

# Single Bipolar Transistor multicomp<sup>PRO</sup>

RoHS  
Compliant



## Features

- Epitaxial planar die construction.

## Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	$V_{CB0}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	40	
Emitter - Base Voltage	$V_{EBO}$	6	
Collector Current - Continuous	$I_C$	0.2	A
Collector Power Dissipation	$P_C$	0.2	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Operating and storage temperature range	$T_{stg}$	-55 to +150	

## Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100 \mu\text{A}, I_E = 0$	60			V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_B = 0$	40			
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10 \mu\text{A}, I_C = 0$	6			
Collector cutoff current	$I_{CBO}$	$V_{CB}=60\text{V}, I_E=0$			0.1	$\mu\text{A}$
Collector cutoff current	$I_{CEX}$	$V_{CE}=30\text{V}, V_{BE(off)}=3\text{V}$			50	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB}=5\text{V}, I_C=0$			0.1	$\mu\text{A}$
DC current gain	$h_{FE}$	$V_{CE}=1\text{V}, I_C=10\text{mA}$	100		400	
		$V_{CE}=1\text{V}, I_C=50\text{mA}$	60			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=50\text{mA}, I_B=5\text{mA}$			0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=50\text{mA}, I_B=5\text{mA}$			0.95	
Delay time	$t_d$	$V_{CC}=3\text{V}, V_{BE}=-0.5\text{V}, I_C=10\text{mA}, I_{B1}=-I_{B2}=1\text{mA}$			35	ns
Rise time	$t_r$				35	
Storage time	$t_s$	$V_{CC}=3\text{V}, I_C=10\text{mA}, I_{B1}=-I_{B2}=1\text{mA}$			200	
Fall time	$t_f$				50	
Transition frequency	$f_T$	$V_{CE}=20\text{V}, I_C=10\text{mA}, f=100\text{MHz}$	250			MHz

\* pulse test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

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multicomp<sup>PRO</sup>

# Single Bipolar Transistor **multicomp**PRO

## Typical Characteristics

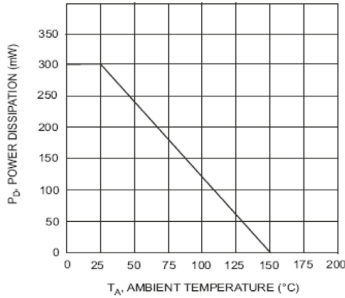


Fig.1 Max Power Dissipation vs Ambient Temperature

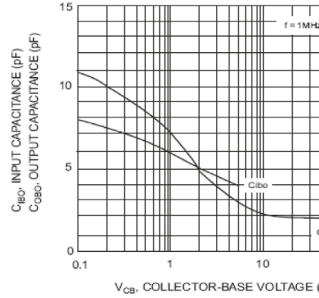


Fig.2 Input and Output Capacitance vs. Collector-Base Voltage

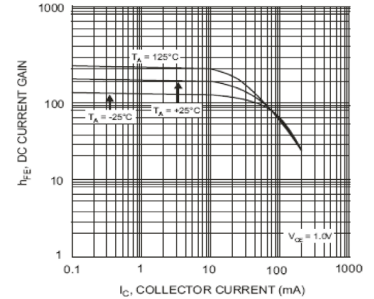


Fig.3 Typical DC Current Gain vs Collector Current

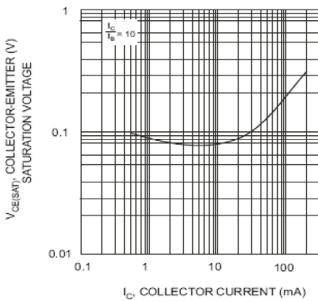


Fig.4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

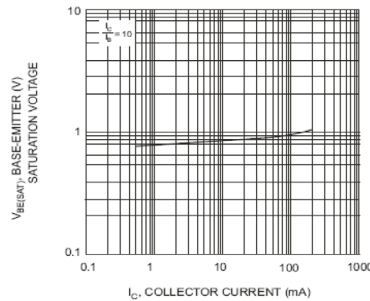
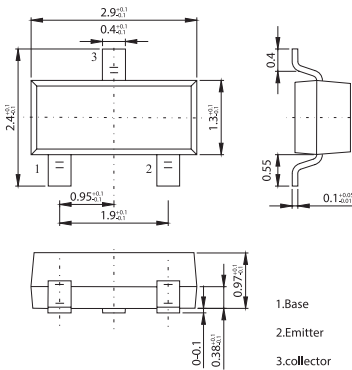


Fig.5 Typical Base-Emitter Saturation Voltage vs. Collector Current

## Diagram



Dimensions : Millimetres

## Part Number Table

Description	Part Number
Single Bipolar Transistor, NPN, 0.2A, 40V, SOT 23	MMBT3904

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