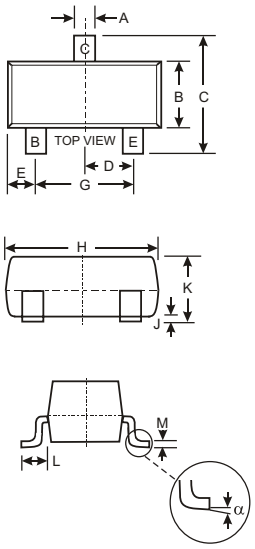
HAICHUANG SEMI

MMBT2222A

NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction.
- PNP complement:MMBT2907A
- Ideal for Medium Power Amplification and Switching.
- Marking Code:1P



SOT-23		
Dim	**Min**	**Max**
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
E	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
α	0°	8°
All Dimensions in mm		

Maximum Ratings @ T_A = 25°C unless otherwise specified

Rating	Symbol	Max	Unit
Collector-Emitter Voltage	VCEO	40	V
Collector-Base Voltage	VCBO	75	V
Emitter-Base Voltage	VEBO	6	V
Collector Current	I C	600	mA

• THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board,(1) TA=25°C Derate above 25°C	PD	 225 1.8	 mW mW/°C
Thermal Resistance,Junction to Ambient	RΘJA	556	°C/W
Total Device Dissipation Alumina Substrate,(2) TA=25°C Derate above 25°C	PD	 300 2.4	 mW mW/°C
Thermal Resistance,Junction to Ambient	RΘJA	417	°C/W
Junction and Storage Temperature	T j, Tstg	-55 to +150	°C

1. FR–5 = 1.0 x 0.75 x 0.062 in.
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

Electrical Characteristics @ T_A = 25°C unless otherwise specified

OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage (IC = 10 mA, IB = 0)	VBR(CEO)	40	-	-	V
Collector–Base Breakdown Voltage (IC = 10 μA, IE = 0)	VBR(CBO)	75	-	-	V
Emitter–Base Breakdown Voltage (IE = 10 μA, IC = 0)	VBR(EBO)	6	-	-	V
Collector Cutoff Current (VCE = 60 V, VEB(off) = 3.0V)	ICEX	-	-	10	nA
Collector Cutoff Current (VCB = 60 V, IE = 0)	ICBO	-	-	0.01	μA
(VCB = 60 V, IE = 0, TA = 125°C)		-	-	10	
Emitter Cutoff Current (VEB = 3.0 V, IC = 0)	IEBO	-	-	100	nA
Base Cutoff Current (VCE = 60 V, VEB(off) = 3.0 V)	IBL	-	-	20	nA

ON CHARACTERISTICS (Note 2.)

DC Current Gain					
(IC = 0.1 mA, VCE = 10 V)	HFE	35	-	-	
(IC = 1.0 mA, VCE = 10 V)		50	-	-	
(IC = 10 mA, VCE = 10 V)		75	-	-	
(IC = 10 mA, VCE = 10 V,TA= –55°C)		35	-	-	
(IC = 150 mA, VCE = 10 V)		100	-	300	
(IC = 150 mA, VCE = 1.0 V)		50	-	-	
(IC = 500 mA, VCE = 10 V)		40	-	-	
Collector–Emitter Saturation Voltage					
(IC = 150 mA, IB = 15 mA)	VCE(sat)	-	-	0.3	V
(IC = 500 mA, IB = 50 mA)		-	-	1	
Base–Emitter Saturation Voltage					
(IC = 150 mA, IB = 15 mA)	VBE(sat)	0.6	-	1.2	V
(IC = 500 mA, IB = 50 mA)		-	-	2	

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product (IC = 20mA, VCE= 20V, f = 100MHz)	fT	300	-	-	MHz
Output Capacitance (VCB = 5.0 V, IE = 0, f = 1.0 MHz)	Cobo	-	-	8	pF
Input Capacitance (VEB = 0.5 V, IC = 0, f = 1.0 MHz)	Cibo	-	-	25	pF

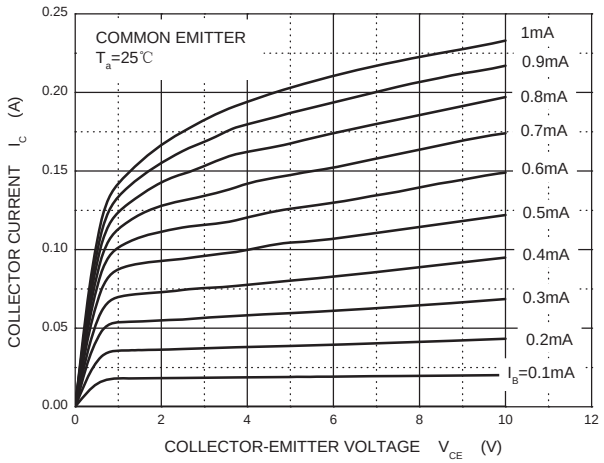
SWITCHING CHARACTERISTICS

Delay Time	(VCC = 30 V,VEB=-0.5V, IC = 150mA, IB1 = 15 mA)	td	-	-	10	ns
Rise Time		tr	-	-	25	
Storage Time	(VCC = 30 V, IC = 150 mA,IB1 = IB2 = 15 mA)	ts	-	-	225	
Fall Time		tf	-	-	60	

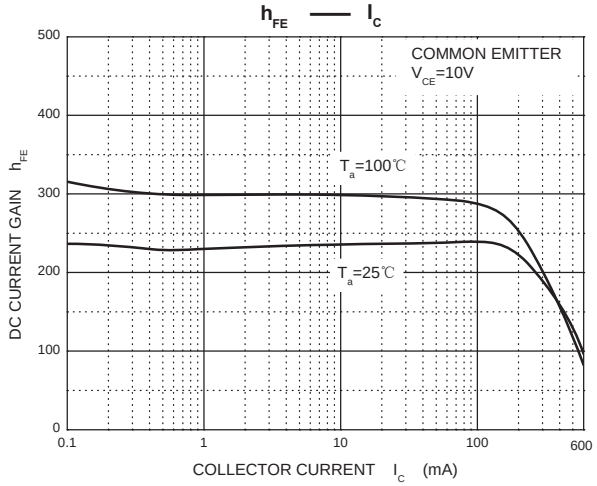
2.Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.

TYPICAL TRANSIENT CHARACTERISTICS

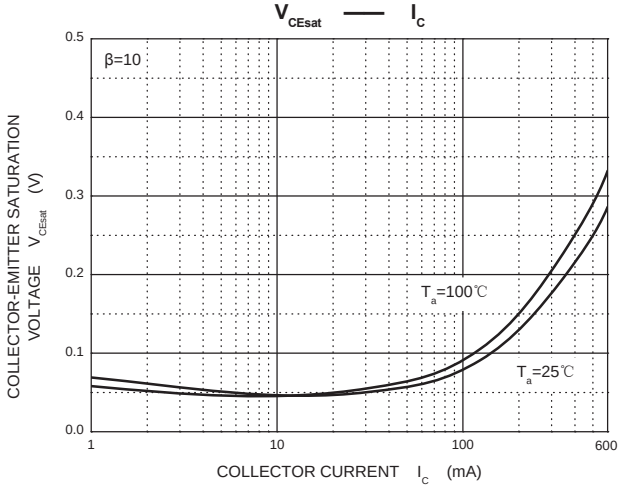
Static Characteristic



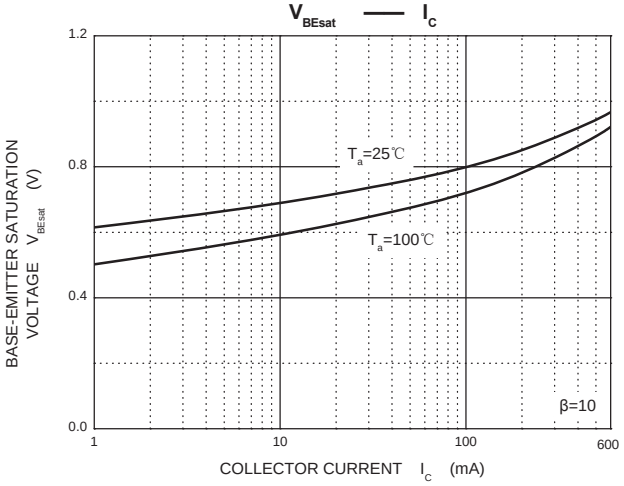
h_{FE} — I_C



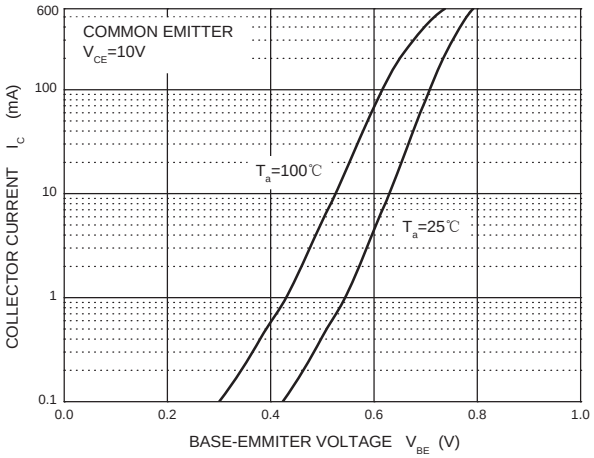
V_{CEsat} — I_C



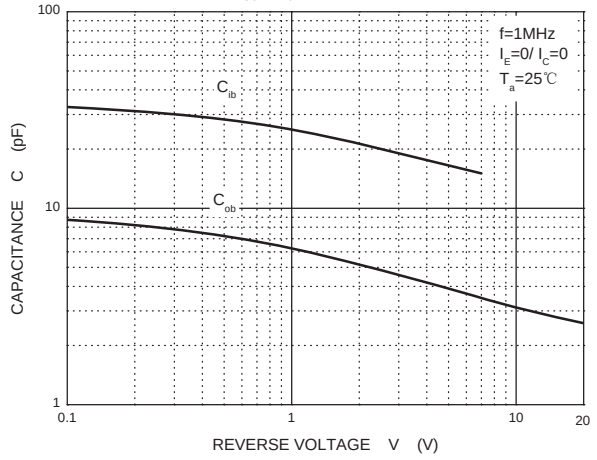
V_{BEsat} — I_C



I_C — V_{BE}



C_{ob} / C_{ib} — V_{CB} / V_{EB}



IMPORTANT NOTICE

HC-SEMI reserves the right to make changes without further notice to any products herein.

HC-SEMI makes no warranty, representation or guarantee regarding

The suitability of its products for any particular purpose, nor does HC-SEMI assume any liability arising out of the application or use of any product or circuit,and specifically disclaims any and all liability, including without limitation consequential or incidental damages.

“Typical” parameters can and do vary in different applications. All operating parameters, including “Typicals” must be validated for each customer application by customer’s technical experts.

HC-SEMI products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the HC-SEMI product could create a situation where personal injury or death may occur.

Should Buyer purchase or use HC-SEMI products for any such unintended or unauthorized application, Buyer shall indemnify and hold HC-SEMI and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that HC-SEMI was negligent regarding the design or manufacture of the part.