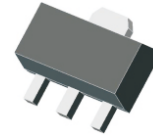


## 2SA1213-HF Series (PNP)

RoHS Device

Halogen Free



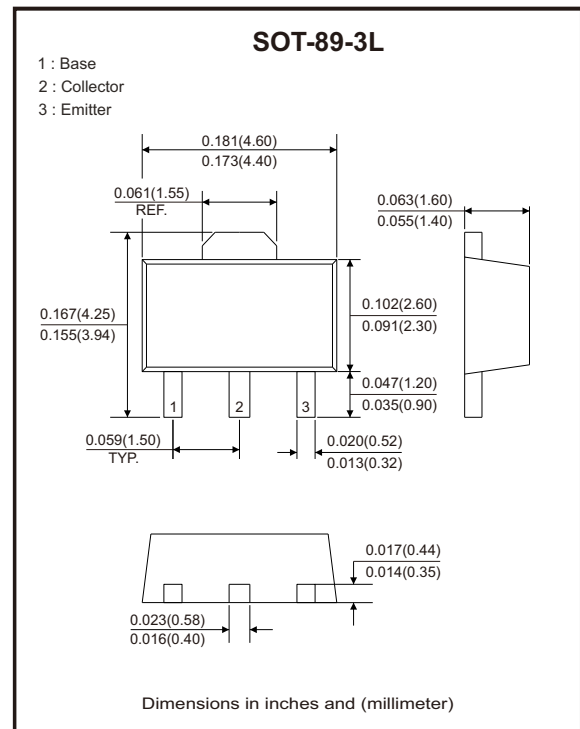
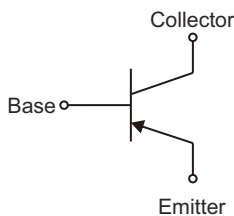
### Features

- Small flat package.
- Power amplifier and switching applications.
- Low saturation voltage.
- High speed switching time.

### Mechanical data

- Case: SOT-89-3L, molded plastic.
- Mounting position: Any.

### Circuit Diagram



### Maximum Ratings (at TA=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-base voltage	V <sub>CB0</sub>	-50	V
Collector-emitter voltage	V <sub>CEO</sub>	-50	V
Emitter-base voltage	V <sub>EBO</sub>	-5	V
Continuous current	I <sub>c</sub>	-2	A
Collector power dissipation	P <sub>c</sub>	500	mW
Thermal resistance from junction to ambient	R <sub>θJA</sub>	250	°C/W
Operation junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

## Electrical Characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Collector-base breakdown voltage	$I_C = -0.1\text{mA}$ , $I_E = 0$	$V_{(BR)CBO}$	-50			V
Collector-emitter breakdown voltage	$I_C = -10\text{mA}$ , $I_B = 0$	$V_{(BR)CEO}$	-50			V
Emitter-base breakdown voltage	$I_E = -0.1\text{mA}$ , $I_C = 0$	$V_{(BR)EBO}$	-5			V
Collector cut-off current	$V_{CB} = -50\text{V}$ , $I_E = 0$	$I_{CBO}$			-100	nA
Emitter cut-off current	$V_{EB} = -5\text{V}$ , $I_C = 0$	$I_{EBO}$			-100	nA
DC current gain	$V_{CE} = -2\text{V}$ , $I_C = -500\text{mA}$	$h_{FE}$	70		240	
	$V_{CE} = -2\text{V}$ , $I_C = -2\text{A}$		20			
Collector-emitter saturation voltage	$I_C = -1\text{A}$ , $I_B = -50\text{mA}$	$V_{CE(sat)}$			-0.5	V
Base-emitter saturation voltage	$I_C = -1\text{A}$ , $I_B = -50\text{mA}$	$V_{BE(sat)}$			-1.2	V
Collector output capacitance	$V_{CB} = -10\text{V}$ , $I_E = 0$ , $f = 1\text{MHz}$	$C_{ob}$		40		pF
Transition frequency	$V_{CE} = -2\text{V}$ , $I_C = -0.5\text{A}$	$f_T$	100			MHz

## Classification Of $h_{FE}$

Part No.	2SA12130-HF	2SA1213Y-HF
Range	70-140	120-240

## Typical Rating and Characteristic Curves (2SA1213-HF Series)

Fig.1 - Static Characteristic

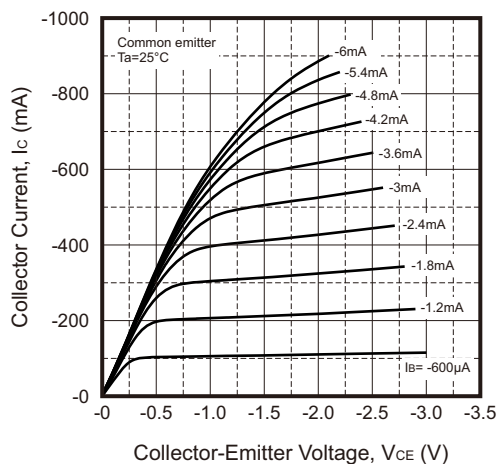
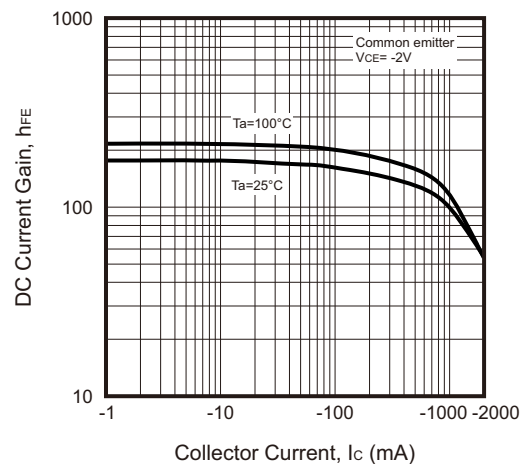


Fig.2 -  $h_{FE} - I_C$



## Typical Rating and Characteristic Curves (2SA1213-HF Series)

Fig.3 -  $V_{BEsat} - I_c$

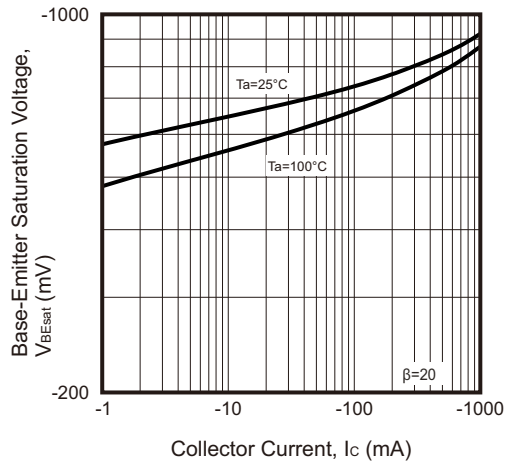


Fig.4 -  $V_{CEsat} - I_c$

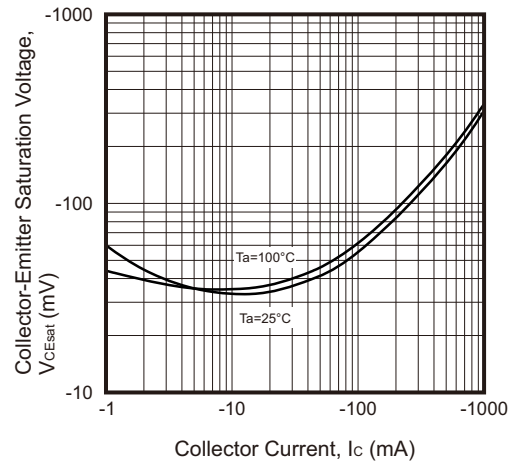


Fig.5 -  $I_c - V_{BE}$

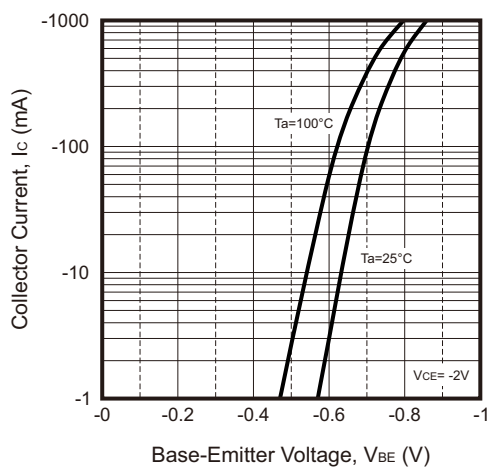


Fig.6 -  $C_{ob}/C_{ib} - V_{CB}/V_{EB}$

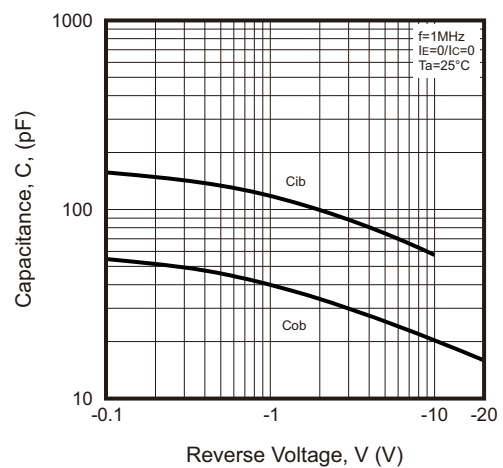
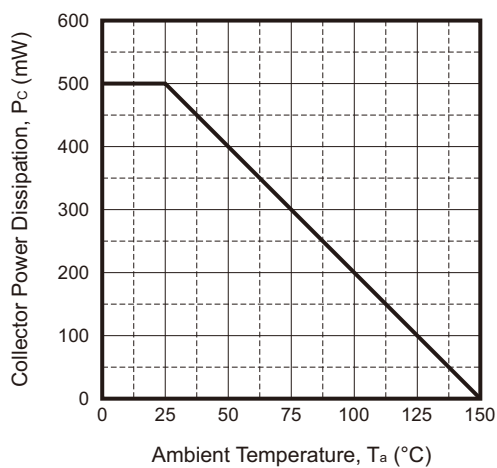
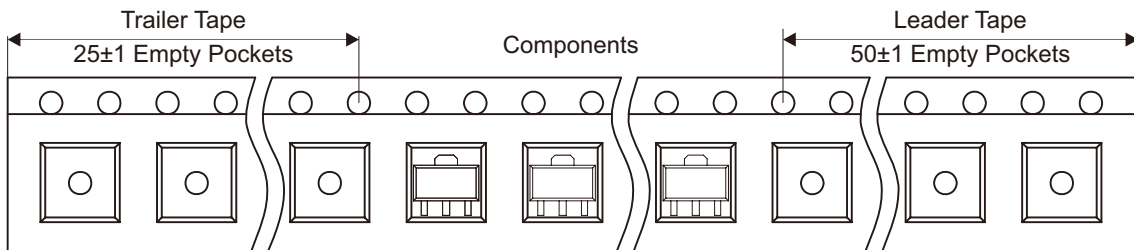
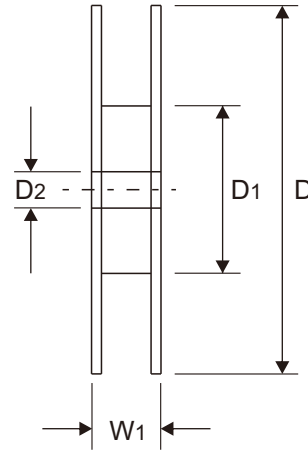
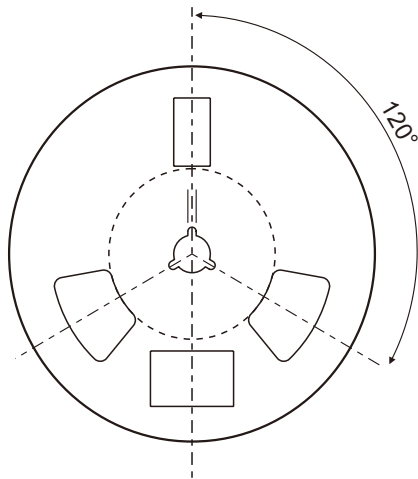
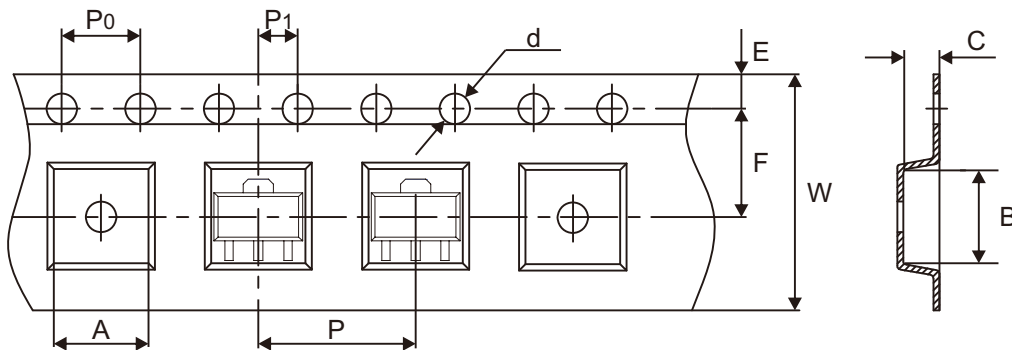


Fig.7 -  $P_c - T_a$



## Reel Taping Specification

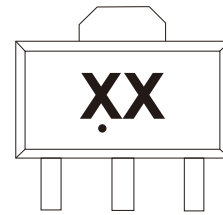


SOT-89-3L	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	4.85 ± 0.10	4.45 ± 0.10	1.85 ± 0.10	1.50 + 0.10	180.00 ± 1.00	60.00 ± 1.50	13.20 ± 0.20
	(inch)	0.191 ± 0.004	0.175 ± 0.004	0.073 ± 0.004	0.059 + 0.004	7.087 ± 0.039	2.362 ± 0.059	0.520 ± 0.008

SOT-89-3L	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	5.50 ± 0.05	8.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	12.00 + 0.30 - 0.10	16.50 + 2.00 - 1.00
	(inch)	0.069 ± 0.004	0.217 ± 0.002	0.315 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.472 + 0.012 - 0.004	0.650 + 0.079 - 0.039

## Marking Code

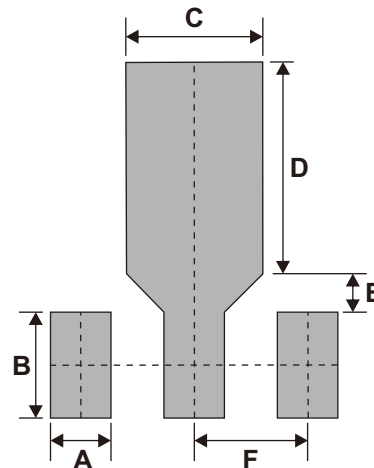
Part Number	Marking Code
2SA1213O-HF	NO
2SA1213Y-HF	NY



xx = Product type marking code  
 Solid dot = Control code

## Suggested P.C.B. PAD Layout

SIZE	SOT-89-3L	
	(mm)	(inch)
A	0.80	0.031
B	1.40	0.055
C	1.80	0.071
D	2.80	0.110
E	0.50	0.020
F	1.50	0.059



## Standard Packaging

Case Type	REEL PACK	
	REEL ( pcs )	Reel Size (inch)
SOT-89-3L	1,000	7

# Mouser Electronics

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