

PF01411B

MOS FET Power Amplifier Module for E-GSM Handy Phone

HITACHI

ADE-208-434C (Z)
4th Edition
Jan. 2001

Application

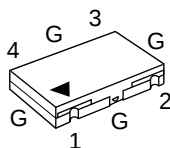
- For E-GSM class4 880 MHz to 915 MHz
- For 3.5 V nominal battery use

Features

- High gain 3stage amplifier : 0 dBm input
- Lead less thin & Small package : 2 mm Max, 0.2cc
- High efficiency : 45 % Typ at 35.5 dBm
- Wide gain control range : 70 dB Typ

Pin Arrangement

- RF-K-4



1: Pin
2: V_{apc}
3: V_{dd}
4: P_{out}
G: GND

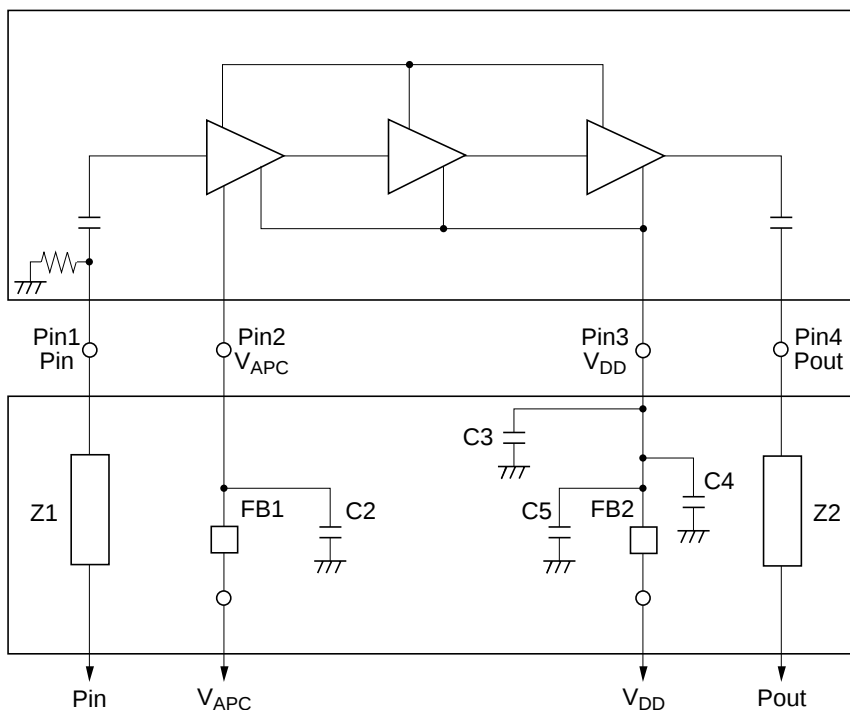
Absolute Maximum Ratings (T_c = 25°C)

Item	Symbol	Rating	Unit
Supply voltage	V _{DD}	8	V
Supply current	I _{DD}	3	A
V _{APC} voltage	V _{APC}	4	V
Input power	P _{in}	10	mW
Operating case temperature	T _c (op)	−30 to +100	°C
Storage temperature	T _{stg}	−30 to +100	°C
Output power	P _{out}	5	W

Electrical Characteristics (Tc = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Condition
Frequency range	f	880	—	915	MHz	
Control voltage range	V _{APC}	0.5	—	2.2	V	
Drain cutoff current	I _{DS}	—	—	100	μA	V _{DD} = 8 V, V _{APC} = 0 V
Total efficiency	η _T	40	45	—	%	Pin = 0 dBm, V _{DD} = 3.5 V,
2nd harmonic distortion	2nd H.D.	—	−45	−35	dBc	Pout = 35.5 dBm,
3rd harmonic distortion	3rd H.D.	—	−45	−35	dBc	Vapc = controlled,
Input VSWR	VSWR (in)	—	1.5	3	—	R _L = Rg = 50 Ω, Tc = 25°C
Output power (1)	Pout (1)	35.5	36.0	—	dBm	Pin = 0 dBm, V _{DD} = 3.5 V, V _{APC} = 2.2 V, R _L = Rg = 50 Ω, Tc = 25°C
Output power (2)	Pout (2)	33.5	34.2	—	dBm	Pin = 0 dBm, V _{DD} = 3.0 V, V _{APC} = 2.2 V, R _L = Rg = 50 Ω, Tc = 85°C
Isolation	—	—	−40	−36	dBm	Pin = 0 dBm, V _{DD} = 3.5 V, V _{APC} = 0.5 V, R _L = Rg = 50 Ω, Tc = 25°C
Switching time	t _r , t _f	—	1	2	μs	Pin = 0 dBm, V _{DD} = 3.5 V, Pout = 0 to 35.5 dBm, R _L = Rg = 50 Ω, Tc = 25°C
Stability	—	No parasitic oscillation			—	Pin = 0 dBm, V _{DD} = 3 to 5.1 V, Pout ≤ 35.5 dBm, Vapc ≤ 2.2 V GSM pulse. Rg = 50 Ω, Tc = 25°C, Output VSWR = 6 : 1 All phases
Load VSWR tolerance	—	No degradation			—	Pin = 0 dBm, V _{DD} = 3 to 5.1 V, Pout ≤ 35.5 dBm, Vapc ≤ 2.2 V GSM pulse. Rg = 50 Ω, t = 20 sec., Tc = 25°C, Output VSWR = 10 : 1 All phases

Internal Diagram and External Circuit



C2 = 1000 pF (Ceramic chip capacitor)

C3 = 0.01 μ F (Ceramic chip capacitor)

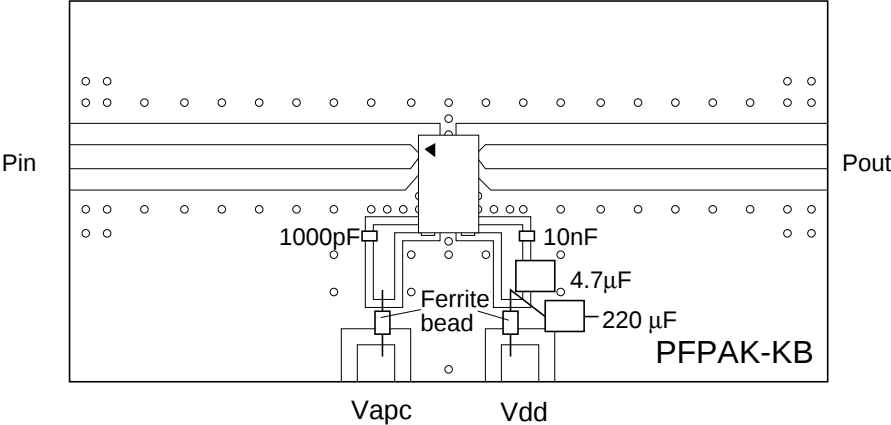
C4 = 4.7 μ F (Tantalum Electrolyte Capacitor)

C5 = 330 μ F (Aluminum Electrolyte Capacitor)

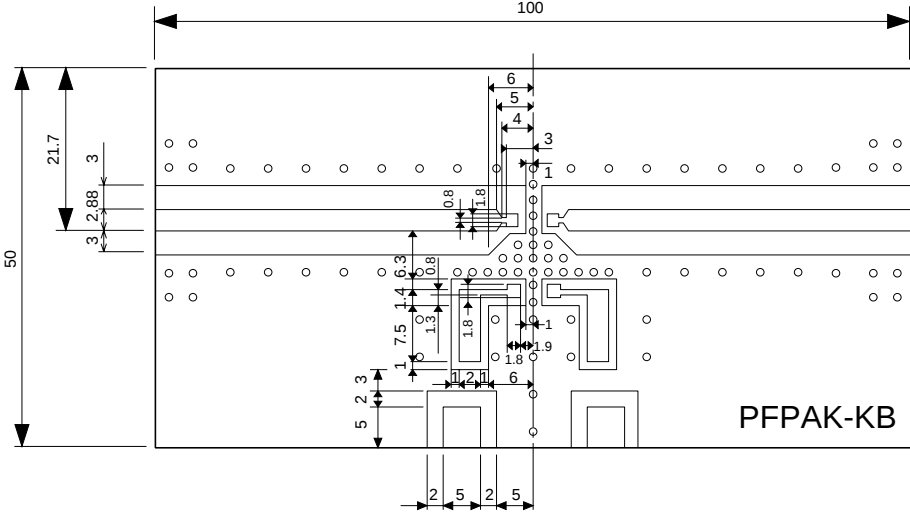
FB = Ferrite bead BLO1RN1-A62-001 (Manufacture: MURATA) or equivalent

Z1 = Z2 = 50 Ω (Microstrip line)

Test Fixture Pattern

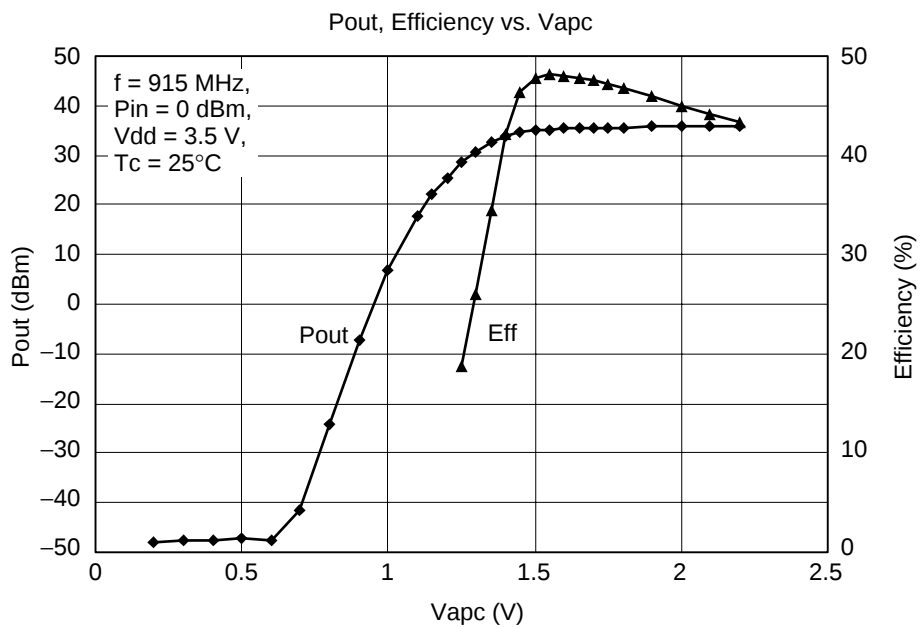
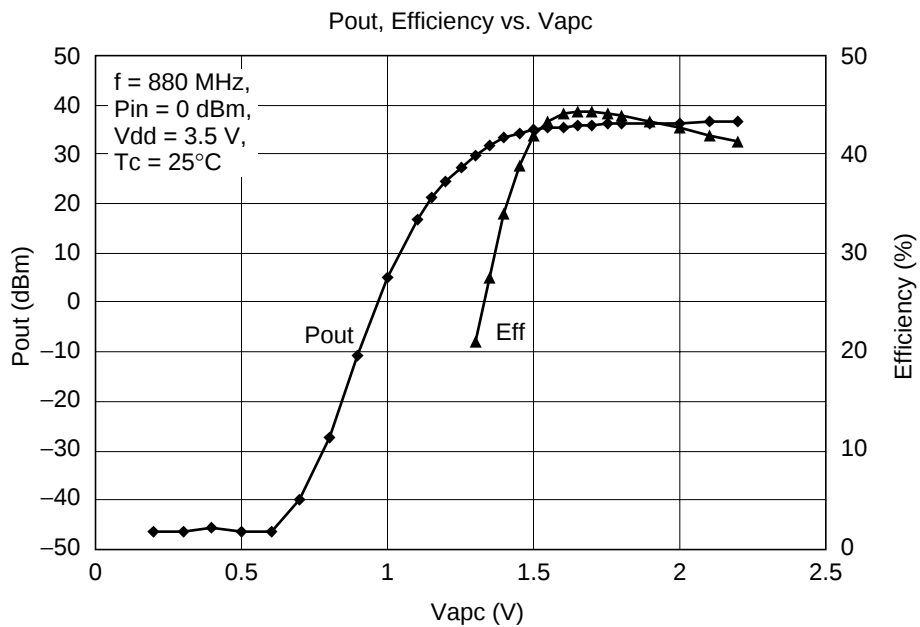


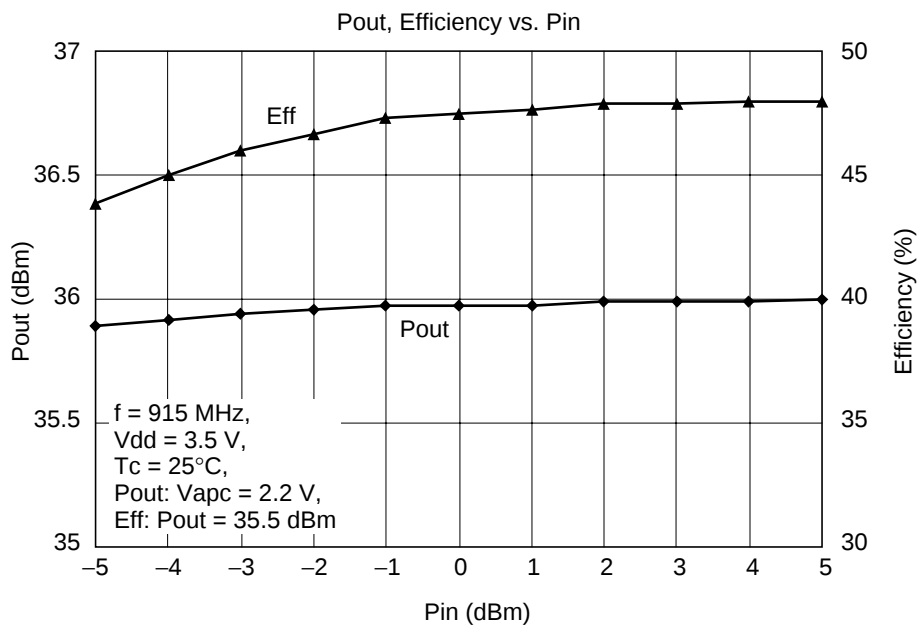
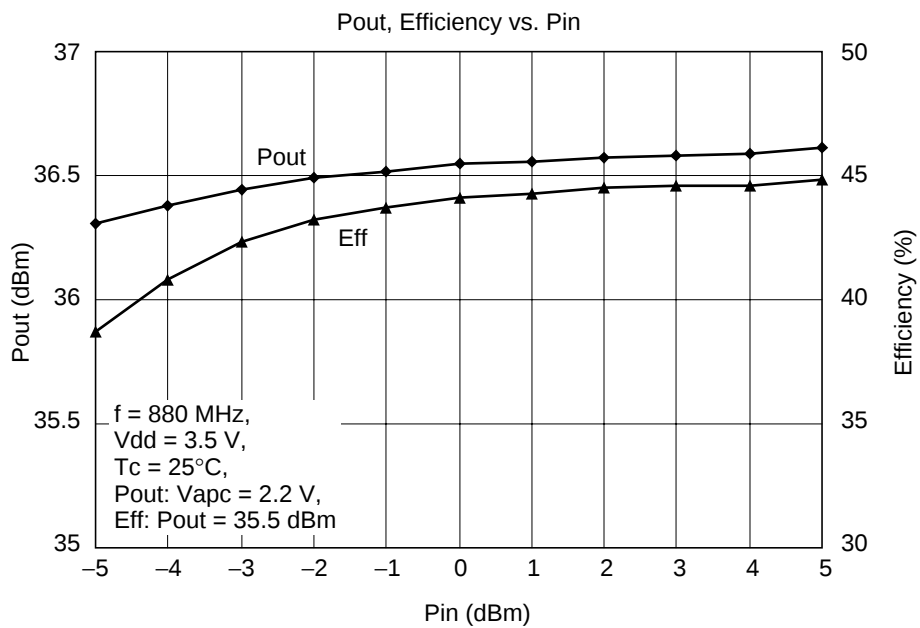
PCB pattern example and external parts for GSM K package

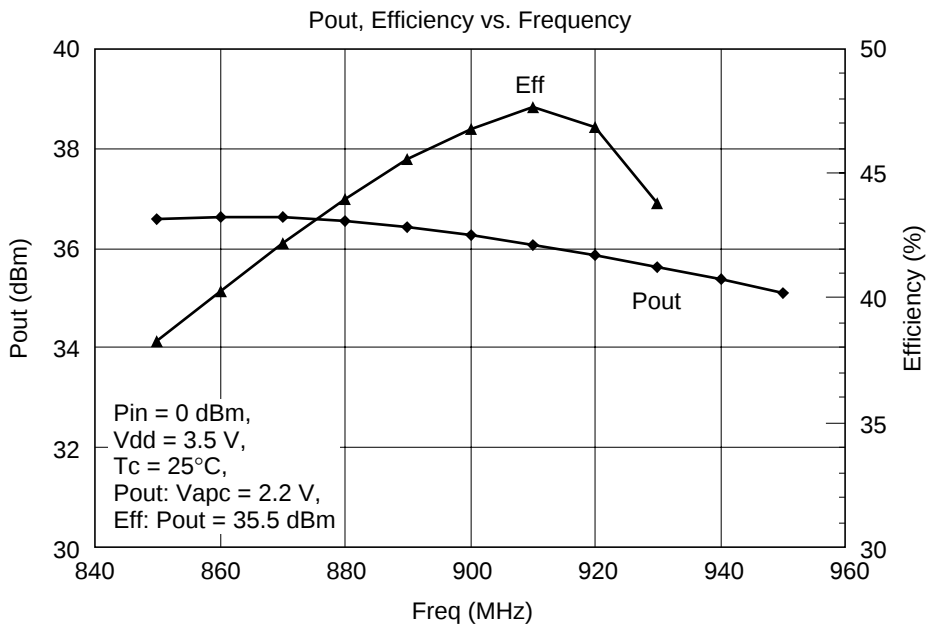


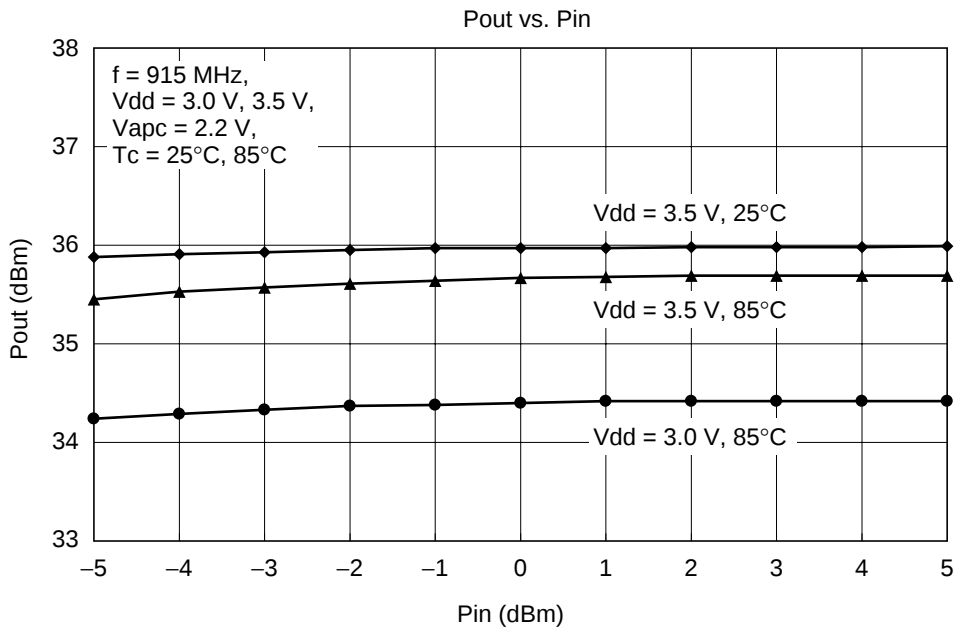
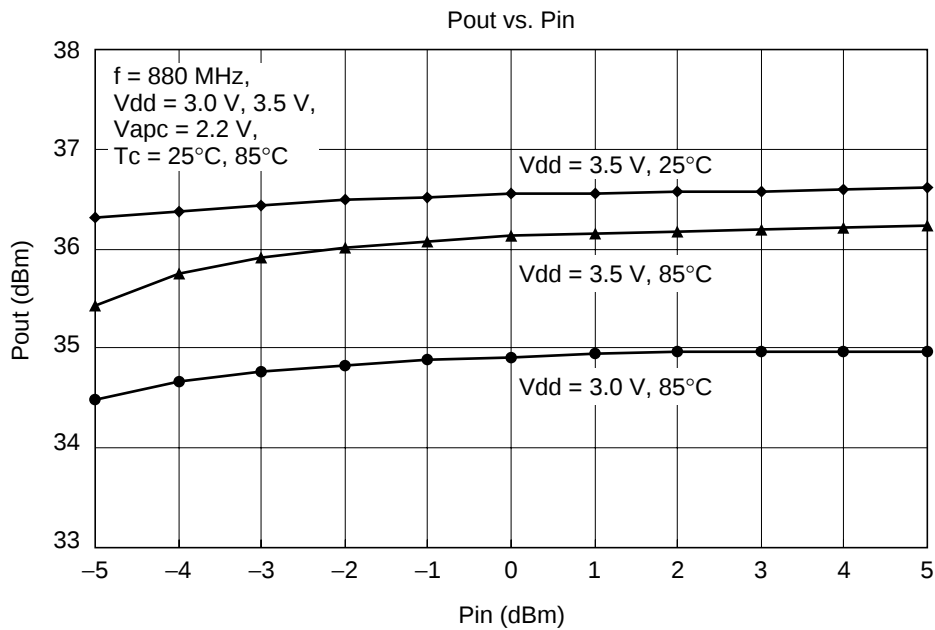
SCALE : 1/1
Grass Epoxy Double sided P.C.B
(t = 1.6mm, ϵ_r = 4.8) UNIT : mm

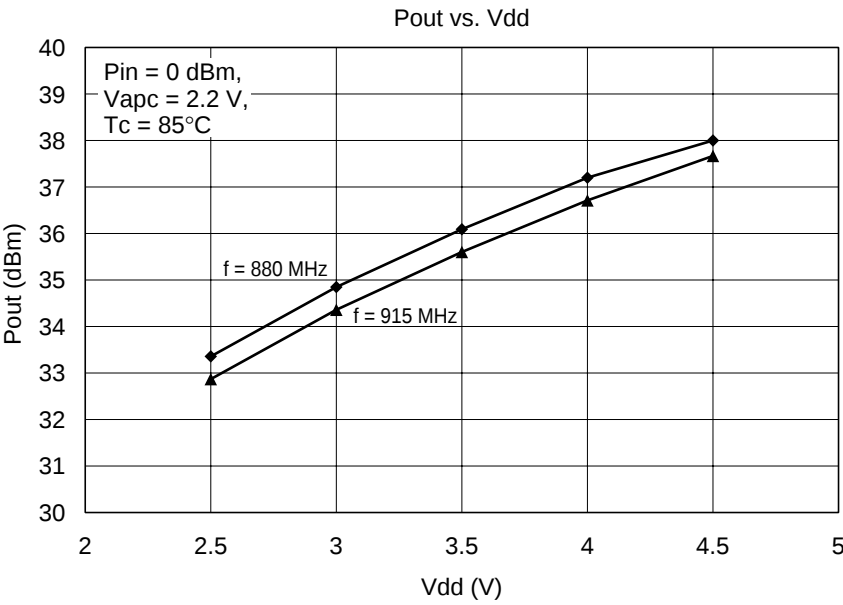
Characteristic Curves

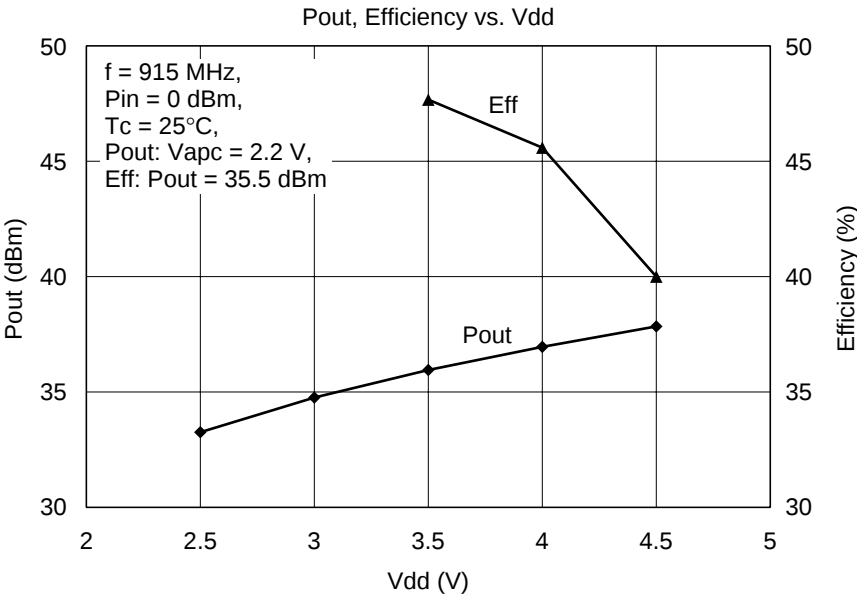
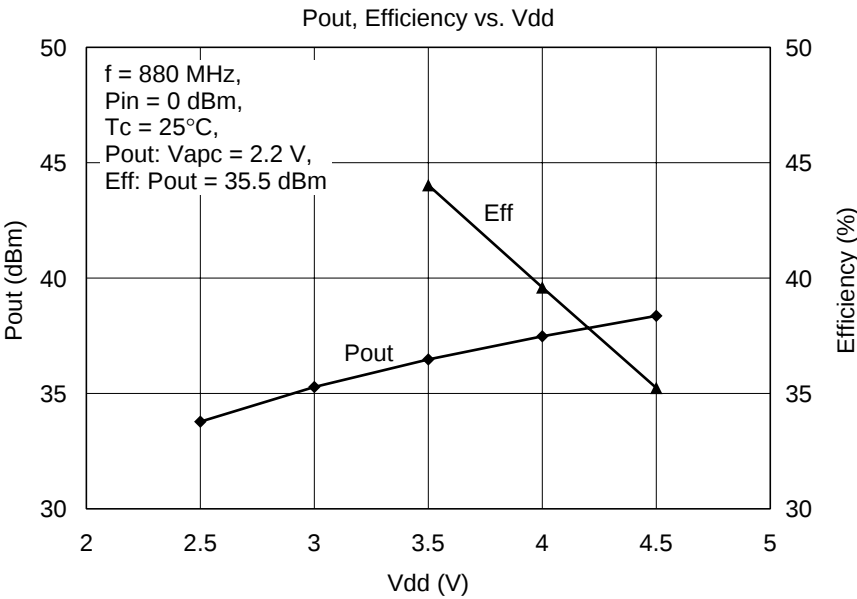






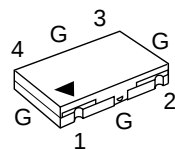
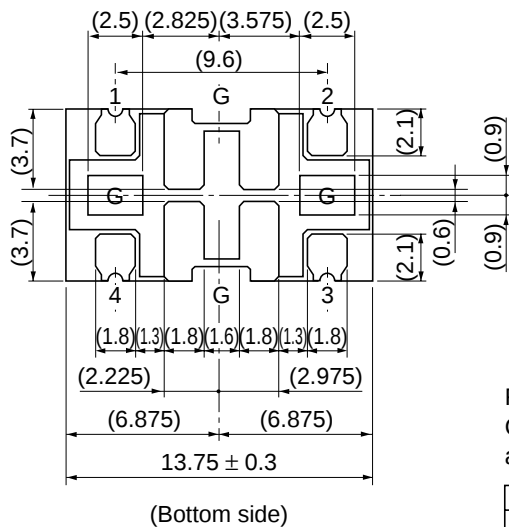
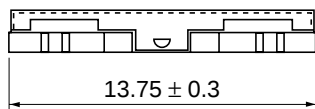
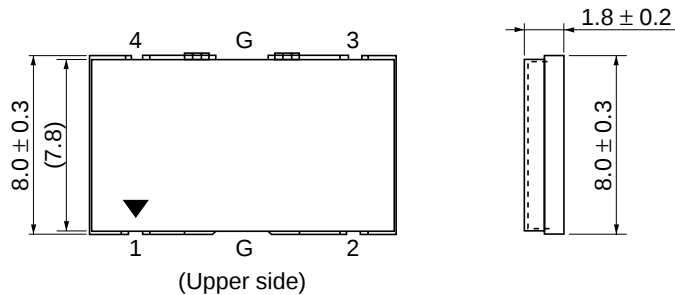






Package Dimensions

Unit: mm



- 1: Pin
- 2: Vapc
- 3: Vdd
- 4: Pout
- G: GND

Remark:
Coplanarity of bottom side of terminals
are less than 0 ± 0.1 mm.

Hitachi Code	RF-K-4
JEDEC	—
EIAJ	—
Mass (reference value)	—

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