

# TOSHIBA

## MICROWAVE SEMICONDUCTOR

### TECHNICAL DATA

MICROWAVE POWER GaAs FET

**S8855**

#### FEATURES:

- HIGH POWER  
 $P_{1dB} = 31.5 \text{ dBm}$  at  $f = 15 \text{ GHz}$
- HIGH GAIN  
 $G_{1dB} = 6.5 \text{ dB}$  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)				S8855 (2-4J1B)		
CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Output Power at 1dB Compression Point	$P_{1dB}$	$V_{DS} = 10V$  $f = 15GHz$	dBm	30.5	31.5	-
Power Gain at 1dB Compression Point	$G_{1dB}$		dB	5.5	6.5	-
Drain Current	$I_{DS}$		A	-	0.48	0.7
Power Added Efficiency	$\eta_{add}$		%	-	23	-

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

TYPE NUMBER (PACKAGE CODE)				S8855 (2-4J1B)		
CHARACTERISTIC	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Trans-conductance	$g_m$	$V_{DS} = 3V$ $I_{DS} = 0.5A$	mS	-	300	-
Pinch-off Voltage	$V_{GSoff}$	$V_{DS} = 3V$ $I_{DS} = 15mA$	V	-2.5	-3.5	-5
Saturated Drain Current	$I_{DSS}$	$V_{DS} = 3V$ $V_{GS} = 0V$	A	-	1.0	1.3
Gate to Source Breakdown Voltage	$V_{GSO}$	$I_{GS} = -15\mu A$	V	-5	-	-
Thermal Resistance	$R_{th(c-c)}$	Channel to case	$^\circ\text{C/W}$	-	10	16.7

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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.

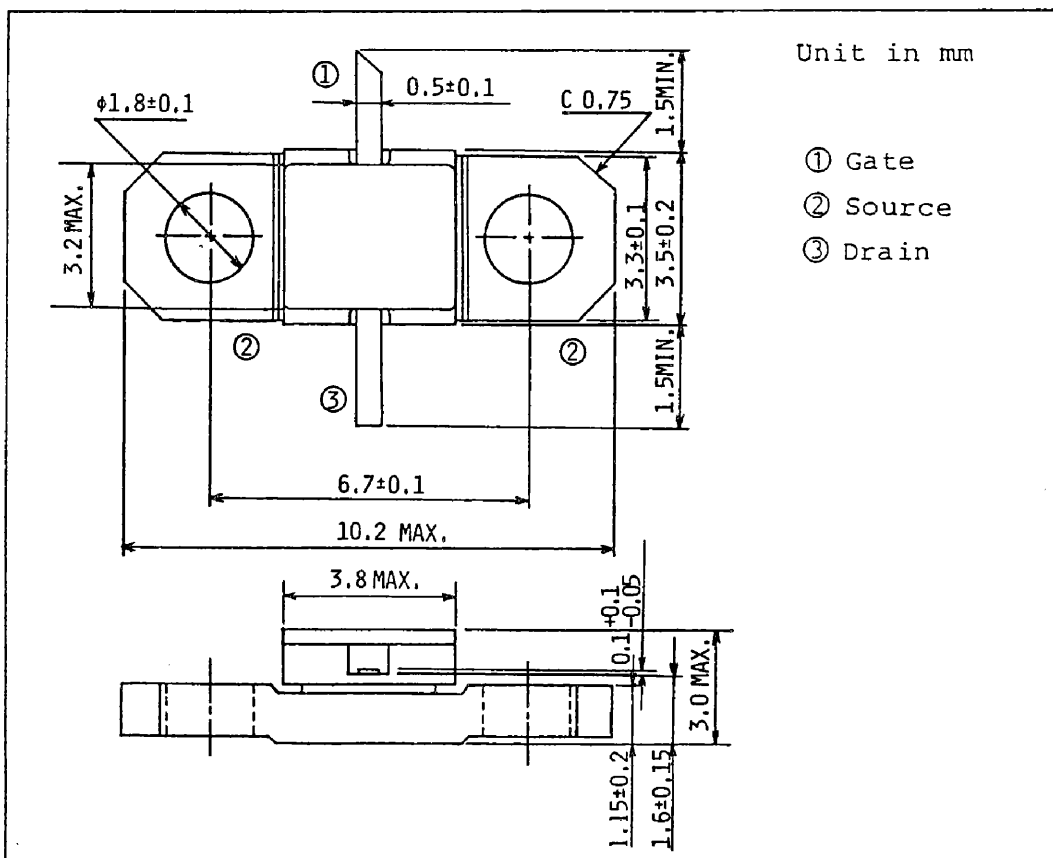


# S8855

## ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

TYPE NUMBER (PACKAGE CODE)			S8855 (2-4J1B)
CHARACTERISTIC	SYMBOL	UNIT	RATING
Drain-Source Voltage	$V_{DS}$	V	15
Gate-Source Voltage	$V_{GS}$	V	-5
Drain Current	$I_D$	A	1.3
Total Power Dissipation (Tc=25°C)	$P_T$	W	9
Channel Temperature	$T_{ch}$	°C	175
Storage Temperature	$T_{stg}$	°C	-65 ~ 175

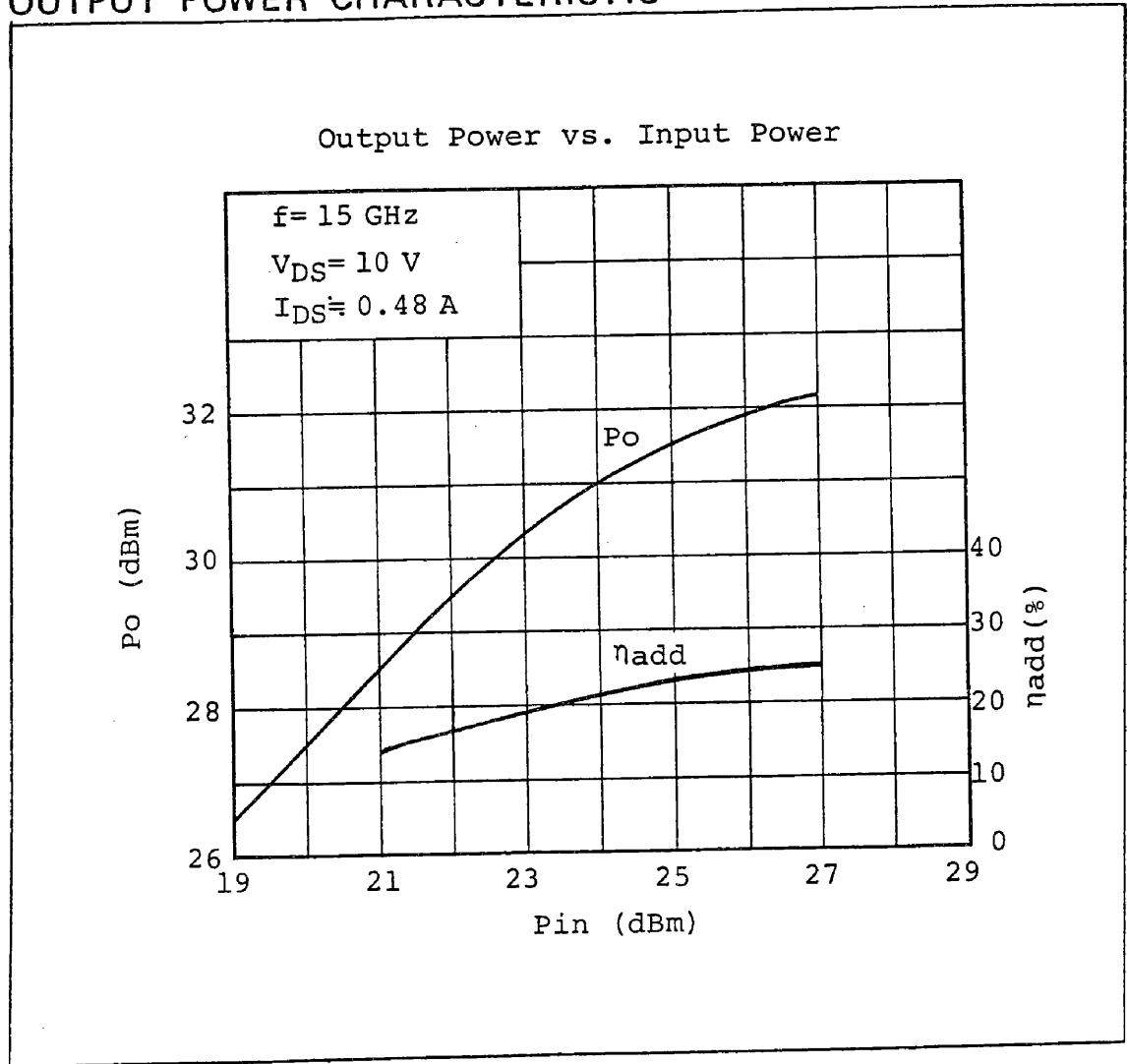
## PACKAGE OUTLINE (2-4 J1B)



### HANDLING PRECAUTIONS FOR PACKAGED TYPE

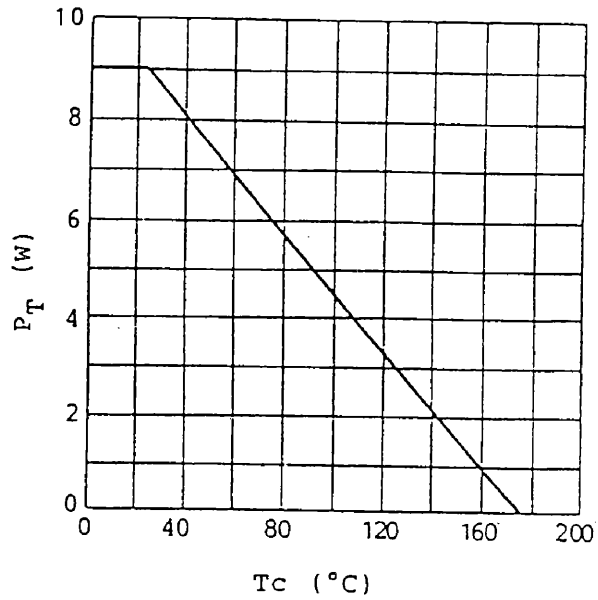
Soldering iron should be grounded and the operating time should not exceed 10 seconds at 260°C.

OUTPUT POWER CHARACTERISTIC



# S8855

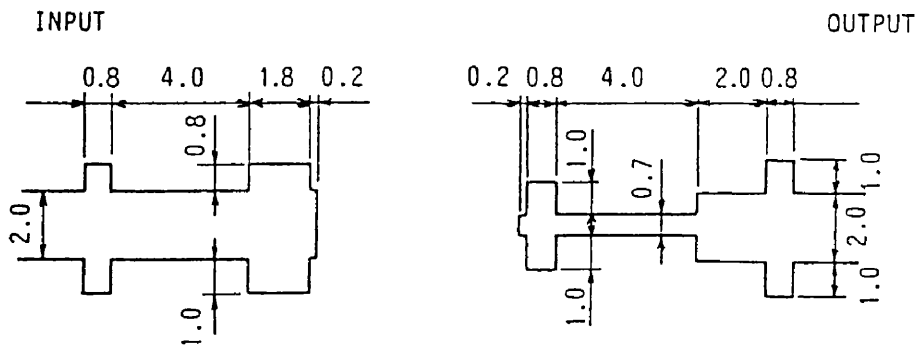
## POWER DISSIPATION VS. CASE TEMPERATURE



## DRAWING OF MATCHING NETWORK FOR S8855

Unit in mm

(f = 15 GHz)

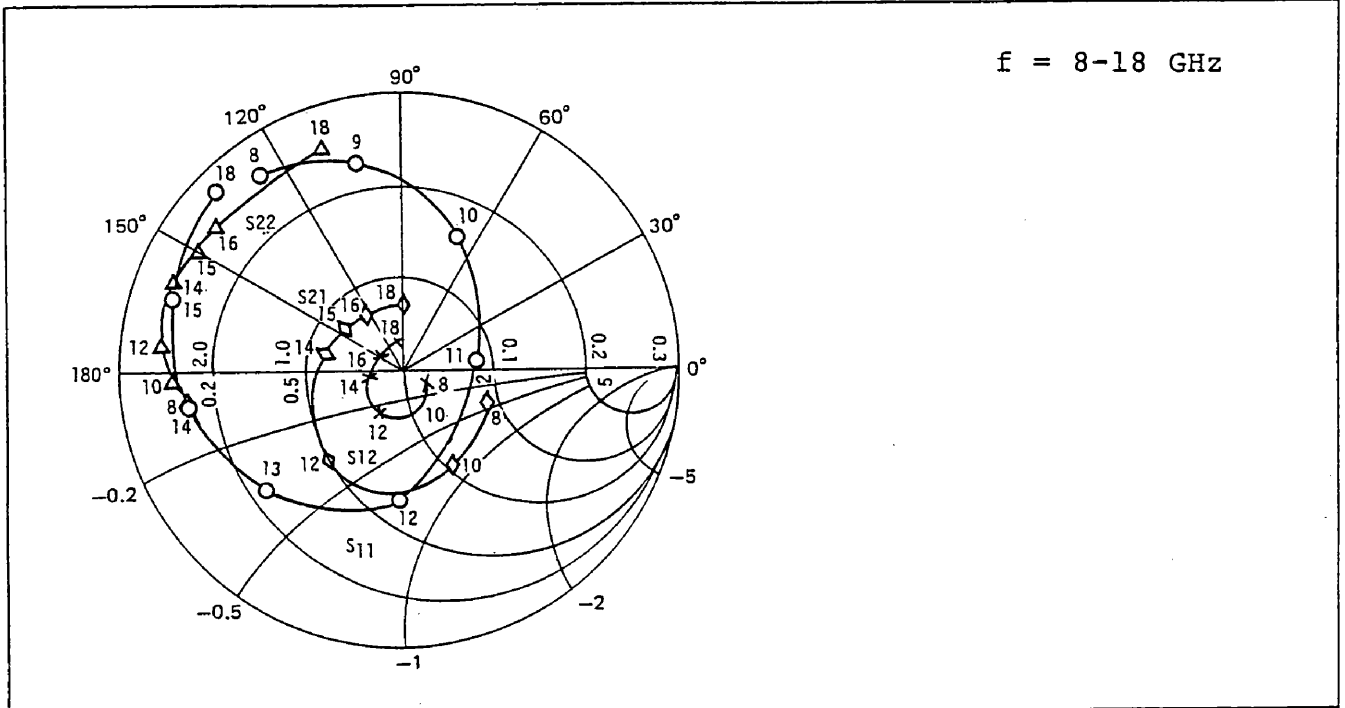


$\epsilon_r = 2.6$  (Teflon Glass)  
 $t = 0.7$  mm

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## S8855 S-PARAMETERS (MAGN. and ANGLES)

$V_{DS} = 10 \text{ V}$ ,  $I_{DS} = 400 \text{ mA}$



FREQUENCY (GHz)	S <sub>11</sub>		S <sub>12</sub>		S <sub>21</sub>		S <sub>22</sub>	
8	0.85	126	0.031	-32	0.95	-21	0.77	-172
9	0.75	102	0.035	-45	1.05	-43	0.80	-174
10	0.51	69	0.042	-60	1.13	-63	0.82	-177
11	0.27	6	0.051	-83	1.35	-94	0.86	178
12	0.41	-93	0.052	-119	1.24	-131	0.87	174
13	0.65	-140	0.044	-148	1.01	-163	0.87	168
14	0.77	-170	0.039	-173	0.85	171	0.86	159
15	0.86	162	0.031	162	0.75	146	0.84	150
16	0.87	154	0.027	147	0.70	126	0.82	142
17	0.90	144	0.029	129	0.66	107	0.81	131
18	0.91	136	0.032	100	0.64	94	0.82	110