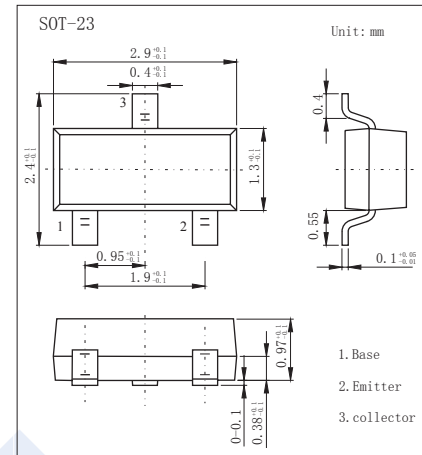


NPN Transistors

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■ Features

- Collector Current Capability $I_c=80\text{mA}$
- Collector Emitter Voltage $V_{CE0}=12\text{V}$



■ 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}	12	
Emitter - Base Voltage	V_{EB0}	3	
Collector Current - Continuous	I_c	80	mA
Base Current	I_B	40	
Collector Power Dissipation	P_C	150	mW
Junction Temperature	T_J	125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 125	

■ 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}	$I_c = 1 \text{ mA}, I_B = 0$	12			
Emitter - base breakdown voltage	V_{EB0}	$I_E = 100 \mu\text{A}, I_c = 0$	3			
Collector-base cut-off current	I_{CB0}	$V_{CB} = 10\text{V}, I_E = 0$			1	μA
Emitter cut-off current	I_{EB0}	$V_{EB} = 3\text{V}, I_c = 0$			1	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_c = 80 \text{ mA}, I_B = 8 \text{ mA}$			0.5	V
Base - emitter saturation voltage	$V_{BE(sat)}$	$I_c = 80 \text{ mA}, I_B = 8 \text{ mA}$			1.2	
DC current gain	h_{FE}	$V_{CE} = 10\text{V}, I_c = 20\text{mA}$	30		250	
Insertion Power Gain	$ S_{21e} ^2$	$V_{CE} = 10\text{V}, I_c = 20 \text{ mA}, f = 0.5\text{GHz}$		16.5		dB
		$V_{CE} = 10\text{V}, I_c = 20 \text{ mA}, f = 1\text{GHz}$	7.5			
Noise Figure	NF	$V_{CE} = 10\text{V}, I_c = 5 \text{ mA}, f = 0.5\text{GHz}$		1		
		$V_{CE} = 10\text{V}, I_c = 5 \text{ mA}, f = 1\text{GHz}$			2	
Reverse transfer capacitance	C_{re}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$			1.15	pF
Collector output capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$		1		pF
Transition frequency	f_T	$V_{CE} = 10\text{V}, I_c = 20\text{mA}$	5			GHz

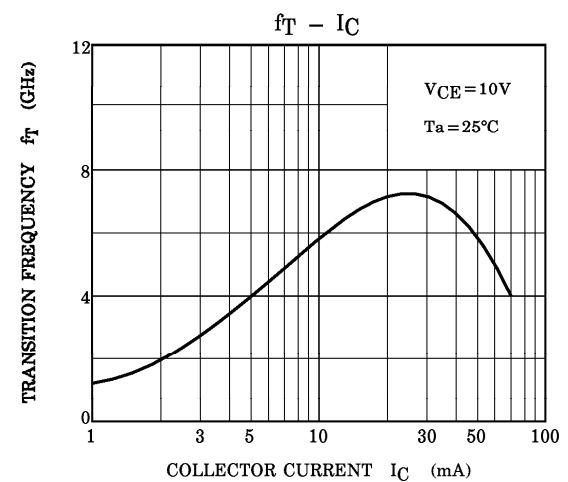
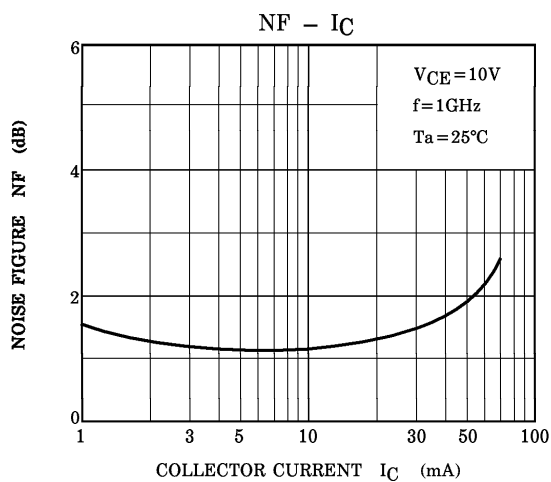
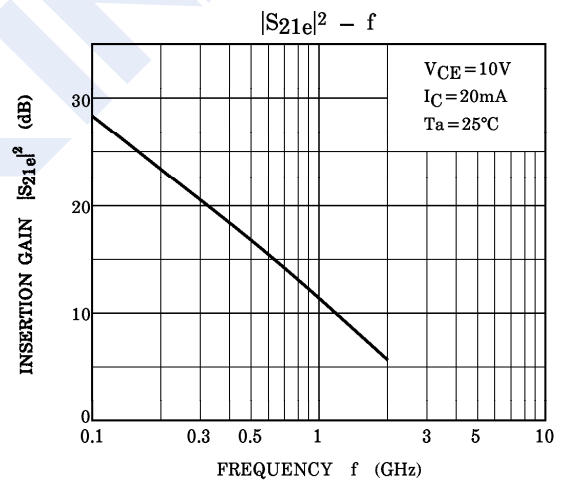
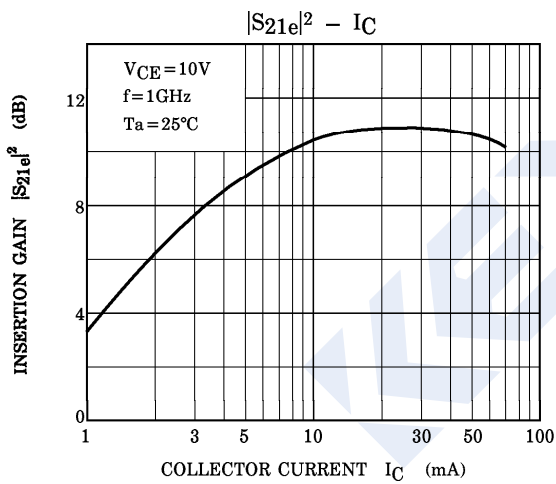
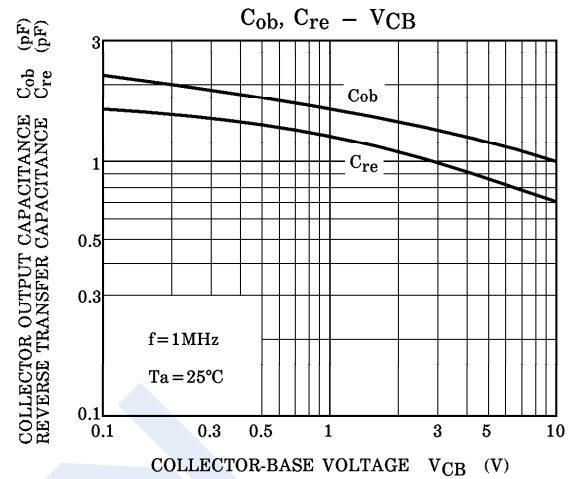
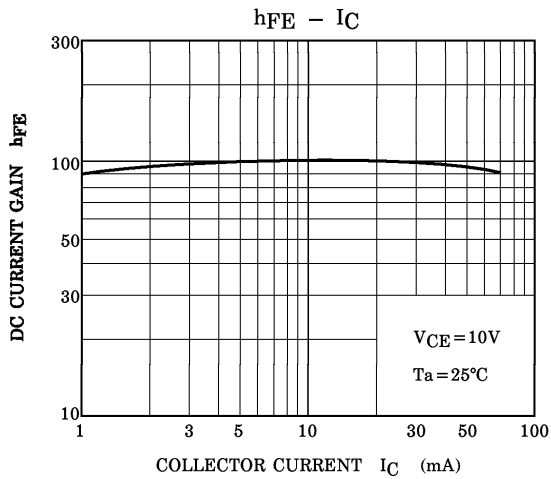
■ Marking

Marking	MH
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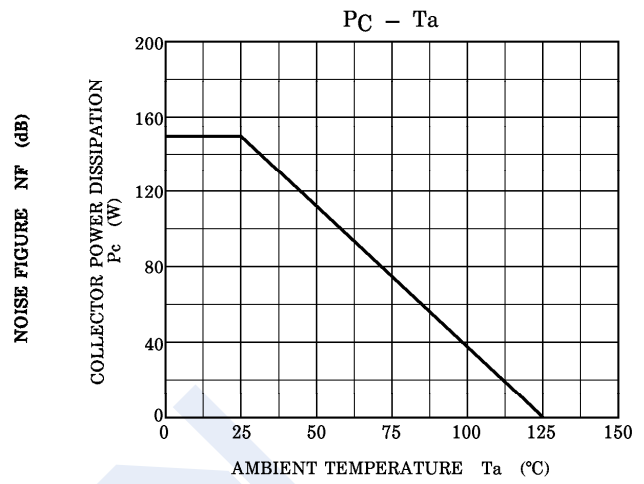
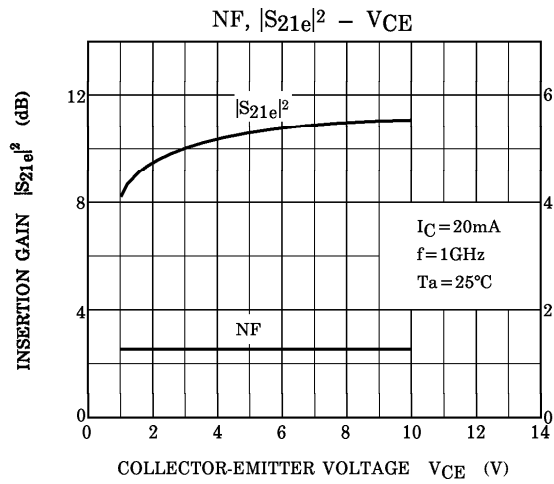
■ Typical Characteristics



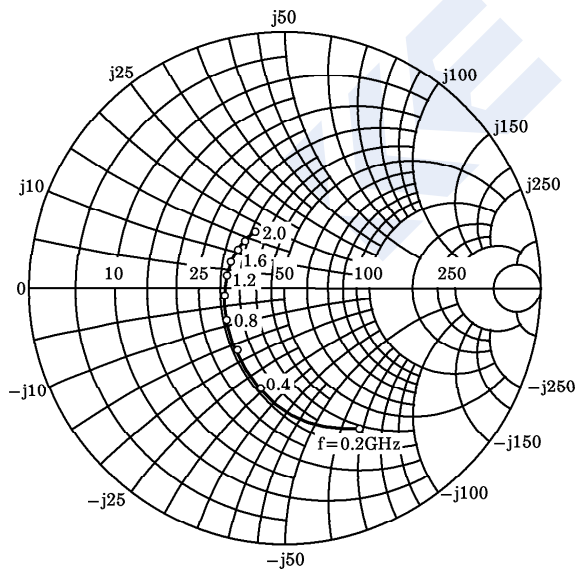
NPN Transistors

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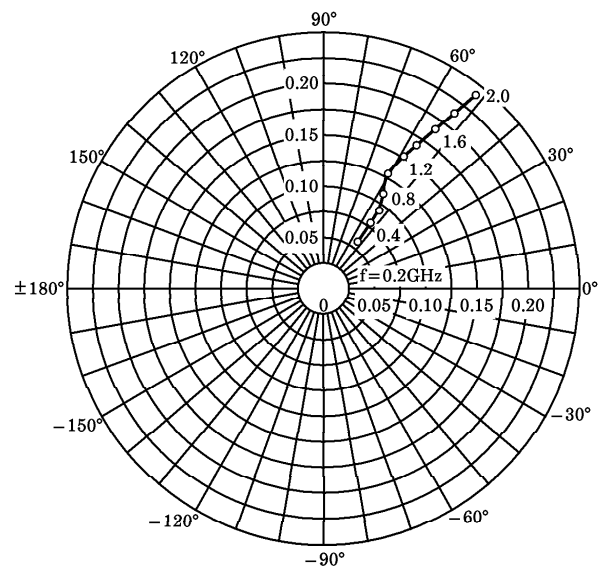
■ Typical Characteristics



S_{11e}
 $V_{CE} = 10\text{V}$
 $I_C = 5\text{mA}$
 $T_a = 25^\circ\text{C}$
 (Unit : Ω)



S_{12e}
 $V_{CE} = 10\text{V}$
 $I_C = 5\text{mA}$
 $T_a = 25^\circ\text{C}$

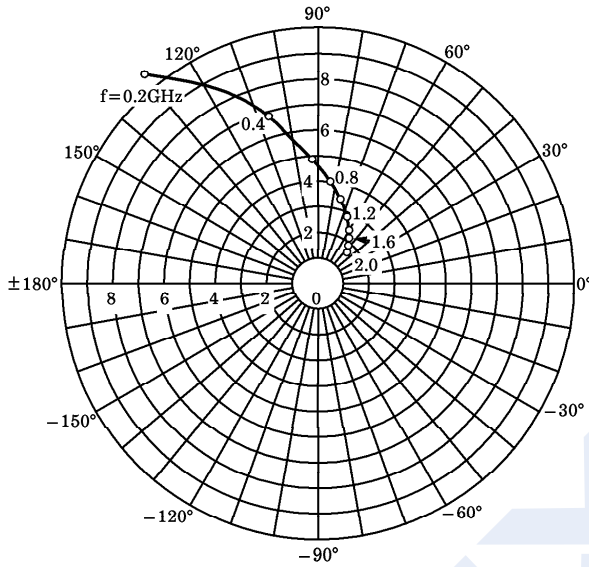


NPN Transistors

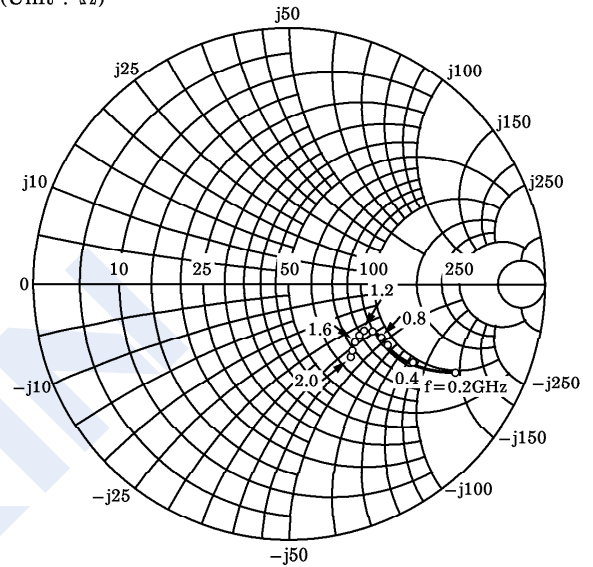
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■ Typical Characteristics

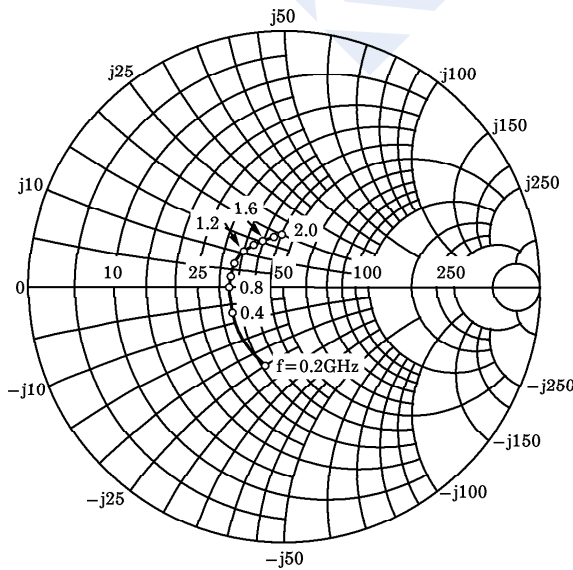
S_{21e}
V_{CE} = 10V
I_C = 5mA
T_a = 25°C



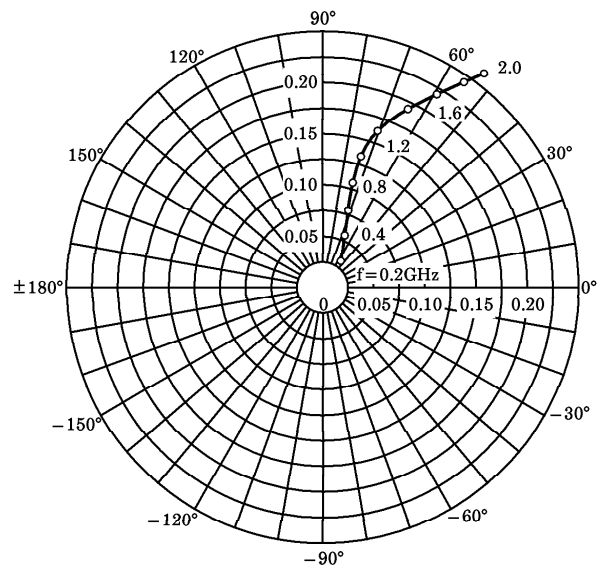
S_{22e}
V_{CE} = 10V
I_C = 5mA
T_a = 25°C
(Unit : Ω)



S_{11e}
V_{CE} = 10V
I_C = 20mA
T_a = 25°C
(Unit : Ω)



S_{12e}
V_{CE} = 10V
I_C = 20mA
T_a = 25°C

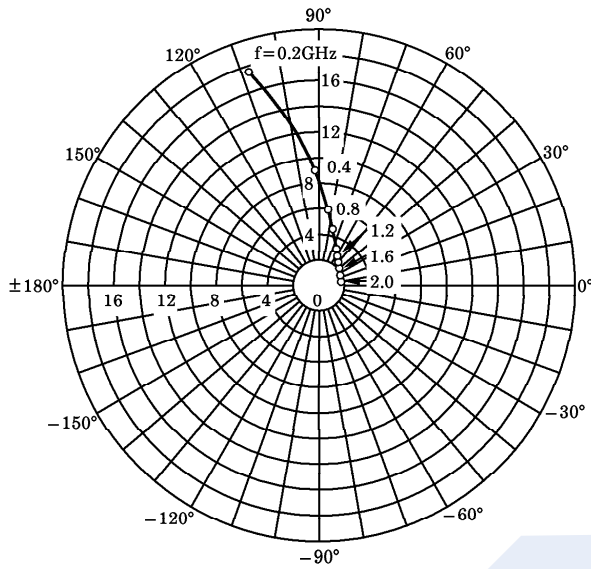


NPN Transistors

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■ Typical Characteristics

S_{21e}
 $V_{CE} = 10V$
 $I_C = 20mA$
 $T_a = 25^\circ C$



S_{22e}
 $V_{CE} = 10V$
 $I_C = 20mA$
 $T_a = 25^\circ C$
 (Unit : Ω)

