NEC

L&S BAND MEDIUM POWER GaAs MESFET | NE6500496

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.

ABSOLUTE MAXIMUM RATINGS

(T_C= 25 °C unless otherwise noted)

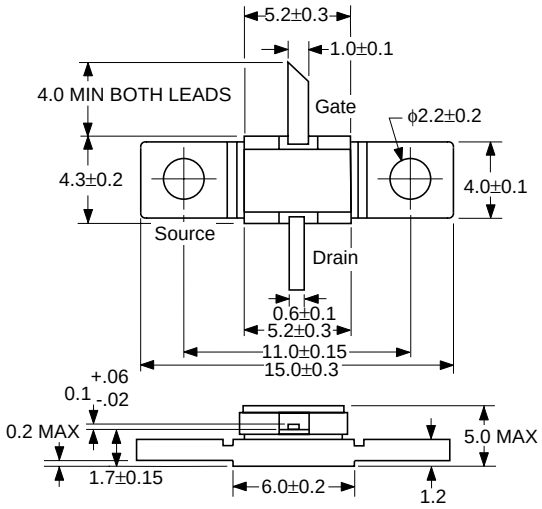
SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{DSX}	Drain to Source Voltage	V	15
V_{GDX}	Gate to Drain Voltage	V	-18
V_{GSX}	Gate to Source Voltage	V	-12
I_{DS}	Drain Current	A	4.5
I_{GS}	Gate Current	mA	25
P_T	Total Power Dissipation	W	25
T_{CH}	Channel Temperature	°C	175
T_{STG}	Storage Temperature	°C	-65 to +175

RECOMMENDED OPERATING LIMITS

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V_{DS}	Drain to Source Voltage	V		10	10
T_{CH}	Channel Temperature	°C			130
G_{COMP}	Gain Compression	dB			3.0
R_G	Gate Resistance	Ω			200

OUTLINE DIMENSIONS (Units in mm)

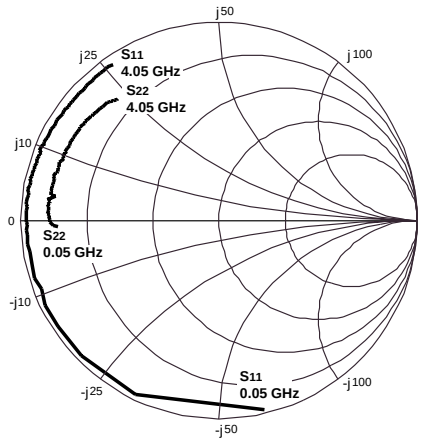
PACKAGE OUTLINE 96

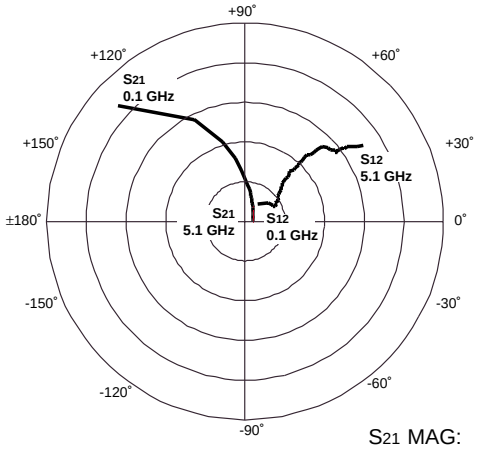


ELECTRICAL CHARACTERISTICS (T_C = 25°C)

PART NUMBER				NE6500496			
	SYMBOLS	CHARACTERISTICS	UNITS	MIN	TYP	MAX	TEST CONDITIONS
Functional Characteristics	P_{OUT}	Power Out at Fixed Input Power	dBm	35.5	36.0		P_{IN} = 26.0 dBm
	G_L	Linear Gain	dB	11.0	11.5		V_{DS} = 10 V; I_{DSQ} = 400 mA
	η_{ADD}	Power Added Efficiency	%		45		f = 2.3 GHz; R_G = 200 Ω
	I_{DS}	Drain Source Current	A		0.8		
Electrical DC Characteristics	I_{DSS}	Saturated Drain Current	A	1.0	2.3	3.5	V_{DS} = 2.5 V; V_{GS} = 0 V
	V_P	Pinch-off Voltage	V	-3.5	-2.0	-0.5	V_{DS} = 2.5 V; I_{DS} = 15 mA
	g_m	Transconductance	mS		1300		V_{DS} = 2.5 V; I_{DS} = 1 mA
	R_{TH}	Thermal Resistance	°C/W		5.0	6.0	Channel to Case

TYPICAL SCATTERING PARAMETERS (T_A = 25 °C)





S_{21} MAG:
4.0 / DIV., 20.0 FS
S_{12} MAG:
0.02 / DIV., 0.1 FS

V_{DS} = 10.0 V, I_{DS} = 400 mA

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG[1]
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		(dB)
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:

$MAG = \frac{|S_{21}|}{|S_{12}|}\left(K \pm \sqrt{K^2 - 1}\right)$. When $K \le 1$, 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