NEC

MICROWAVE GaAs POWER FET SERIES

NE800898

C-Band GaAs Power FET Amplifier Modules

FEATURES

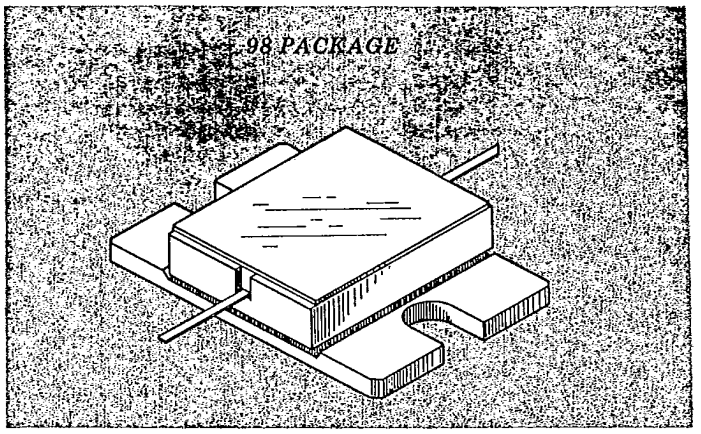
- CLASS A OPERATION
- HIGH P_{out} & POWER ADDED EFFICIENCY
- BROADBAND CAPABILITY
- INTERNALLY MATCHED
- HIGH RELIABILITY

DESCRIPTION AND APPLICATIONS

The NE800898 power GaAs FET covers the 3.5 to 8.4 GHz frequency range with seven different Class A, 3.5W matched devices. Each device has an input and output matching network. The active device is two four-cell recessed gate FET chips operating with a drain voltage of 8 to 9 volts for CW operation, and 13 volts for pulsed operation with greater than 6 watts peak output power.

SELECTION CHART

NE PART NUMBER	TYPICAL PERFORMANCE		
	P_{1dB} (WATTS)	USABLE FREQUENCY (GHz)	G_{1dB} (dB)
NE800898-4	3.5	3.5 – 4.5	7
NE800898-5 NE800898-5H	3.5 3.5	4.3 – 5.1 5.0 – 5.5	7 7
NE800898-6	3.5	5.5 – 6.5	6.5
NE800898-7 NE800898-7H	3.5 3.5	6.5 – 7.2 7.1 – 7.7	6.5 6.5
NE800898-8	3.5	7.5 – 8.4	5.5



PERFORMANCE SPECIFICATIONS (T_a=25°C)

NE PART NUMBER PACKAGE CODE			NE800898-4,5,5H 98			NE800898-6,7,7H 98			NE800898-8 98		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX
P_{TEST}	Power Output at Test Point[1] P_{in} = 29.0dBm, V_{DS} = 9V, $I_D \leq$ 1.2A P_{in} = 29.5dBm, V_{DS} = 9V, $I_D \leq$ 1.2A P_{in} = 30.0dBm, V_{DS} = 9V, $I_D \leq$ 1.2A P_{in} = 30.5dBm, V_{DS} = 9V, $I_D \leq$ 1.2A	dBm dBm dBm dBm	35	36		35 35	36 36		35	36	
P_{1dB}	Output Power at 1dB Compression Point[2] V_{DS} = 9V, $I_D \leq$ 1.2A	dBm		35.5			35.5			35.5	
G_{1dB}	Gain at 1dB Compression Point[2] V_{DS} = 9V, $I_D \leq$ 1.2A	dB		7.0			6.5			5.5	
η	Efficiency[3] V_{DS} = 9V, $I_D \leq$ 1.2A, $P_{out} = P_{1dB}$	%		38			35			32	
VSWR	Input Voltage Standing Wave Ratio[2] V_{DS} = 9V, $I_D \leq$ 1.2A, $P_{out} = P_{1dB}$			2.5:1			2.5:1			2.5:1	

SEE NOTES ON BACK PAGE.

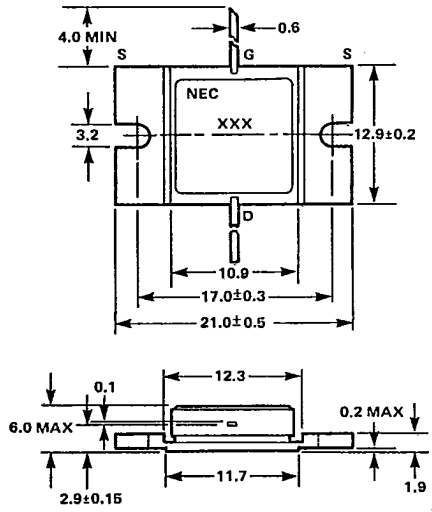
NE800898 SERIES, C-Band GaAs POWER FET AMPLIFIER MODULES

ELECTRICAL CHARACTERISTICS (T_a=25°C)

NE PART NUMBER PACKAGE CODE			NE800898-4,5,5H,6,7,7H,8 98		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I_{DSS}	Saturated Drain Current at V_{DS} = 2.5V, V_{GS} = 0	A	1.8	2.4	3.2
V_P	Pinch-off Voltage at V_{DS} = 2.5V, I_D = 16mA	V	–2.5	–3.5	–5
g_m	Transconductance at V_{DS} = 2.5V, I_D = 0.8A	m℧		480	
$R_{th(c-c)}$	Thermal Resistance	°C/W		7.0	8.0
P_T	Total Power Dissipation	W			20.0

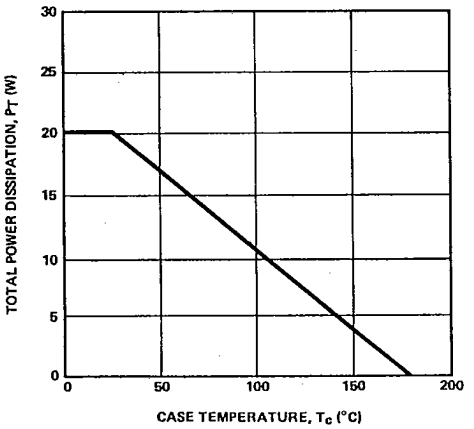
PHYSICAL DIMENSIONS *(Units in mm)*

PACKAGE CODE - 98



THERMAL CHARACTERISTICS

POWER DERATING CURVE



ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{DS}	Drain to Source Voltage	V	20
V_{GS}	Gate to Source Voltage	V	–14
I_D	Drain Current	A	3.2
I_G	Gate Current	mA	15.0
T_{ch}	Channel Temperature	°C	175
T_{stg}	Storage Temperature	°C	–65~+175

NOTES:

1. This is a production test. Devices are measured in a broadband amplifier circuit with the drain current between 1.0 to 1.35A. The gate current is limited to 15mA. Test frequencies are:
   –4 @ 4.2GHz, –5 @ 5.0GHz, –5H @ 5.5GHz, –6 @ 6.5GHz, –7 @ 7.2GHz, –7H @ 7.7GHz, –8 @ 8.4GHz.
2. Amplifier performance in a circuit optimized at the center of the usable frequency band.
3. $\eta = \frac{P_{1dB}}{V_{DS} \times I_D + P_{in}} \times 100\%$