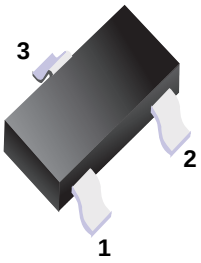
■ NPN Transistor

■ Features

- Collector Current Capability I_C=50mA
- Collector Emitter Voltage V_{CEO}=9V

lead-free ROHS



1.Base
2.Emitter
3.Collector

■ Simplified outline(SOT-323)

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	15	V
Collector - Emitter Voltage	V_{CEO}	9	
Emitter - Base Voltage	V_{EBO}	1.5	
Collector Current - Continuous	I_C	50	mA
Collector Power Dissipation	P_C	100	mW
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	-55 to 150	

■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	I_C= 10 μA， I_E= 0	15			V
Collector-base cut-off current	I_{CBO}	V_{CB}= 12 V , I_E= 0			10	uA
Collector- emitter cut-off current	I_{CEO}	V_{CE}= 9 V , I_E= ∞			1	mA
Emitter cut-off current	I_{EBO}	V_{EB}= 1.5V , I_C=0			10	uA
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=50 mA, I_B=5mA			0.6	V
Base - emitter saturation voltage	$V_{BE(sat)}$	I_C= 50 mA, I_B= 5 mA			1.2	
DC current gain	h_{FE}	V_{CE}= 5V, I_C= 20mA	50		250	
Collector output capacitance	C_{ob}	V_{CB}= 5V, I_E= 0,f=1MHz			1.4	pF
Transition frequency	f_T	V_{CE}= 5V, I_C= 20mA	6			GHz
Power gain	PG	V_{CE} = 5 V, I_C = 20 mA,f = 900 MHz	10			dB
Noise figure	NF	V_{CE} = 5 V, I_C = 5 mA,f = 900 MHz			2.5	

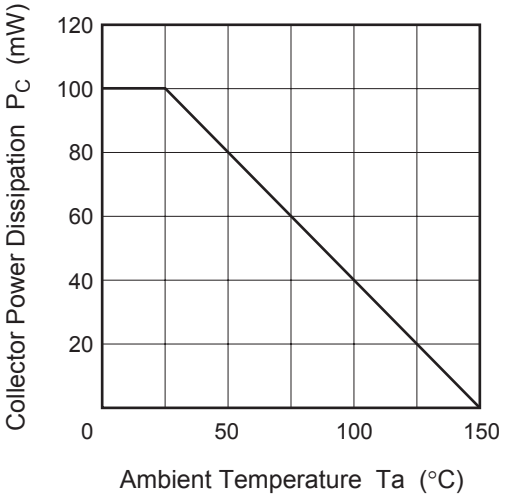
■ Classification of h_{fe}

Marking	YK

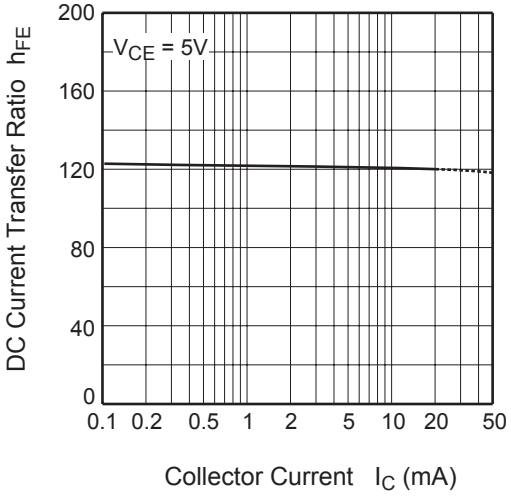
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■ Typical Characterisitics

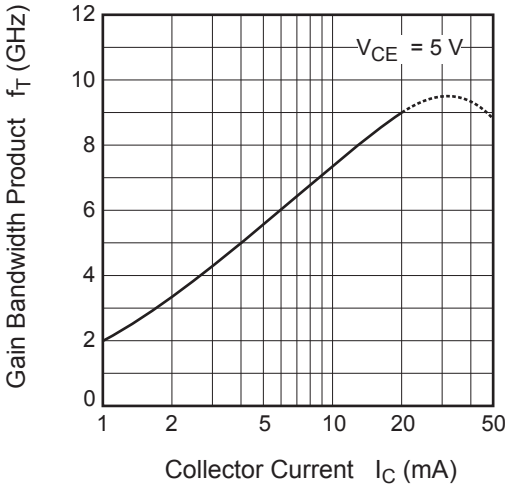
Maximum Collector Dissipation Curve



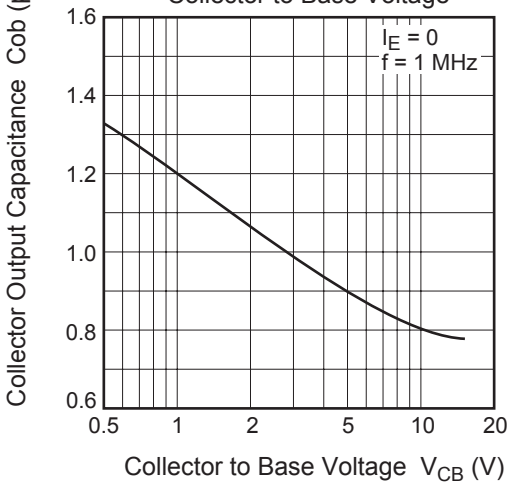
DC Current Transfer Ratio vs. Collector Current



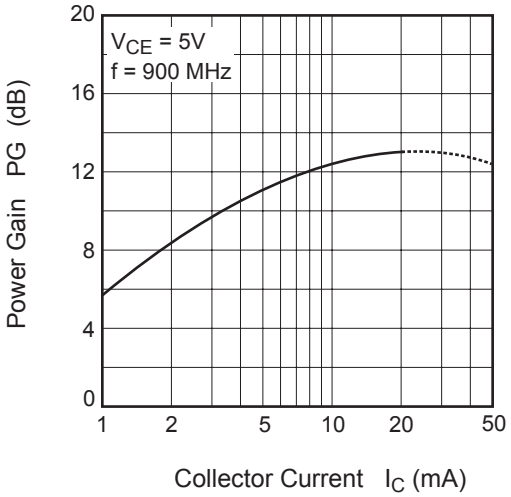
Gain Bandwidth Product vs. Collector Current



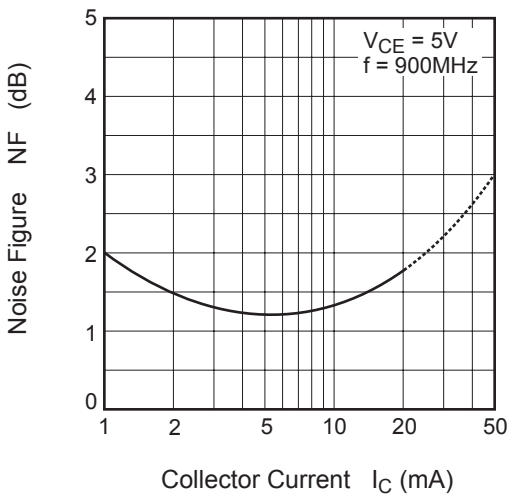
Collector Output Capacitance vs. Collector to Base Voltage



Power Gain vs. Collector Current

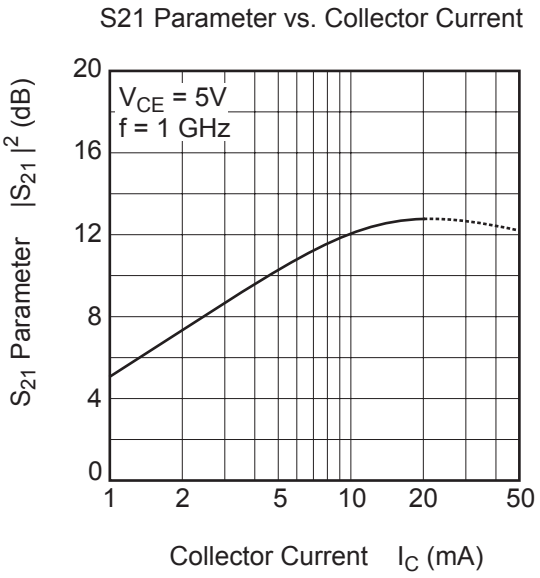


Noise Figure vs. Collector Current



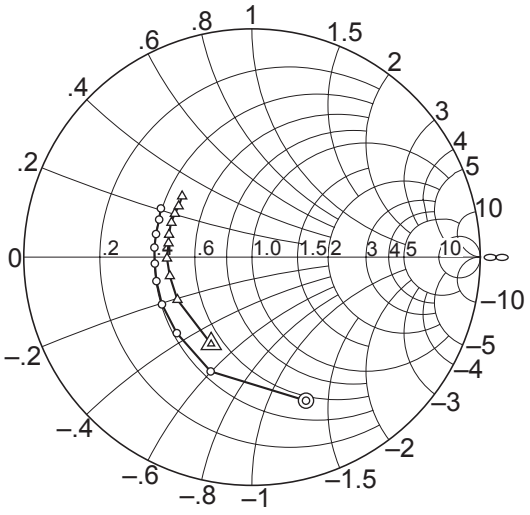
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■ Typical Characterisitics



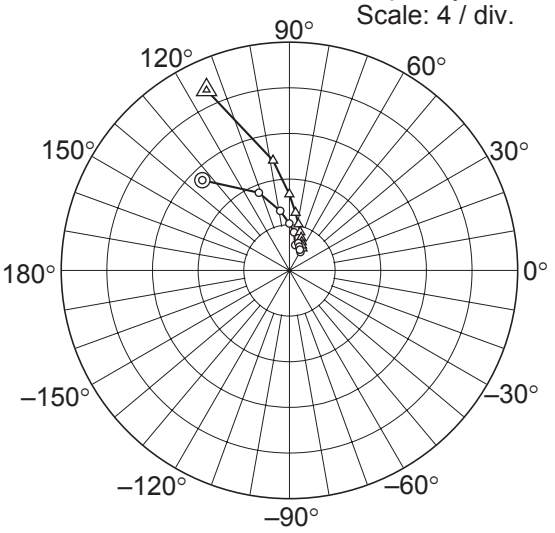
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S11 Parameter vs. Frequency



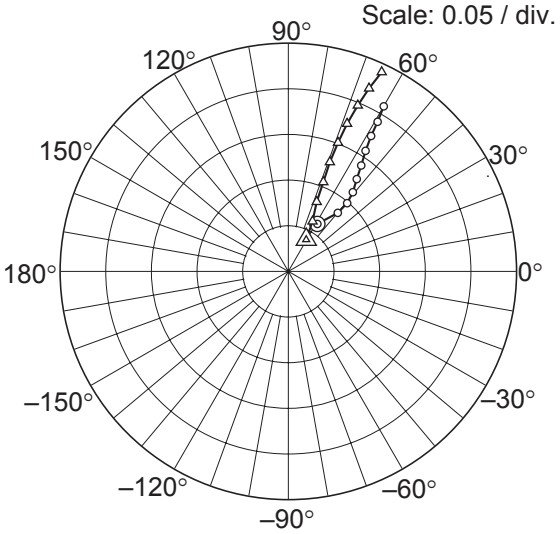
Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I C = 5 mA)
(I C = 20 mA)

S21 Parameter vs. Frequency
Scale: 4 / div.



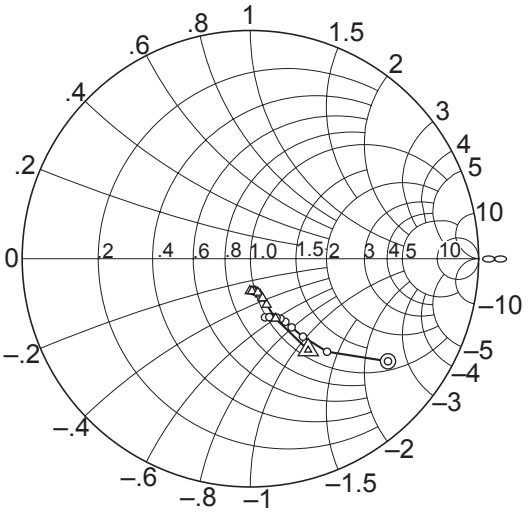
Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I C = 5 mA)
(I C = 20 mA)

S12 Parameter vs. Frequency
Scale: 0.05 / div.



Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I C = 5 mA)
(I C = 20 mA)

S22 Parameter vs. Frequency



Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I C = 5 mA)
(I C = 20 mA)

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S Parameter

(V_{CE} = 5 V, I_C = 5 mA, Z_O = 50Ω, Emitter common)

Freq.	S11		S21		S12		S22	
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.672	–69.4	10.99	134.0	0.0610	58.8	0.752	–26.7
400	0.533	–109.9	7.32	111.5	0.0841	49.9	0.528	–50.5
600	0.469	–134.7	5.28	98.8	0.0989	49.3	0.412	–56.0
800	0.446	–152.3	4.12	90.2	0.112	50.9	0.351	–59.0
1000	0.432	–165.9	3.37	83.2	0.126	53.5	0.316	–61.0
1200	0.427	–176.2	2.88	77.2	0.141	55.5	0.294	–63.3
1400	0.430	174.1	2.52	72.1	0.157	57.4	0.282	–66.0
1600	0.433	166.5	2.26	67.5	0.174	58.6	0.274	–69.1
1800	0.439	158.0	2.04	63.3	0.191	59.2	0.269	–72.0
2000	0.453	151.9	1.88	59.2	0.209	60.0	0.265	–76.0

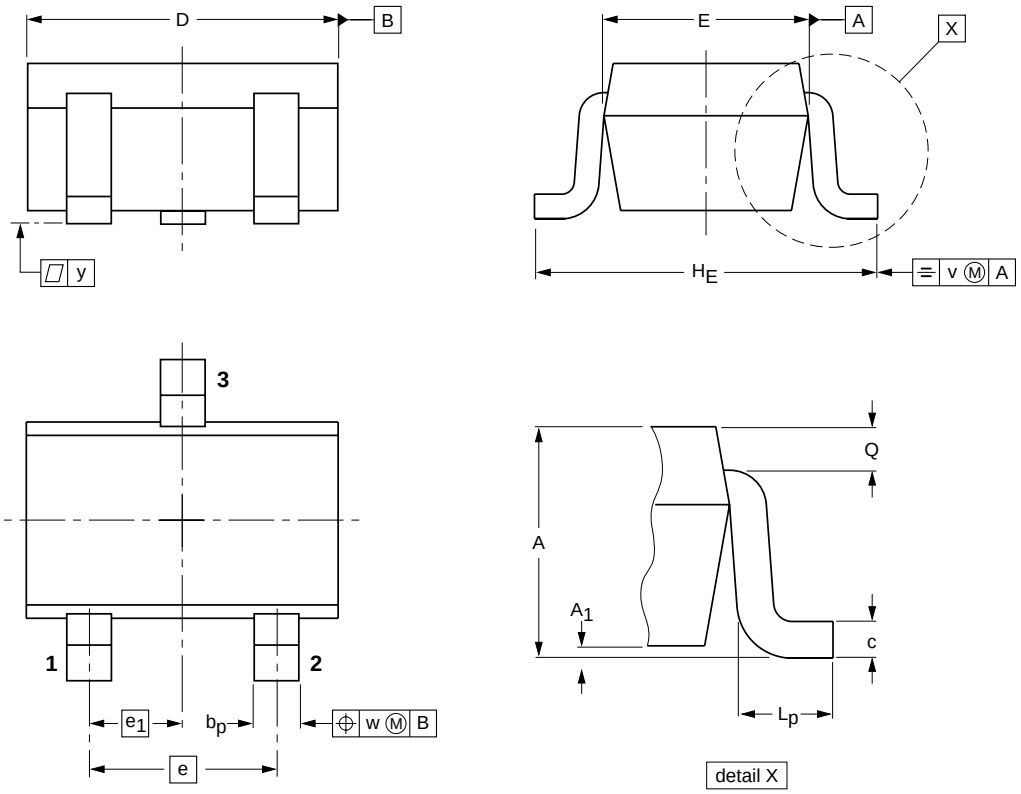
S Parameter

(V_{CE} = 5 V, I_C = 20 mA, Z_O = 50Ω, Emitter common)

Freq.	S11		S21		S12		S22	
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.421	–115.2	17.40	114.7	0.0399	50.6	0.474	–57.7
400	0.377	–150.2	9.74	98.5	0.0609	64.2	0.284	–67.2
600	0.370	–167.0	6.68	90.1	0.0822	67.8	0.213	–70.5
800	0.373	–179.1	5.09	84.0	0.105	68.6	0.180	–72.9
1000	0.371	170.6	4.13	79.0	0.128	69.2	0.161	–74.9
1200	0.377	164.9	3.49	74.3	0.151	68.9	0.151	–77.6
1400	0.384	156.9	3.04	70.3	0.174	68.3	0.146	–80.7
1600	0.388	150.7	2.71	66.8	0.197	67.3	0.143	–83.5
1800	0.392	145.3	2.45	63.3	0.219	66.2	0.142	–87.2
2000	0.406	139.0	2.25	59.5	0.241	64.9	0.141	–91.0

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Package Outline SOT-323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

Summary of Packing Options

Package	Package Description	Packing Quantity	Industry Standard
SOT-323	Tape/Reel,7"reel	3000	EIA-481-1

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