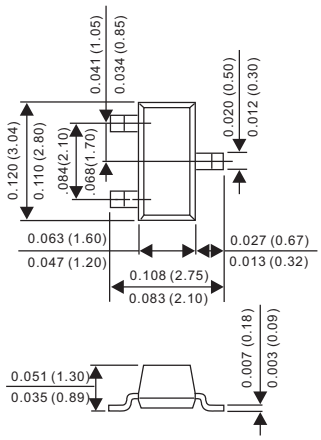
HMBT2222A

General Purpose Transistor
NPN Silicon

Package outline

SOT-23



Dimensions in inches and (millimeters)

Features

- High collector-emitterbreakdien voltage (BVCEO MIN= 40V@IC =10mA)
- 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 225mW power dissipation
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates halogen free parts, ex. HMBT2222A-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

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

Parameter		Symbol	Limits	Unit
Collector-base voltage		VCBO	75	V
Collector-emitter voltage		VCEO	40	V
Emitter-base voltage		VEBO	6.0	V
Collector current-continuous		IC	600	mA
Total device dissipation FR-5 board (1)	TA = 25°C	PD	225	mW
	Derate above 25°C		1.8	mW/°C
Thermal resistance(1)	Junction to ambient	RθJA	556	°C/W
Thermal resistance(1)	Junction to case	RθJC	300	°C/W
Operating junction temperature range		TJ	-55 to +150	°C
Storage temperature range		TSTG	-55 to +150	°C

1.FR-5 = 1.0 X 0.75 X0.062 in.

HMBT2222A

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

Off characteristics

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
Collector-emitter breakdown voltage	I_C = 10mA, I_B = 0	$V_{(BR)CEO}$	40			V
Collector-base breakdown voltage	I_C = 10μA, I_E = 0	$V_{(BR)CBO}$	75			V
Emitter-base breakdown voltage	I_E = 10μA, I_C = 0	$V_{(BR)EBO}$	6.0			V
Collector cutoff current	V_{CE} = 60V, $V_{EB(off)}$ = 3.0V	I_{CEX}			10	nA
Collector cutoff current	V_{CB} = 60V, I_E = 0 V_{CB} = 60V, I_E = 0, T_A = 125°C	I_{CBO}			0.01 10	μA
Emitter cutoff current	V_{EB} = 3.0V, I_C = 0	I_{EBO}			100	nA
Collector-emitter cutoff current	V_{CE} = 40V, I_B = 0	I_{CEO}			10	μA
Base cutoff current	V_{CE} = 60V, $V_{EB(off)}$ = 3.0V	I_{BL}			20	nA

On characteristics(2)

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
DC current gain	I_C = 0.1mA, V_{CE} = 10V	h_{FE}	35			
	I_C = 1.0mA, V_{CE} = 10V		50			
	I_C = 10mA, V_{CE} = 10V		75			
	I_C = 10mA, V_{CE} = 10V, T_A = -55°C		35			
	I_C = 150mA, V_{CE} = 10V		100		300	
	I_C = 150mA, V_{CE} = 1.0V		50			
	I_C = 500mA, V_{CE} = 10V		40			
Collector-emitter saturation voltage	I_C = 150mA, I_B = 15mA	$V_{CE(sat)}$			0.3	V
	I_C = 500mA, I_B = 50mA				1.0	
Base-emitter saturation voltage	I_C = 150mA, I_B = 15mA	$V_{BE(sat)}$	0.6		1.2	V
	I_C = 500mA, I_B = 50mA				2.0	

Small-signal characteristics

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
Current-gain-bandwidth product	I_C = 20mA, V_{CE} = 20V, f = 100MHz	f_T	300			MHz
Output capacitance	V_{CB} = 5.0V, I_E = 0, f = 1.0MHz	C_{obo}			8.0	pF
Input capacitance	V_{EB} = 0.5V, I_C = 0, f = 1.0MHz	C_{ibo}			25	pF

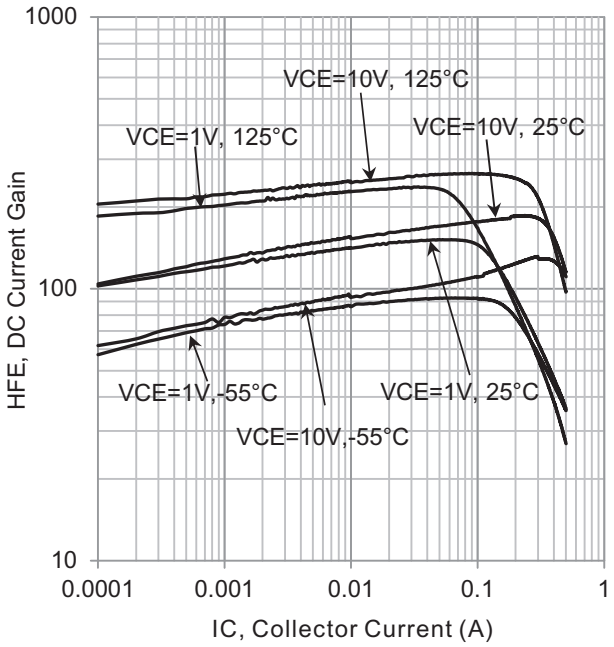
Switching characteristics

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
Delay time	V_{CC} = 30V, V_{EB} = 0.5V, I_C = 150mA, I_{B1} = 15mA	t_d			10	ns
Rise time		t_r			25	
Storage time	V_{CC} = 30V, I_C =150mA, I_{B1} = I_{B2} = 15mA	t_s			225	
Fall time		t_f			60	

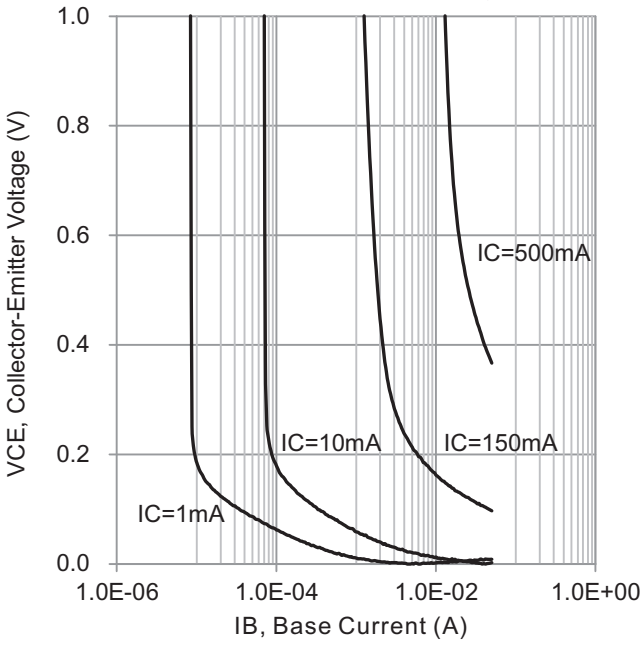
2.Pulse test : pulse width ≦ 300μs, duty cycle ≦ 2.0%.

Rating and characteristic curves (HMBT2222A)

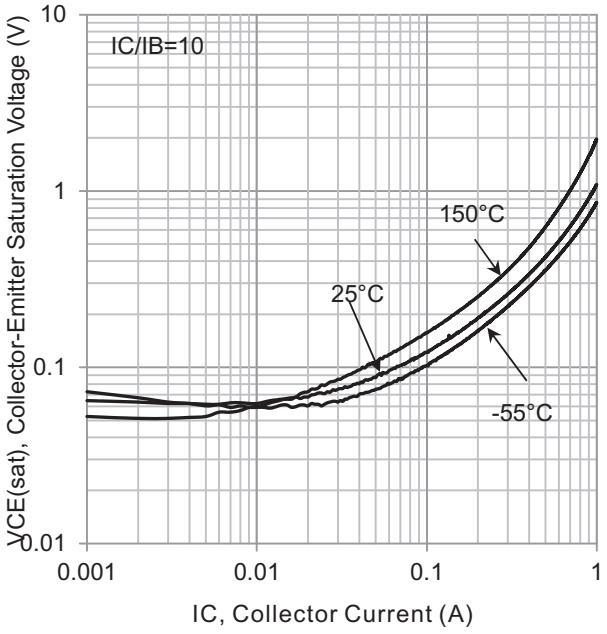
DC Current Gain



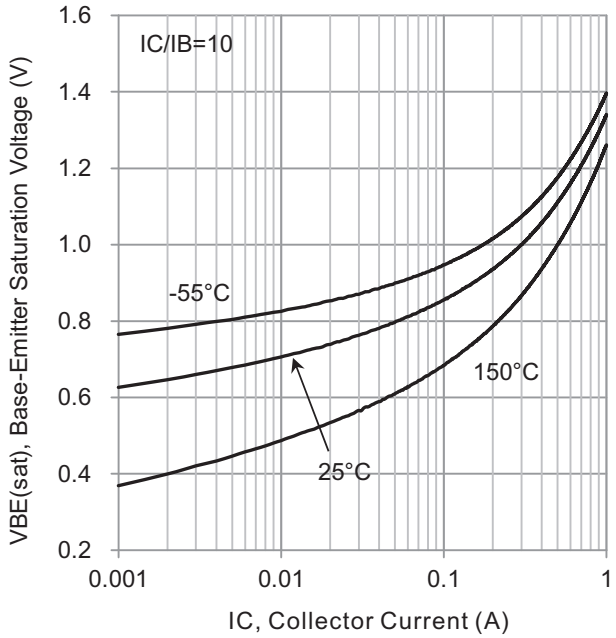
Collector Saturation Region



Collector Emitter Saturation Voltage vs. Collector Current

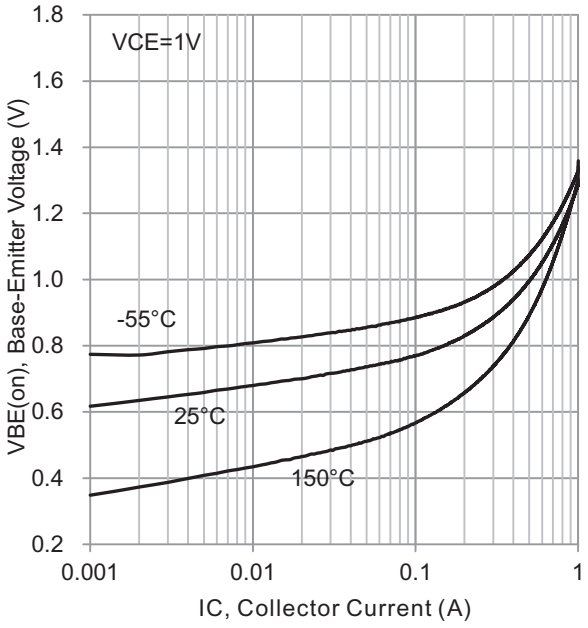


Base Emitter Saturation Voltage vs. Collector Current

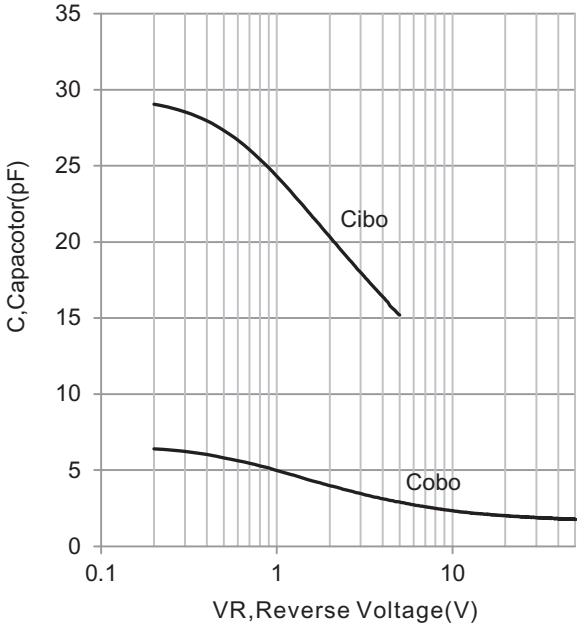


Rating and characteristic curves (HMBT2222A)

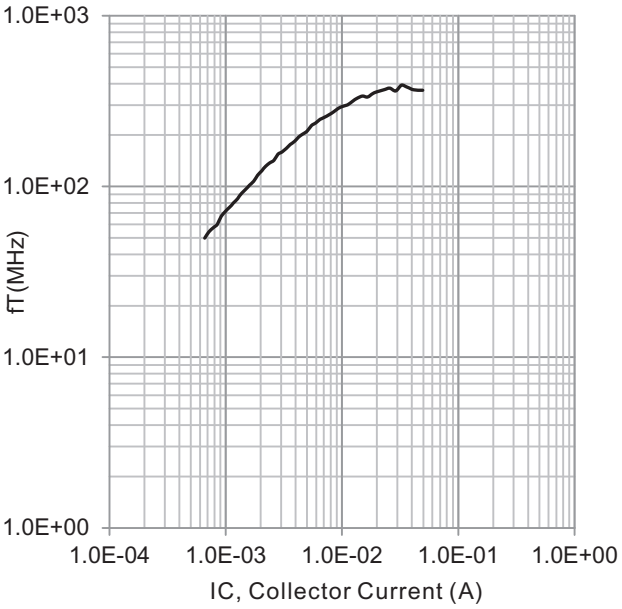
Base Emitter Voltage vs. Collector Current



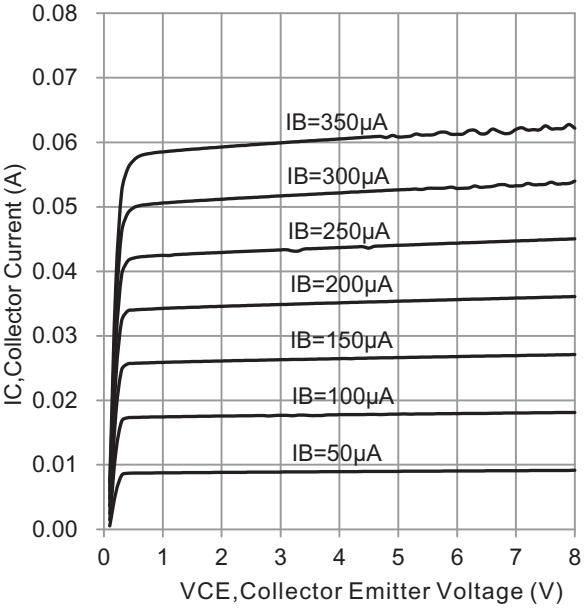
Capacitance



Current−Gain Bandwidth Product

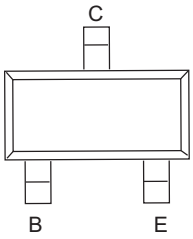
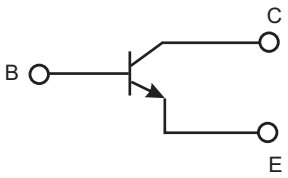


Collector Current vs.Collector Emitter Voltage



HMBT2222A

Pinning information

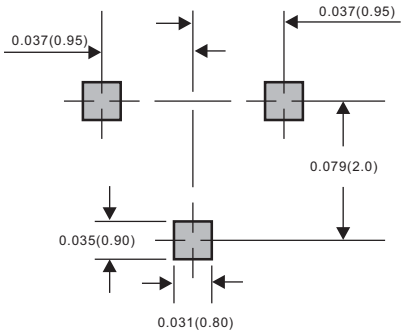
Pin	Simplified outline	Symbol
PinB Base PinC Collector PinE Emitter		

Marking

Type number	Marking code
HMBT2222A	1P

Suggested solder pad layout

SOT-23



Dimensions in inches and (millimeters)