

FEATURES

- **HIGH OUTPUT POWER:** 10 W
- **HIGH LINEAR GAIN:** 10.5 dB
- **HIGH EFFICIENCY:** 40%
- **INDUSTRY STANDARD PACKAGING**

DESCRIPTION

The NE6501077 is a medium power GaAs MESFET designed for up to a 10 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 NE6501077 transistors are manufactured to NEC's stringent quality assurance standards to ensure highest reliability and consistent superior performance.

RECOMMENDED OPERATING LIMITS

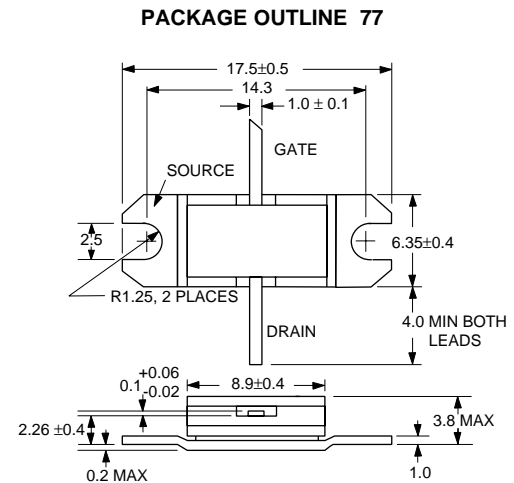
SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V _{DS}	Drain to Source Voltage	V		10	10
T _{CH}	Channel Temperature	°C			130
G _{COMP}	Gain Compression	dB			3.0
R _G	Gate Resistance	Ω			100

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	9.0
I _{GS}	Gate Current	mA	50
P _T	Total Power Dissipation	W	50
T _{CH}	Channel Temperature	°C	175
T _{STG}	Storage Temperature	°C	-65 to +175

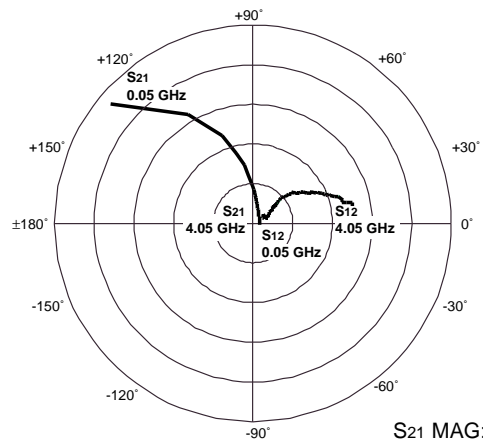
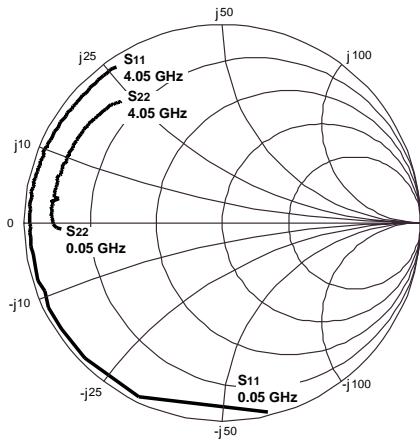
OUTLINE DIMENSIONS (Units in mm)



ELECTRICAL CHARACTERISTICS (T_c = 25°C)

PART NUMBER PACKAGE OUTLINE				NE6501077 77			TEST CONDITIONS
	SYMBOLS	CHARACTERISTICS	UNITS	MIN	TYP	MAX	
Functional Characteristics	P _{OUT}	Power Out at Fixed Input Power	dBm	39.0	39.5		P _{IN} = 31.0 dBm f = 2.3 GHz V _{DS} = 10 V; I _{DSQ} = 1 A R _G = 100Ω
	GL	Linear Gain	dB	9.5	10.5		
	η _{ADD}	Power Added Efficiency	%		40		
	I _{DS}	Drain Source Current	A		2.0		
Electrical DC Characteristics	I _{DSS}	Saturated Drain Current	A	2.0	4.5	7.0	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		2600		V _{DS} = 2.5 V; I _{DS} = 2 A
	R _{TH}	Thermal Resistance	°C/W		2.5	3.0	Channel to Case

TYPICAL SCATTERING PARAMETERS (TA = 25°C)



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

VDS = 10.0 V, IDS = 1000 mA

FREQUENCY (GHz)	S11		S21		S12		S22		K	MAG ¹ (dB)
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		
0.05	0.984	-76.400	18.696	140.100	0.006	23.700	0.812	-177.700	-0.320	34.936
0.10	0.974	-115.700	12.798	120.500	0.006	28.600	0.840	-178.100	0.036	33.290
0.20	0.970	-146.600	7.261	103.200	0.007	22.000	0.857	179.600	0.212	30.159
0.25	0.973	-154.100	5.934	98.700	0.008	21.500	0.862	178.600	0.251	28.703
0.40	0.971	-166.400	3.794	90.100	0.008	25.900	0.862	176.400	0.488	26.760
0.50	0.969	-170.700	3.049	86.800	0.008	26.100	0.862	175.500	0.593	25.811
1.00	0.968	176.000	1.582	72.400	0.010	35.500	0.856	169.900	0.979	21.992
1.50	0.976	167.400	1.124	60.100	0.015	39.700	0.865	165.100	0.874	18.747
2.00	0.968	159.700	0.894	47.600	0.018	41.500	0.850	158.700	1.088	15.156
2.50	0.962	151.500	0.778	35.000	0.024	37.500	0.850	151.700	1.081	13.368
3.00	0.952	143.100	0.705	21.800	0.031	29.500	0.836	144.300	1.100	11.639
3.50	0.953	134.700	0.674	8.700	0.039	21.300	0.825	137.300	0.940	12.376
4.00	0.954	125.200	0.673	-5.500	0.051	12.000	0.800	130.400	0.761	11.204

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

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