

TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

S8836A

FEATURES:

- HIGH POWER
 $P_{1dB} = 29.5 \text{ dBm}$ at $f = 8 \text{ GHz}$
- HIGH GAIN
 $G_{1dB} = 7.5 \text{ dB}$ at $f = 8 \text{ GHz}$
- SUITABLE FOR C-BAND AMPLIFIER
- ION IMPLANTATION

RF PERFORMANCE SPECIFICATIONS ($T_a = 25^\circ\text{C}$)

TYPE NUMBER (PACKAGE CODE)				S8836A (2-7C1B)		
CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Com- pression Point	P_{1dB}	$V_{DS} = 10V$ $f = 8\text{GHz}$	dBm	28.5	29.5	-
Power Gain at 1dB Com- pression Point	G_{1dB}		dB	6.5	7.5	-
Drain Current	I_{DS}		A	-	0.25	0.4
Power Added Efficiency	η_{add}		%	-	30	-

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

TYPE NUMBER (PACKAGE CODE)				S8836A (2-7C1B)		
CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Trans- conductance	g_m	$V_{DS} = 3V$ $I_{DS} = 0.28A$	mS	-	170	-
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 5mA$	V	-2	-3.5	-5
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V$ $V_{GS} = 0V$	A	-	0.55	0.7
Gate to Source Breakdown Voltage	V_{GSO}	$I_{GS} = -10\mu A$	V	-5	-	-
Thermal Resistance	$R_{th(c-c)}$	Channel to case	$^\circ\text{C/W}$	-	20	30

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TOSHIBA CORPORATION

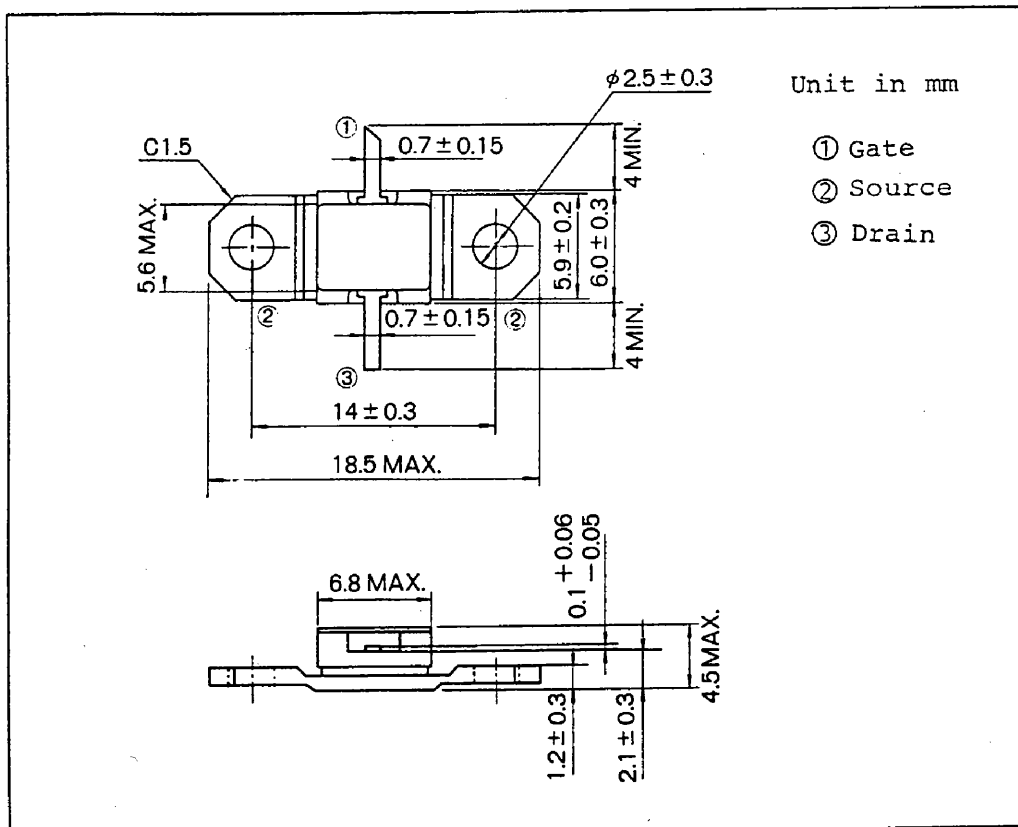
Revised May 1989

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ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

TYPE NUMBER (PACKAGE CODE)			S8836A (2-7C1B)
CHARACTERISTIC	SYMBOL	UNIT	RATING
Drain-Source Voltage	V_{DS}	V	15
Gate-Source Voltage	V_{GS}	V	-5
Drain Current	I_D	A	0.7
Total Power Dissipation ($T_c=25^\circ\text{C}$)	P_T	W	5.0
Channel Temperature	T_{ch}	$^\circ\text{C}$	175
Storage Temperature	T_{stg}	$^\circ\text{C}$	-65~175

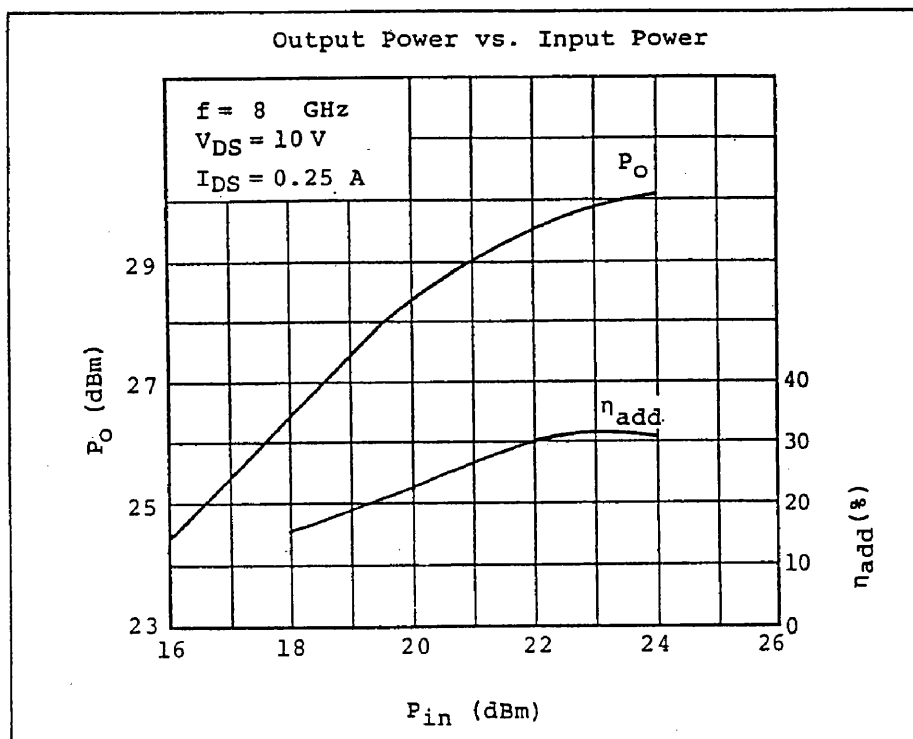
PACKAGE OUTLINE (2-7C1B)



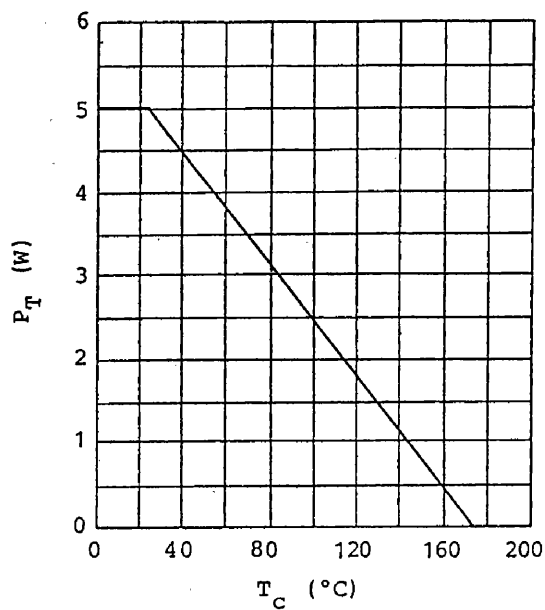
HANDLING PRECAUTIONS FOR PACKAGED TYPE

Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C .

OUTPUT POWER CHARACTERISTIC



POWER DISSIPATION VS. CASE TEMPERATURE



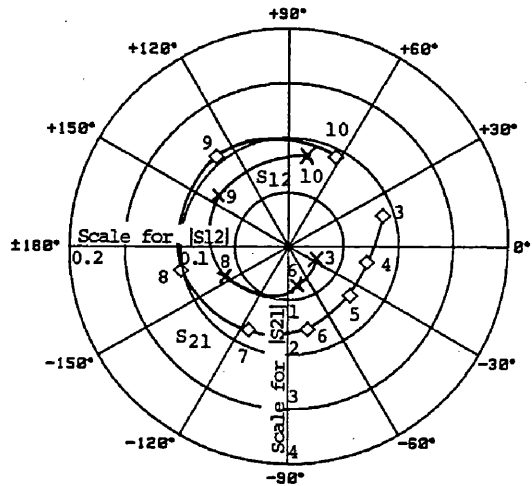
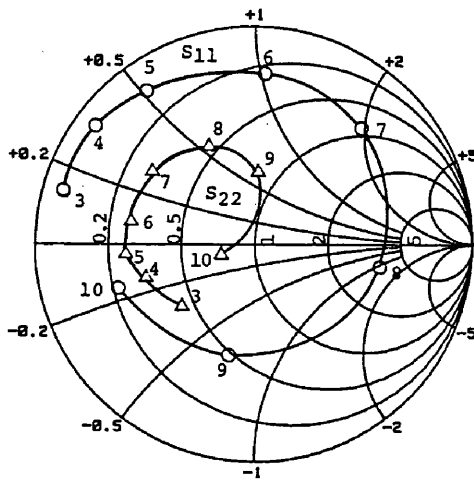
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S8836A S-PARAMETERS

(MAGN. and ANGLES)

$V_{DS} = 10 \text{ V}$, $I_{DS} = 226 \text{ mA}$

$f = 3 - 10 \text{ GHz}$



FREQUENCY (GHz)	S_{11}		S_{12}		S_{21}		S_{22}	
3	0.91	164	0.027	-22	1.79	19	0.44	-139
4	0.91	143	0.026	-35	1.43	-11	0.52	-163
5	0.86	125	0.029	-51	1.43	-39	0.59	-176
6	0.79	87	0.036	-78	1.56	-77	0.57	169
7	0.72	48	0.045	-106	1.70	-116	0.58	144
8	0.58	-10	0.065	-155	2.04	-168	0.50	115
9	0.52	-103	0.081	144	2.15	129	0.34	88
10	0.65	-162	0.086	79	1.86	63	0.16	-164