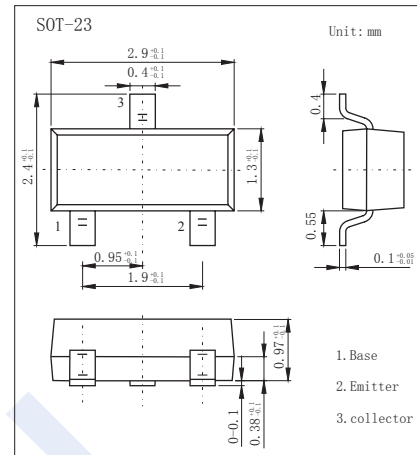


## NPN Transistors

### 2SC3838-HF

#### ■ Features

- High transition frequency.
- Small  $r_{bb'}$ ·Cc and high gain.
- Small NF.
- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish



#### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	$V_{CB0}$	20	V
Collector - Emitter Voltage	$V_{CE0}$	11	
Emitter - Base Voltage	$V_{EB0}$	3	
Collector Current - Continuous	$I_C$	50	mA
Collector Power Dissipation	$P_C$	200	mW
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to 150	

#### ■ Electrical Characteristics $T_a = 25^\circ\text{C}$

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{CB0}$	$I_C = 100 \mu\text{A}$ , $I_E = 0$	20			V
Collector-emitter breakdown voltage	$V_{CE0}$	$I_C = 1 \text{ mA}$ , $I_B = 0$	11			
Emitter - base breakdown voltage	$V_{EB0}$	$I_E = 100 \mu\text{A}$ , $I_C = 0$	3			
Collector-base cut-off current	$I_{CBO}$	$V_{CB} = 20 \text{ V}$ , $I_E = 0$			0.5	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 3 \text{ V}$ , $I_C = 0$			0.5	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10 \text{ mA}$ , $I_B = 5 \text{ mA}$			0.5	V
Base - emitter saturation voltage	$V_{BE(sat)}$	$I_C = 10 \text{ mA}$ , $I_B = 5 \text{ mA}$			1.2	
DC current gain	$h_{FE}$	$V_{CE} = 10 \text{ V}$ , $I_C = 5 \text{ mA}$	82		240	
Collector-base time constant	$r_{bb'}$ ·Cc	$V_{CB} = 10 \text{ V}$ , $I_C = 10 \text{ mA}$ , $f = 31.8 \text{ MHz}$		4	12	PS
Noise figure	NF	$V_{CE} = 6 \text{ V}$ , $I_C = 2 \text{ mA}$ , $f = 500 \text{ MHz}$ , $R_g = 50 \Omega$		3.5		dB
Collector output capacitance	$C_{ob}$	$V_{CB} = 10 \text{ V}$ , $I_E = 0$ , $f = 1 \text{ MHz}$			1.5	pF
Transition frequency	$f_T$	$V_{CE} = 10 \text{ V}$ , $I_C = 10 \text{ mA}$ , $f = 500 \text{ MHz}$	1.4	3.2		GHz

#### ■ Classification of $h_{FE}$

Type	2SC3838-P-HF	2SC3838-Q-HF	2SC3838-Y-HF
Range	82-180	100-200	120-240
Marking	ADP <sub>F</sub>	ADQ <sub>F</sub>	ADY <sub>F</sub>