



CLASS C, 900 MHz, 28 VOLT POWER TRANSISTOR

T-33-15

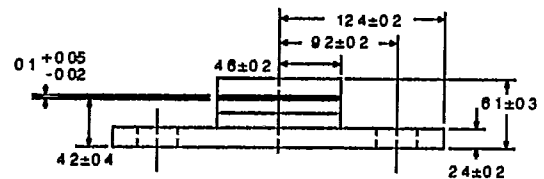
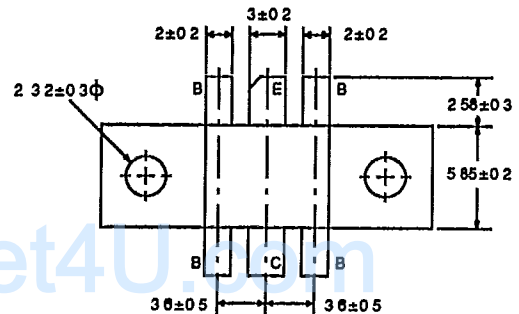
NEM092081B-28
NEM094081B-28
NEM096081B-28

FEATURES

- HIGH POWER
- HIGH GAIN
- TITANIUM/PLATINUM/GOLD METALLIZATION FOR HIGH RELIABILITY
- SUPERIOR RF PERFORMANCE
- RUGGED VSWR ∞ : 1 at $V_{cc} = 24$ V
- LOW COST PACKAGES
- COMMON BASE

OUTLINE DIMENSIONS (Units in mm)

OUTLINE 81B



All dimensions typical unless noted.

DESCRIPTION AND APPLICATIONS

NEC's NEM0900 series of NPN epitaxial UHF power transistors is designed specifically for base stations in the 800 & 960 MHz band. The series is available in a low cost metal-ceramic stripline package offering power levels of 20, 40, and 60 watts. Internal matching is incorporated to simplify circuit design. The series provides high gain, high efficiency, and high tolerance to load mismatch.

PERFORMANCE SPECIFICATIONS (T_A = 25°C)

PART NUMBER EIAJ* REGISTERED NUMBER PACKAGE OUTLINE			NEM092081B-28 2SC3537 81B			NEM094081B-28 2SC3538 81B			NEM096081B-28 2SC3539 81B		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
P _{out}	Output Power at V _{cc} = 24 V, f = 900 MHz, P _{IN} = 2.5 W P _{IN} = 6.3 W P _{IN} = 10 W	W W W	15.8	20		32	40		50	63	
η _c	Collector Efficiency at V _{cc} = 24 V, f = 900 MHz, P _{IN} = 2.5 W P _{IN} = 6.3 W P _{IN} = 10 W	% % %	50	60		50	60		45	50	

*Electronic Industrial Association of Japan.

NEM092081B-28, NEM094081B-28, NEM096081B-28**ELECTRICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$)

PART NUMBER EIAJ* REGISTERED NUMBER PACKAGE OUTLINE			NEM092081B-28 2SC3537 81B			NEM094081B-28 2SC3538 81B			NEM096081B-28 2SC3539 81B		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
ICBO	Collector Cutoff Current at $V_{CB} = 30\text{ V}$, $I_E = 0$	mA			2			4			8
IEBO	Emitter Cutoff Current at $V_{EB} = 2\text{ V}$, $I_C = 0$	mA			2			4			8
hFE	DC Forward Current Gain at $V_{CE} = 10\text{ V}$ (pulsed) $I_C = 1\text{ A}$ $I_C = 2\text{ A}$ $I_C = 3\text{ A}$		20	60	200	20	60	200	20	60	200
COB	Output Capacitance** at $V_{CB} = 28\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$	pF		25	40		50	80		80	140

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**Emitter and Case is grounded.

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

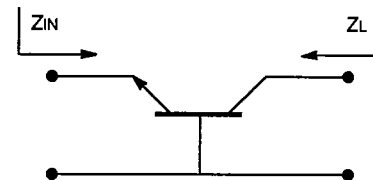
PART NUMBER EIAJ* REGISTERED NUMBER PACKAGE OUTLINE			NEM092081B-28 2SC3537 81B	NEM094081B-28 2SC3538 81B	NEM096081B-28 2SC3539 81B
SYMBOLS	PARAMETERS	UNITS	RATINGS	RATINGS	RATINGS
V _{CB0}	Collector to Base Voltage	V	50	50	50
V _{CE} **	Collector to Emitter Voltage	V	50	50	50
V _{EB0}	Emitter to Base Voltage	V	3	3	3
I _C	Collector Current	A	3	6	9
R _{TH}	Thermal Resistance (Junction-to-Case)	°C/W	4	1.6	1.1
P _T	Total Power Dissipation ($T_C = 25^\circ\text{C}$)	W	50	110	170
T _J	Junction Temperature	°C	200	200	200
T _{STG}	Storage Temperature	°C	-65 to +150	-65 to +150	-65 to +150

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R_{BE} = 10 ΩTYPICAL IMPEDANCE**

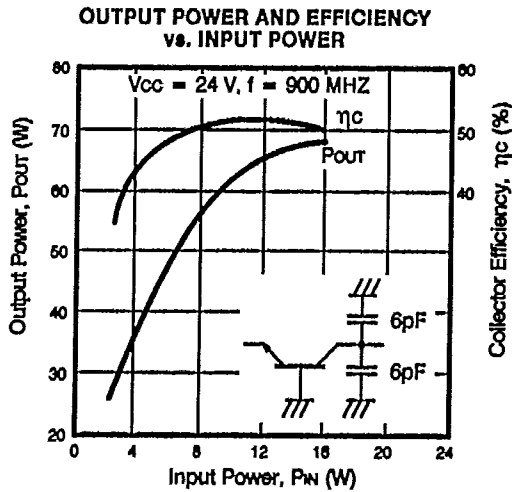
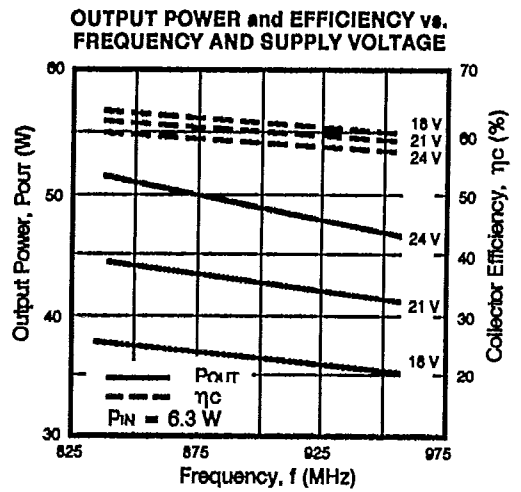
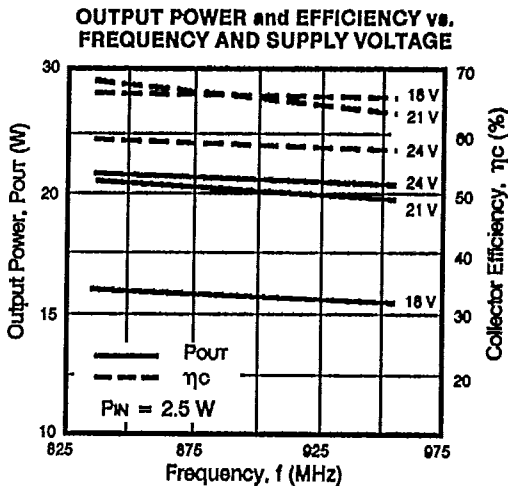
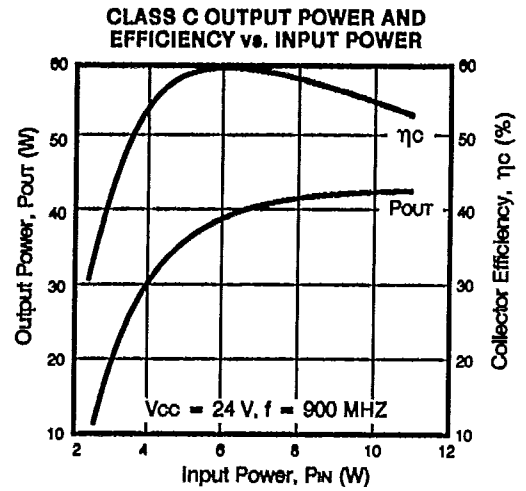
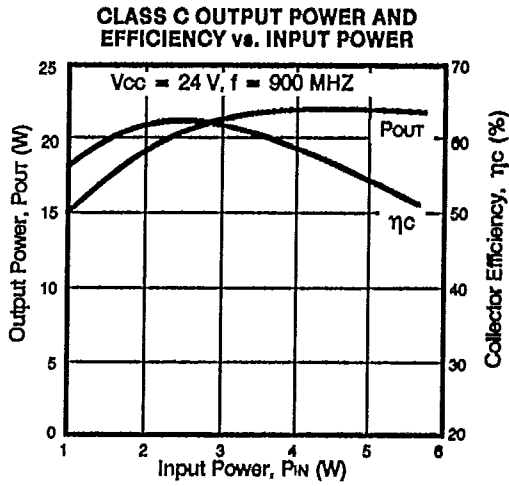
TYPICAL LARGE SIGNAL INPUT AND OUTPUT
IMPEDANCES OF THE NEM0900-28 Series
At $V_{CC} = 24\text{ V}$, $f = 900\text{ MHz}$

PART NUMBER	INPUT POWER P _{IN} (dBm)	OUTPUT POWER P _{OUT} (dBm)	Z _{IN} (Ω)	Z _L (Ω)
NEM092081B-28	34	43	4.09 + j6.31	4.03 - j1.74
NEM094081B-28	38	46	2.93 + j7	2.87 - j0.43
NEM096081B-28	40	48.3	0.8 + j1.75	2.25 + j0.4



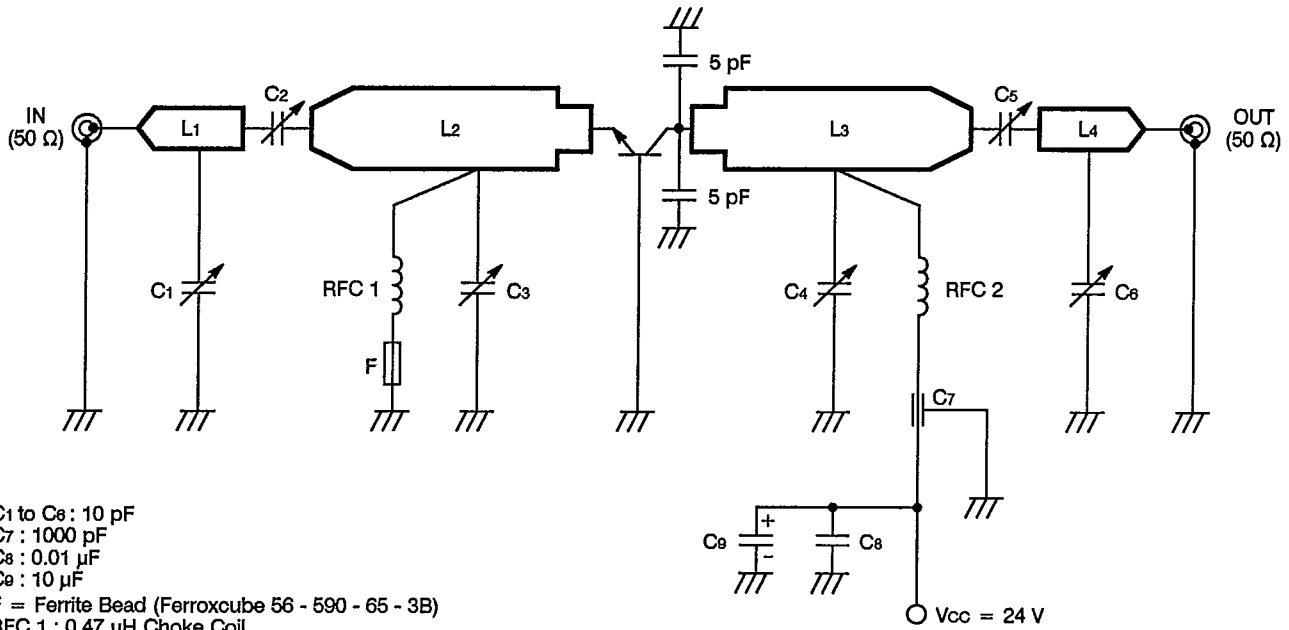
Z_L is optimum load impedance
at rated output power.

TYPICAL PERFORMANCE CHARACTERISTICS (T_A = 25°C)

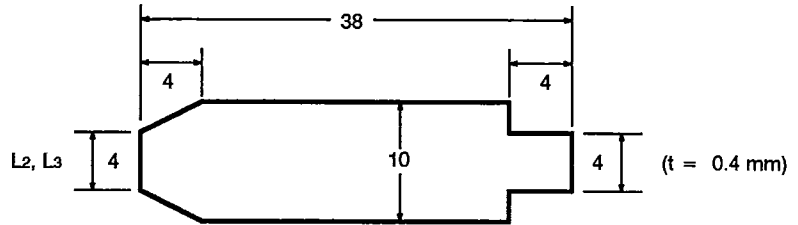
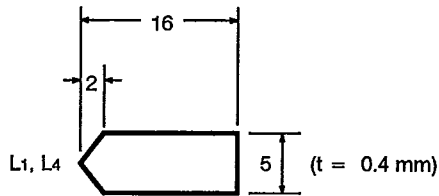


TEST CIRCUIT DIAGRAM*

NEM092081B-28, NEM094081B-28, NEM096081B-28



- C1 to C6 : 10 pF
- C7 : 1000 pF
- C8 : 0.01 μF
- C9 : 0.01 μF
- Ce : 10 μF
- F = Ferrite Bead (Ferroxcube 56 - 590 - 65 - 3B)
- RFC 1 : 0.47 μH Choke Coil
- RFC 2 : Copper, Silver Plated (w = 3 mm, t = 0.4 mm) 10 mm ID 1/2 Turn



*Application Note TEA-561 is available upon request. This note describes a microstrip design using the NEM096081B-28 in the 860 to 920 MHz band