

F2SB1386UP/UQ/UR**List**

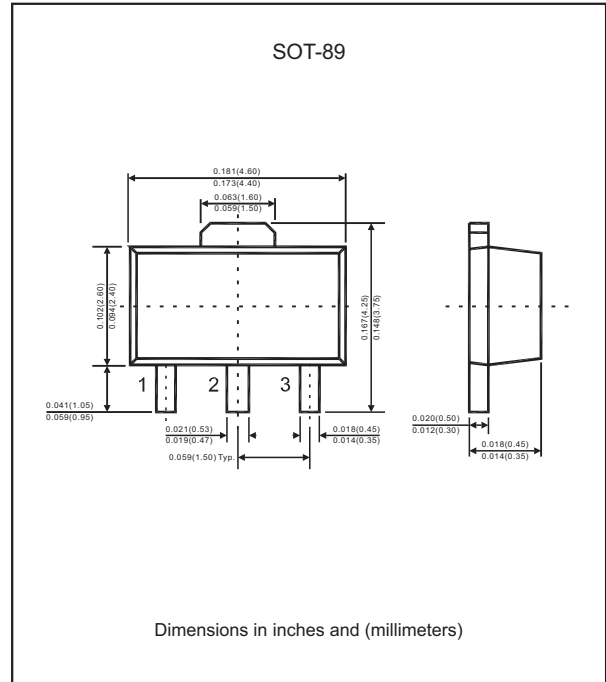
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F2SB1386UP/UQ/UR**-5A, -30V PNP Silicon Transistor****Features**

- Low collector saturation voltage
- Excellent current-to-gain characteristics
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen free part, ex. F2SB1386UP-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-89
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.045 gram

Package outline**Maximum ratings** (At $T_A=25^{\circ}\text{C}$ unless otherwise noted)

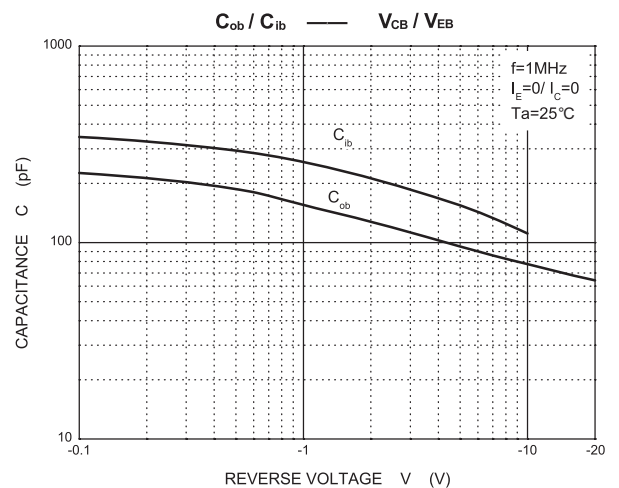
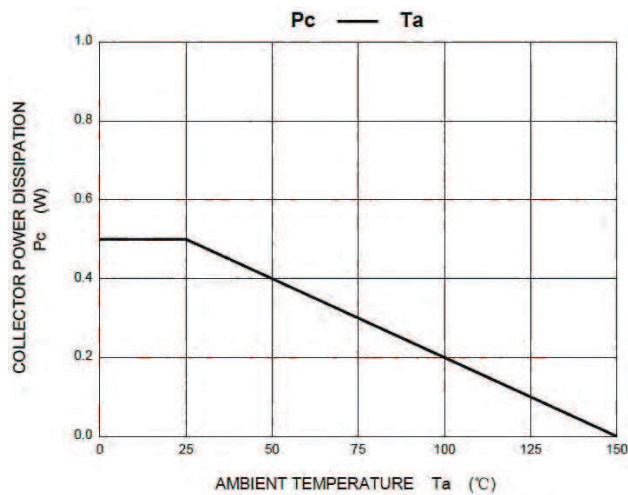
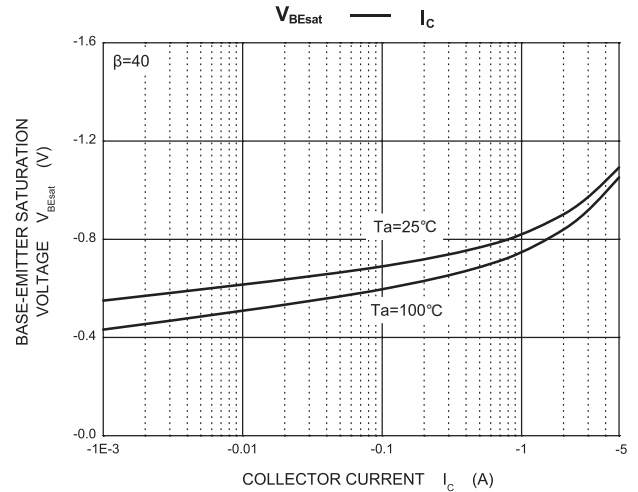
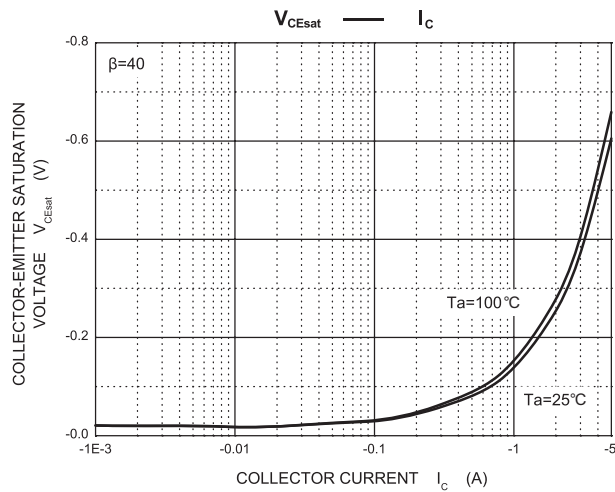
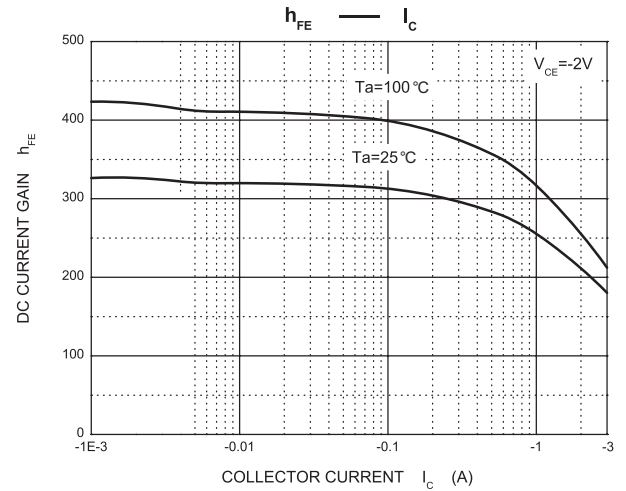
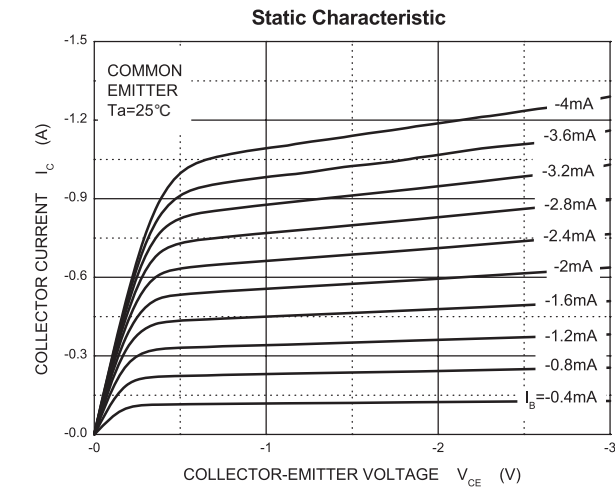
Parameter	Symbol	Value	Unit
Collector to base voltage	$-V_{CBO}$	30	V
Collector to Emitter Voltage	$-V_{CEO}$	20	V
Emitter to base voltage	$-V_{EBO}$	6	V
Collector current-DC (Note 1)	$-I_C$	5	A
Collector current -Pulse (Note 1)	$-I_{CP}$	10	A
Collector power dissipation	P_D	0.5	W
Junction temperature	T_j	+150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

Note : 1. Single pulse, $P_D=10\text{ms}$

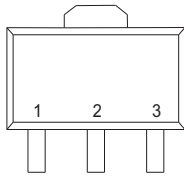
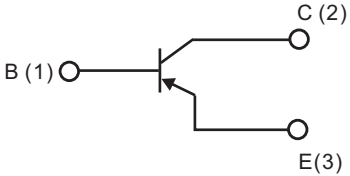
F2SB1386UP/UQ/UR**Electrical characteristics** (At $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Off Characteristics						
Collector-base breakdown voltage	$-I_C=50\mu\text{A}, I_E=0$	$-V_{(BR)CBO}$	30			V
Collector-emitter breakdown voltage	$-I_C=1\text{mA}, I_B=0$	$-V_{(BR)CEO}$	20			V
Emitter-base breakdown voltage	$-I_E=50\mu\text{A}, I_C=0$	$-V_{(BR)EBO}$	6			V
Collector-emitter cut off current	$-V_{CB}=20\text{V}, I_E=0$	$-I_{CBO}$			500	nA
Emitter-base cut off current	$-V_{EB}=5\text{V}, I_C=0$	$-I_{EBO}$			500	nA
On Characteristics						
DC current gain current gain group F2SB1386UP	$-V_{CE}=2\text{V}, -I_C=500\text{mA}$	h_{FE}	82		180	
DC current gain current gain group F2SB1386UQ			120		270	
DC current gain current gain group F2SB1386UR			180		390	
Collector-emitter saturation voltage	$-I_C=4\text{A}, -I_B=100\text{mA}$	$V_{CE(sat)}$			1.0	V
Small Signal Characteristics						
Output capacitance	$-V_{CB}=20\text{V}, I_E=0, f=1\text{MHz}$	C_{ob}		60		pF
Gain-bandwidth product	$-V_{CE}=6\text{V}, -I_E=50\text{mA}, f=100\text{MHz}$	f_T		120		MHz

Rating and characteristic curves (F2SB1386UP/UQ/UR)

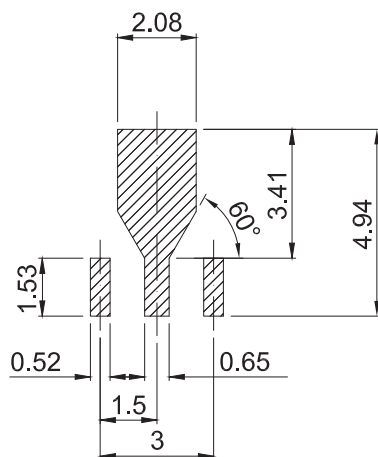


F2SB1386UP/UQ/UR**Pinning information**

Pin	Simplified outline	Symbol
Pin1 BASE Pin2 COLLECTOR Pin3 EMITTER		

Marking

Type number	Marking code
F2SB1386UP	BHP
F2SB1386UQ	BHQ
F2SB1386UR	BHR

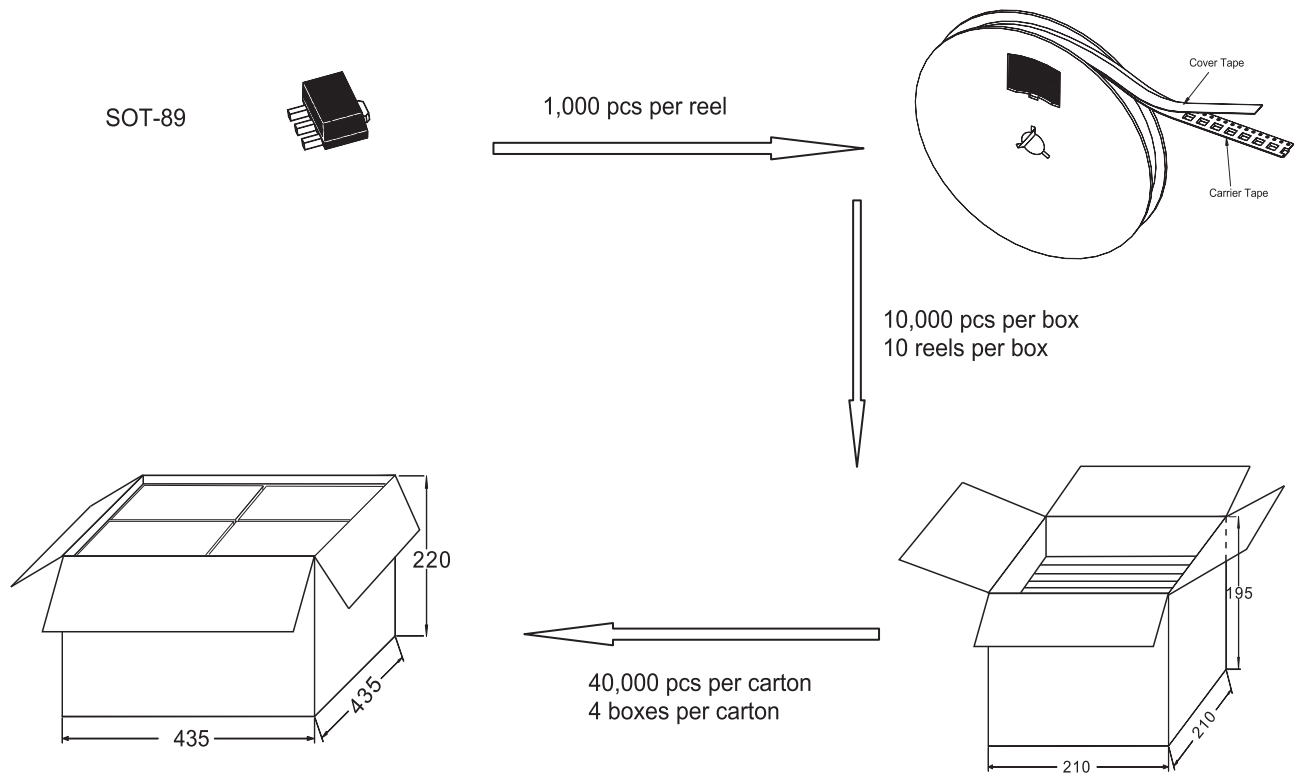
Suggested solder pad layout

Note :

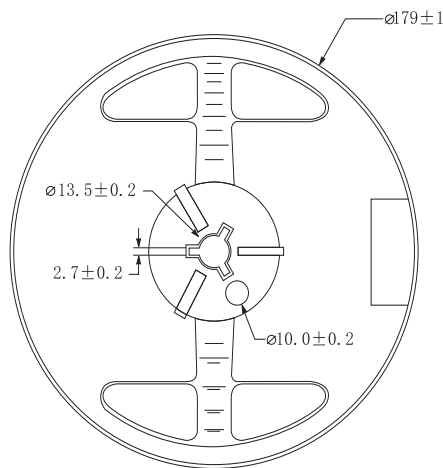
1. Controlling dimension : in millimeters.
2. General tolerance : $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

F2SB1386UP/UQ/UR

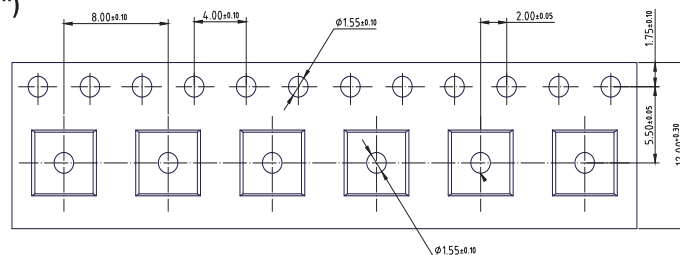
The method of packaging



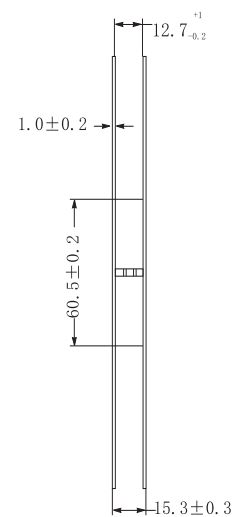
Embossed tape and reel data



Reel (7")



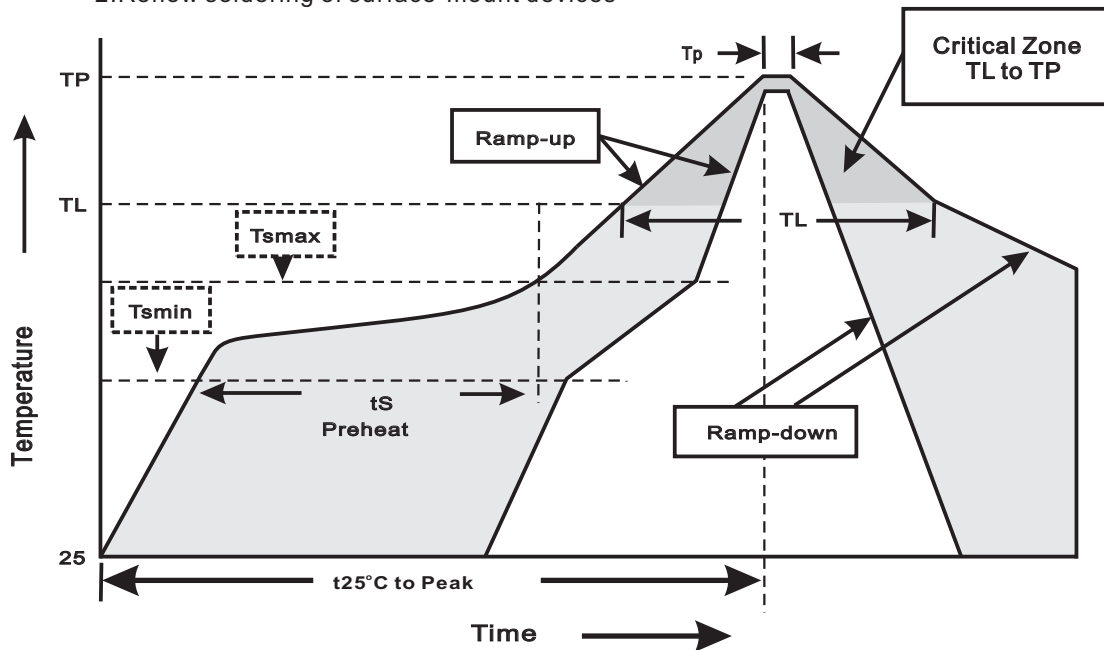
Tape (12mm)



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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°C/sec
Preheat -Temperature Min(T_{smin}) -Temperature Max(T_{smax}) -Time(min to max)(t_s)	150°C 200°C 60~120sec
T_{smax} to T_L -Ramp-upRate	<3°C/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	<3°C/sec
Time 25°C to Peak Temperature	<6minutes