

Shanghai Qualcomm Semiconductor Co., Ltd.

GT24L24A2Y standard lattice Chinese font chip

GT24L24A2Y

Standard dot matrix Chinese and foreign languages chip

V1.0_I_D
2015-8

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Revision History

version number	Modify content	date	Remarks
V1.0_I_A	Font chip specification book development	2015-07	
V1.0_I_B	Add deep sleep mode	2015-07	
V1.0_I_C	Modify the chip features and electrical characteristics	2015-07	
V1.0_I_D	"GT22L24A2Y" changed to "GT24L24A2Y"	2015-08	

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1 Overview

GT24L24A2Y is a 16,24 dot matrix font chip, GB18030 GB simplified Chinese characters support, BIG5 traditional, JIS0208 Japanese character set, KSC5601 Korean character set and other multinational character sets and are Unicode compatible. Arrange the font in vertical, horizontal, and use of user manuals to provide the method to calculate the character dot matrix chip address can be read character dot matrix information.

GT24L24A2Y In addition to the above fonts, it also provides 16 sectors, each sector 4K bytes or 16 pages, 256 bytes per page, Free to write space address range: 1EFFFF-1FFFFFF. Only supports PC burn, repeat erase 100,000 times.

1.1 Chip features

- Data bus: SPI serial bus interface
- lattice arrangement: vertical horizontal row
- Clock frequency: 120MHz (max.) @ 3.3V
- working voltage: 2.7V ~ 3.6V
- Current:
 - Working current: 12mA
 - Standby current: 1 ~ 5uA

DFN8 2X3

- Working temperature: -40 °C ~ 85 °C
- Package: DFN8 2X3
- character set:
 - Simplified GB18030
 - Traditional BIG5
 - Japanese SHIFTJIS / JIS0208

Korean KSC5601
 Multi-language UNICODE
 Compatible with UNICODE

- font size: 16,24 lattice

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1.2 Chip content

character set	Font	Font size	Number of characters	Font	Arrangement
ASCII character set	ASCII	5x7	96	standard	Y-vertical horizontal row
	ASCII	7x8	96	standard	Y-vertical horizontal row
	ASCII	6x12	96	standard	Y-vertical horizontal row
	ASCII	12 dot matrix unequal width	96	Arial	Y-vertical horizontal row
	ASCII	12 dot matrix unequal width	96	Times New Roman	Y-vertical horizontal row
	ASCII	8x16	96	standard	Y-vertical horizontal row
	ASCII	16 dot matrix unequal width	96	Arial	Y-vertical horizontal row
	ASCII	16 dot matrix unequal width	96	Times New Roman	Y-vertical horizontal row
	ASCII	12x24	224	Print body	Y-vertical horizontal row
	ASCII	24 lattice width	96	Arial	Y-vertical horizontal row
	ASCII	16X32	96	Bold	Y-vertical horizontal row
	ASCII	32 lattice width	96	Arial	Y-vertical horizontal row
	Chinese GB18030	16x16	27533 + 1038	Times New Roman	Y-vertical horizontal row
	Chinese GB2312	24x24	6763 + 376	Bold	Y-vertical horizontal row
Japanese JIS0208	16x16	8366	standard	Y-vertical horizontal row	
SHIFJI half character	8x16	63	standard	Y-vertical horizontal row	
Korean KSC5601	16x16	3456	Bold	Y-vertical horizontal row	
UNICODE multi-lingual	Latin	8x16	496	standard	Y-vertical horizontal row
	Cyrillic	16 dot matrix unequal width	496	Modern	Y-vertical horizontal row
		8x16	208	standard	Y-vertical horizontal row
	Greek	16 dot matrix unequal width	208	Modern	Y-vertical horizontal row
		8x16	96	standard	Y-vertical horizontal row
	Hebrew	16 dot matrix unequal width	96	Modern	Y-vertical horizontal row
		8x16	112	standard	Y-vertical horizontal row
	Arabic	16 dot matrix unequal width	112	Bold	Y-vertical horizontal row
		24 o'clock width	128	standard	Y-vertical horizontal row
	Unicode to GB18030				
BIG5 to GB18030					
Transcoding Unicode to JIS0208					
Unicode to KSC5601					
SHIFT-JIS to JIS0208					
Special numbers	16 dot matrix unequal width	15	Arial	Y-vertical horizontal row	
	Arial 24 lattice width	15	Arial	Y-vertical horizontal row	
	Numbers and symbols 24 lattice width	15	Arial	Y-vertical horizontal row	
	48 lattice width	15	Arial	Y-vertical horizontal row	
	64 lattice width	15	Arial	Y-vertical horizontal row	

	16 dot matrix unequal width	15	Times New Roman Y-vertical horizontal row
Times New	24 lattice width	15	Times New Roman Y-vertical horizontal row
Roman	32 lattice width	15	Times New Roman Y-vertical horizontal row
Numbers and symbols	48 lattice width	15	Times New Roman Y-vertical horizontal row

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	64 lattice width	15	Times New Roman Y-vertical horizontal row
	24 lattice width	15	Clock body Y-vertical horizontal row
Clock body	32 lattice width	15	Clock body Y-vertical horizontal row
Numbers and symbols	48 lattice width	15	Clock body Y-vertical horizontal row
	64 lattice width	15	Clock body Y-vertical horizontal row
	16 dot matrix unequal width	15	Square body Y-vertical horizontal row
Square body	24 lattice width	15	Square body Y-vertical horizontal row
Numbers and symbols	32 lattice width	15	Square body Y-vertical horizontal row
	48 lattice width	15	Square body Y-vertical horizontal row
	64 lattice width	15	Square body Y-vertical horizontal row
UI icon	UI icon	32 lattice width	64 customize Y-vertical horizontal row

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1.3 Font proofs

1.3.1 Chinese characters

16x16 GB18030 Chinese characters

24x24 lattice **GB2312** Chinese characters

16x16 JIS0208 Japanese

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16x16 KSC5601 Korean

1.3.2 ASCII characters

5x7 ASCII standard character

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6x12 ASCII standard characters

7x8 ASCII standard characters

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8x16 ASCII standard characters

12 lattice unequal width (**Time new Roman**)

12 dot matrix width (**Arial**)

16 lattice unequal width (**Time new Roman**)

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16 lattice width (Arial)

1

16x32 ASCII standard characters

12X24 print body

24 lattice width (Arial)

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1.3.3 UNICODE characters

8x16 standard Latin character

16 points unequal width Latin

8x16 standard Greek

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8x16 standard Cyrillic

48 lattice width (**Arial**)

48 lattice unequal width (**Times new Roman**)

48 lattice unequal width (clock body)

48 lattice unequal width (block body)

32 lattice unequal width (**UI icon**)

2 operation instruction

2.1 Instruction Parameter (command parameter)

Instruction	Description	Instruction Code (One-Byte)	Address Bytes	Dummy Bytes	Data Bytes
READ	Read Data Bytes	0000 0011 03 h	3	-	1 to ∞
FAST_READ	Read Data Bytes at Higher Speed	0000 1011 0B h	3	1	1 to ∞

All the operations on the chip only two, that is, Read Data Bytes (READ - General Read) and Read Data Bytes at Higher Speed (FAST_READ - Fast Read Dot Data).

2.2 Read Data Bytes

Read Data Bytes need to use the script to perform each operation. The READ instruction timing is as follows (Figure):

- The chip select signal (CS #) goes low first, followed by a 1-byte command word (03h) and a 3-byte Address and shift input through the serial data input pin (SI), each bit is latched on the rising edge of the serial clock (SCLK).
- The byte data of this address is then shifted and output through the serial data output pin (SO). Each bit is clocked out at the serial clock (SCLK). The falling edge is removed.
- After reading byte data, the chip select signal (CS #) goes high, ending the operation.

If the chip select signal (CS #) continues to be held low, the byte data of the next address continues through the serial data output pin

(SO) shift output.

Read Data Bytes (READ) Instruction Sequence and Data-out sequence:

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GT24L24A2Y standard lattice Chinese font chip

2.3 Read Data Bytes at Higher Speed

Read Data Bytes at Higher Speed You need to use the script to perform the operation.

The sequence of the READ_FAST (CS #) goes low, follows (Figure)-byte command word (0Bh) and a 3-byte Address and a byte Dummy Byte The serial data input pin (SI) shift input, each bit in the serial clock (SCLK) rising edge is latched.

- The byte data of this address is then shifted and output through the serial data output pin (SO). Each bit is clocked out at the serial clock (SCLK) rising edge. The falling edge is removed.
 - If the chip select signal (CS #) continues to bottom, the byte data of the next address continues to be output through the serial data output pin (SO) shift output. Example: read a 15x16 dot matrix Chinese characters need 32Byte, the continuous 32 bytes read End of a Chinese character lattice data read operation.
- If you do not need to continue to read the data, the chip select signal (CS #) goes high, the end of this operation.

Figure: Read Data Bytes at Higher Speed (READ_FAST) Instruction Sequence and Data-out sequence:

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2.4 Write Enable (Write Enable)

The timing of the Write Enable instruction is as follows (Figure):
CS # goes low - → sends Write Enable command -> CS # goes high

2.5 Write Disable (write non-can)

The timing of the Write Enable instruction is as follows (Figure):
CS # goes low - → sends Write Disable command -> CS # goes high

2.6 Page Program

The timing of the Page Program instruction is as follows (Figure):
CS # goes low - → sends Page Program command → sends 3-byte address -> sends data -> CS # goes high

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2.7 Sector Erase (Sector Erase)

Sector Erase instruction timing is as follows (Figure):

CS # goes low - → sends Sector Erase command → sends 3-byte address -> CS # goes high

2.8 Deep Sleep Mode Instructions (B9H)

Once the font chip into deep sleep mode, all the commands will be ignored, in addition to wake up deep sleep mode command, first

First, CS # is low, enter the B9H command, and then CS # goes high for the duration of TDP (TDP = 25us)

In TDP's duration, font chip into deep shutdown mode.

Deep-sleep mode instruction timing waveform

2.9 wake up deep sleep mode command (ABH)

First, CS # is low, send the ABH instruction to the font chip, then CS # goes high and continues for Tres1 time

(Tres1 = 25us), the font chip will resume normal operation and the CS # pin must be held high for Tres1.

WAKE-UP Deep-sleep mode command timing waveform

3 pin description and circuit connection

3.1 Pin Configuration

DFN8 2X3

3.2 pin description

DFN8 2X3

NO.	name	I / O	description
1	GND		Ground
2	NC		Dangling
3	SI	I	Serial data input
4	SCLK	I	Serial clock input
5	HOLD #	I	Hold, to pause the device without
6	VCC		Power (+ 3.3V Power Supply)
7	CS #	I	Chip select input (Chip enable input)
8	SO	O	Serial data output

Serial Data Output (**SO**): This signal is used to serially output data from the chip and data is clocked out on the falling edge of the clock.

Serial Data Input (**SI**): This signal is used to input data from the serial port to the chip. Data is clocked in on the rising edge of the clock.

Serial Clock Input (**SCLK**): Data is clocked in on the rising edge of the clock and shifted out on the falling edge.

Chip Select Input (**CS #**): All serial data transfers begin at the falling edge of CS # and CS # must be held low during transfer, Between the two instructions remain high.

Bus Suspend Input (**HOLD #**):

This signal is used to suspend data transfer while the chip select signal is active. During the bus suspend, the serial data output signal is in a high state. The chip does not respond to serial data input signals and serial clock signals.

When the HOLD # signal goes low and the serial clock signal (SCLK) is low, it enters bus hold.

When the HOLD # signal goes high and the serial clock signal (SCLK) is low, the bus hangs.

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3.3 SPI interface and host interface reference circuit diagram

SPI and the host interface circuit connection can refer to the figure (#HOLD pin recommended 2K resistance 3.3V pulled high).

GT2X

SPI interface and host interface reference circuit diagram

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4 Electrical Characteristics

4.1 Absolute maximum rating

Symbol	Parameter	Min.	Max.	Unit	Condition
T _{OP}	Operating Temperature	-40	85	°C	
T _{STG}	Storage Temperature	-65	150	°C	
V _{CC}	Supply Voltage	-0.3	3.6	V	
V _{IN}	Input Voltage	-0.3	V _{CC} + 0.3	V	
GND	Power Ground	-0.3	0.3	V	

4.2 DC characteristics

Condition: T_{OP} = -40 °C to 85 °C, GND = 0V

Symbol	Parameter	Min.	Max.	Unit	Condition
I _{DD}	VCC Supply Current (active)		12	mA	
I _{SB}	VCC Standby Current		5	uA	
I _{o2}	Deep Power-Down Current	1	5	uA	
V _{IL}	Input LOW Voltage	-0.3	0.2V _{CC}	V	
V _{IH}	Input HIGH Voltage	0.7V _{CC}	V _{CC} + 0.4	V	
V _{OL}	Output LOW Voltage		0.4 (I _{OL} = 1.6mA)	V	V _{CC} = 2.7 ~ 3.6V
V _{OH}	Output HIGH Voltage	V _{CC} -0.2 (I _{OH} = -100uA)		V	
I _{II}	Input Leakage Current	0	2	uA	
I _{LO}	Output Leakage Current	0	2	uA	

Note: I_{IL} : Input LOW Current, I_{IH} : Input HIGH Current,
I_{OL} : Output LOW Current, I_{OH} : Output HIGH Current,

4.3 AC characteristics

Symbol	Alt.	Parameter	Min.	Max.	Unit
F _c	F _c	Clock Frequency	DC	120	MHz
t _{CH}	t _{CLH}	Clock High Time	4		ns
t _{CL}	t _{CLL}	Clock Low Time	4		ns
t _{CLCH}		Clock Rise Time (peak to peak)	0.2		V / ns
t _{CHCL}		Clock Fall Time (peak to peak)	0.2		V / ns
t _{SLCH}	t _{CSS}	CS # Active Setup Time (relative to SCLK)	5		ns
t _{CHSL}		CS # Not Active Hold Time (relative to SCLK)	5		ns
t _{DVCH}	t _{DSU}	Data In Setup Time	2		ns
t _{CHDX}	t _{DH}	Data In Hold Time	2		ns
t _{CHSH}		CS # Active Hold Time (relative to SCLK)	5		ns
t _{SHCH}		CS # Not Active Setup Time (relative to SCLK)	5		ns
t _{SHSL}	t _{CSH}	CS # Deselect Time	20		ns
t _{SHQZ}	t _{DIS}	Output Disable Time		6	ns

t CLQV	tV	Clock Low to Output Valid	6.5	ns
t CLQX	tHO	Output Hold Time	0	ns
t HLCH		HOLD # Setup Time (relative to SCLK)	5	ns
t CHHH		HOLD # Hold Time (relative to SCLK)	5	ns
t HHCH		HOLD Setup Time (relative to SCLK)	5	ns
t CHHL		HOLD Hold Time (relative to SCLK)	5	ns
t HHQX	tLZ	HOLD to Output Low-Z	6	ns
t HLQZ	tHZ	HOLD # to Output High-Z	6	ns

twenty two

5 package size

Package type
DFN8 2X3

Package

Package size
2.0mmx 3.0mm (79milX118mil)

twenty three

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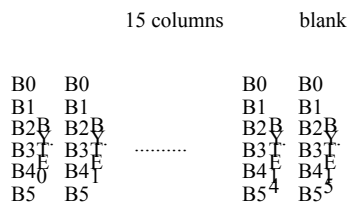
6 font layout (vertical row)

6.1 lattice arrangement format

Each Chinese character in the chip is stored in the form of Chinese dot matrix font, each dot with a binary representation, save a point, When the display can be displayed on the screen bright spots, save 0 points, then the screen does not show. Lattice arrangement format is vertical horizontal row, namely one. The high byte indicates the following point, the low indicates the above point (if you read the dot matrix data by 16bit bus width, please note The order of high and low byte), row after row of the next row. This dot matrix information is used directly on the display according to the above rules, The corresponding Chinese character will appear.

6.2 15X16 Kanji arrangement format example

15X16 Kanji information needs 32 bytes (BYTE 0 - BYTE 31) to represent. The 15X16 dot Chinese dot matrix It is vertical rows, the specific arrangement of the structure as shown below:



16 lines	B6	B6	B6	B6
	B7	B7		B7	B7
	B0	B0		B0	B0
	B1	B1		B1	B1
	B2	B2	B2	B2
	B3	B3		B3	B3
	B4	B4		B4	B4
	B5	B5		B5	B5
	B6	B6		B6	B6
	B7	B7	B7	B7

6.3 16 lattice unequal width ASCII (Arial) character arrangement format

16 dot matrix character information needs 34 bytes (BYTE 0 - BYTE33) to represent.

■ Storage format

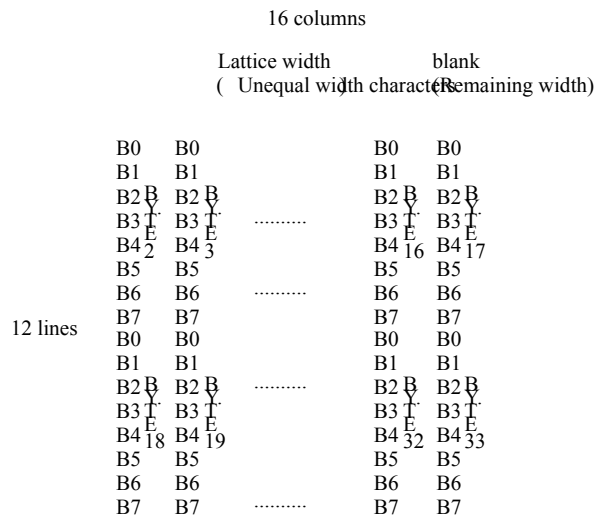
As the characters are unequal width, so in the storage format BYTE0 ~ BYTE1 storage lattice width data, BYTE2-33 storage Vertical horizontal dot matrix data. The specific format as shown below:



■ Storage structure

Lattice storage width is fixed at 16, according to different characters, the actual lattice width will be less than 16, and the corresponding b Area. According to BYTE0 ~ BYTE1 stored lattice width data, you can restore the next word display or layout for reference.

twenty four



For example: ASCII square head character B

The lattice data for 0-33BYTE is: 00 0C 00 F8 F8 18 18 18 18 F8 F0 00 00 00 00 00 00 7F 7F
63 63 63 63 63 67 3E 1C 00 00 00 00 00

among them:

BYTE0 ~ BYTE1: 00 0C for the ASCII square character B lattice width data, namely: 12-bit width.

There are 4 blank spaces behind the character, which can be taken into consideration when the next word is typeset, and the start position of the next word (See below figure)

BYTE2-33: 00 F8 F8 18 18 18 18 18 F8 F0 00 00 00 00 00 00 7F 7F 63 63 63 63 63 67 3E 1C
00 00 00 00 00 Dot matrix data for ASCII square B characters.

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7 dot matrix data verification (customer reference)

Customers will be the chip "A" data transfer with the following comparison. If consistent, said SPI driver work properly; if inconsistent, please re-Write a new driver.

Arrangement: Y (vertical horizontal row) lattice size 8X16
Letter "A"
Lattice data: 00 E0 9C 82 9C E0 00 00 0F 00 00 00 00 00 0F 00

Arrangement: W (transverse horizontal row) lattice size 8X16
Letter "A"
Dot data: 00 10 28 28 28 44 44 7C 82 82 82 82 00 00 00 00

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8 177 Foreign language library summary table

177 foreign language library summary table

Department	Country	Language	ISO-8859	
Europe	1 Britain	Britain or United Kingdom	English	
	2 Ireland	Ireland		
	3 United States	USA		
	4 Canada	Canada		
	5 Belize	Belize		
	Jamaica	Jamaica		
	Trinidad and Tobago	Trinidad and Tobago		
	8 Bahamas	Bahamas		
	9 Antigua and Barbuda			
	10 Dominica	Dominica		
	11 Saint Vincent	St.Vincent		
	12 Saint Lucia	St.Lucia		
	13 Grenada	Grenada		
	14 St. Kitts-Nevis	St.Kitts-Nevis		
South America	15 Guyana	Guyana	English	
	Australia	Australia		
Latin (English)	New Zealand	New Zealand	English, Afrikaans	
	18 Tonga	Tonga		
	19 Fiji	Fiji		
	20 Palau	Palau		
	Oceania	21 Solomon		Solomon
		Vanuatu		Vanuatu
		23 Kiribati		Kiribati
		Nauru		Nauru
		Marshall Islands		Marshall Islands
		South Africa		South Africa
27 Zimbabwe		Zimbabwe		
28 Gambia	Gambia			
29 Sierra Leone	Sierra Leone			
Africa	Liberia	Liberia		
	31 Ghana	Ghana	English	
	Nigeria	Nigeria		
	Uganda	Uganda		
	34 Zambia	Zambia		
	35 Malawi	Malawi		
	36 Seychelles	Seychelles		
	37 Mauritius	Mauritius		
38 Botswana	Botswana			
Namibia	Namibia			
40 Lesotho	Lesotho			
41 France	France	French	ISO8859-15	
Europe	Belgium	Belgium	French, Dutch	ISO8859-15

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37 Mauritius	Mauritius		
38 Botswana	Botswana		
Namibia	Namibia		
40 Lesotho	Lesotho		
41 France	France	French	ISO8859-15
Europe	Belgium	Belgium	French, Dutch

		43 Monaco	Monaco	French, Italian	ISO8859-15
	North America	44 Haiti	Haiti	French	ISO8859-15
		45 Senegal	Senegal	French	
		46 Mali	Mali		
Latin		47 Burkina Faso	Burkina Faso		
(French)		48 Guinea	Guinea		
	Africa	49 Côte d'Ivoire	cote dlvoire		
		50 Togo	Togo	French	ISO8859-15
		51 Benin	Benin		
		52 Niger	Niger		
		53 Cameroon	Cameroon		
		54 Chad	Chad		
		55 Central Africa	Central African Republic		
		56 Djibouti	Djibouti		
		57 Burundi	Burundi		
Latin		58 Democratic Congo	Republic of Democratic Congo		
(French)	Africa	59 Congo	Congo	French	ISO8859-15
		60 Gabon	Gabon		
		61 Comoros	Comoros		
		62 Madagascar	Madagascar		
	Europe	63 Spain	Spain	Spanish, Catalan language	ISO8859-1, -15
		64 Andorra	Andorra	Spanish	ISO8859-1, -15
		65 Mexico	Mexico		
		Guatemala	Guatemala		
		Costa Rica	Costa Rica		
Latin		68 Panama	Panama		
(Spain language)	North America	69 Dominican Republic	Dominican Republic	Spanish	ISO8859-1
		70 El Salvador	El Salvador		ISO8859-15
		71 Honduras	Honduras		
		Nicaragua	Nicaragua		
		73 Borromi	Puerto Rico		
		74 Cuba	Cuba		
	South America	75 Venezuelan	Venezuela	Spanish	ISO8859-1
		76 Colombia	Colombia		ISO8859-15

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		77 Peru	Peru		
		78 Argentina	Argentina		
		Ecuador	Ecuador		
		80 Chile	Chile		
		81 Uruguay	Uruguay		
		82 Paraguay	Paraguay		
		83 Bolivia	Bolivia		
	Africa	84 Equatorial Guinea	Equatorial New Guinea	Spanish	ISO8859-1
		85 Ceuta and Melia	Ceuta and Melilla		ISO8859-15
	Europe	86 Portugal	Portugal		
	South America	87 Brazil	Brazil		
Latin		88 Cape Verde	Cape Verde		
(Portugal language)	Africa	89 Guinea-Bissau	Guinea-Bissau	Portuguese	ISO8859-1
		90 Sao Tome and Principe			ISO8859-15
		91 Angola	Angola		
		92 Mozambique	Mozambique		
		93 Germany	Germany	German	ISO8859-1, -15
Latin		94 Switzerland	Switzerland	German, French	ISO8859-1, -15
	Europe	95 Austria	Austria	German	ISO8859-1, -15

(German)	96 Luxembourg	Luxembourg	German, French	ISO8859-1, -15
	97 Liechtenstein	Liechtenstein	German	ISO8859-1, -15
Latin	Europe 98 Netherlands	Holland	Dutch	ISO8859-1
(Dutch)	South America 99 Suriname	Surinam		ISO8859-15
	100 Denmark	Denmark	Danish	ISO8859-1, -10
	101 Norway	Norway	Norwegian	ISO8859-1, -10
	102 Sweden	Sweden	Swedish	ISO8859-1, -10
	Faroe Islands	Faroes, The	Faroese	ISO8859-1, -10
Latin	104 Greenland	Greenland	Greenlandic	ISO8859-1, -10
(Nordic)	Europe 105 Iceland	Iceland	Icelandic	ISO8859-1, -10
	Finland	Finland	Finnish, Swedish	ISO8859-13, -15
	Estonia	Estonia	Estonian	ISO8859-4, -13
	Latvia	Latvia	Latvian	ISO8859-4, -13
	109 Lithuania	Lithuania	Lithuanian	ISO8859-4, -13
	110 Czech Republic	Czech	Czech	ISO8859-2
	111 Slovakia	Slovakia	Slovak	ISO8859-2
Latin	Europe 112 Poland	Poland	Polish	ISO8859-2, -16
(Central European)	113 Hungary	Hungary	Hungarian	ISO8859-2, -16
	Romania	Romania	Romanian	ISO8859-16
Latin	Europe Slovenia	Slovenia	Slovenian	ISO8859-2, -16
(Central European)	116 Croatia	Croatia	Croatian	ISO8859-2, -16
Latin	Europe 117 Italy	Italy	Italian	ISO8859-1
(Southern Europe)	118 San Marino	San Marino		ISO8859-16

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	119 Vatican City	Vatican		
	120 Turkey	Turkey	Turkish	ISO8859-9
	121 Malta	Malta	Maltese	ISO8859-3, -9
	Albania	Albania	Albanian	ISO8859-1, -16
	123 Vietnam	Vietnam	Vietnamese	ISO8859-1
	Malaysia	Malaysia	Malay	ISO8859-1
Latin	Asia 125 Brunei	Brunei		
(Southeast Asia)	Indonesia	Indonesia	Indonesian	ISO8859-1
	East Timor	East Timor		
	128 Philippines	Philippines, The	English, Tagalog	ISO8859-1
Latin	Africa 129 Kenya	Kenya	Swahili	ISO8859-1
(Africa)	130 Tanzania	Tanzania		
	131 Russia	Russia	Russian	ISO8859-5
	132 Belarus	Byelorussia or Belarus		
	133 Ukraine	Ukraine	Russian, Ukrainian	ISO8859-5
Cyrillic	Europe 134 Bulgaria	Bulgaria	Bulgarian	ISO8859-5
(Eastern Europe)	135 Moldova	Moldova	Russian	ISO8859-5
	136 Yugoslavia	FRYugoslavia	Serbian	ISO8859-5
	137 Bosnia Herzegovina	Barbados	Serbian	ISO8859-5
	138 Macedonia	Macedonia	Macedonian	ISO8859-5
	Azerbaijan	Azerbaijan	Azerbaijani	ISO8859-5
	140 Kyrgyzstan	Kirghizstan	Kyrgyzstan	ISO8859-5
	141 Tajikistan	Tajikistan	Tajikistan	ISO8859-5
Cyrillic	Asia 142 Turkmenistan	Turkmenistan	Turkmen	ISO8859-5
(Asia)	143 Uzbekistan	Uzbekistan	Uzbekistan	ISO8859-5
	144 Kazakhstan	Kazakhstan	Kazakh	ISO8859-5
	Mongolia	Mongolia	Mongolian	ISO8859-5
	146 Greece	Greece	Greek	ISO8859-7
Greek	Asia 147 Cyprus	Cyprus		
	148 Egypt	Egypt		
	Tunisia	Tunisia		

Arabic (Africa)	Africa	Libya	Libya	Arabic	ISO8859-6
		151 Morocco	Morocco		
		152 Algeria	Algeria		
		153 Sudan	Sudan, The		
		154 Somalia	Somalia		
		155 Western Sahara	West Sahara		
		156 Mauritania	Mauritania		
Arabic (Asia)	Asia	157 Syria	Syria	Arabic	ISO8859-6
		158 United Arab Emirates	United Arab Emirates, The		
		159 Lebanon	Lebanon		
		160 Yemen	Yemen		

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		161 Kuwait	Kuwait			
		162 Qatar	Qatar			
		163 Bahrain	Bahrain			
		164 Oman	Oman			
		165 Jordan	Jordan			
		166 Iraq	Iraq			
		Saudi Arabia	Saudi Arabia			
		168 Palestine	Palestine			
		169 Iran	Iran			Persian
		170 Pakistan	Pakistan			Urdu, Arabic language
Hebrew Asia		171 Afghanistan	Afghanistan	Pashto		
		172 Israel	Israel	Hebrew	ISO8859-8	
		173 Thailand	Thailand	Thai	ISO8859-11	
		174 Japan	Japan	Japanese	JIS0208	
		175 South Korea	KSC5601	Korean	KSC5601	
Chinese Asia		176 China	China	Chinese	GB2312	
		Singapore	Singapore	Chinese		

9 177 Foreign Phonetic Alphabet (Pinyin Ranking)

177 Foreign Character Database Index Table (Pinyin Sorting)

First word mother	country	The total table Serial number	First word mother	country	The total table Serial number	First word mother	country	The total table Serial number
A (15)	Afghanistan	171 F (7)	Cape Verde		88	Lesotho		40
	Albania	122	Vatican		119	Lebanon		159
	Algeria	152	Faroe Islands		103 M (18)	Malta		121
	Oman	164	Finland		106	Macedonia		138
	Argentina	78	Philippines		128	Madagascar		62
	United Arab Emirates	158	France		41	Malaysia		124
	Azerbaijan	139	Fiji		19	Malawi		35
	Ireland	2	G (8) The Gambia		28	Mali		46
	Estonia	107	Cuba		74	Marshall Islands		25
	Austria	95	Colombia		76	Moldova		135
	Australia	16	Grenada		13	Monaco		43
	Andorra	64	Greenland		104	Morocco		151
	Antigua and Barbuda	9	Congo		59	Mauritius		37
	Angola	91	Costa Rica		67	Mauritania		156
	Egypt	148	Guyana		15	Peru		77
B (20)	Panama	68	H (5) South Korea		175	United States		3
	Bahrain	163	Haiti		44	Mongolia		145
	Pakistan	170	Honduras		71	Mexico		65
	Palestine	168	Netherlands		98	Democratic Republic of the Congo		58
	Paraguay	82	Kazakhstan		144	Mozambique		92
	Bahamas	8	J (10) Kyrgyzstan	140		N (8) Namibia		39
	Brazil	87	Djibouti		56	South Africa		26
	Belarus	132	Zimbabwe		27	Nauru		twenty four
	Iceland	105	Gabon		60	Nicaragua		72
	Benin	51	Canada		4	Nigeria		32
	Belize	5	Ghana		31	Niger		52
	Belgium	42	Guinea		48	Yugoslavia		136
	Polo Li	73	Guinea-Bissau		89	Norway		101
	Bolivia	83	Kiribati		twenty three P (2)	Portugal		86
	Poland	112	Czech Republic		110	Palau		20
	Burundi	57	K (7) Cameroon		53	R (3) Sweden		102
	Bosnia	137	Comoros		61	Japan		174
	Bulgaria	134	Côte d'Ivoire		49	Switzerland		94
	Burkina Faso	47	Qatar		162	S (17) El Salvador		70
	Botswana	38	Kenya		129	San Marino		118
C (1)	Equatorial Guinea	84	Croatia		116	Sao Tome and Principe		90

D (6)	Germany	93	Kuwait		161	Saint Kitts and Nevis		14
	Denmark	100	L (9) Liberia		30	Saint Vincent		11
	Dominica	10	Libya		150	Saint Lucia		12
	Dominican Republic	69	Latvia		108	Cyprus		147
	East Timor	127	Lithuania		109	Senegal		45

	Togo	50	Romania	114	Sierra Leone	29
E (2)	Russia	131	Liechtenstein	97	Seychelles	36
	Ecuador	79	Luxembourg	96	Somalia	154

first letter	country	The total table Serial number	first letter	country	The total table Serial number	first letter	country	The total table Serial number	
S	Sudan	153	X (8)	Guatemala	66	Y (10)	Jamaica	6	
	Saudi Arabia	167		Brunei	125		Yemen	160	
	Solomon	twenty one		Uruguay	81		Italy	117	
	Slovakia	111		Ukraine	133		Jordan	165	
	Slovenia	115		Uganda	33		Indonesia	126	
	Suriname	99		Uzbekistan	143		Vietnam	123	
	T (8)	Turkey		120	Venezuela		75	Iraq	166
		Turkmenistan		142	Spain		63	Iran	169
		Tunisia		149	Ceuta and Melia		85	United Kingdom	1
		Trinidad and Tobago		7	Greece		146	Israel	172
Tonga		18	Syria	157	Z (5)	Zambia	34		
Tajikistan		141	new Zealand	17		Central Africa	55		
Thailand		173	Singapore	177		China	176		
Tanzania		130	Western Sahara	155	Chad	54			
W (8)	Vanuatu	twenty two	Hungary	113	Chile	80			

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