MMBT3904

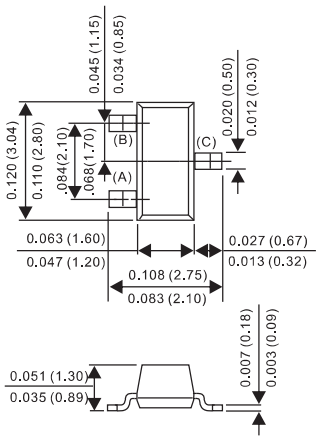
200mA Silicon NPN Epitaxial Planar Transistor

Features

- High collector-emitterbreakdien voltage. (BV_{CEO} 40V Min.@I_C=1mA)
- Small load switch transistor with high gain and low stauration voltage, is designed for general purpose amflifier and switching applications at collector current.
- Capable of 200mW power dissipation.
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Compliant to Halogen-free

Package outline

SOT-23



Dimensions in inches and (millimeters)

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

Maximum ratings (AT T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Collector-base voltage		V_{CBO}			60	V
Collector-emitter voltage		V_{CEO}			40	V
Emitter-base voltage		V_{EBO}			6.0	V
Collector current - continuous		I_C			200	mA
Collector Power Dissipation		P_D			200	mW
Thermal resistance	Junction to ambient	$R_{\theta JA}$			625	°C/W
Operating junction temperature range		T_J	-55		+150	°C
Storage temperature range		T_{STG}	-55		+150	°C

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Electrical characteristics (AT T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Collector-base breakdown voltage	I_C = 10uA, I_E = 0	$V_{(BR)CBO}$	60			V
Collector-emitter breakdown voltage	I_C = 1mA, I_B = 0	$V_{(BR)CEO}$	40			V
Emitter-base breakdown voltage	I_E = 10uA, I_C = 0	$V_{(BR)EBO}$	6.0			V
Collector cutoff current	V_{CE} = 30V, V_{EB} = 3.0V	I_{CEX}			50	nA
Collector cutoff current	V_{CB} = 60V, I_E = 0V	I_{CBO}			100	nA
Emitter cutoff current	V_{EB} = 5 V, I_C = 0V	I_{EBO}			100	nA
DC current gain	I_C = 10mA, V_{CE} = 1.0V	h_{FE}	100		300	-
	I_C = 50mA, V_{CE} = 1.0V		60			
	I_C = 100mA, V_{CE} = 1.0V		30			
Collector-emitter saturation voltage	I_C = 50mA, I_B = 5.0mA	$V_{CE(sat)}$			0.3	V
Base-emitter saturation voltage	I_C = 50mA, I_B = 5.0mA	$V_{BE(sat)}$			0.95	V
Current-gain-bandwidth product	I_C = 10mA, V_{CE} = 20V, f = 100MHz	f_T	300			MHz
Delay time	V_{CC} = 3.0V, V_{BE} = -0.5V, I_C = 10mA, I_{B1} = 1.0mA	td			35	ns
Rise time		tr			35	
Storage time	V_{CC} = 3.0V, I_C =10mA, I_{B1} = I_{B2} = 1.0mA	ts			200	
Fall time		tf			50	

Classification of hFE

HFE	100-300	
RANK	L	H
RANGE	100-200	200-300

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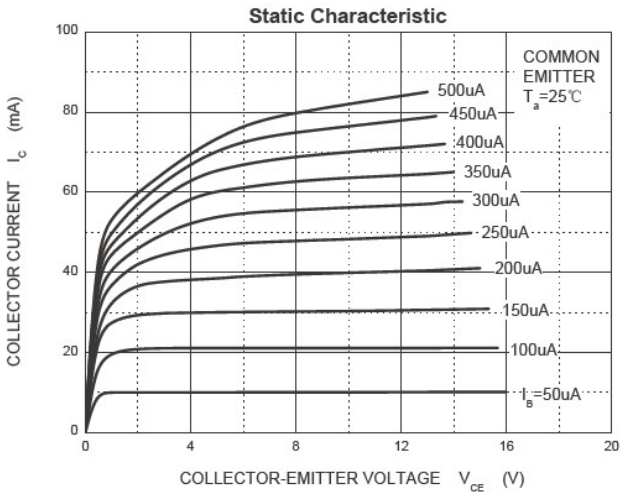
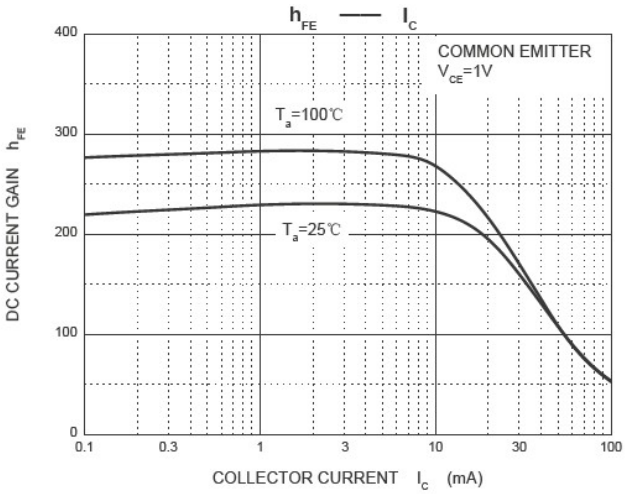
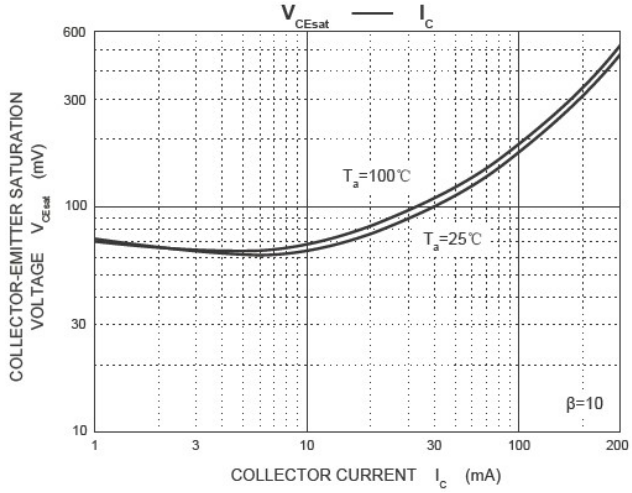
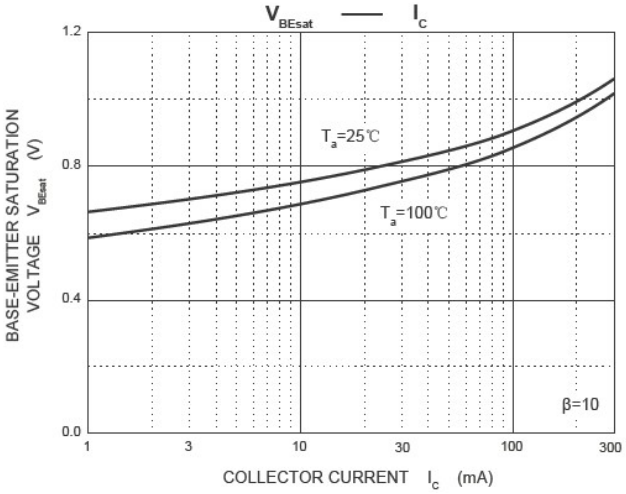
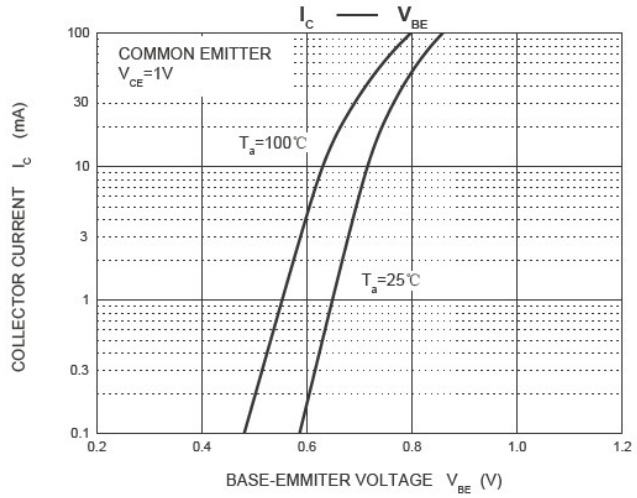
Typical characteristics

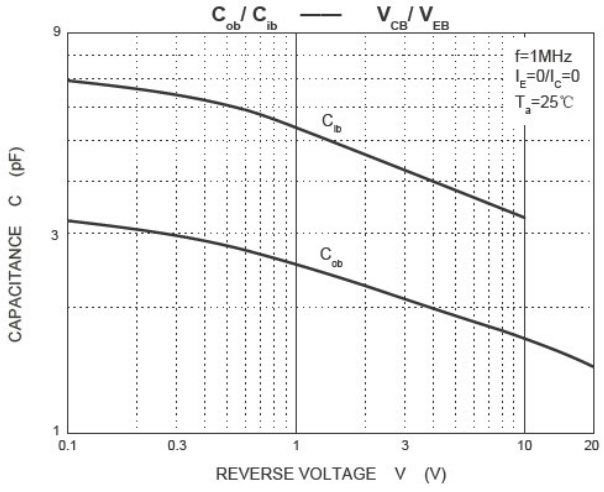












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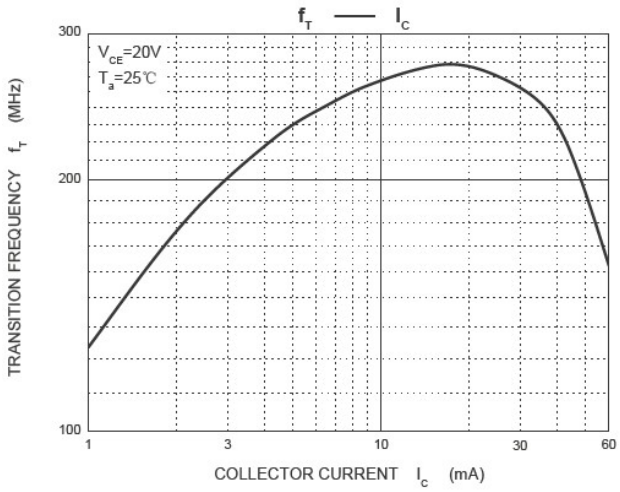
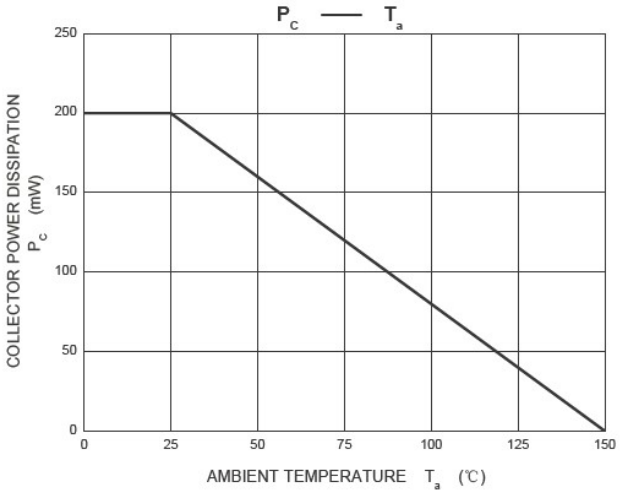
Typical characteristics





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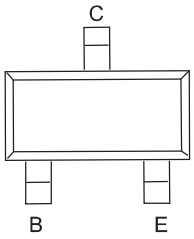
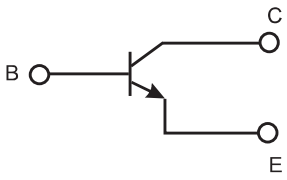
Pinning information

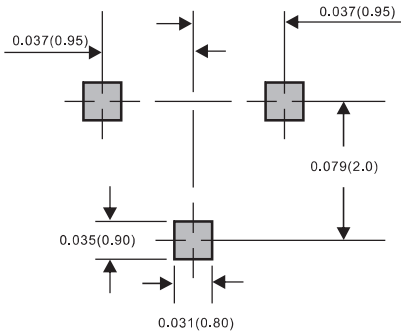
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
MMBT3904	1AM

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)