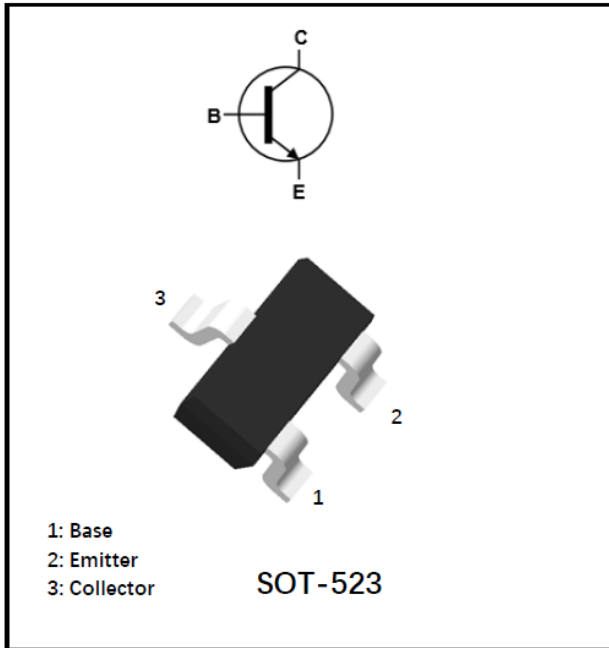


NPN General Purpose Amplifier



Features

- Moisture Sensitivity Level 1
- Surface mount package ideally Suited for Automatic Insertion
- Epoxy meets UL-94 V-0 flammability rating, halogen-free

Mechanical Data

- **Package:** SOT-523
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** 1N

■Maximum Ratings (Ta=25°C Unless otherwise specified)

Item	Symbol	Unit	Conditions	Value
Collector-Emitter Voltage	V_{CEO}	V	$I_C=1.0mA, I_B=0$	40
Collector-Base Voltage	V_{CBO}	V	$I_C=10\mu A, I_E=0$	60
Emitter-Base Voltage	V_{EBO}	V	$I_E=10\mu A, I_C=0$	6.0
Collector Current	I_C	mA		200
Collector Power Dissipation	P_C	mW		150
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	°C/W		833
Operation Junction Temperature	T_J	°C		-55 to +150
Storage Temperature	T_{STG}	°C		-55 to +150



MMBT3904T

■Electrical Characteristics (Ta=25℃ unless otherwise specified)

Item	Symbol	Unit	Conditions	Min	Max
Collector-Emitter Voltage	V_{CEO}	V	$I_C=1.0mA, I_B=0$	40	
Collector-Base Voltage	V_{CBO}	V	$I_C=10\mu A, I_E=0$	60	
Emitter-Base Voltage	V_{EBO}	V	$I_E=10\mu A, I_C=0$	6.0	
Collector-base Cut-off Current	I_{CBO}	nA	$V_{CB}=30Vdc$		50
Emitter-base cut-off current	I_{EBO}	nA	$V_{EB}=5Vdc$		50
Collector-emitter Cut-off Current	I_{CEX}	nA	$V_{CE}=30Vdc, V_{EB}=3Vdc$		50
DC Current Gain	h_{FE}		$I_C=0.1mA, V_{CE}=1.0Vdc$	40	
			$I_C=1.0mA, V_{CE}=1.0Vdc$	70	
			$I_C=10mA, V_{CE}=1.0Vdc$	100	300
			$I_C=50mA, V_{CE}=1.0Vdc$	60	
			$I_C=100mA, V_{CE}=1.0Vdc$	30	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V	$I_C=10mA, I_B=1.0mA$		0.2
			$I_C=50mA, I_B=5.0mA$		0.3
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	V	$I_C=10mA, I_B=1.0mA$	0.65	0.85
			$I_C=50mA, I_B=5.0mA$		0.95
Collector-base Output Capacitance	C_{obo}	pF	$V_{CB}=5.0Vdc, f=1.0MHz, I_E=0$		4
Transition frequency	f_T	MHz	$I_C=10mA, V_{CE}=20V, f=100MHz$	300	
Delay Time	t_d	ns	$V_{CC}=3.0V, V_{BE}=0.5V, I_C=10mA, I_{B1}=1.0mA$	35	
Rise Time	t_r	ns		35	
Storage Time	t_s	ns	$V_{CC}=3.0V, I_C=10mA, I_{B1}=I_{B2}=1.0mA$	200	
Fall Time	t_f	ns		50	

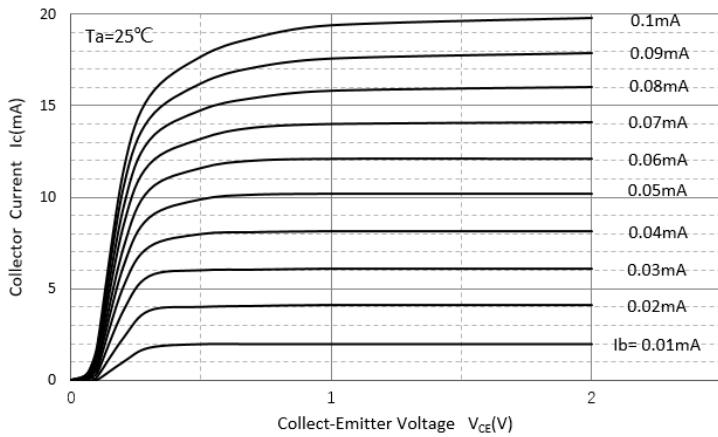
■ Ordering Information (Example)

Preferred P/N	Packing Code	Unit Weight(G)	Minimum Package(Pcs)	Inner Box Quantity(Pcs)	Outer Carton Quantity(Pcs)	Delivery Mode
MMBT3904T	F2	Approximate 0.0027	3000	30000	120000	7" reel

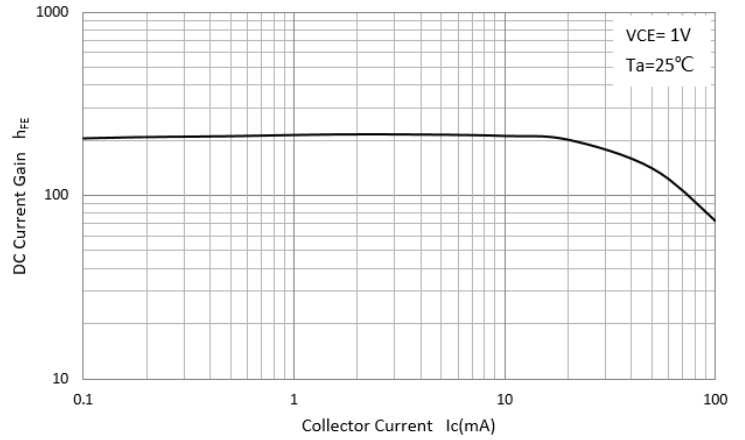


■ Characteristics (Typical)

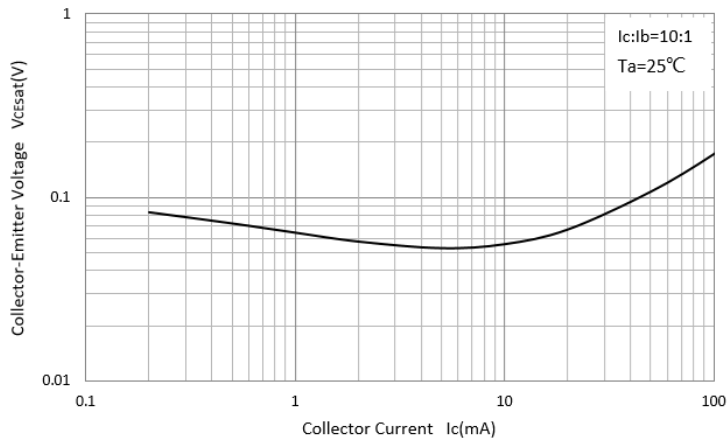
Static Characteristic



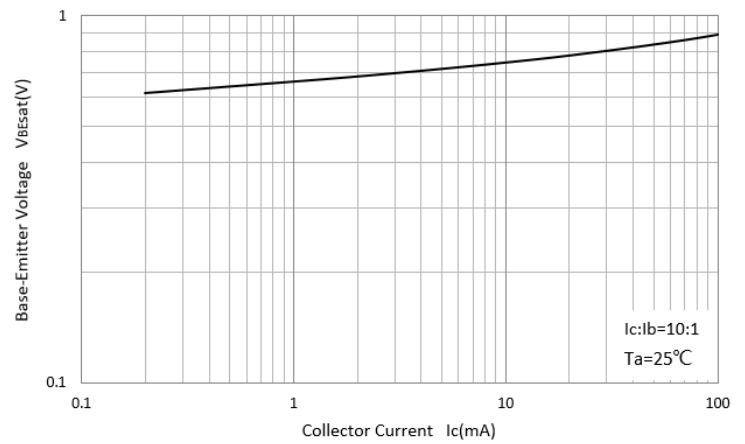
DC Current Gain



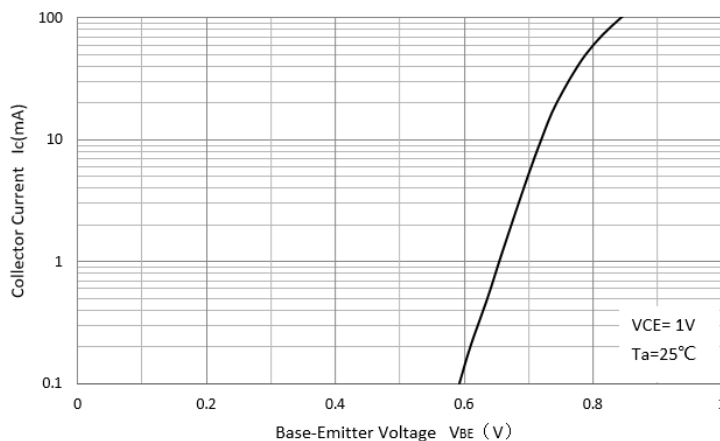
Collector-Emitter Saturation Voltage



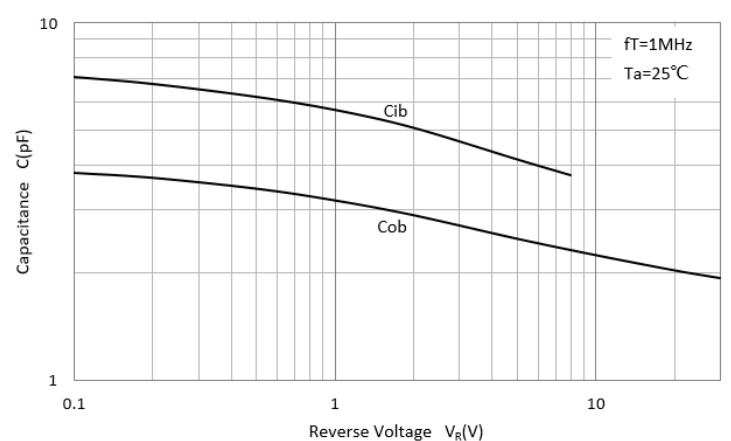
Base-Emitter Saturation Voltage



Base-Emitter On Voltage

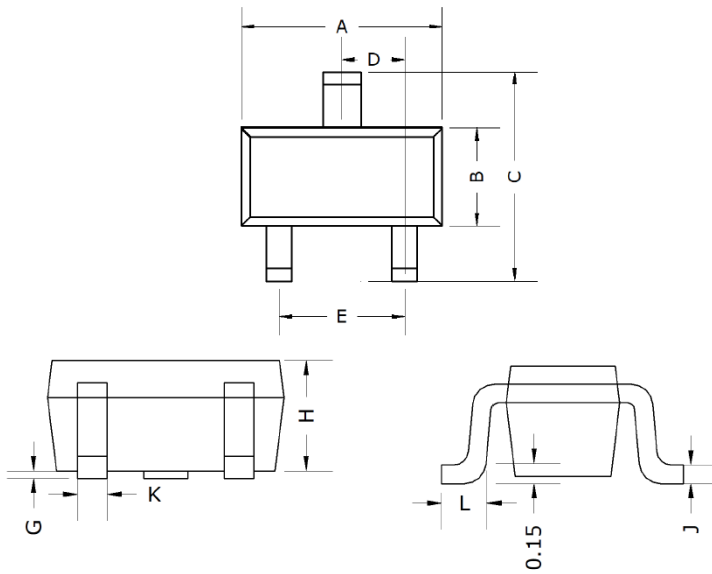


$C_{ob}/C_{ib}-V_{CB}/V_{EB}$



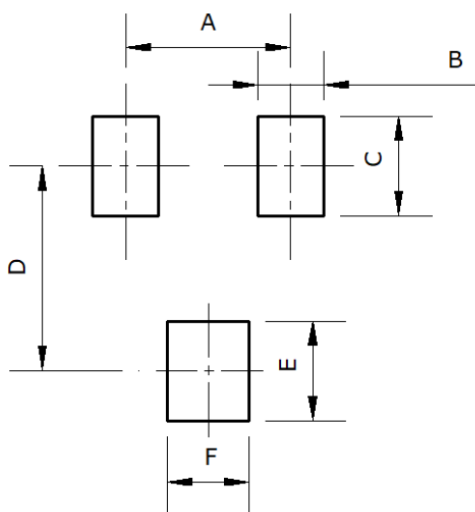


■ SOT-523 Package Outline Dimensions



DIMENSIONS				
DIM	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.059	0.067	1.50	1.70
B	0.030	0.033	0.75	0.85
C	0.057	0.069	1.45	1.75
D	0.020TYP		0.50TYP	
E	0.035	0.043	0.90	1.10
G	0.000	0.004	0.00	0.10
H	0.024	0.031	0.60	0.80
J	0.004	0.008	0.10	0.20
K	0.006	0.014	0.15	0.35
L	0.010	0.018	0.26	0.46

■ SOT-523 Suggested Pad Layout



DIMENSIONS	
DIM	MM (TYP)
A	1.00
B	0.40
C	0.60
D	1.24
E	0.60
F	0.50



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