TOSHIBA

MICROWAVE SEMICONDUCTORS
TECHNICAL DATA

MICROWAVE POWER
GaAs FET

JS9P04-AS

FEATURES:

■HIGH POWER
P1dB= 26. 0dBm @ f = 38GHz

■HIGH GAIN
G1dB= 6. 5dB @ f =38GHz

■CHIP FORM

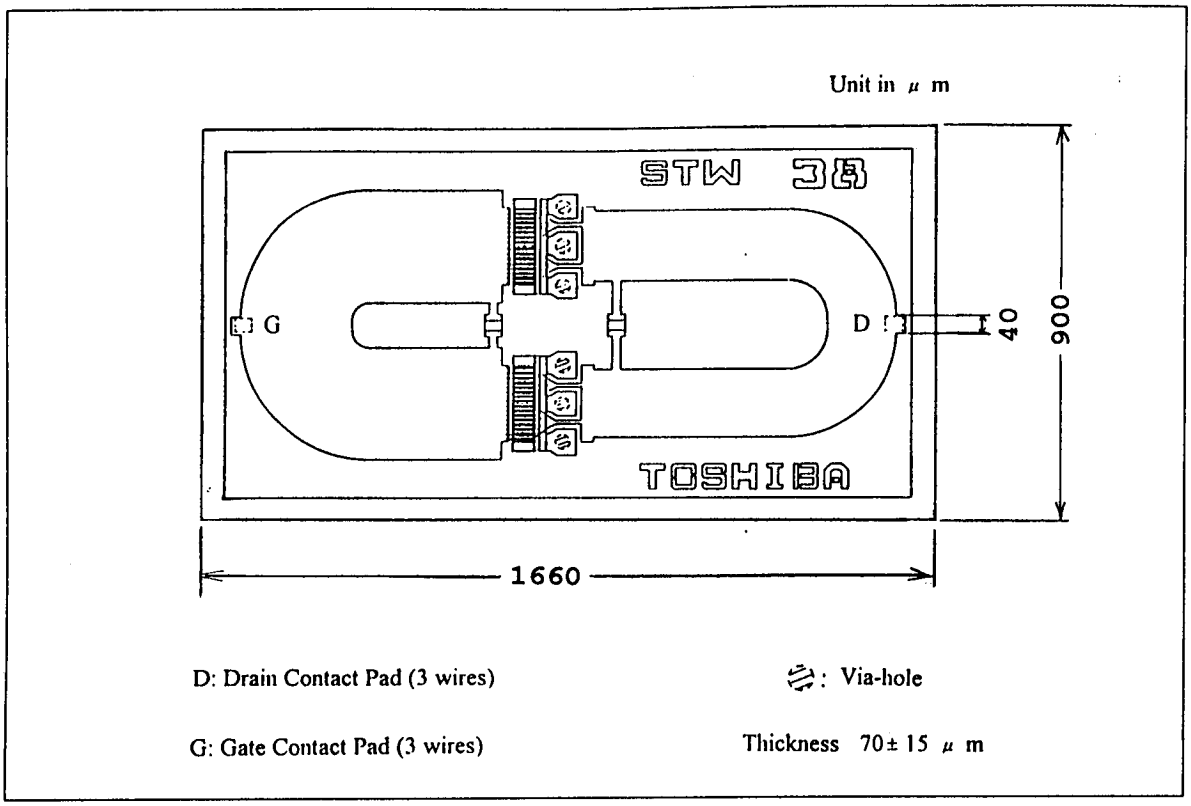
RF PERFORMANCE SPECIFICATIONS (Ta= 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN	TYP.	MAX.
Output Power at 1dB Compression Point	P_{1dB}	VDS= 4.5V f= 38 GHz	dBm	24.5	26.0	-
Power Gain at 1dB Compression Point	G_{1dB}		dB	5.5	6.5	-
Drain Current	I_{DS1}		mA	-	360	600
Power Added Efficiency	η_{add}		%	-	20	-

ELECTRICAL CHARACTERISTICS (Ta= 25°C)

CHARACTERISTICS	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Transconductance	gm	V_{DS}= 2V I_{DS}= 0.2A	mS	-	400	-
Pinch-Off Voltage	V_{GSoff}	V_{DS}= 2V I_{DS}= 3.0mA	V	-0.7	-1.5	-3.0
Saturated Drain Current	I_{DSS}	V_{DS}= 2V V_{GS}= 0V	mA	-	500	800
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS}= -1.6mA	V	-4.5	-	-

CHIP OUTLINE



ASSEMBLY PRECAUTIONS FOR CHIP

The operations must be performed in a clean and dry environment. This chips must be kept in the same environment when they are not used. All test instruments , assembly machines , benches , tweezers and operators should be grounded to avoid damage due to electrostatic discharge. Careful attention must be paid in handling chips with tweezers because GaAs is more brittle than Si .

DIE ATTACHMENT

Die attachment can be accomplished with Au-Sn preform in nitrogen atmosphere. The operating temperature must be 290±10℃ for the preform to be well melted. The operating time should be kept within one minute.

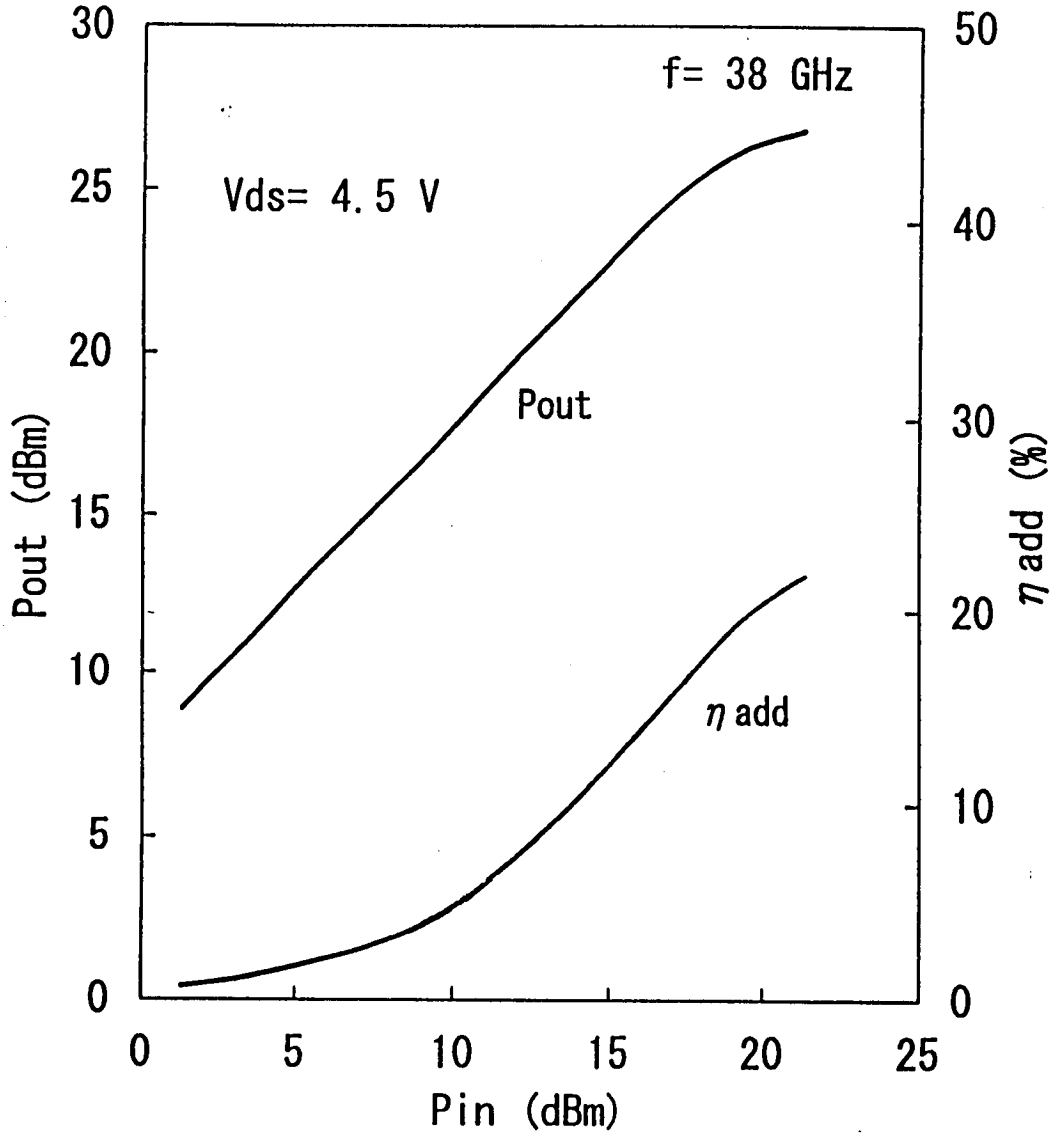
WIRE BONDING

Bonding should be performed with thermal compression wedge bonder in nitrogen atmosphere. The recommended condition of wire bonding are as follows :

(1)Operating temperature ····· 200±10℃
(2)Operating time ····· 5 minutes max.
(3)Bonding wire····· 25μm diameter pure Au

OUTPUT POWER CHARACTERISTIC

Output Power vs. Input Power



S-Parameter of JS9P04-AS

VDS=4.5V,IDS=300mA

Freq.	S11		S21		S12		S22	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
30.0	0.92	126.9	0.63	-84.5	0.039	-130.9	0.85	134.4
30.5	0.91	123.0	0.67	-89.0	0.042	-133.8	0.85	131.2
31.0	0.90	118.7	0.70	-93.6	0.046	-137.0	0.84	128.5
31.5	0.89	115.3	0.73	-98.0	0.048	-141.5	0.82	124.9
32.0	0.88	112.7	0.77	-102.0	0.051	-143.0	0.82	121.5
32.5	0.87	109.4	0.81	-106.4	0.056	-146.4	0.81	118.1
33.0	0.87	107.6	0.86	-110.3	0.062	-149.7	0.81	115.0
33.5	0.88	104.3	0.92	-114.7	0.065	-159.2	0.81	113.2
34.0	0.88	102.8	1.00	-117.9	0.066	-157.0	0.80	111.7
34.5	0.86	101.1	1.11	-122.3	0.084	-159.3	0.78	109.6
35.0	0.84	98.2	1.21	-129.0	0.093	-168.5	0.77	105.2
35.5	0.81	94.9	1.36	-133.6	0.102	-173.8	0.74	102.6
36.0	0.77	90.2	1.57	-141.1	0.121	-180.0	0.71	97.3
36.5	0.69	83.8	1.83	-150.4	0.144	171.2	0.65	91.2
37.0	0.57	72.9	2.14	-163.3	0.171	159.3	0.53	81.0
37.5	0.40	58.1	2.43	-178.9	0.201	144.7	0.38	66.0
38.0	0.18	26.5	2.62	162.8	0.223	127.0	0.20	43.2
38.5	0.13	-97.1	2.62	143.9	0.231	107.8	0.09	-60.5
39.0	0.31	-143.9	2.39	125.0	0.218	89.3	0.25	-130.1
39.5	0.43	-158.2	2.13	111.5	0.192	75.1	0.35	-150.4

Including bonding wire inductances