PF0040 Series

MOS FET Power Amplifier

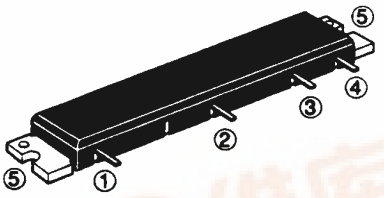
■ FEATURES

- High Stability: Load VSWR ≈ ∞
- Low Power Control Current: 400 μA
- Thin Package: 5 mmt

■ ORDERING INFORMATION

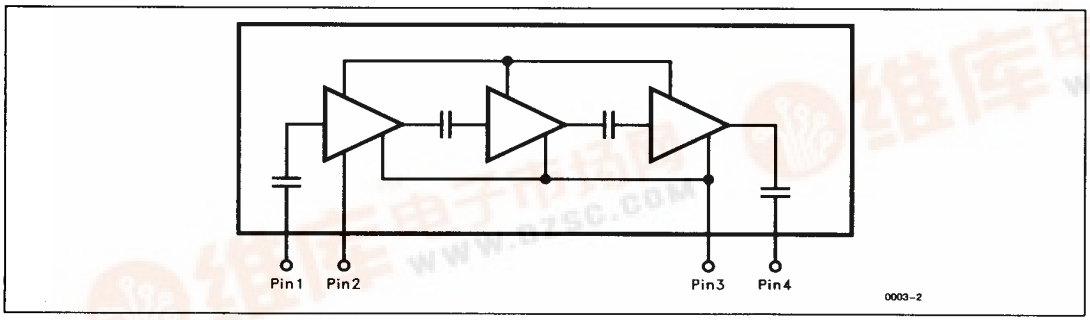
Part No.	Operating Frequency	Application
PF0040	824 to 849 MHz	AMPS
PF0042	872 to 905 MHz	E-TACS

■ PIN OUT



Pin No.	Pin Name
①	P_{in}
②	V_{APC}
③	V_{DD}
④	P_{out}
⑤	GND

■ BLOCK DIAGRAM



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■ ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{DD}	17	V
Supply Current	I_{DD}	3	A
APC Voltage	V_{APC}	±8	V
Input Power	P_{in}	20	mW
Operating Case Temperature	$T_{C(op)}$	−30 to +110	°C
Storage Temperature	T_{stg}	−40 to +110	°C

■ ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain Cutoff Current	I_{DS}	—	—	500	μA	V_{DD} = 17V, V_{APC} = 0V
Total Efficiency	η_T	35	40	—	%	P_{in} = 2 mW, V_{DD} = 12.5V, P_{out} = 6W (at APC controlled), Z_{in} = Z_{out} = 50Ω
2nd Harmonic Distortion	2nd H.D.	—	−50	−30	dB	
3rd Harmonic Distortion	3rd H.D.	—	−50	−30	dB	
Input VSWR	VSWR (in)	—	1.5	3	—	
Output VSWR	VSWR (out)	—	1.5	—	—	
Stability	—	No Parasitic Oscillation			—	P_{in} = 2 mW, V_{DD} = 12.5V, P_{out} = 6W (at APC controlled), Z_{in} = Z_{out} = 50Ω, Output VSWR ≈ ∞ All Phases, t = 20 sec

■ PF0040 STANDARD DATA

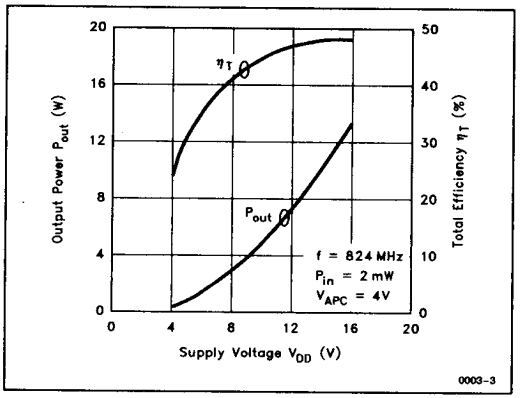

Figure 1. P_{out}, η_T vs. V_{DD}

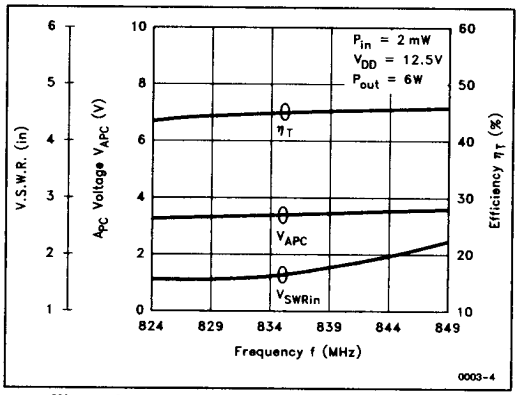

Figure 2. V_{APC}, η_T, VSWR (in) vs. Frequency

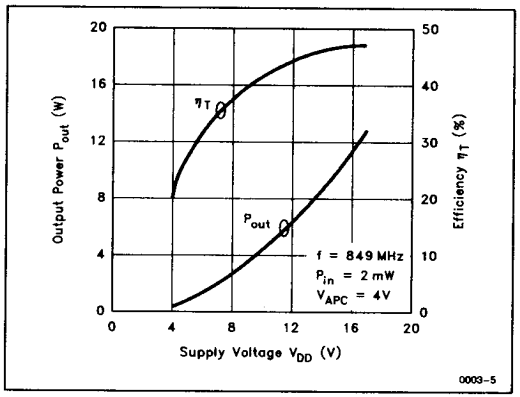

Figure 3. P_{out}, η_T vs. V_{DD}

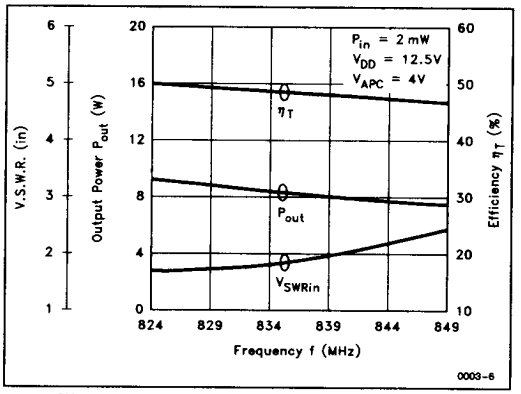

Figure 4. P_{out}, η_T, VSWR (in) vs. Frequency

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■ PF0040 STANDARD DATA (cont.)

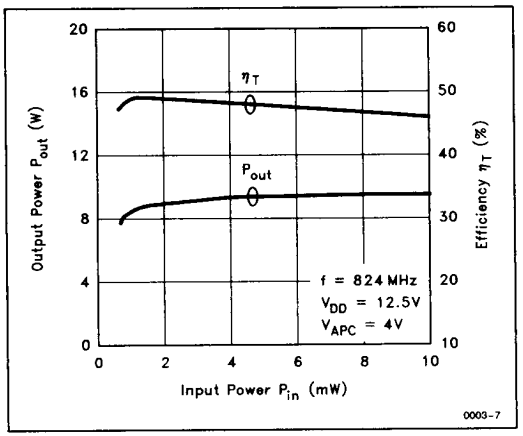


Figure 5. P_{out}, η_T vs. P_{in}

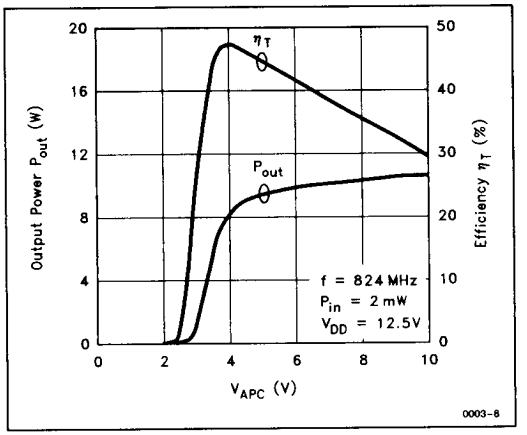


Figure 6. P_{out}, η_T vs. V_{APC}

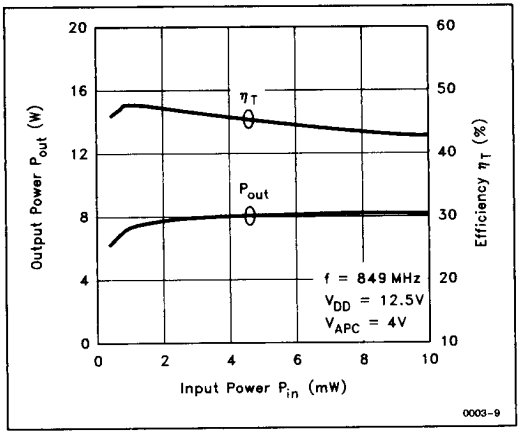


Figure 7. P_{out}, η_T vs. P_{in}

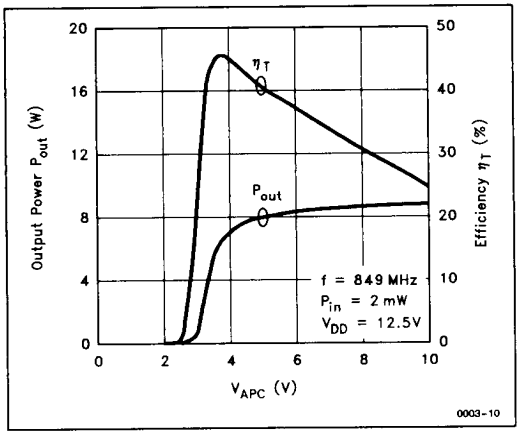


Figure 8. P_{out}, η_T vs. V_{APC}

■ PF0040 STANDARD DATA (cont.)

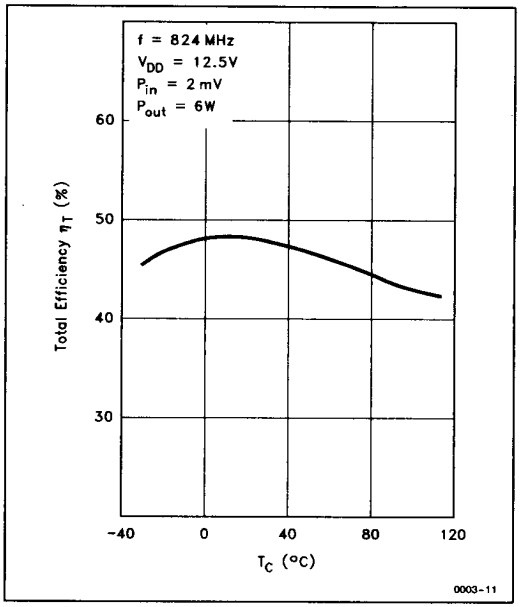


Figure 9. η_T vs. T_C

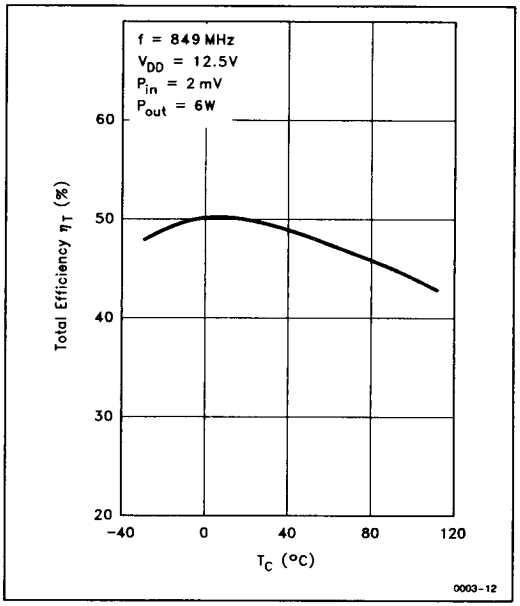


Figure 10. η_T vs. T_C

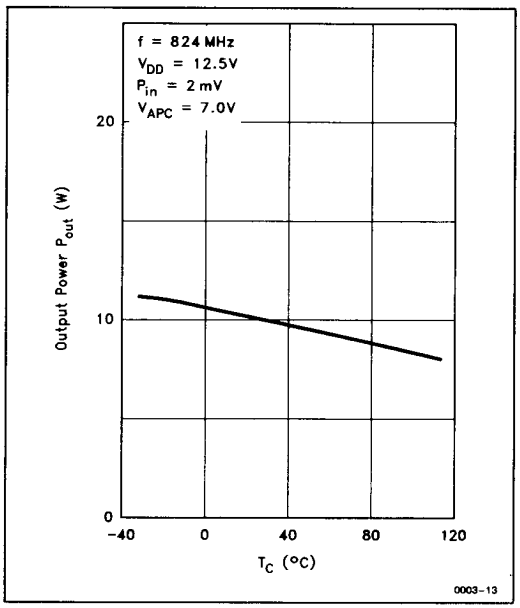


Figure 11. P_{out} vs. T_C

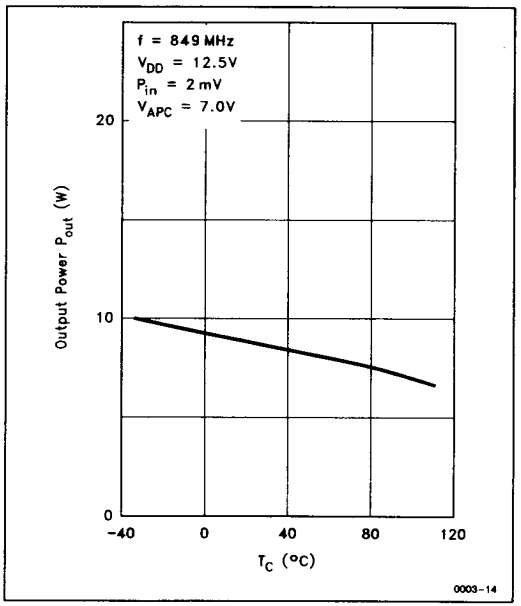


Figure 12. P_{out} vs. T_C

■ PF0042 STANDARD DATA

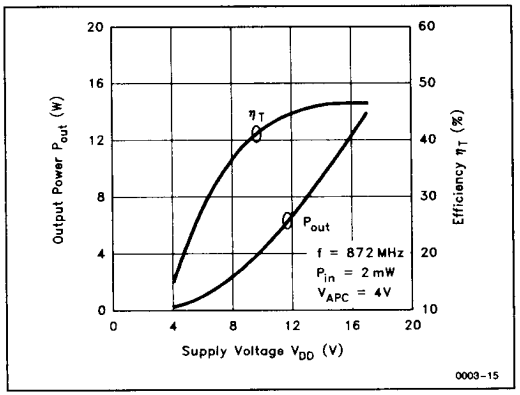


Figure 13. P_{out}, η_T vs. V_{DD}

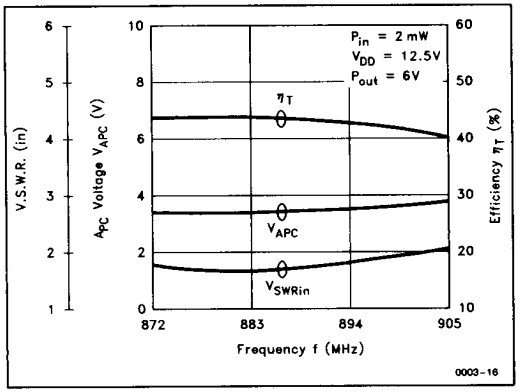


Figure 14. V_{APC}, η_T, VSWR (in) vs. Frequency

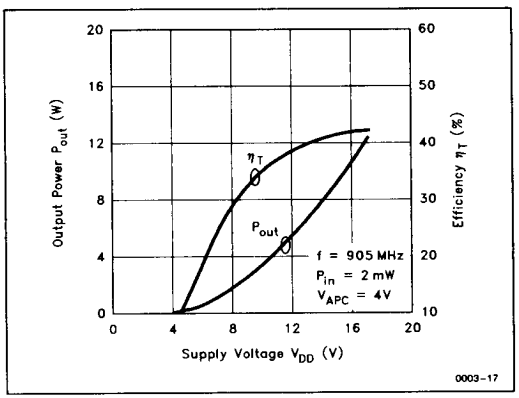


Figure 15. P_{out}, η_T vs. V_{DD}

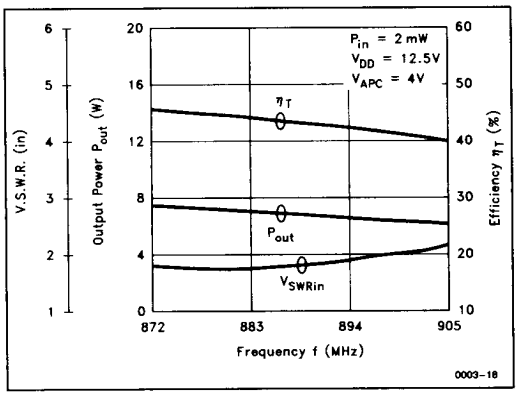


Figure 16. P_{out}, η_T, VSWR (in) vs. Frequency

■ PF0042 STANDARD DATA (cont.)

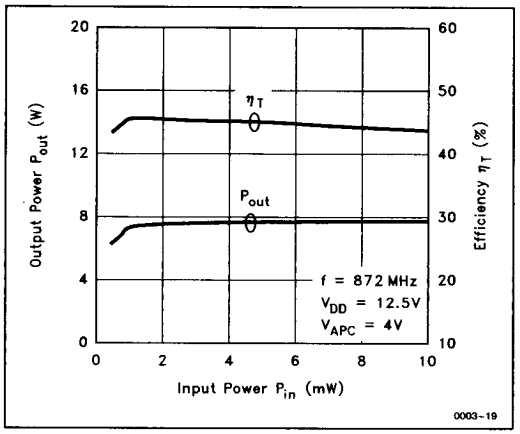


Figure 17. P_{out}, η_T vs. P_{in}

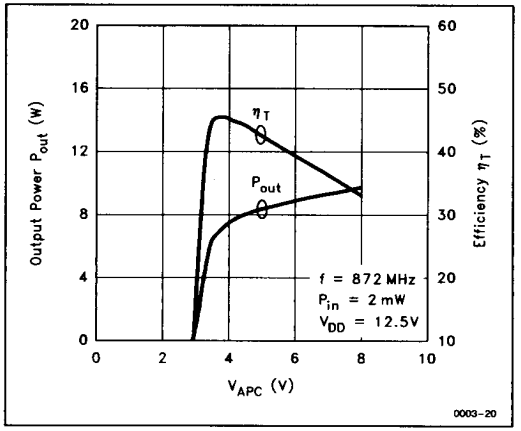


Figure 18. P_{out}, η_T vs. V_{APC}

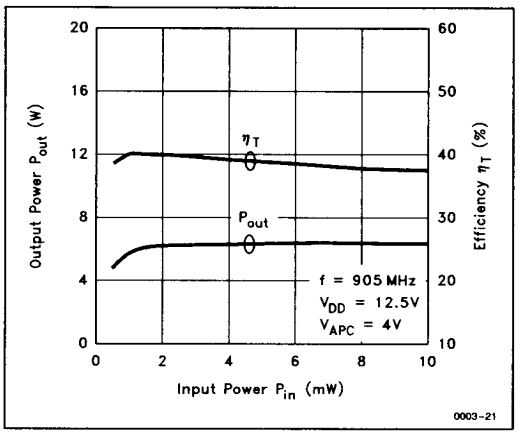


Figure 19. P_{out}, η_T vs. P_{in}

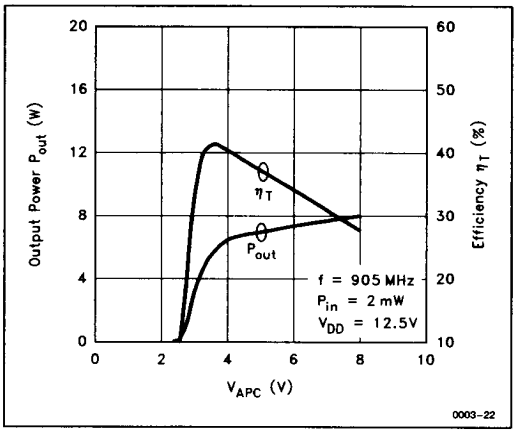


Figure 20. P_{out}, η_T vs. V_{APC}

■ PF0042 STANDARD DATA (cont.)

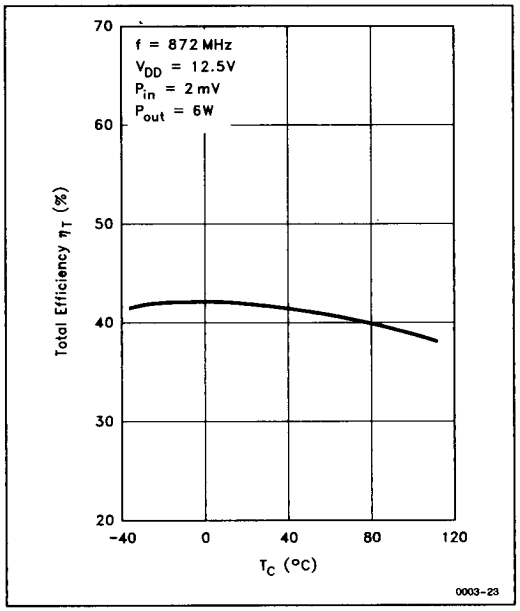


Figure 21. η_T vs. T_C

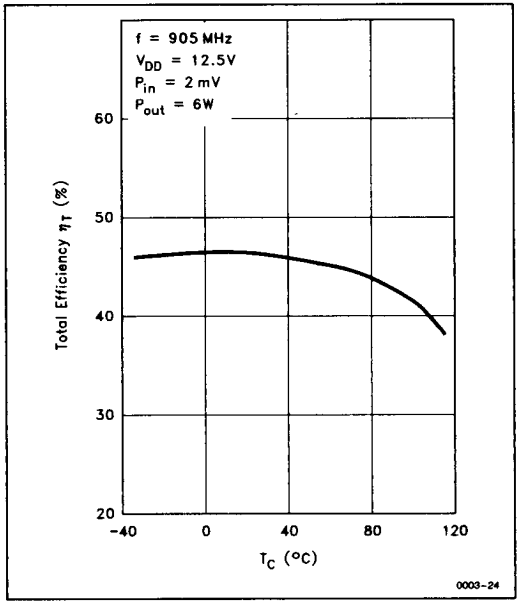


Figure 22. η_T vs. T_C

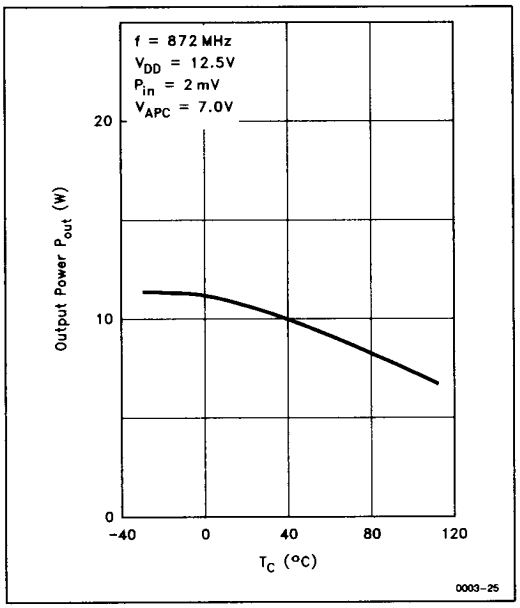


Figure 23. P_{out} vs. T_C

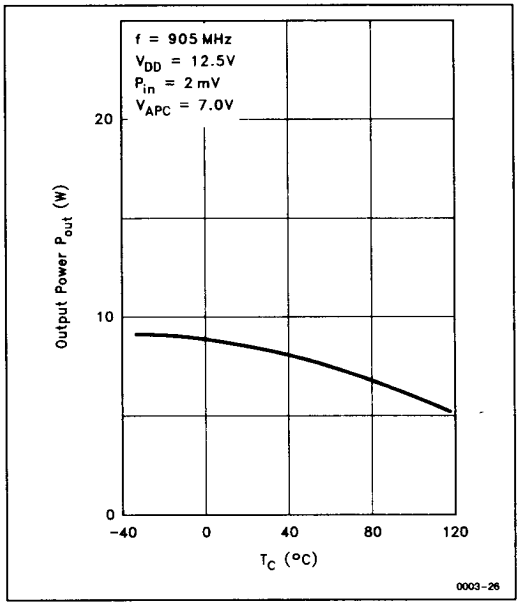
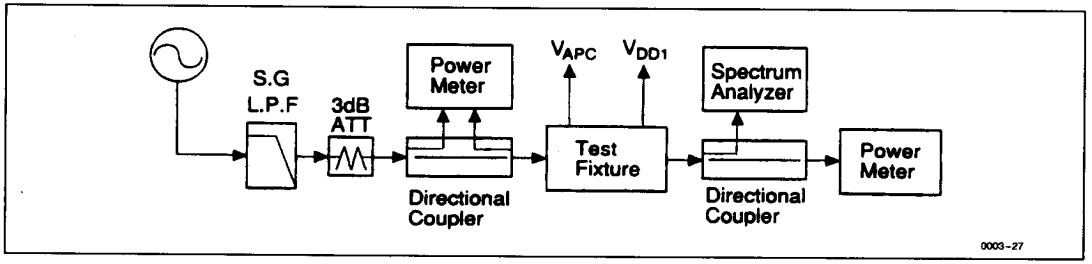


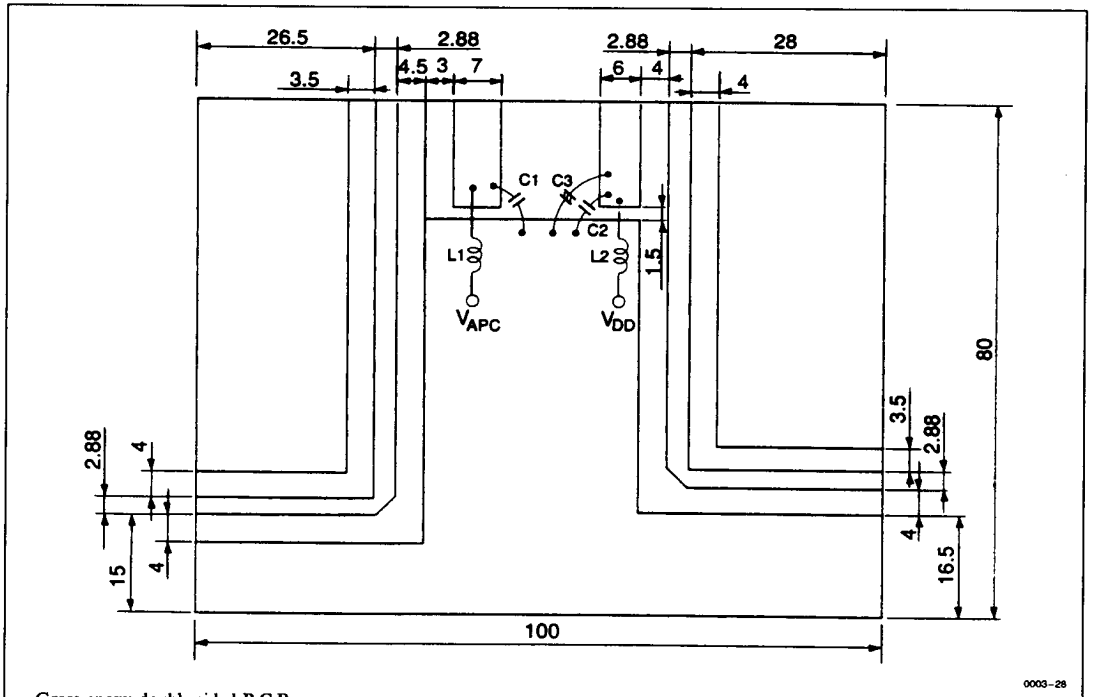
Figure 24. P_{out} vs. T_C

■ TEST SYSTEM DIAGRAM



■ TEST FIXTURE PATTERN

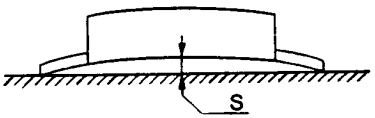
Unit: mm



Grass epoxy double-sided P.C.B.
(t = 1.6 mm, ϵr = 4.8)

C1 = C2 = 0.01 μF (Ceramic chip capacitor)
C3 = 10 μF (Aluminum electrolyte capacitor)
L1 = L2: BL02RN1-R62 (Manufacturer: MURATA)
or equivalent (Ferrite bead inductor)

■ 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

■ NOTES FOR USE

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

■ PACKAGE DIMENSIONS

Unit: mm