

TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

S8838A

FEATURES:

- HIGH POWER
 $P_{1dB} = 33.5 \text{ dBm}$ at $f = 8 \text{ GHz}$
- HIGH GAIN
 $G_{1dB} = 5.5 \text{ dB}$ 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)				S8838A (2-7C1B)		
CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	P_{1dB}	$V_{DS} = 10\text{V}$ $f = 8 \text{ GHz}$	dBm	32.5	33.5	-
Power Gain at 1dB Compression Point	G_{1dB}		dB	4.5	5.5	-
Drain Current	I_{DS}		A	-	0.65	1.0
Power Added Efficiency	η_{add}		%	-	25	-

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

TYPE NUMBER (PACKAGE CODE)				S8838A (2-7C1B)		
CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Trans-conductance	g_m	$V_{DS} = 3\text{V}$ $I_{DS} = 0.8\text{A}$	mS	-	500	-
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3\text{V}$ $I_{DS} = 10\text{mA}$	V	-2	-3.5	-5
Saturated Drain Current	I_{DSS}	$V_{DS} = 3\text{V}$ $V_{GS} = 0\text{V}$	A	-	1.6	2.0
Gate to Source Breakdown Voltage	V_{GSO}	$I_{GS} = -30\mu\text{A}$	V	-5	-	-
Thermal Resistance	$R_{th(c-c)}$	Channel to case	$^\circ\text{C/W}$	-	10	15

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- * The information contained herein may be changed without prior notice. It is therefore advisable to contact TOSHIBA before proceeding with the design of equipment incorporating this product.

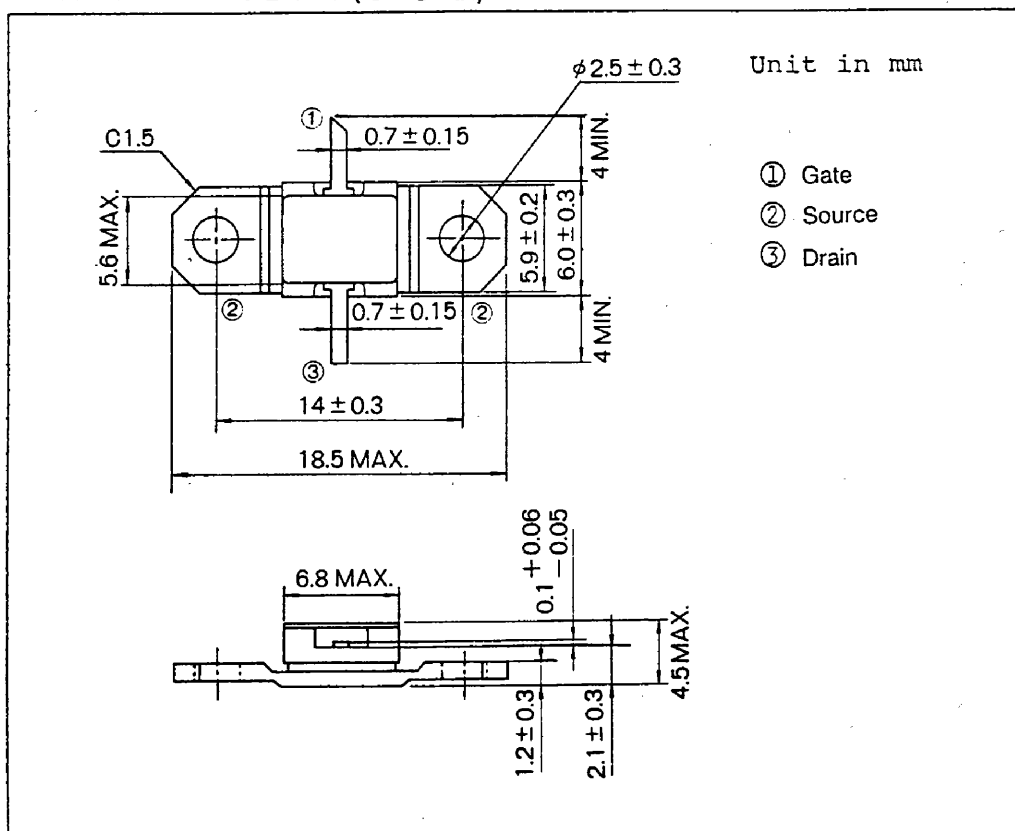


S8838A

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

TYPE NUMBER (PACKAGE CODE)			S8838A (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	2.0
Total Power Dissipation ($T_c = 25^\circ\text{C}$)	P_T	W	10
Channel Temperature	T_{ch}	$^\circ\text{C}$	175
Storage Temperature	T_{stg}	$^\circ\text{C}$	-65~175

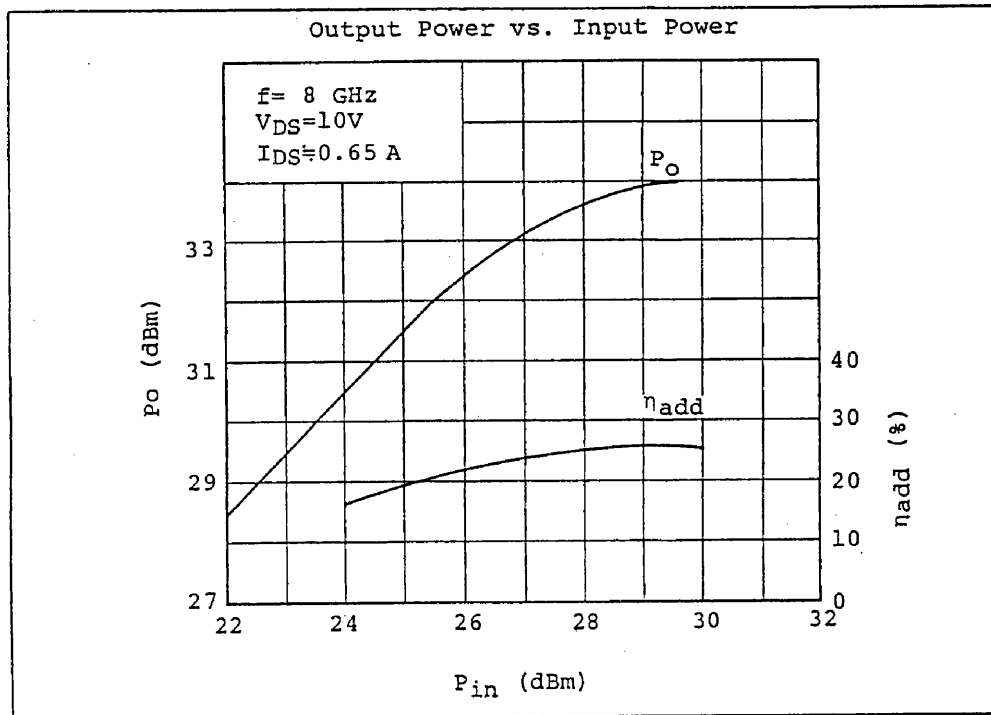
PACKAGE OUTLINE (2-7C1B)



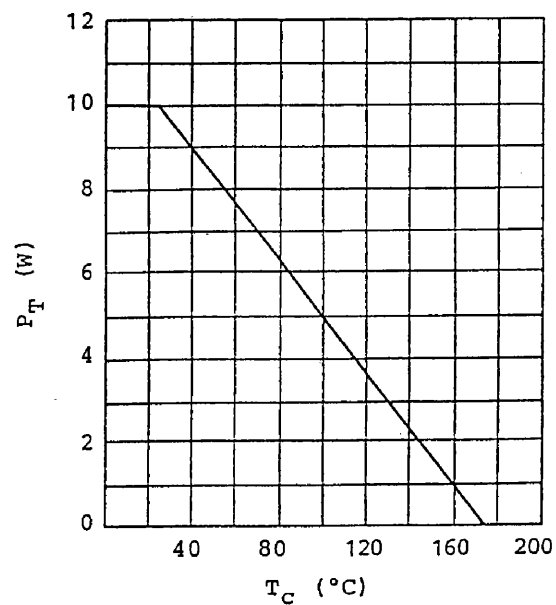
HANDLING PRECAUTIONS FOR PACKAGED TYPE

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

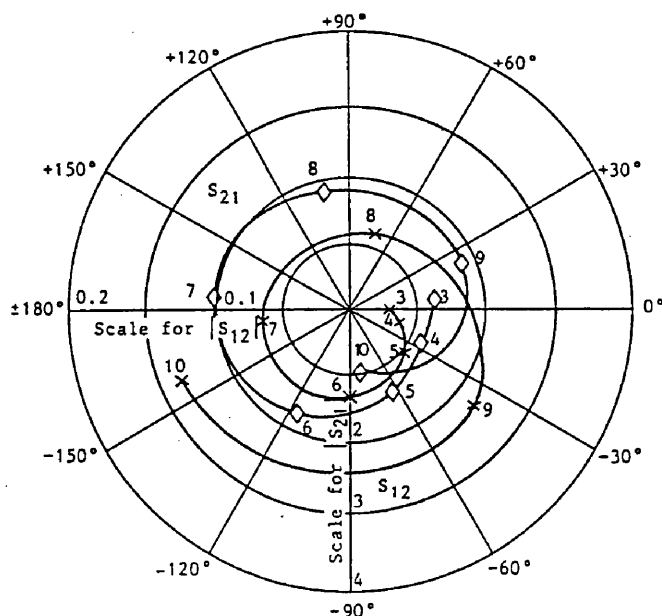
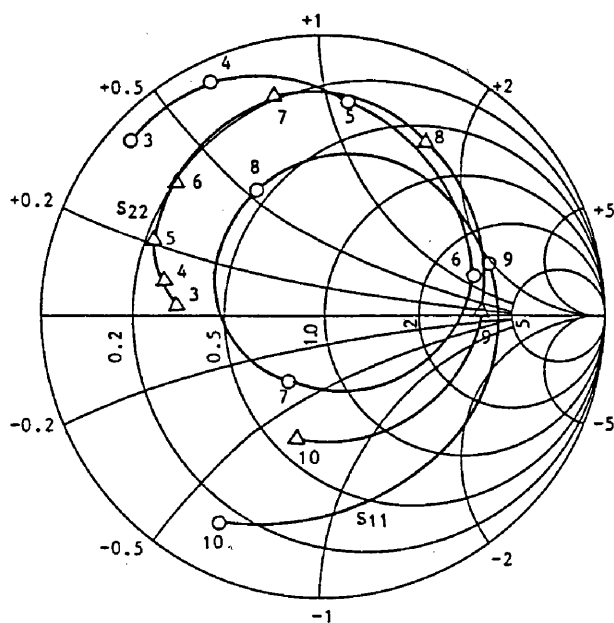


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S8838A S-PARAMETERS (MAGN. and ANGLES)

$V_{DS} = 10 \text{ V}$, $I_{DS} = 650 \text{ mA}$

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



FREQUENCY (GHz)	S_{11}		S_{12}		S_{21}		S_{22}	
3	0.92	137	0.031	1	1.29	6	0.52	176
4	0.90	115	0.038	-12	1.17	-26	0.58	167
5	0.76	83	0.053	-39	1.43	-63	0.66	156
6	0.55	15	0.068	-90	1.78	-116	0.71	137
7	0.26	-119	0.064	-172	2.06	175	0.80	102
8	0.51	117	0.059	70	1.82	101	0.71	59
9	0.61	18	0.119	-40	1.85	23	0.57	2
10	0.81	-117	0.135	-157	0.91	-83	0.45	-102