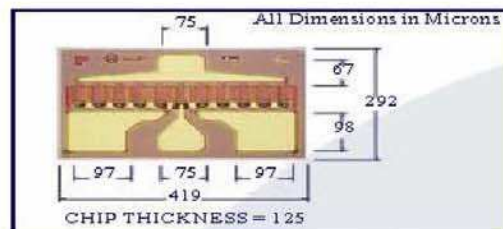


MwT-A9

18 GHz High Gain, Low Noise GaAs FET



DOWNLOAD ADDITIONAL DATA WWW.MWTINC.COM



FEATURES

- IDEAL FOR HIGH DYNAMIC RANGE RECEIVER APPLICATIONS
- 1.6 dB NOISE FIGURE AT 12 GHz
- +24.5 dBm OUTPUT POWER AT 12 GHz
- 9 dB SMALL SIGNAL GAIN AT 12 GHz
- 0.3 MICRON REFRACTORY METAL/GOLD GATE
- 750 MICRON GATE WIDTH
- AVAILABLE IN CHIP AND PACKAGES

DESCRIPTION

The MwT-A9 is a GaAs MESFET device whose nominal quarter-micron gate length and 750 micron gate width make it ideally suited to applications requiring high-gain in the 500 MHz to 18 GHz frequency range with moderate power output while exhibiting low noise figure. The chip is produced using MwT's reliable metal system and devices from each wafer are screened to insure reliability. All chips are passivated using MwT's patented "Diamond-Like Carbon" process for increased durability. Designers can use MwT's unique BIN selection feature to choose devices from narrow I_{dss} ranges, insuring consistent circuit operation.

DC SPECIFICATIONS AT $T_a = 25^\circ\text{C}$

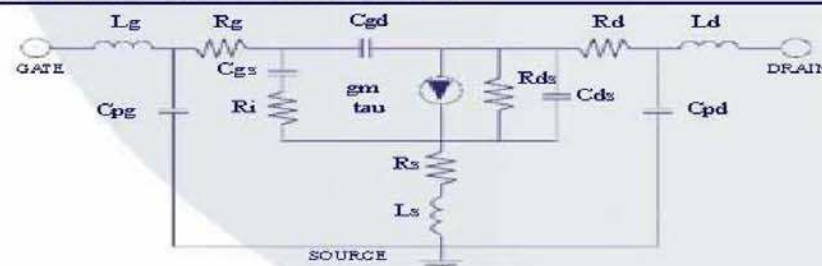
SYMBOL	PARAM. & CONDITIONS	UNITS	MIN	TYP	MAX
I_{DSS}	Saturated Drain Current $V_{ds} = 4.0\text{ V}$ $V_{gs} = 0.0\text{ V}$	mA	78		282
G_m	Transconductance $V_{ds} = 2.0\text{ V}$ $V_{gs} = 0.0\text{ V}$	mS	95	120	
V_p	Pinch-off Voltage $V_{ds} = 3.0\text{ V}$ $I_{DS} = 5.0\text{ mA}$	V		-2.0	-5.0
BV_{GSO}	Gate-to-Source Breakdown Volt. $I_{gs} = -1.0\text{ mA}$	V	-5.0	-10.0	
BV_{GDO}	Gate-to-Drain Breakdown Volt. $I_{gd} = -1.0\text{ mA}$	V	-6.0	-10.0	
R_{th}	Thermal Resistance MwT-A9 Chip, A971 MwT-A970, A973	$^\circ\text{C/W}$		70	175*

*Overall R_{th} depends on case mounting.

RF SPECIFICATIONS AT $T_a = 25^\circ\text{C}$

SYMBOL	PARAMETERS AND CONDITIONS	FREQ	UNITS	MIN	TYP
P_{1dB}	Output Power at 1 dB Compression $V_{DS} = 5.0\text{ V}$ $I_{dss} = 0.6$ $I_{DS} = 120\text{ mA}$	12 GHz	dBm	20.5	22.0
SSG	Small Signal Gain $V_{DS} = 5.0\text{ V}$ $I_{dss} = 0.6$ $I_{DS} = 120\text{ mA}$	12 GHz	dB	8.5	9.0
N_{Fopt}	Optimum Noise Figure $V_{DS} = 3.0\text{ V}$ $I_{DS} = 30\text{ mA}$	12 GHz	dB		1.8
GA	Gain at Optimum Noise Figure $V_{DS} = 3.0\text{ V}$ $I_{DS} = 30\text{ mA}$	12 GHz	dB	6.0	6.5

DEVICE EQUIVALENT CIRCUIT MODEL



PARAMETER	VALUE
Source Resistance	$R_s = 0.80\ \Omega$
Source Inductance	$L_s = 0.04\text{ nH}$
Drain-Source Resistance	$R_{ds} = 100.0\ \Omega$
Drain-Source Capacitance	$C_{ds} = 0.08\text{ pF}$
Drain Resistance	$R_d = 1.0\ \Omega$
Drain Pad Capacitance	$C_{pd} = 0.10\text{ pF}$
Drain Inductance	$L_d = 0.28\text{ nH}$
Gate Bond Wire Inductance	$L_g = 0.10\text{ nH}$
Gate Pad Capacitance	$C_{pg} = 0.03\text{ pF}$
Gate Resistance	$R_g = 0.50\ \Omega$
Gate-Source Capacitance	$C_{gs} = 0.78\text{ pF}$
Channel Resistance	$R_i = 0.8\ \Omega$
Gate-Drain Capacitance	$C_{gd} = 0.10\text{ pF}$
Transconductance	$g_m = 120.0\text{ mS}$
Transit Time	$\tau = 1.0\text{ psec}$

ORDERING INFORMATION

Chip	MwT-A9
Package 70	MwT-A970
Package 71	MwT-A971
Package 73	MwT-A973

NOTE:

For Package information, please see supplementary application note from our website at www.mwtinc.com. When placing an order or inquiry, please specify BIN range, wafer no. if known, and screening level required.

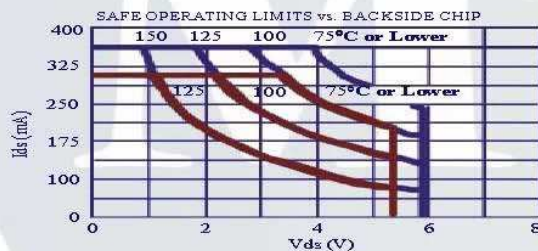
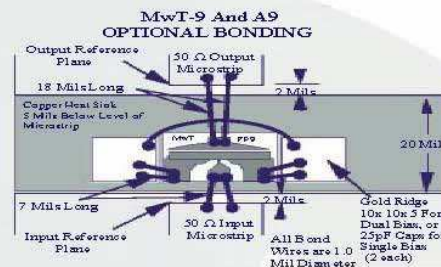
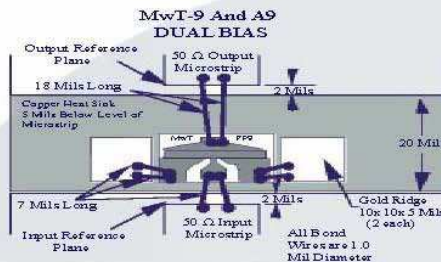
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MwT-A9

18 GHz High Gain, Low Noise

GaAs FET



TYPICAL NOISE PARAMETERS
MwT-A9LN Chip: VDS= 3.0V IDS= 35mA

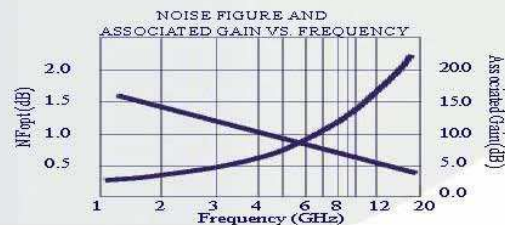
FREQUENCY GHz	NF MIN dB	GAMMA OPT MAG	ANGLE	Rn/50
1.00	0.30	0.83	4.3	0.19
2.00	0.33	0.69	36.8	0.18
4.00	0.62	0.36	73.4	0.19
6.00	0.93	0.32	106.3	0.19
10.00	1.48	0.37	132.0	0.17
12.00	1.73	0.61	167.3	0.17
16.00	2.19	0.68	-169.8	0.16
18.00	2.40	0.71	-160.8	0.15

Absolute Maximum Continuous Maximum

MAXIMUM RATINGS AT Ta = 25°C

SYMBOL	PARAMETER	UNITS	CONT MAX*	ABSOLUTE MAX*
VDS	Drain to Source Voltage	V	See Safe Operating Limits	
Tch	Channel Temperature	°C	+150	+175
Tst	Storage Temperature	°C	-65 to +150	+175
Pin	RF Input Power	mW	240	360

NOTES: 1. Exceeding any one of these limits in continuous operation may reduce the mean time-to-failure below the design goals.
2. Exceeding any one of these limits may cause permanent damage.



Bin Selection Guide

Bin No.	A	B	C	D	E
Idss	78-	114-	150-	198-	234-
Range	114mA	150mA	198mA	234mA	294mA

BIN ACCURACY STATEMENT

When placing order or inquiring, please specify BIN range, wafer no., if known, and screening level required.

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