

T-33-05

NEC[®]**NPN MEDIUM POWER
OSCILLATOR TRANSISTOR****NE243
SERIES****FEATURES**

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

DESCRIPTION AND APPLICATIONS

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.

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

PART NUMBER			NE24300		NE243187 NE243188 87,88		NE243287 NE243288 87,88		NE243499	
PACKAGE OUTLINE			00 (CHIP)						99	
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MIN	TYP	MIN	TYP	MIN	TYP
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
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	

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

PART NUMBER			NE24300			NE243187 NE243188 87,88			NE243287 NE243288 87,88			NE243499		
PACKAGE OUTLINE			00 (CHIP)									99		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
I _{CBO}	Collector Cutoff Current at V _{CB} = 15 V, I _E = 0	μA			0.25			0.25			0.5			1
I _{EBO}	Emitter Cutoff Current at V _{EB} = 1 V, I _C = 0	μA		1			1			2				4
h _{FE}	Forward Current Gain at V _{CE} = 8 V, I _c = 50 mA I _c = 100 mA I _c = 200 mA		20		200	20		200	20		200	20		200
C _{OB}	Output Capacitance at V _{CB} = 10 V, I _E = 0	pF		0.30			0.65	1		0.95	1.5		2.9	4
R _{TH}	Thermal Resistance (Junction-to-Case)	°C/W		45			45			30				18
P _T	Total Power Dissipation	W		2.75			2.75			5.5				9.7

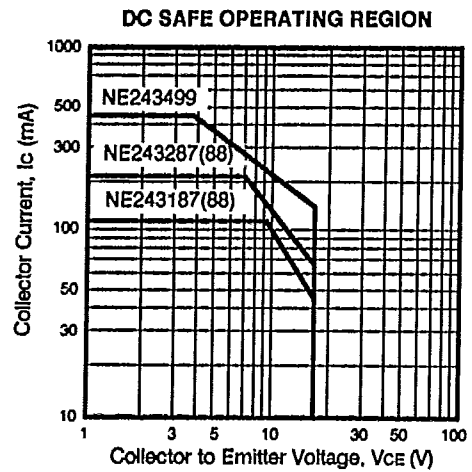
NE243 SERIES

ABSOLUTE MAXIMUM RATINGS (TA = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
VcBo	Collector to Base Voltage	V	25
VEBo	Emitter to Base Voltage	V	1.5
VCEo	Collector to Emitter Voltage	V	16
VCEr*	Collector to Emitter Voltage	V	25
Ic	Collector Current		
	NE24300	mA	110
	NE243187, NE243188	mA	110
	NE243287, NE243288	mA	220
	NE243499	mA	440
TJ	Junction Temperature	°C	200
Tstg	Storage Temperature	°C	-65 to +200

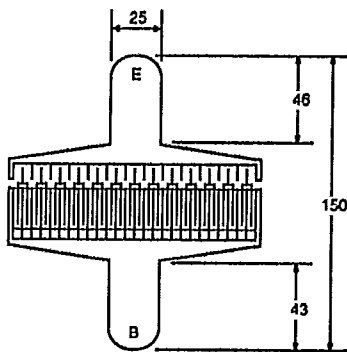
*RBE = 300 Ω

TYPICAL DEVICE CHARACTERISTICS (TA = 25°C)



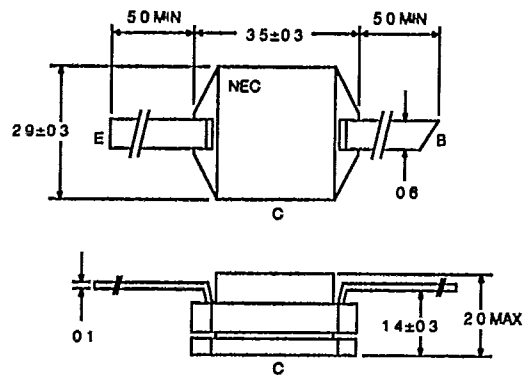
OUTLINE DIMENSIONS (Units in mm)

NE24300 (CHIP)

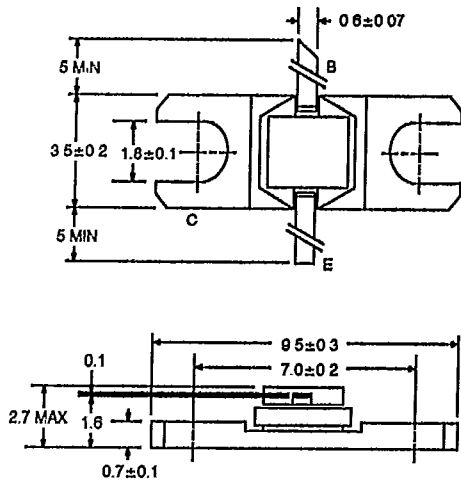


Die Size: 350 x 350 μm
Die Thickness: 110 to 160 μm

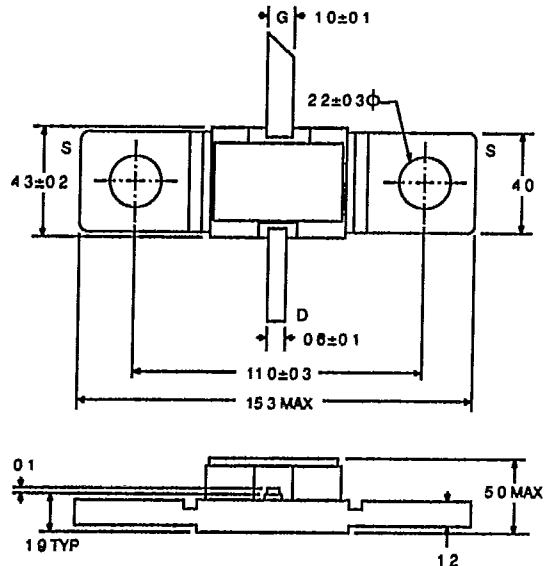
OUTLINE 87



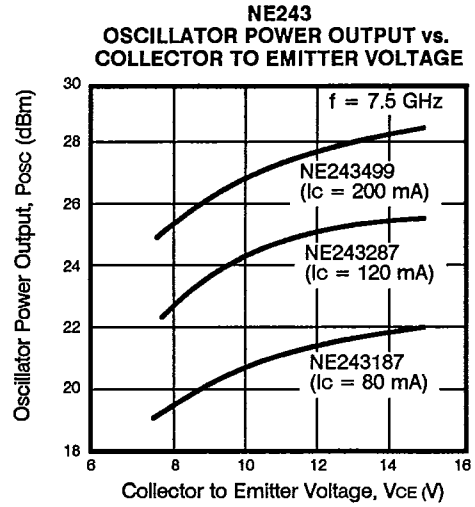
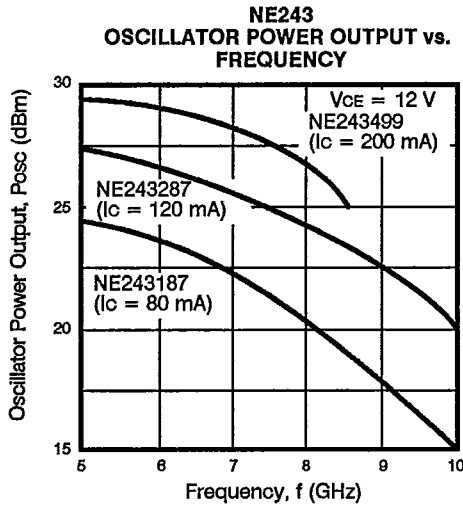
OUTLINE 88



OUTLINE 99



TYPICAL PERFORMANCE CHARACTERISTICS (TA = 25°C)



NE243187 COMMON COLLECTOR* SCATTERING PARAMETERS

S-MAGN AND ANGLES:
VCE = 12 V, IC = 80 mA

FREQUENCY (MHz)	S11		S21		S12		S22	
2000	.92	-75	1.70	-53	.46	27	.78	118
3000	.85	-109	1.51	-76	.61	2	.69	89
4000	.81	-140	1.35	-97	.72	-24	.58	64
5000	.77	-171	1.21	-118	.79	-46	.50	39
6000	.72	161	1.06	-137	.83	-68	.42	16
7000	.69	130	.91	-157	.86	-89	.36	-2
8000	.65	105	.83	-175	.87	-115	.30	-20
9000	.68	74	.72	162	.85	-137	.26	-33
10000	.68	44	.60	143	.77	-163	.22	-27

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

NE243287 COMMON COLLECTOR* SCATTERING PARAMETERS

S-MAGN AND ANGLES:
VCE = 12 V, IC = 120 mA

FREQUENCY (MHz)	S11		S21		S12		S22	
2000	.97	-91	1.60	-59	.44	22	.72	129
3000	.96	-126	1.36	-82	.56	-3	.58	110
4000	.97	-156	1.16	-103	.62	-29	.45	99
5000	.98	175	.97	-124	.65	-50	.35	93
6000	.96	150	.80	-144	.62	-71	.30	96
7000	.92	127	.69	-159	.64	-92	.28	98
8000	.95	108	.60	-178	.62	-113	.31	99
9000	.97	81	.49	158	.57	-136	.37	89
10000	.96	54	.39	138	.54	-159	.43	75

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

NE243188 COMMON COLLECTOR* SCATTERING PARAMETERS

S-MAGN AND ANGLES:
VCE = 12 V, IC = 80 mA

FREQUENCY (MHz)	S11		S21		S12		S22	
2000	.91	-73	1.65	-50	.47	28	.72	120
3000	.83	-104	1.47	-72	.64	6	.65	93
4000	.77	-133	1.30	-91	.74	-20	.55	67
5000	.71	-159	1.17	-108	.81	-40	.49	42
6000	.65	176	1.02	-127	.85	-62	.43	18
7000	.59	148	.92	-145	.89	-81	.40	-2
8000	.51	123	.82	-164	.87	-105	.35	-27
9000	.53	94	.75	178	.88	-127	.32	-46
10000	.53	60	.67	156	.85	-151	.26	-62

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

NE243288 COMMON COLLECTOR* SCATTERING PARAMETERS

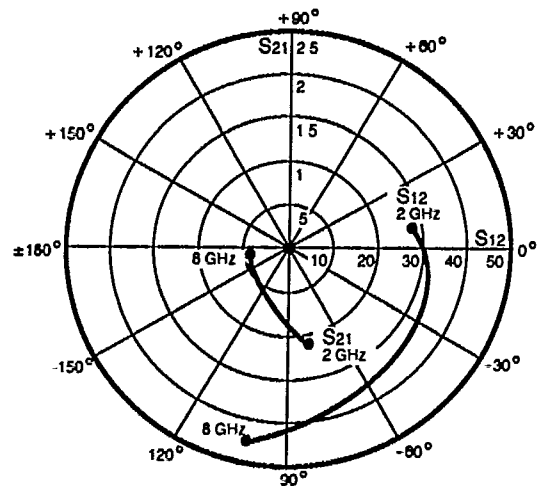
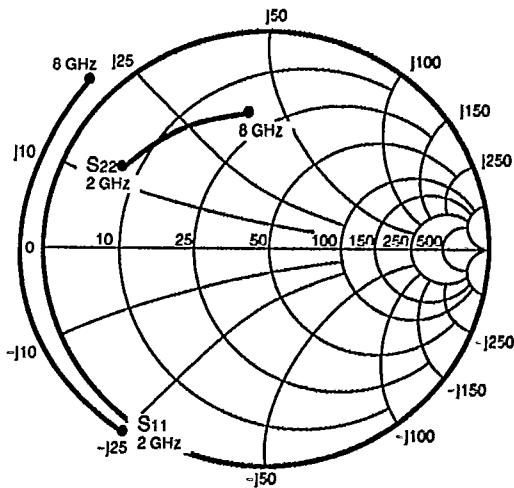
S-MAGN AND ANGLES:

VCE = 12 V, IC = 120 mA

FREQUENCY (MHz)	S11		S21		S12		S22	
2000	.97	-90	1.54	-56	.45	25	.69	132
3000	.96	-120	1.31	-77	.57	2	.55	116
4000	.96	-146	1.11	-95	.64	-22	.42	104
5000	.95	-169	.95	-112	.67	-42	.33	98
6000	.94	171	.81	-130	.68	-62	.25	96
7000	.91	151	.70	-145	.66	-79	.24	96
8000	.89	134	.61	-164	.65	-100	.23	97
9000	.92	112	.54	179	.64	-120	.30	87
10000	.97	87	.49	157	.63	-142	.36	71

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

NE243499 COMMON COLLECTOR* SCATTERING PARAMETERS



S-MAGN AND ANGLES:

VCE = 12 V, IC = 200 mA

FREQUENCY (MHz)	S11		S21		S12		S22	
2000	1.04	-125	1.12	-76	.29	8	.72	150
3000	1.06	-151	.84	-97	.32	-11	.67	143
4000	1.08	-170	.67	-114	.34	-33	.66	137
5000	1.10	173	.57	-130	.35	-48	.65	128
6000	1.08	159	.49	-145	.36	-67	.63	118
7000	1.03	146	.45	-159	.39	-82	.62	106
8000	1.06	134	.47	-175	.45	-103	.61	93

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