

Ordering number:EN4580

NPN Epitaxial Planar Silicon Transistor



2SC4860

UHF Converter, Local Oscillator Applications

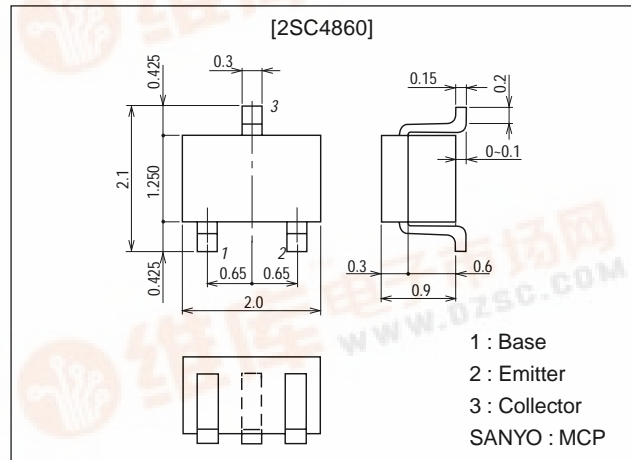
Features

- High cutoff frequency : $f_T=6.5\text{GHz}$ typ.
- High gain : $|S_{21e}|^2=11.5\text{dB}$ typ ($f=1\text{GHz}$).
- Small Cob : $NF=0.65\text{pF}$ typ.

Package Dimensions

unit:mm

2059B



Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CB0}		20	V
Collector-to-Emitter Voltage	V_{CE0}		10	V
Emitter-to-Base Voltage	V_{EB0}		2	V
Collector Current	I_C		30	mA
Collector Dissipation	P_C		150	mW
Junction Temperature	T_j		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CB0}	$V_{CB}=10\text{V}, I_E=0$			1.0	μA
Emitter Cutoff Current	I_{EB0}	$V_{EB}=1\text{V}, I_C=0$			10	μA
DC Current Gain	h_{FE}	$V_{CE}=5\text{V}, I_C=5\text{mA}$	60*		270*	
Gain-Bandwidth Product	f_T	$V_{CE}=5\text{V}, I_C=5\text{mA}$		6.5		GHz
Output Capacitance	Cob	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.65	1.1	pF
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE}=5\text{V}, I_C=5\text{mA}, f=1\text{GHz}$	8	11.5		dB
Noise Figure	NF	$V_{CE}=5\text{V}, I_C=5\text{mA}, f=1\text{GHz}$		2.2	4.0	dB

* : The 2SC4860 is classified by 5mA h_{FE} as follows :

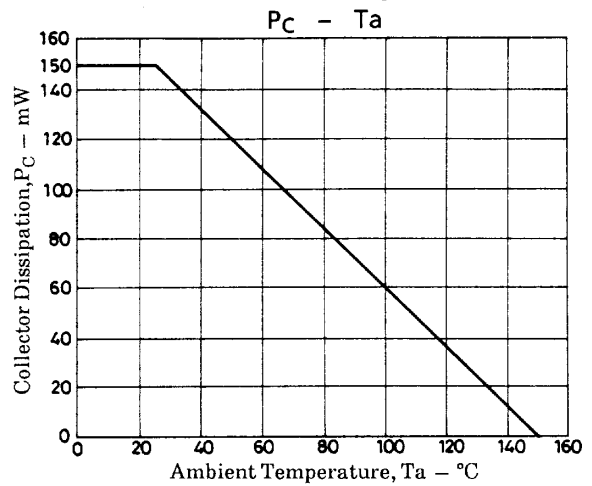
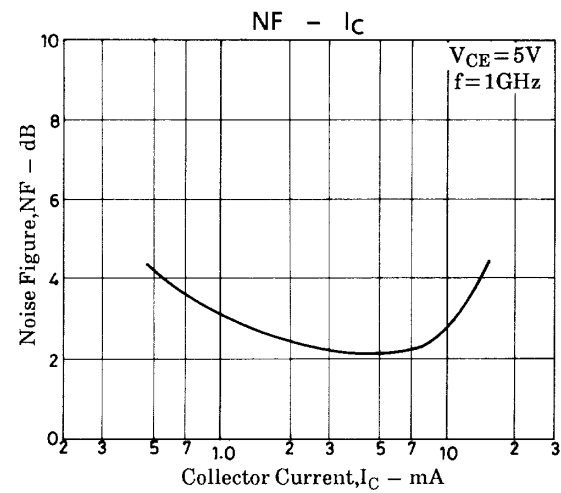
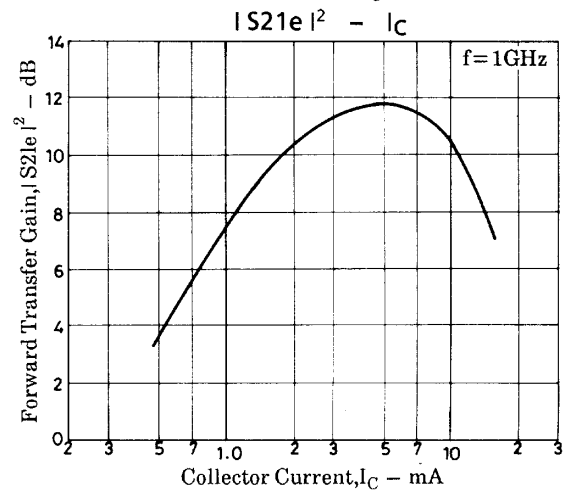
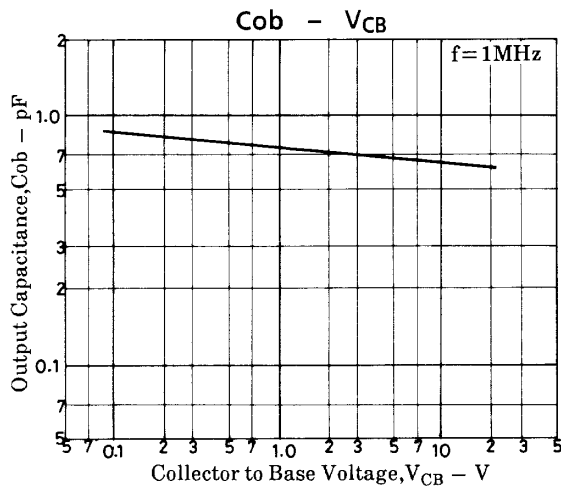
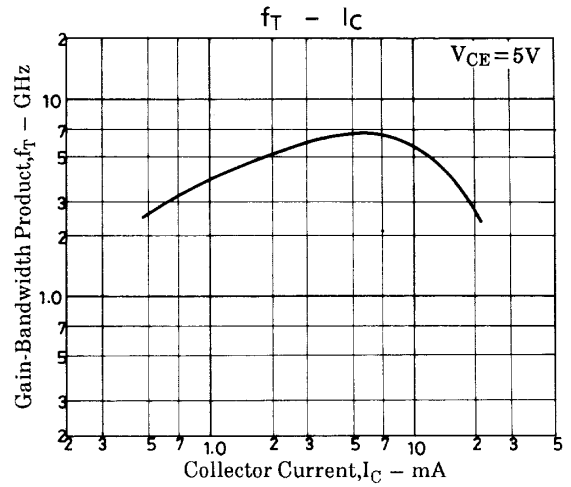
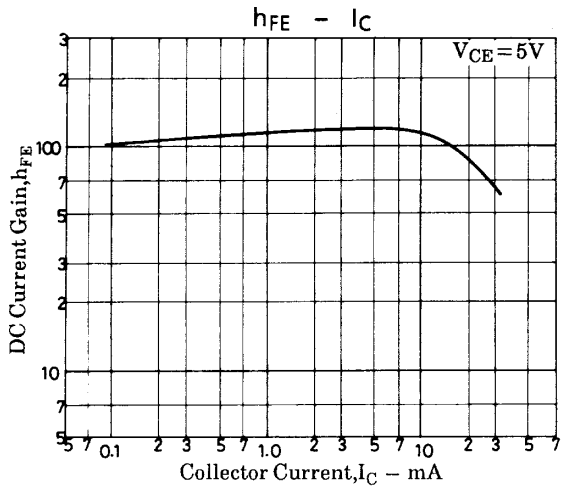
60	3	120	90	4	180	135	5	270
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Marking : EN

h_{FE} rank : 3, 4, 5

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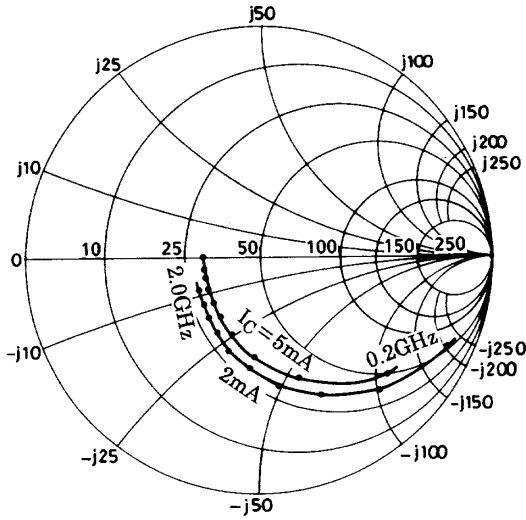
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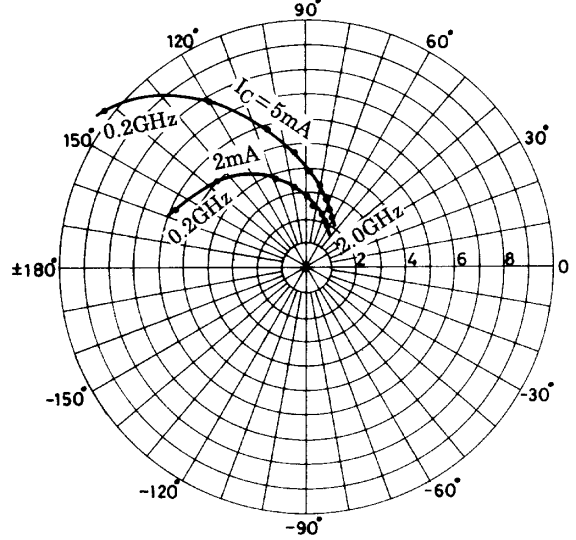
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S parameter

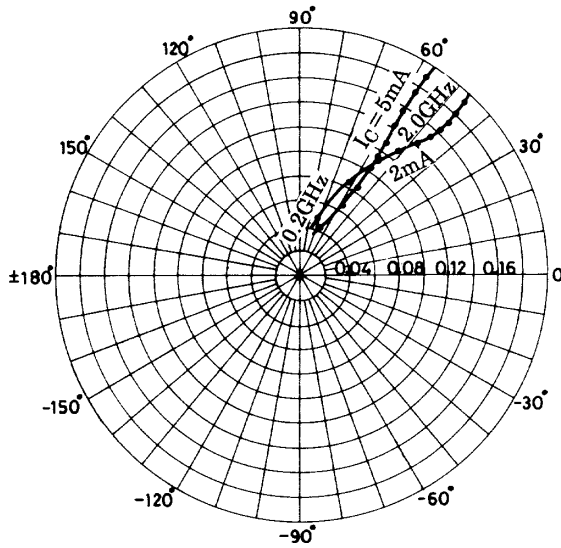
S11e: $V_{CE} = 5V$
f = 200 to 2000MHz (200MHz step)



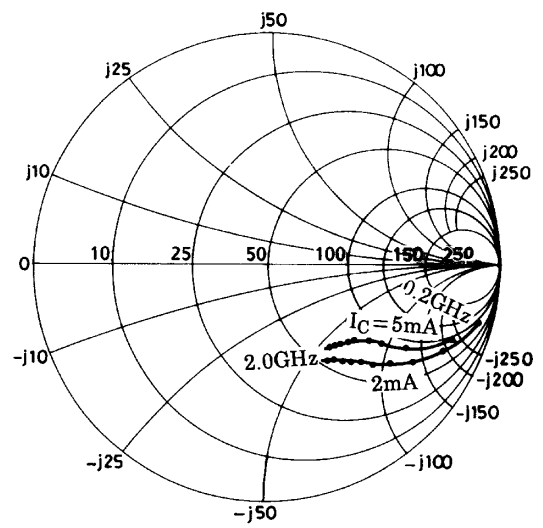
S21e: $V_{CE} = 5V$
f = 200 to 2000MHz (200MHz step)



S12e: $V_{CE} = 5V$
f = 200 to 2000MHz (200MHz step)



S22e: $V_{CE} = 5V$
f = 200 to 2000MHz (200MHz step)



2SC4860

S parameter (Common emitter)

$V_{CE}=5V, I_C=2mA, Z_O=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.888	-25.7	5.847	155.4	0.049	73.1	0.946	-14.8
400	0.765	-47.7	5.082	136.2	0.085	62.3	0.845	-25.6
600	0.645	-66.2	4.368	121.1	0.110	55.1	0.755	-32.7
800	0.553	-81.7	3.777	108.9	0.127	50.9	0.678	-37.8
1000	0.475	-95.5	3.281	98.5	0.141	47.8	0.625	-42.0
1200	0.419	-108.4	2.915	89.5	0.153	46.1	0.586	-45.0
1400	0.367	-120.1	2.593	81.5	0.162	45.3	0.553	-48.0
1600	0.337	-131.8	2.350	74.4	0.170	45.2	0.525	-50.7
1800	0.312	-141.7	2.141	69.2	0.180	45.5	0.501	-53.8
2000	0.297	-153.0	1.996	63.3	0.191	46.0	0.488	-56.3

$V_{CE}=5V, I_C=5mA, Z_O=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.737	-42.9	10.312	142.5	0.043	67.0	0.858	-21.1
400	0.540	-72.3	7.574	119.9	0.068	58.5	0.698	-29.9
600	0.418	-93.2	5.789	105.8	0.084	56.3	0.601	-33.4
800	0.349	-110.1	4.604	95.5	0.099	56.3	0.548	-35.7
1000	0.299	-125.4	3.885	87.1	0.114	56.6	0.518	-38.0
1200	0.275	-137.3	3.310	80.1	0.128	56.8	0.498	-39.9
1400	0.257	-149.9	2.906	73.6	0.142	57.2	0.480	-42.3
1600	0.249	-161.0	2.595	67.7	0.157	57.1	0.466	-45.5
1800	0.246	-170.2	2.346	63.6	0.172	57.1	0.450	-48.5
2000	0.245	179.7	2.174	58.4	0.189	56.7	0.447	-51.5

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