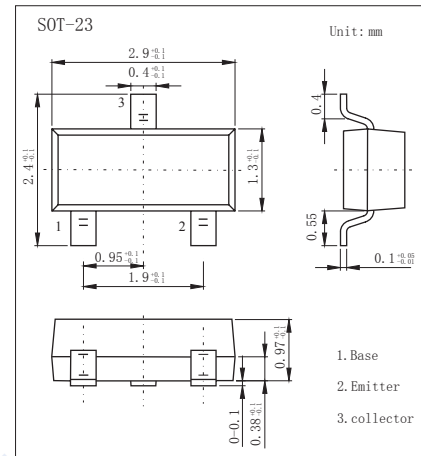


NPN Transistors

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■ Features

- Collector Current Capability $I_c=50\text{mA}$
- Collector Emitter Voltage $V_{CE0}=20\text{V}$

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

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CB0}	30	V
Collector - Emitter Voltage	V_{CE0}	20	
Emitter - Base Voltage	V_{EB0}	3	
Collector Current - Continuous	I_c	50	mA
Collector Power Dissipation	P_c	150	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}	$I_c = 100 \mu\text{A}, I_E = 0$	30			V
Collector- emitter breakdown voltage	V_{CE0}	$I_c = 1\text{mA}, I_B = 0$	20			
Emitter - base breakdown voltage	V_{EB0}	$I_E = 100 \mu\text{A}, I_c = 0$	3			
Collector-base cut-off current	I_{CB0}	$V_{CB} = 30\text{V}, I_E = 0$			0.1	μA
Emitter cut-off current	I_{EB0}	$V_{EB} = 4\text{V}, I_c = 0$			0.1	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_c = 10\text{mA}, I_B = 5\text{mA}$			0.7	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}	$V_{CE} = 10\text{V}, I_c = 5\text{mA}$	30		200	
Oscillating output voltage	V_{osc}	$V_{CC} = 12\text{V}, I_c = 7\text{mA}, f_{osc} = 300\text{MHz}$		300		mV
		$V_{CC} = 12\text{V}, I_c = 7\text{mA}, f_{osc} = 930\text{MHz}$		200		
Noise figure	NF	$V_{CC} = 12\text{V}, I_c = 2\text{mA}, f = 200\text{MHz}, f_{osc} = 230\text{MHz} (0\text{dBm})$		4		dB
Conversion gain	CG	$V_{CC} = 12\text{V}, I_c = 2\text{mA}, f = 200\text{MHz}, f_{osc} = 230\text{MHz} (0\text{dBm})$		22.5		
		$V_{CC} = 12\text{V}, I_c = 2\text{mA}, f = 900\text{MHz}, f_{osc} = 930\text{MHz} (0\text{dBm}), f_{out} = 30\text{MHz}$		10		
Collector output capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$			1	pF
Transition frequency	f_t	$V_{CE} = 10\text{V}, I_c = 5\text{mA}$	1.4			GHz

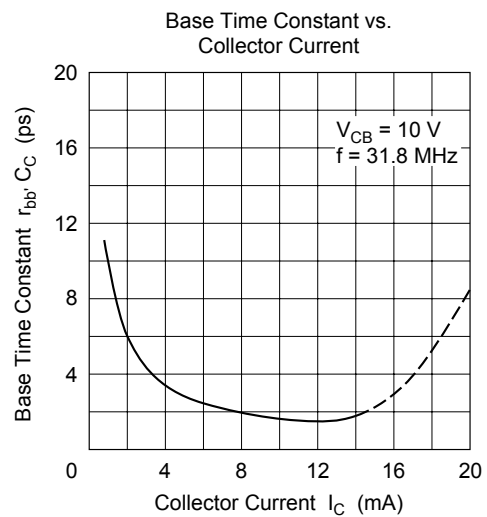
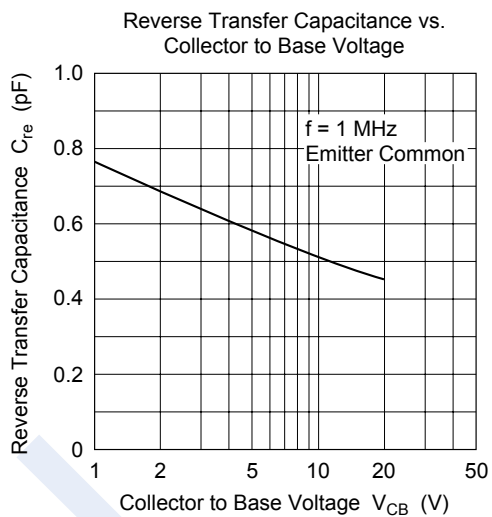
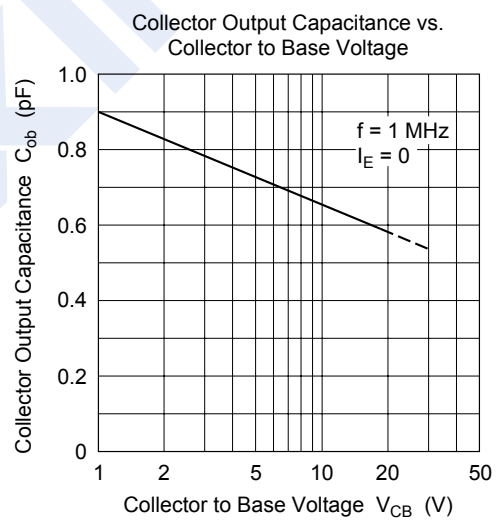
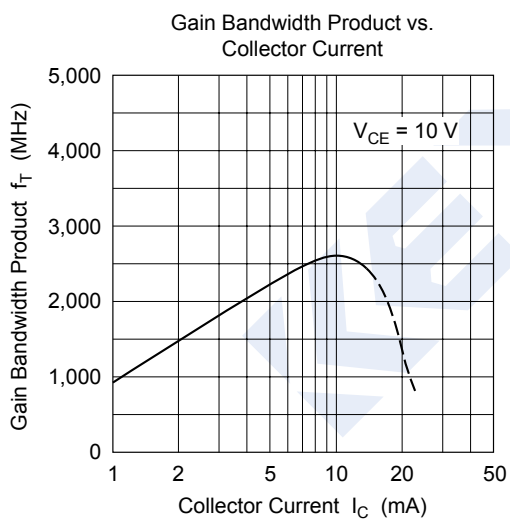
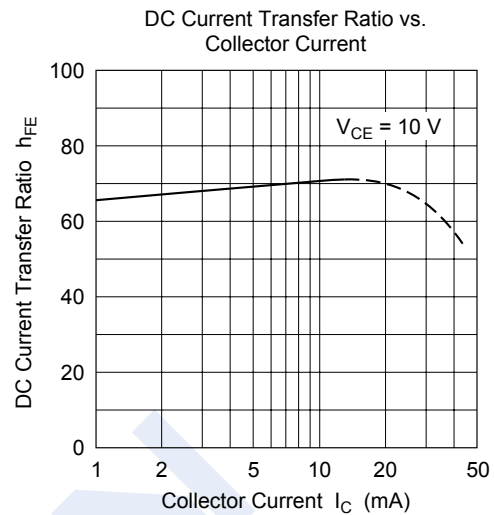
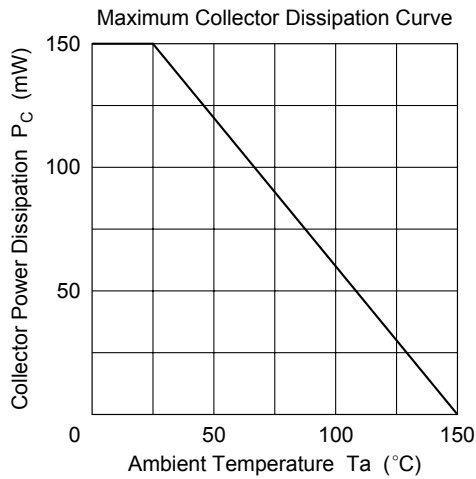
■ Marking

Marking	TC
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NPN Transistors

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■ Typical Characteristics

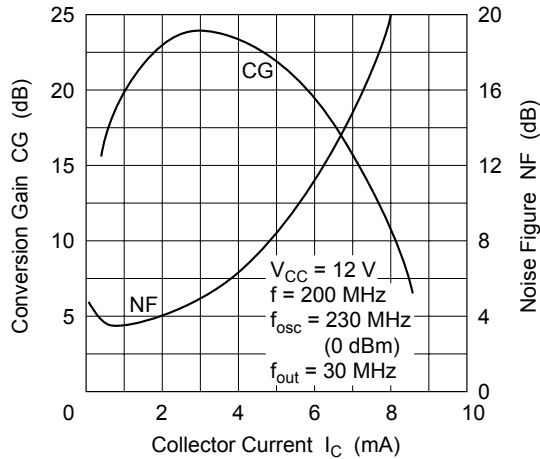


NPN Transistors

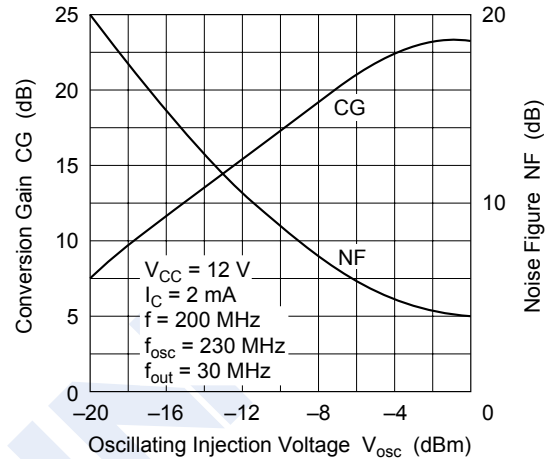
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■ Typical Characteristics

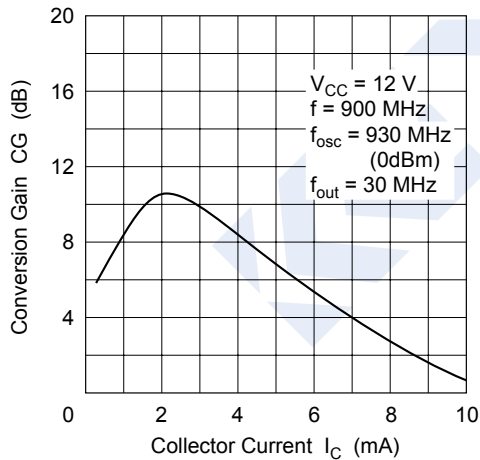
Conversion Gain, Noise Figure vs. Collector Current



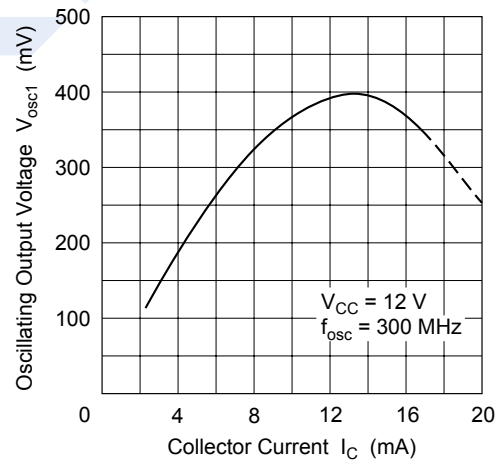
Conversion Gain, Noise Figure vs. Oscillating Injection Voltage



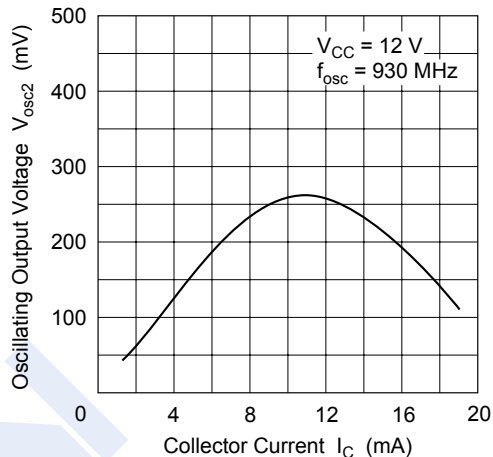
Conversion Gain vs. Collector Current



Oscillating Output Voltage vs. Collector Current



Oscillating Output Voltage vs. Collector Current



Oscillating Output Voltage vs. Supply Voltage

