

FMBTRC118SS

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FMBTRC118SS

**100mA 50V Digital Transistors
(Built-in Resistors) NPN Silicon**

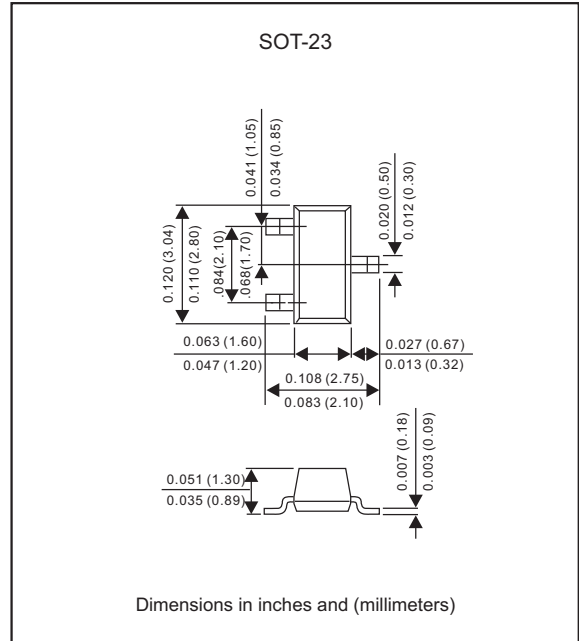
Features

- For Switching and interface circuit and drive circuit applications
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen free parts, ex. FMBTRC118SS-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)

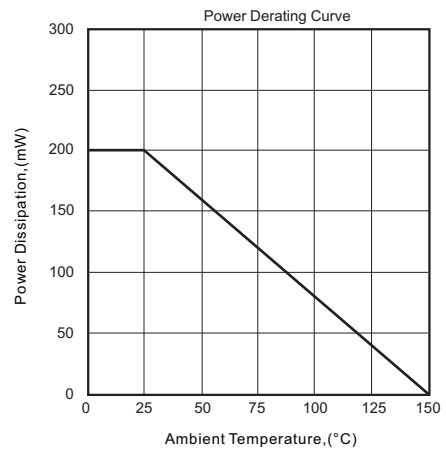
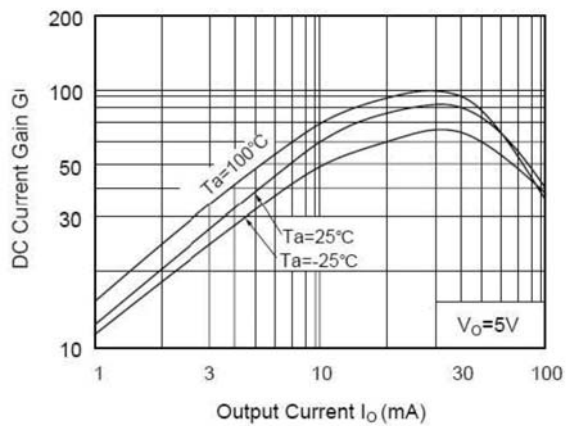
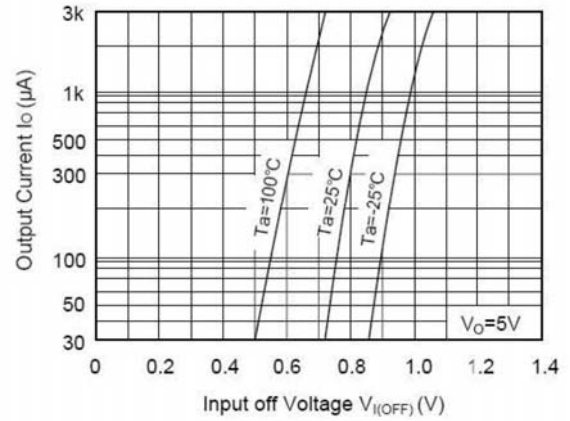
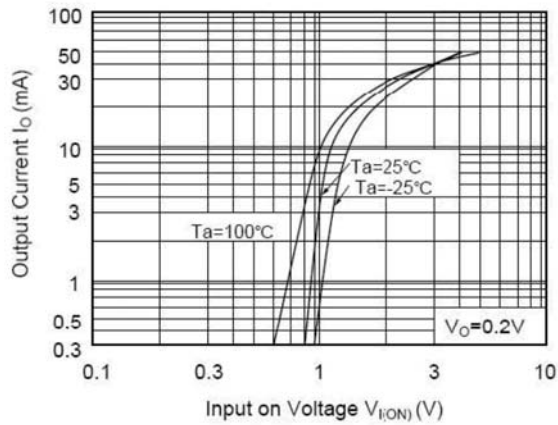
Parameter	Symbol	Value	Unit
Output voltage	V_o	50	V
Input voltage	V_i	12 to -5	V
Output current	I_o	100	mA
Total power dissipation	P_{tot}	200	mW
Operating junction temperature range	T_J	-55 to +150	$^{\circ}\text{C}$
Storage temperature range	T_{stg}	-55 to +150	$^{\circ}\text{C}$

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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
DC current gain	$V_o=5\text{V}$, $I_o=10\text{mA}$	G_i	33			
Output cutoff current	$V_o=50\text{V}$	$I_{o(OFF)}$			500	nA
Input current	$V_i=5\text{V}$	I_i			3.8	mA
Output voltage	$I_o=10\text{mA}$, $I_i=0.5\text{mA}$	$V_{o(ON)}$			0.3	V
Input on voltage (ON)	$V_o=0.3\text{V}$, $I_o=20\text{mA}$	$V_{i(ON)}$			3.0	V
Input off voltage (OFF)	$V_{cc}=5\text{V}$, $I_o=100\mu\text{A}$	$V_{i(OFF)}$	0.3			V
Transition frequency (Note 1)	$V_o=10\text{V}$, $I_o=5\text{mA}$	f_T		250		MHZ
Input resistance		R_1	1.54	2.2	2.86	K Ω
Resistance ratio		R_2/R_1	3.6	4.5	5.5	

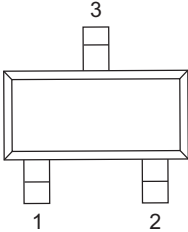
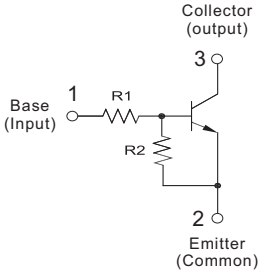
Note 1: Characteristic of transistor only

Rating and characteristic curves(FMBTRC118SS)



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Pinning information

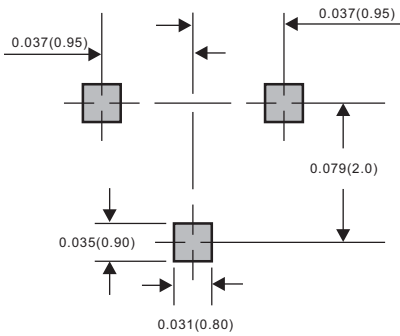
Pin	Simplified outline	Symbol
Pin1 Base Pin2 Emitter Pin3 Collector		

Marking & Resistor values

Type number	Marking code	R ₁ (KΩ)	R ₂ (KΩ)
FMBTRC118SS	18BR, YR	2.2	10

Suggested solder pad layout

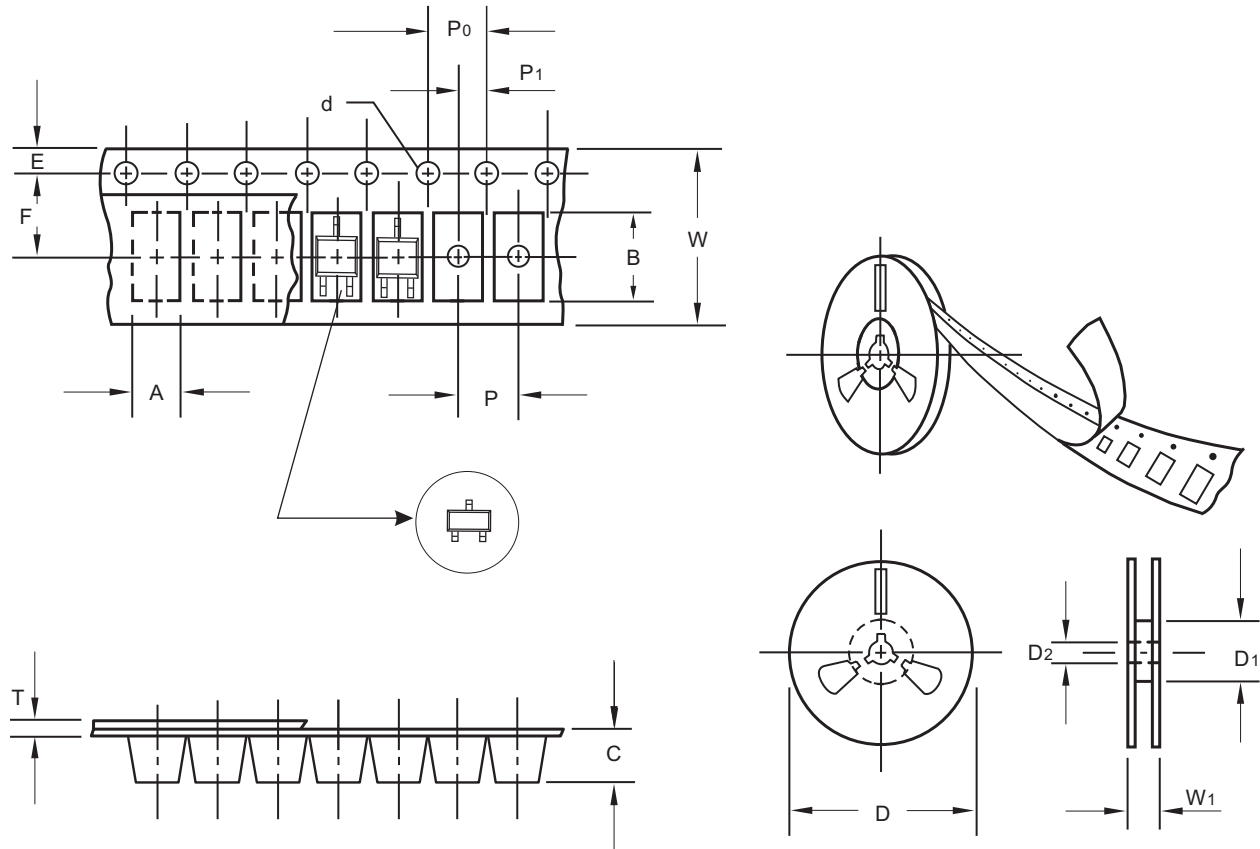
SOT-23



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	55.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	12.0

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

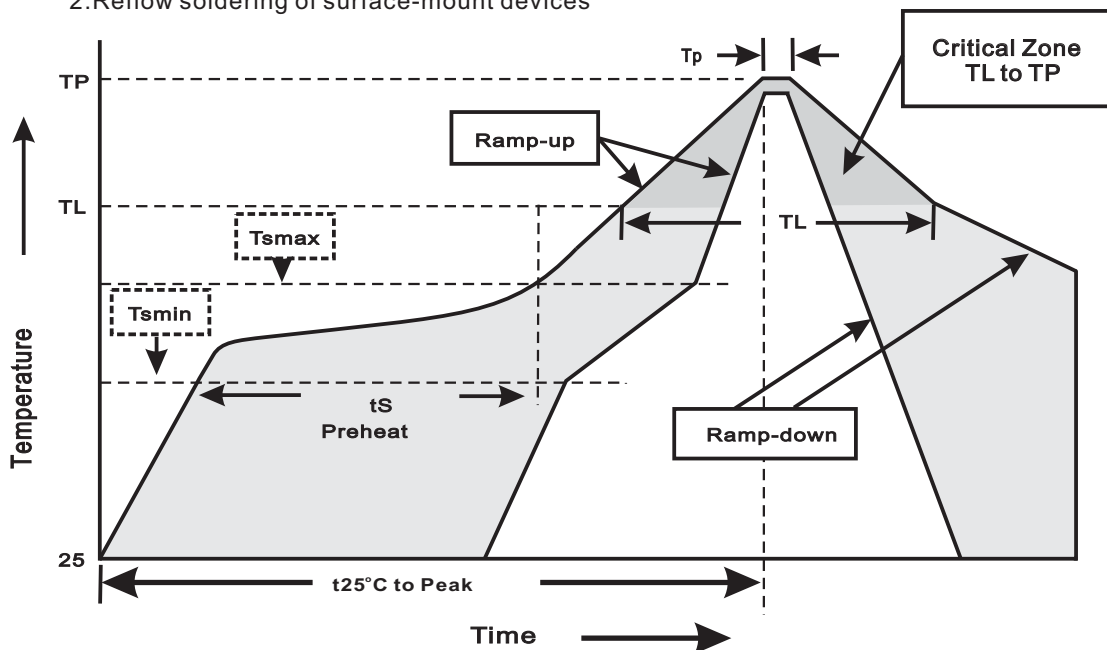
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Reel packing

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)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

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 _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} 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	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

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High reliability test capabilities

Item Test	Conditions
1. Steady State Operating Life	$P_D=200\text{mW}$ Test Duration:1000hrs
2. High Temperature Reverse Bias	$T_J=150^\circ\text{C}$, $V_{CE}=80\%$ related volage, 1000hrs
3. Temperature Cycle	-55°C (15min) to 150°C (15min) Air to Air Transition Time<20sec Test Cycles: 1000cycle
4. Autoclave	$P=2\text{atm}$ $T_a=121^\circ\text{C}$ $RH=100\%$ Test Duration: 96hrs
5. High Temperature Storage Life	$T_a=150^\circ\text{C}$ Test Duration: 1000hrs
6. Solderability	245°C ,5sec
7. High Temperature High Humidity Reverse Bias	$T_a=85^\circ\text{C}$, 85%RH, $V_{CE}=80\%$ related volage, 1000hrs
8. Resistance to Soldering Heat	260°C ,10sec