PF0313 Series

MOS FET Power Amplifier Module for VHF Band

HITACHI

ADE-208-342A (Z)
2nd. Edition
July 1996

Features

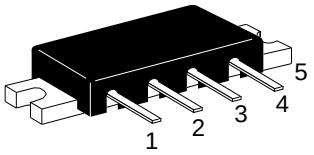
- Small package: 30 × 10 × 5.9 mm
- Low operation voltage: 7 W at 7.2 V
- High efficiency: 55% Typ
- Low power control current: 0.5 mA Max

Ordering Information

Type. Name	Operating frequency
PF0313	135 to 150 MHz
PF0314	150 to 175 MHz

Pin Arrangement

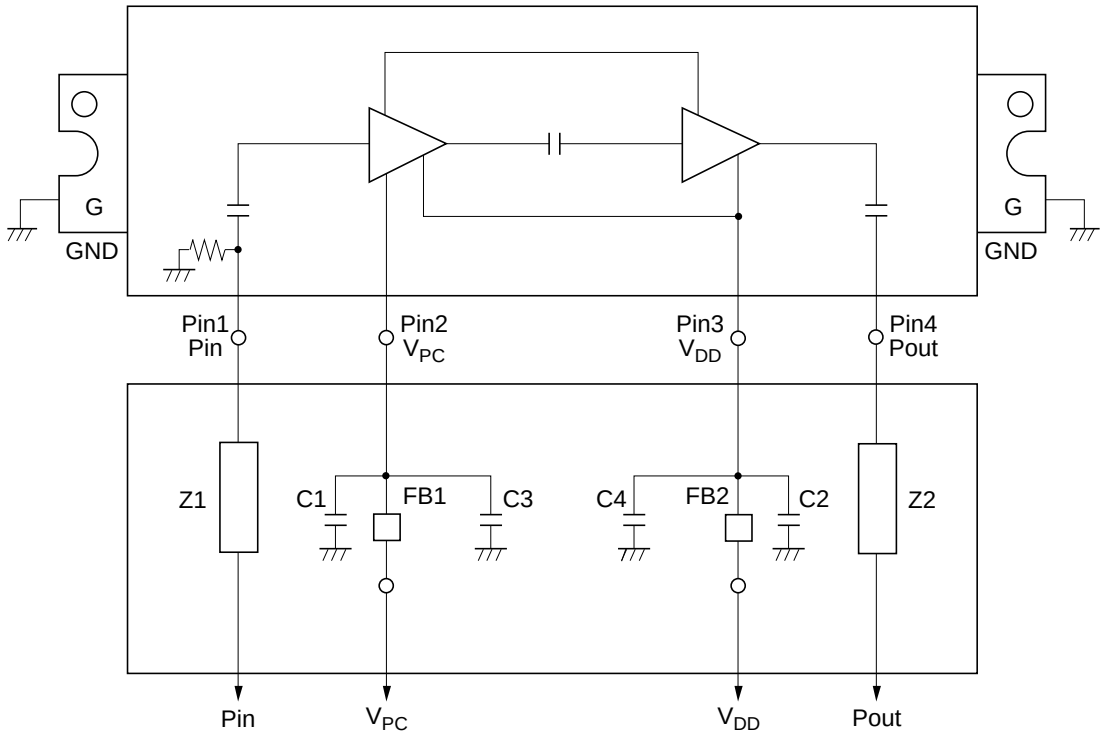
• RF-J



1: Pin
2: V_{PC}
3: V_{DD}
4: Pout
5: GND (Flange)

Hitachi semiconductor

Internal Diagram and External Circuit



C1 = C2 = 0.01 μF (Ceramic chip capacitor)
C3 = C4 = 10 μF (Aluminum Electrolyte Capacitor)
FB = Ferrite bead BL01RN1-A62-001 (Manufacture: MURATA) or equivalent
Z1 = Z2 = 50 Ω (Microstrip line)

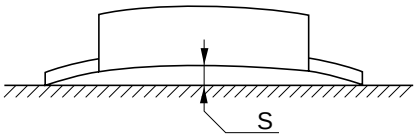
Absolute Maximum Ratings (Tc = 25°C)

Item	Symbole	Rating	Unit
Supply voltage	V_{DD}	17	V
Supply current	I_{DD}	3	A
PC voltage	V_{PC}	7	V
Input power	Pin	100	mW
Operating case temperature	Tc (op)	–30 to +100	°C
Storage temperature	Tstg	–40 to +110	°C

Electrical Characteristics (Tc = 25°C)

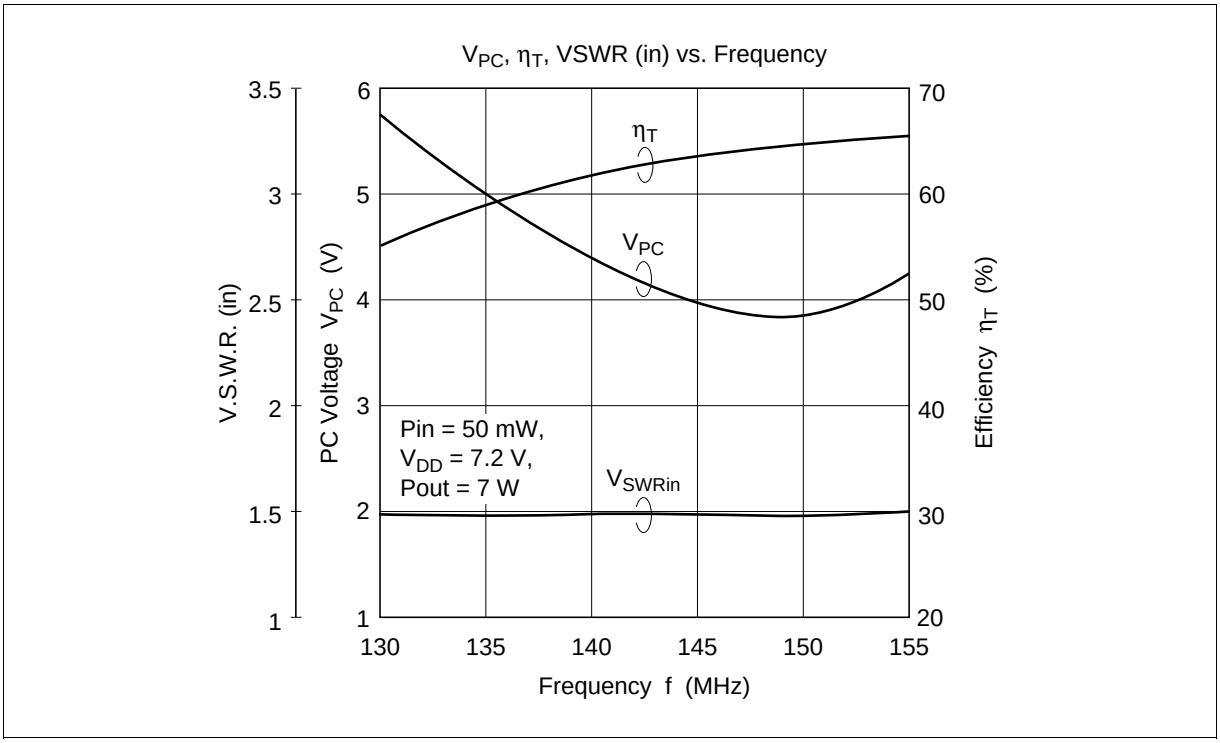
Item	Symbol	Min	Typ	Max	Unit	Test Condition
Drain cutoff current	I_{DS}	—	—	100	μA	V_{DD} = 17 V, V_{PC} = 0 V, R_L = Rg = 50 Ω,
Total efficiency	η_T	45	55	—	%	Pin = 50 mW, V_{DD} = 7.2 V,
2nd harmonic distortion	2nd H.D.	—	–25	–20	dBc	Pout = 7 W (at V_{PC} controlled),
3rd harmonic distortion	3rd H.D.	—	–35	–30	dBc	R_L = Rg = 50 Ω, Tc = 25°C
4th harmonic distortion	4th H.D.	—	–40	–30	dBc	
Input VSWR	VSWR (in)	—	1.5	3.0	—	
Output power (1)	Pout (1)	7	8	—	W	Pin = 50 mW, V_{DD} = 7.2 V, V_{PC} = 6 V, R_L = Rg = 50 Ω
Output power (2)	Pout (2)	4	5	—	W	Pin = 50 mW, V_{DD} = 6 V, V_{PC} = 5.5 V, R_L = Rg = 50 Ω
Load VSWR tolerance	—	No degradation		—		Pin = 50 mW, V_{DD} = 15 V, Pout ≤ 7 W, (at V_{PC} controlled), Output VSWR = 6:1 All phases
Stability	—	No parasitic oscillation		—		Pin = 50 mW, V_{DD} = 6 to 15 V, Pout ≤ 7 W, (at V_{PC} controlled), Output VSWR = 3:1 All phases

Mechanical Characteristics

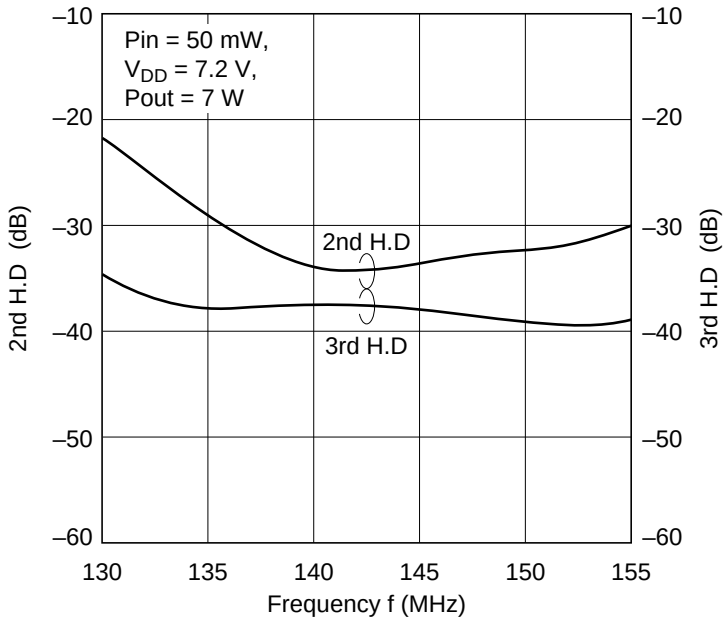
Item	Measuring Conditions	Spec
Torque for screw up the heatsink flange	M2.6 Screw Bolts	1.5 to 3.5 kg•cm
Warp size of the heatsink flange: S		S = 0 +0.1/–0 mm

Characteristics Curve

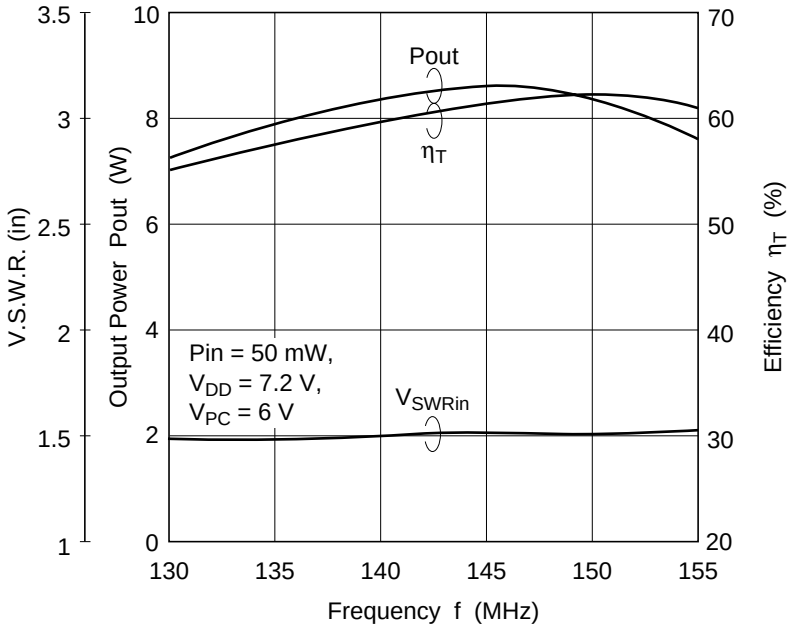
PF0313



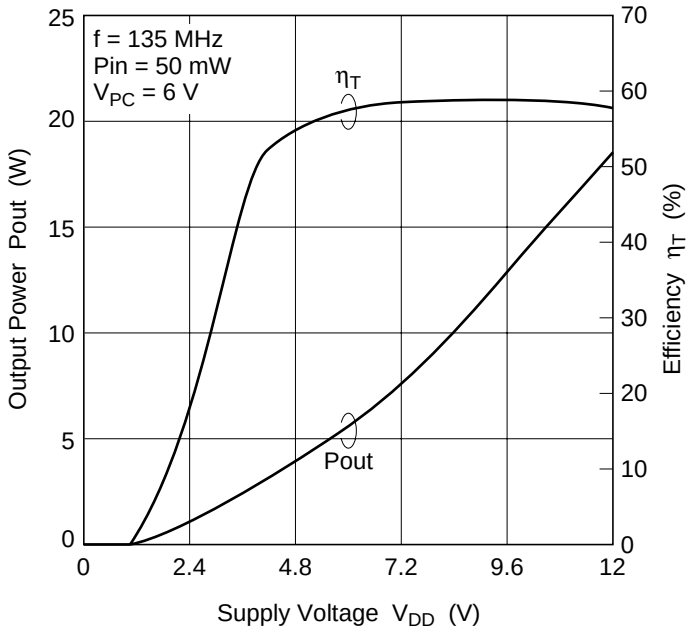
2nd H.D, 3rd H.D vs. Frequency



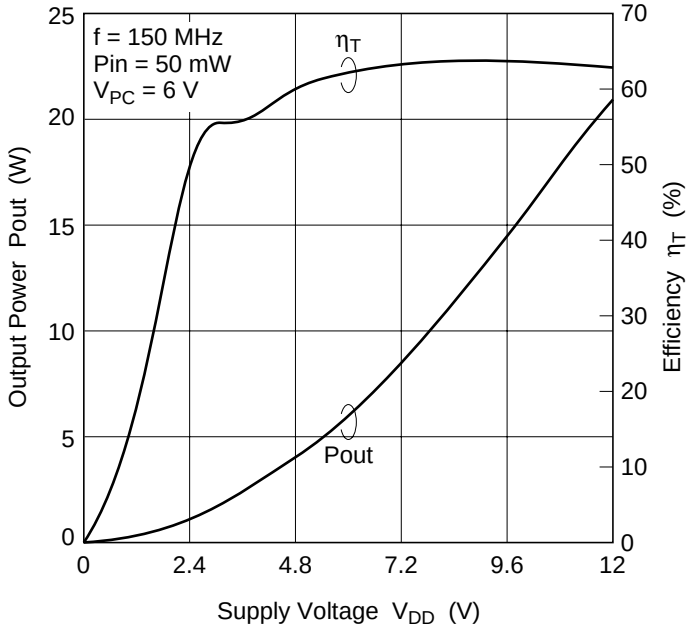
Pout, η_T, VSWR (in) vs. Frequency



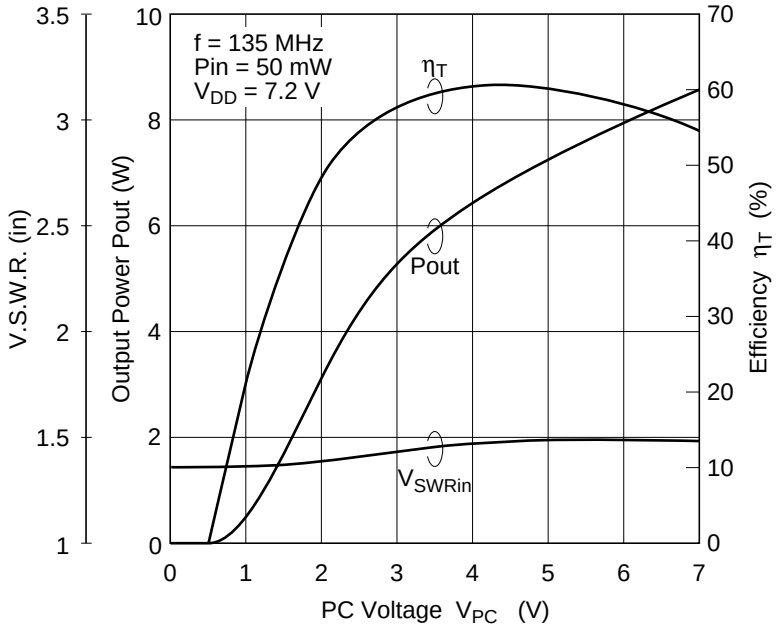
Pout, η_T vs. V_{DD} (1)



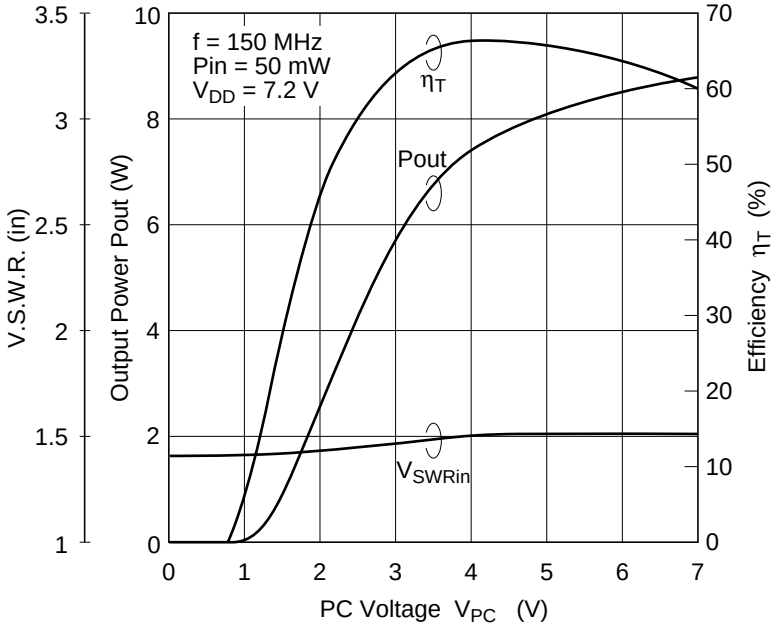
Pout, η_T vs. V_{DD} (2)



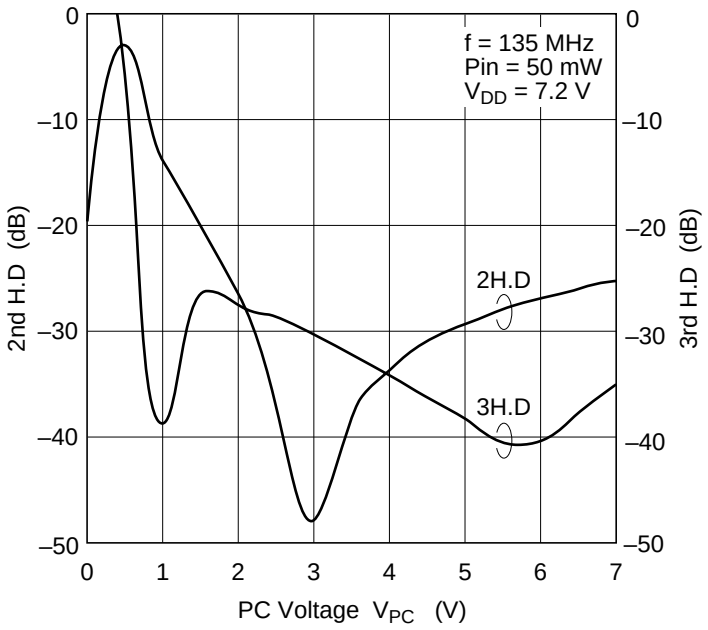
Pout, η_T, VSWR (in) vs. V_{PC} (1)



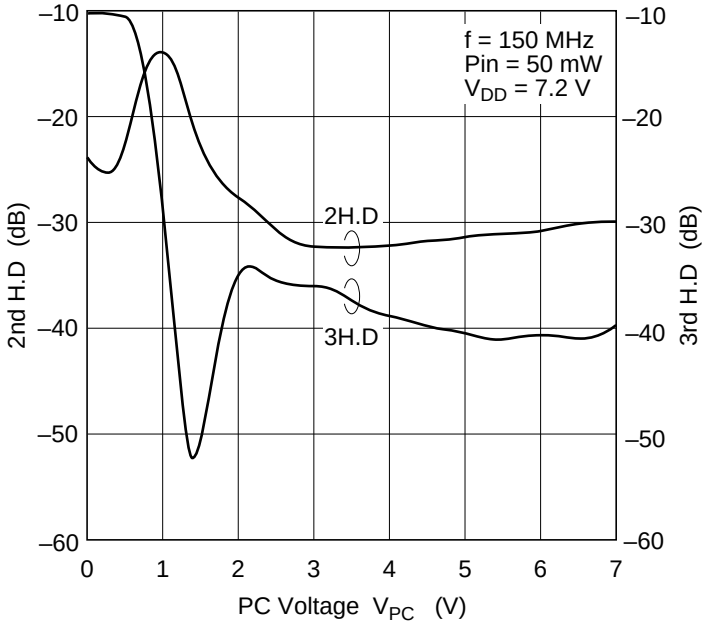
Pout, η_T, VSWR (in) vs. V_{PC} (2)



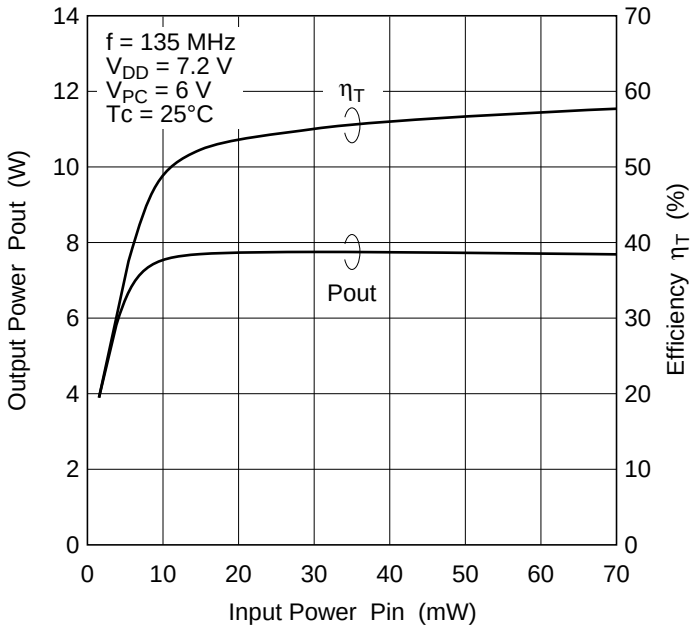
2nd H.D, 3rd H.D vs. V_{PC} (1)



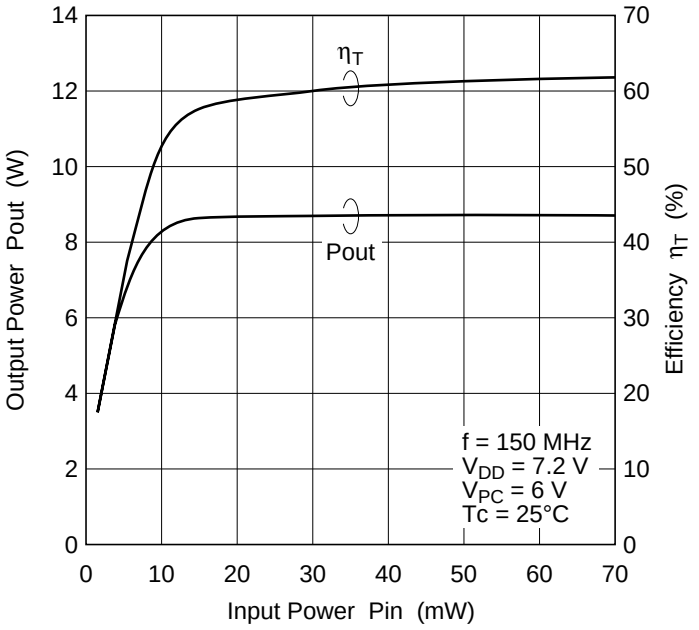
2nd H.D, 3rd H.D vs. V_{PC} (2)



Pout, η_T vs. Pin (1)

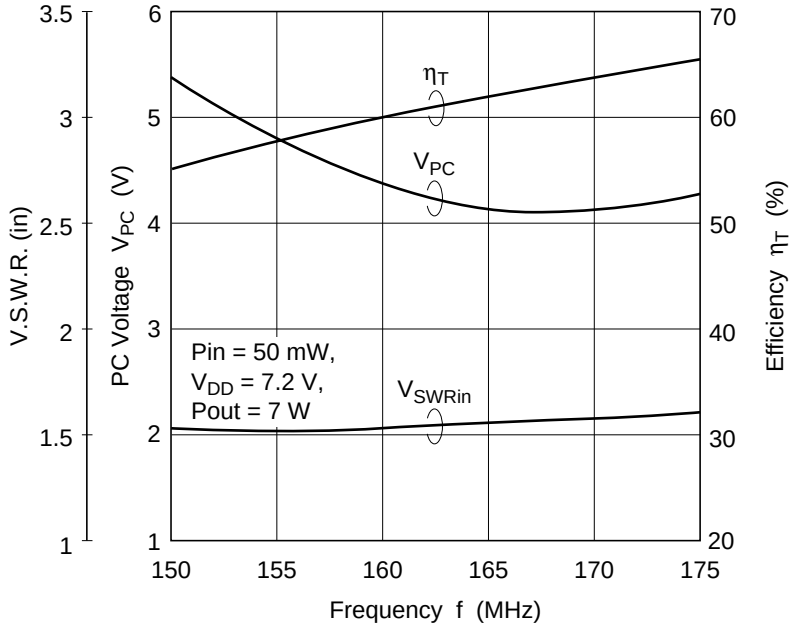


Pout, η_T vs. Pin (2)

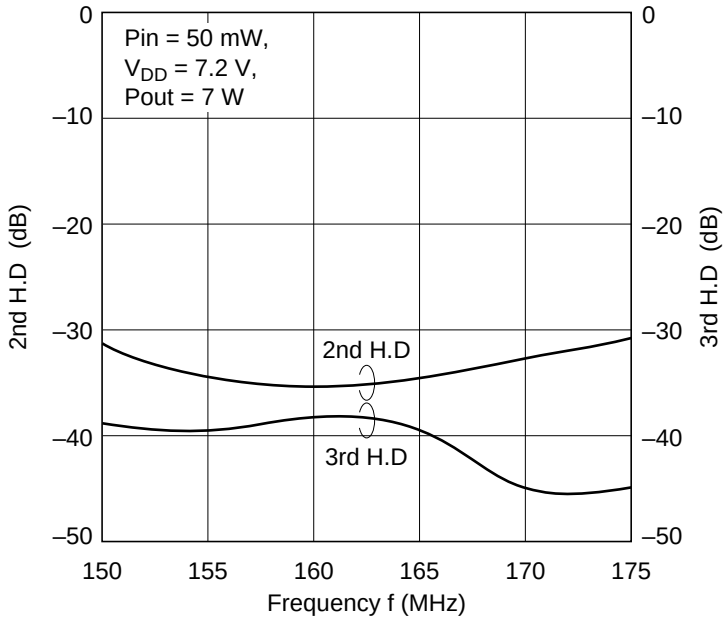


PF0314

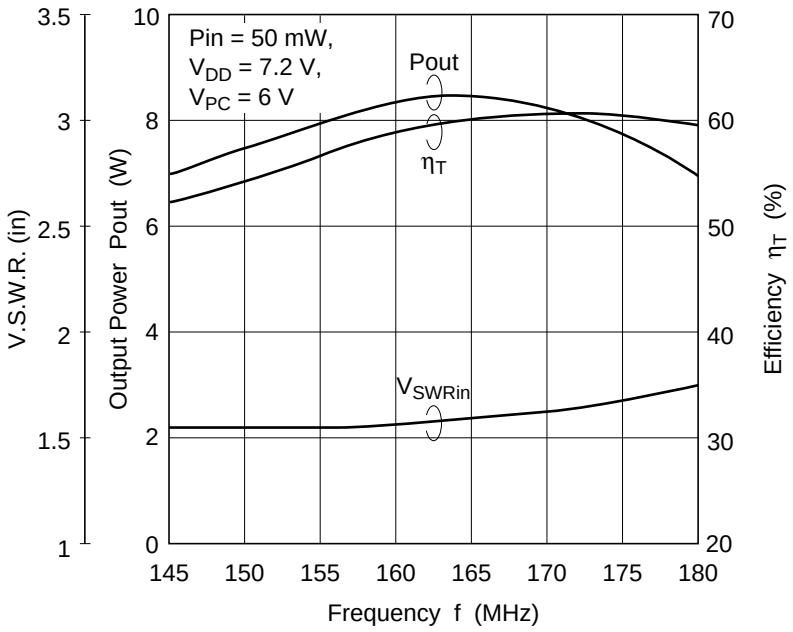
V_{PC}, η_T, VSWR (in) vs. Frequency



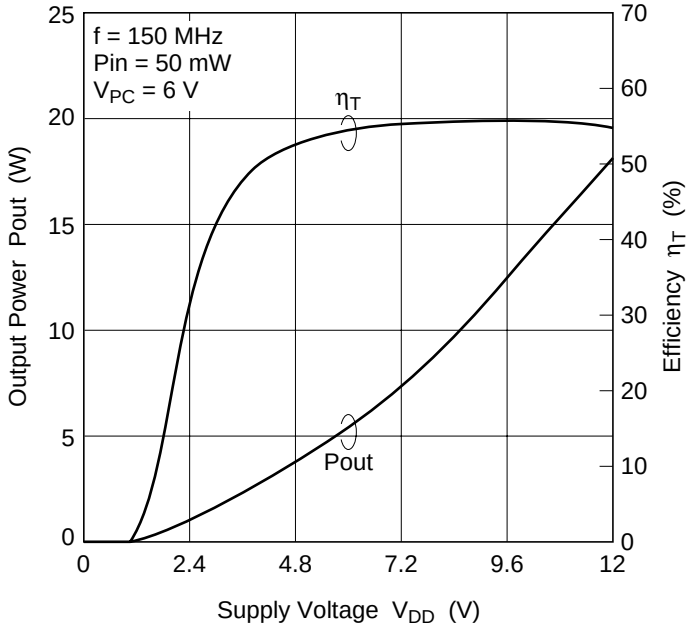
2nd H.D, 3rd H.D vs. Frequency



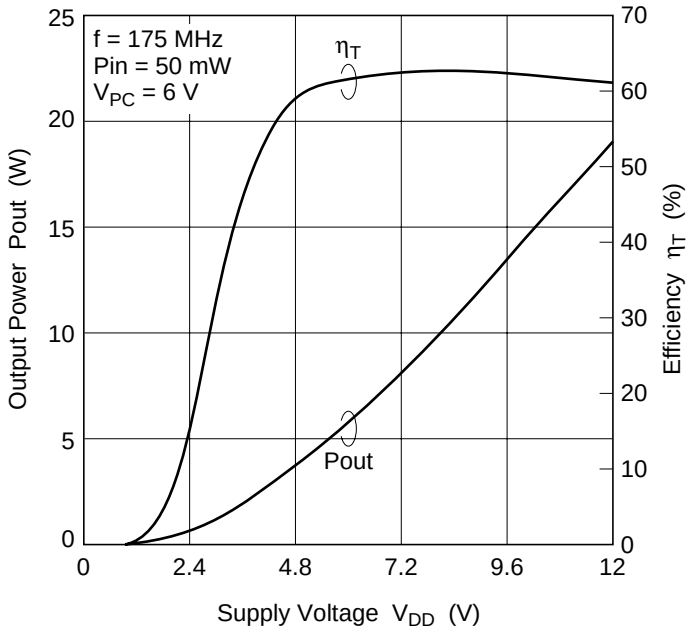
Pout, η_T, VSWR (in) vs. Frequency



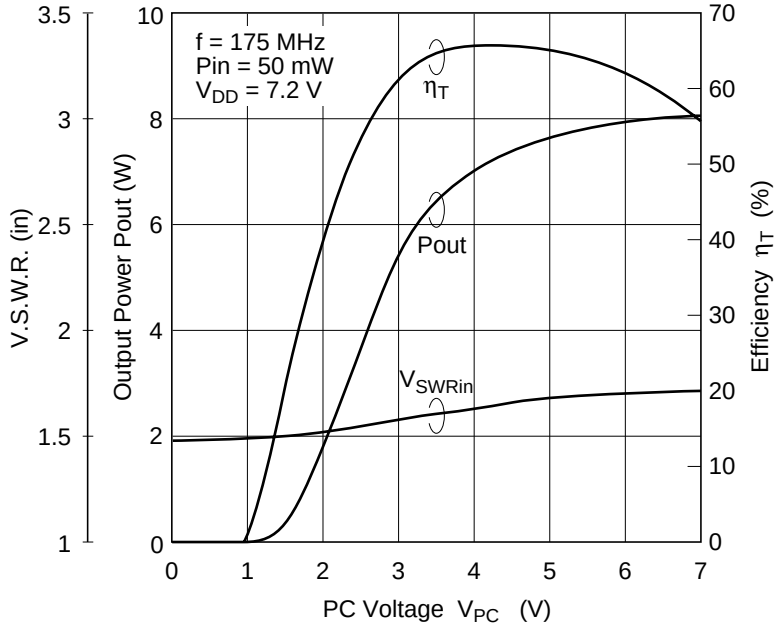
Pout, η_T vs. V_{DD} (1)



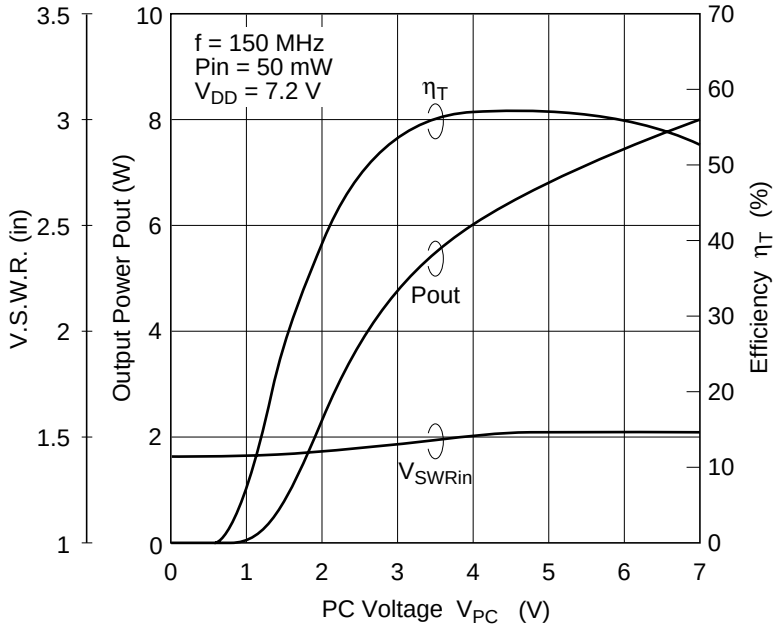
Pout, η_T vs. V_{DD} (2)



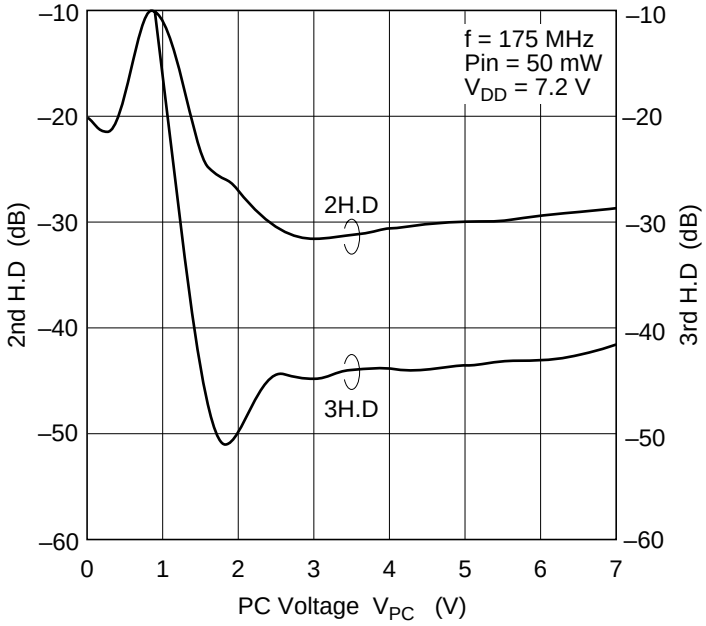
Pout, η_T, VSWR (in) vs. V_{PC} (1)

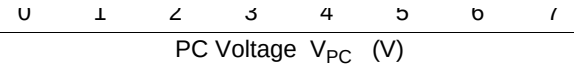


Pout, η_T, VSWR (in) vs. V_{PC} (2)

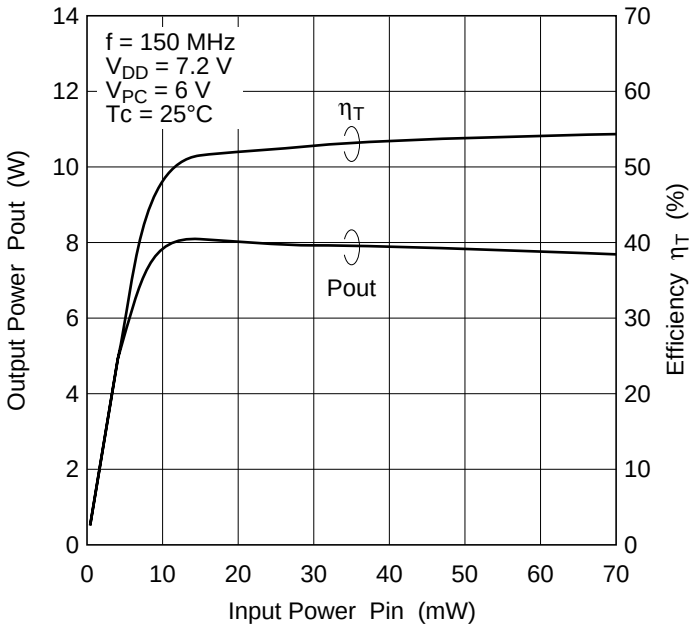


2nd H.D, 3rd H.D vs. V_{PC} (1)

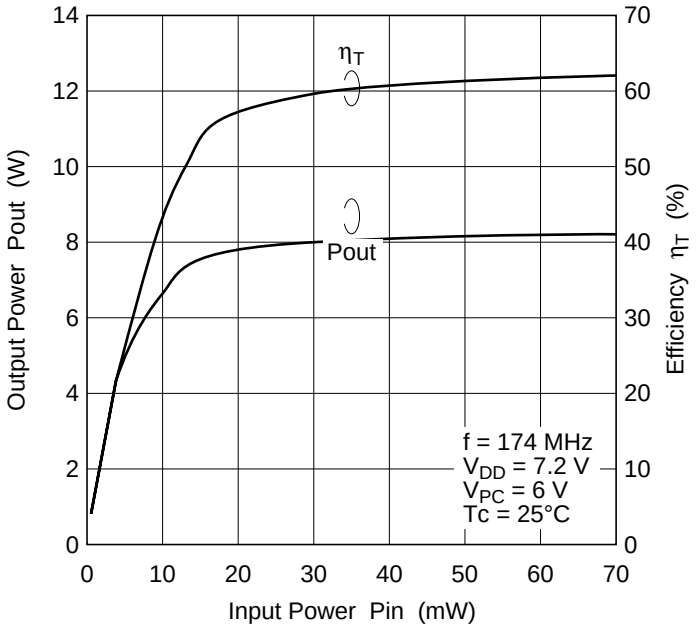




Pout, η_T vs. Pin (1)

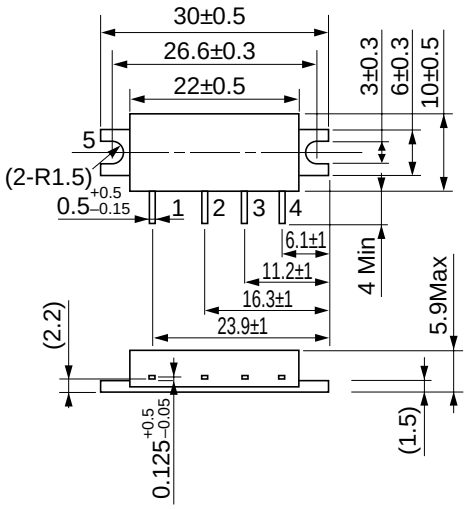


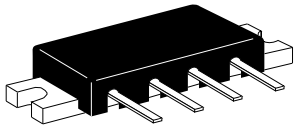
Pout, η_T vs. Pin (2)



Package Dimensions

Unit: mm





Hitachi code	RF-J
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