

### FEATURES

- **HIGH OUTPUT POWER:** 4 W
- **HIGH LINEAR GAIN:** 11.5 dB
- **HIGH EFFICIENCY (PAE):** 45%
- **INDUSTRY STANDARD PACKAGING**

### DESCRIPTION

The NE6500496 is a medium power GaAs MESFET designed for up to a 4 W output stage or as a driver for high power devices. The device has no internal matching and can be used from UHF frequencies up to 3.0 GHz. The chips used in this series offer superior reliability and consistent performance for which NEC microwave semiconductors are known.

The NE6500496 Transistors are manufactured to NEC's stringent quality assurance standards to ensure highest reliability and consistent superior performance.

### RECOMMENDED OPERATING LIMITS

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V <sub>DS</sub>	Drain to Source Voltage	V		10	10
T <sub>CH</sub>	Channel Temperature	°C			130
G <sub>COMP</sub>	Gain Compression	dB			3.0
R <sub>G</sub>	Gate Resistance	Ω			200

### ELECTRICAL CHARACTERISTICS (T<sub>c</sub> = 25°C)

PART NUMBER		NE6500496					TEST CONDITIONS
SYMBOLS	CHARACTERISTICS	UNITS	MIN	TYP	MAX		
Functional Characteristics	P <sub>OUT</sub>	Power Out at Fixed Input Power	dBm	35.5	36.0		P <sub>IN</sub> = 26.0 dBm V <sub>DS</sub> = 10 V; I <sub>DSQ</sub> = 400 mA f = 2.3 GHz; R <sub>G</sub> = 200 Ω
	GL	Linear Gain	dB	11.0	11.5		
	η <sub>ADD</sub>	Power Added Efficiency	%		45		
	I <sub>DS</sub>	Drain Source Current	A		0.8		
Electrical DC Characteristics	I <sub>DSS</sub>	Saturated Drain Current	A	1.0	2.3	3.5	V <sub>DS</sub> = 2.5 V; V <sub>GS</sub> = 0 V
	V <sub>P</sub>	Pinch-off Voltage	V	-3.5	-2.0	-0.5	V <sub>DS</sub> = 2.5 V; I <sub>DS</sub> = 15 mA
	g <sub>m</sub>	Transconductance	mS		1300		V <sub>DS</sub> = 2.5 V; I <sub>DS</sub> = 1 mA
	R <sub>TH</sub>	Thermal Resistance	°C/W		5.0	6.0	Channel to Case

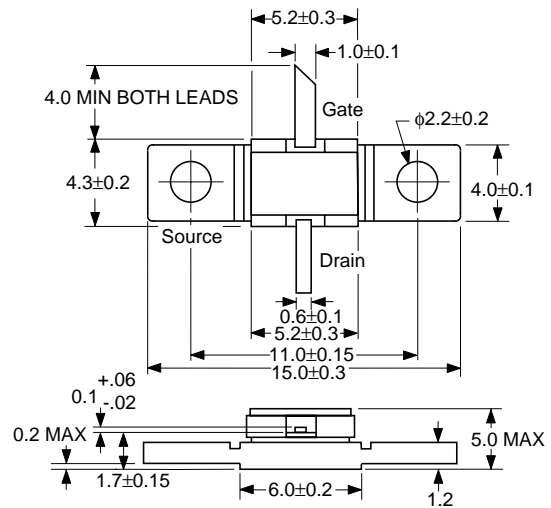
### ABSOLUTE MAXIMUM RATINGS

(T<sub>c</sub> = 25 °C unless otherwise noted)

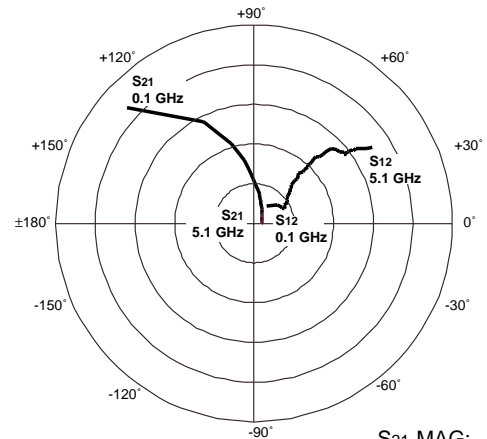
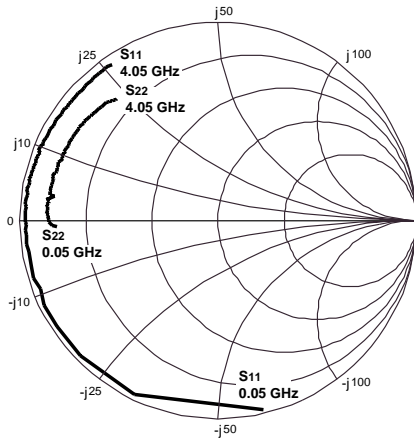
SYMBOLS	PARAMETERS	UNITS	RATINGS
V <sub>DSX</sub>	Drain to Source Voltage	V	15
V <sub>GDX</sub>	Gate to Drain Voltage	V	-18
V <sub>GSX</sub>	Gate to Source Voltage	V	-12
I <sub>DS</sub>	Drain Current	A	4.5
I <sub>GS</sub>	Gate Current	mA	25
P <sub>T</sub>	Total Power Dissipation	W	25
T <sub>CH</sub>	Channel Temperature	°C	175
T <sub>STG</sub>	Storage Temperature	°C	-65 to +175

### OUTLINE DIMENSIONS (Units in mm)

#### PACKAGE OUTLINE 96



**TYPICAL SCATTERING PARAMETERS** (TA = 25 °C)



S21 MAG:  
4.0 / DIV., 20.0 FS  
S12 MAG:  
0.02 / DIV., 0.1 FS

V<sub>DS</sub> = 10.0 V, I<sub>DS</sub> = 400 mA

FREQUENCY (GHz)	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>		K	MAG <sup>1</sup> (dB)
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		
0.10	0.975	-80.100	17.360	137.500	0.011	55.300	0.601	-172.500	0.131	31.982
0.20	0.956	-118.900	11.506	116.500	0.015	39.800	0.657	-175.000	0.230	28.848
0.40	0.949	-148.400	6.420	98.700	0.016	28.900	0.687	-179.500	0.369	26.034
0.50	0.947	-155.300	5.212	93.800	0.017	26.700	0.692	178.900	0.426	24.866
1.00	0.945	-171.200	2.691	77.900	0.019	32.400	0.702	173.300	0.763	21.512
1.50	0.944	-178.200	1.834	66.500	0.022	38.500	0.708	168.900	0.968	19.210
2.00	0.944	176.800	1.408	55.800	0.026	43.400	0.712	163.500	1.076	15.651
2.50	0.944	172.700	1.166	46.200	0.031	46.000	0.728	157.900	1.086	13.965
3.00	0.945	168.700	1.008	36.900	0.039	46.700	0.753	152.900	0.986	14.124
3.50	0.947	165.000	0.901	28.700	0.046	47.000	0.761	149.200	0.921	12.920
4.00	0.950	160.500	0.838	20.000	0.056	41.300	0.769	144.600	0.771	11.751
4.50	0.940	155.300	0.806	10.900	0.059	37.300	0.775	138.600	0.812	11.355
5.00	0.933	149.600	0.792	0.400	0.068	34.000	0.791	131.200	0.772	10.662

Note:

1. Gain Calculations:

$$MAG = \frac{|S_{21}|}{|S_{12}|} (K \pm \sqrt{K^2 - 1})$$

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

MAG = Maximum Available Gain

MSG = Maximum Stable Gain