

F2SB1116L / F2SB1116K / F2SB1116U**List**

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F2SB1116L / F2SB1116K / F2SB1116U

General Purpose Transistors PNP Silicon

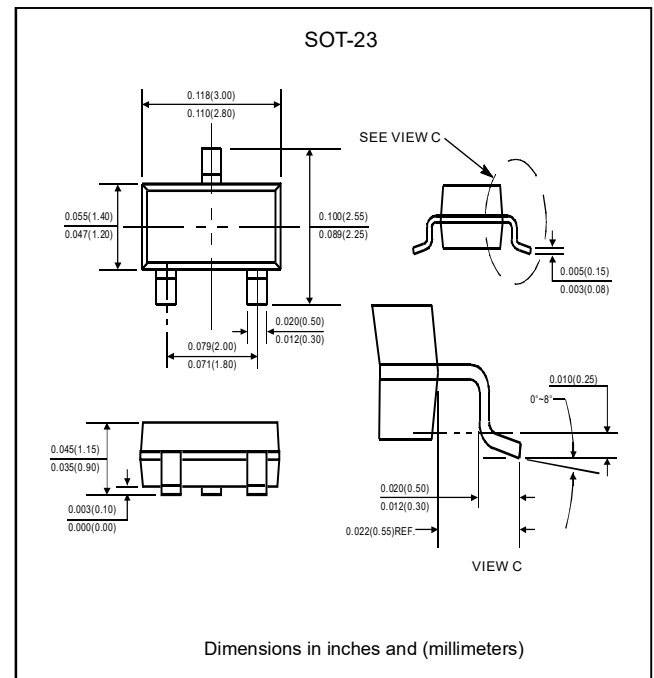
Features

- High collector power dissipation.
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen free part, ex. F2SB1116L-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Package outline



Maximum ratings (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector to base voltage	$-V_{CBO}$	60	V
Collector to Emitter Voltage	$-V_{CEO}$	50	V
Emitter to base voltage	$-V_{EBO}$	6	V
Collector current	$-I_C$	1	A
Total power dissipation	P_D	350	mW
Junction temperature	T_J	+150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

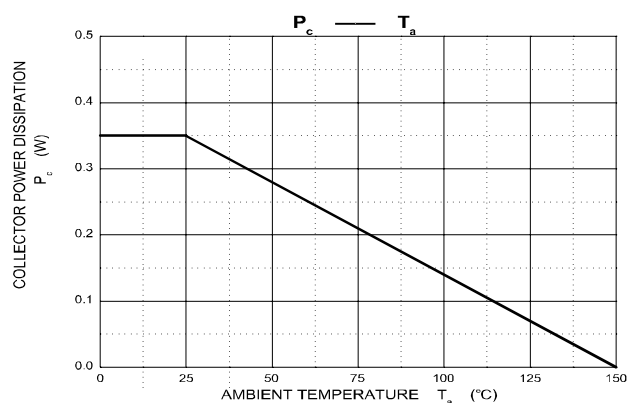
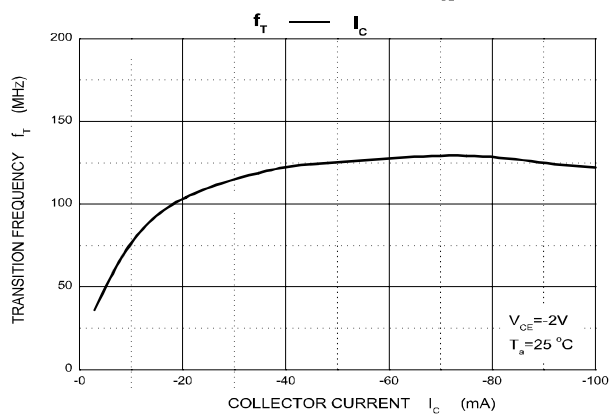
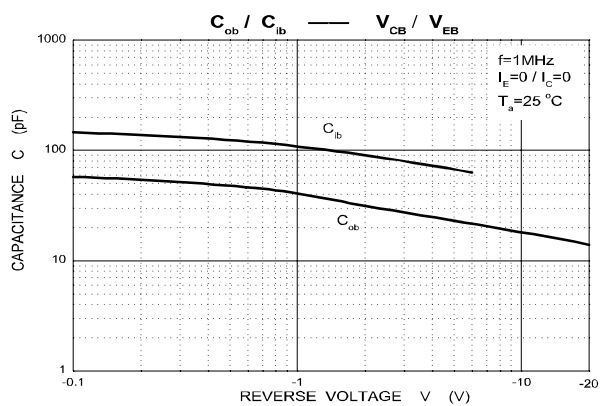
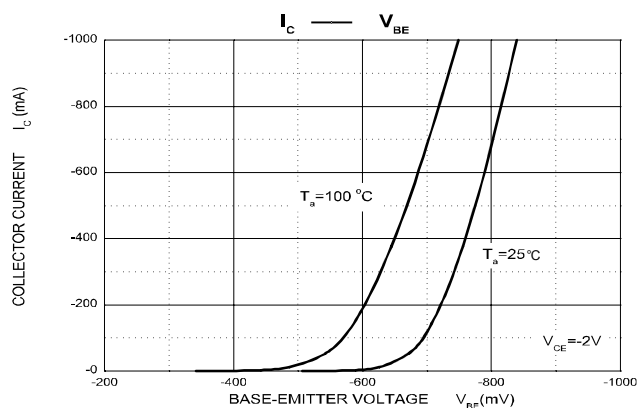
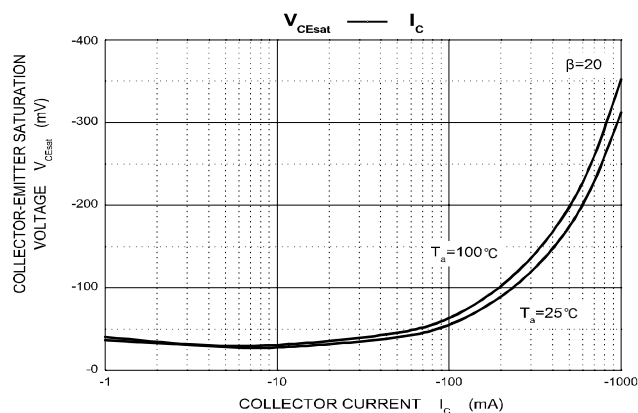
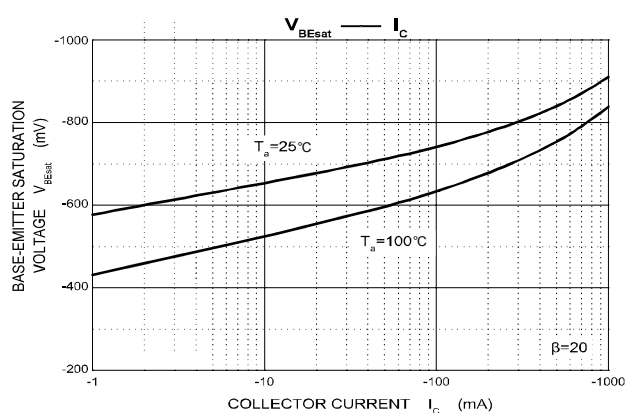
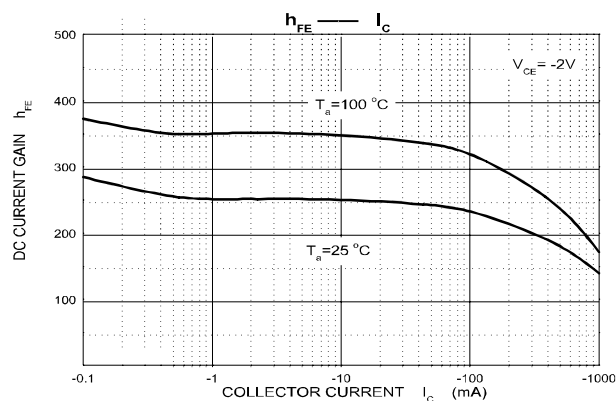
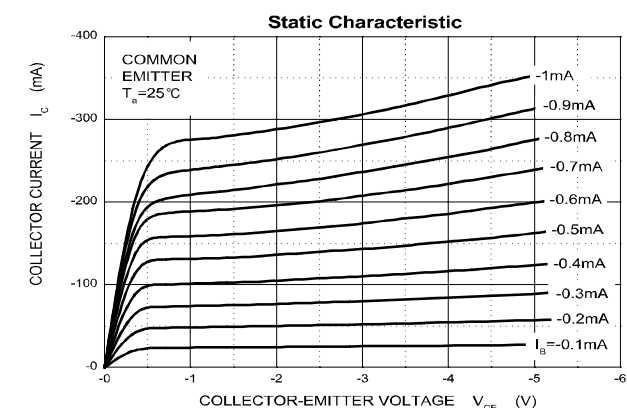
F2SB1116L / F2SB1116K / F2SB1116U**Electrical characteristics** (AT $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector base cut off current	$-V_{CB} = 60\text{V}$	$-I_{CBO}$			0.1	μA
Emitter base cut-off current	$-V_{EB} = 6\text{V}$	$-I_{EBO}$			0.1	μA
Collector base breakdown voltage	$-I_C = 100\mu\text{A}$	$-V_{(BR)CBO}$	60			V
Collector emitter breakdown voltage	$-I_C = 1\text{mA}$	$-V_{(BR)CEO}$	50			V
Emitter base breakdown voltage	$-I_E = 100\mu\text{A}$	$-V_{(BR)EBO}$	5			V
Collector emitter saturation voltage	$-I_C = 1\text{A}, -I_B = 50\text{mA}$	$-V_{CE(sat)}$			0.3	V
Base emitter saturation voltage	$-I_C = 1\text{A}, -I_B = 50\text{mA}$	$-V_{BE(sat)}$			1.2	V
DC current gain	$-V_{CE}=2\text{V}, -I_C=100\text{mA}$ Current gain group L	h_{FE}	135		270	
	$-V_{CE}=2\text{V}, -I_C=100\text{mA}$ Current gain group K		200		400	
	$-V_{CE}=2\text{V}, -I_C=100\text{mA}$ Current gain group U		300		600	
	$-V_{CE}=2\text{V}, -I_C=1\text{A}$		81			
Transition Frequency	$-V_{CE}=2\text{V}, -I_C=100\text{mA}$	f_T	70			MHZ
Output capacitance	$-V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$	C_{ob}		25		pF
Turn-on time	$-V_{CC}=10\text{V}, -I_C=0.1\text{A}, -I_{B1}=-I_{B2}=0.01\text{A}, V_{BE(off)}=2\text{ to }3\text{V}$	t_{on}		0.07		μs
Storage time		t_s		0.7		
Fall time		t_f		0.07		

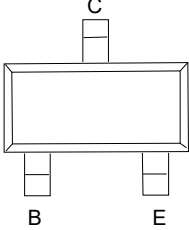
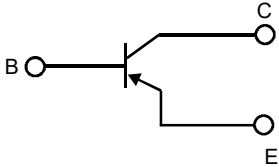
Classification of h_{FE}

Rank	L	K	U
Range	135 ~ 270	200 ~ 400	300 ~ 600

Rating and characteristic curves (F2SB1116L / F2SB1116K / F2SB1116U)

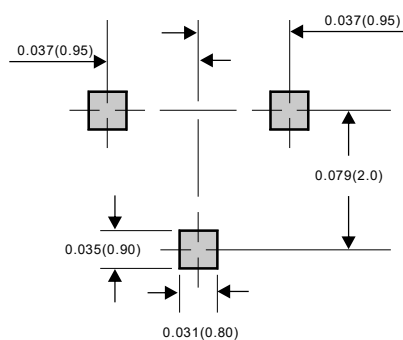


F2SB1116L / F2SB1116K / F2SB1116U**Pinning information**

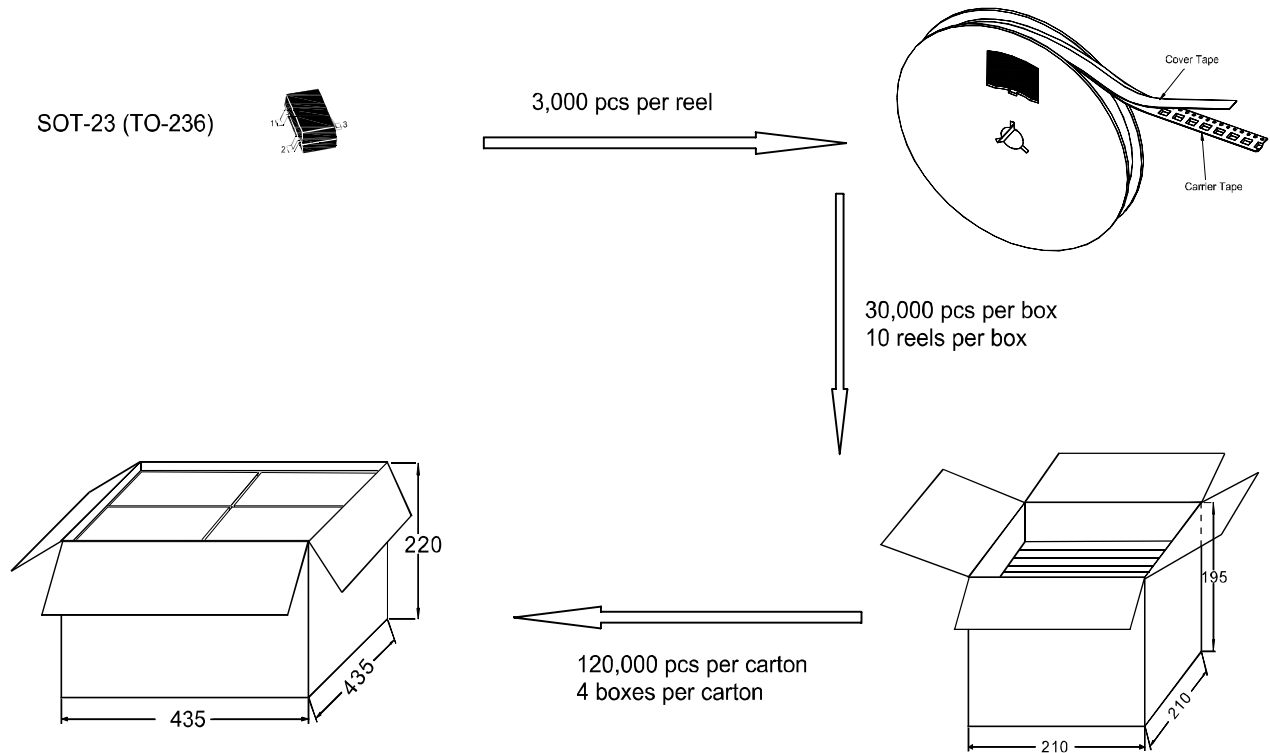
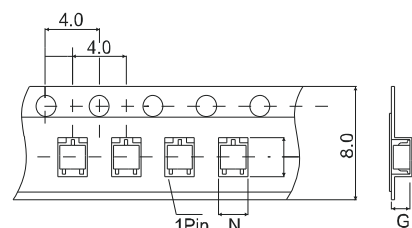
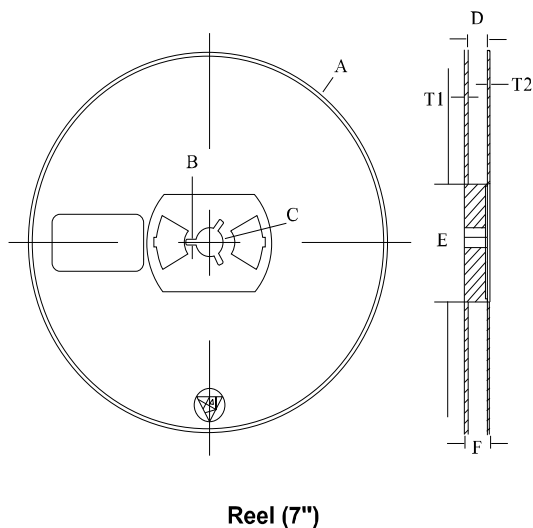
Pin	Simplified outline	Symbol
Pin B BASE Pin C COLLECTOR Pin E EMITTER		

Marking

Type number	Marking code
F2SB1116L	JCL
F2SB1116K	JCK
F2SB1116U	JCU

Suggested solder pad layout**SOT-23**

Dimensions in inches and (millimeters)

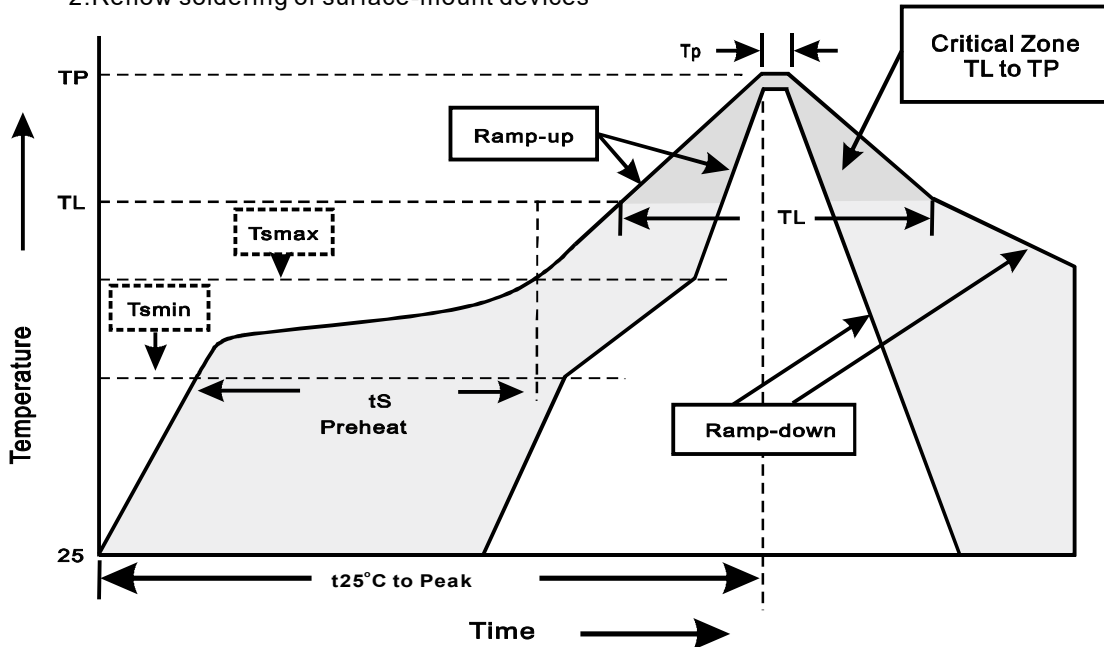
F2SB1116L / F2SB1116K / F2SB1116U**The method of packaging****Embossed tape and reel data****Tape (8mm)**

Symbol	Value (unit: mm)
A	$\varnothing 177.8 \pm 1$
B	2.7 ± 0.2
C	$\varnothing 13.5 \pm 0.2$
E	$\varnothing 54.5 \pm 0.2$
F	12.3 ± 0.3
D	$9.6 + 2 / - 0.3$
T1	1.0 ± 0.2
T2	1.2 ± 0.2
N	3.15 ± 0.1
G	1.25 ± 0.1

F2SB1116L / F2SB1116K / F2SB1116U

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	$<3^{\circ}\text{C}/\text{sec}$
Preheat -Temperature Min($T_{\text{smín}}$) -Temperature Max($T_{\text{smáx}}$) -Time(min to max)(t_S)	150°C 200°C 60~120sec
$T_{\text{smáx}}$ to T_L -Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$