

TOSHIBA

MICROWAVE SEMICONDUCTOR

TECHNICAL DATA

MICROWAVE POWER GaAs FET

S8851

FEATURES:

- HIGH POWER
 $P_{1dB} = 24 \text{ dBm}$ at $f = 15 \text{ GHz}$
- HIGH GAIN
 $G_{1dB} = 8 \text{ dB}$ at $f = 15 \text{ GHz}$
- SUITABLE FOR Ku-BAND AMPLIFIER
- ION IMPLANTATION

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

TYPE NUMBER (PACKAGE CODE)				S8851 (2-3K1B)		
CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	P_{1dB}	$V_{DS} = 10V$ $f = 15GHz$	dBm	23.0	24.0	-
Power Gain at 1dB Compression Point	G_{1dB}		dB	7.0	8.0	-
Drain Current	I_{DS}		A	-	0.08	0.14
Power Added Efficiency	η_{add}		%	-	26	-

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

TYPE NUMBER (PACKAGE CODE)				S8851 (2-3K1B)		
CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Trans-conductance	g_m	$V_{DS} = 3V$ $I_{DS} = 0.09A$	mS	-	60	-
Pinch-off Voltage	V_{GSoff}	$V_{DS} = 3V$ $I_{DS} = 3mA$	V	-2.5	-3.5	-5
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V$ $V_{GS} = 0V$	A	-	0.2	0.25
Gate to Source Breakdown Voltage	V_{GSO}	$I_{GS} = -3\mu A$	V	-5	-	-
Thermal Resistance	$R_{th(c-c)}$	Channel to case	$^\circ\text{C/W}$	-	40	75

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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.

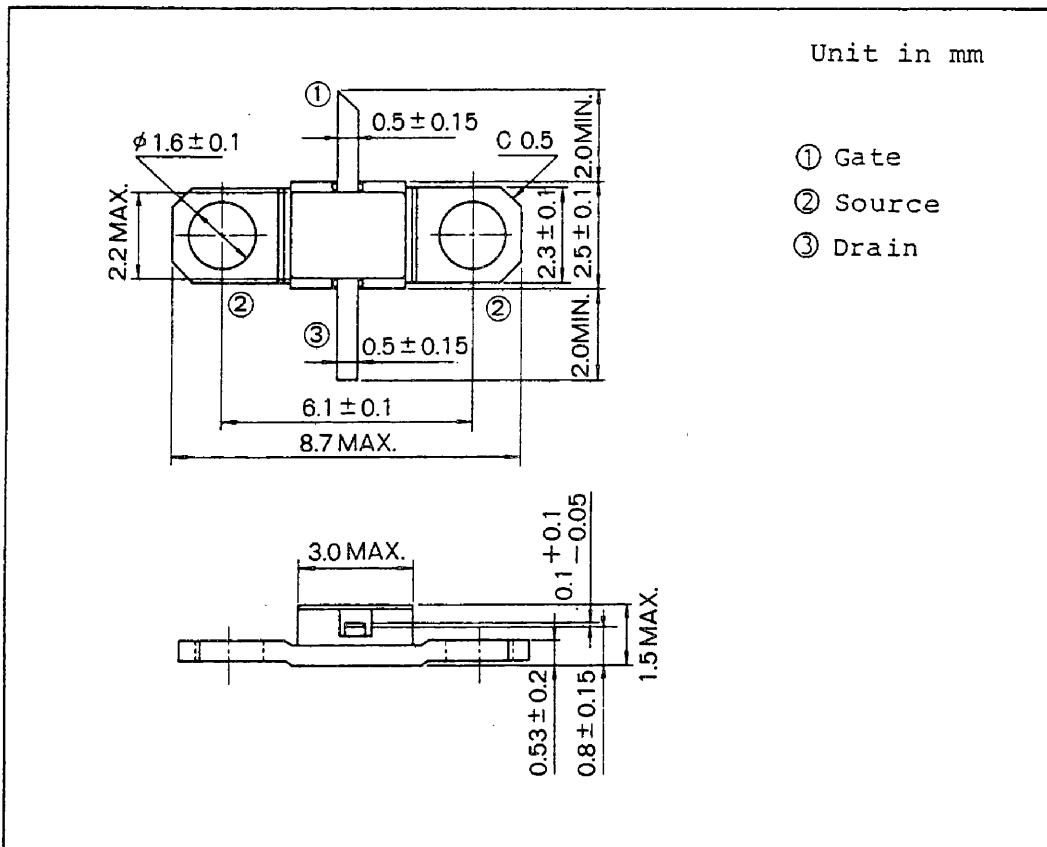


S8851

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

TYPE NUMBER (PACKAGE CODE)			S8851 (2-3K1B)
CHARACTERISTIC	SYMBOL	UNIT	RATING
Drain-Source Voltage	V _{DS}	V	15
Gate-Source Voltage	V _{GS}	V	-5
Drain Current	I _D	A	0.25
Total Power Dissipation (Tc=25°C)	P _T	W	2
Channel Temperature	T _{ch}	°C	175
Storage Temperature	T _{stg}	°C	-65~125

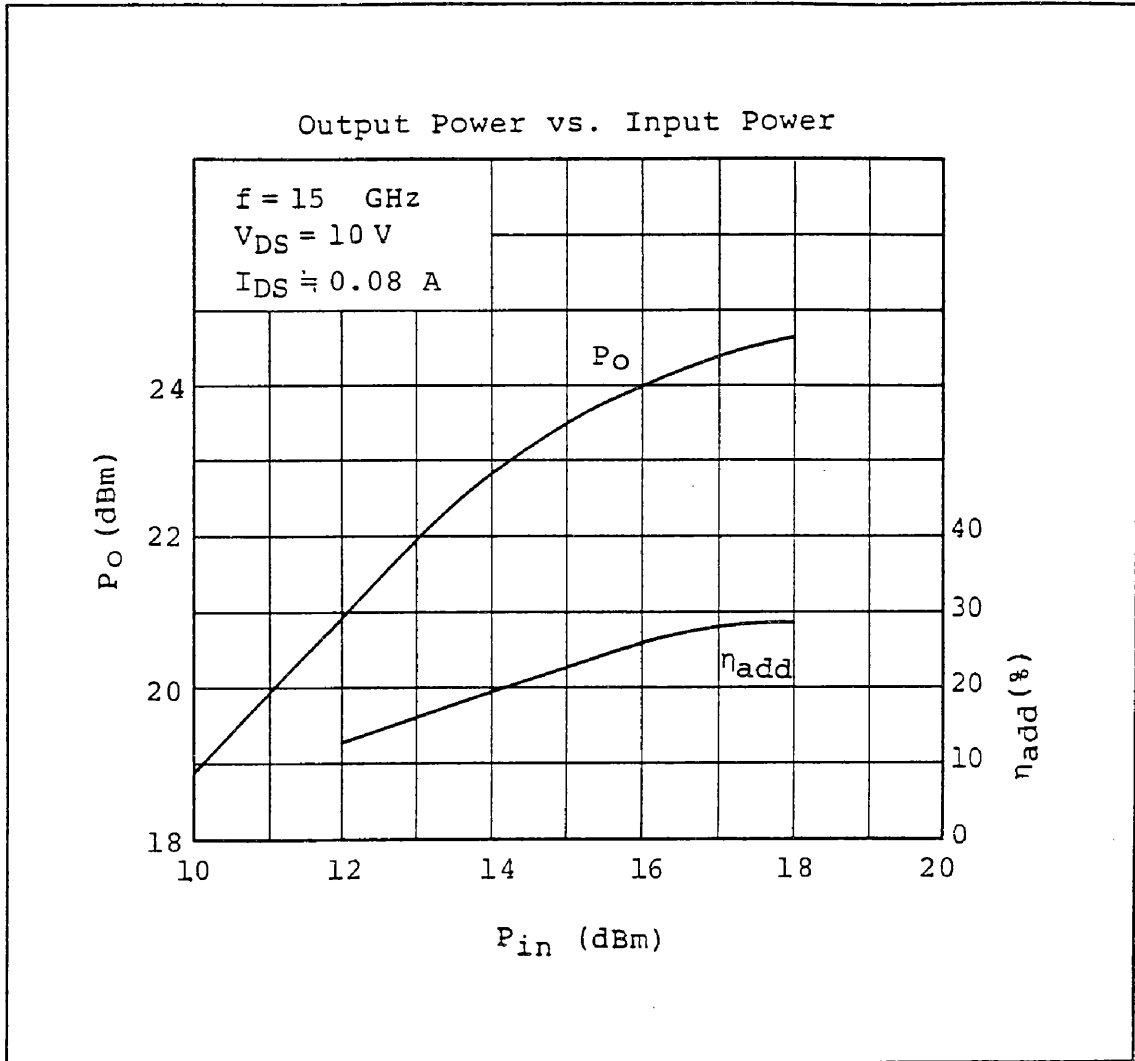
PACKAGE OUTLINE (2-3K1B)



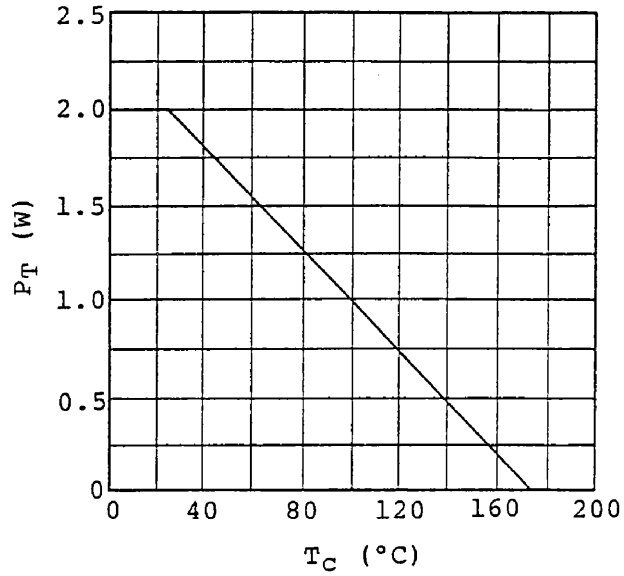
HANDLING PRECAUTIONS FOR PACKAGED TYPE

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

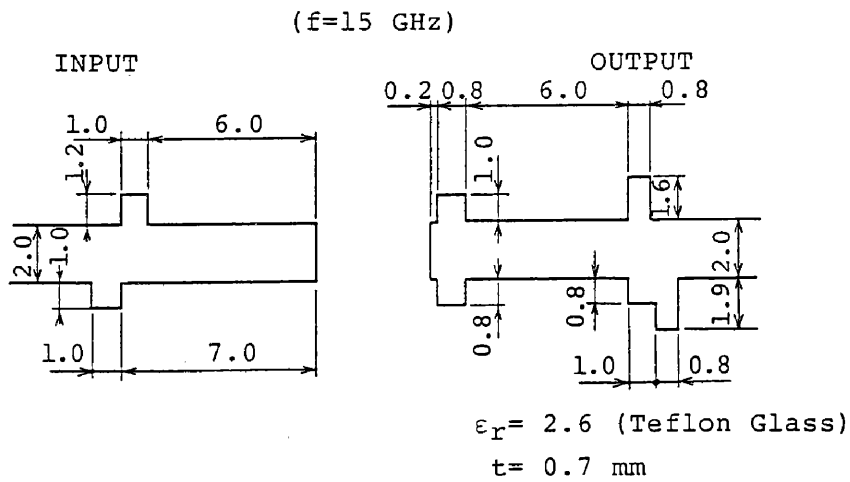
OUTPUT POWER CHARACTERISTICS



POWER DISSIPATION VS. CASE TEMPERATURE



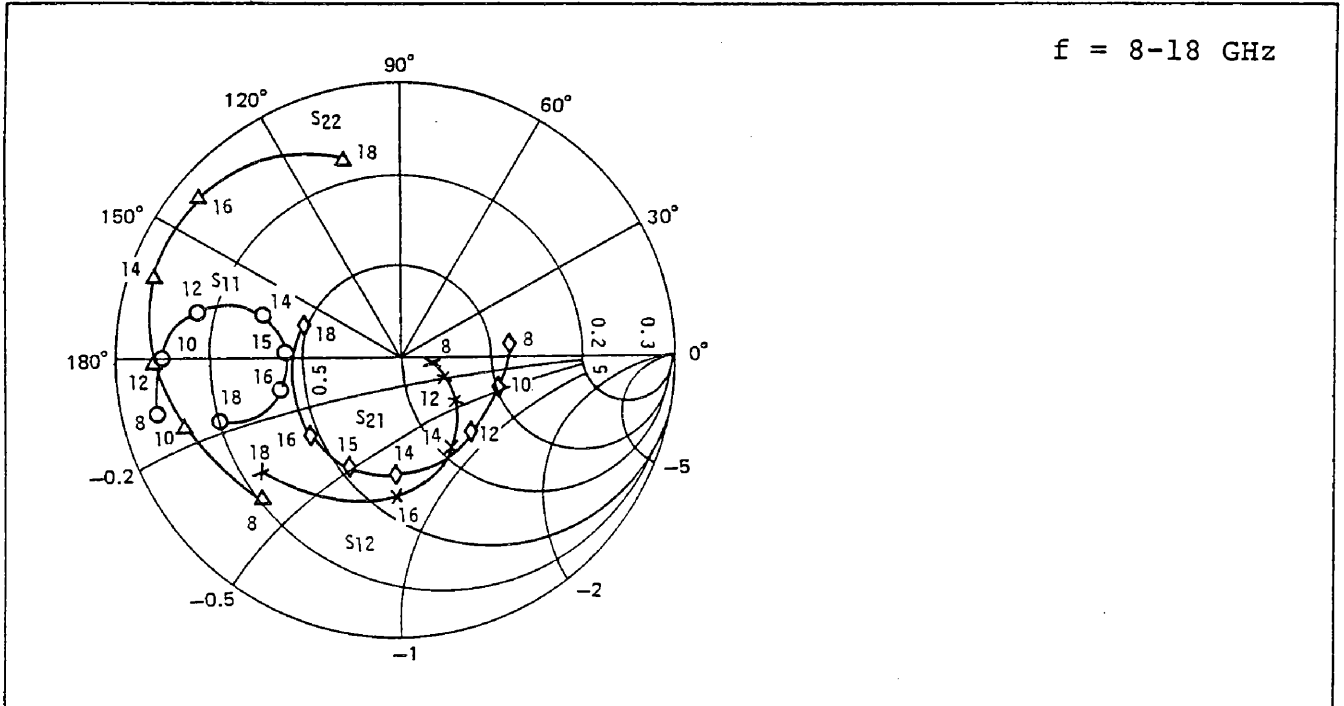
DRAWING OF MATCHING NETWORK FOR S8851



S8851

S8851 S-PARAMETERS (MAGN. and ANGLES)

$V_{DS} = 10 \text{ V}$, $I_{DS} = 100 \text{ mA}$



FREQUENCY (GHz)	S ₁₁		S ₁₂		S ₂₁		S ₂₂	
8	0.88	-167	0.037	-5	1.17	7	0.70	-136
9	0.86	-179	0.043	-12	1.11	-4	0.75	-152
10	0.84	180	0.050	-20	1.10	-18	0.80	-163
11	0.81	173	0.061	-28	1.05	-30	0.83	-172
12	0.75	166	0.075	-36	1.08	-45	0.87	-178
13	0.65	162	0.091	-47	1.18	-67	0.90	172
14	0.51	162	0.109	-60	1.22	-92	0.92	161
15	0.40	178	0.126	-75	1.27	-116	0.92	152
16	0.44	-166	0.146	-92	1.24	-140	0.91	140
17	0.54	-157	0.164	-116	1.15	-170	0.87	125
18	0.68	-162	0.188	-142	1.07	161	0.72	106