NEC

N-CHANNEL GaAs MES FET

NE6500379A

3W L, S-BAND POWER GaAs MESFET

DESCRIPTION

The NE6500379A is a 3W GaAs MESFET designed for middle power transmitter applications for mobile communication handset and base station systems. It is capable of delivering 3 watt of output power (CW) with high linear gain, high efficiency and excellent distortion. Reliability and performance uniformity are assured by NEC's stringent quality and control procedures.

FEATURES

- High Output Power : $P_{o\ (1dB)}$ = +35 dBm typ.
- High Linear Gain : 10 dB typ.
- High Power Added Efficiency: 50% typ. @V_{DS} = 6 V, I_{Dset} = 500 mA, f = 1.9 GHz

ORDERING INFORMATION

Part Number	Package	Supplying Form
NE6500379A-T1	79A	12 mm tape width, 1 kpcs/reel

Remark To order evaluation samples, please contact your local NEC sales office.
(Part number for sample order: NE6500379A)

★ ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Operation in excess of any one of these parameters may result in permanent damage.

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V_{DS}	15	V
Gate to Source Voltage	V_{GSO}	–7	V
Drain Current	I_D	5.6	A
Gate Current	I_G	50	mA
Total Power Dissipation	P_T	21	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–65 to +150	°C

Caution Please handle this device at static-free workstation, because this is an electrostatic sensitive device.

Document No. P13495EJ2V0DS00 (2nd edition)
Date Published August 1998 N CP(K)
Printed in Japan

The mark ★ shows major revised points.

RECOMMENDED OPERATING LIMITS

Characteristics	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Drain to Source Voltage	V_{DS}			6.0	6.0	V
Gain Compression	Gcomp				3.0	dB
Channel Temperature	T_{ch}				+125	°C

★ ELECTRICAL CHARACTERISTICS

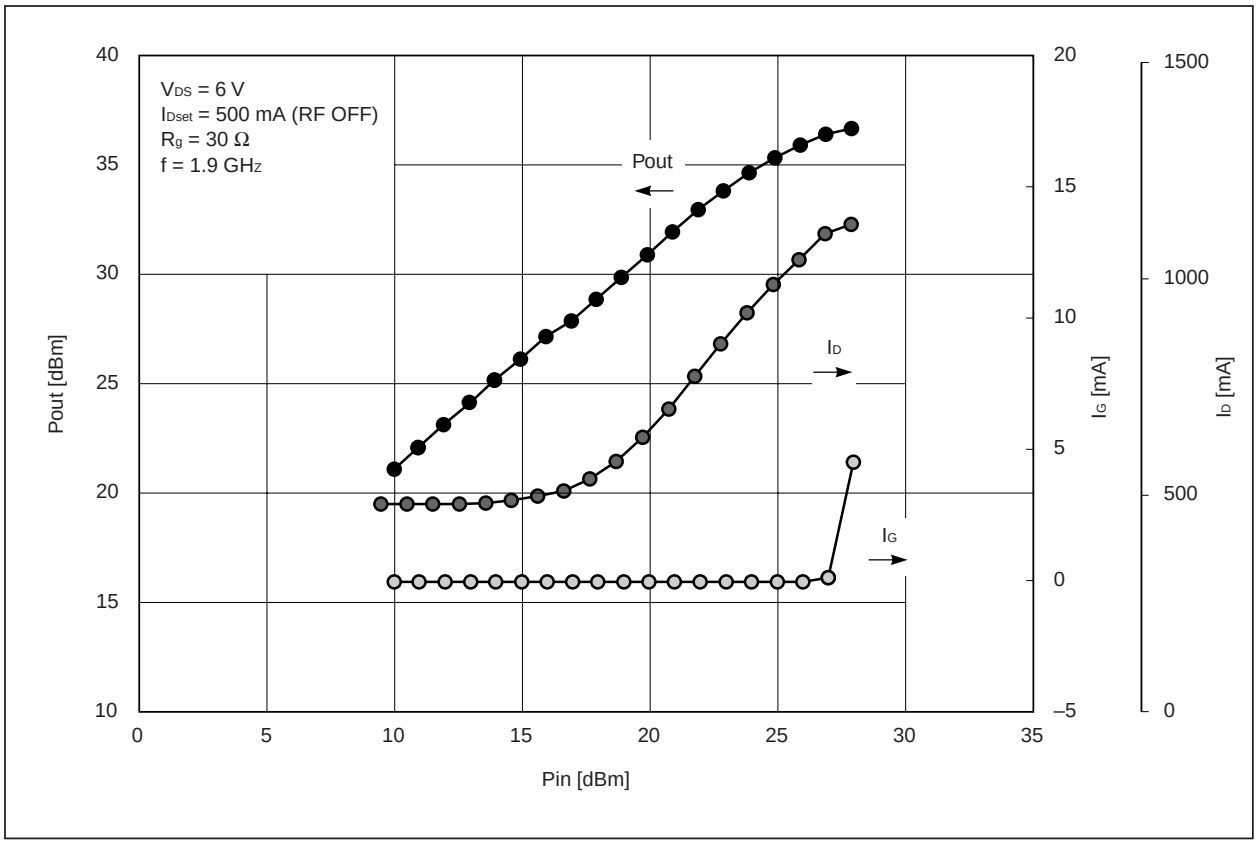
(T_A = 25°C, Unless otherwise specified, using NEC standard test fixture.)

Characteristics	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Saturated Drain Current	I_{DSS}	V_{DS} = 2.5 V, V_{GS} = 0 V		4.5		A
Pinch-off Voltage	V_p	V_{DS} = 2.5 V, I_D = 21 mA	–3.6		–1.6	V
Gate to Drain Break Down Voltage	BV_{gd}	I_{gd} = 21 mA	17			V
Thermal Resistance	R_{th}	Channel to Case		5	6	°C/W
Output Power at 1 dB Gain Compression Point	$P_{o(1dB)}$	f = 1.9 GHz, V_{DS} = 6.0 V Rg = 30 Ω		35.0		dBm
Drain Current	I_D	I_{Dset} = 500 mA (RF OFF)		1.0		A
Power Added Efficiency	η_{add}	**Note 2**		50		%
Linear Gain[Note 1]	G_L		9.0	10.0		dB

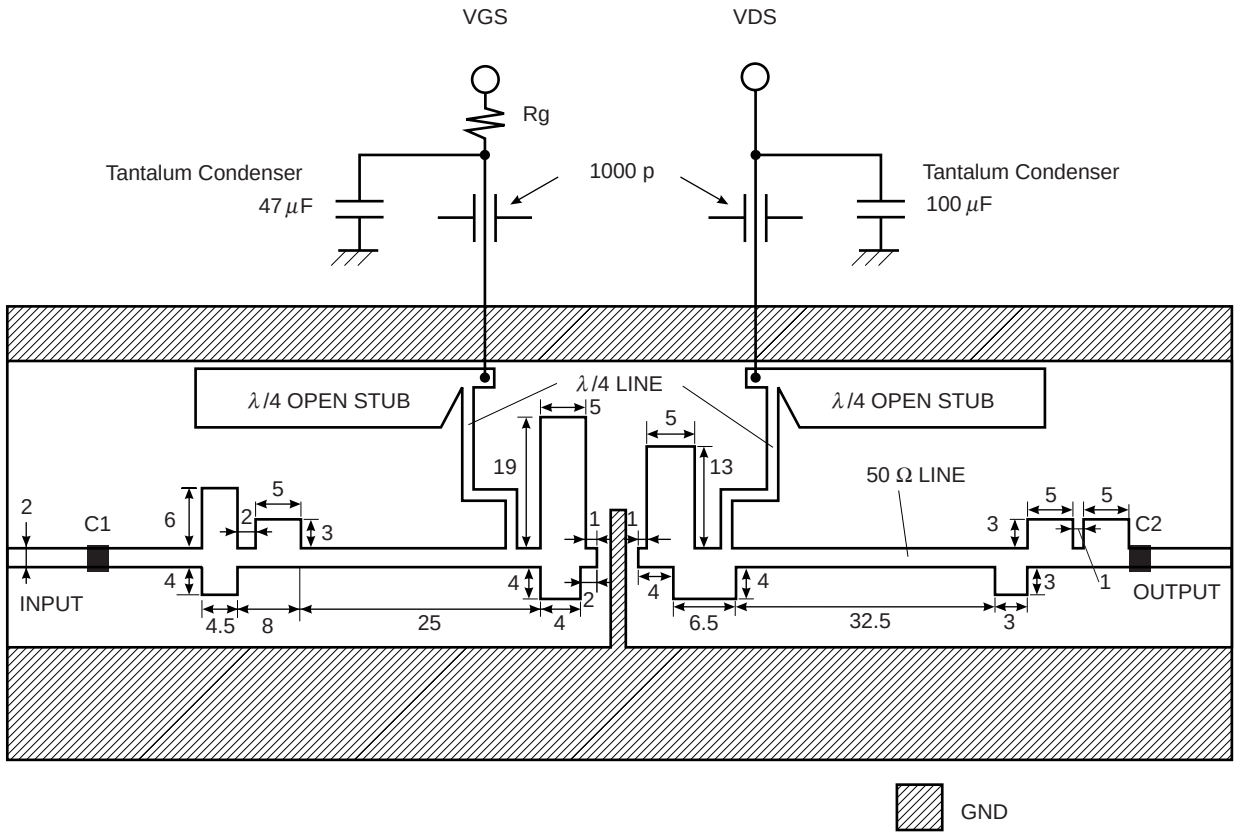
Notes 1. Pin = 0 dBm

2. DC performance is 100% testing. RF performance is testing several samples per wafer. Wafer rejection criteria for standard devices is 1 reject for several samples.

★ **OUTPUT POWER, DRAIN CURRENT AND GATE CURRENT vs. INPUT POWER**



★ **APPLICATION CIRCUIT EXAMPLE (Unit: mm)**



f = 1.9 GHz
VDS = 6 V
I_{Dset} = 500 mA (RF OFF)

C1 = 30 pF
C2 = 30 pF

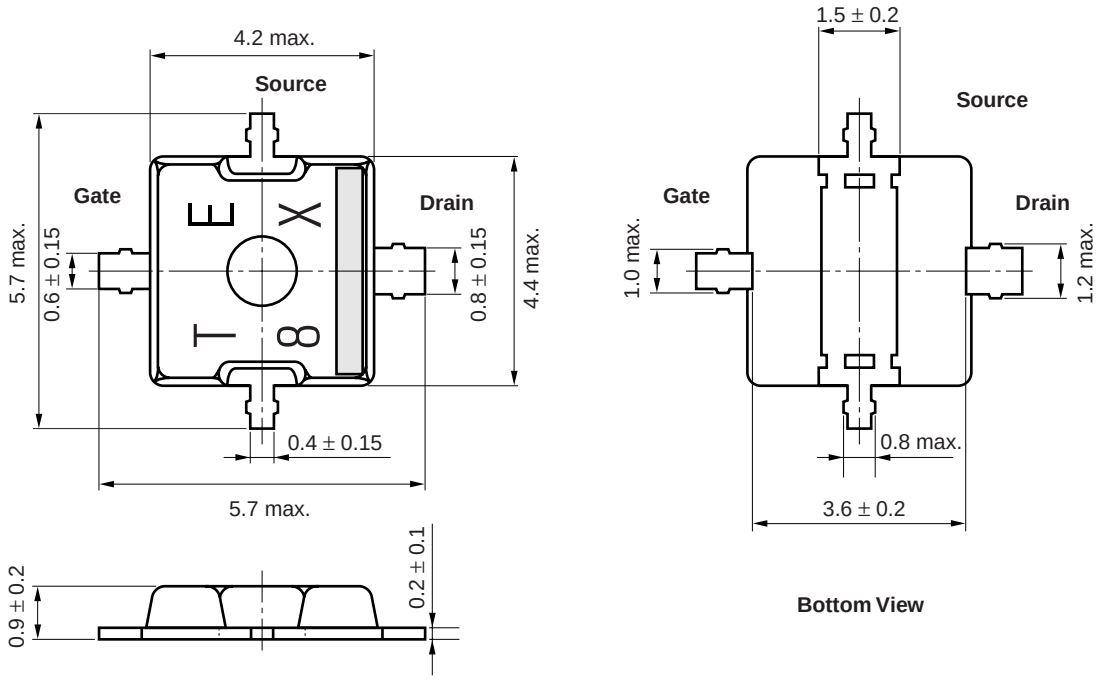
Rg = 30 Ω

Substrate: Teflon glass (εr = 2.6)
t = 0.8 mm

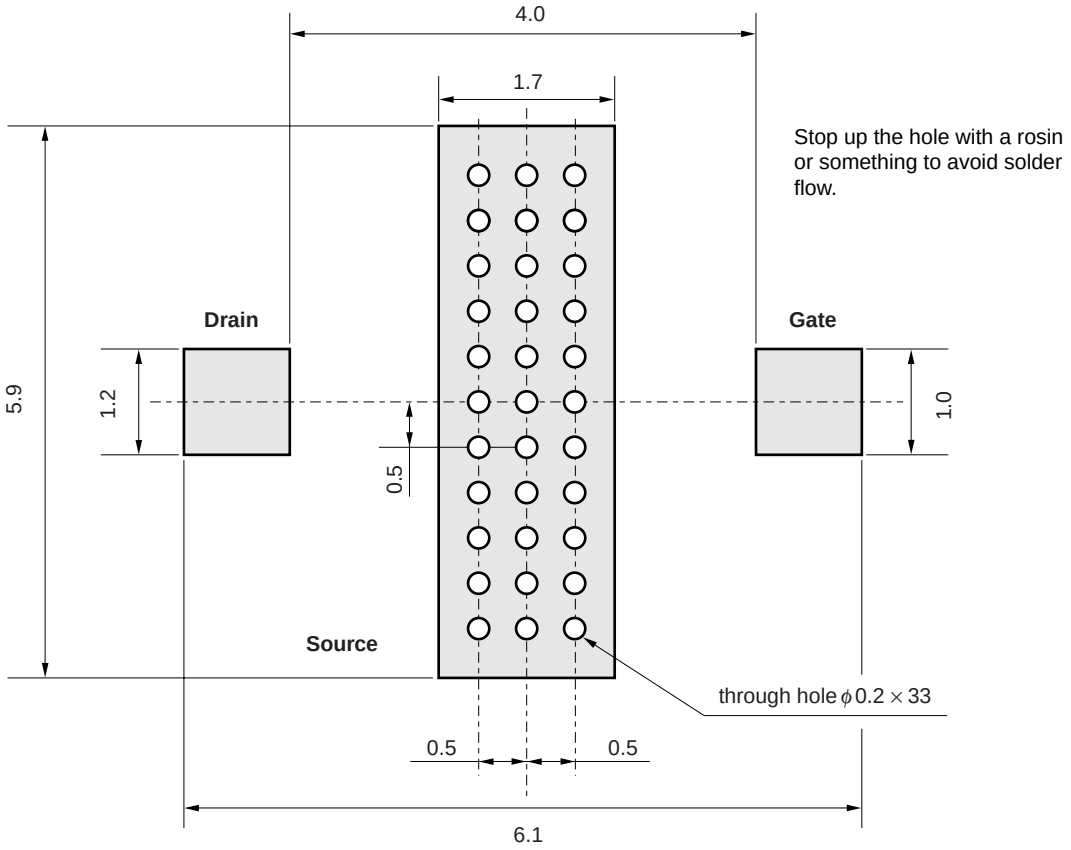
NE6500379A S-PARAMETERS TEST CONDITIONS: V_{DS} = 6.0 V, I_{Dset} = 500 mA

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
MHz	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)
1400	0.950	173.0	0.933	93.1	0.019	54.0	0.833	170.5
1450	0.946	172.6	0.906	91.6	0.020	54.9	0.841	170.5
1500	0.950	171.9	0.884	92.8	0.019	58.1	0.832	169.6
1550	0.947	171.4	0.851	93.3	0.020	58.3	0.837	169.6
1600	0.967	171.6	0.847	94.0	0.020	61.0	0.847	170.2
1650	0.948	170.3	0.818	92.5	0.021	62.7	0.838	168.8
1700	0.946	169.8	0.816	94.8	0.021	63.2	0.835	168.2
1750	0.944	169.0	0.762	93.0	0.022	63.8	0.838	168.0
1800	0.945	168.5	0.787	91.1	0.022	67.7	0.836	166.8
1850	0.947	167.8	0.742	94.4	0.022	66.2	0.833	166.9
1900	0.944	167.1	0.716	88.6	0.024	68.4	0.835	165.6
1950	0.939	166.2	0.704	92.6	0.022	68.5	0.835	165.8
2000	0.945	165.5	0.665	91.1	0.024	69.3	0.831	164.9
2050	0.944	164.9	0.655	93.3	0.023	68.2	0.834	164.5
2100	0.945	163.9	0.641	89.6	0.024	73.0	0.831	162.9
2150	0.936	163.4	0.621	96.7	0.024	69.6	0.828	162.4
2200	0.950	162.4	0.592	91.0	0.026	75.8	0.828	161.7

79A Package Dimensions (Unit: mm)



79A Package Recommended P.C.B. Layout (Unit: mm)



RECOMMENDED SOLDERING CONDITIONS

This product should be soldered under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your NEC sales representative.

Soldering Method	Soldering Conditions	Recommended Condition Symbol
Infrared Reflow	Package peak temperature: 235°C or below Time: 30 seconds or less (at 210°C) Count: 2, Exposure limit[Note]: None	IR35-00-2
Partial Heating	Pin temperature: 260°C Time: 5 seconds or less (per pin row) Exposure limit[Note]: None	–

Note After opening the dry pack, keep it in a place below 25°C and 65% RH for the allowable storage period.

Caution Do not use different soldering methods together (except for partial heating).

Caution

The Great Care must be taken in dealing with the devices in this guide.
The reason is that the material of the devices is GaAs (Gallium Arsenide), which is designated as harmful substance according to the law concerned.
Keep the law concerned and so on, especially in case of removal.

The application circuits and their parameters are for reference only and are not intended for use in actual design-ins.

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