

**SOT-23 Formed SMD Package**

**CMBT2907  
CMBT2907A**

**SILICON PLANAR EPITAXIAL TRANSISTORS**

*P-N-P silicon transistors*

**Marking**

*CMBT2907 = 2B*

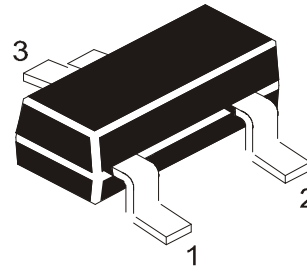
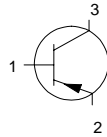
*CMBT2907A = 2F*

**Pin configuration**

1 = BASE

2 = EMITTER

3 = COLLECTOR



**ABSOLUTE MAXIMUM RATINGS**

		<b>CMBT2907</b>		<b>CMBT2907A</b>	
Collector-base voltage (open emitter)	$-V_{CB0}$	max.	60	60	V
Collector-emitter voltage (open base)	$-V_{CE0}$	max.	40	60	V
Emitter-base voltage (open collector)	$-V_{EB0}$	max.	5,0		V
Collector current (d.c.)	$-I_C$	max.	600		mA
Total power dissipation up to $T_{amb} = 25^\circ C$	$P_{tot}$	max.	250		mW
Junction temperature	$T_j$	max.	150		$^\circ C$
D.C. current gain					
$-I_C = 500mA; -V_{CE} = 10V$	$h_{FE}$	>	30	50	
Turn-off switching time					
$-I_{Con} = 150 mA; -I_{Bon} = I_{Boff} = 15 mA$	$t_{off}$	<	100		ns
Transition frequency at $f = 100 MHz$					
$-I_C = 50 mA; -V_{CE} = 20 V$	$f_T$	>	200		MHz

# CMBT2907 CMBT2907A

## RATINGS (at $T_A = 25^\circ\text{C}$ unless otherwise specified)

### Limiting values

		CMBT2907	CMBT2907A	
Collector-base voltage (open emitter)	$-V_{CB0}$	max. 60	60	V
Collector-emitter voltage (open base)	$-V_{CE0}$	max. 40	60	V
Emitter-base voltage (open collector)	$-V_{EB0}$	max. 5,0		V
Collector current (d.c.)	$-I_C$	max. 600		mA
Power dissipation up to $T_{amb} = 25^\circ\text{C}$	$P_{tot}$	max. 250		mW
Storage temperature range	$T_{stg}$	-55 to +150		$^\circ\text{C}$
Junction temperature	$T_j$	max. 150		$^\circ\text{C}$

## THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	500	K/W
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## CHARACTERISTICS

$T_j = 25^\circ\text{C}$  unless otherwise specified

### Collector cut-off current

		CMBT2907	CMBT2907A	
$I_E = 0$ ; $-V_{CB} = 50\text{V}$	$-I_{CB0}$	< 20	10	nA
$I_E = 0$ ; $-V_{CB} = 50\text{V}$ ; $T_j = 125^\circ\text{C}$	$-I_{CB0}$	< 20	10	$\mu\text{A}$
$-V_{EB} = 0,5\text{ V}$ ; $-V_{CE} = 30\text{ V}$	$-I_{CEX}$	< 50		nA

### Base current

with reverse biased emitter junction

$-V_{EB} = 3\text{V}$ ; $-V_{CE} = 30\text{V}$	$-I_{BEX}$	< 50		nA
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### Saturation voltages

$-I_C = 150\text{ mA}$ ; $-I_B = 15\text{ mA}$	$-V_{CEsat}$	< 0,4		V
	$-V_{BEsat}$	< 1,3		V
$-I_C = 500\text{ mA}$ ; $-I_B = 50\text{ mA}$	$-V_{CEsat}$	< 1,6		V
	$-V_{BEsat}$	< 2,6		V

### Collector-base breakdown voltage

Open emitter; $-I_C = 10\text{ }\mu\text{A}$ ; $I_E = 0$	$-V_{(BR)CBO}$	> 60		V
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### Collector-emitter breakdown voltage

Open base; $-I_C = 10\text{ mA}$ ; $I_B: 0$	$-V_{(BR)CEO}$	> 40	60	V
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### Emitter-base breakdown voltage

Open collector; $-I_E = 10\text{ }\mu\text{A}$ ; $I_C = 0$	$-V_{(BR)EBO}$	> 5,0		V
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### D.C. current gain

		CMBT2907	CMBT2907A	
$-I_C = 0,1\text{ mA}$ ; $-V_{CE} = 10\text{ V}$	$h_{FE}$	> 35	75	
$-I_C = 1\text{ mA}$ ; $-V_{CE} = 10\text{ V}$	$h_{FE}$	> 50	100	
$-I_C = 10\text{ mA}$ ; $-V_{CE} = 10\text{ V}$	$h_{FE}$	> 75	100	
$-I_C = 150\text{ mA}$ ; $-V_{CE} = 10\text{ V}$	$h_{FE}$	100 to 300		
$-I_C = 500\text{ mA}$ ; $-V_{CE} = 10\text{ V}$	$h_{FE}$	> 30	50	

**CMBT2907**  
**CMBT2907A**

*Transition frequency at  $f = 100$  MHz*

$-I_C = 50$  mA;  $-V_{CE} = 20$  V;

$T_{amb} = 25$  °C

$f_T$  > 200 MHz

*Output capacitance at  $f = 1$  MHz*

$I_E = I_e = 0$ ;  $-V_{CB} = 10$  V

$C_o$  < 8,0 pF

*Input capacitance at  $f = 1$  MHz*

$I_C = I_c = 0$ ;  $-V_{EB} = 2$  V

$C_i$  < 30 pF

**Switching times** (between 10% and 90% levels)

*Turn-on time when switched to*

$-I_C = 150$  mA;  $-I_B = 15$  mA;  $V_{CC} = 30$  V

*delay time*

$t_d$  < 10 ns

*rise time*

$t_r$  < 40 ns

*turn on time ( $t_d + t_r$ )*

$t_{on}$  < 45 ns

*Turn-off time when switched from*

$-I_C = 150$  mA;  $-I_B = 15$  mA;  $V_{CC} = 6$  V

*to cut-off with  $+I_{BM} = 15$  mA*

*storage time*

$t_s$  < 80 ns

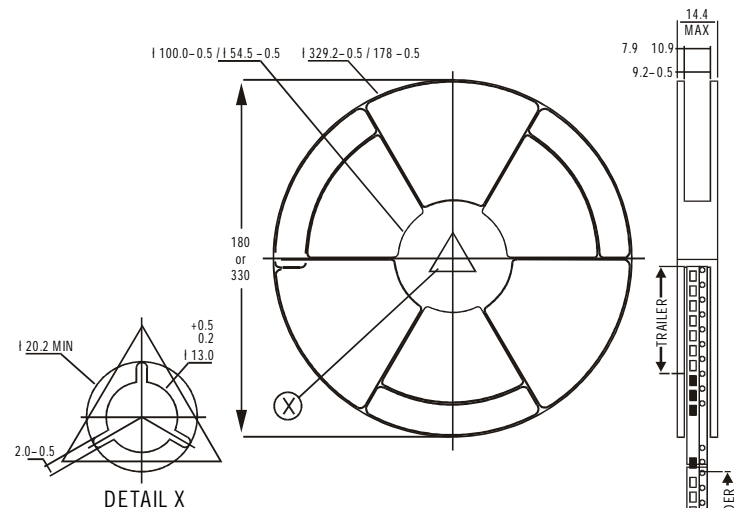
*fall time*

$t_f$  < 30 ns

*turn-off time ( $t_s + t_f$ )*

$t_{off}$  < 100 ns

**SOT-23 Package Reel Information**  
**Reel specifications for Packing (13"/7" reels)**



	8mm Tape	8mm Tape
	Size of Reel	Size of Reel
	330 mm (13")	180 mm (7")
No. of Devices	10,000 Pcs	3,000 Pcs

1. The bandolier of 330 mm reel contains at least 10,000 devices.
2. The bandolier of 180 mm reel contains at least 3,000 devices.
3. No more than 0.5% missing devices / reel. 50 empty compartments for 330 mm reel. 15 empty compartments for 180 mm reel.
4. Three consecutive empty places might be found provided this gap is followed by 6 consecutive devices.
5. The carrier tape (leader) starts with at least 75 empty positions (equivalent to 330 mm). In order to fix the carrier tape a self adhesive tape of 20 to 50 mm is applied. At the end of the bandolier at least 40 empty positions (equivalent to 160 mm) are there.

Technical drawing of a roller assembly, showing a cross-section and a plan view.

**Cross-section (Left):**

- Overall width: 1.6 MAX
- Overall height: 2.77
- Internal height: 1.22
- Internal width: 0.10
- Internal height: 0.1

**Plan View (Right):**

- Overall width: 11.55
- Overall height: 8.0
- Center-to-center distance between rollers: 4.0
- Distance from left edge to first roller center: 2.0
- Distance from last roller center to right edge: 1.55
- Distance from top edge to roller center line: 1.75
- Distance from bottom edge to roller center line: 5.75 MAX
- Distance from top edge to roller center line: 0.1
- Distance from bottom edge to roller center line: 0.05
- Distance from top edge to roller center line: 0.05
- Distance from bottom edge to roller center line: 0.1
- Distance from top edge to roller center line: 0.05
- Distance from bottom edge to roller center line: 0.1
- Distance from top edge to roller center line: 0.05
- Distance from bottom edge to roller center line: 0.1
- Distance from top edge to roller center line: 0.05
- Distance from bottom edge to roller center line: 0.1

**Direction of Unreeling:** Indicated by an arrow pointing to the right.

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## Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
SOT-23 T&R	3K/reel	136 gm/3K pcs	3" x 7.5" x 7.5"	12.0K	17" x 15" x 13.5"	192.0K	12 kgs
			9" x 9" x 9"	51.0K	19" x 19" x 19"	408.0K	28 kgs
	10K/reel	415 gm/10K pcs	13" x 13" x 0.5"	10.0K	17" x 15" x 13.5"	300.0K	16 kgs

## Customer Notes

### Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

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