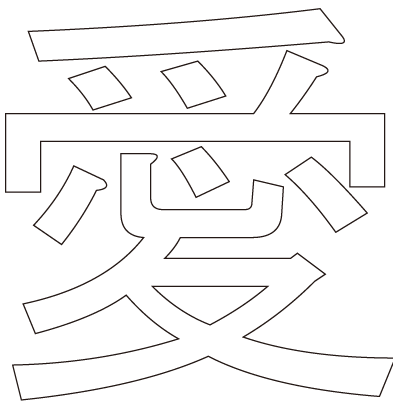
1 character exists independently   Character are configured with
as 1 unit of data.   elements (parts).

Since the elements (vertical lines, horizontal lines, "migiharai strokes," etc.) are used in all characters, data volume can be held down through the common use of kanji radicals, etc.

Data volume reduced
through shared use.

Vertical line
element

Horizontal line
element

Differences with TrueType Fonts

Weight adjustment

Using just the data for a single font, the thickness of the line (weight value) can be adjusted.

Weight value can be selected from a scale of 1 to 9.

美しい
文字

Weight 1

美しい
文字

Weight 5

美しい
文字

Weight 9
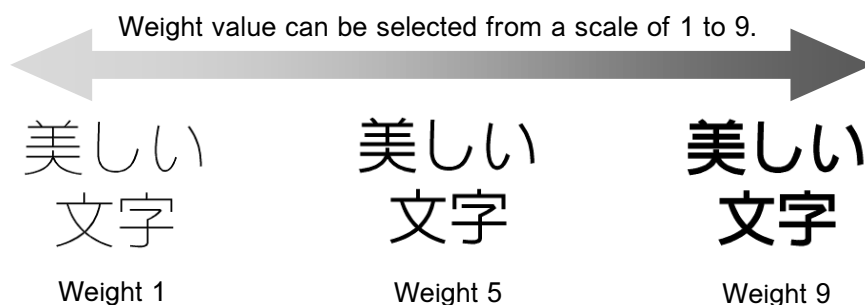
Borders

A border may be added to the rasterized image of a character to enhance its affinity with the background color (image). Border widths can also be adjusted.
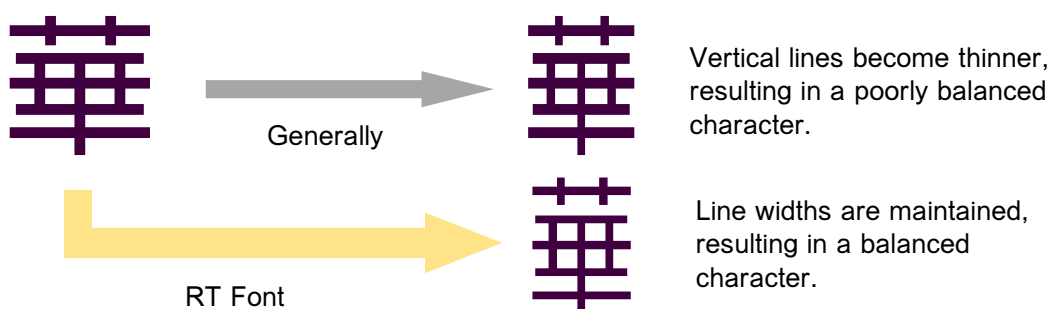
縁取り
袋文字

Border width: 1dot

縁取り
袋文字

Border width: 2dot

縁取り
袋文字

Border width: 3dot
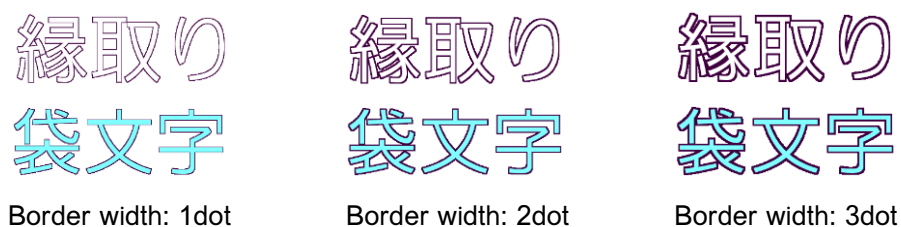
Rendering mode selection

For straight lines, you can select "Sharp Mode" for non-grayscale rendering and "Smooth Mode" for grayscale rendering.

Sharp mode
ABCあ亜草012

Smooth mode
ABCあ亜草012

Vertical/horizontal arbitrary multiplication (Sharp Mode only)

This ensures the design consistency of characters by maintaining the width balance of horizontal and vertical lines whether a character is displayed wide or narrow.

華 → 華
Generally

Vertical lines become thinner, resulting in a poorly balanced character.

華 → 華
RT Font

Line widths are maintained, resulting in a balanced character.

Other functions

Anti-aliasing (grayscale)

Characters can be represented more smoothly with the use of four- and sixteen-level grayscale display. Processing is faster with fewer levels.

Four-level grayscale 綺麗な文字

Sixteen-level grayscale 綺麗な文字

Rotation

The rasterized image of a character can be rotated in increments of one degree.

あ あ あ あ あ あ

Oblique

The upper part of the rasterized image of a character may be slanted in 1 dot increments.

あ あ あ あ あ

Cache

High-speed rendering is possible by holding the rendered character (rasterized image) in memory, and calling the character directly from memory (without rasterizing) the next time it is rendered.

Other functions

Bitmap Font replacement

The inclusion of Bitmap Font with characters forms optimized for each size makes it possible to display even small characters, such as those of 10 or 12 dots, without loss of readability.
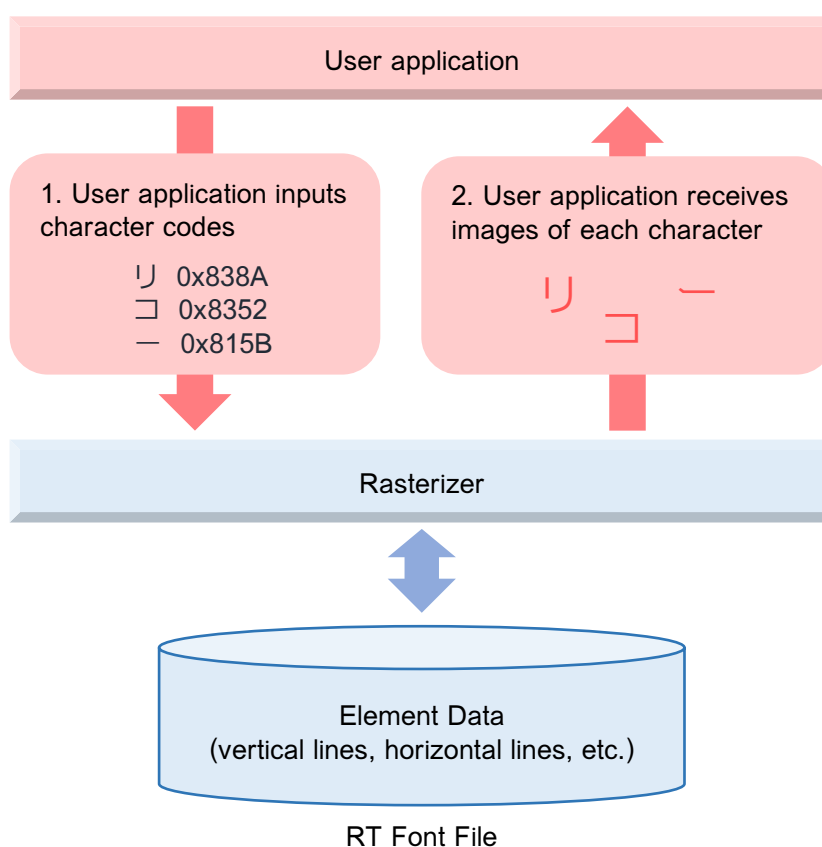
Note: Use of the bitmap replacement function increases file size by the data volume of the bitmap font.

Scalable font

Replaced bitmap font

綺麗な文字

綺麗な文字

綺麗な文字

綺麗な文字

Rasterizer

With outline fonts (RT Fonts, etc.), characters cannot be displayed using the font file alone.

It is necessary to have rasterizer software that rasterizes the font data into character images.

User application

1. User application inputs character codes

リ 0x838A
コ 0x8352
ー 0x815B

2. User application receives images of each character

リ ー
コ

Rasterizer

Element Data
(vertical lines, horizontal lines, etc.)

RT Font File

Layout Engine (option)

The Layout Engine puts individual character images in character strings. It can also do a variety of processing such as adjusting character and line spacing and rotating character strings. This software is necessary to correctly display languages with complex writing rules (Arabic, Thai, etc.).

<Arabic grammar rule processing example>

Input text character code string { 0643, 062A, 0627, 0628 }

			Final character form	Medial character form	Initial character form	Isolated character form
1.	0643	Convert to initial character form	لك	كـ	كـ	ك
2.	062A	Convert to medial character form	ـت	ـتـ	تـ	ت
3.	0627	It is a medial position, but there is no medial character form definition, so allocate the final form	ـا			ا
4.	0628	Since the previous character is final character form, next would be an initial-form character, but since there are no following characters, allocated character form	ـب	ـبـ	بـ	ب

كتاب	=	ب	+	ا	+	ـت	+	كـ
Correct word display		4. Final character form		3. Medial character form		2. Initial character form		1. Isolated character form

Ricoh's layout engine equips with Bidi (Bidirectional) Algorithm. It is a bidirectional algorithm.

When characters written left to right and characters written right to left are mixed together, there are ambiguities in the direction in which the characters should be displayed. For such cases, an algorithm defined in Unicode® is used to decide the display direction.

<Example mixing Arabic and English characters>

The writing direction of the text as a whole is the direction used by Arabic (right to left), but the numbers are written left to right.

إنجاز : 100%

The writing direction of the text as a whole is the direction used by European languages (left to right), but the portion containing Arabic characters is written right to left.

jpg.إنجاز

Ricoh's rasterizer and layout engine:
Since this is totally internally developed software, you do not have to worry about open-source license problems or quality assurance.
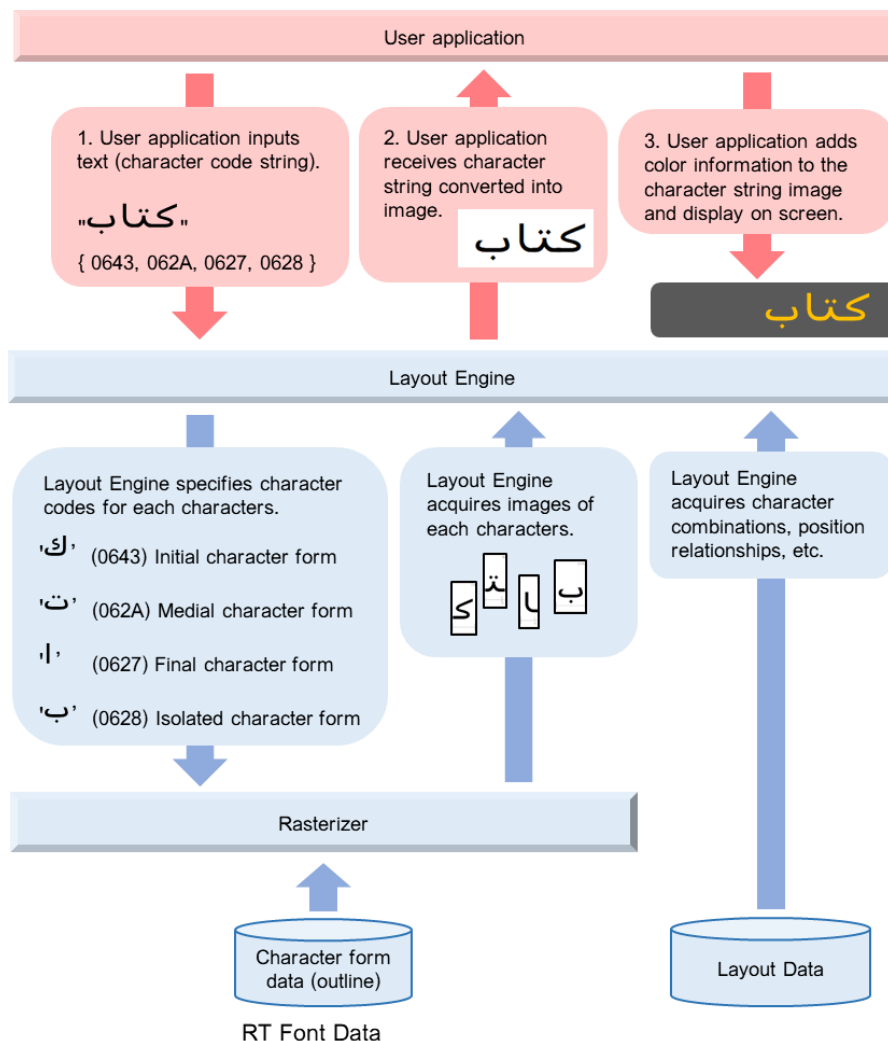Since the source code is provided, you don't have to be concerned about the development environment or execution environment.

Layout Engine (option)

Program size

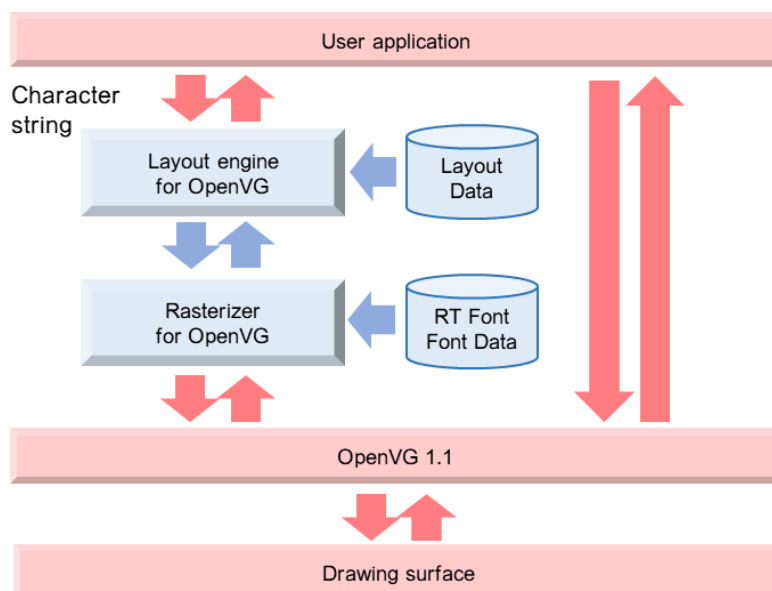| Rasterizer		52 [KB]
Layout engine		30 [KB]
Layout data	Japanese	15 [KB]
	European languages	21 [KB]
	Simplified Chinese characters	12 [KB]
	Traditional Chinese characters	12 [KB]
	Korean	12 [KB]
	Arabic	54 [KB]
	Thai	20 [KB]
	Hebrew	29 [KB]
	Vietnamese	20 [KB]
	Hindi	176 [KB]

Note: Varies depending on the environment where compiled.

User application

1. User application inputs text (character code string).

كتاب"

{ 0643, 062A, 0627, 0628 }

2. User application receives character string converted into image.

كتاب

3. User application adds color information to the character string image and display on screen.

كتاب

Layout Engine

Layout Engine specifies character codes for each characters.

'ك، (0643) Initial character form

'ت، (062A) Medial character form

'ا، (0627) Final character form

'ب، (0628) Isolated character form

Layout Engine acquires images of each characters.

Layout Engine acquires character combinations, position relationships, etc.

Rasterizer

Character form data (outline)

RT Font Data

Layout Data

OpenVG support

We can provide a rasterizer and Layout Engine that support the OpenVG1.1 API (Application Programming Interface).
For more information, please use the free consultation.   zjc_font@jp.ricoh.com

User application

Character string

Layout engine for OpenVG

Layout Data

Rasterizer for OpenVG

RT Font Font Data

OpenVG 1.1

Drawing surface

Character Set

Language	Character Set	Total Characters	Encoding (Character Code)	Typeface File size [KB]
Japanese	**CP932** JIS X 0201 Half-width (158 characters) JIS X 0208 Non-Kanji (524 characters) JIS X 0208 Kanji Level 1 (2,965 characters) JIS X 0208 Kanji Level 2 (3,390 characters) NEC special (83 characters) NEC special IBM® extension (374 characters) IBM extension (388 characters) Characters for vertical writing (108 characters)	7,990 (Including overlapping)	Shift_JIS Unicode® encoding (UTF-16)	New Gothic 632[KB] New Round Gothic 686[KB]

	CP932 + JIS X 0213:2004
	
	CP932 (7,990 characters : Including overlapping)
	
	JIS X 0213:2004 Non-Kanji (575 characters)
	  *Of 659, addition from CP932
	
	JIS X 0213:2004 Kanji Level 3 (1,071 characters)
	  *Of 1,259, addition from CP932
	
	JIS X 0213:2004 Kanji Level 4 (2,348 characters)
	  *Of 2,436, addition from CP932
		11, 984 (Including overlapping)	Shift_JIS Unicode encoding (UTF-16)
			
			In Shift_JIS, character set for CP932 only can be used.
				New Gothic 850[KB]
				New Round Gothic 908[KB]

	ARIB STD-B24 JIS X 0201 Half-width (158 characters) JIS X 0208 Non-Kanji (524 characters) JIS X 0208 Kanji Level 1 (2,965 characters) JIS X 0208 Kanji Level 2 (3,390 characters) ARIB Additional code (394 characters) ARIB Additional Kanji (137 characters) Characters for vertical writing (58 characters)	7,626	Shift_JIS Unicode encoding (UTF-16)	New Gothic 641[KB] New Round Gothic 701[KB]

[Note]
- All files shown at the above are for monospaced pitch.
- JIS X 0213
    Both character forms of JIS X 0212:2000 and JIS X 0213:2004 are loaded in Font data and either can be selected by rasterizer.
- ARIB STD-B24 set
    16 character forms of both JIS and ARIB are overlapped and either can be selected by rasterizer.

Character Set

Language	Character Set	Total Characters	Encoding (Character Code)	Typeface File size [KB]
European	CP1250 CP1251 CP1252 CP1253 CP1254 CP1257 ISO 8859-1,2,3,4,5, 7,9,10,13,14,15,16	527	Unicode encoding (UTF-16) In the case of CP1252, ISO 8859-1, etc., Local code can be used.	New Gothic 53[KB] Proportional
Simplified Chinese characters (Chinese government certification received)	GB2312-80	7,540	GB Unicode encoding (UTF-16)	New Gothic 609[KB] Monospaced
	GB18030-2005 Mandatory part	28,522		New Gothic 1,780[KB] Monospaced
Traditional Chinese characters	Big5-1984 + E-TEN	13,563 (Including overlapping)	Big5 Unicode encoding (UTF-16)	New Gothic 996[KB] Monospaced
Korean	KS X 1001:2004 (Without hanja) + KS X 1003-1993	3,434	KS (EUC-KR) Unicode encoding (UTF-16)	New Gothic 235[KB] Monospaced
Arabic	CP1256	223	CP1256	Sans Serif 47[KB] Proportional
	CP1256 + 137 characters (Supports Persian)	360	Unicode encoding (UTF-16)	
Hebrew	CP1255	200	CP1255	Sans Serif 52[KB] Proportional
	CP1255 + 82 characters	282	Unicode encoding (UTF-16)	
Thai	CP874	192	CP874 Unicode encoding (UTF-16)	PhSansThai_RT 120[KB] Proportional
Vietnamese	CP1258	214	CP1258	Sans Serif 37[KB] Proportional
	CP1258 + 110 characters	324	Unicode encoding (UTF-16)	
Hindi	Unicode Devanagari defined characters	155	Unicode encoding (UTF-16)	Sans Serif 74[KB] Proportional

Japanese

New Gothic   UD font

愛の広がる美しいフォント

New Round Gothic   UD font

愛の広がる美しいフォント

European languages

New Gothic   UD font

Beautiful typeface

Simplified Chinese characters

Chinese government certification received

New Gothic   UD font

美丽的字体

Traditional Chinese characters

New Gothic   UD font

美麗的字體

Korean

New Gothic   UD font

아름다운 서체

Arabic   (Layout Engine required)

Sans Serif

محرف جميل

Thai   (Layout Engine required)

PhSansThai_RT

แบบอักษรที่สวยงาม

Hebrew   (Layout Engine required)

Sans Serif

גופן יפה

Vietnamese   (Layout Engine required)

Sans Serif

Kiểu chữ đẹp

Hindi   (Layout Engine required)

Sans Serif

सुंदर टाइपफेस

RICOH
imagine. change.

RICOH Industrial Solutions Inc.
Font Section

| Free consultation | zjc_font@jp.ricoh.com |
| Web site | http://industry.ricoh.com/font/ |