Ordering number:EN4580

NPN Epitaxial Planar Silicon Transistor

2SC4860

UHF Converter, Local Oscillator Applications

Features

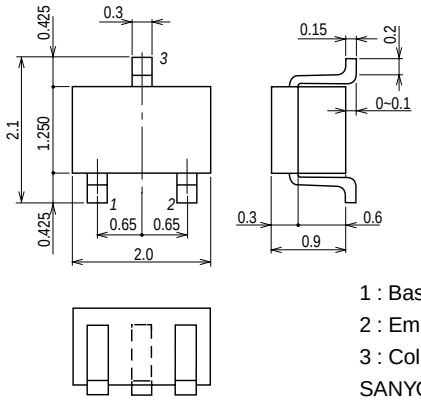
- High cutoff frequency : f_T=6.5GHz typ.
- High gain : $|S21e|^2$=11.5dB typ (f=1GHz).
- Small Cob : NF=0.65pF typ.

Package Dimensions

unit:mm

2059B

[2SC4860]



1 : Base
2 : Emitter
3 : Collector
SANYO : MCP

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		20	V
Collector-to-Emitter Voltage	V_{CEO}		10	V
Emitter-to-Base Voltage	V_{EBO}		2	V
Collector Current	I_C		30	mA
Collector Dissipation	P_C		150	mW
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=10V, I_E=0			1.0	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=1V, I_C=0			10	μA
DC Current Gain	h_{FE}	V_{CE}=5V, I_C=5mA	60*		270*	
Gain-Bandwidth Product	f_T	V_{CE}=5V, I_C=5mA		6.5		GHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		0.65	1.1	pF
Forward Transfer Gain	$\|S21e\|^2$	V_{CE}=5V, I_C=5mA, f=1GHz	8	11.5		dB
Noise Figure	NF	V_{CE}=5V, I_C=5mA, f=1GHz		2.2	4.0	dB

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

60	3	120	90	4	180	135	5	270

Marking : EN

h_{FE} rank : 3, 4, 5

SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
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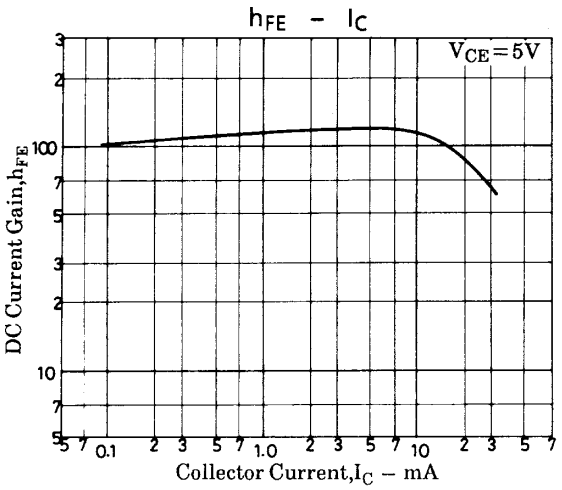
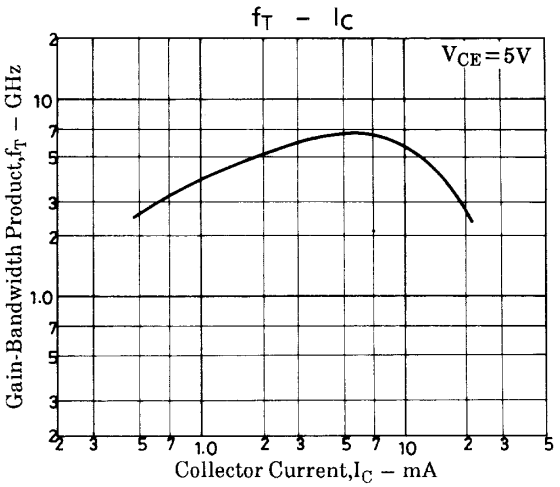
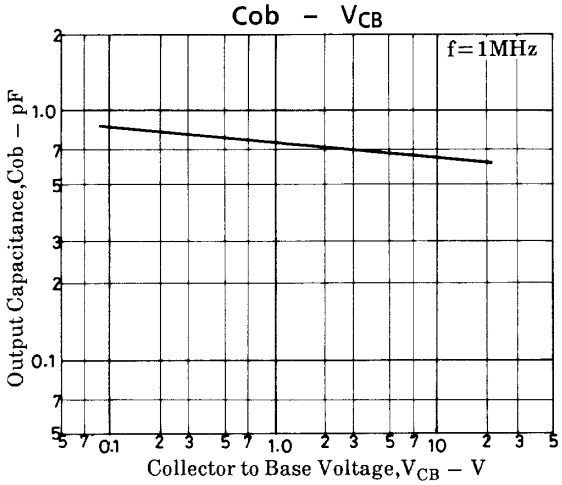
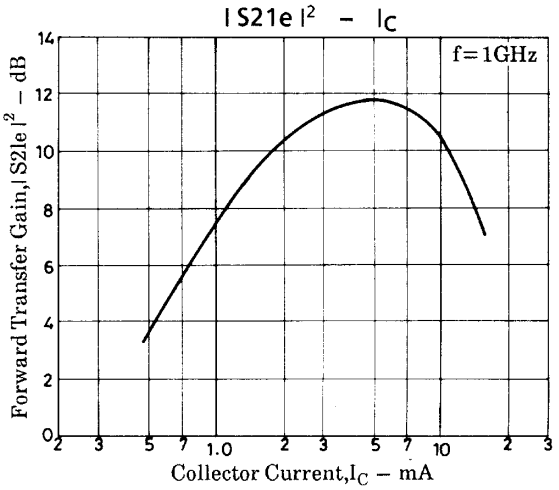
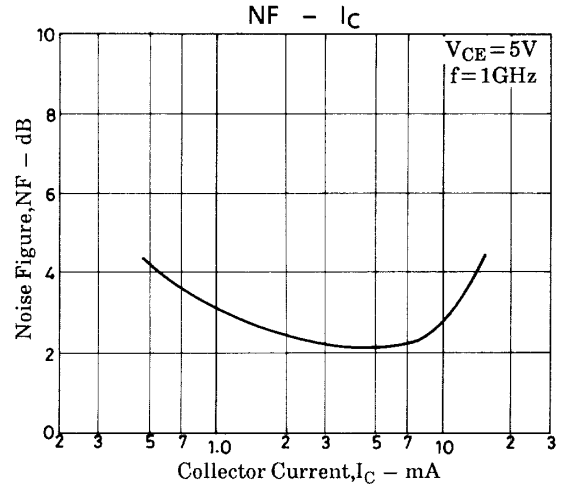
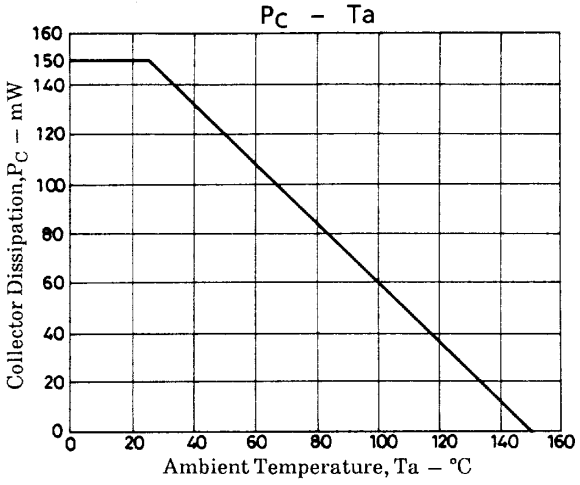

hFE – IC
VCE=5V
DC Current Gain,hFE
Collector Current,IC – mA


fT – IC
VCE=5V
Gain-Bandwidth Product,fT – GHz
Collector Current,IC – mA


Cob – VCB
f=1MHz
Output Capacitance,Cob – pF
Collector to Base Voltage,VCB – V

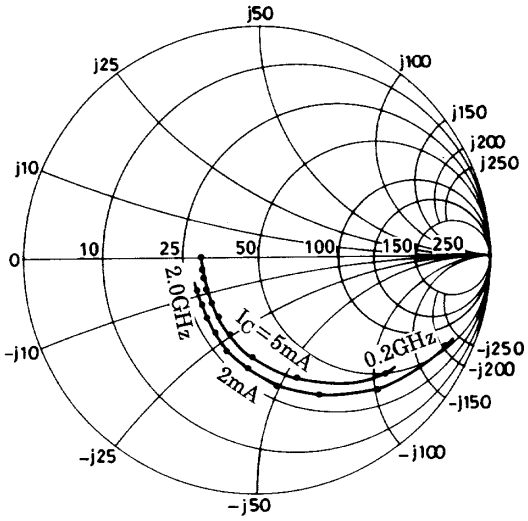

| S21e |2 – IC
f=1GHz
Forward Transfer Gain,| S2le |2 – dB
Collector Current,IC – mA


NF – IC
VCE=5V
f=1GHz
Noise Figure,NF – dB
Collector Current,IC – mA

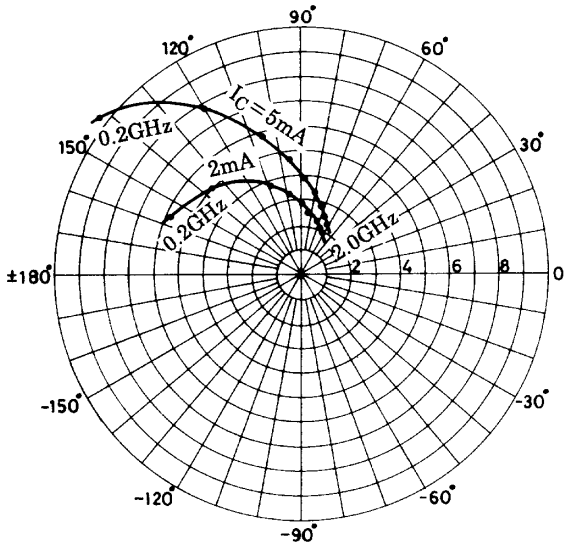

PC – Ta
Collector Dissipation,PC – mW
Ambient Temperature, Ta – °C

S parameter

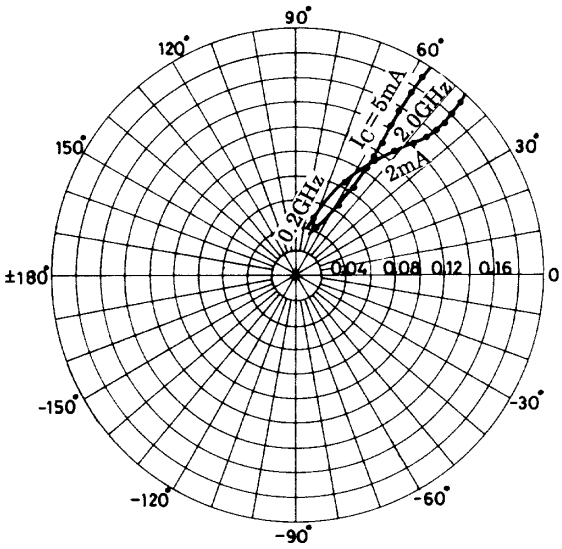
S11e : V_{CE} = 5V
f = 200 to 2000MHz (200MHz step)



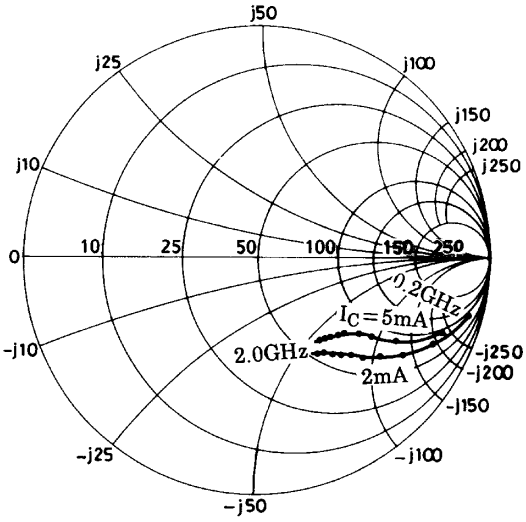
S21e : V_{CE} = 5V
f = 200 to 2000MHz (200MHz step)



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



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



S parameter (Common emitter)

V_{CE}=5V, I_C=2mA, Z_O=50Ω

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=50Ω

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