

**SOT-23 Formed SMD Package**

**CMBT4403**

**SILICON PLANAR EPITAXIAL TRANSISTOR**

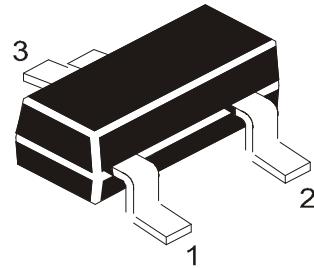
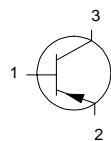
*P-N-P transistor*

**Marking**

CMBT4403 = 2T

**Pin configuration**

1 = BASE  
2 = Emitter  
3 = COLLECTOR



**ABSOLUTE MAXIMUM RATINGS**

Collector-emitter voltage	$-V_{CEO}$	max.	40 V
Collector current (DC)	$-I_C$	max.	600 mA
DC current gain $I_C = 150$ mA; $V_{CE} = 2$ V	$h_{FE}$	min.	100
		max.	300
Total power dissipation up to $T_{amb} = 25$ °C	$P_{tot}$	max	250 mW

**RATINGS (at  $T_A = 25$  °C unless otherwise specified)**

*Limiting values*

Collector-emitter voltage	$-V_{CEO}$	max.	40 V
Collector-base voltage	$-V_{CBO}$	max.	40 V
Emitter-base voltage	$-V_{EBO}$	max.	5 V
Collector current (DC)	$-I_C$	max.	600 mA
Total power dissipation up to $T_{amb} = 25$ °C	$P_{tot}$	max	250 mW
Storage temperature range	$T_{stg}$	-55 to +150	°C
Junction temperature	$T_j$	max.	150 °C

**THERMAL RESISTANCE**
*From junction to ambient*

$$R_{th\ j-a} = 500 \text{ K/W}$$

**CHARACTERISTICS**

$T_{amb} = 25^\circ\text{C}$  unless otherwise specified  
 Collector-emitter breakdown voltage

$-I_C = 1.0 \text{ mA}; I_B = 0$	$-V_{(BR)CEO} >$	40 V
Collector-base breakdown voltage		
$-I_C = 100 \mu\text{A}; I_E = 0$	$-V_{(BR)CBO} >$	40 V
Emitter-base breakdown voltage		
$-I_E = 100 \mu\text{A}; I_C = 0$	$-V_{(BR)EBO} >$	5 V
Base cut-off current		
$-V_{CE} = 35 \text{ V}; -V_{EB} = 0.4 \text{ V}$	$-I_{BEX} <$	0.1 $\mu\text{A}$
Collector cut-off current		
$-V_{CE} = 35 \text{ V}; -V_{EB} = 0.4 \text{ V}$	$-I_{CEX} <$	0.1 $\mu\text{A}$

*D.C. current gain*

$-I_C = 0.1 \text{ mA}; -V_{CE} = 1 \text{ V}$	$h_{FE}$	$>$	30
$-I_C = 1.0 \text{ mA}; -V_{CE} = 1 \text{ V}$	$h_{FE}$	$>$	60
$-I_C = 10 \text{ mA}; -V_{CE} = 1 \text{ V}$	$h_{FE}$	$>$	100
$-I_C = 150 \text{ mA}; -V_{CE} = 2 \text{ V}$	$h_{FE}$	100 to 300	
$-I_C = 500 \text{ mA}; -V_{CE} = 2 \text{ V}$	$h_{FE}$	$>$	20

*Saturation voltage*

$-I_C = 150 \text{ mA}; -I_B = 15 \text{ mA}$	$-V_{CEsat}$	$<$	0.4 V
	$-V_{BEsat}$		0.75 to 0.95 V
$-I_C = 500 \text{ mA}; -I_B = 50 \text{ mA}$	$-V_{CEsat}$	$<$	0.75 V
	$-V_{BEsat}$	$<$	1.3 V

*Transition frequency*

$f = 100 \text{ MHz}; -I_C = 20 \text{ mA}; -V_{CE} = 10 \text{ V}$	$f_T$	$>$	200 MHz
Collector-base capacitance			
$I_E = 0; -V_{CB} = 10 \text{ V}; f = 100 \text{ kHz}$	$C_{cb}$	$<$	8.5 pF
Emitter-base capacitance			
$I_C = 0; -V_{BE} = 0.5 \text{ V}; f = 100 \text{ kHz}$	$C_{eb}$	$<$	35 pF
Input impedance at $f = 1 \text{ kHz}$ ;			
$-I_C = 1 \text{ mA}; -V_{CE} = 10 \text{ V}$	$h_{ie}$	min.	1.5 k $\Omega$
		max.	15 k $\Omega$

Voltage feed-back ratio at  $f = 1 \text{ kHz}$ ;  
 $-I_C = 1 \text{ mA}; -V_{CE} = 10 \text{ V}$

$$h_{re} \text{ min. } 0.1 \times 10^{-4}$$

$$\text{max. } 8 \times 10^{-4}$$

Small-signal current gain at  $f = 1 \text{ kHz}$   
 $-I_C = 1 \text{ mA}; -V_{CE} = 10 \text{ V}$

$$h_{fe} \text{ min. } 60$$

$$\text{max. } 500$$

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*Output admittance at f = 1 kHz;*

$-I_C = 1 \text{ mA}$ ;  $-V_{CE} = 10 \text{ V}$

$h_{oe}$       *min.*      1  $\mu\text{s}$   
*max.*      100  $\mu\text{s}$

*Switching times (resistive load)*

*Turn-on time*

$-I_C = 150 \text{ mA}$ ;  $-I_{B1} = 15 \text{ mA}$ ;  
 $-V_{CC} = 30 \text{ V}$ ;  $-V_{EB} = 2 \text{ V}$

*delay time*

$t_d$       *max.*      15 ns

*rise time*

$t_r$       *max.*      20 ns

*Turn-off time*

$-I_C = 150 \text{ mA}$ ;  $-V_{CC} = 30 \text{ V}$ ;  
 $-I_{B1} = +I_{B2} = 15 \text{ mA}$

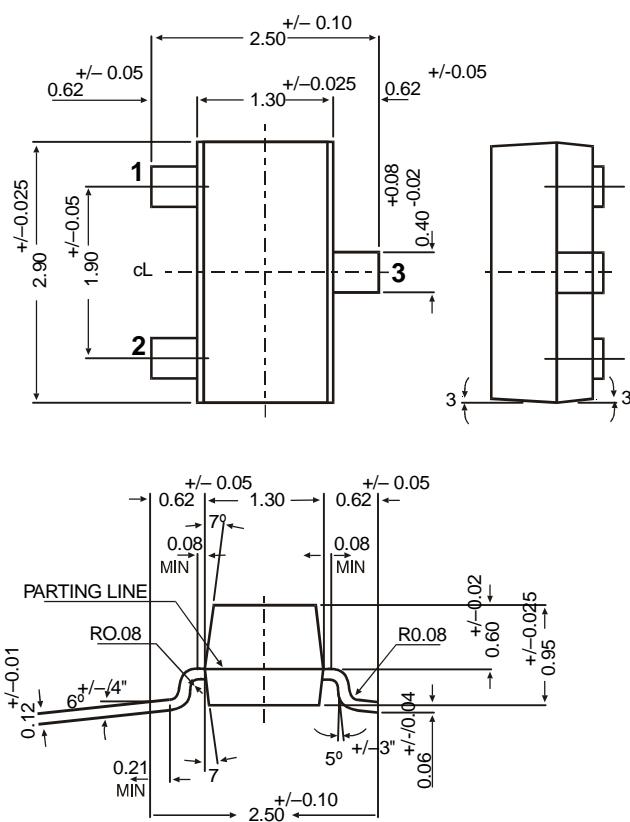
*storage time*

$t_s$       *max.*      225 ns

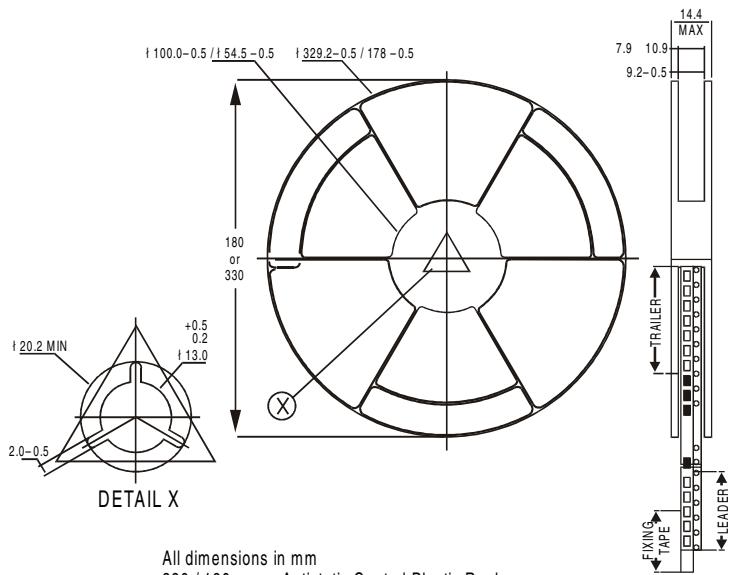
*fall time*

$t_f$       *max.*      30 ns

## **SOT-23 Formed SMD Package**



## SOT-23 Package Reel Information



All dimensions in mm  
330 / 180 mm Antistatic Coated Plastic Reel

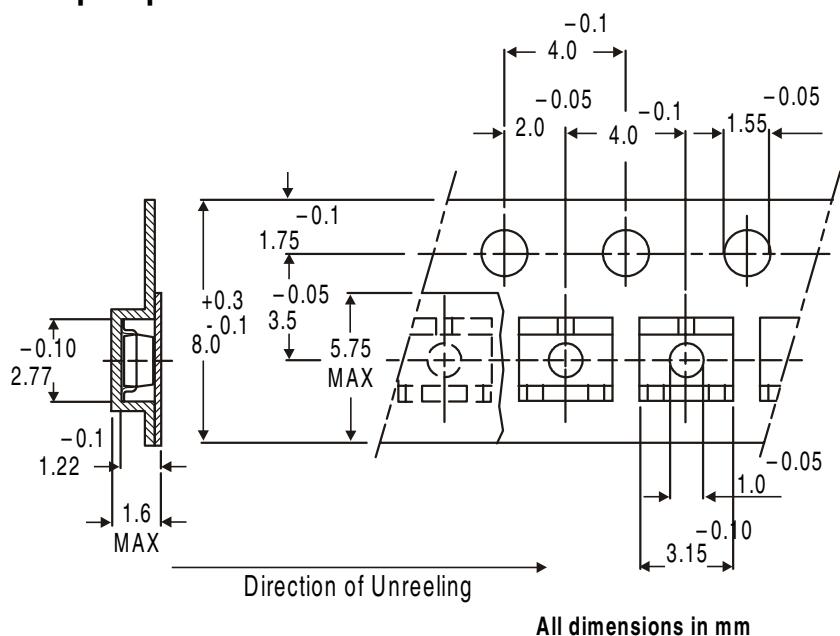
## NOTES:

8mm Tape	8mm Tape
Size of Reel	Size of Reel
330 mm (13")	180 mm (7")
10,000 Pcs	3,000 Pcs

8mm Tape  
Size of Reel  
180 mm (7")  
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.

## Tape Specification for SOT-23 Surface Mount Device



## 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" 9" x 9" x 9"	12.0K 51.0K	17" x 15" x 13.5" 19" x 19" x 19"	192.0K 408.0K	12 kgs 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).

## Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Discrete Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

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