
PF0031

MOS FET Power Amplifier Module for Mobile Phone

HITACHI

ADE-208-461 (Z)
1st Edition
July 1, 1996

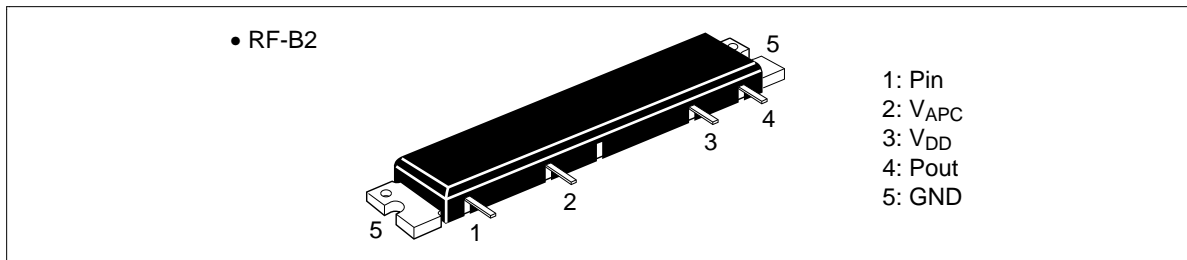
Application

PF0031: For NMT900 890 to 925 MHz

Features

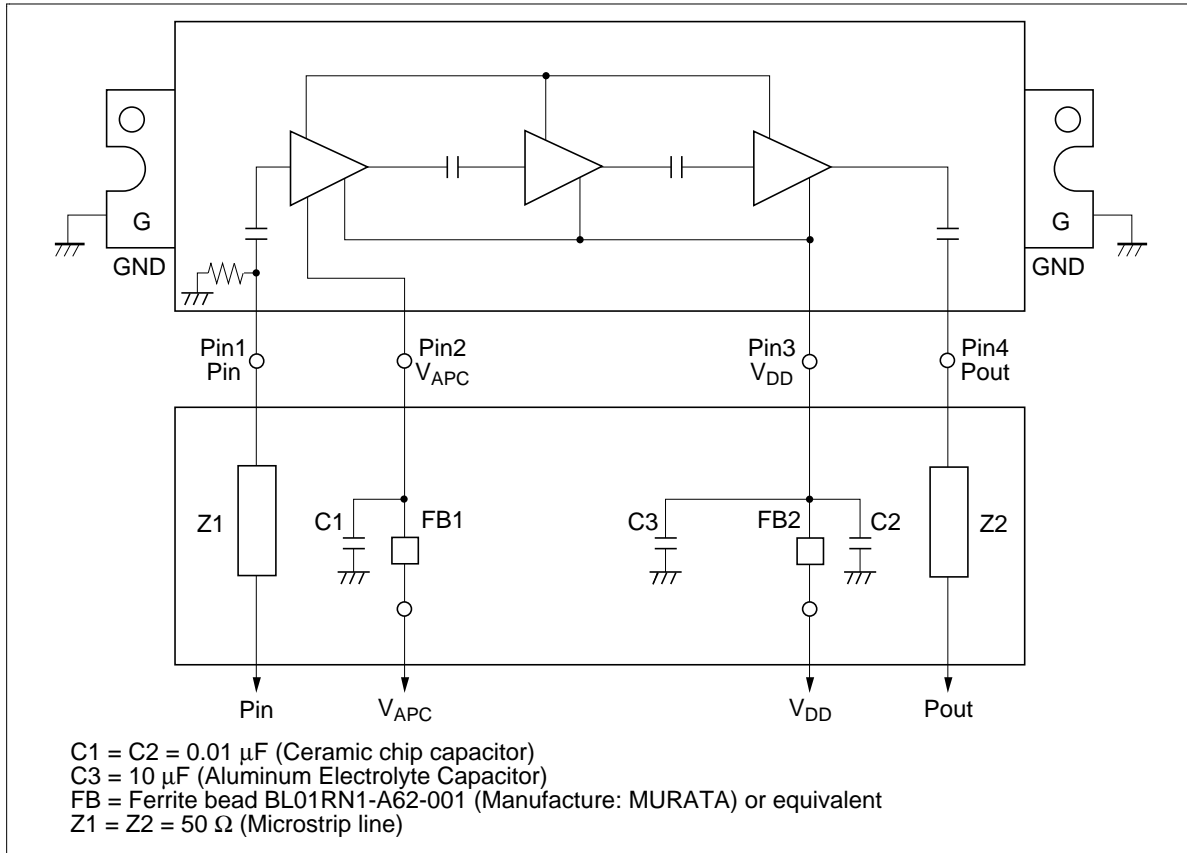
- High stability: Load VSWR \approx 20:1
- Low power control current: 400 μ A
- Thin package: 5 mm t

Pin Arrangement



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Internal Diagram and External Circuit



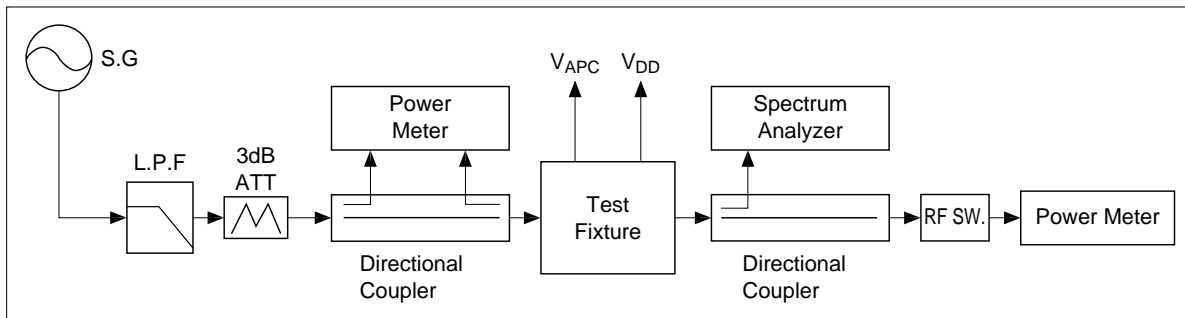
Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$)

Item	Symbol	Rating	Unit
Supply voltage	V_{DD}	17	V
Supply current	I_{DD}	3	A
APC voltage	V_{APC}	8	V
Input power	Pin	20	mW
Operating case temperature	T_c (op)	-30 to +100	$^\circ\text{C}$
Storage temperature	T_{stg}	-40 to +110	$^\circ\text{C}$

Electrical Characteristics (Tc = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Condition
Drain cutoff current	I_{DS}	—	—	500	μA	$V_{DD} = 17 V, V_{APC} = 0 V, R_g = R_L = 50 \Omega$
Total efficiency	η_T	35	40	—	%	$P_{in} = 2 mW, V_{DD} = 12.5 V,$
2nd harmonic distortion	2nd H.D.	—	-50	-30	dB	$P_{out} = 6 W$ (at APC controlled)
3rd harmonic distortion	3rd H.D.	—	-50	-30	dB	$R_L = R_g = 50 \Omega$
Input VSWR	VSWR (in)	—	1.5	3	—	
Output VSWR	VSWR (out)	—	1.5	—	—	
Stability	—	No parasitic oscillation			—	$P_{in} = 2 mW, V_{DD} = 12.5 V,$ $P_{out} = 6 W$ (at APC controlled), $R_L = R_g = 50 \Omega, Output VSWR = 20:1$ All phases, t = 20sec

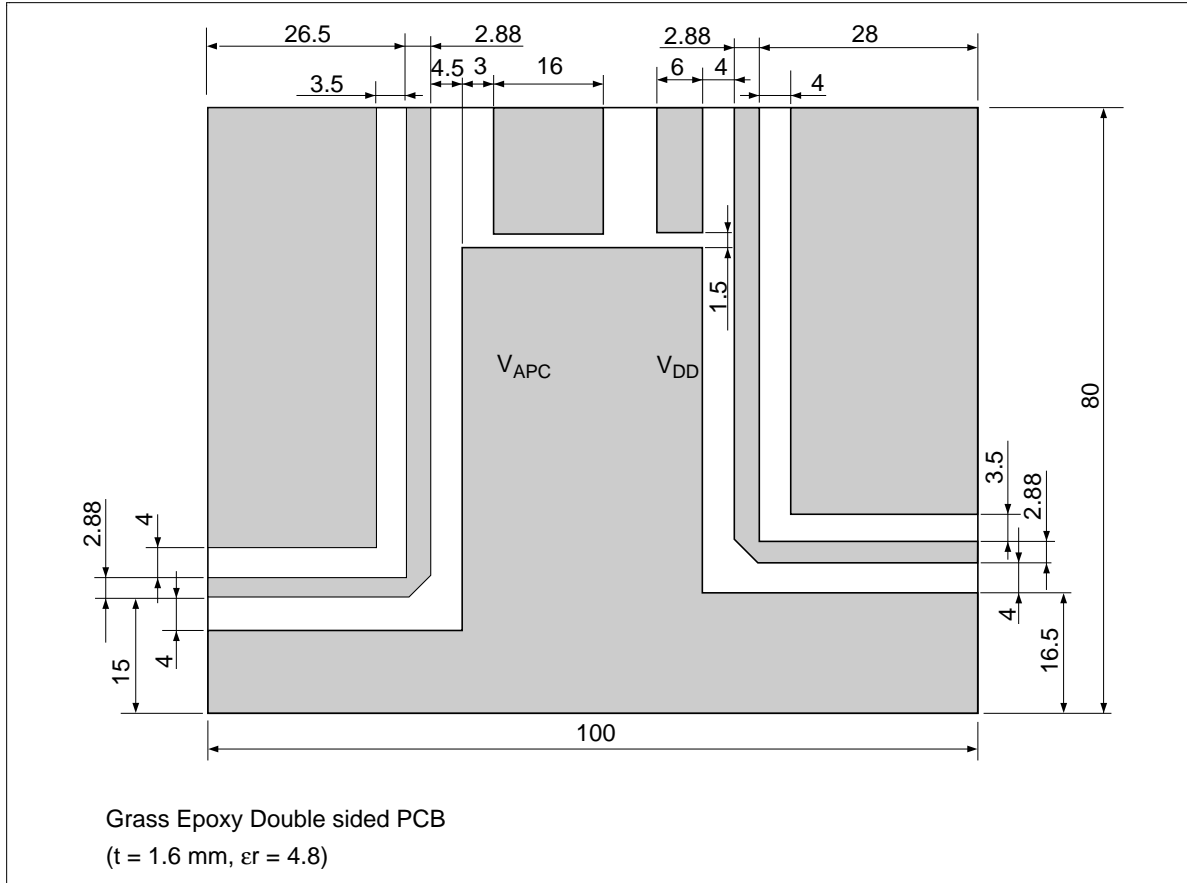
Test System Diagram



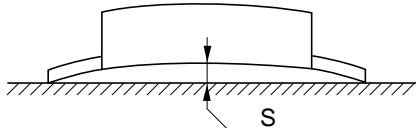
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Test Fixture Pattern

Unit: mm



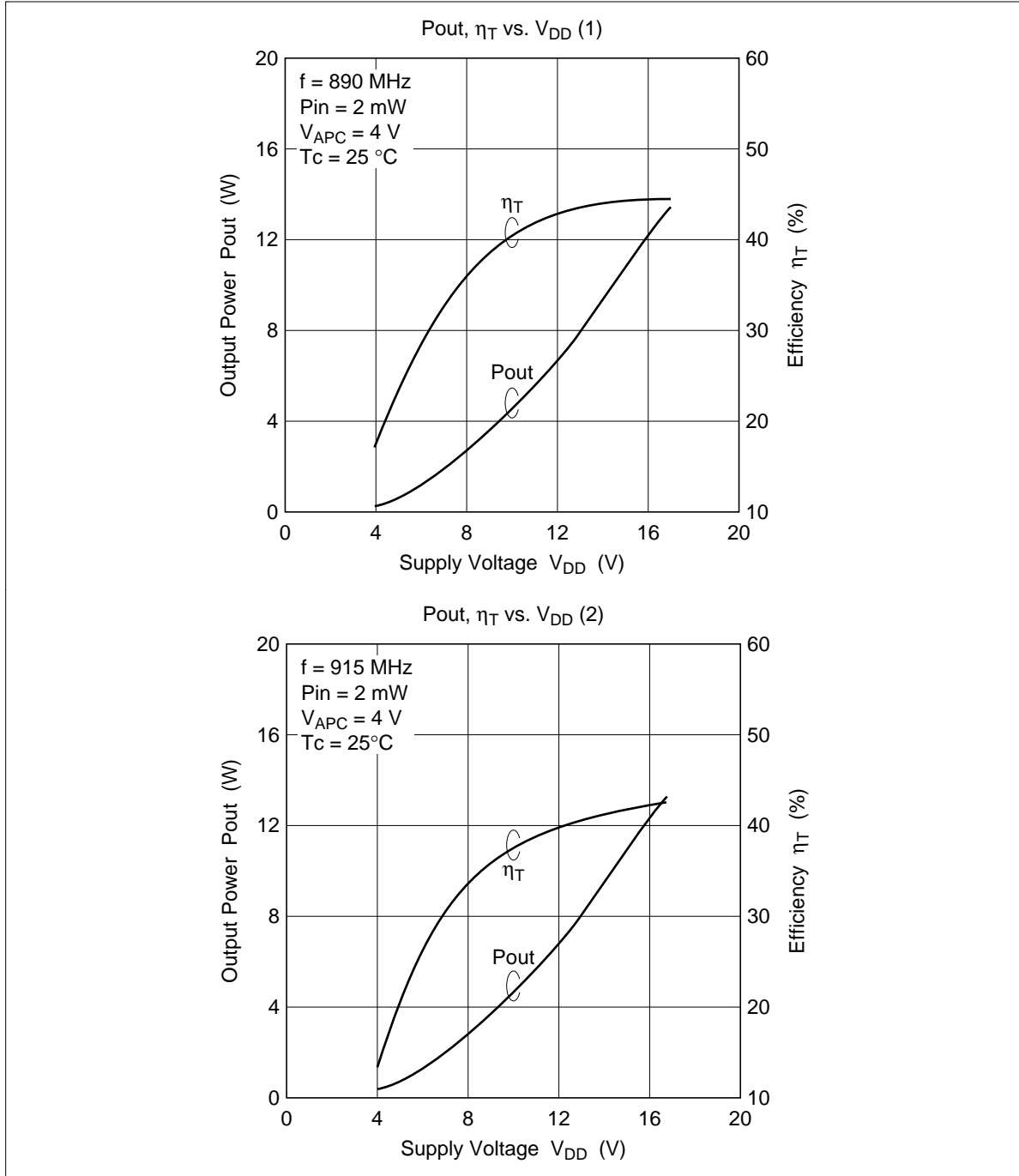
Mechanical Characteristics

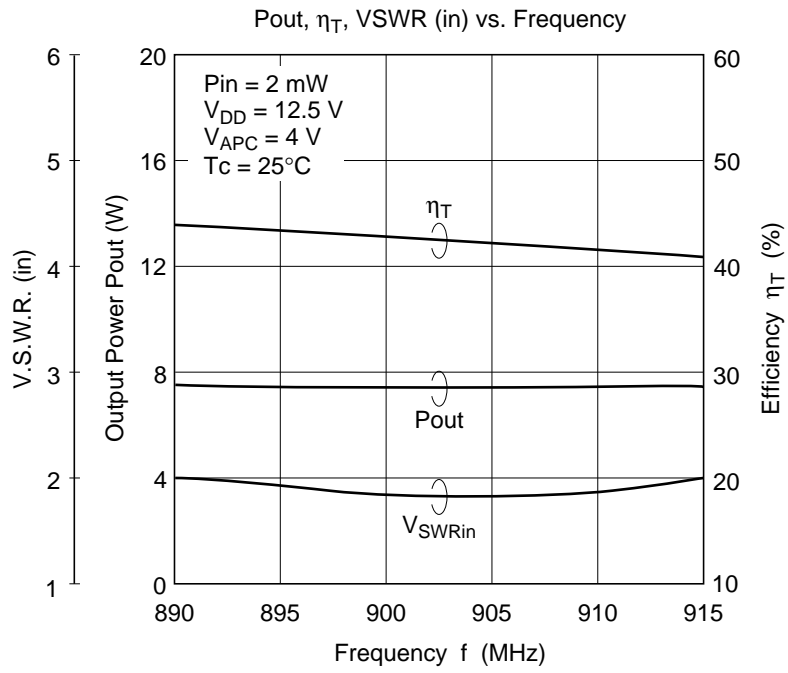
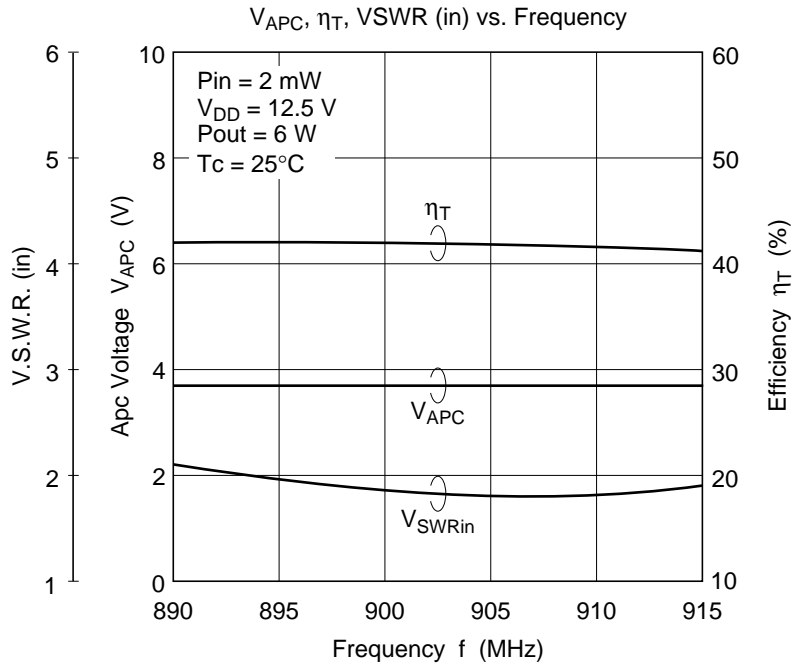
Item	Conditions	Spec
Torque for screw up the heatsink flange	M3 Screw Bolts	4 to 6 kg•cm
Warp size of the heatsink flange: S		S = 0 +0.3/- 0 mm

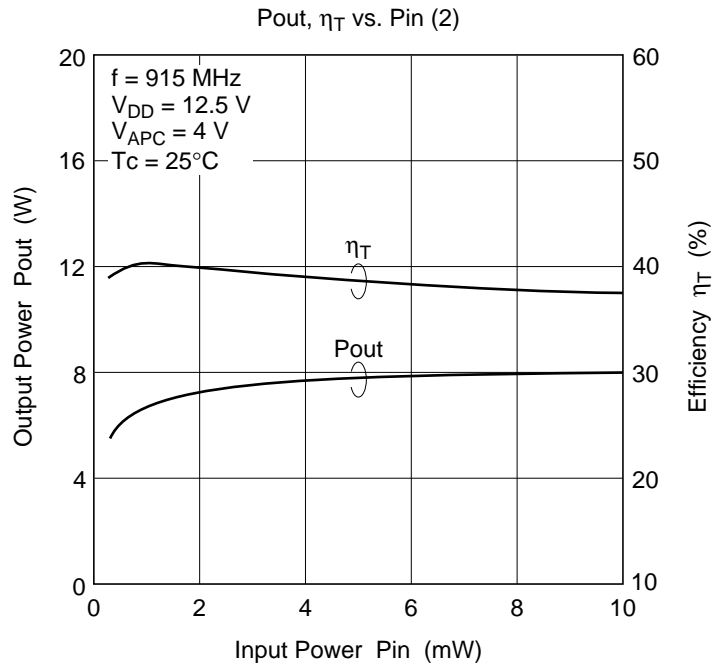
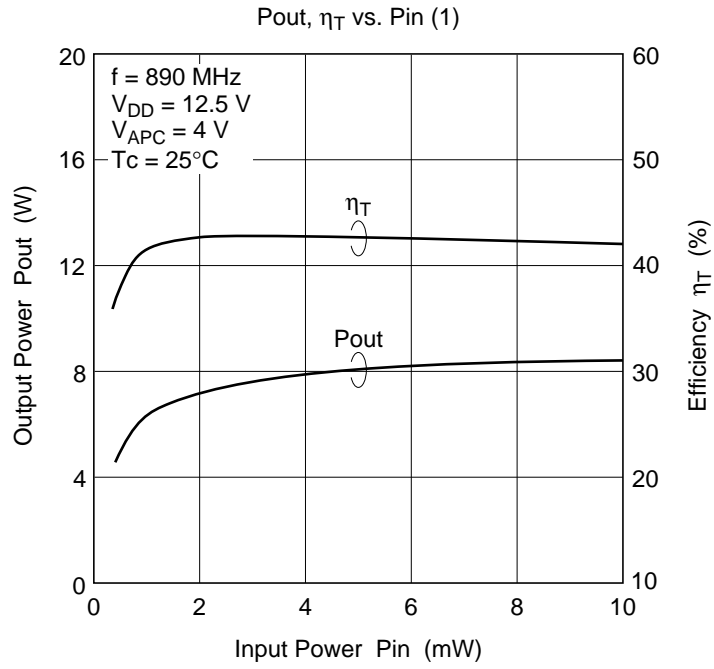
Note for Use

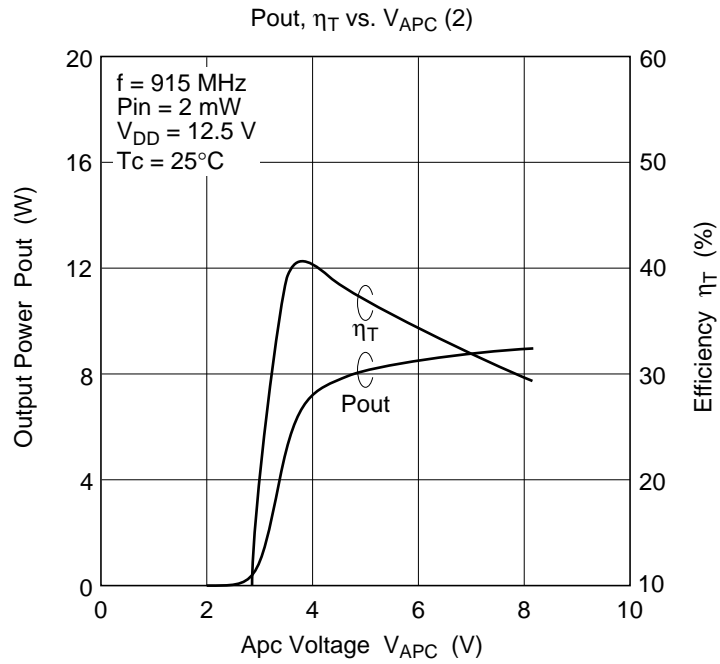
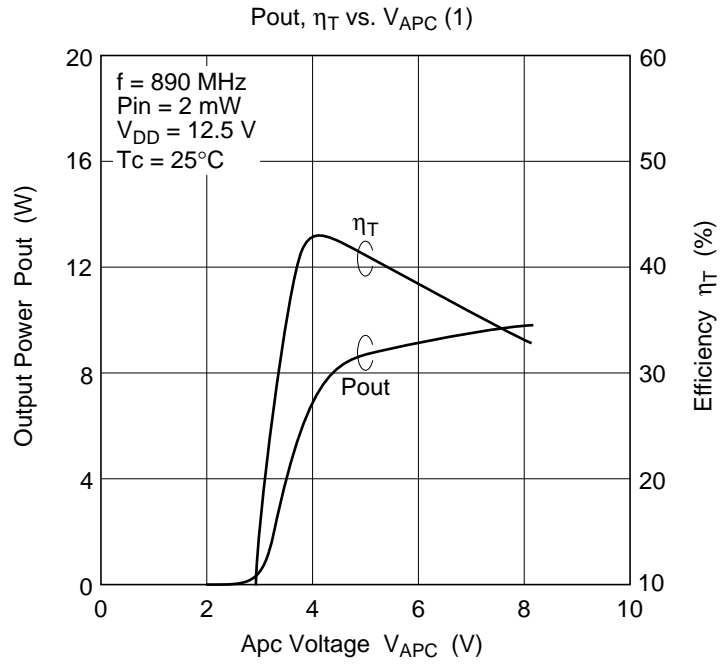
- Unevenness and distortion at the surface of the heatsink attached module should be less than 0.05 mm.
- It should not be existed any dust between module and heatsink.
- MODULE should be separated from PCB less than 1.5 mm.
- Soldering temperature and soldering time should be less than 230°C, 10 sec.
(Soldering position spaced from the root point of the lead frame: 2 mm)
- Recommendation of thermal joint compounds is TYPE G746.
(Manufacturer: Shin-Etsu Chemical, Co., Ltd.)
- To protect devices from electro-static damage, soldering iron, measuring-equipment and human body etc. should be grounded.
- Torque for screw up the heatsink flange should be 4 to 6 kg · cm with M3 screw bolts.
- Don't solder the flange directly.
- It should make the lead frame as straight as possible.
- The module should be screwed up before lead soldering.
- It should not be given mechanical and thermal stress to lead and flange of the module.
- When the external parts (Isolator, Duplexer, etc.) of the module are changed, the electrical characteristics should be evaluated enough.
- Don't washing the module except lead pins.
- To get good stability, ground impedance between the module GND flange and PCB GND pattern should be designed as low as possible.

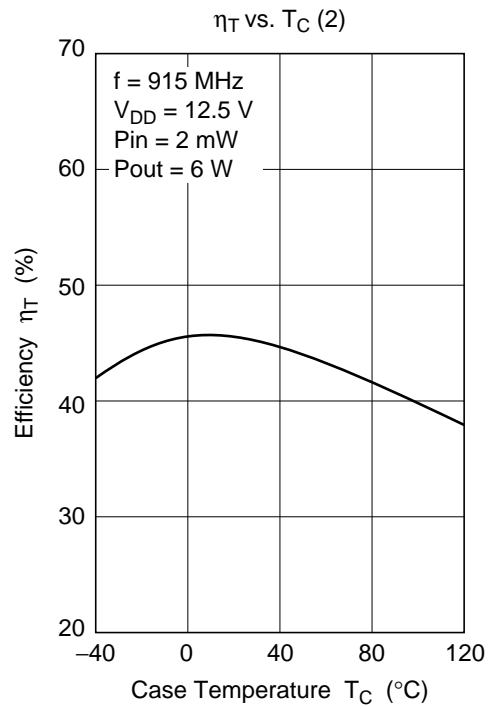
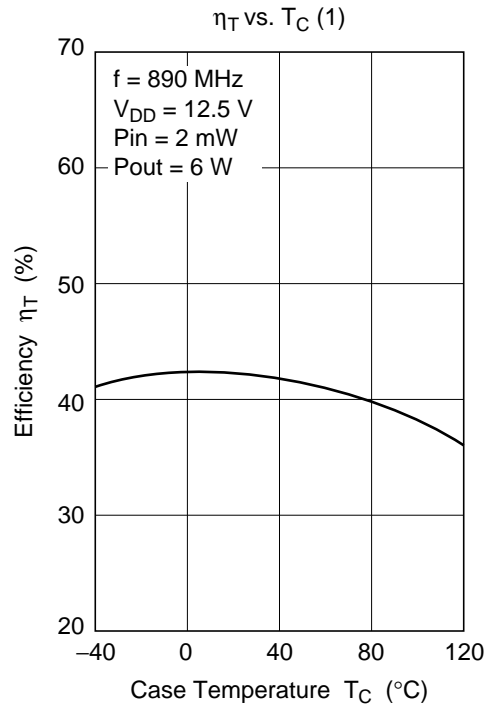
Characteristics Curve



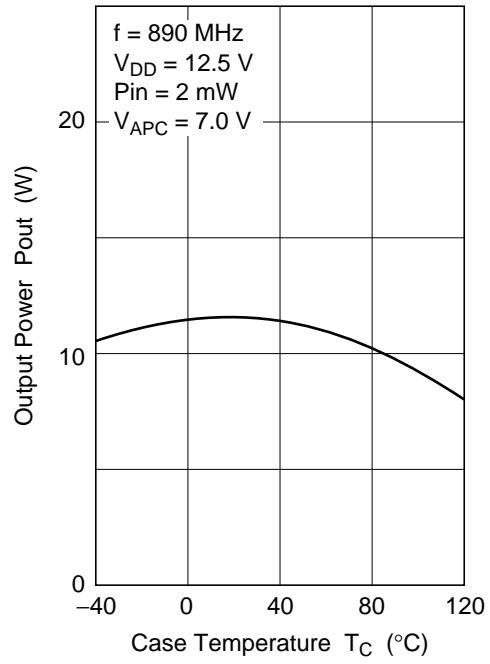




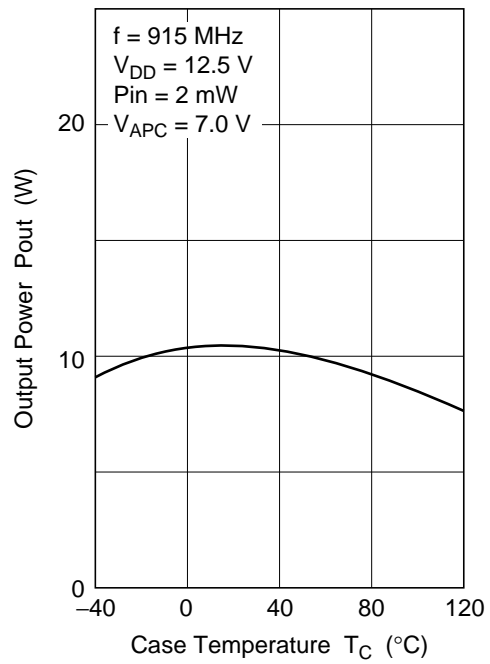




Pout vs. T_C (1)

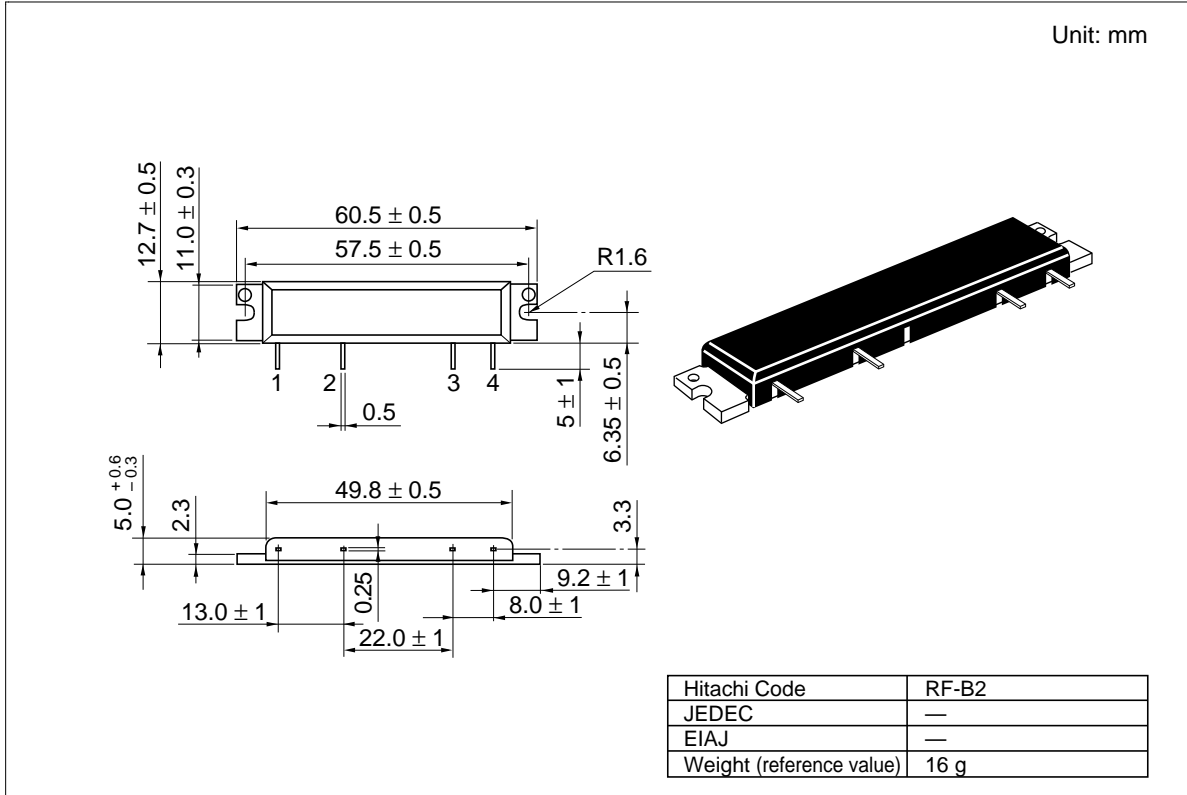


Pout vs. T_C (2)



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Package Dimensions



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