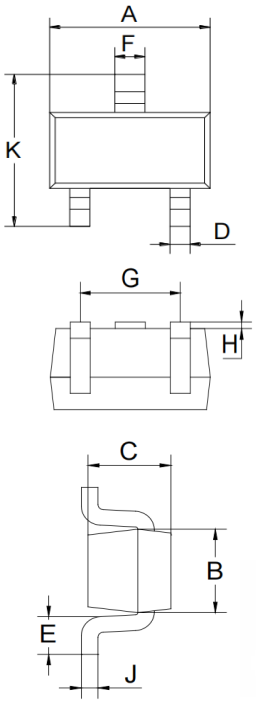
HAICHUANG SEMI

MMBT3904T

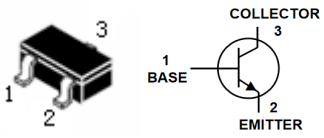
NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial planar die construction.
- Complementary PNP type available (MMBT3906T).
- Collector Current Capability Ic=200mA.
- Collector-emitter Voltage V_{CEO}=40V.



SOT-523		
Dim	Min	Max
A	1.50	1.70
B	0.75	0.85
C	0.60	0.80
D	0.15	0.30
E	0.30	0.40
F	0.25	0.40
G	0.90	1.10
H	0.02	0.10
J	0.08	0.18
K	1.45	1.75
All Dimensions in mm		



Maximum Ratings @ T_A = 25°C unless otherwise specified

Parameter	Symbol	Limits	Unit
Collector–Emitter Voltage	VCEO	40	Vdc
Collector–Base Voltage	VCBO	60	Vdc
Emitter–Base Voltage	VEBO	6	Vdc
Collector Current — Continuous	IC	200	mAdc

• THERMAL CHARACTERISTICS

Total Device Dissipation, FR−5 Board @ TA = 25°C	PD	150	mW
Thermal Resistance,Junction–to–Ambient	RΘJA	833	℃/W
Junction and Storage temperature	TJ,Tstg	−55～+150	℃

Electrical Characteristics @ T_A = 25°C unless otherwise specified

OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Collector–Emitter Breakdown Voltage (IC = 1.0 mAdc, IB = 0)	VBR(CEO)	40	–	–	V
Collector–Base Breakdown Voltage (IC = 10 μAdc, IE = 0)	VBR(CBO)	60	–	–	V
Emitter–Base Breakdown Voltage (IE = 10 μAdc, IC = 0)	VBR(EBO)	6	–	–	V
Collector Cutoff Current (VCE = 30 Vdc, VEB = 3.0Vdc)	ICEX	–	–	50	nA
Emitter cut-off current (IC=0,VEB=5V)	IEBO	–	–	50	nA

ON CHARACTERISTICS (Note 3.)

DC Current Gain (IC = 0.1 mAdc, VCE = 1.0 Vdc) (IC = 1.0 mAdc, VCE = 1.0 Vdc) (IC = 10 mAdc, VCE = 1.0 Vdc) (IC = 50 mAdc, VCE = 1.0 Vdc) (IC = 100 mAdc, VCE = 1.0 Vdc)	HFE	40 70 100 60 30	– – – – –	– – 300 – –	
Collector–Emitter Saturation Voltage(3) (IC = 10 mAdc, IB = 1.0 mAdc) (IC = 50mAdc, IB = 5.0 mAdc)	VCE(sat)	– –	– –	0.2 0.3	V
Base–Emitter Saturation Voltage (IC = 10 mAdc, IB = 1.0 mAdc) (IC = 50mAdc, IB = 5.0 mAdc)	VBE(sat)	0.65 –	– –	0.85 0.95	V

SMALL–SIGNAL CHARACTERISTICS

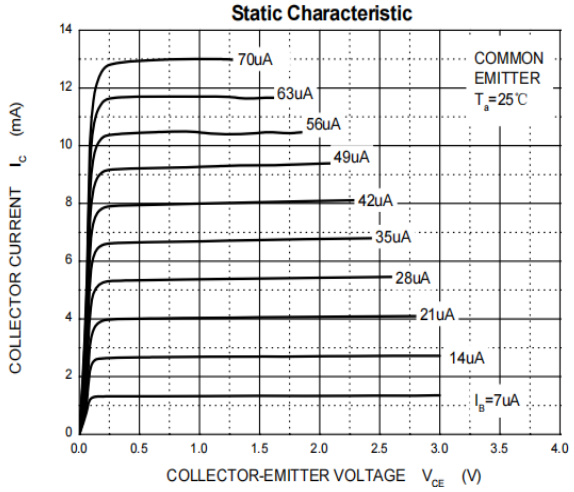
Characteristic	Symbol	Min.	Typ.	Max.	Unit
Current–Gain — Bandwidth Product (IC = 10mAdc, VCE= 20Vdc, f = 100MHz)	fT	300	–	–	MHz
Output Capacitance (VCB = 5.0 Vdc, IE = 0, f = 1.0 MHz)	Cobo	–	–	4	pF
Input Capacitance (VEB = 0.5 Vdc, IC = 0, f = 1.0 MHz)	Cibo	–	–	8	pF

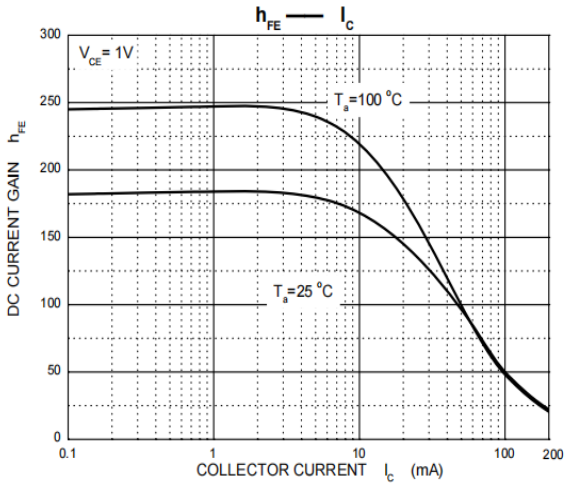
SWITCHING CHARACTERISTICS

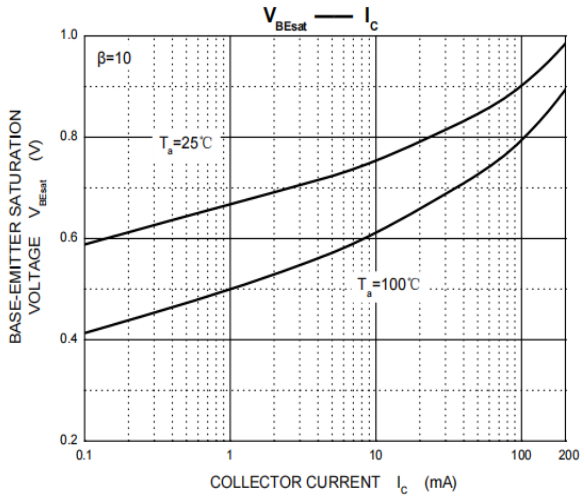
Delay Time	(VCC = 3.0 Vdc, VBE= – 0.5Vdc, IC = 10 mAdc, IB1 = 1.0 mAdc)	td	–	–	35	ns
Rise Time		tr	–	–	35	
Storage Time	(VCC = 3.0 Vdc, IC = 10 mAdc, IB1 = I B2 = 1.0 mAdc)	ts	–	–	200	
Fall Time		tf	–	–	50	

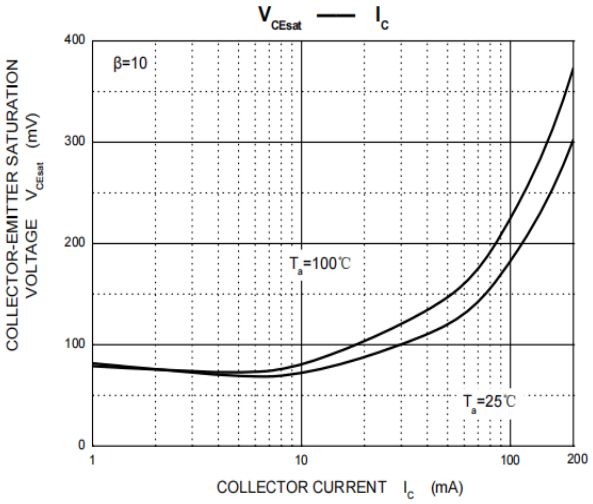
3. Pulse Test: Pulse Width <300 μs, Duty Cycle <2.0%.

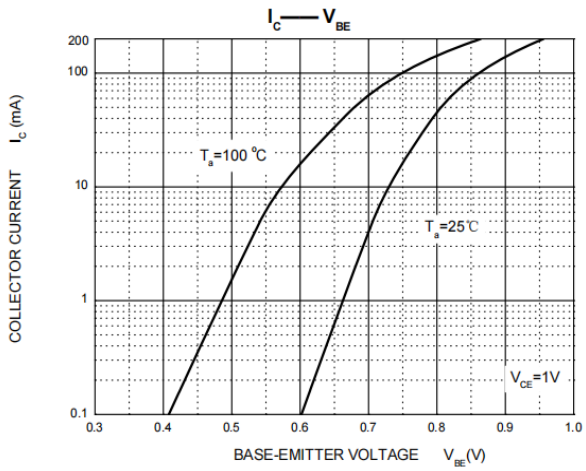
TYPICAL TRANSIENT CHARACTERISTICS

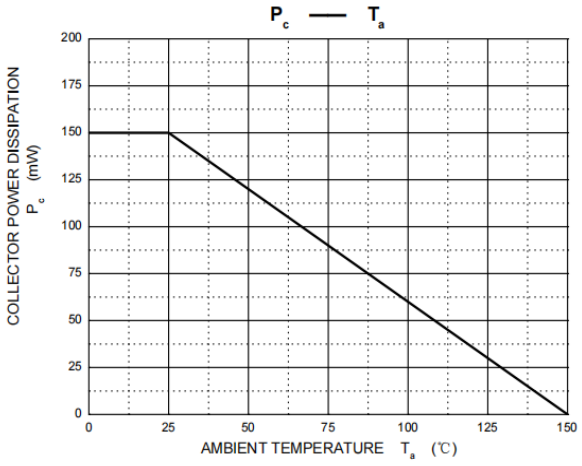












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