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Ordering number:ENN6288

NPN Epitaxial Planar Silicon Transistor

2SC5488

VHF to UHF Low-Noise Wide-Band Amplifier Applications

Features

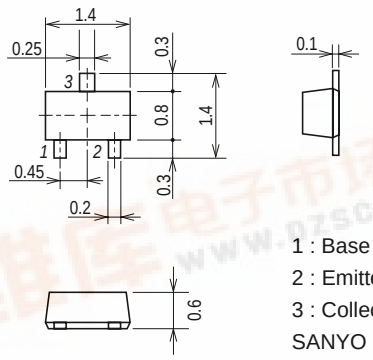
- Low noise : NF=1.0dB typ (f=1GHz).
- High gain : $|S21e|^2$=12dB typ (f=1GHz).
- High cutoff frequency : f_T=7GHz typ.
- Ultrasmall, slim flat-lead package. (1.4mm×0.8mm×0.6mm)

Package Dimensions

unit:mm

2159

[2SC5488]



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

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		70	mA
Collector Dissipation	P_C		100	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=20mA	90		200	
Gain-Bandwidth Product	f_T	V_{CE}=5V, I_C=20mA	5	7		GHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		0.7	1.2	pF
Reverse Transfer Capacitance	Cre	V_{CB}=10V, f=1MHz		0.45		pF
Forward Transfer Gain	$\|S21e\|^2$ 1	V_{CE}=5V, I_C=20mA, f=1GHz	9	12		dB
	$\|S21e\|^2$ 2	V_{CE}=2V, I_C=3mA, f=1GHz		8.5		dB
Noise Figure	NF	V_{CE}=5V, I_C=7mA, f=1GHz		1.0	1.8	dB

Marking : LN

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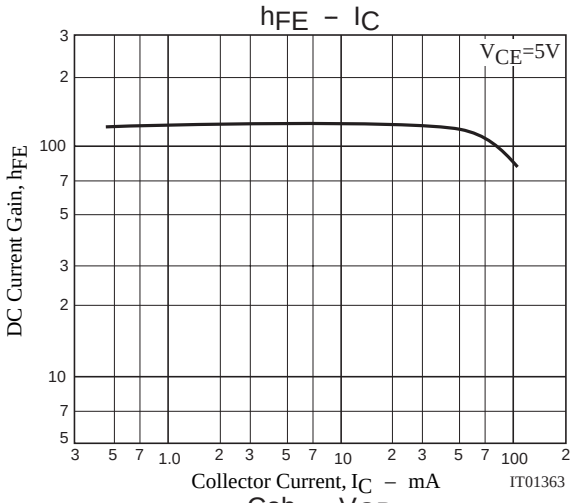
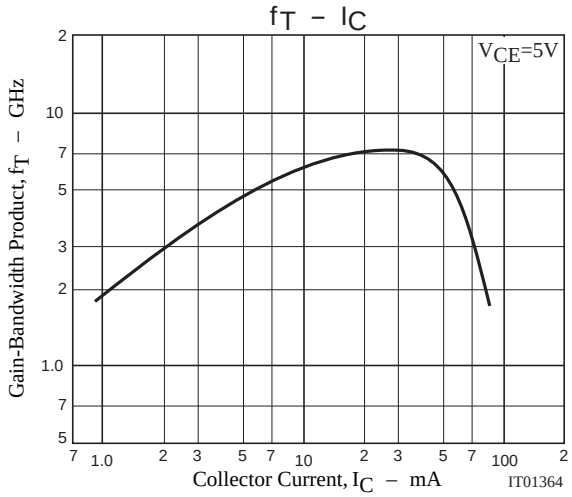
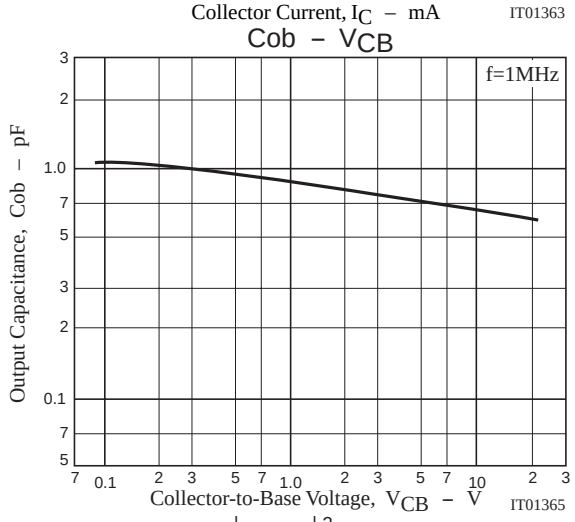
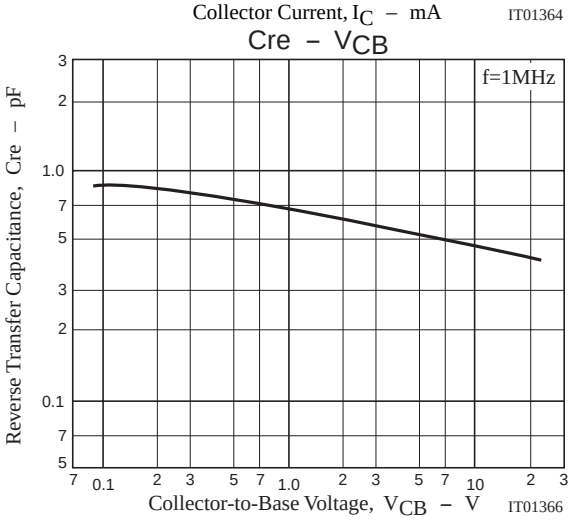
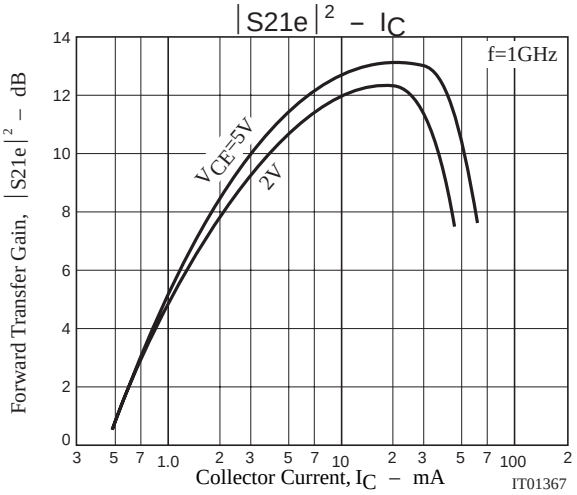
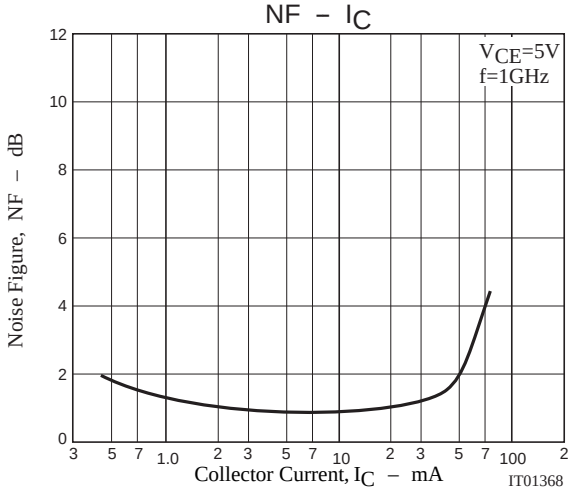

hFE – IC
VCE=5V
DC Current Gain, hFE
Collector Current, IC – mA
IT01363

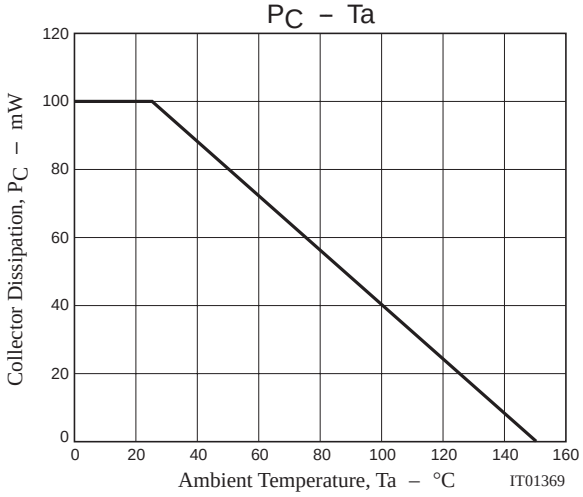

fT – IC
VCE=5V
Gain-Bandwidth Product, fT – GHz
Collector Current, IC – mA
IT01364


Cob – VCB
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT01365


Cre – VCB
f=1MHz
Reverse Transfer Capacitance, Cre – pF
Collector-to-Base Voltage, VCB – V
IT01366


|S21e|2 – IC
f=1GHz
VCE=5V
2V
Forward Transfer Gain, |S21e|2 – dB
Collector Current, IC – mA
IT01367


NF – IC
VCE=5V
f=1GHz
Noise Figure, NF – dB
Collector Current, IC – mA
IT01368


PC – Ta
Collector Dissipation, PC – mW
Ambient Temperature, Ta – °C
IT01369

S Parameters (Common emitter)

V_{CE}=5V, I_C=7mA, Z_O=50Ω

Freq (MHz)	$\lvert S_{11} \rvert$	$\angle S_{11}$	$\lvert S_{21} \rvert$	$\angle S_{21}$	$\lvert S_{12} \rvert$	$\angle S_{12}$	$\lvert S_{22} \rvert$	$\angle S_{22}$
100	0.786	–40.7	17.507	151.3	0.028	70.1	0.898	–20.4
200	0.677	–72.4	13.998	131.4	0.046	58.0	0.739	–33.4
400	0.546	–112.7	9.061	108.6	0.064	49.6	0.525	–43.7
600	0.492	–135.2	6.442	96.1	0.076	49.3	0.423	–46.7
800	0.473	–150.0	5.005	87.3	0.087	50.8	0.374	–44.4
1000	0.465	–160.0	4.073	80.4	0.099	52.6	0.346	–49.7
1200	0.457	–169.5	3.449	74.0	0.111	54.0	0.332	–51.6
1400	0.451	–176.2	2.989	68.6	0.124	55.2	0.321	–54.1
1600	0.449	177.8	2.658	63.8	0.138	56.6	0.319	–56.2
1800	0.454	172.5	2.378	58.4	0.151	56.7	0.313	–60.0
2000	0.460	167.1	2.154	54.0	0.166	56.7	0.311	–63.2

V_{CE}=5V, I_C=20mA, Z_O=50Ω

Freq (MHz)	$\lvert S_{11} \rvert$	$\angle S_{11}$	$\lvert S_{21} \rvert$	$\angle S_{21}$	$\lvert S_{12} \rvert$	$\angle S_{12}$	$\lvert S_{22} \rvert$	$\angle S_{22}$
100	0.601	–65.8	28.967	137.1	0.023	64.1	0.757	–32.9
200	0.497	–103.7	19.309	116.6	0.035	57.0	0.534	–50.3
400	0.435	–139.6	10.891	98.6	0.050	58.7	0.345	–50.3
600	0.419	–156.6	7.461	89.3	0.065	61.3	0.280	–50.7
800	0.414	–166.6	5.695	82.5	0.081	63.1	0.251	–51.3
1000	0.413	–174.0	4.613	77.0	0.098	63.8	0.235	–52.9
1200	0.413	178.6	3.870	71.8	0.144	63.9	0.226	–55.1
1400	0.411	173.8	3.345	66.9	0.131	63.6	0.221	–57.7
1600	0.413	169.6	2.960	62.7	0.148	63.2	0.220	–60.2
1800	0.416	165.1	2.655	58.0	0.165	61.8	0.219	–64.8
2000	0.422	160.3	2.406	54.0	0.182	60.6	0.218	–68.3

V_{CE}=2V, I_C=3mA, Z_O=50Ω

Freq (MHz)	$\lvert S_{11} \rvert$	$\angle S_{11}$	$\lvert S_{21} \rvert$	$\angle S_{21}$	$\lvert S_{12} \rvert$	$\angle S_{12}$	$\lvert S_{22} \rvert$	$\angle S_{22}$
100	0.888	–30.2	9.280	158.6	0.038	73.6	0.949	–15.1
200	0.815	–56.4	8.218	141.3	0.067	60.5	0.849	–26.9
400	0.690	–96.0	6.074	116.7	0.098	45.1	0.657	–41.1
600	0.616	–120.7	4.517	101.4	0.122	38.4	0.539	–47.6
800	0.584	–138.0	3.610	90.4	0.120	35.8	0.475	–51.2
1000	0.566	–150.7	2.995	81.9	0.125	35.7	0.434	–54.5
1200	0.555	–161.2	2.540	74.2	0.131	36.5	0.410	–57.5
1400	0.546	–169.3	2.213	67.5	0.137	38.4	0.393	–60.7
1600	0.541	–176.4	1.982	62.0	0.143	40.7	0.391	–64.0
1800	0.545	177.1	1.774	55.9	0.152	42.5	0.382	–67.8
2000	0.547	170.9	1.614	50.9	0.163	44.7	0.381	–72.1

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