

F2SD31N-H

List

List.....1

Package outline.....2

Features.....2

Mechanical data.....2

Maximum ratings2

Electrical characteristics.....3

Rating and characteristic curves.....4

Pinning information.....5

Marking.....5

Suggested solder pad layout.....5

Packing information.....6

Reel packing.....7

Suggested thermal profiles for soldering processes.....7

F2SD31N-H

3.0A 100V NPN Silicon Power Transistor

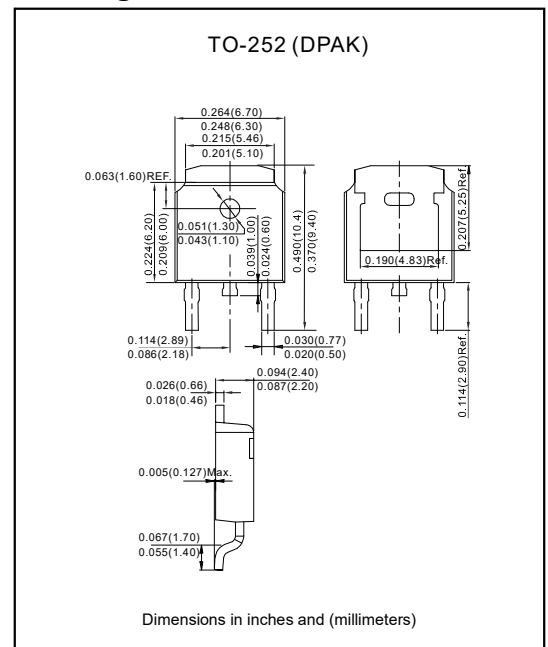
Features

- Designed for general purpose amplifier and low speed applications.
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, TO-252 (DPAK).
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Mounting Position : Any.
- Weight : Approximated 0.35 gram.

Package outline



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

Parameter	Symbol	Ratings	Units
Collector to base voltage	V_{CBO}	100	V
Collector to Emitter Voltage	V_{CEO}	100	V
Emitter to base voltage	V_{EBO}	5	V
Continuous collector current	I_C	3	A
Pulsed collector current	I_{CM}	5	A
Collector power dissipation	P_C	1.25	W
Total power dissipation ($T_c=25^{\circ}\text{C}$)	P_D	15	W
Junction temperature	T_J	+150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

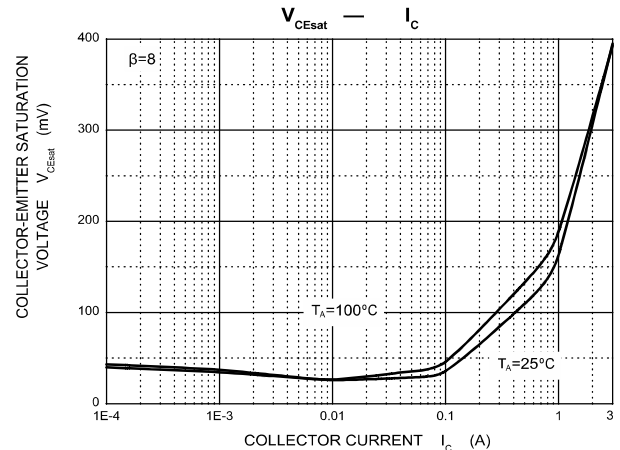
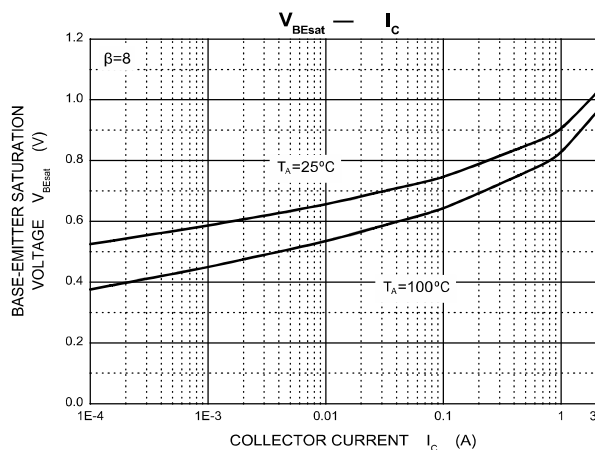
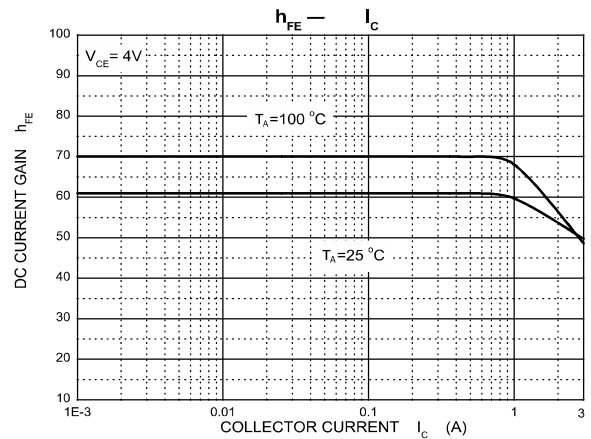
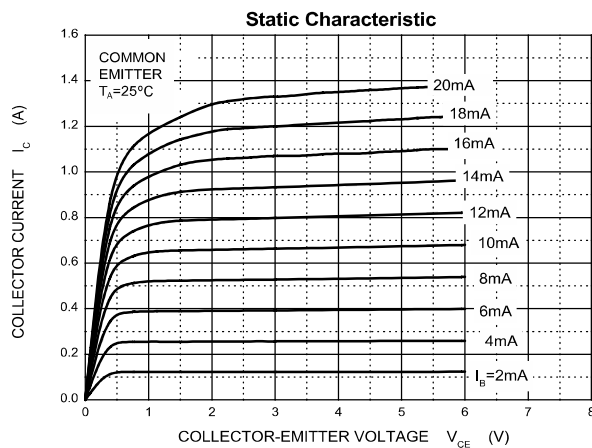
F2SD31N-H

Electrical characteristics (At $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector-base breakdown voltage	$I_C = 1\text{mA}, I_E = 0$	$V_{(BR)CBO}$	100			V
Collector-emitter breakdown voltage (Note1)	$I_C = 30\text{mA}, I_B = 0$	$V_{(BR)CEO}$	100			V
Emitter-base breakdown voltage	$I_E = 1\text{mA}, I_C = 0$	$V_{(BR)EBO}$	5			V
Collector cut-off current	$V_{CE} = 100\text{V}, V_{EB} = 0$	I_{CES}			20	μA
Collector cut off current	$V_{CB} = 60\text{V}, I_B = 0$	I_{CEO}			50	μA
Emitter cut-off current	$V_{EB} = 5\text{V}, I_C = 0$	I_{EBO}			1	mA
Collector-emitter saturation voltage	$I_C = 3\text{A}, I_B = 0.375\text{A}$	$V_{CE(SAT)}$			1.2	V
Base-emitter saturation voltage	$I_C = 3\text{A}, V_{CE} = 4\text{V}$	$V_{BE(on)}$			1.8	V
DC current gain	$V_{CE} = 4\text{V}, I_C = 1\text{A}$	h_{FE1}	25			
	$V_{CE} = 4\text{V}, I_C = 3\text{A}$	h_{FE2}	15		75	
Current gain bandwidth product	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}, f_T = 1\text{KHz}$	f_T	3			MHZ

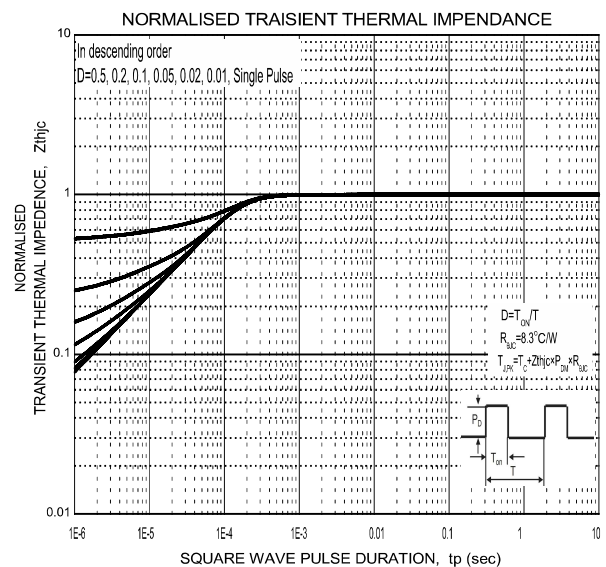
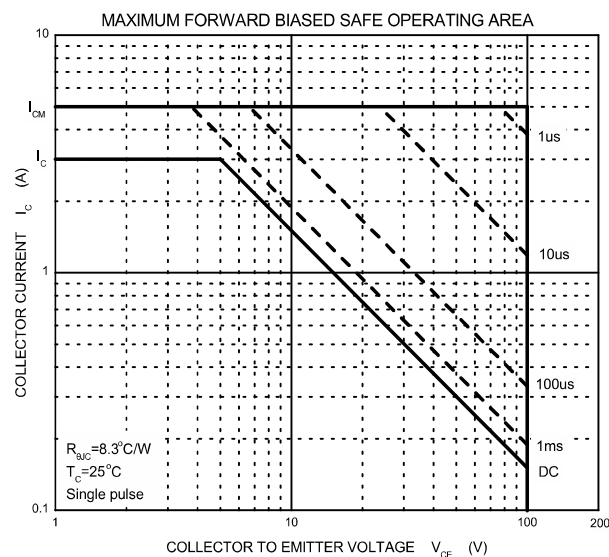
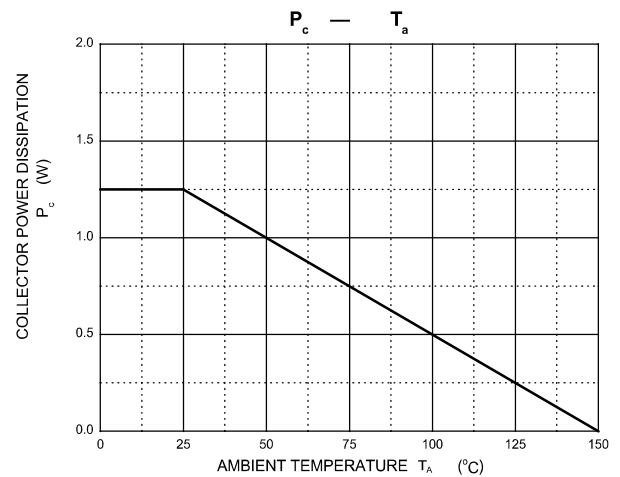
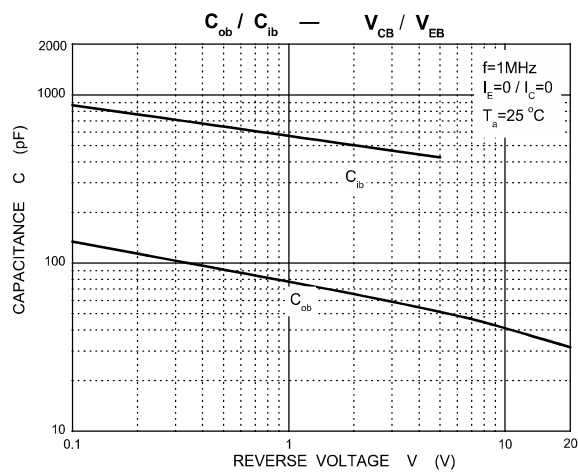
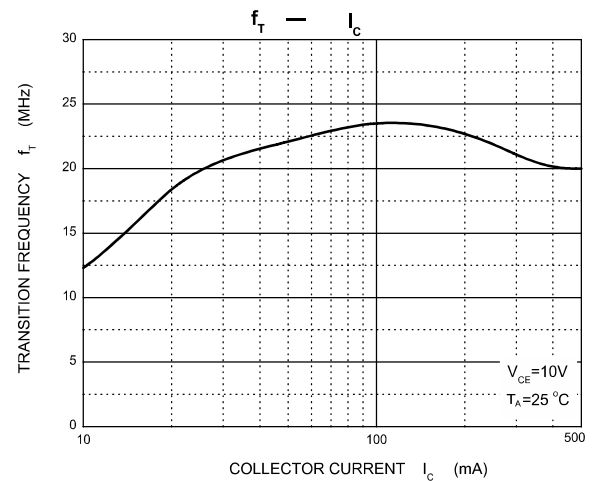
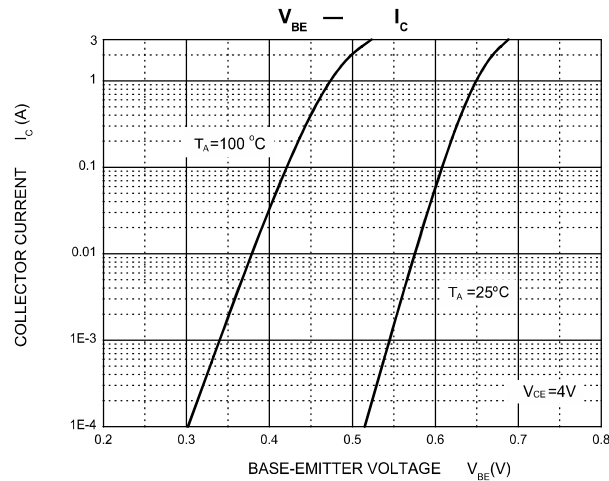
Note: 1. Pulse test: $P_w \leq 300\mu\text{s}$, duty cycles 2%.

Rating and characteristic curves



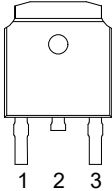
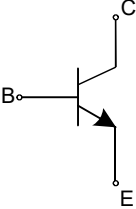
F2SD31N-H

Rating and characteristic curves



F2SD31N-H

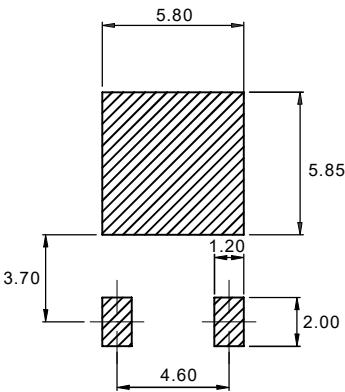
Pinning information

Pin	Simplified outline	Symbol
Pin 1 Base Pin 2 Collector Pin 3 Emitter		

Marking

Type number	Marking Code
F2SD31N-H	SD31N

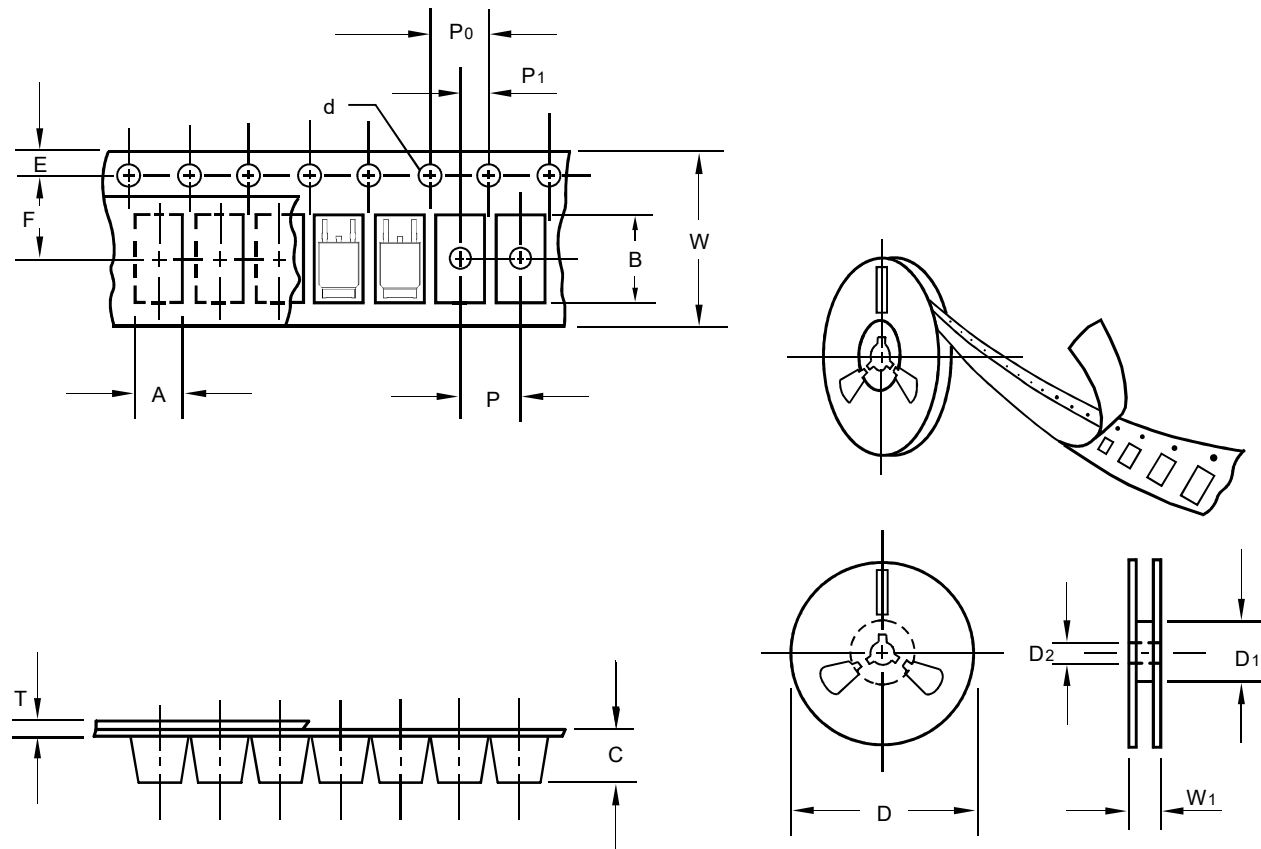
Suggested solder pad layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

F2SD31N-H

Packing information



unit:mm

Item	Symbol	Tolerance	TO-252
Carrier width	A	0.1	6.90
Carrier length	B	0.1	10.50
Carrier depth	C	0.1	2.70
Sprocket hole	d	0.1	1.55
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D ₁	min	100.00
7" Reel outside diameter	D	2.0	-
7" Reel inner diameter	D ₁	min	-
Feed hole diameter	D ₂	0.5	21.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	7.50
Punch hole pitch	P	0.1	8.00
Sprocket hole pitch	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	16.00
Reel width	W ₁	1.0	21.00

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

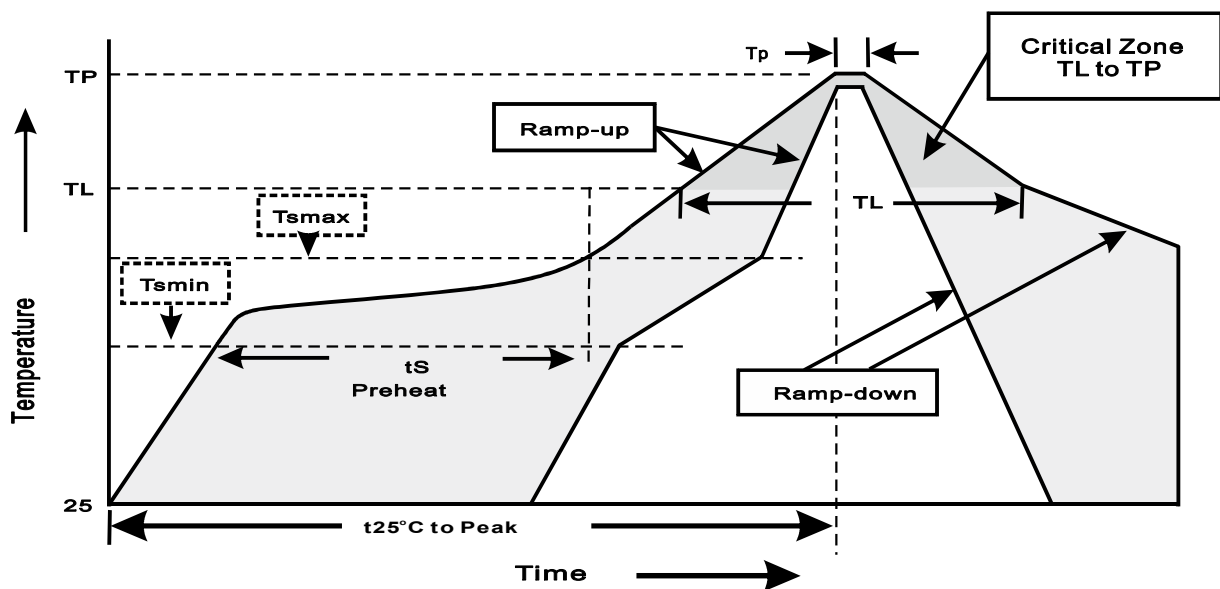
F2SD31N-H

Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
TO-252	13"	2,500	8.0	5,000	335*335*38	330	350*350*225	25,000

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