

NEC[®]**CLASS C, 800-960 MHz,
12 VOLT POWER TRANSISTOR**T-33-15
**NEM080481-12
NEM081081-12
NEM082081B-12
NEM084081B-12****FEATURES**

- **LOW OPERATING VOLTAGE:** 13.5 V
- **TITANIUM/PLATINUM/GOLD METALLIZATION FOR HIGH RELIABILITY**
- **GAIN AS HIGH AS 7 dB**
- **RUGGED VSWR:** ∞ at $V_{cc} = 13.5$ V
- **IDEALLY SUITED FOR 800/960 MHz BAND MOBILE/CELLULAR RADIO APPLICATIONS**
- **LOW COST PACKAGES**
- **HIGH OUTPUT POWER:** 37 Watts at 860 MHz
- **COMMON BASE**

DESCRIPTION AND APPLICATIONS

NEC's NEM0800 series of NPN epitaxial UHF power transistors are designed specifically for large volume mobile radio applications in the 800 & 960 MHz bands. The series is available in a low cost metal-ceramic stripline package offering power levels of 6, 12, 24, and 40 W. Internal matching is incorporated to simplify circuit design. The series provides high gain, high efficiency, and a high resistance to burn-out with load mismatch. The NEM0800 series is complementary to NEC's range of power amplifier modules offering total discrete/modular design flexibility.

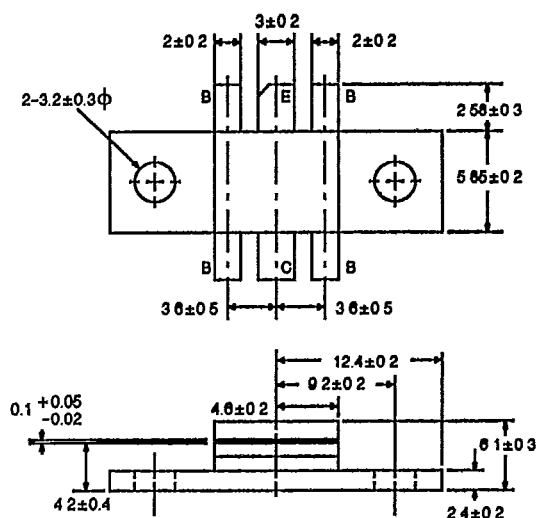
PERFORMANCE SPECIFICATIONS ($T_A = 25^\circ\text{C}$)

PART NUMBER EIAJ* REGISTERED NUMBER PACKAGE OUTLINE			NEM080481E-12 81E			NEM081081E-12 81E			NEM082081B-12 2SC3282A 81B			NEM084081B-12 2SC3283A 81B		
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
P_{OUT}	Output Power at $V_{cc} = 13.5$ V $f = 950$ MHz, $P_{IN} = 1.5$ W $f = 950$ MHz, $P_{IN} = 3.5$ W $f = 860$ MHz, $P_{IN} = 4$ W $f = 860$ MHz, $P_{IN} = 8$ W	W W W W	4	6		10	12.5		18	22		30	37	
η_c	Collector Efficiency at $V_{cc} = 13.5$ V $f = 950$ MHz, $P_{IN} = 1.5$ W $f = 950$ MHz, $P_{IN} = 3.5$ W $f = 860$ MHz, $P_{IN} = 4$ W $f = 860$ MHz, $P_{IN} = 8$ W	% % % %	55	60		55	65		50	58		50	55	
VSWR	Voltage Standing Wave Ratio at $V_{cc} = 13.5$ V $P_{OUT} = 4$ W $P_{OUT} = 10$ W $P_{OUT} = 20$ W $P_{OUT} = 40$ W				∞			∞			∞			∞
I_{CBO}	Collector Cutoff Current at $V_{CB} = 20$ V, $I_E = 0$	mA		0.2			0.3				2			4
I_{EBO}	Emitter Cutoff Current at $V_{EB} = 20$ V, $I_E = 0$	mA		0.2			0.3				2			4
h_{FE}	DC Forward Current Gain at $V_{cc} = 10$ V $I_C = 0.3$ A (pulsed) $I_C = 0.5$ A (pulsed) $I_C = 1$ A (pulsed) $I_C = 2$ A (pulsed)		20	60	200	20	60	200	20	50	200	20	50	200
C_{OB}	Output Capacitance at $V_{CB} = 10$ V, $I_E = 0$ $f = 1$ MHz	pF		7	10		15	19.5		2.5	35		50	70

*Electronic Industrial Association of Japan

OUTLINE DIMENSIONS (Units in mm)

OUTLINE 81B*

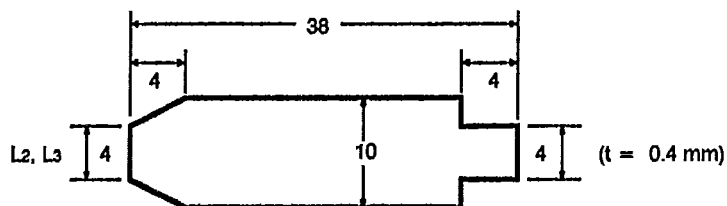
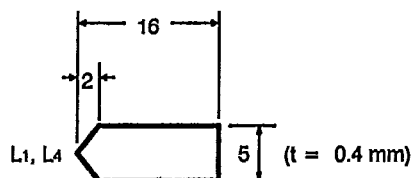
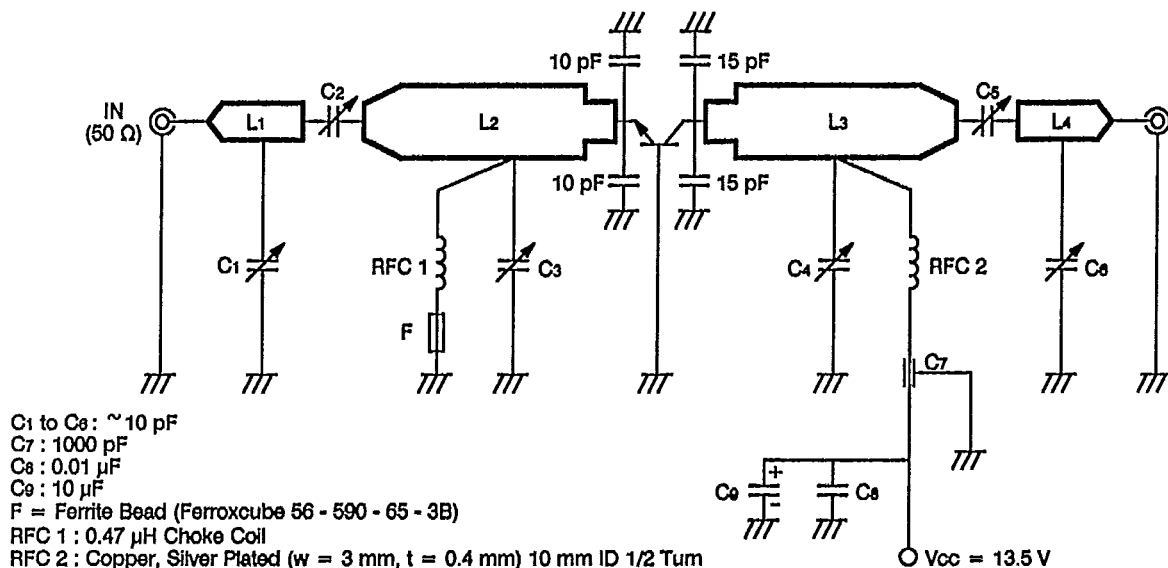


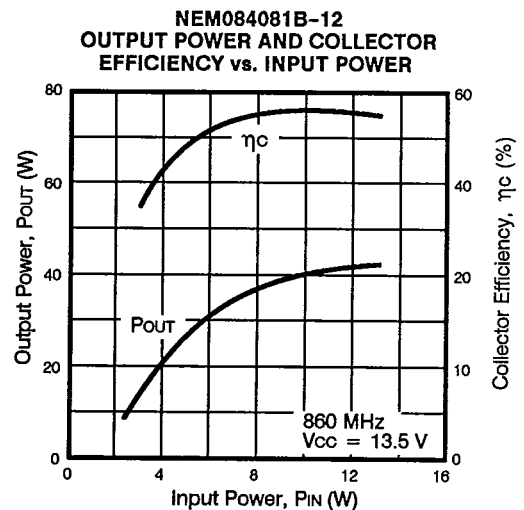
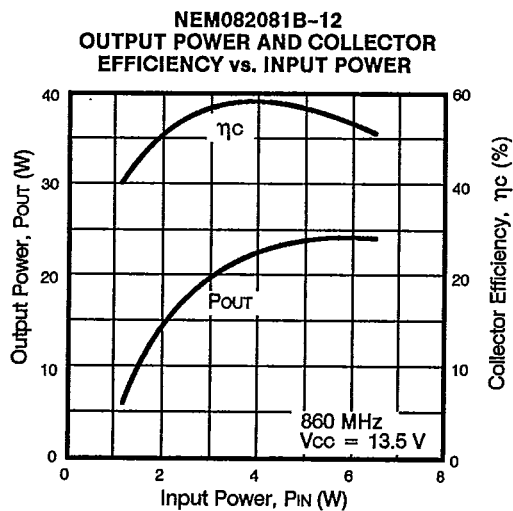
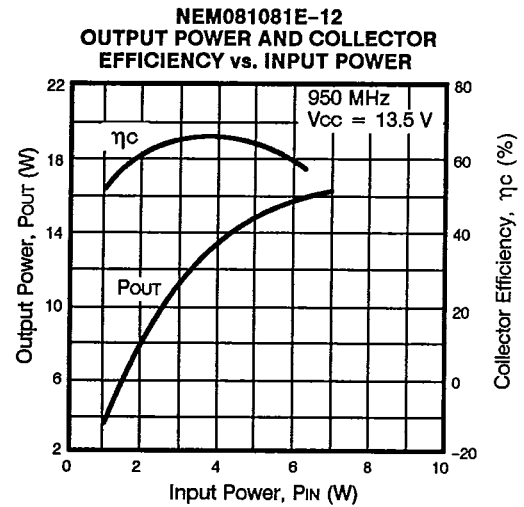
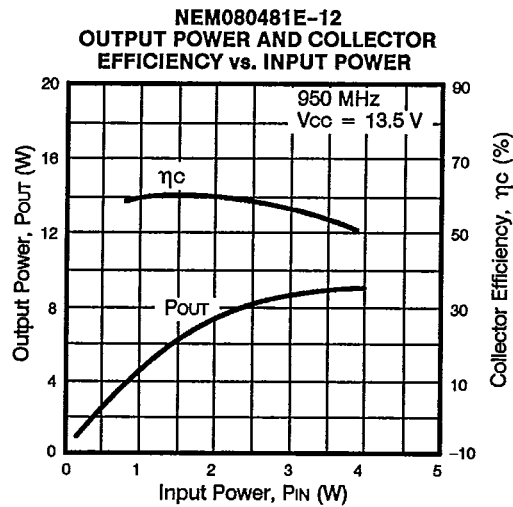
*81E has emitter and base reversed.

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

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CB0}	Collector to Base Voltage	V	35
V_{CE0}	Collector to Emitter Voltage	V	18
		V	18
		V	16
		V	16
V_{EB0}	Emitter to Base Voltage	V	3
		V	3
		V	2.5
		V	2.5
I_C	Collector Current	A	1.5
		A	3
		A	7.5
		A	15
$R_{\theta JC}$	Thermal Resistance (Junction-to-Case)	$^\circ\text{C/W}$	10
		$^\circ\text{C/W}$	5
		$^\circ\text{C/W}$	2.5
		$^\circ\text{C/W}$	1.5
P_D	Total Power Dissipation ($T_c = 25^\circ\text{C}$)	W	17.5
		W	35
		W	70
		W	120
T_J	Junction Temperature	$^\circ\text{C}$	200
T_{STG}	Storage Temperature	$^\circ\text{C}$	-65 to +150

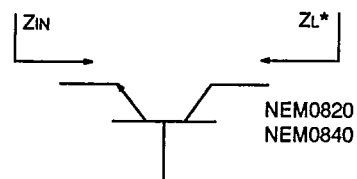
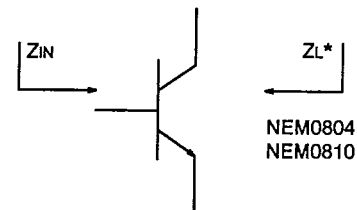
TEST CIRCUIT DIAGRAM



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

TYPICAL IMPEDANCE

PART NUMBER	FREQUENCY	Z_{IN}		Z_L^*	
NEM080481E-12	950 MHz	3.22	+j6.6	6.36	-j4.7
NEM081081E-12	950 MHz	2.31	+j3.49	9.8	-j5.91
NEM082081B-12	860 MHz	2.5	+j0.5	2.23	+j0
NEM084081B-12	860 MHz	1.5	-j4.75	1.75	-j2.0

* Z_L is optimum load impedance at rated output power.