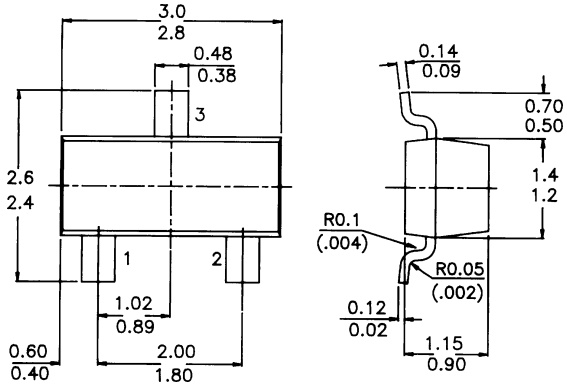
SOT-23 Formed SMD Package **CMBT4401**

SILICON PLANAR EPITAXIAL TRANSISTOR

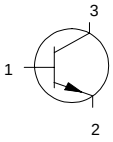
N–P–N transistor

Marking
CMBT4401 = 2X

PACKAGE OUTLINE DETAILS
ALL DIMENSIONS IN mm



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} = 1 V	h_{FE}	*min.* *max.*	*100* *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.*	*60*	*V*
Emitter–base voltage	V_{EBO}	*max.*	*6*	*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	K/W

CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified

Collector–emitter breakdown voltage				
I_C = 1.0 mA; I_B = 0	$V_{(BR)CEO}$	>	40	V
Collector–base breakdown voltage				
I_C = 100 µA; I_E = 0	$V_{(BR)CBO}$	>	60	V
Emitter–base breakdown voltage				
I_E = 100 µA; I_C = 0	$V_{(BR)EBO}$	>	6	V
Base cut–off current				
V_{CE} = 35 V; V_{EB} = 0.4 V	I_{BEX}	<	0.1	µA
Collector cut–off current				
V_{CE} = 35 V; V_{EB} = 0.4 V	I_{CEX}	<	0.1	µA
D.C. current gain				
I_C = 0.1 mA; V_{CE} = 1 V	h_{FE}	>	20	
I_C = 1.0 mA; V_{CE} = 1 V	h_{FE}	>	40	
I_C = 10 mA; V_{CE} = 1 V	h_{FE}	>	80	
I_C = 150 mA; V_{CE} = 1 V	h_{FE}		100 to 300	
I_C = 500 mA; V_{CE} = 2 V	h_{FE}	>	40	
Saturation voltage				
I_C = 150 mA; I_B = 15 mA	V_{CEsat}	<	0.4	V
	V_{BEsat}		0.75 to 0.95	V
I_C = 500 mA; I_B = 50 mA	V_{CEsat}	<	0.75	V
	V_{BEsat}	<	1.2	V
Transition frequency				
f = 100 MHz; I_C = 20 mA; V_{CE} = 10 V	f_T	>	250	MHz
Collector–base capacitance				
I_E = 0; V_{CB} = 5 V; f = 100 kHz	C_{cb}	<	8	pF
Emitter–base capacitance				
I_C = 0; V_{BE} = 0.5 V; f = 100 kHz	C_{eb}	<	30	pF
Input impedance; f = 1 kHz;				
I_C = 1 mA; V_{CE} = 10 V	h_{ie}	min.	1	kΩ
		max.	8	kΩ
Voltage feed–back ratio				
I_C = 1 mA; V_{CE} = 10 V; f = 1 kHz	h_{re}	min.	0.1×10^{-4}	
		max.	30×10^{-4}	
Small–signal curent gain; f = 1 kHz;				
I_C = 1 mA; V_{CE} = 10 V	h_{fe}	min.	40	
		max.	500	

Output admittance; f = 1 kHz;			
I_C = 1 mA; V_{CE} = 10 V	h_{oe}	min.	1 µS
		max.	30 µS
Switching times (resistive load)			
Turn–on time			
I_C = 150 mA; I_{B1} = 15 mA;			
V_{CC} = 30 V; V_{EB} = 2 V			
delay time	t_d	max.	15 ns
rise time	t_r	max.	20 ns
Turn–off time			
I_C = 150 mA; V_{CC} = 30 V;			
I_{B1} = I_{B2} = 15 mA			
storage time	t_s	max.	225 ns
fall time	t_f	max.	30 ns

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