Silicon Transistor 2SC5337

NPN EPITAXIAL SILICON TRANSISTOR HIGH FREQUENCY LOW DISTORTION AMPLIFIER

DESCRIPTION

NEC

The 2SC5337 is a high-frequency transistor designed for a low distortion and low noise amplifier on the VHF to UHF band, which is suitable for the CATV, tele-communication, and such.

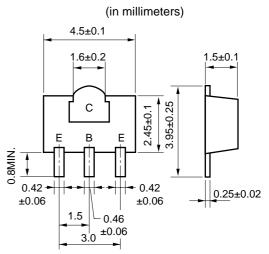
FEATURES

- Low distortion $IM_2 = 59 \text{ dB TYP}$. $@V_{CE} = 10 \text{ V}$, $I_C = 50 \text{ mA}$ $IM_3 = 82 \text{ dB TYP}$. $@V_{CE} = 10 \text{ V}$, $I_C = 50 \text{ mA}$
- Low noise NF = 1.5 dB TYP. @V_{CE} = 10 V, I_C = 10 mA, f = 1 GHz
- New power mini-mold package version of a 4-pin type gain-improved on the 2SC3356

ABSOLUTE MAXIMUM RATINGS ($T_A = 25 \degree$ C)

Parameter	Symbol	Rating	Unit
Collector to Base Voltage	V _{CBO}	30	V
Collector to Emitter Voltage	V _{CEO}	15	V
Emitter to Base Voltage	V _{EBO}	3.0	V
Collector Current	Ic	250	mA
Total Power Dissipation	P_T Note1	2.0	W
Junction Temperature	Tj	150	°C
Storage Temperature	T _{stg}	-65 to +150	°C







C: Collector

Note 1. $0.7 \text{ mm} \times 16 \text{ cm}^2$ double sided ceramic substrate (Copper plaiting)

B: Base

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Collector Cutoff Current	I _{CBO}	$V_{CB} = 20 \text{ V}, \text{ I}_{E} = 0$		0.01	5.0	μA
Emitter Cutoff Current	I _{EBO}	$V_{EB} = 2 V, I_{C} = 0$		0.03	5.0	μA
DC Current Gain	h _{FE}	V_{CE} = 10 V, I_C = 50 mA ^{Note2}	40	120	200	
Insertion Power Gain	$ S_{21e} ^2$	V_{CE} = 10 V, I_{C} = 50 mA, f = 1 GHz	7.0	8.3		dB
Noise Figure 1	NF ₁	V_{CE} = 10 V, I _C = 50 mA, f = 500 MHz ^{Note3}		1.5	3.5	dB
Noise Figure 2	NF ₂	V_{CE} = 10 V, I_C = 50 mA, f = 1 GHz ^{Note3}		2.0	3.5	dB
2nd Order Intermoduration	IM ₂	V_{CE} = 10 V, I _C = 50 mA, R _S = R _L = 75 Ω		59.0		dB
Distortion		P_{in} = 105 dB μ V/75 Ω , f ₁ = 190 MHz				
		$f_2 = 90 \text{ MHz}, f = f_1 - f_2$				
3rd Order	IM ₃	V_{CE} = 10 V, I_{C} = 50 mA, R_{S} = R_{L} = 75 Ω		82.0		dB
Intermoduration Distortion		P_{in} = 105 dB μ V/75 Ω , f ₁ = 190 MHz				
		$f_2 = 200 \text{ MHz}, f = 2 \times f_1 - f_2$				

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

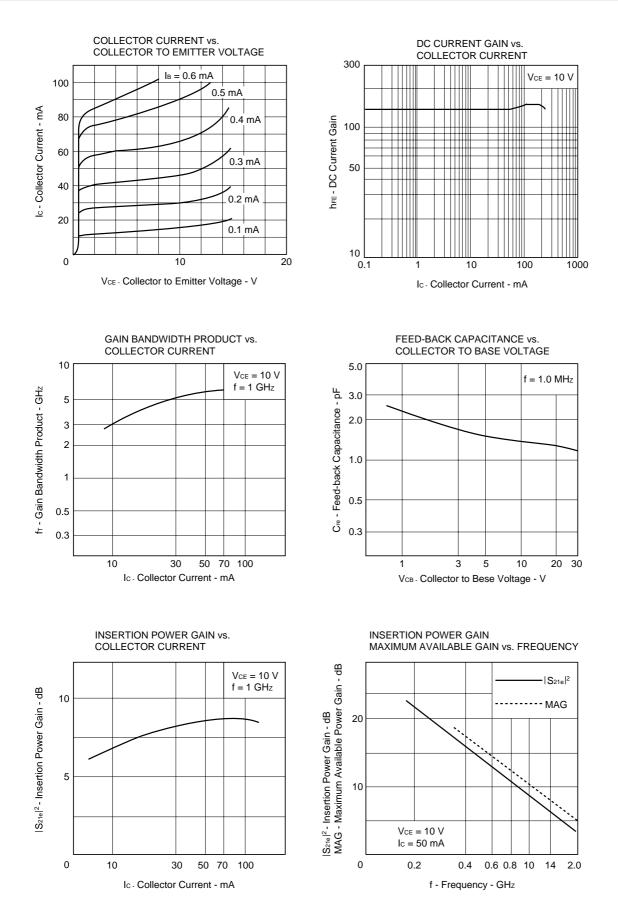
Notes 2. Pulse measurement: PW \leq 350 μ S, Duty Cycle \leq 2 %

3. $R_S = R_L = 50 \Omega$, tuned

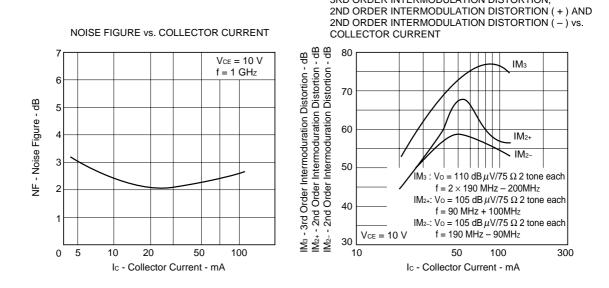
h_{FE} Classification

Rank	QQ	QR	QS	
Marking	QQ	QR	QS	
h _{FE}	40 to 80	60 to 120	100 to 200	

TYPICAL CHARACTERISTICS (T_A = 25 °C)



3RD ORDER INTERMODULATION DISTORTION,



S-PARAMETER

 V_{CE} = 10 V, f = 1 GHz

	S ₁₁		S	S ₂₁		S ₁₂		S ₂₂	
I _C (mA)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
10.0	.553	175.2	2.007	64.7	.127	67.4	.336	- 91.0	
30.0	.500	168.1	2.492	68.0	.156	69.9	.247	- 122.5	
50.0	.490	166.3	2.561	68.1	.158	70.3	.223	- 131.3	
70.0	.490	165.3	2.640	69.0	.167	71.2	.253	- 136.0	
100.0	.492	164.8	2.601	68.6	.162	69.3	.225	- 138.1	

 $V_{CE} = 10 \text{ V}, \text{ Ic} = 50 \text{ mA}$

	S ₁₁			S ₂₁		S ₁₂		S ₂₂		
f (MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		
100	.592	- 136.6	24.447	108.4	.030	50.5	.465	- 95.2		
200	.577	- 160.0	12.746	96.5	.042	57.4	.335	- 123.0		
300	.566	- 168.5	8.591	91.2	.055	67.3	.276	- 130.1		
400	.558	- 174.0	6.438	87.2	.066	70.8	.269	- 132.7		
500	.554	- 177.5	5.160	84.1	.083	68.6	.262	- 134.5		
600	.542	- 179.4	4.312	82.3	.095	70.6	.262	- 139.1		
700	.527	177.9	3.729	80.9	.112	71.2	.251	- 133.4		
800	.519	175.8	3.292	78.7	.123	74.6	.252	- 132.9		
900	.509	174.4	2.983	77.7	.136	75.0	.252	- 124.6		
1000	.514	171.0	2.759	76.6	.151	75.3	.257	- 125.3		
1100	.498	166.8	2.648	75.4	.166	75.8	.278	- 118.4		
1200	.494	167.3	2.665	71.3	.180	74.7	.306	- 120.2		
1300	.487	161.7	2.478	63.0	.194	75.9	.314	- 124.2		
1400	.467	160.4	2.177	60.1	.216	74.7	.273	- 124.0		
1500	.477	157.4	1.973	57.9	.230	74.9	.281	- 123.2		
1600	.471	154.5	1.815	57.2	.240	73.2	.291	- 120.2		
1700	.467	152.5	1.754	55.3	.260	72.9	.316	- 118.7		
1800	.469	151.3	1.639	54.4	.273	70.5	.312	- 123.1		
1900	.465	149.1	1.568	53.4	.285	69.9	.316	- 125.5		
2000	.468	147.0	1.475	52.6	.289	69.3	.323	- 126.3		

S-PARAMETER

 $V_{CE} = 10 \text{ V}, I_{C} = 100 \text{ mA}$

	S ₁₁			S ₂₁		S ₁₂		S ₂₂	
f (MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
100	.564	- 146.0	24.857	105.3	.019	50.2	.284	- 116.1	
200	.586	- 165.8	12.845	94.5	.026	59.6	.204	- 129.9	
300	.576	- 171.9	8.681	89.7	.041	73.2	.199	- 138.7	
400	.561	- 176.3	6.541	86.3	.048	77.8	.200	- 140.1	
500	.550	179.9	5.209	83.5	.060	81.4	.196	- 137.0	
600	.540	178.2	4.358	82.2	.069	82.0	.182	- 137.6	
700	.538	175.7	3.772	80.6	.086	84.2	.216	- 131.0	
800	.521	174.6	3.332	78.4	.099	85.1	.210	- 130.5	
900	.510	173.2	3.037	77.0	.113	85.4	.222	- 122.2	
1000	.524	168.5	2.780	76.9	.119	83.5	.198	- 120.1	
1100	.502	165.2	2.680	75.3	.136	86.8	.213	- 114.9	
1200	.489	165.9	2.718	72.3	.156	83.5	.246	- 114.9	
1300	.488	161.1	2.578	63.0	.177	85.5	.251	- 122.8	
1400	.472	157.9	2.213	58.7	.184	81.8	.209	- 127.2	
1500	.480	155.3	2.012	57.8	.194	85.3	.252	- 114.1	
1600	.470	153.4	1.846	57.2	.219	82.2	.242	- 117.6	
1700	.465	151.1	1.745	56.5	.235	82.4	.240	- 112.9	
1800	.464	149.5	1.677	54.9	.248	79.0	.263	- 121.9	
1900	.460	147.9	1.571	53.3	.249	78.6	.281	- 120.0	
2000	.466	146.0	1.514	52.3	.264	77.4	.276	- 124.0	

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Anti-radioactive design is not implemented in this product.

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