

FEATURES

- HIGH OSCILLATOR POWER OUTPUT:
630 mW TYP at 7.5 GHz
- FREQUENCY USE TO 10 GHz
- LOW AM/FM NOISE
- GOLD METALLIZATION FOR
HIGH RELIABILITY

DESCRIPTION

The NE243 NPN series transistor is designed for oscillator applications to 10 GHz. Reliable operation is assured by NEC's gold, platinum and titanium metallization system. The NE243 series is available as a chip or in hermetically sealed packages.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

PARTNUMBER PACKAGE OUTLINE			NE24300 00 (CHIP)			NE243187 NE243188 87,88			NE243287 NE243288 87,88			NE243499 99		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
S ₂₁ ²	Insertion Power Gain at V _{CC} = 8 V, f = 1 GHz I _C = 50 mA I _C = 100 mA I _C = 200 mA	dB dB dB	4.3			4.3			4			3.5		
h _{FE}	Forward Current Gain at V _{CE} = 8V, I _C = 50 mA I _C = 100 mA I _C = 200 mA		20		200	20		200	20		200	20		200
I _{CBO}	Collector Cutoff Current at V _{CB} = 15 V, I _E = 0	μA			0.25			0.25			0.5			1.0
I _{EBO}	Emitter Cutoff Current at V _{EB} = 1 V, I _C = 0	μA			1.0			1.0			2.0			4.0
P _{osc}	Oscillator Power Output at V _{ce} = 12 V, f = 7.5 GHz, I _C = 80 mA I _C = 120 mA I _C = 200 mA	mW mW mW		150			150			320			630	
C _{OB}	Collector to Base Capacitance at V _{CB} = 10 V, I _E = 0	pF		0.30			0.65	1		0.95	1.5		2.9	4
P _T	Total Power Dissipation	W			2.75			2.75			5.5			9.7
R _{TH (J-C)}	Thermal Resistance (Junction to Case)	°C/W			45			45			30			18

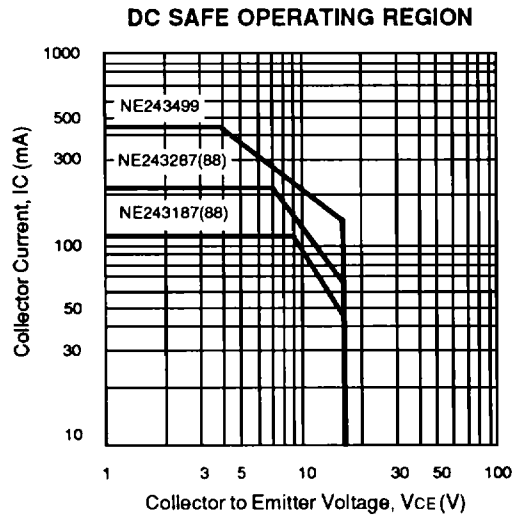
ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{CBO}	Collector to Base Voltage	V	25
V _{EBO}	Emitter to Base Voltage	V	1.5
V _{CEO}	Collector to Emitter Voltage	V	16
V _{CER²}	Collector to Emitter Voltage	V	25
I _C	Collector Current		
	NE24300	mA	110
	NE243187, NE243188	mA	110
	NE243287, NE243288	mA	220
	NE243499	mA	440
T _J	Junction Temperature	°C	200
T _{STG}	Storage Temperature	°C	-65 to +200

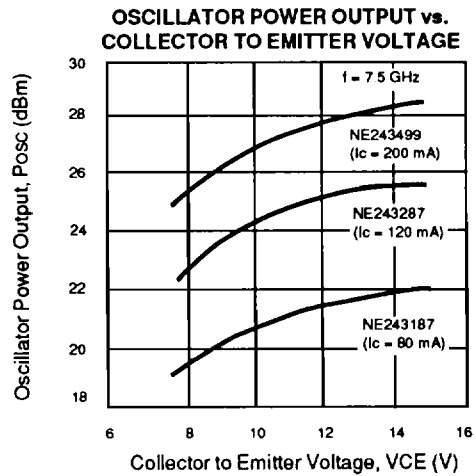
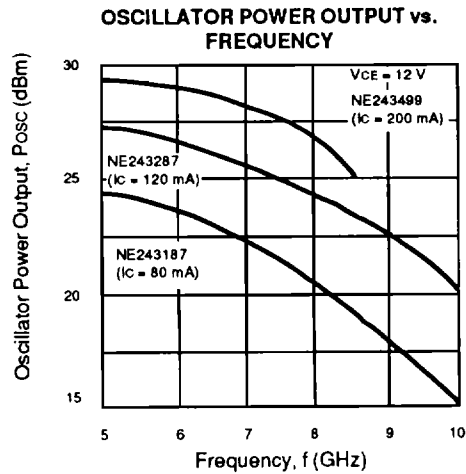
Notes:

1. Operation in excess of any one of these parameters may result in permanent damage.
2. R_{BE} = 300 Ω

TYPICAL PERFORMANCE CURVES (T_A = 25°C)



TYPICAL PERFORMANCE CURVES (T_A = 25°C)



NE243 SERIES

COMMON COLLECTOR* SCATTERING PARAMETERS

NE243187

VCE = 12 V, IC = 80 mA

FREQUENCY (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG ¹
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		
200	.92	-75	1.70	-53	.46	27	.78	118	0.172	5.677
3000	.85	-109	1.51	-76	.61	2	.69	89	0.195	3.936
4000	.81	-140	1.35	-97	.72	-24	.58	64	0.271	2.730
5000	.77	-171	1.21	-118	.79	-46	.50	39	0.311	1.852
6000	.72	161	1.06	-137	.83	-68	.42	16	0.385	1.062
7000	.69	130	.91	-157	.86	-89	.36	-2	0.442	0.245
8000	.65	105	.83	-175	.87	-115	.30	-20	0.537	-0.204
9000	.68	74	.72	162	.85	-137	.26	-33	0.546	-0.721
10000	.68	44	.60	143	.77	-163	.22	-27	0.665	-1.083

*S₁₁ is base to collector, S₂₂ is emitter to collector.

NE243287

VCE = 12 V, IC = 120 mA

2000	.97	-91	1.60	-59	.44	22	.72	129	0.191	5.607
3000	.96	-126	1.36	-82	.56	-3	.58	110	0.215	3.854
4000	.97	-156	1.16	-103	.62	-29	.45	99	0.279	2.721
5000	.98	175	.97	-124	.65	-50	.35	93	0.295	1.739
6000	.96	150	.80	-144	.62	-71	.30	96	0.375	1.107
7000	.92	127	.69	-159	.64	-92	.28	98	0.494	0.327
8000	.95	108	.60	-178	.62	-113	.31	99	0.523	-0.142
9000	.97	81	.49	158	.57	-136	.37	89	0.535	-0.657
10000	.96	54	.39	138	.54	-159	.43	75	0.615	-1.413

*S₁₁ is base to collector, S₂₂ is emitter to collector.

NE243188

VCE = 12 V, IC = 80 mA

2000	.91	-73	1.65	-50	.47	28	.72	120	0.206	5.454
3000	.83	-104	1.47	-72	.64	6	.65	93	0.256	3.611
4000	.77	-133	1.30	-91	.74	-20	.55	67	0.329	2.447
5000	.71	-159	1.17	-108	.81	-40	.49	42	0.374	1.597
6000	.65	176	1.02	-127	.85	-62	.43	18	0.448	0.792
7000	.59	148	.92	-145	.89	-81	.40	-2	0.513	0.144
8000	.51	123	.82	-164	.87	-105	.35	-27	0.634	-0.257
9000	.53	94	.75	178	.88	-127	.32	-46	0.650	-0.694
10000	.53	60	.67	156	.85	-151	.26	-62	0.737	-1.033

*S₁₁ is base to collector, S₂₂ is emitter to collector.

NE243288

VCE = 12 V, IC = 120 mA

2000	.97	-90	1.54	-56	.45	25	.69	132	0.173	5.343
3000	.96	-120	1.31	-77	.57	2	.55	116	0.238	3.614
4000	.96	-146	1.11	-95	.64	-22	.42	104	0.296	2.391
5000	.95	-169	.95	-112	.67	-42	.33	98	0.348	1.516
6000	.94	171	.81	-130	.68	-62	.25	96	0.411	0.760
7000	.91	151	.70	-145	.66	-79	.24	96	0.485	0.256
8000	.89	134	.61	-164	.65	-100	.23	97	0.591	-0.276
9000	.92	112	.54	179	.64	-120	.30	87	0.586	-0.738
10000	.97	87	.49	157	.63	-142	.36	71	0.517	-1.091

*S₁₁ is base to collector, S₂₂ is emitter to collector.

Note:

1. Gain Calculations:

$$\text{MAG} = \frac{|S_{21}|}{|S_{12}|} \left(K \pm \sqrt{K^2 - 1} \right). \text{ When } K \leq 1, \text{ MAG is undefined and MSG values are used. } \text{MSG} = \frac{|S_{21}|}{|S_{12}|}, K = \frac{1 + |\Delta|^2 - |S_{11}|^2 - |S_{22}|^2}{2 |S_{12} S_{21}|}, \Delta = S_{11} S_{22} - S_{21} S_{12}$$

MAG = Maximum Available Gain

MSG = Maximum Stable Gain

