

MOS FET Power Amplifier Module for Handy Mobile Phone

MOS FET Power Amplifier FOR AMPS 824 ~ 849 MHz

■ FEATURES

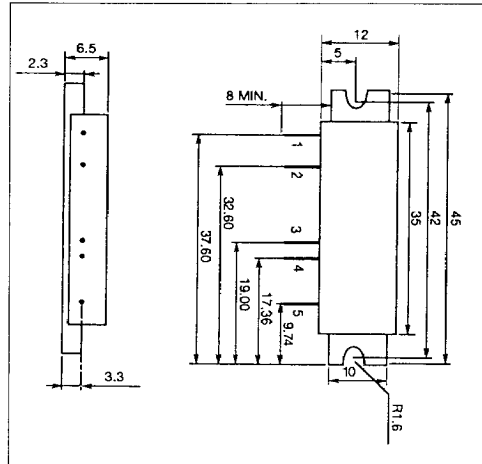
- Small outline $12 \times 45 \times 6.5 \text{ mm}^3$
- Low voltage operation 6V
- Low power control current $300 \mu\text{A}$
- High stability load VSWR ≥ 20

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

Item	Symbol	Rating	Unit
Supply Voltage	V_{DD}	12	V
Supply Current	I_{DD}	2	A
APC Voltage	V_{APC}	± 8	V
Input Power	P_{in}	20	mW
Operating Case Temperature	$T_{C(op)}$	$-30 \sim +100$	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-30 \sim +100$	$^\circ\text{C}$

The absolute maximum ratings are limiting values, to be applied individually, beyond which the device may be permanently damaged. Functional operation under any of these conditions is not guaranteed. Exposing a circuit to its absolute maximum rating for extended periods of time may affect the device's reliability.

■ OUTLINE DRAWING

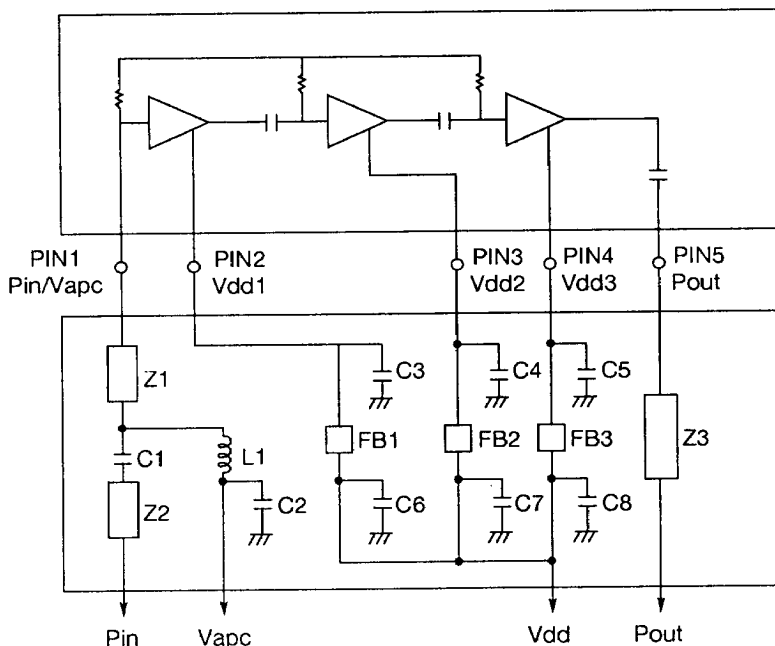


■ ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

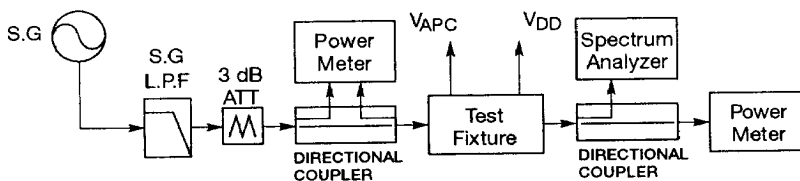
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain Cutoff Current	I_{DS}	$V_{DD1} = V_{DD2} = V_{DD3} = 12\text{V}$, $V_{apc} = 0\text{V}$	—	—	100	μA
Total Efficiency	η_T	$f = 824, 849 \text{ MHz}$, $P_{in} = 1 \text{ mW}$, $V_{DD1} = V_{DD2} = V_{DD3} = 6\text{V}$, $P_{out} = 1.2\text{W}$ (at APC Control), $Z_{in} = Z_{out} = 50 \Omega$	35	40	—	%
2nd Harmonic Distortion	2nd H.D.		—	-40	-30	dB
3rd Harmonic Distortion	3rd H.D.		—	-50	-30	dB
Input VSWR	VSWR(in)		—	1.8	3	—
Output VSWR	VSWR(out)		—	2	—	—
Stability	—	$V_{DD1} = V_{DD2} = V_{DD3} = 6\text{V}$, $P_{in} = 1 \text{ mW}$, $f = 824 \text{ MHz}$, $R_g = 50 \Omega$, $P_{out} = 1.2\text{W}$ (at APC Control), Output VSWR = 20 All Phases, $t = 20 \text{ sec}$	No Parastic Oscillation		—	



■ TEST SYSTEM DIAGRAM



$C_1 = 0.02 \mu\text{F}$ Ceramic Chip
 $C_2, C_3, C_4, C_5 = 0.01 \mu\text{F}$ Ceramic Dip
 $C_6, C_7, C_8 = 10 \mu\text{F}$ Tantalum
 $L_1 = \text{RFC } 1\text{mm } \phi, 15 \text{ turns}$
 $\text{FB} = \text{Ferrite Bead BL01RN1-A62-001 (MURATA) or equivalent}$
 $Z_1, Z_2, Z_3 = 50 \Omega$ Microstrip Line



Output power P_{out} is defined at the root point of the module output pin P_{out} . The coefficient of output power loss in the PCB output line Z_3 is shown below.

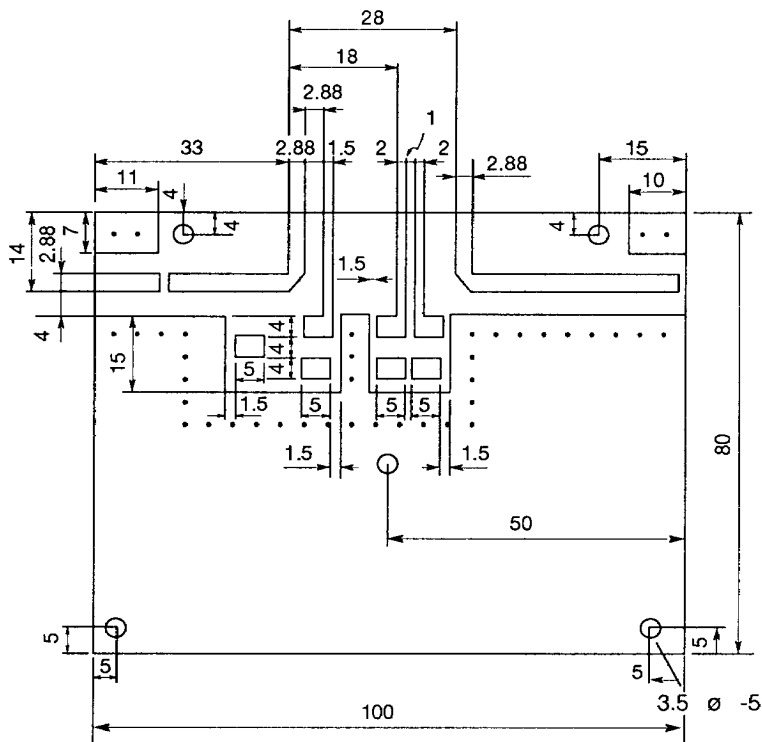
$$1/S_{21}^2 = 1/(0.9805)^2 = 1.04$$



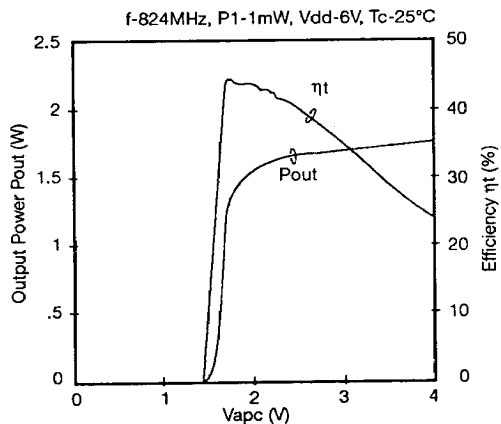
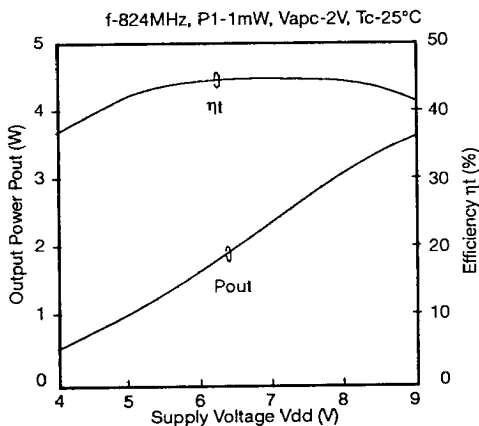
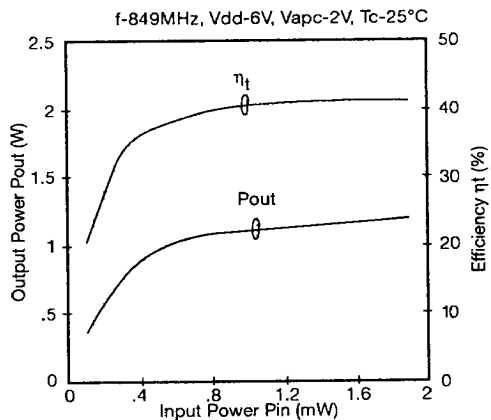
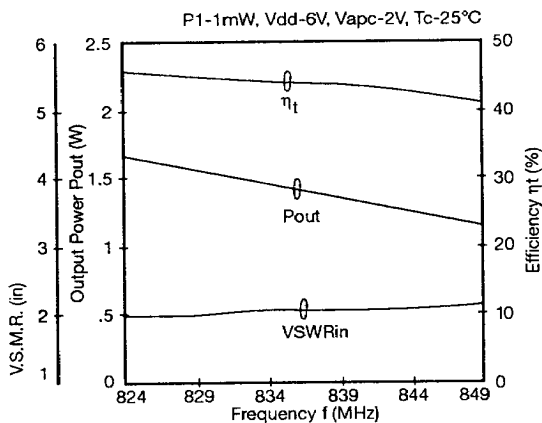
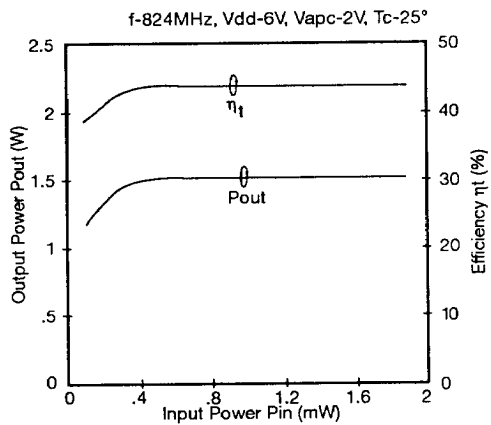
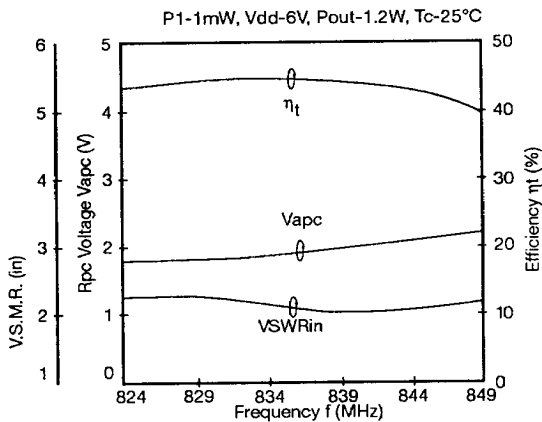
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■ TEST FIXTURE PATTERN

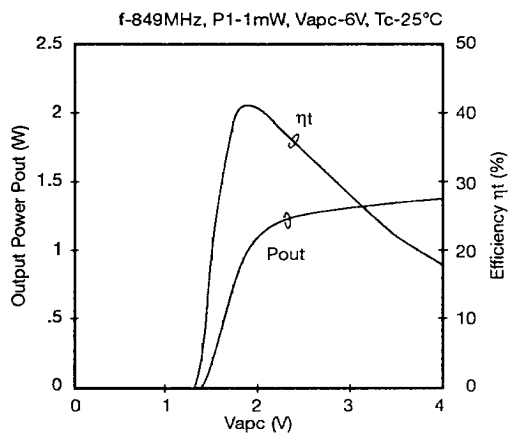
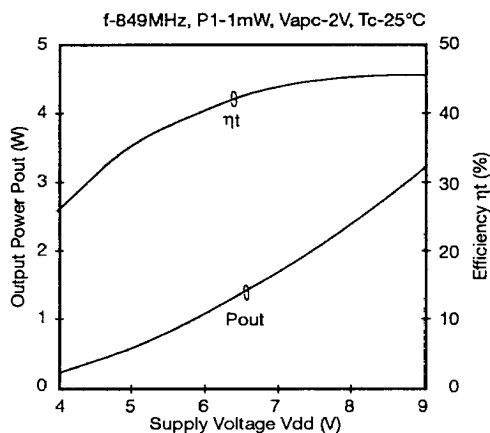


Grass Epoxy Double Sided PCB
($t = 1.6 \text{ mm}$, $\epsilon_r = 4.8$)

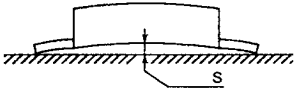


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• Mechanical Characteristics

Item	Conditions	Spec.
Torque for screw up the heatsink flange	M3 Screw-Bolts	4 ~ 6 kg/cm
Warp size of the heatsink flange: S		S = 0 +0.3/-0 mm

Note for Use

1. Unevenness and distortion at the surface of the heatsink attached PF0015 should be less than 0.05 mm.
2. It should not be existed any dust between PF0015 and heatsink.
3. PF0015 should be separated from PCB more than 1.5 mm.
4. Soldering temperature and soldering time should be less than 230°C, 10 sec. (Soldering position spaced from the root point of the lead frame: 2 mm).
5. Recommendation of thermal joint compounds is TYPE G746 (Manufacturer: Shin-Etu Chemical, Co., Ltd.) or equivalent.
6. To protect devices from electro-static damage, soldering iron, measuring-equipment and human body etc. should be grounded.

