



NPN SILICON HIGH FREQUENCY TRANSISTOR

NE68337

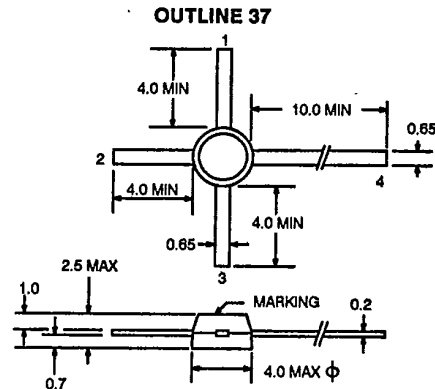
FEATURES

- LOW OPERATING VOLTAGE
- LOW POWER CONSUMPTION
- HIGH INPUT IMPEDANCE

DESCRIPTION AND APPLICATIONS

The NE68337 is designed primarily for use in low voltage and low current applications up to 2 GHz. The NE68337 is ideal for pagers, electro-optic detector post-amplifier applications, and other battery powered systems.

OUTLINE DIMENSIONS (Units in mm)



ABSOLUTE MAXIMUM RATINGS (TA = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{CB0}	Collector to Base Voltage	V	15
V _{CE0}	Collector to Emitter Voltage	V	8
V _{EB0}	Emitter to Base Voltage	V	2
I _c	Collector Current	mA	5
T _J	Junction Temperature	°C	150
T _{STG}	Storage Temperature	°C	-65 to +150

PIN CONNECTIONS

1. Emitter
2. Base
3. Emitter
4. Collector

PERFORMANCE SPECIFICATIONS (TA = 25°C)

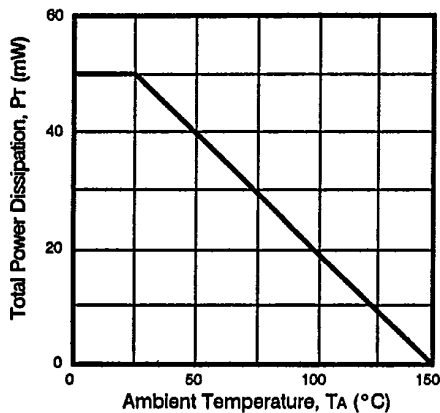
PART NUMBER PACKAGE OUTLINE			NE68337 37		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
f _r	Gain Bandwidth Product at V _{CE} = 1 V, I _c = 1 mA	GHz		4.0	
S _{21E} ²	Insertion Power Gain at V _{CE} = 1 V, I _c = 1 mA, f = 1 GHz	dB	5.5	7.5	
MAG	Maximum Available Gain at V _{CE} = 1 V, I _c = 1 mA, f = 1 GHz	dB	13.0	14.5	
NF	Noise Figure at V _{CE} = 1 V, I _c = 0.25 mA, f = 1 GHz	dB		3.0	4.5
GA	Associated Gain at Optimum Noise Figure, V _{CE} = 1 V, I _c = 0.25 mA, f = 1 GHz	dB		6.5	

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

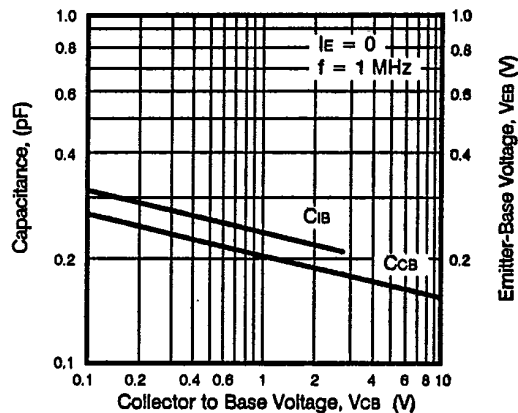
PART NUMBER PACKAGE OUTLINE			NE68337 37		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I_{CBO}	Collector Cutoff Current at $V_{CB} = 5\text{ V}$, $I_E = 0$	μA			0.1
I_{EBO}	Emitter Cutoff Current at $V_{EB} = 1\text{ V}$, $I_C = 0$	μA			0.1
h_{FE}	Forward Current Gain at $V_{CE} = 1\text{ V}$, $I_C = 250\ \mu\text{A}$		50	100	250
C_{CB}	Collector to Base Capacitance at $V_{CB} = 1\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$	pF		0.2	0.3
P_T	Total Power Dissipation	mW			50

TYPICAL DEVICE CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

POWER DERATING CURVE

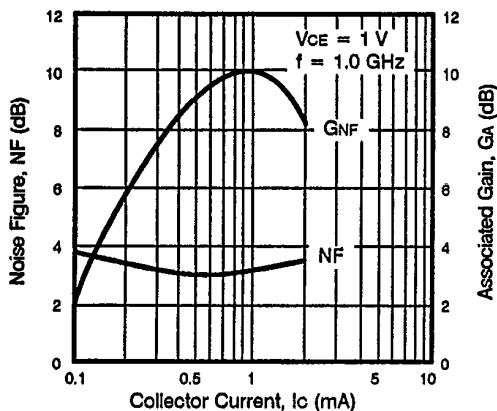


DEVICE CAPACITANCE

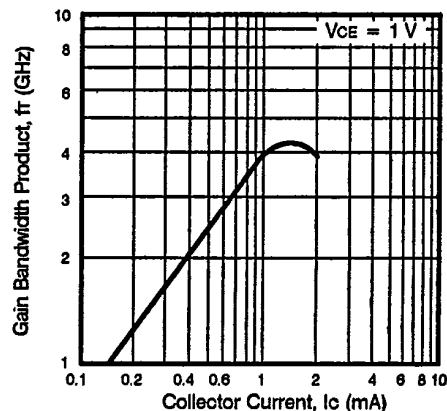


TYPICAL PERFORMANCE CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

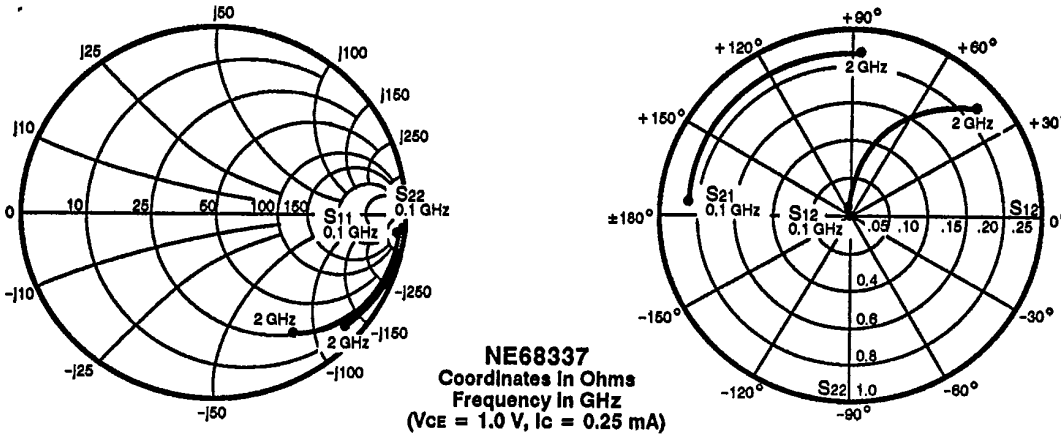
NOISE FIGURE AND ASSOCIATED GAIN vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



TYPICAL COMMON EMITTER SCATTERING PARAMETERS



S-MAGN AND ANGLES:
VCE = 1.0 V, IC = 0.25 mA

FREQUENCY (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
100	0.99	-3	0.82	174	0.01	92	1.00	-2
200	0.99	-6	0.84	171	0.02	84	1.00	-4
400	0.99	-10	0.82	162	0.05	82	1.00	-9
600	0.99	-16	0.85	153	0.08	75	1.00	-12
800	0.96	-21	0.86	142	0.10	70	0.99	-16
1000	0.94	-28	0.86	132	0.13	65	0.97	-22
1200	0.89	-35	0.86	123	0.15	59	0.97	-26
1400	0.87	-40	0.88	112	0.17	55	0.95	-30
1600	0.83	-45	0.87	104	0.19	51	0.92	-34
1800	0.79	-50	0.88	95	0.20	46	0.92	-39
2000	0.74	-56	0.87	88	0.22	42	0.89	-42

VCE = 1.0 V, IC = 0.5 mA

100	0.99	-3	1.57	173	0.01	87	1.00	-2
200	0.98	-8	1.60	169	0.02	86	1.00	-5
400	0.97	-13	1.54	159	0.05	80	1.00	-10
600	0.96	-19	1.57	149	0.08	73	0.99	-14
800	0.91	-26	1.53	138	0.10	69	0.97	-18
1000	0.87	-33	1.51	128	0.12	63	0.94	-24
1200	0.80	-40	1.47	117	0.14	57	0.93	-28
1400	0.76	-45	1.46	107	0.16	53	0.90	-32
1600	0.71	-50	1.40	99	0.17	50	0.86	-36
1800	0.66	-54	1.37	89	0.19	44	0.86	-40
2000	0.61	-59	1.32	83	0.20	42	0.83	-43

VCE = 1.0 V, IC = 0.75 mA

100	0.98	-4	2.27	172	0.01	84	1.00	-3
200	0.97	-9	2.30	167	0.02	84	0.99	-5
400	0.95	-15	2.17	156	0.05	77	0.98	-11
600	0.92	-22	2.19	145	0.07	72	0.96	-16
800	0.85	-29	2.10	132	0.10	66	0.93	-20
1000	0.80	-37	2.02	122	0.11	61	0.90	-26
1200	0.72	-44	1.92	111	0.13	56	0.88	-30
1400	0.67	-48	1.85	101	0.15	52	0.85	-33
1600	0.61	-53	1.74	93	0.16	49	0.82	-36
1800	0.56	-56	1.66	84	0.17	45	0.81	-41
2000	0.51	-60	1.57	77	0.19	43	0.78	-43

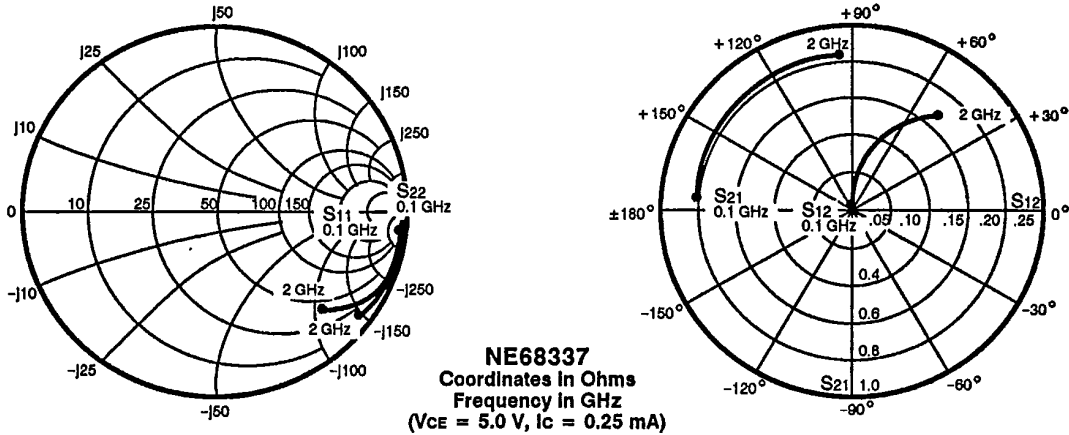
VCE = 1.0 V, IC = 1.0 mA

100	0.97	-4	2.93	171	0.01	88	1.00	-3
200	0.96	-10	2.95	165	0.02	81	0.99	-6
400	0.93	-17	2.75	152	0.05	76	0.98	-12
600	0.88	-25	2.72	140	0.07	70	0.95	-17
800	0.80	-32	2.55	127	0.09	64	0.91	-21
1000	0.73	-40	2.39	116	0.11	60	0.87	-26
1200	0.65	-46	2.24	106	0.13	55	0.85	-30
1400	0.59	-50	2.11	96	0.14	52	0.82	-33
1600	0.54	-53	1.97	88	0.15	50	0.78	-37
1800	0.49	-55	1.85	80	0.17	47	0.77	-40
2000	0.45	-59	1.72	73	0.18	45	0.75	-43



NE68337

TYPICAL COMMON EMITTER SCATTERING PARAMETERS



S-MAGN AND ANGLES:
V_{CE} = 5.0 V, I_C = 0.25 mA

FREQUENCY (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
100	0.99	-2	0.80	174	0.00	89	1.00	-2
200	0.99	-5	0.82	172	0.01	87	1.00	-3
400	1.00	-9	0.80	164	0.03	82	1.00	-7
600	1.00	-14	0.83	156	0.06	79	1.00	-10
800	0.97	-19	0.83	146	0.08	73	1.00	-14
1000	0.96	-25	0.84	137	0.09	69	1.00	-18
1200	0.91	-31	0.83	128	0.11	63	1.00	-22
1400	0.89	-35	0.85	118	0.13	59	0.98	-26
1600	0.86	-40	0.84	111	0.14	56	0.96	-29
1800	0.84	-45	0.85	102	0.15	51	0.95	-34
2000	0.79	-50	0.84	95	0.17	48	0.95	-37

V_{CE} = 5.0 V, I_C = 0.5 mA

100	0.98	-3	1.54	174	0.01	93	1.00	-2
200	0.99	-7	1.58	170	0.01	81	1.00	-3
400	0.97	-11	1.52	161	0.03	80	1.00	-8
600	0.97	-17	1.56	152	0.05	76	1.00	-12
800	0.93	-22	1.52	141	0.07	72	1.00	-15
1000	0.89	-30	1.50	132	0.09	67	0.96	-20
1200	0.84	-36	1.45	122	0.11	61	0.96	-23
1400	0.80	-40	1.46	112	0.12	58	0.94	-27
1600	0.76	-44	1.40	105	0.13	55	0.92	-30
1800	0.71	-49	1.38	95	0.14	51	0.91	-35
2000	0.66	-53	1.32	89	0.15	49	0.90	-37

V_{CE} = 5.0 V, I_C = 0.75 mA

100	0.97	-3	2.26	173	0.01	83	1.00	-2
200	0.97	-7	2.30	168	0.01	81	1.00	-4
400	0.96	-13	2.18	168	0.03	80	0.99	-9
600	0.93	-19	2.20	148	0.05	73	0.98	-13
800	0.88	-26	2.11	136	0.07	70	0.96	-17
1000	0.83	-33	2.04	126	0.09	65	0.94	-21
1200	0.77	-39	1.94	116	0.10	61	0.93	-25
1400	0.72	-43	1.89	106	0.11	58	0.91	-28
1600	0.67	-46	1.78	98	0.12	55	0.88	-31
1800	0.62	-49	1.70	90	0.13	52	0.88	-35
2000	0.58	-53	1.61	83	0.15	50	0.86	-38

V_{CE} = 5.0 V, I_C = 1.0 mA

100	0.97	-3	2.90	172	0.01	89	1.00	-2
200	0.97	-9	2.93	166	0.01	84	1.00	-4
400	0.94	-15	2.76	155	0.03	80	1.00	-10
600	0.90	-21	2.73	144	0.05	73	0.98	-13
800	0.83	-28	2.58	131	0.07	70	0.95	-17
1000	0.78	-35	2.45	121	0.08	65	0.92	-22
1200	0.70	-40	2.29	111	0.10	61	0.91	-25
1400	0.65	-43	2.19	101	0.11	57	0.88	-28
1600	0.60	-46	2.03	94	0.12	56	0.86	-31
1800	0.56	-49	1.92	85	0.13	53	0.85	-35
2000	0.52	-52	1.79	79	0.14	51	0.83	-37