

MITSUBISHI SEMICONDUCTOR (GaAs FET)

FA01205, FA01206, FA01207

800MHz BAND 0.6W RF POWER HYBRID IC

DESCRIPTION

FA01205, FA01206, FA01207 is RF power Hybrid IC designed for 800MHz band small size hand held radio.

FEATURE

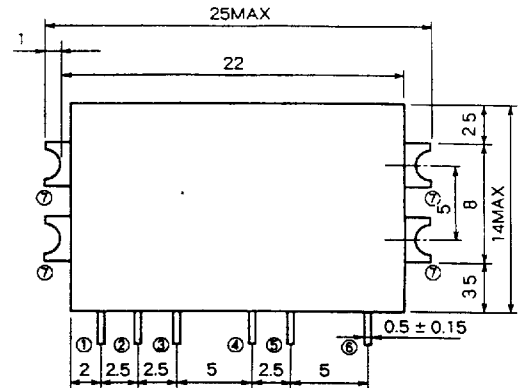
- High efficiency 50 %
- High power 31.5dBm
- High gain 24.5dB
- Small size 25 × 14 × 4.5mm
- Frequency range FA01205 824~849MHz
- FA01206 872~905MHz
- FA01207 890~915MHz

APPLICATION

RF output stage of 0.6W small size hand held radio

OUTLINE DRAWING

Dimensions in mm



- ① RF INPUT
- ② 1ST GATE BIAS
- ③ 1ST DRAIN BIAS
- ④ 2ND GATE BIAS
- ⑤ 2ND DRAIN BIAS
- ⑥ RF OUTPUT
- ⑦ GROUND

t = 4.5mm
TOLERANCE : ± 0.5

ABSOLUTE MAXIMUM RATINGS (T_c = 25 °C)

Symbol	Parameters	Conditions	Ratings	Unit
V _{D1} , V _{D2}	Drain bias Voltage	Z _G = Z _L = 50 Ω	9	V
I _{D1}	Drain Current	Ditto	200	mA
I _{D2}		Ditto	500	mA
V _{G1} , V _{G2}	Gate bias Voltage	Ditto	- 5.5	V
P _{in}	Input power	V _{D1} = V _{D2} = 5.8V, V _{G1} = V _{G2} = - 4.0V	10	dBm
P _o	Output power	Z _G = Z _L = 50 Ω	33	dBm
T _{c(op)}	Operating case temperature	-	- 30 ~ + 90	°C
T _{stg}	Storage temperature	-	- 30 ~ + 90	°C

ELECTRICAL CHARACTERISTICS (T_c = 25 °C)

Symbol	Parameters	Test conditions	Limits			Unit
			Min	Typ	Max	
f	Frequency	FA01205	824	-	849	MHz
		FA01206	872	-	905	MHz
		FA01207	890	-	915	MHz
P _o	Output power	V _{D1} = V _{D2} = 5.8V, V _{G1} = V _{G2} = - 4.0V P _{in} = 7dBm, Z _G = Z _L = 50 Ω	31.5	32.0	-	dBm
η _T	Total efficiency	P _o = 31.5dBm, V _{D2} = 5.8V V _{D1} : Controlled, V _{G1} = V _{G2} = - 4.0V P _{in} = 7dBm, Z _G = Z _L = 50 Ω	50	60	-	%
ρ _{in}	Input VSWR		-	-	3	-
2SP	2nd harmonic		-	-	- 30	dBc
3SP	3rd harmonic		-	-	- 30	dBc
4SP	4th harmonic		-	-	- 30	dBc
-	Stability	P _o ≤ 31.5dBm, V _{D2} = 5~7V V _{D1} = 0~5.8V, V _{G1} = V _{G2} = - 4.0V P _{in} = 7dBm, Z _G = 50 Ω, ρ _L ≤ 3.1	Parasitic oscillation level ≤ - 60dBc			-

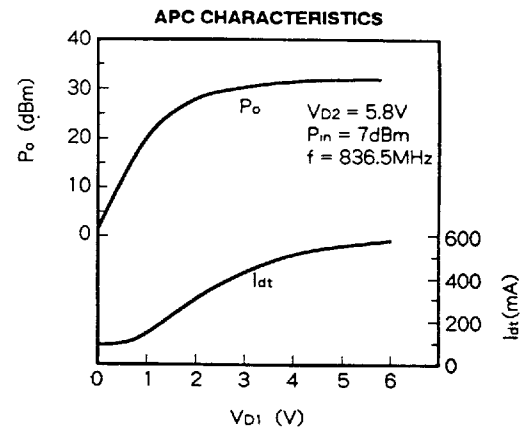
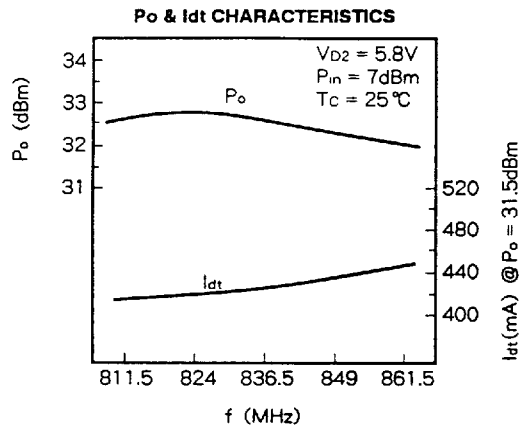


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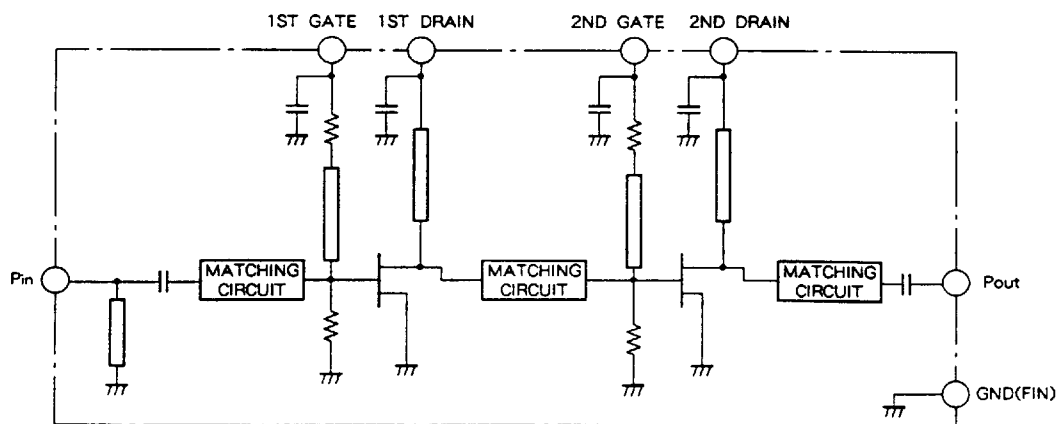
800MHz BAND 0.6W RF POWER HYBRID IC

FA01205

TYPICAL CHARACTERISTICS (Ta = 25°C)



EQUIVALENT CIRCUIT

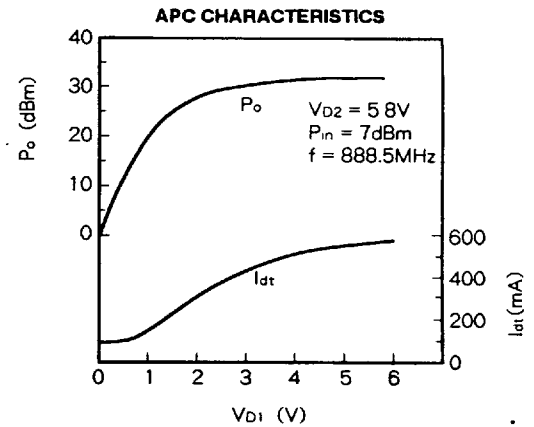
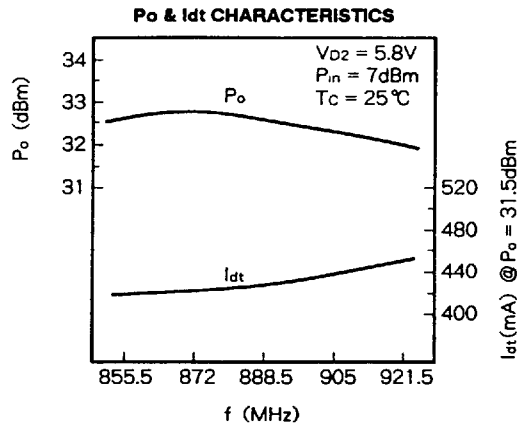


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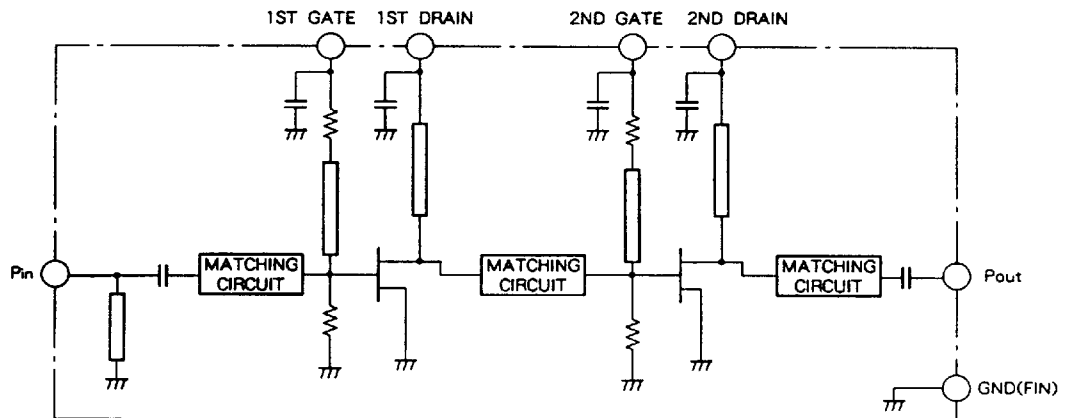
800MHz BAND 0.6W RF POWER HYBRID IC

FA01206

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



EQUIVALENT CIRCUIT

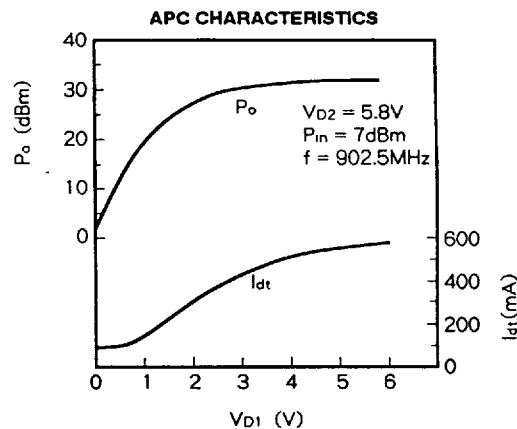
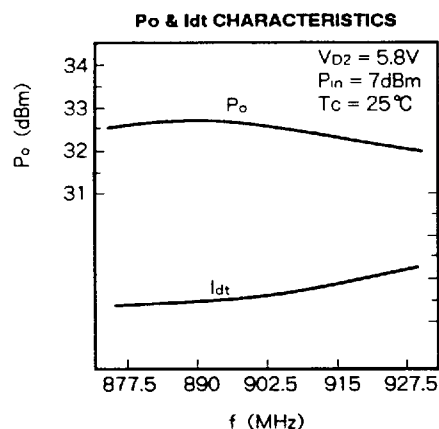


FA01205,FA01206,FA01207

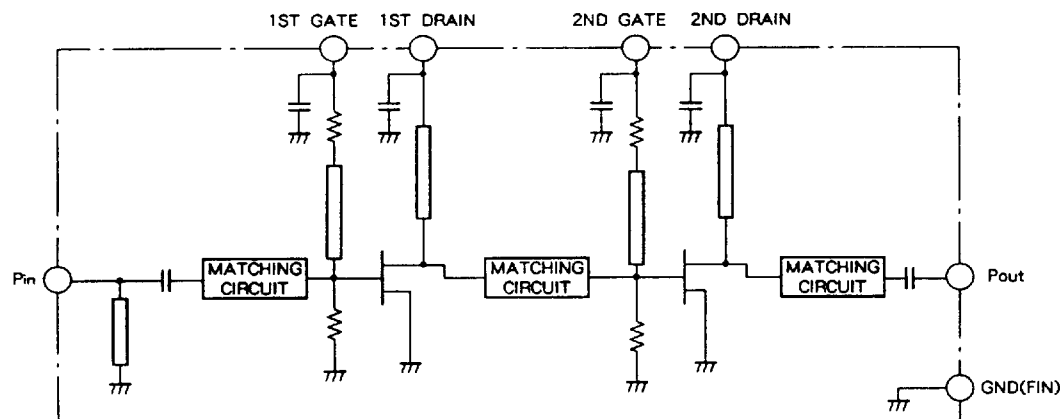
800MHz BAND 0.6W RF POWER HYBRID IC

FA01207

TYPICAL CHARACTERISTICS (Ta = 25°C)



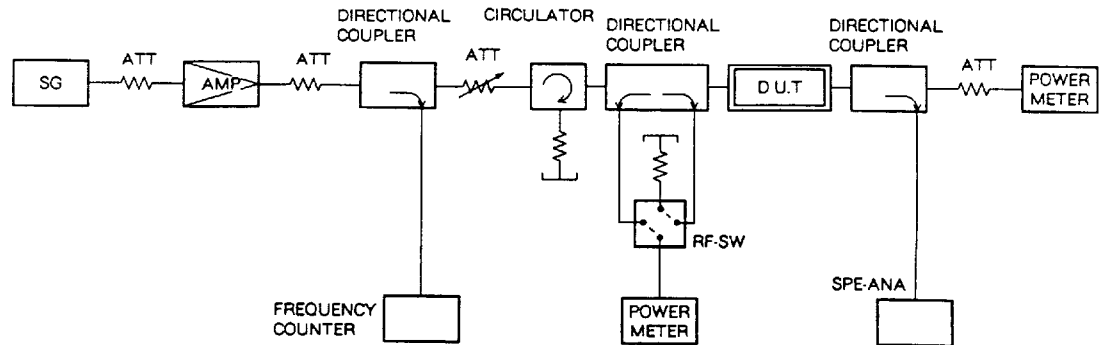
EQUIVALENT CIRCUIT



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BLOCK DIAGRAM OF RF TEST SYSTEM



HANDLING PRECAUTIONS FOR FA01205, FA01206, FA01207

Handling and mounting

- 1) Before testing or mounting, the workdesk, the test equipments, soldering iron and worker should be grounded. Please note that GaAsFETs are much more sensitive to electrostatic discharge than Si transistors. Therefore, handling without grounding possibly damages the GaAsFETs.
- 2) The surface of the board to mount FA01205, FA01206, FA01207 on, should be as flat and clean as possible (flatness should be less than 50 microns) to prevent the ceramic substrate from cracking by bending the FA01205, FA01206, FA01207.
- 3) Lead pins should be soldered after the soldering of ground flange to prevent stress against the FA01205, FA01206, FA01207.
- 4) The conditions for soldering should be :
 Temperature : less than 350 °C
 Time : less than 3 sec
- 5) After soldering, remove the flux with ethyl alcohol. Take care that ethyl alcohol don't penetrate into the FA01205, FA01206, FA01207.
- 6) Don't apply the reflow soldering process and dipping solder process.

Biassing

- 1) To prevent parastic osillation, connect by-pass capacitors of 1000pF and 10 to 50 μ F in parallel to each Gate and Drain bias circuit, respectively.
- 2) In the evaluation of FA01205, FA01206, FA01207, the following bias procedure is recommended :
 a) Connect 1st and 2nd Gate (pin ② and ④)
 b) Connect 1st and 2nd Drain (pin ③ and ⑤)
 c) Input RF signal
- 3) At the actual use, the following bias timing is recommended :
 a) Telephone stand by Drain bias off Gate bias on
 b) Telephone on Drain bias on Gate bias on
- 4) To change output power, control the 1st drain bias (pin ③).