

# PF0414B

## MOS FET Power Amplifier Module for DCS 1800 Handy Phone

# HITACHI

ADE-208-432C (Z)  
4th Edition  
December 1997

### Application

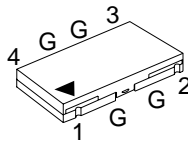
For DCS 1800 class1 1710 to 1785 MHz.

### Features

- 3stage amplifier : 0 dBm input
- Lead less thin & small package : 2 mm Max & 0.2cc
- High efficiency : 40% Typ at 32.5 dBm
- Wide gain control range : 70 dB Typ
- Low voltage operation : 3.5 V

### 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 <sub>DD</sub>  | 8           | V    |
| Supply current             | I <sub>DD</sub>  | 2           | A    |
| V <sub>APC</sub> voltage   | V <sub>APC</sub> | 4           | V    |
| Input power                | Pin              | 10          | mW   |
| Operating case temperature | Tc (op)          | -30 to +100 | °C   |
| Storage temperature        | Tstg             | -30 to +100 | °C   |
| Output power               | Pout             | 3           | W    |

**Electrical Characteristics** ( $T_c = 25^\circ\text{C}$ )

| <b>Item</b>             | <b>Symbol</b> | <b>Min</b>               | <b>Typ</b> | <b>Max</b> | <b>Unit</b>   | <b>Test Condition</b>                                                                                                                                                                                                   |
|-------------------------|---------------|--------------------------|------------|------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency range         | f             | 1710                     | —          | 1785       | MHz           |                                                                                                                                                                                                                         |
| Control voltage range   | $V_{APC}$     | 0.5                      | —          | 2.2        | V             |                                                                                                                                                                                                                         |
| Drain cutoff current    | $I_{DS}$      | —                        | —          | 100        | $\mu\text{A}$ | $V_{DD} = 8\text{ V}, V_{APC} = 0\text{ V}$                                                                                                                                                                             |
| Total efficiency        | $\eta_T$      | 35                       | 40         | —          | %             | $P_{in} = 0\text{ dBm}, V_{DD} = 3.5\text{ V},$                                                                                                                                                                         |
| 2nd harmonic distortion | 2nd H.D.      | —                        | -45        | -35        | dBc           | $P_{out} = 32.5\text{ dBm}$ (at APC controlled),                                                                                                                                                                        |
| 3rd harmonic distortion | 3rd H.D.      | —                        | -45        | -35        | dBc           | $R_L = R_g = 50\ \Omega, T_c = 25^\circ\text{C}$                                                                                                                                                                        |
| Input VSWR              | VSWR (in)     | —                        | 1.5        | 3          | —             |                                                                                                                                                                                                                         |
| Output power (1)        | $P_{out}$ (1) | 32.5                     | 33.0       | —          | dBm           | $P_{in} = 0\text{ dBm}, V_{DD} = 3.5\text{ V},$<br>$V_{APC} = 2.2\text{ V}, R_L = R_g = 50\ \Omega,$<br>$T_c = 25^\circ\text{C}$                                                                                        |
| Output power (2)        | $P_{out}$ (2) | 31                       | 31.5       | —          | dBm           | $P_{in} = 0\text{ dBm}, V_{DD} = 3.0\text{ V},$<br>$V_{APC} = 2.2\text{ V}, R_L = R_g = 50\ \Omega,$<br>$T_c = 85^\circ\text{C}$                                                                                        |
| Isolation               | —             | —                        | -36        | -33        | dBm           | $P_{in} = 0\text{ dBm}, V_{DD} = 3.5\text{ V},$<br>$V_{APC} = 0.5\text{ V}, R_L = R_g = 50\ \Omega,$<br>$T_c = 25^\circ\text{C}$                                                                                        |
| Switching time          | $t_r, t_f$    | —                        | 1          | 2          | $\mu\text{s}$ | $P_{in} = 0\text{ dBm}, V_{DD} = 3.5\text{ V},$<br>$P_{out} = 32.5\text{ dBm}, R_L = R_g = 50\ \Omega,$<br>$T_c = 25^\circ\text{C}$                                                                                     |
| Stability               | —             | No parasitic oscillation |            |            | —             | $P_{in} = 0\text{ dBm}, V_{DD} = 3\text{ to }5.1\text{ V},$<br>$P_{out} \leq 32.5\text{ dBm}$ (at APC controlled),<br>$R_g = 50\ \Omega, t = 20\text{ sec.}, T_c = 25^\circ\text{C},$<br>Output VSWR = 6 : 1 All phases |



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