Source Han Mono Version 1.002

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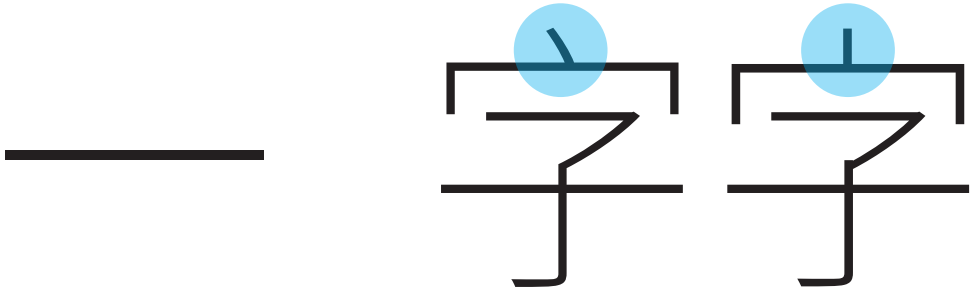
Overview

Source Han Mono, modeled after Source Han Code JP, is a monospaced Pan-CJK typeface family that was derived from Source Han Sans and Source Code Pro, designed by Ryoko Nishizuka (西塚涼子) and Paul D. Hunt, respectively. It is offered in seven different weights—EL (ExtraLight), L (Light), N (Normal), Regular, M (Medium), **Bold**, and **H** (Heavy)—and as a single 70-font Super OpenType/CFF Collection (Super OTC).

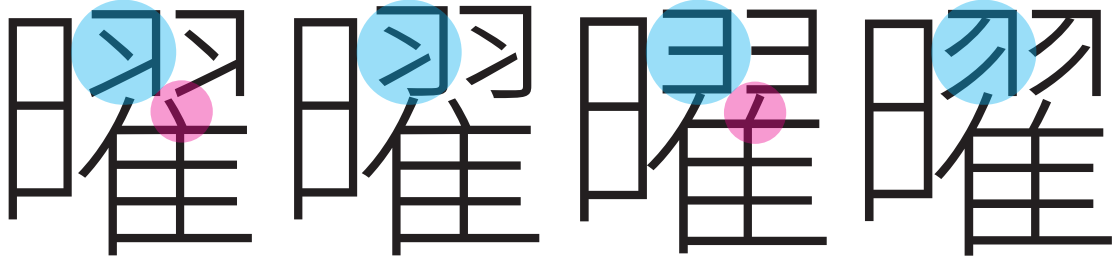
Pan-CJK fonts, such as those provided by the *Source Han* typeface families, are intended to support and render the most important characters for Simplified Chinese, Traditional Chinese, Japanese, and Korean. The samples on this page demonstrate that the differences for each language can be subtle or striking, depending on the ideograph, yet they all clearly share the same typeface style, design, weight, and other characteristics that are not necessarily tied to a particular language.

The first sample shows the completely shared form of U+4E00, along with the shared Simplified/Traditional Chinese and shared Japanese/Korean forms of U+5B57:



The second sample below shows, from left to right, the Simplified Chinese form of U+9AA8, its Traditional Chinese (Taiwan) form, and the form shared by Traditional Chinese (Hong Kong), Japanese, and Korean:

The third sample shows, also from left to right, the almost completely unshared Simplified Chinese, Traditional Chinese (Taiwan and Hong Kong), Japanese, and Korean forms of U+66DC:



The fourth and final example shows, again from left to right, the completely unshared Simplified Chinese, Traditional Chinese (Taiwan), Traditional Chinese (Hong Kong), Japanese, and Korean forms of U+8FD4:

The passage shown below is *Genesis 11:1* (创世记 11:1 in Simplified Chinese, 創世記 11:1 in Traditional Chinese, 創世記 11:1 in Japanese, and 창세기 11:1 in Korean) displayed in six languages, in three of the seven weights, and using both styles:

EL & EL Italic

Now the whole world had one language and a common speech.
Now the whole world had one language and a common speech.
那时，天下人的口音、言语都是一样。
那時，天下人的口音、言語都是一樣。
那時，天下人的口音、言語都是一樣。
全地は同じ発音、同じ言葉であった。
온 땅의 구음이 하나이요 언어가 하나이었더라.

Regular & Italic

Now the whole world had one language and a common speech.
Now the whole world had one language and a common speech.
那时，天下人的口音、言语都是一样。
那時，天下人的口音、言語都是一樣。
那時，天下人的口音、言語都是一樣。
全地は同じ発音、同じ言葉であった。
온 땅의 구음이 하나이요 언어가 하나이었더라.

H & H Italic

Now the whole world had one language and a common speech.
Now the whole world had one language and a common speech.
那时，天下人的口音、言语都是一样。
那時，天下人的口音、言語都是一樣。
那時，天下人的口音、言語都是一樣。
全地は同じ発音、同じ言葉であった。
온 땅의 구음이 하나이요 언어가 하나이었더라.

The use of these open source Pan-CJK fonts and their sources is covered under the terms of the SIL Open Font License, Version 1.1.

The pages that follow provide excruciating technical details about the font resource that is included in this open source project, and the information corresponds to Version 1.002.

Configuration

Source Han Mono is provided in only one deployment format, which is a 70-font Super OpenType/CFF Collection (Super OTC). This “all in one” deployment format packs all seven weights, all five languages, and both styles into a single font resource that includes a total of 70 font instances and 458,745 total glyphs. As a result of 'sfnt' table sharing, there are seven unique 'CFF ', 'hmtx', and 'vmtx' tables (one per weight), 10 unique 'GSUB' tables (one per language/style), and 10 unique 'cmap' tables (one per language/style). These represent the largest tables, and the greater sharing resulted in a 15MB-smaller overall footprint compared to a per-weight OTC deployment. While each font instance necessarily specifies a default language, the 'locl' (*Localized Forms*) GSUB feature can also be used to access the glyphs for the four other supported languages.

> *Users of this deployment format simply choose the appropriate font in an app’s font menu, and the glyphs that are suitable for that language are displayed. Windows 10 Anniversary Update (Version 1607, released on 2016-08-02), OS X Version 10.8, iOS Version 7.0, and Adobe CS6 apps represent the first environments that support this particular deployment format. Please be aware that while Windows 10 Anniversary Update (Version 1607) is the first version of Windows OS to support OTCs, Windows 10 Creators Update (Version 1703, released on 2017-04-05) is necessary to support this Super OTC, due to its large number of font instances.*

Font Resources

The table below lists the single font resource that is included in this release, providing its file and PostScript names (the order of the fonts in the fourth column represents the actual order of the fonts in the font resource):

File Name	PostScript Names
SourceHanMono.ttc	SourceHanMono-ExtraLight, SourceHanMono-ExtraLightIt, SourceHanMonoK-ExtraLight, SourceHanMonoK-ExtraLightIt, SourceHanMonoSC-ExtraLight, SourceHanMonoSC-ExtraLightIt, SourceHanMonoTC-ExtraLight, SourceHanMonoTC-ExtraLightIt, SourceHanMonoHC-ExtraLight, SourceHanMonoHC-ExtraLightIt, SourceHanMono-Light, SourceHanMono-LightIt, SourceHanMonoK-Light, SourceHanMonoK-LightIt, SourceHanMonoSC-Light, SourceHanMonoSC-LightIt, SourceHanMonoTC-Light, SourceHanMonoTC-LightIt, SourceHanMonoHC-Light, SourceHanMonoHC-LightIt, SourceHanMono-Normal, SourceHanMono-NormalIt, SourceHanMonoK-Normal, SourceHanMonoK-NormalIt, SourceHanMonoSC-Normal, SourceHanMonoSC-NormalIt, SourceHanMonoTC-Normal, SourceHanMonoTC-NormalIt, SourceHanMonoHC-Normal, SourceHanMonoHC-NormalIt, SourceHanMono-Regular, SourceHanMono-RegularIt, SourceHanMonoK-Regular, SourceHanMonoK-RegularIt, SourceHanMonoSC-Regular, SourceHanMonoSC-RegularIt, SourceHanMonoTC-Regular, SourceHanMonoTC-RegularIt, SourceHanMonoHC-Regular, SourceHanMonoHC-RegularIt, **SourceHanMono-Medium**, **SourceHanMono-MediumIt**, **SourceHanMonoK-Medium**, **SourceHanMonoK-MediumIt**, **SourceHanMonoSC-Medium**, **SourceHanMonoSC-MediumIt**, **SourceHanMonoTC-Medium**, **SourceHanMonoTC-MediumIt**, **SourceHanMonoHC-Medium**, **SourceHanMonoHC-MediumIt**, **SourceHanMono-Bold**, **SourceHanMono-BoldIt**, **SourceHanMonoK-Bold**, **SourceHanMonoK-BoldIt**, **SourceHanMonoSC-Bold**, **SourceHanMonoSC-BoldIt**, **SourceHanMonoTC-Bold**, **SourceHanMonoTC-BoldIt**, **SourceHanMonoHC-Bold**, **SourceHanMonoHC-BoldIt**, **SourceHanMono-Heavy**, **SourceHanMono-HeavyIt**, **SourceHanMonoK-Heavy**, **SourceHanMonoK-HeavyIt**, **SourceHanMonoSC-Heavy**, **SourceHanMonoSC-HeavyIt**, **SourceHanMonoTC-Heavy**, **SourceHanMonoTC-HeavyIt**, **SourceHanMonoHC-Heavy**, **SourceHanMonoHC-HeavyIt**

Glyph Set Particulars

Glyph Set

The number of glyphs in each font instances is 65,535 (CIDs 0 through 65534), which is at the architectural limit for CID-keyed fonts (65,535 glyphs).

The ordering file, *AI0-SourceHanMono*, which is provided in the Resources folder of this open source project, lists all 65,535 CIDs in the first column, and shows the FDArray and row font structure in the second and third columns, respectively, along with the Unicode-based working glyph names in the fourth column. All 65,535 working glyph names are unique, and all—with the exception of the ones for CID+0 (the *.notdef* glyph) and CIDs 65332 through 65534—use a “uni” (BMP) or “u” (outside BMP) prefix followed by uppercase hexadecimal digits. Glyphs that are represented by (or can be considered) sequences are made up of concatenations of the appropriate Unicode-based glyph names. Identifiers for regions and other purposes are also used.

Weights

The table below shows sample glyphs in each of the seven weights, ranging from EL (ExtraLight) to H (Heavy). The EL and H weights represent the master designs, and

the five intermediate weights are the result of multiple master interpolation (the interpolation ratios are provided):

EL–0	L–160	N–320	Regular–420	M–560	Bold–780	H–1000
汉漢 漢한	汉漢 漢한	汉漢 漢한	汉漢 漢한	汉漢 漢한	汉漢 漢한	汉漢 漢한

Glyph Complement PDFs

Included in the GlyphComplements folder of this open source project are seven per-weight 4,022-page glyph complement PDFs that provide a visual synopsis for all 65,535 glyphs, along with Unicode tables for each of the five languages: Japanese, Korean, Simplified Chinese, Traditional Chinese (Taiwan), and Traditional Chinese (Hong Kong).

Pp 1 through 132 show all 65,535 glyphs by CID.

For the 10 bookmarked 389-page Unicode tables, for each code point that maps to a glyph, there are three types of annotations, described as follows according to their position relative to the code-point box:

Upper-Left—Glyph width: **F** = Full-width, **I** = Monospaced Italic, **M** = Monospaced, **Z** = Zero (non-spacing/combining)

Upper-Right—Language (Region): **C** = Simplified Chinese (China), **H** = Traditional Chinese (Hong Kong), **J** = Japanese, **K** = Korean, **T** = Traditional Chinese (Taiwan)

Bottom—The CID of the glyph

Glyphs that are non-spacing/combining (Z) may appear outside the glyph or code-point box, which include those for U+20DD, U+20DE, U+302A through U+302D, U+3099, and U+309A, along with those for combining jamo.

Unencoded Glyphs

Ignoring code points that share different Simplified Chinese, Traditional Chinese, Japanese, Korean, and proportional/half-width glyphs, there are 2,903 unencoded glyphs in each 65,535-glyph font resource.

Approximately one-third of the unencoded glyphs are Japanese ideographs (kanji), all of which represent kanji included in Adobe-Japan1-7. Some of these have been explicitly identified as JIS90 (JIS X 0208-1990) glyphs according to their source glyph names (CIDs 61929 through 62097; 169 glyphs) and are reflected in the 'jp90' GSUB feature that is specific to Japanese fonts and font instances, and the remainder have been identified according to their registered IVSes (CIDs 62098 through 63140; 1,043 glyphs) in the *Adobe-Japan1* IVD (Ideographic Variation Database) Collection, and are reflected in the Format 14 'cmap' subtable in the same fonts and font instances.

The bulk of the remaining unencoded glyphs are the glyphs for combining jamo, vertical forms, and a small number of other variants.

Latin, Greek & Cyrillic Glyphs

Included in all font resources is a rich set of Latin glyphs that support not only ASCII and ISO/IEC 8859-1 (aka ISO Latin 1), but also the characters that are necessary for broadly-used CJK transliteration and transcription systems, along with

those that are necessary for Latin-based Vietnamese. A basic set of glyphs for Greek and Cyrillic is also included.

Source Han Mono Versus Source Code Pro

The monospaced Latin, Greek, and Cyrillic glyphs in *Source Han Mono* are derived from Source Code Pro. There are two primary differences between the glyphs that are common in *Source Han Mono* and *Source Code Pro*:

- The interpolation ratios for the weights are different. *Source Han Mono* is available in seven weights and two styles: EL (*EL Italic*), L (*L Italic*), N (*N Italic*), Regular (*Italic*), M (*M Italic*), Bold (*Bold Italic*), and H (*H Italic*). *Source Code Pro* is also available in seven weights and two styles, though with different names for most of them: ExtraLight (*ExtraLight Italic*), Light (*Light Italic*), Regular (*Italic*), Medium (*Medium Italic*), Semibold (*Semibold Italic*), Bold (*Bold Italic*), and Black (*Black Italic*). While some of the weight names are the same, even in abbreviated form, one should not assume that the interpolation ratios are the same. They will be relatively close, but not precisely the same.
- The glyphs that are derived from *Source Code Pro* have been adapted for use in *Source Han Mono* by scaling them to 111.2%, which resulted in 667-unit horizontal advances. The *Source Han Mono* glyphs therefore appear to be slightly larger than those in *Source Code Pro*. Masataka Hattori (服部正貴) originally came up with the idea to adapt the *Source Code Pro* glyphs in this way for Source Han Code JP.

The table below compares *Source Han Mono* with *Source Code Pro* for three weights—EL/ExtraLight, Regular, and H/Black—and both styles:

Weight	Source Han Mono ↔ Source Code Pro
EL/ExtraLight	Unicode Version 12.1 ↔ Unicode Version 12.1
	Unicode Version 12.1 ↔ *Unicode Version 12.1*
Regular	Unicode Version 12.1 ↔ Unicode Version 12.1
	Unicode Version 12.1 ↔ *Unicode Version 12.1*
H/Black	**Unicode Version 12.1** ↔ **Unicode Version 12.1**
	Unicode Version 12.1 ↔ ***Unicode Version 12.1***

Upright Versus Italic

Source Han Mono includes 551 Latin, Greek, and Cyrillic glyphs that were derived from *Source Code Pro*. The only characters with proportional-width glyphs in *Source Han Sans* that are not included are for U+FB00, U+FB03, U+FB04, and U+1F16A through U+1F16C.

Also included are 410 *italic* glyphs that were derived from *Source Code Pro*. In addition to the lack of *italic* glyphs for the Greek and Cyrillic scripts, except for U+03C0 *π* (Greek), the glyphs for the following 26 characters are provided only in upright form for space-efficiency, and because the upright and *italic* glyphs are identical in *Source Code Pro*: U+0020 (*space*), U+002B +, U+003C <, U+003D =, U+003E >, U+007C |, U+007E ~, U+00A6 ¦, U+00AC ¬, U+00B1 ±, U+00D7 ×, U+00F7 ÷, U+2016 ‖, U+212E ℮, U+2190 ←, U+2191 ↑, U+2192 →, U+2193 ↓, U+2194 ↔, U+2195 ↕, U+2196 ↖, U+2197 ↗, U+2198 ↘, U+2199 ↙, U+2212 −, and U+2713 ✓.

The *italic* glyphs are accessible via two mechanisms:

- By selecting an *italic*-style font, either by explicitly selecting the font or via an “Italic” style button that is provided by some apps.
- By enabling the 'ital' (*Italics*) GSUB feature, which is included in the non-*italic* fonts.

Anisotropic Techniques

One of the requirements for *Source Han Mono* was that all glyphs must have one of three horizontal advances: 0 (zero), 667, or 1000 units. For the glyphs derived from *Source Code Pro* that were scaled to become 667 units, this was not an issue, nor was it an issue for the glyphs for kana, ideographs, punctuation, and most symbols. Two particular glyph classes presented a challenge: half-width katakana with 500-unit horizontal advances, and hangul letters and syllables with 920-unit horizontal advances.

Anisotropic techniques, which can preserve vertical stem weights, were used to horizontally-expand the half-width katakana masters to 667 units, and the same techniques were applied to the masters for the hangul letters and syllables, to make them 1000 units. A small number of additional glyphs required similar treatment. The Version 1.001 font instances included improved glyphs for half-width katakana that were retouched by the designer.

Vertical Glyphs

The usual and expected set of vertical glyphs is included, some of which are region- or language-specific. In addition, all glyphs for kana, meaning not only those for small kana, include a vertical glyph variant. A small number of vertical glyphs happen to be encoded for compatibility reasons, most of which can be found in the U+FE*xx* range, but they are still accessible via the 'vert' GSUB feature as vertical variants of the horizontal forms that are encoded elsewhere.

The pre-rotated non-full-width glyphs that are typically accessible via the effectively-deprecated 'vrt2' GSUB feature have been intentionally excluded from the glyph set.

CIDFont Resource & CFF Particulars

CIDFont Resource Structure

The source font resources that include 65,535 glyphs began their life as an *Adobe-Identity-0* ROS CIDFont resource that includes 18 FDArray elements, each of which specifies its own hinting parameters. The table below shows the names of each of the 18 FDArray elements, its index, the CIDs and CID ranges that are included, and the total number of glyphs:

FDArray Name	Index	CIDs & CID Ranges	Glyphs
Alphabetic	0	59117-59142, 59149-59174	52
AlphabeticDigits	1	960-979, 59100-59109, 59252-59262	41
Bopomofo	2	1647-1689, 1799-1826, 64779	72

FDArray Name	Index	CIDs & CID Ranges	Glyphs
Dingbats	3	245-253, 255-256, 724, 735, 743, 745, 749, 754-761, 764, 766-768, 770-771, 806-832, 834-918, 920-959, 980-1079, 1240-1287, 1289-1294, 1296-1330, 1332-1356, 1384-1457, 1544-1547, 1551, 1642, 1783-1798, 1879-2438, 59017-59099, 59110-59116, 59143-59148, 59175-59179, 59243-59249, 59263-59293, 59295-59508, 63172-63183, 63195-63221, 64579-64593, 64680-64681, 64685, 64796-64897	1,564
DingbatsDigits	4	772-795	24
Generic	5	0, 1080-1239, 1288, 1295, 65332-65534	366
HDingbats	6	59250-59251	2
HKana	7	59180-59242	63
Hangul	8	372-627, 1690-1782, 47623-58895, 63222-64578	12,979
Ideographs	9	1357-1383, 1827-1862, 2439-47622, 58896-59014, 59509-61896, 61929-63140	48,966
Italic	10	64922-65290	369
ItalicCJK	11	65291-65320	30
ItalicDigits	12	65321-65331	11
Kana	13	1458-1543, 1548-1550, 1552-1641, 1643-1646, 1863-1878, 61905-61928	223
Monospace	14	1-244, 254, 257-371, 628-723, 725-734, 736-742, 744, 746-748, 750-753, 762-763, 765, 769, 796-805, 833, 919, 1331, 59015-59016, 59294, 61897-61904, 63141	510
MonospaceCJK	15	63142-63171	30
MonospaceDigits	16	63184-63194	11
VKana	17	64594-64679, 64682-64684, 64686-64778, 64780-64795, 64898-64921	222

CFF Subroutinization

All 'CFF ' tables have been subroutinized. The size savings ranges anywhere from 1.5 to 3MB for the source 65,535-glyph OTFs. The EL weight exhibits the greatest size savings.

The AFDKO *tx* tool and its “-cff +S -no_futile” command-line options were used to convert the CIDFont resources into subroutinized CFFs. The latest subroutinizer in *tx* is almost three orders of magnitude faster than the one that is currently in *makeotf*, meaning that the process takes a small number of minutes instead of several hours. The resulting subroutinized CFFs were subsequently spliced into the source 'sfnt' font resources (aka OpenType/CFF fonts) using the *sfntedit* tool.

Unicode Particulars

Unicode Mappings

The Format 12 (UTF-32) 'cmap' subtable for each language and style specifies 44,798 meaningful mappings. Note that some glyphs map from multiple code points, such as the range U+2F00 through U+2FD5, along with a large chunk of the CJK Compatibility Ideographs. When the ten UTF-32 CMap resources are combined, a total of 62,632 glyphs are covered, which leaves 2,903 glyphs as being not directly unencoded. One

of the mappings, U+31BB, is expected to be included in Unicode Version 13.0 (2020), but has been deemed stable enough to implement.

In addition to the ideographs for which there are obviously a large number of language-specific glyphs, the following code points also exhibit language-specific variation:

Unicode	Simplified Chinese	Traditional Chinese	Japanese	Korean
U+2018	‘	‘	‘	‘
U+2019	’	’	’	’
U+201C	“	“	“	“
U+201D	”	”	”	”
U+2264	≦	≤	≤	≤
U+2265	≧	≥	≥	≥
U+226E	≮	≮	≮	≮
U+226F	≯	≯	≯	≯
U+3001	、	、	、	、
U+3002	。	。	。	。
U+FF01	！	！	！	！
U+FF0C	，	，	，	，
U+FF0E	．	．	．	．
U+FF1A	：	：	：	：
U+FF1B	；	；	；	；
U+FF1F	？	？	？	？

Included in the Resources folder of this open source project are the raw (aka human-readable, with one mapping per line) UTF-32 mapping files—named *utf32-cn.map*, *utf32-tw.map*, *utf32-hk.map*, *utf32-jp.map*, and *utf32-kr.map*—that are used to compile the UTF-32 CMap resources that the AFDKO *makeotf* tool uses to generate the Format 12 (UTF-32) 'cmap' subtables. Corresponding *italic* versions are also provided that differ by 364 mappings.

Matching UTF-16 CMap resources, which should not be used to build the OpenType/CFF fonts, are also provided in the Resources folder of this open source project for good measure.

Unicode Coverage

In addition to complete URO (*Unified Repertoire & Ordering*; up through U+9FEF for Unicode Version 12.0), Extension A, and modern hangul syllable coverage, the

65,535-glyph font resources completely cover the following 256-character Unicode blocks: U+00*xx*, U+11*xx*, U+2F*xx* through U+33*xx* (except for U+332C), U+D7*xx*, U+FF*xx*, U+1F1*xx* (except for U+1F16A through U+1F16C and U+1F1E6 through U+1F1FF), and U+1F2*xx* (except for U+1F260 through U+1F265).

CJK Unified Ideographs Extension G

Although CJK Unified Ideographs Extension G (aka IRG Working Set 2015) is not yet encoded, and therefore its tentative Plane 3 code points are not yet stable, all font instances include glyphs for four of its ideographs.

The table below lists these four ideographs by providing their IRG Working Set 2015 serial numbers (their source references are in parentheses), their language-specific forms, and the IDSes (*Ideographic Description Sequences*) that can be used to access their glyphs via the 'ccmp' GSUB feature that is generally enabled in most apps:

IRG	CN	TW	HK	JP	KR	IDS
02063 (UTC-01200)	KR	KR	KR	KR	恩	⿰氵恩
04318 (UTC-01312)	邐	CN	CN	CN	CN	⿺辶⿱穴⿰月⿱幺⿱幺长⿰言马⿱幺长 ⿰心
04319 (UTC-00791)	邐	HK	邐	邐	邐	⿺辶⿱穴⿰月⿱幺⿱幺長⿰言馬⿱幺長 ⿰心
04752 (UK-02960)	龘	龘	龘	龘	JP	⿱雲⿰雲龍雲⿰龍龍

For those who wish to repurpose the IDSes in the last column of the above table, please be aware that there is a U+200A HAIR SPACE character immediately after the first IDC (*Ideographic Description Character*), which was necessary to prevent the 'ccmp' GSUB from being invoked, and as a result, the IDS is visible. Instead, simply select and copy the desired ideograph from the CN, TW, HK, JP, or KR column in the above table, which will copy the underlying three-, nine-, or 19-character IDS, then repurpose in other apps.

Unicode Variation Sequences

All font resources include 16 SVSes (*Standardized Variation Sequences*) that correspond to eight full-width CJK punctuation characters, and can be used to explicitly invoke them, thereby overriding the default glyphs. These SVSes were included in Unicode Version 12.0 (2019). The table below lists these SVSes and the glyphs that correspond to them:

Unicode	VS1 (U+FE00)—Corner-Justified Form	VS2 (U+FE01)—Centered Form
U+3001	あ汉、汉あ	永、永
U+3002	あ汉。汉あ	永。永
U+FF01	汉！汉	あ永！永あ
U+FF0C	あ汉，汉あ	永，永
U+FF0E	あ汉．汉あ	永・永
U+FF1A	汉：汉	あ永：永あ
U+FF1B	汉；汉	あ永；永あ
U+FF1F	汉？汉	あ永？永あ

The use of these SVSes is meant as a “plain text” alternative to language-tagging in order to achieve the same results, which means that subsequent language-tagging of such text, explicit or otherwise, will override the results in potentially unpredictable ways. In other words, these SVSes should be considered a last-resort means of displaying particular forms of these full-width CJK punctuation characters. Also see the table that starts on page 21 to learn how these eight full-width CJK punctuation characters are expected to behave in vertical writing mode.

Each Simplified Chinese font instance additionally includes nine SVSes that correspond to nine of the 1,002 Standardized Variants that were introduced in Unicode Version 6.3. Six of these SVSes are default (directly encoded). 14 of its 26 total UVSes are default, and the remaining 12 are non-default. The provided *SourceHanMono_CN_sequences.txt* and *SourceHanMono_CN_sequences_italic.txt* files specify the UVSes.

Each Traditional Chinese (Taiwan) font instance additionally includes two SVSes that correspond to two of the 1,002 Standardized Variants that were introduced in Unicode Version 6.3. Both of these SVSes are default (directly encoded). 10 of its 19 total UVSes are default, and the remaining nine are non-default. The provided *SourceHanMono_TW_sequences.txt* and *SourceHanMono_TW_sequences_italic.txt* files specify the UVSes.

Each Traditional Chinese (Hong Kong) font instance additionally includes 14 SVSes that correspond to 14 of the 1,002 Standardized Variants that were introduced in Unicode Version 6.3. 10 of its 31 total UVSes are default, and the remaining 21 are non-default. The provided *SourceHanMono_HK_sequences.txt* and *SourceHanMono_HK_sequences_italic.txt* files specify the UVSes.

All IVSes from the registered Adobe-Japan1 IVD Collection—except for <6CE8 E0102> (Adobe-Japan1-7 CID+12869), which is excluded because it is outside the scope of the *Source Han Mono* glyph set—are specified in the Format 14 'cmap' subtable of each Japanese font and font instance, along with 89 of the 1,002 Standardized Variants that were introduced in Unicode Version 6.3. This means that 14,682 *Adobe-Japan1* IVSes and 106 SVSes are included. 13,319 of these UVSes are default, meaning that the glyph is directly encoded, and the remaining 1,469 are non-de-

fault (unencoded or encoded in a CJK Compatibility Ideograph block, at least for Japanese font instances). The provided *SourceHanMono_JP_sequences.txt* and *SourceHanMono_JP_sequences.txt* files specify the UVSes.

Each Korean font instance additionally includes 270 SVSes that correspond to 270 of the 1,002 Standardized Variants that were introduced in Unicode Version 6.3. All of these SVSes are default (directly encoded). The 36 IVSes from the registered KRName IVD Collection are also supported. 293 of its 323 total UVSes are default, and the remaining 30 are non-default. The provided *SourceHanMono_KR_sequences.txt* and *SourceHanMono_KR_sequences_italic.txt* files specify the UVSes.

Glyph Sharing Statistics

One of the defining characteristics of Pan-CJK typeface designs is the significant sharing of glyphs across its supported languages. However, in order to honor regional conventions, some code points, in particular those for ideographs, may require more than one glyph per code point. Of course, the URO exhibits the greatest variation, in terms of including a large number of code points that require multiple language-specific glyphs. In general, as one progresses through the CJK Unified Ideograph extensions, from Extension A through Extension F, the number of code points that require multiple language-specific glyphs diminishes.

The table below lists several code point categories, and shows how many glyphs are used to represent the 44,798 code points:

			CJK Unified Ideograph Extensions						
		URO	A	B	C	D	E	F	Other
Glyphs	1	8,783	6,123	2,080	47	34	112	5	14,694
	2	7,642	447	28					191
	3	3,737	12						48
	4	746							1
	5	68							

Of particular interest should be the 68 highlighted URO code points that have five unique glyphs, one per language. The table below shows these 68 ideographs for each of the five supported languages:

Simplified Chinese	傑僭割劘匾叟喝塌姿贏幰廋扇扉搧摩榻 溲潛瀛瘦瞎磨窖竇箭篠簉糙綢蠶羸翁翦 翩肓贏艘花裯褐謁譖豁贏轄返迷途造週 遍遭選遼鄰釁閥雕靠靡颼飯驎鬣魔麗麟
Traditional Chinese–Taiwan	傑僭割劘匾叟喝塌姿贏幰廋扇扉搧摩榻 溲潛瀛瘦瞎磨窖竇箭篠簉糙綢蠶羸翁翦 翩肓贏艘花裯褐謁譖豁贏轄返迷途造週 遍遭選遼鄰釁閥雕靠靡颼飯驎鬣魔麗麟

Traditional Chinese–Hong Kong	傑僭割廱匾叟喝塌姿嬴幰廋扇扉搧摩榻 溲潛瀛瘦瞎磨窖竇箭篠簉糙綢蠶羸翁翦 翩肯贏艘花裯褐謁譖豁贏轄返迷途造週 遍遭選遼鄰釁閥雕靠靡颼飯驎鬣魔麗麟
Japanese	傑僭割廱匾叟喝塌姿嬴幰廋扇扉搧摩榻 溲潛瀛瘦瞎磨窖竇箭篠簉糙綢蠶羸翁翦 翩肯贏艘花裯褐謁譖豁贏轄返迷途造週 遍遭選遼鄰釁閥雕靠靡颼飯驎鬣魔麗麟
Korean	傑僭割廱匾叟喝塌姿嬴幰廋扇扉搧摩榻 溲潛瀛瘦瞎磨窖竇箭篠簉糙綢蠶羸翁翦 翩肯贏艘花裯褐謁譖豁贏轄返迷途造週 遍遭選遼鄰釁閥雕靠靡颼飯驎鬣魔麗麟

The Resources folder of this open source project includes a two-sheet and six-column spreadsheet, named *region-map.xlsx*, which shows the glyphs that are used for each code point. The first sheet covers the URO (U+4E00 through U+9FEF), and the second one covers Extension A (U+3400 through U+4DB5). In order to make clear whether a glyph is shared, and with what language or languages, the primary language of the glyph is shown instead of the glyph itself. For only the KR, TW, and HK columns, if a code point is outside the scope of the KS standards, Big Five, or Big Five plus HKSCS-2016, respectively, a “#” is shown after the region code to indicate that the code point is outside the scope of those particular standards. The same data is also provided in “plain text” (UTF-8) format as the file named *region-map-utf8.txt*.

UAX #50 Compliance

Source Han Mono is one of the first font implementations that is compliant with UAX #50 (*Unicode Vertical Text Layout*). Only the substitutions in the 'vert' GSUB feature are expected to be used, and the 'vrt2' GSUB feature, which is a subset of the 'vert' GSUB feature, is included only because some environments, such as Windows and some Microsoft apps, require it to be present. In particular, pre-rotated non-full-width glyphs have been excluded from the 'vrt2' GSUB feature, and substitutions for arrows and arrow-like characters have also been excluded from both GSUB features.

Language Particulars

Simplified Chinese: GB 18030 & Tōngyòng Guīfàn Hànzìbiǎo

In addition to supporting GB 18030, which primarily amounts to Simplified Chinese glyphs for all URO and Extension A code points plus six Extension B code points, China's latest list of 8,105 hanzi (通用规范汉字表 *Tōngyòng Guīfàn Hànzìbiǎo*), which includes 196 additional Extension B through E code points, along with three that were appended to the URO for 199 in total, is also supported. Among these 199 hanzi, 36 map to Extension B, 44 map to Extension C, eight map to Extension D, 108 map to Extension E, and three have been appended to the URO (U+9FCD through U+9FCF).

For those who wish to develop versions of the fonts that support the 24 PUA (*Private Use Area*) code points required by GB 18030, please reference the *utf32-gb18030pua24.map* file that is provided in the Resources folder of this open source project.

Traditional Chinese—Taiwan: Big Five + CNS 11643

The scope of Traditional Chinese for Taiwan is limited to Big Five (equivalent to CNS 11643 Planes 1 and 2), and the glyphs mostly adhere to the Taiwan MOE (Ministry of Education) glyph standard. Any CJK Unified Ideograph code point that is outside the scope of Big Five is not likely to display appropriately for Traditional Chinese (Taiwan) use.

Traditional Chinese—Hong Kong: Big Five & HKSCS-2016

The Traditional Chinese (Hong Kong) fonts and font instances include as their scope Big Five and HKSCS-2016, with the glyphs for both mostly adhering to Hong Kong conventions.

Japanese: Adobe-Japan1-7 Table & JIS Coverage

The *aj17-kanji.txt* mapping file that is provided in the Resources folder of this open source project shows how all Adobe-Japan1-7 kanji map to working glyph names as specified in the fourth field of the included *AI0-SourceHanMono* ordering file. In order to support the *Adobe-Japan1* IVD Collection, glyphs for all Adobe-Japan1-7 kanji—except for <6CE8 E0102> (Adobe-Japan1-7 CID+12869), which is excluded because it is outside the scope of the *Source Han Mono* glyph set—are included.

Due to the JIS standard coverage of Adobe-Japan1-7 that is inherited by *Source Han Mono*, all JIS X 0208, JIS X 0213, and JIS X 0212 kanji are therefore supported. JIS2004 (aka JIS X 0213:2004) glyphs are the default for the relevant code points. A small number of characters in the JIS standards, such as those for IPA, along with additional Latin, Greek, and Cyrillic that were not deemed necessary, have been intentionally excluded.

Although *Source Han Mono* includes the same kanji as Adobe-Japan1-7, including a large number of kanji variants, compatibility shouldn't be expected for documents that were authored using apps that specify glyphs by CID. The only Adobe-Japan1-7 compatibility that should be expected is at the Unicode level, which includes the *Adobe-Japan1* IVSes that are specified in the Format 14 'cmap' subtable.

Korean: Hangul Glyphs & Hanja Coverage

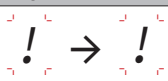
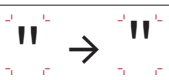
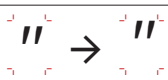
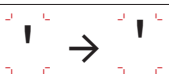
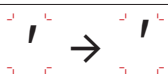
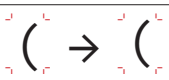
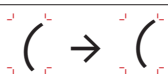
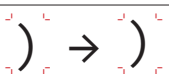
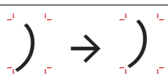
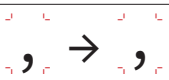
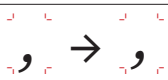
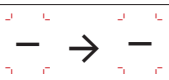
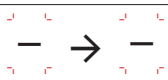
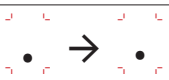
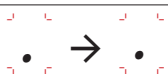
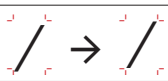
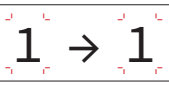
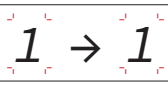
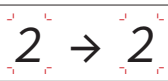
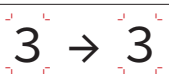
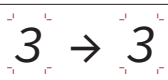
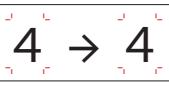
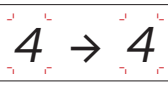
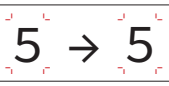
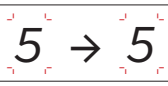
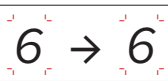
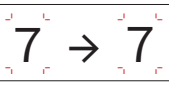
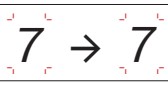
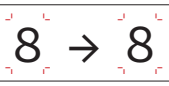
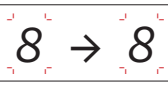
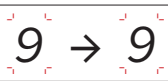
Glyphs for all modern Korean hangul symbols, letters (including compatibility versions), and syllables are included, along with the additional glyphs necessary to

compose archaic (aka non-modern) hangul via the 'ljmo', 'vjmo', and 'tjmo' GSUB features.

The *ks-hanja.txt* mapping file that is provided in the Resources folder of this open source project shows how the hanja in the KS X 1001 (4,620) and KS X 1002 (2,856) standards map to working glyph names as specified in the fourth field of the included *AI0-SourceHanMono* ordering file.

Monospaced & Monospaced Italic CJK Punctuation

Included in these fonts are special forms of the monospaced and monospaced *italic* digits, punctuation, and symbols shown in the table below, which have been tailored for CJK use in that they are aligned to the em-box, not to Latin features, and which are accessible via the 'locl' GSUB feature:

Unicode	Western versus CJK		Chinese	JP	KR
	Monospaced	Monospaced Italic			
U+0021					Yes
U+0022			Yes	Yes	Yes
U+0027			Yes	Yes	Yes
U+0028					Yes
U+0029					Yes
U+002C					Yes
U+002D					Yes
U+002E					Yes
U+002F					Yes
U+0030[1]			Yes	Yes	Yes
U+0031[1]			Yes	Yes	Yes
U+0032[1]			Yes	Yes	Yes
U+0033[1]			Yes	Yes	Yes
U+0034[1]			Yes	Yes	Yes
U+0035[1]			Yes	Yes	Yes
U+0036[1]			Yes	Yes	Yes
U+0037[1]			Yes	Yes	Yes
U+0038[1]			Yes	Yes	Yes
U+0039[1]			Yes	Yes	Yes

Unicode	Western versus CJK		Chinese	JP	KR
	Monospaced	Monospaced Italic			
U+003A	: → :	: → :			Yes
U+003B	; → ;	; → ;			Yes
U+003F	? → ?	? → ?			Yes
U+005B	[→ [	[→ [			Yes
U+005D	] →]	] →]			Yes
U+007B	{ → {	{ → {			Yes
U+007D	} → }	} → }			Yes
U+007E	~ → ~	*no change*			Yes
U+00A7	§ → §	*no change*	Yes	Yes	
U+00AD	− → −	− → −			Yes
U+00B1	± → ±	*no change*	Yes	Yes	
U+00B6	¶ → ¶	*no change*	Yes	Yes	
U+00B7	· → ·	· → ·			Yes
U+00D7	× → ×	*no change*	Yes	Yes	
U+00F7	÷ → ÷	*no change*	Yes	Yes	
U+2010	− → -	− → -	Yes	Yes	
U+2011	− → −	− → −			Yes
U+2013	– → –	– → –			Yes
U+2014	— → —	— → —	Yes	Yes	Yes
U+2016	‖ → ‖	*no change*	Yes	Yes	
U+2018	‘ → ‘	‘ → ‘	Yes[2]	Yes	Yes
U+2019	’ → ’	’ → ’	Yes[2]	Yes	Yes
U+201A	‚ → ‚	‚ → ‚	Yes	Yes	Yes
U+201C	“ → “	“ → “	Yes[2]	Yes	Yes
U+201D	” → ”	” → ”	Yes[2]	Yes	Yes

Unicode	Western versus CJK		Chinese	JP	KR
	Monospaced	Monospaced Italic			
U+201E	„ → „	*„ → „*	Yes	Yes	Yes
U+2020	† → †	*no change*	Yes	Yes	
U+2021	‡ → ‡	*no change*	Yes	Yes	
U+2026	… → ⋯	*… → ⋯*	Yes	Yes	
U+2030	‰ → ‰	*no change*	Yes	Yes	
U+203C	‼ → ‼	*‼ → ‼*	Yes	Yes	Yes
U+2047	⁇ → ⁇	*⁇ → ⁇*	Yes	Yes	Yes
U+2048	⁇ → ⁇	*⁇ → ⁇*	Yes	Yes	Yes
U+2049	⁉ → ⁉	*⁉ → ⁉*	Yes	Yes	Yes
U+2190	← → ←	*no change*	Yes	Yes	
U+2191	↑ → ↑	*no change*	Yes	Yes	
U+2192	→ → →	*no change*	Yes	Yes	
U+2193	↓ → ↓	*no change*	Yes	Yes	
U+2194	↔ → ↔	*no change*	Yes	Yes	
U+2195	↕ → ↕	*no change*	Yes	Yes	
U+2196	↖ → ↖	*no change*	Yes	Yes	
U+2197	↗ → ↗	*no change*	Yes	Yes	
U+2198	↘ → ↘	*no change*	Yes	Yes	
U+2199	↙ → ↙	*no change*	Yes	Yes	
U+2212	− → —	*no change*	Yes	Yes	
U+2423	␣ → ␣	*no change*	Yes	Yes	

1 These characters are unique in that the CJK forms are encoded by default, and the Western forms are accessible when the text is language-tagged for English.

2 These characters are unique in that the full-width glyphs are encoded by default for the Chinese fonts.

OpenType Particulars

Menu Names

The table below shows the English and localized Family names for each font instance:

Configuration	Family Name—English	Family Name—Localized
Simplified Chinese	*Source Han Mono SC*	思源等宽
Traditional Chinese—Taiwan	*Source Han Mono TC*	思源等寬
Traditional Chinese—Hong Kong	*Source Han Mono HC*	思源等寬 香港
Japanese	*Source Han Mono*	源ノ等幅
Korean	*Source Han Mono K*	본모노

With the exception of Japanese, all of the fonts include a one- or two-letter language identifier only for their English menu names.

The Regular weight is style-linked to the Bold weight, and all seven weights are style-linked to their *italic* versions. For apps that support style-linking, the Regular weight becomes the Bold weight if the “Bold” style is selected, and the Bold weight may therefore not appear in the font menu. Likewise, all weights become the *italic* style if the “Italic” style is selected.

OpenType Tables

The font resource includes the following 16 OpenType tables: 'BASE', 'CFF ', 'GDEF', 'GPOS', 'GSUB', 'OS/2', 'VORG', 'cmap', 'head', 'hhea', 'hmtx', 'maxp', 'name', 'post', 'vhea', and 'vmtx'. The Super OTC shares OpenType tables very efficiently.

OpenType Table Overrides

Several values in particular OpenType tables have been overridden from their otherwise default values. The subsections below detail some of the more important table-specific overrides that have been applied.

The 'OS/2' Table

The *OS/2.sTypoLineGap* value has been set to 0 (zero) units, and is also reflected in the *hhea.LineGap* and *vhea.lineGap* values. The *OS/2.usWinAscent* and *OS/2.usWinDescent* values have been calculated by removing the glyphs for U+302A through U+302D from the equation, and have been harmonized across all seven weights. These same harmonized settings are also reflected in the *hhea.Ascender* and *hhea.Descender* values. This is for the benefit of apps that use these values for determining default leading. These and other 'OS/2' table settings are intended to provide consistent cross-platform line spacing (aka vertical metrics).

The 'name' Table

Unlike mainstream OpenType/CFF CJK fonts, a *name.ID=20* string is not specified because there are no legacy (non-Unicode) encodings that meaningfully correspond to these fonts. In addition, the 'name' table does not include any Macintosh (*PlatformID=1*) strings, which was accomplished by invoking the AFDKO *makeotf* tool’s “-omitMacNames” command-line option. This means that the 'name' table includes only Unicode strings.

The 'vmtx' Table

In addition to specifying alternate vertical origins for full-width Latin and Latin-like glyphs that rest on the Latin baseline, proper vertical origins and vertical advances are also specified for the glyphs that correspond to the vertical forms of U+02D9, U+302E, and U+302F.

OpenType GSUB Features

All fonts and font instances include the OpenType GSUB features (see the OpenType Feature Registry for additional information) as detailed in the table below:

GSUB Feature	SC	TC	HC	J	K
aalt	Yes	Yes	Yes	Yes	Yes
ccmp	Yes	Yes	Yes	Yes	Yes
dlig	Yes	Yes	Yes	Yes	Yes
fwid[1]	Yes	Yes	Yes	Yes	Yes
hist	Yes	Yes	Yes	Yes	Yes
ital[1,2]	Yes	Yes	Yes	Yes	Yes
jp78[1]				Yes	
jp83[1]				Yes	
jp90[1]				Yes	
ljmo	Yes	Yes	Yes	Yes	Yes
locl	Yes	Yes	Yes	Yes	Yes
nlck[1]				Yes	
pwid[1,3]	Yes	Yes	Yes	Yes	Yes
ruby[1]	Yes	Yes	Yes	Yes	Yes
tjmo	Yes	Yes	Yes	Yes	Yes
vert[1]	Yes	Yes	Yes	Yes	Yes
vjmo	Yes	Yes	Yes	Yes	Yes
vrt2[4]	Yes	Yes	Yes	Yes	Yes
zero[1]	Yes	Yes	Yes	Yes	Yes

1 This GSUB feature is inherited by the 'aalt' GSUB feature.
2 This GSUB feature is not included in the *italic* fonts.
3 This GSUB feature is used to substitute full-width glyphs with their non-full-width monospaced forms.
4 This GSUB feature is a subset—not superset, as is usually the case—of the 'vert' GSUB feature.

The 'ccmp' GSUB Feature

The 'ccmp' GSUB feature is used to form the appropriate glyphs that correspond to the sequences needed to support a small number of kana, many of which are included in JIS X 0213 but are intentionally unencoded, along with additional glyphs. A complete listing of the supported sequences is provided in the table below:

Unicode Sequence	Glyph	Present in JIS X 0213
<004D 0300>	M̀ or *M̀*	
<004D 0304>	M̄ or *M̄*	
<006D 0300>	m̀ or *m̀*	

Unicode Sequence	Glyph	Present in JIS X 0213
<006D 0304>	m̄ or m̄	
<00CA 0304>	Ē or Ē	
<00CA 030C>	Ě or Ě	
<00EA 0304>	ē or ē	
<00EA 030C>	ě or ě	
<3042 3099>	ゔ	
<3044 3099>	ゐ	
<3048 3099>	ゑ	
<304A 3099>	ゕ	
<304B 309A>	ゖ	Yes
<304D 309A>	ぎ	Yes
<304F 309A>	ぐ	Yes
<3051 309A>	げ	Yes
<3053 309A>	ご	Yes
<3093 3099>	ゔ	
<30A2 3099>	ヴ	
<30A4 3099>	ヸ	
<30A8 3099>	ヹ	
<30AA 3099>	ヺ	
<30AB 309A>	ガ	Yes
<30AD 309A>	ギ	Yes
<30AF 309A>	グ	Yes
<30B1 309A>	ゲ	Yes
<30B3 309A>	ゴ	Yes
<30BB 309A>	ゼ	Yes
<30C4 309A>	ヅ	Yes

Unicode Sequence	Glyph	Present in JIS X 0213
<30C8 309A>	ド	Yes
<30F3 3099>	ジ	
<31F7 309A>	プ	Yes

See the table in the “CJK Unified Ideographs Extension G” section on page 10 for details about four additional characters that are handled via the 'ccmp' GSUB feature.

The 'locl' GSUB Feature

The 'locl' GSUB feature plays a critical role for language-specific OTFs in that it represents the *only* mechanism within the font resource for accessing the glyphs for the non-default languages. If the 'locl' GSUB feature is not supported, or not properly used, the default glyphs are used. Each non-default language is handled via a separate lookup that is associated with the appropriate language and script, and one of its purposes is to mimic the 'cmap' table of the target language.

The font instances of the Super OTC include the 'locl' GSUB feature, but its presence represents an alternate method for accessing the glyphs for the non-default languages that does not involve selecting a different font instance of the OTC. As a real-world usage example, this ReadMe file was produced using only the font instances whose default language is Japanese, and any instances of glyphs for the non-default languages were invoked via language tagging.

Note that in addition to using an app that supports the 'locl' GSUB feature, such as Adobe InDesign or modern browsers (examples include Chrome, Edge, Firefox, and Safari), the text must also be properly language-tagged at the character, paragraph, or document level.

While the 'locl' GSUB feature mainly affects the glyphs for ideographs, a small number of other characters are also affected. See the table in the “Monospaced & Monospaced Italic CJK Punctuation” section on page 15 for a complete listing of these special glyphs.

The 'vert' GSUB Feature

The 'vert' GSUB feature includes substitutions that may be different for each language, which apply to the following code points:

Unicode	Simplified Chinese	Traditional Chinese	Japanese	Korean
U+2018[1]	‘ → ﹁	‘ → ′	‘	‘
U+2019[1]	’ → ﹂	’ → ′	’	’
U+201C[1]	“ → ﹃	“ → ″	“	“
U+201D[1]	” → ﹄	” → ″	”	”
U+3001	、 → ﹑	、	、 → ﹅	、 → ﹅
U+3002	。 → ﹒	。	。 → ﹒	。 → ﹒
U+FF01	！ → ﹗	！	！	！ → ﹗

Unicode	Simplified Chinese	Traditional Chinese	Japanese	Korean
U+FF0C	， → ﹐	，	， → ﹐	， → ﹐
U+FF0E	． → ﹒	．	． → ﹒	． → ﹒
U+FF1A	： → ﹕	：	： → ‥	： → ﹕
U+FF1B	； → ﹔	；	；	； → ﹔
U+FF1F	？ → ﹖	？	？	？ → ﹖

1 To achieve the same vertical substitution effect as Traditional Chinese for Japanese or Korean, the 'fwid' GSUB feature must first be applied to change the default monospaced glyphs to their full-width forms.

OpenType GPOS Features

Only two GPOS features, 'mark' and 'vert', are included in all font instances, and their details are listed below (see the OpenType Feature Registry for additional information):

- The 'mark' GPOS feature is used for handling bopomofo tone mark placement.
- The 'vert' GPOS feature is used to adjust the glyphs for U+20DD, U+20DE, U+302A through U+302D, U+3099, U+309A, U+3127, U+31B4 through U+31B7, U+31BB, and those that represent vowels and trailing consonants of combining jamo, which have zero-unit horizontal advances, such that their positions and vertical origins are appropriate for vertical writing.

Source Han Sans Differences

Source Han Mono Version 1.002 is largely derived from *Source Han Sans* Version 2.001, defects and all. The following are the notable differences between the fonts for these two typeface families:

- All proportional glyphs were replaced with *Source Code Pro*-derived versions that were scaled to 111.2%, which resulted in 667-unit horizontal advances.
- *Italic* glyphs, also derived from *Source Code Pro* using the same scaling factor, were added.
- All of the fonts map U+2F2A 亢 to the HK glyph for U+21BC1 𡯁, *u21BC1-HK*.
- The Traditional Chinese (Hong Kong) fonts map U+5C13 尓 to the JP glyph for U+5C13 尓, *uni5C13-JP*.
- The glyphs that are associated with the following 10 characters were removed with reasons given in parentheses: U+2E3A and U+2E3B (too wide and too tall), U+3031 and U+3032 (too tall), U+FB00, U+FB03, and U+FB04 (not necessary), and U+1F16A through U+1F16C (not available in *Source Code Pro*).
- The glyphs for the 500 high-frequency archaic hangul syllables were removed.
- The half-width Latin glyphs were removed.
- The glyphs for half-width katakana and hangul letters/syllables were anisotropically-scaled to have 667- and 1000-unit horizontal advances, respectively. Their original *Source Han Sans* horizontal advances were 500 and 920 units, respectively.
- The 'ital' (*Italics*) GSUB feature was added to the non-*italic* font instances.
- The 'zero' (*Slashed Zero*) GSUB feature was added to all font instances.

Changes

Version 1.002

Built: June 3, 2019. Built By: Dr. Ken Lunde (小林劍). Released: June 3, 2019.

Listed below are the changes that were made in this release:

General

- In order to better accommodate Windows apps that use GDI, the *CFF.isFixedPitch* value was changed from 1 (true) to 0 (false), the fourth element of the *OS/2.panose* array, *Proportion*, was changed from 9 (*Monospaced*) to 0 (*Any*), and the eighth element of the *OS/2.panose* array, *Letterform*, was changed from 2 (*Normal/Contact*) or 9 (*Oblique/Contact*) to 0 (*Any*).

Version 1.001

Built: May 30, 2019. Built By: Dr. Ken Lunde (小林劍). Released: May 30, 2019.

Listed below are the changes that were made in this release:

General

- The FDArray elements whose glyphs were derived from *Source Code Pro* have improved alignment zones and other hinting parameters.

Japanese

- The glyphs for half-width katakana that were expanded to have 667-unit horizontal advances using anistropic techniques were improved by the designer. This affected only the glyphs that map from characters in the range U+FF66 through U+FF9D.

Version 1.000

Built: May 21, 2019. Built By: Dr. Ken Lunde (小林劍). Released: May 26, 2019.

First public release.

Known Issues

Please report all issues in the GitHub repository so that they can be properly tracked and addressed, and for greater visibility among the user community. The Wiki also conveys some useful information about upcoming releases. Also, be sure to thoroughly check the closed issues prior to submitting a new issue, being sure to exercise the search feature.

Because these fonts exercise several architectural limits, particularly the ones that include 65,535 glyphs, some environments may have difficulties using them properly, sometimes due to implementation limits or poor assumptions. If this is the case, please report such issues so that they can be recorded and tracked. You are also strongly encouraged to contact the developer of such environments to report the same.

General

- The glyphs for the four CJK Unified Ideographs Extension G ideographs, which are made accessible via the 'ccmp' GSUB feature using their IDSes, will be mapped from the appropriate Plane 3 code points as soon as their code points have been deemed stable enough to implement.
- At some point, the 'vert' GPOS feature will be removed in favor of a different solution for handling the affected characters and their glyphs.

Western

- None

Chinese—Simplified & Traditional

- None

Simplified Chinese

- None

Traditional Chinese—TW & HK

- None

Traditional Chinese—TW

- None.

Traditional Chinese—HK

- The glyph for U+50E7 僧, *uni50E7-HK*, needs to be corrected by changing the lower-right component from 日 to 曰.

Japanese

- The EL glyph for U+9EA4 麤, *uni9EA4-JP*, needs to be corrected by changing the first stroke so that it does not protrude through the second stroke.

Korean

- The correction for the EL glyph for U+9EA4 麤, *uni9EA4-JP*, also applies to Korean (KS X 1002).

That is all.