PF0415A

MOS FET Power Amplifier Module
for PCS 1900 Handy Phone

HITACHI

ADE-208-473C (Z)
4th Edition
August 1997

Application

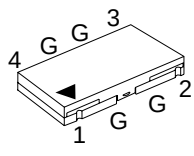
For PCS 1900 class1 1850 to 1910 MHz.

Features

- 3stage amplifier
- Small package : 0.2cc
- High efficiency : 45% Typ
- High speed switching : 0.9µsec

Pin Arrangement

• RF-K



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

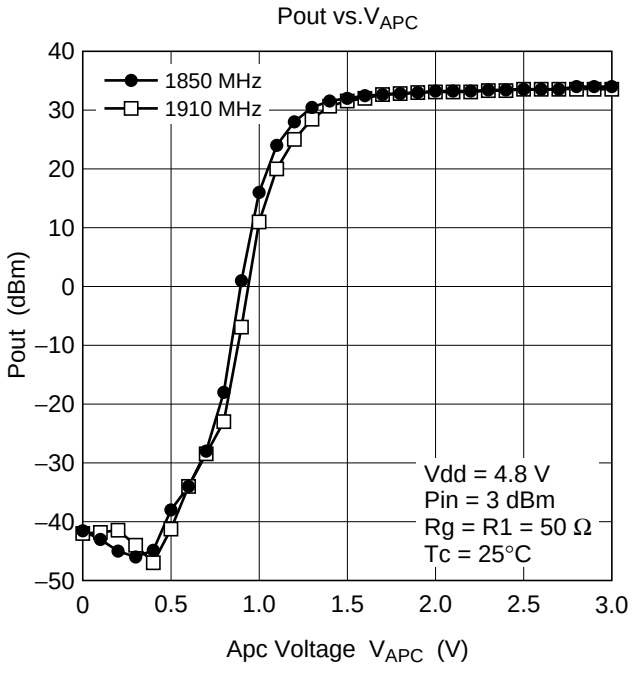
Absolute Maximum Ratings (Tc = 25°C)

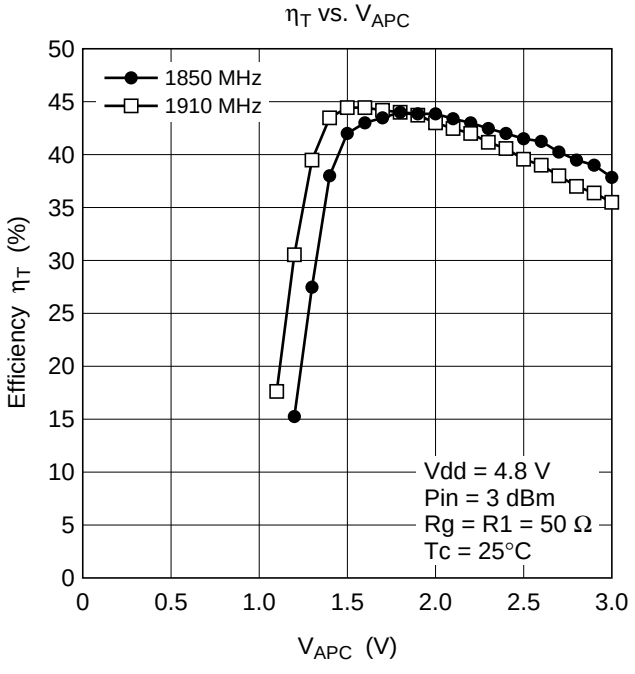
Item	Symbol	Rating	Unit
Supply voltage	V_{DD}	11	V
Supply current	I_{DD}	3	A
V_{APC} voltage	V_{APC}	6	V
Input power	Pin	20	mW
Operating case temperature	Tc (op)	–30 to +100	°C
Storage temperature	Tstg	–30 to +100	°C
Output power	Pout	3	W

Hitachi semiconductor

Electrical Characteristics (Tc = 25°C)

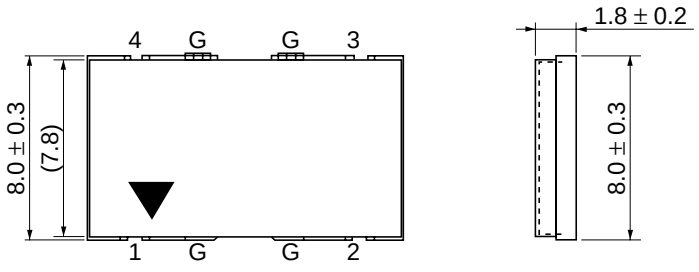
Item	Symbol	Min	Typ	Max	Unit	Test Condition
Frequency range	f	1850	—	1910	MHz	
Control voltage range	V_{APC}	0.5	—	3	V	
Drain cutoff current	I_{DS}	—	—	100	µA	V_{DD} = 11 V, V_{APC} = 0 V
Total efficiency	η_T	37	45	—	%	Pin = 2 mW, V_{DD} = 4.8 V,
2nd harmonic distortion	2nd H.D.	—	–45	–35	dBc	Pout = 1.8 W (at APC controlled),
3rd harmonic distortion	3rd H.D.	—	–45	–35	dBc	R_L = Rg = 50 Ω, Tc = 25°C
Input VSWR	VSWR (in)	—	1.5	3	—	
Output power (1)	Pout (1)	2.0	2.4	—	W	Pin = 2 mW, V_{DD} = 4.8 V, V_{APC} = 3 V, R_L = Rg = 50 Ω, Tc = 25°C
Output power (2)	Pout (2)	1.2	1.5	—	W	Pin = 2 mW, V_{DD} = 4.3 V, V_{APC} = 3 V, R_L = Rg = 50 Ω, Tc = 80°C
Isolation	—	—	–40	–30	dBm	Pin = 2 mW, V_{DD} =4.8 V, V_{APC} = 0.5 V, R_L = Rg = 50 Ω, Tc = 25°C
Switching time	tr, tf	—	0.9	2	µs	Pin = 2 mW, V_{DD} = 4.8 V, Pout = 1.8 W, R_L = Rg = 50 Ω, Tc = 25°C
Stability	—	No parasitic oscillation			—	Pin = 2 mW, V_{DD} = 6 V, Ids ≤ 0.9 A (only pulsed), Pout ≤ 1.8 W (at APC controlled), Rg = 50 Ω, t = 20 sec., Tc = 25°C, Output VSWR = 10 : 1 All phases


Pout vs.V_{APC}
1850 MHz
1910 MHz
Pout (dBm)
40
30
20
10
0
–10
–20
–30
–40
–50
0
0.5
1.0
1.5
2.0
2.5
3.0
Vdd = 4.8 V
Pin = 3 dBm
Rg = R1 = 50 Ω
Tc = 25°C
Apc Voltage V_{APC} (V)

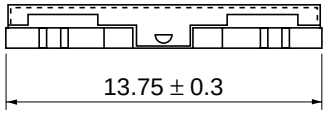

η_T vs. V_{APC}
1850 MHz
1910 MHz
Efficiency η_T (%)
50
45
40
35
30
25
20
15
10
5
0
0
0.5
1.0
1.5
2.0
2.5
3.0
Vdd = 4.8 V
Pin = 3 dBm
Rg = R1 = 50 Ω
Tc = 25°C
V_{APC} (V)

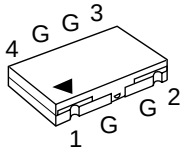
Package Dimensions

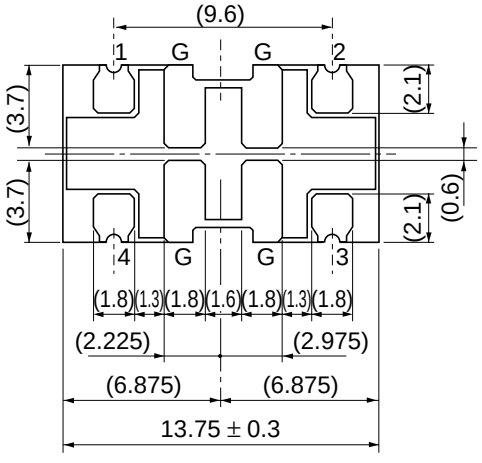
Unit: mm



(Upper side)







(Bottom side)

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

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

Cautions

1. Hitachi neither warrants nor grants licenses of any rights of Hitachi's or any third party's patent, copyright, trademark, or other intellectual property rights for information contained in this document. Hitachi bears no responsibility for problems that may arise with third party's rights, including intellectual property rights, in connection with use of the information contained in this document.
2. Products and product specifications may be subject to change without notice. Confirm that you have received the latest product standards or specifications before final design, purchase or use.
3. Hitachi makes every attempt to ensure that its products are of high quality and reliability. However, contact Hitachi's sales office before using the product in an application that demands especially high quality and reliability or where its failure or malfunction may directly threaten human life or cause risk of bodily injury, such as aerospace, aeronautics, nuclear power, combustion control, transportation, traffic, safety equipment or medical equipment for life support.
4. Design your application so that the product is used within the ranges guaranteed by Hitachi particularly for maximum rating, operating supply voltage range, heat radiation characteristics, installation conditions and other characteristics. Hitachi bears no responsibility for failure or damage when used beyond the guaranteed ranges. Even within the guaranteed ranges, consider normally foreseeable failure rates or failure modes in semiconductor devices and employ systemic measures such as fail-safes, so that the equipment incorporating Hitachi product does not cause bodily injury, fire or other consequential damage due to operation of the Hitachi product.
5. This product is not designed to be radiation resistant.
6. No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without written approval from Hitachi.
7. Contact Hitachi's sales office for any questions regarding this document or Hitachi semiconductor products.

HITACHI

Hitachi, Ltd.
Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL
NorthAmerica : http:semiconductor.hitachi.com/
Europe : http://www.hitachi-eu.com/hel/ecg
Asia (Singapore) : http://www.has.hitachi.com.sg/grp3/sicd/index.htm
Asia (Taiwan) : http://www.hitachi.com.tw/E/Product/SICD_Frame.htm
Asia (HongKong) : http://www.hitachi.com.hk/eng/bo/grp3/index.htm
Japan : http://www.hitachi.co.jp/Sicd/indx.htm

For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive,
San Jose,CA 95134
Tel: <1> (408) 433-1990
Fax: <1>(408) 433-0223

Hitachi Europe GmbH
Electronic components Group
Dornacher Straße 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building. No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX