HMBTA05 / HMBTA06

Drive NPN Transistor

Features

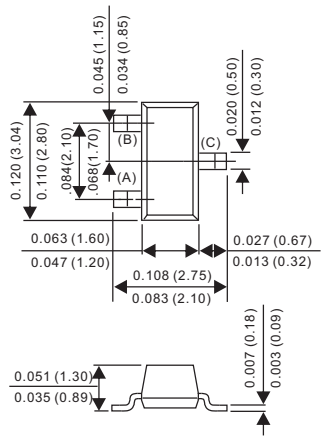
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free part, ex. HMBTA05-H.

Mechanical data

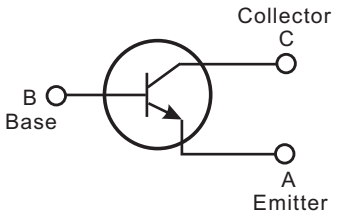
- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Package outline

SOT-23



Dimensions in inches and (millimeters)



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

PARAMETER	CONDITIONS	Symbol	HMBTA05	HMBTA06	UNIT
Collector-Base voltage		V_{CBO}	60	80	Vdc
Collector-Emitter voltage		V_{CEO}	60	80	Vdc
Emitter-Base voltage		V_{EBO}	4.0		Vdc
Collector current		I_C	500		mAdc

Thermal Characteristics

Characteristics	CONDITIONS	Symbol	Max	UNIT
Total device dissipation FR-5 board (1)	T_A = 25°C	P_D	225	mW
	Derate above 25°C	P_D	1.8	mW/°C
Thermal resistance	Junction to ambient	$R_{\theta JA}$	556	°C/W
Total device dissipation alumina substrate(2)	T_A = 25°C	P_D	300	mW
	Derate above 25°C	P_D	2.4	mW/°C
Thermal resistance	Junction to ambient	$R_{\theta JA}$	417	°C/W
Operating temperature		T_J	-55 ~ +150	°C
Storage temperature		T_{STG}	-65 ~ +150	

1.FR-5 = 1.0 X 0.75 X0.062 in.
2.Alumina = 0.4 X 0.3 X 0.024 in. 99.5% alumina.
3. Pulse test: pulse width >=300μs, duty cycle<=2.0%
4. f_T is defined as the frequency at which hfe extrapolates to unity.

HMBTA05 / HMBTA06

Characteristics (AT T_A=25°C unless otherwise noted)

Off Characteristics

PARAMETER	CONDITIONS	Symbol	Types	Min.	Max.	UNIT
Collector-Base breakdown voltage	I_c = 100μAdc, I_E = 0	$V_{(BR)CBO}$	HMBTA05	60	-	Vdc
			HMBTA06	80	-	
Collector-Emitter breakdown voltage(3)	I_c = 1.0mAdc, I_B = 0	$V_{(BR)CEO}$	HMBTA05	60	-	Vdc
			HMBTA06	80	-	
Emitter-Base breakdown voltage	I_E = 100μAdc, I_C = 0	$V_{(BR)EBO}$		4.0	-	Vdc
Collector Cutoff Current	V_{EB}=3Vdc, I_C=0	I_{EBO}		-	0.1	μAdc
Collector cutoff current	V_{CB} = 60Vdc, I_E = 0	I_{CBO}	HMBTA05	-	0.1	μAdc
	V_{CB} = 80Vdc, I_E = 0		HMBTA06	-	0.1	
Collector cutoff current	V_{CE}=60Vdc, I_B=0	I_{CEO}	HMBTA05		0.1	μAdc
			HMBTA06		1	

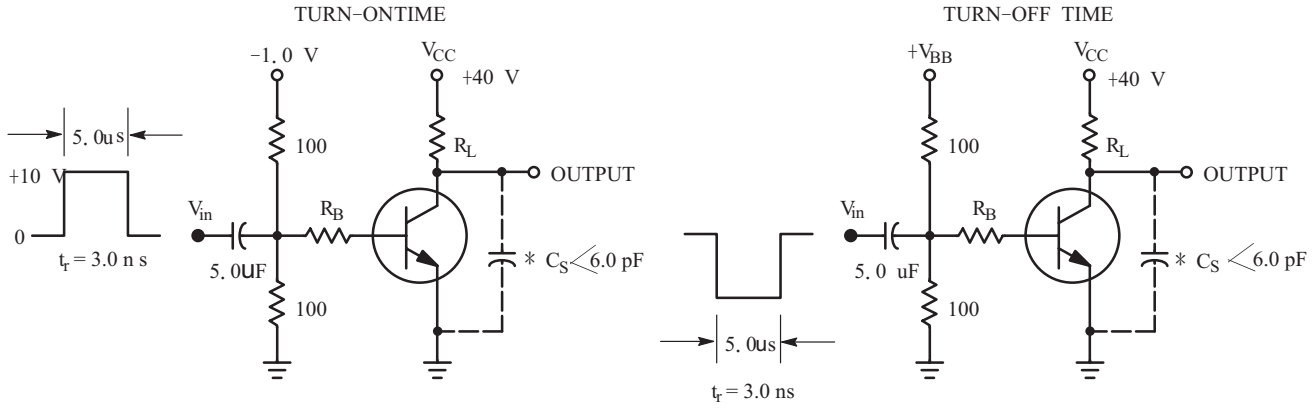
On Characteristics

PARAMETER	CONDITIONS	Symbol	Min.	Max.	UNIT
DCcurrent gain	I_c = 10mAdc, V_{CE} = 1.0Vdc	h_{FE}	100	400	-
	I_c = 100mAdc, V_{CE} = 1.0Vdc		100	-	
Collector-Emitter saturation voltage	I_c = 100mAdc, I_B = 10mAdc	$V_{CE(sat)}$	-	0.25	Vdc
Base-Emitter saturation voltage	I_c = 100mAdc, V_{CE} = 1.0Vdc	$V_{BE(on)}$	-	1.2	Vdc

Small Signal Characteristics

PARAMETER	CONDITIONS	Symbol	Min.	Max.	UNIT
Current Gain Bandwidth Product (4)	I_c = 10mA, V_{CE} = 2.0V, f=100MHz	f_T	100	-	MHz

HMBTA05 / HMBTA06



*Total Shunt Capacitance of Test Jig and Connectors
For PNP Test Circuits, Reverse All Voltage Polarities

FIG1. Switching Time Test Circuits

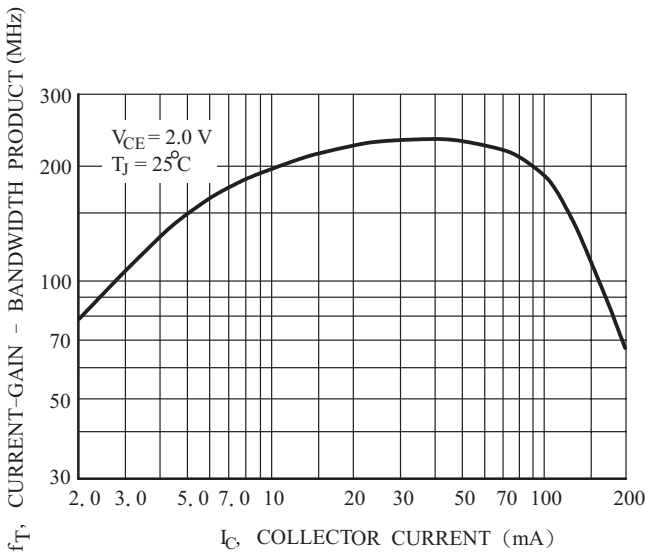


FIG2. Current-Gain Bandwidth Product

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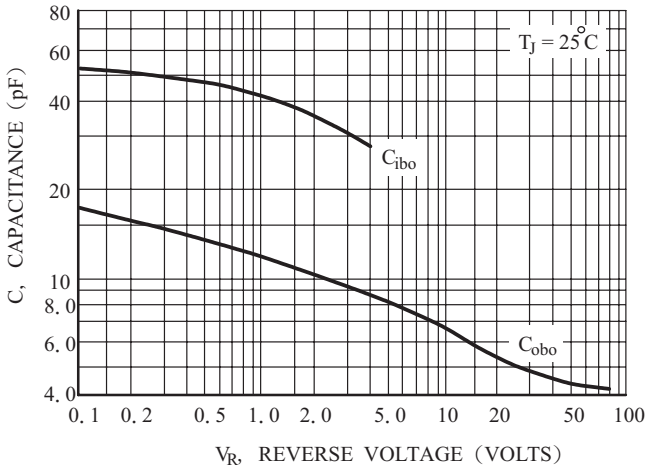


FIG3. Capacitance

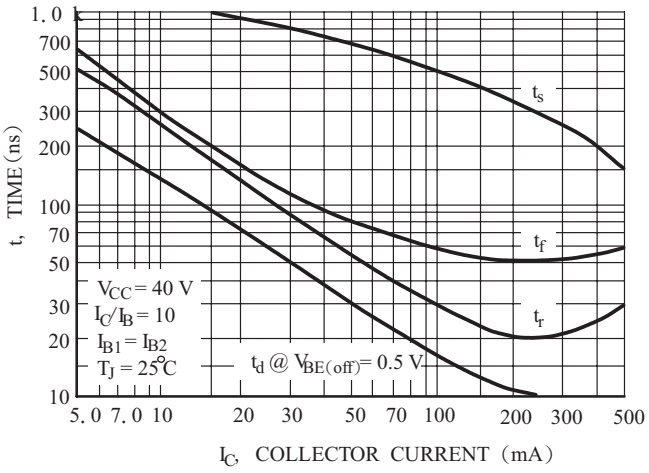


FIG4. Switching Time

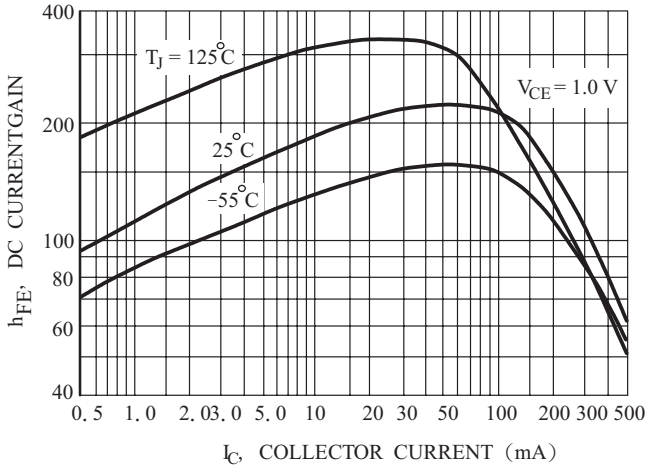


FIG5. DC Current Gain

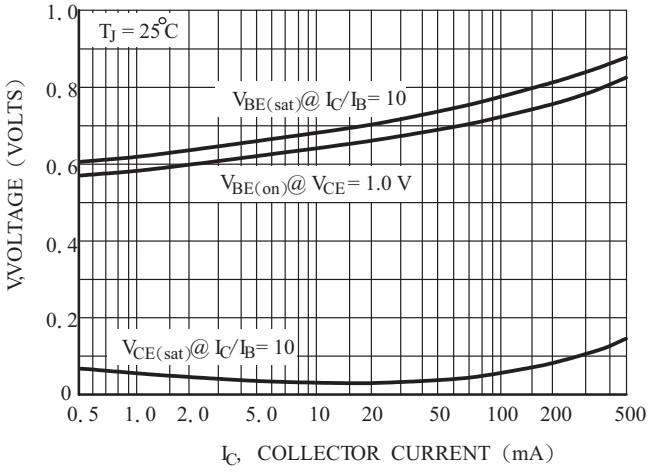


FIG6. "ON" Voltages

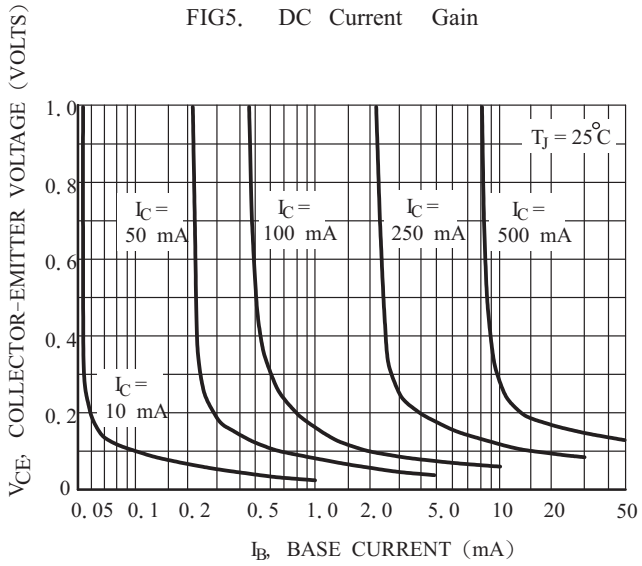


FIG7. Collector Saturation Region

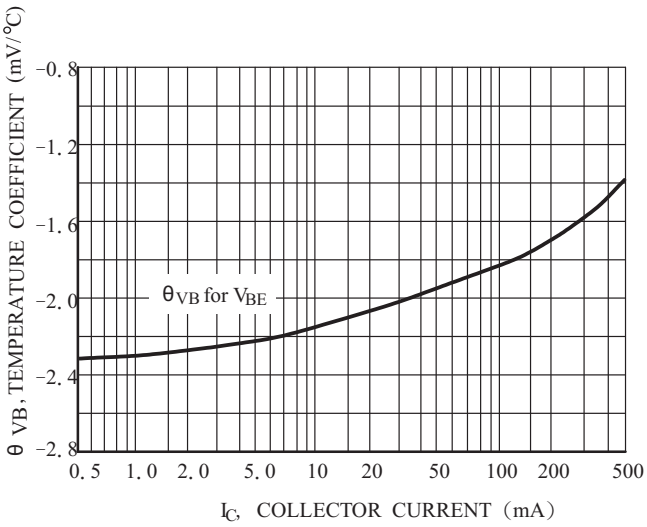
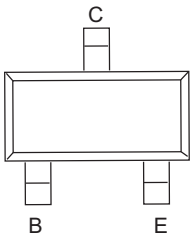
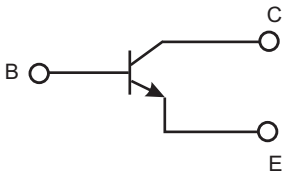


FIG8. Base-Emitter Temperature Coefficient

HMBTA05 / HMBTA06

Pinning information

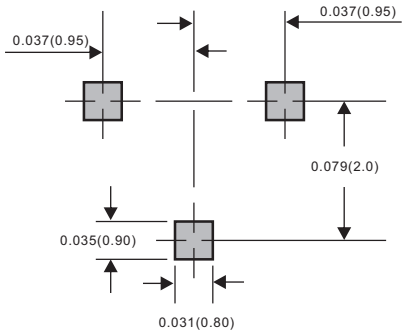
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
HMBTA05	1H
HMBTA06	1GM

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)