

MMBD914

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MMBD914

200mA Surface Mount Switching Diode-100V

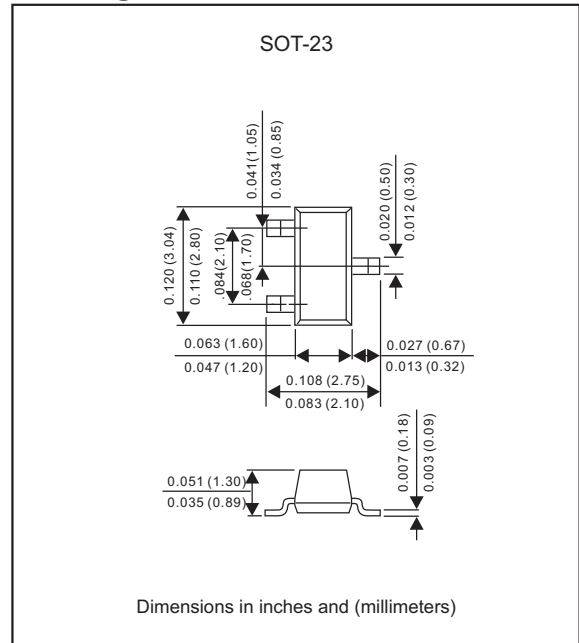
Features

- Low reverse leakage current
- High speed
- Small outline surface mount SOT-23 package
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen-free parts, ex. MMBD914-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	MIN.	TYP.	MAX.	Unit
Reverse voltage	V_R			100	Vdc
Peak forward surge current $t=1\text{s}$	$I_{FM}(\text{surge})$			0.5	Adc
Forward current	I_F			200	mAdc

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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Forward voltage $I_F=10\text{mAdc}$	V_F			1.00	Vdc
Reverse leakage current $V_R=20\text{Vdc}$	I_R			25	nAdc
$V_R=75\text{Vdc}$				5	μAdc
Diode capacitance $V_R=0\text{V}$, $f=1\text{MHz}$	C_T			4.0	pF
Reverse recovery time $I_F=I_R=10\text{mAdc}$	t_{rr}			4.0	ns

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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Total device dissipation FR-5 board $T_A=25^\circ\text{C}$	P_D			225	mW
Derate above 25°C				1.8	$\text{mW}/^\circ\text{C}$
Thermal resistance Junction to ambient	$R_{\theta JA}$			556	$^\circ\text{C}/\text{W}$
Total device dissipation alumina substrate(2) $T_A=25^\circ\text{C}$	P_D			300	mW
Derate above 25°C				2.4	$\text{mW}/^\circ\text{C}$
Thermal resistance Junction to ambient	$R_{\theta JA}$			417	$^\circ\text{C}/\text{W}$
Operating junction temperature range	T_J	-55		+150	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55		+150	$^\circ\text{C}$

1. FR-5=1.0x0.75x0.062 in
2. Alumina=0.4x0.3x0.024 in. 99.5% alumina.

Rating and characteristic curves (MMBD914)

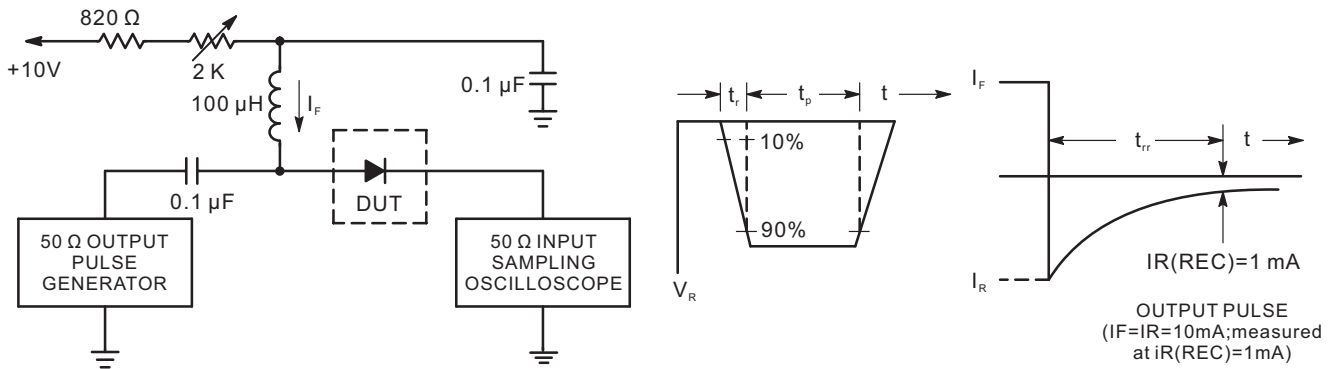


FIG.2-FORWARD VOLTAGE

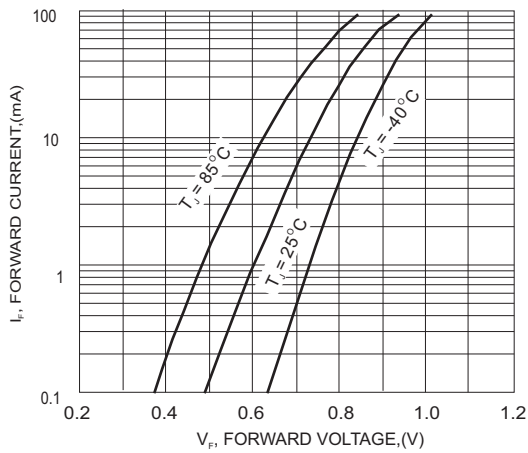


FIG.3 - LEAKAGE CURRENT

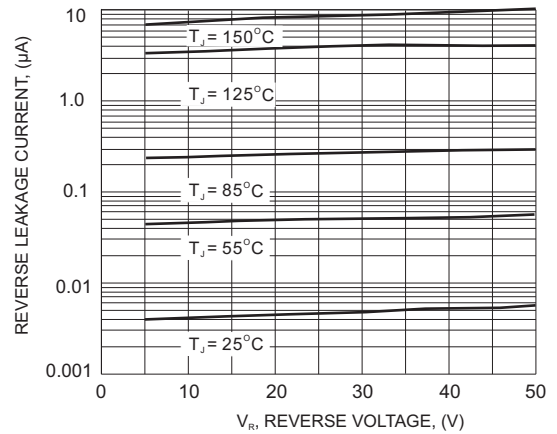
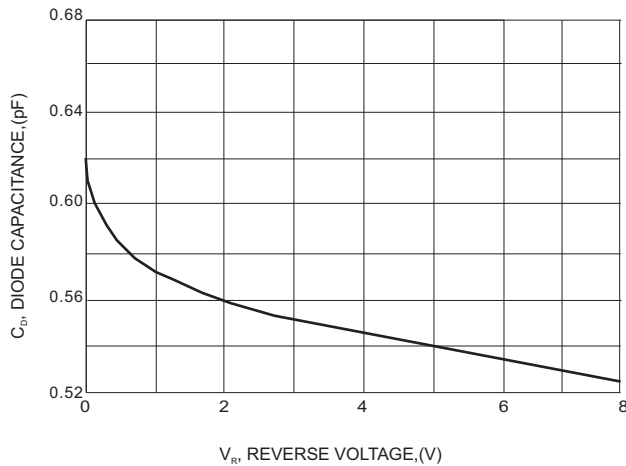
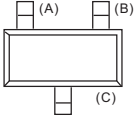
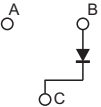


FIG.4-DIODE CAPACITANCE



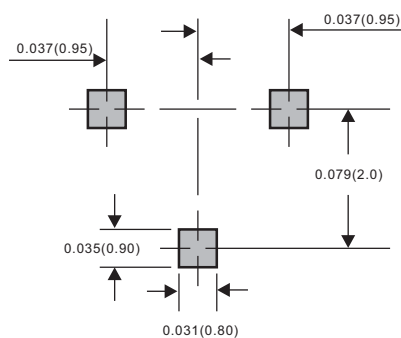
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Pinning information

Type number	Marking code	Simplified outline	Symbol
MMBD914	5D		

Suggested solder pad layout

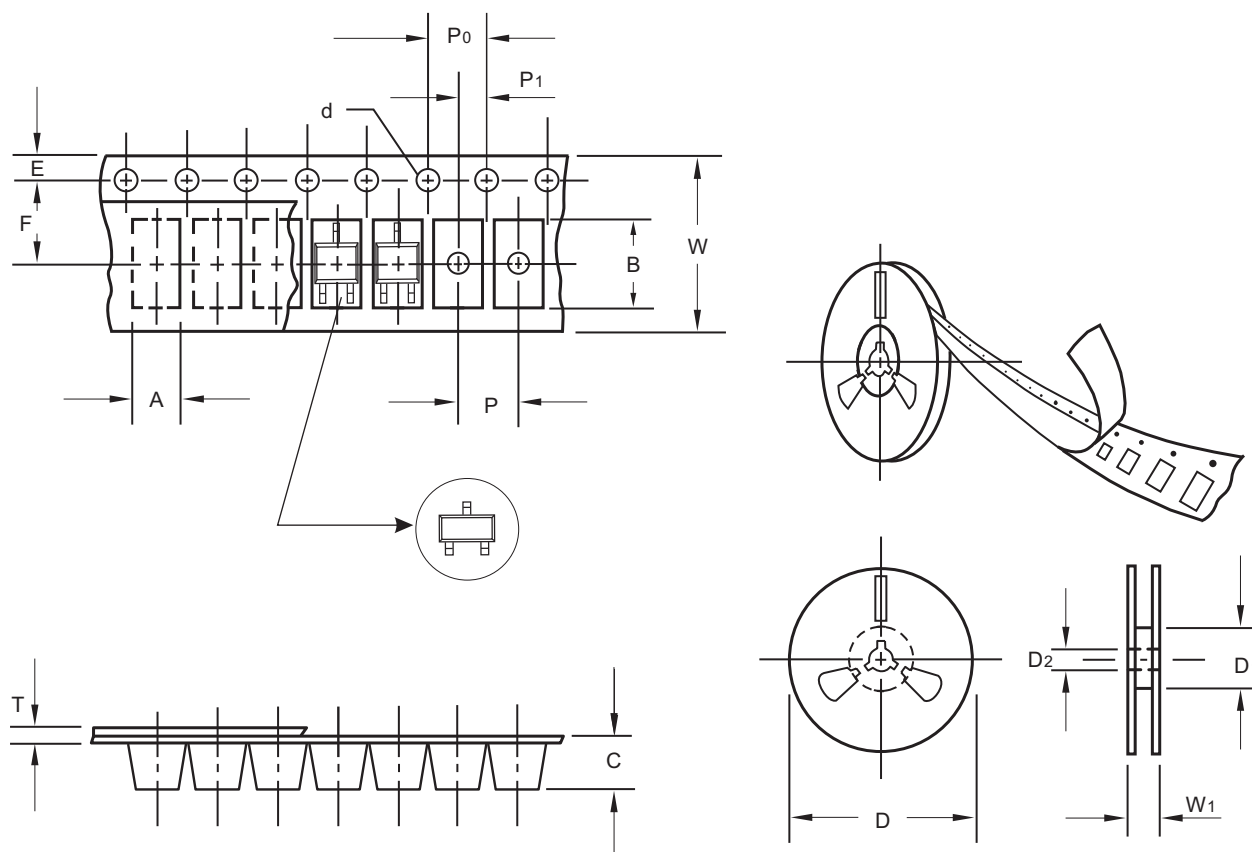
SOT-23



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	62.00
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	11.40

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

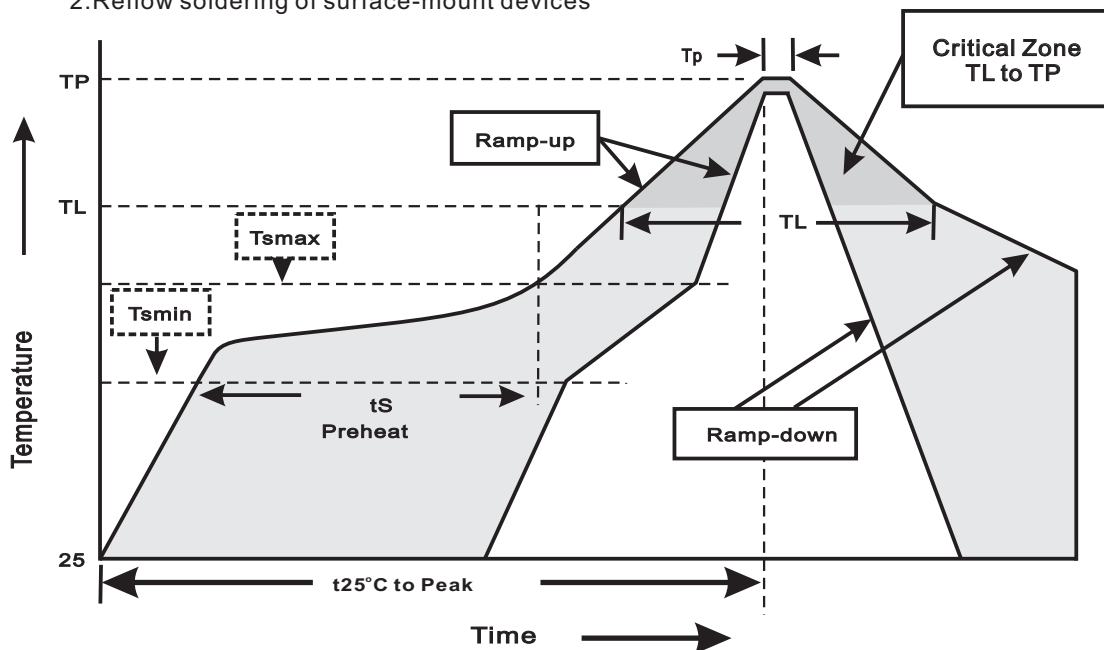
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Reel packing

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	Reference
1. Solder Resistance	at $260 \pm 5^\circ\text{C}$ for $10 \pm 2\text{sec.}$	MIL-STD-750D METHOD-2031
2. Solderability	at $245 \pm 5^\circ\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_R = 80\%$ rate at $T_J = 150^\circ\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Forward Operation Life	Rated average rectifier current at $T_A = 25^\circ\text{C}$ for 500hrs.	MIL-STD-750D METHOD-1027
5. Intermittent Operation Life	$T_A = 25^\circ\text{C}$, $I_F = I_O$ On state: power on for 5 min. off state: power off for 5 min. on and off for 500 cycles.	MIL-STD-750D METHOD-1036
6. Pressure Cooker	$15P_{SIG}$ at $T_A = 121^\circ\text{C}$ for 4 hrs.	JESD22-A102
7. Temperature Cycling	-55°C to $+125^\circ\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
8. Forward Surge	Peak forward surge current	MIL-STD-750D METHOD-4066-2
9. Humidity	at $T_A = 85^\circ\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
10. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031