# sprintFont manual

sprintFont is a plugin for Sprint-Layout v6 2022 and newer version.

for version: v1.5.3

## 1. Features

- Insert text in other fonts
- Import the footprint from Kicad/EasyEDA
- Insert the SVG image
- Insert Qrcode
- Supports auto-routing
- Add teardrop pads
- Rounded-tracks feature

## 2. Usage

### 2.1 Install plugin

1. Decompress sprintFont to a directory, open Sprint-Layout v6.0 2021 and newer version, click menu ["Extras" / "Define Plugin"]



2. Locate the sprintFont.exe

Plugin	<b>×</b>
EXE-File D:\sprintFont\sprintFont.exe	
Change	ОК

3. Execute the plugin by clicking menu ["Extras" / "Run Plugin"]

o Sprint-Layout 6.0		
File Edit Board Functions	Extras Options ?	
🗅 🚅 🔒 🎒 🗠 🖂 .	Project info	
▶ Edit mm0	List drillings	Macros ×
Q Zoom	Scanned copy	
🖍 Track	Footprint-Wizard	
● Pad ▼	Reset solder mask	
SMD-Pad	Remove connections (rubberbands)	
O Circle	Delete elements outside the board	
🗖 Rectangle 🔻	Text-IO: Import elements	E Add as component
Zone	Text-IO: Export elements	
Special form	Define Plugin	
ab  Text	Run Plugin	
O Solder mask		
Connections		
Autoroute		-
🔪 Test	۰ ا	
Measure - Board 1		Drag and Drop
X:         16.500 mm         visible         C1         S1           Y:         67.400 mm         active         Image: Content of the second	<mark>62 52 0</mark> , 🔊 💠 🗶	

### 2.2 Insert text in other fonts

1. Switch to the "Font" page

Choose a font and change some parameters for your application.

A sprintFont v1.3	sprintFont v1.3 [github.com/cdhigh]						
Font						• • •	
Font		Footprint		SVG/Qrcode		Autorouter	
Text	Beaut	iful				-	
						-	-
	_						_
Font	Sego	e Script Bold	•	Height	(mm)	2.0	•
Layer	S1 (F	ront silkscreen)	-	Word spacing	(mm)	-0.5	•
Smooth	Norm		-	Line spacing	(mm)	0.0	-
Sinootii	Norm	Idi	•	Line spacing	(mm)	0.0	•
		Ok		Cancel		Save	as
Report bugs: http	os://git	hub.com/cdhigh/sprint	tFontRel	ease/issues			

 Return to Sprint-Layout by clicking "OK", the text you entered will be "sticky" on the mouse, move to the desired position and click the mouse to drop it.
 If the layer "C2 (Back copper)" or "S2 (Back silkscreen)" is selected, the font is automatically mirrored horizontally.



3. For unicode symbols in font file, you can digit "\u1234" to insert it into Sprint-Layout (replace 1234 with the unicode code of symbol)

## 2.3 Import footprint

Disclaimer: I am not responsible for any loss caused by the incorrect package imported by this plugin. If you do not agree with this disclaimer, please stop using this plugin immediately.

#### 1. Switch to the "Footprint" page

A sprintFont v1.3 [gith	sprintFont v1.3 [github.com/cdhigh]							
Font	Footprint	SVG/Qrcode	Autorouter					
1.	rrently supports: Kicad footprint Library : EasyEDA part ID: C + nu							
Input								
	Import text							
	Ok	Cancel	Save as					
Releases: https://githu	b.com/cdhigh/sprintFontl	Release/releases						

#### 2. Import from Kicad

Kicad installer is already packaged with a lot of footprint libraries. If you don't want to install Kicad, you can just download the libraries from this link <u>Kicad official libraries</u>, in addition, many component search websites also provide footprint library in Kicad format, such as <u>Component</u>. <u>Search Engine</u>.

#### Steps:

Click the button on the right side of the text box to select the footprint kicad\_mod file in your machine to import to Sprint-Layout. It is compatible with Kicad\_v5 and Kicad\_v6 format.

🔯 Footprint Library Browser — Di	splay_7Segment — C:\Program Files\KiCad\share\kicad\modules/Display_7Segment.pretty
File View Help	
🔁   🎄   🗲 📄   🔿	€ ⊖ Q Grid: 1.2700 mm (50.00 mils) ▼ Zoom Auto ▼
Display_7Segment	7SEGMENT-LED_HDSM5 A
Ferrite_THT	7SegmentLED_LTS6760_LT
Fiducial	AD-121F2 REF**
Filter	AFF_2x7SEG-DIGIT_10mm
Fuse	CA56-12CGKWA
Heatsink	CA56-12EWA
Inductor_SMD	CA56-12SEKWA
Inductor_THT	CA56-12SRWA
Jumper	CA56-12SURKWA
LED_SMD	CA56-12SYKWA
LED_THT	CC56-12GWA
Module	CC56-12YWA
Mounting_Wuerth	DA04-11CGKWA
MountingEquipment	DA04-11SEKWA
MountingHole	DA04-11SURKWA
NetTie	DA04-11SYKWA
OptoDevice	DA56-11CGKWA
Oscillator	DA56-11SEKWA
Package_BGA	DA56-11SURKWA
Package_CSP	DA56-11SYKWA
Package_DFN_QFN	DE113-XX-XX
Package_DIP	DE114-RS-20
Package_DirectFET	DE122-XX-XX
Package_LCC	DE172-XX-XX AD-121F2
Package_LGA	ELD_426XXXX
Package_QFP	HDSP-7401
Package CID	
REF** Last Change AD-121F2 Nov 08, 2017	Netlist Path Board Side Pads Status Rotation Attributes Footprint 3D-Shap Front 24 0.0 Normal Display_7Segment:AD-121F2 \${KISYS3
Z 3.73 X 19.050000 Y -6.3	



#### 3. Import from EasyEDA

#### Steps:

If you want to import the footprint from EasyEDA, the first thing is to find the LCSC part code of the component, you can go to the website <u>EasyEDA site</u>, Click the "Library" in the left navigation bar, search and pick the LCSC part code at the bottom of the page

2	& ⊗	🔍 Library				MIN
2	Filter	Search Engine EasyEDA LC	SC Electronics Keywords	at least 3 characters	Q	
oject	Supply Flag	Types Symbol Foot	print Spice Symbol SCH Module	PCB Module 3D Model		
Ē	↓ VCC GND T	Line Pressing Terminals	<ul> <li>Title(PartNO)</li> </ul>	Footprint	JLCPCB Part Class	N <b>^</b>
mo prary	ID Ground VCC	Mezzanine Connectors	XKSIM-004	SIM-SMD_XKSIM-004	Extended Part	>
	Resistor	Micro USB Connectors	C XKTF-015-N	TF-SMD_XKTF-015-N	Extended Part	
Q	•///•	PH Connectors Pin Headers	C XKSIM-114	SIM-SMD_XKSIM-114	Extended Part	>
rary	2_0603_U82_0603_E		C XKSIM-1130-1		Extended Part	>
	I I	Power Connectors	SMO-1511B-P8		Extended Part	
sc	⊷ŵ∻ •Ċ→	Pre-ordered Connectors	SMN-304	₩ 📀 🤆 SIM-SMD_SMN-304	Extended Part	
SC rts	_3386P_U_3386P_E	Rectangular Connecto	SMN-303	M SIM-SMD_SMN-303	Extended Part	
	Capacitor	RF Connectors / Coaxi	SCDA7A0600	M 📀 🖵 SD-SMD_SCDA7A0600	Extended Part	4
IC I	⊷⊪→ ⊷⊪→	RJ11	📋 微型手机卡卡座 翻盖nano1.4	SIM-SMD_C77877 جز 😒	Extended Part	
PCB	C_0603_US_0603_E	Screw terminal	TF-102-15	₩ 📀 🖵 TF-SMD_TF-102-15	Extended Part	>
2	⊷+(→ ⊷+ <b> </b> →	SIM Card Connectors Spring Clamp System	SMN-306	sim-smd_smn-306 جز 😒 🔤	Extended Part	>
?	an_SMD_Aan_SMD_A	EasyEDA > Symbol > LCSC > SIN	I Card Connectors > 微型手机卡卡座 翻盖	inano1.4		
-port	Inductor	\$0.0000 ♀ ₺			Distributor: LCSC	
זו	•••••			🥒 Edit	Place Mo	re 👻 🗙 Cance

Digit the LCSC code in the text box, press Enter or click the "Ok" button to import it.



### 2.4 Insert SVG images/Qrcode

This plugin also supports the importation of SVG vector graphics, but it does not implement all SVG commands internally, so it can only support simple graphics, such as LOGO.

Å	sprintFont v1.3 [gi	ithub.com/cdhigh]				
	<b></b>		5	/G/Qrcode		
	Font	Footprint	51	vo/Qrcode	Autorouter	
		Note: Only for simple images, m	ay fail to	convert complex	images	
	SVG 👻					
	Mode	Track	•	Height (mm)	10.0	•
	Layer	S1 (Front silkscreen)	•	Smooth	Normal	-
		Ok		Cancel	<u>S</u>	ave as
R	Releases: https://git	hub.com/cdhigh/sprintFont	Release/r	releases		



### 2.5 Autorouting

This plugin successfully added auto-routing functionality to Sprint-Layout. The solution is the same as Kicad, divided into three steps:

1. Export the board to Specctra DSN format.

- 2. Use the open source auto-router <u>Freerouting</u> to do auto-routing work and save routing results as a SES file.
- 3. Import the SES file back to Sprint-Layout.

### 2.5.1 Usage

#### 2.5.1.1 Export to Specctra DSN format

1. Switch to the layer "O" firstly in Sprint-Layout, and define a closed zone as board boundary, which can be of different shapes such as rectangles, circles or irregular shapes. After that, switch to other board layers to place components and layout them appropriately. Use the "Connections" tool to connect the pins that need to be connected, this connection is called Ratsnest or Airwire or other names in different software.



2. Deselect all items in Sprint-Layout (**no components or tracks can be selected**), run the plugin, switch to the "Autorouter" page.

🔺 sprin	tFont v1.3 [gitł	nub.com/cdhigh]			x	
	Font	Footprint	SVG/Qrcode	Autorouter		
			ile with Freerouting for a l components placed on t	-		
C	OSN file					
	SES file					
	Т	rack width	0.3	<u> </u>		
	Rules V	ia diameter	0.7	=		
	V	ia drill	0.3			
	C	learance	0.3	-		
Export DSN Import SES Cancel Save as						
Release	es: https://gith	ub.com/cdhigh/sprintFont	Release/releases			

 Specify the DSN file name, modify the rule item value by double-clicking the row, and click "Export DSN" to export the DSN file.
 This plugin also generates a pickle file with the same name of DSN file, please do not delete it, this file will be used when importing SES

#### 2.5.1.2 Auto-routing

- 1. <u>Download and install Freerouting</u>, open it and load the DSN file.
- 2. Click "Autorouter" on the toolbar and wait for it to complete the routing. If the circuit board is complex, it may take a long time to run.



3. The default configuration is for double-sided board, it means both the top and bottom copper layer are allowed to place tracks. If single-sided copper layer is required, you can select the copper layer you need through the Freerouting menu ["Parameter" / "Autoroute"] dialog

🛃 Autoroute Parameter				
Layer:	Active:	Preferred Direction:		
F. Cu	<b>V</b>	horizontal 🔻		
B. Cu		vertical 🔻		
Vias all	.owed:	<b>V</b>		
		🕅 Fanout		
Passes:		🔽 Autoroute		
		📝 Postroute		
Detai	l paramete	r		

4. After the routing is completed, save the result as an SES file via the menu ["File" / "Export Specctra Session File"]



#### 2.5.1.3 Import SES to Sprint-Layout

- Select the correct SES file (ensure that the pickle file with the same name exists), click "Import SES" to directly import the routing result into Sprint-Layout. Sprint-Layout does not necessarily need to pre-open the previous board, it can be a blank board.
- 2. Hold Shift and click "Import SES" to display a menu with more import options.

Å	sprintFont v1.3 [	github.com/cdhigh]				
	[					
	Font	Footprint	SVG/Qrcode	Autorouter		
			N file with Freerouting for a s all components placed on	-		
	DSN file					
	SES file					
		Track width	0.3	<u>^</u>		
	Rules	Via diameter	0.7	=		
		Via drill	0.3	-		
		Clearance	0.3	-		
	Export DSN         Import SES         Cancel         Save as           Import all (remove routed ratsnests)					
			ove routed ratsnests)			
R	eleases: https://g		p all ratsnests)			
	ereases: https://g	Import auto-rou				

- **Import all (remove routed ratsnests)**: It's default behavior when you click "Import SES". The airwires with copper connection are deleted, and the airwires without copper connection are retained.
- **Import all (remove all ratsnests)**: Import all the routing results and components and replace all components on the board, and delete all airwires.
- **Import all (keep all ratsnests)**: Import all the routing results and components and replace all components on the board, and keep all airwires.
- **Import auto-routed tracks only**: Import tracks only, do not import components, do not delete any elements on the circuit board, the imported tracks will "stick" to the mouse, and move to the correct position to drop.

### 2.5.2 other details for auto-routing

- If there is a .rules file in the same folder of the DSN file, Freerouting will use this file to overwrite the routing rules in the DSN file, so maybe need to delete the .rules file if the result is not what you set in plugin.
- Components can only be placed on the front side. for SMD component, both the component body and the pads are on the front side. for THT component, the component body is on the front side, and the single-sided pad is on the back side, can be any side if is THT (plated) pads. (This is default behavior when you place a component in Sprint-Layout)
- If there are some areas that cannot be routed, you can draw a polygon and set it as "Cutoutarea". Or draw it on the layer O (EdgeCuts) can achieve the same effect, but the polygons in the layer O will affect the final circuit board shape.
- If you use the "Disintegrate Component" function to modify the component's pad or silk screen, you have to convert the group back to component again ([right click "Build group" -> right click "Component"]), otherwise Freerouting only displays pads, not silkscreens. (but silkscreens are not lost, they will appear again when be imported into Sprint-Layout)
- Some critical tracks such as power/clock can be prerouted, or modify them manually after Freerouting finished. Auto-routing can be used as the starting point of routing, and can also be used as the end point of routing.

- Due to the limitation(bug?) of Freerouting, silkscreen lines can only be horizontal and vertical or 45-degree. Other angles will be incorrectly drawn in Freerouting, but silkscreen does not affect routing.
- Due to the limitation of Freerouting, the arc of the silk screen is not drawn.
- Sometimes when SES file been imported, the routed net-connections (Ratsnest) have not been deleted. This is a bug of Sprint-Layout. Just create a new blank board and import it again, the problem can be solved.

## 2.6 Teardrop pads

The algorithm of teardrop pads is from <u>https://github.com/NilujePerchut/kicad\_scripts</u>, thanks in advance.



### 2.6.1 Basic operation

- If deselect all elements in Sprint-Layout before executing this plugin, teardrop will be applied to all THT pads. If only some pads need to be added teardrops, you can select the both pads and tracks you need firstly. Deleting teardrops is the same logical, you can delete all teardrops or only those in the selected region.
- 2. By the legend in the GUI, it should be easier to understand the meaning of the three parameters. The base of the percentage is the outer diameter of the pad.

A sprintFont v1.4				
Font	Footprint	SVG/Qrcode	Autorouter	Teardrops
Apply to all	pads when dese	lecting all, otherwis	se apply to selecte	d pads AND tracks only
Horizo	ntal percent 5	0 🗸		
Vert	tical percent 9	0 -		W 100%
Number o	of segments 1	0 🗸		
	Include SMD pad	ls	⊱H →	
Add		Remove	Cance	4
Releases: https://	github.com/cdhig	h/sprintFontRelease	/releases	

### 2.6.2 Details

- thermal pads will not be processed.
- If the teardrop parameters are the same, the teardrop pad will not be added repeatedly. but if the parameters are different, multiple operations may add some overlapping teardrop pads.

## 2.7 Rounded-track

This function can convert ordinary tracks of various angles into rounded tracks, which is very suitable for high-frequency circuits and audio circuits.



### 2.7.1 Basic operation

- 1. If deselect all elements in Sprint-Layout before executing this plugin, all tracks will be converted to rounded-tracks if it can be. If only some tracks need to be converted, you can select the tracks you need firstly.
- 2. The plugin supports three ways to convert rounded tracks:
  - Tangent arc: The two points at the specified distance from the turning point of the route are the starting point and the end point of the arc, and the arc is tangent to the two segments of the track. There are two distances, if the big one is not suitable for short tracks, the small one will be applied.
  - Three-point arc: The arc is drawn according to every three consecutive points, and the three points are all on the arc.
  - Bezier curve: The first point is the starting point, the third one is the end point, the intersection of the two segments of track is the control point, and a Bezier curve is drawn by these three points.

Å	sprintFont v	1.5.1				
	<b>F</b>	<b>F 1 1 1</b>			<b>T</b>	RoundedTrack
	Font	Footprint	SVG/Qrcode	Autorouter	Teardrop	RoundedTrack
	Арр	oly to all track	s when desele	cting all, otherw	vise apply to se	elected tracks only
	Tange	nt 🔘 Th	ree-point	Bezier		Tangent arc
		big d(mm)	β.0 <b>▼</b>		· /	Three points arc
		small d(mm)	0.5 -			Bezier curve
	Numb	er of segmer	10 👻		<u> </u>	
		Conv	vert		Cancel	Save as
R	eleases: http	s://github.com	/cdhigh/sprint	FontRelease/rele	ases	

### 2.7.2 Details

- 1. If a track has many turns, the plugin will try to convert it into several arcs every 3 points from the starting point. If some points do not meet the conditions, the plugin will skip them and continue to find a suitable point.
- 2. The points on the tracks covered by pads or polygons of the same layer are considered as points that do not meet condition of the arc conversion, but you need to select the corresponding pads and polygons at the same time, because the plugin known nothing beside your selection range.

# 3. Others

- If the plug-in cannot be loaded, please download and install the VC runtime library 2015/2017/2019/2022 (any one). If it still does not work, you may also need "Universal C Runtime for Windows". You can search it for links, or just use links below:
- VC runtime x86
- VC runtime x64
- <u>Universal C Runtime</u>

# 4. Changelog

### v1.5.3

- fixed a name attribute error when importing footprint from EasyEDA
- Compile a release package that supports Windows XP

### v1.5.2

- Add name property for all elements (ready for Sprint-Layout 08.07.2022)
- support user fonts in Windows10
- fix render problem for kaiti\_GB2312

### v1.5.1

• Rounded-tracks has two distances, if the big one is not suitable, the small one will be applied

## v1.5

• Convert tracks to Rounded-tracks

### v1.4

• Added teardrop pads

## v1.3

- Added auto-routing (use Freerouting as auto-router)
- Added support for ttc/otc font format
- Some minor optimizations

## v1.2

• Insert Qrcode

### v1.1

- Import footprint from Kicad/EasyEDA
- Insert svg image

### v1.0

• Insert text in other fonts into Sprint-Layout