

MGF7168C

Technical Note

UHF BAND GaAs POWER AMPLIFIER

Specifications are subject to change without notice.

DESCRIPTION

MGF7168C is a monolithic microwave integrated circuit for use in UHF-band power amplifier.

FEATURES

- Low voltage operation
Vd=3.2V
- High output power
Po=33dBm (typ.) @1710~1785MHz
Po=33dBm (typ.) @1850~1910MHz
- High efficiency
Id=1250mA (typ.) @Po=33dBm
- Small size
6.1x7.0x1.10mm
- Surface mount package
- 2 Stage Amplifier
- External matching circuit is required

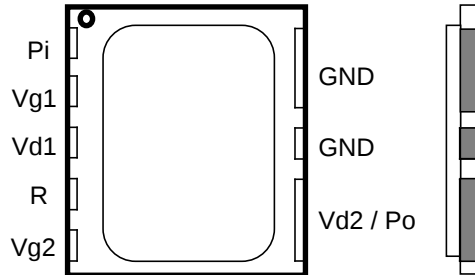
APPLICATION

- 1.8GHz band handheld phone
- 1.9GHz band handheld phone

QUALITY GRADE

- GG

PIN CONFIGURATION (TOP VIEW)



Pin : RF input (Note1)
 Pout : RF output (Note1)
 Vd1 : Drain bias 1
 Vd2 : Drain bias 2
 Vg1 : Gate bias 1
 Vg2 : Gate bias 2
 GND : Connect to GND
 CASE : Connect to GND
 R : Connect to GND through the resistor

Note1: Connect to matching circuits.

*Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary, circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.

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ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Ratings	Unit
Vd1,Vd2	Drain voltage	6	V
Vg1,Vg2	Gate voltage	-4	V
Pi	Input power	15	dBm
Tc(op)	Operating case temperature	-30~+85	°C
Tstg	Storage temperature	-30~+100	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions Note1,2	Limits			Unit
			MIN	TYP	MAX	
f	frequency		1710	—	1785	MHz
			1850	—	1910	
Pin	Input power	Vd1=Vd2=3.2V, Po=33dBm	—	—	10	dBm
Idt	Total drain current	Vd1=Vd2=3.2V, Pin≤10dBm, Po=33dBm	—	1250	—	mA
Ig	Gate current		—	—	3	mA
2sp	2nd harmonics		—	—	-30	dBc
pin	input VSWR		—	—	3	—
—	Damage with-standing Note3	Vd1=Vd2=3.2V, Pin≤10dBm, Load VSWR=10, All phase Time=10 sec	No damage			
—	Stability Note3	Vd1=Vd2=3.2V, Pin≤10dBm, Load VSWR=3:1, All phase	No oscillation Spurious level≤-60dBc			

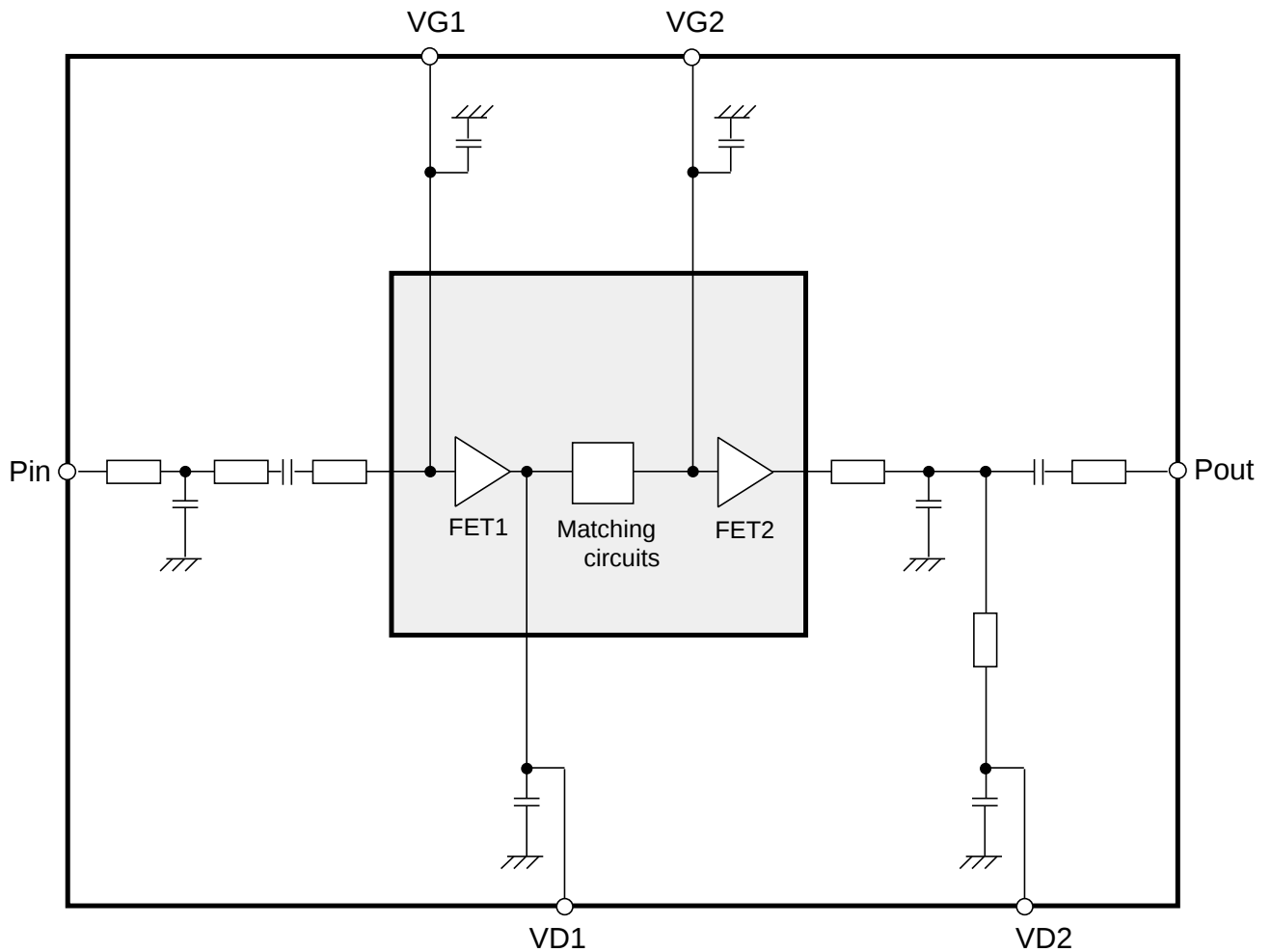
Note1 : Electrical characteristics are changed by the external matching circuit.
Limits are guaranteed by using MITSUBISHI test fixture.

Note2 : GMSK Pulse operation

Note3 : Sampling inspection

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Equivalent circuit of MGF7168C with our test board

- : MGF7168C(Ceramic package)
- : our test board($\epsilon_r=4.8$, $t=0.6\text{mm}$)

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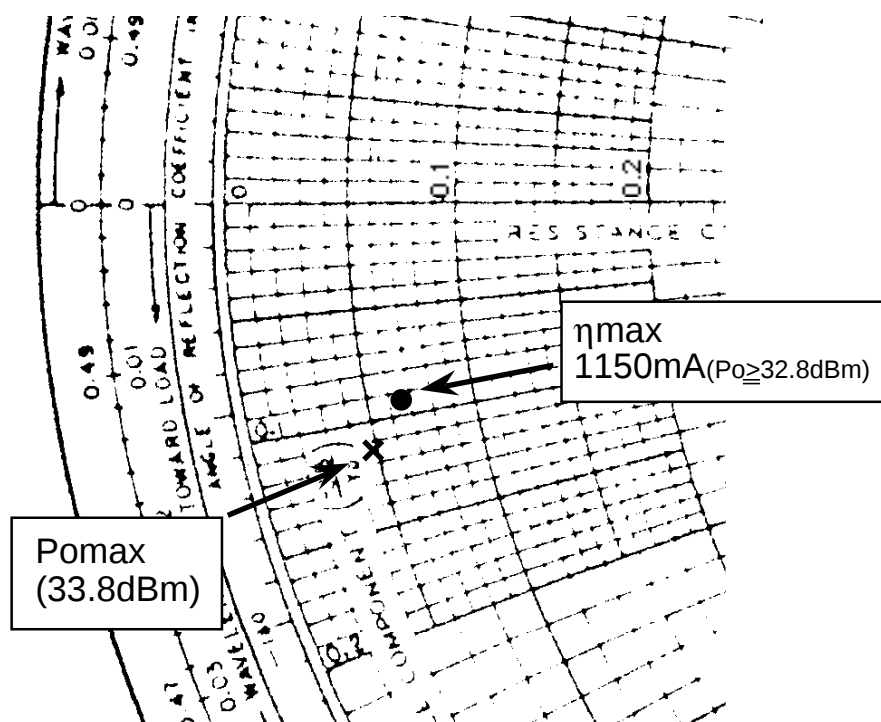
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Input/Output Impedance

$Z_I = 4.5 - j27.8 \ (\Omega) : 1.88\text{GHz}$

$Z_L(\eta_{\max}) = 3.3 - j4.7 \ (\Omega) : f = 1.88\text{GHz}$

$Z_L(P_o \max) = 2.4 - j5.8 \ (\Omega) : f = 1.88\text{GHz}$

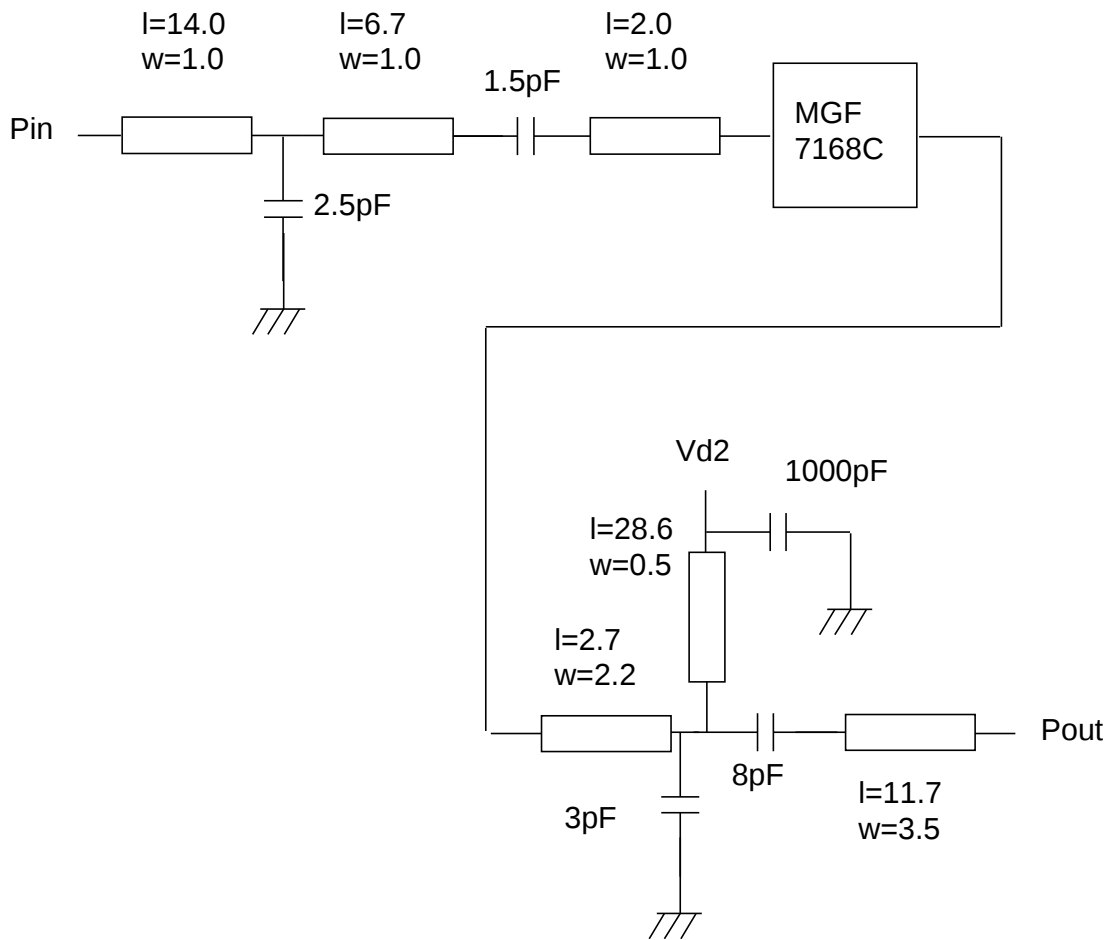


Conditions;
 $V_{d1} = V_{d2} = 3.2\text{V}$
 $V_{gg} = -2.0\text{V}$
 $P_{in} = 10\text{dBm}$

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Equivalent Circuit of Test Board for PCS(DCS1900)



Unit:mm

SUB. data

ER=4.8

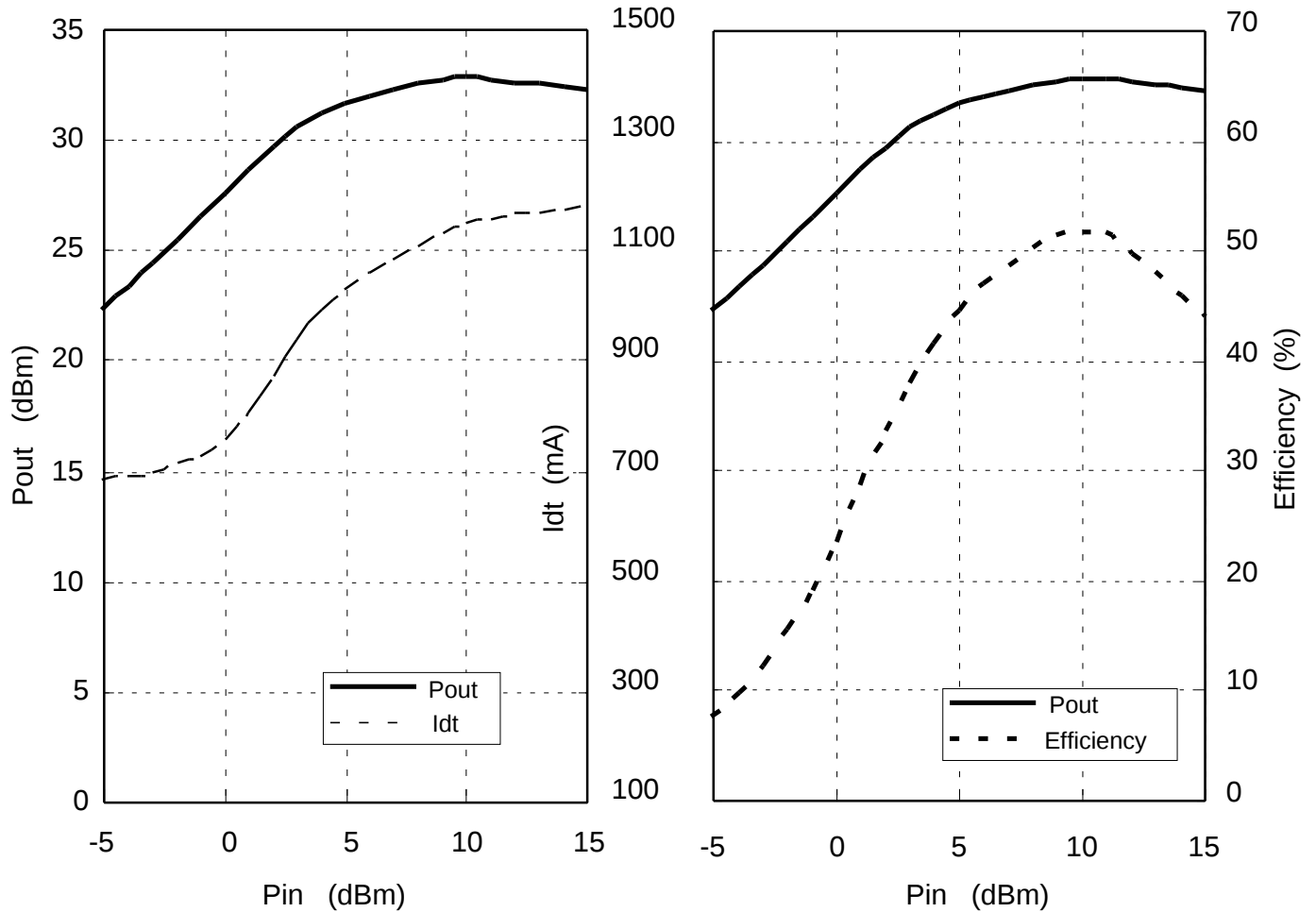
H=600 μm

Metal T=43 μm

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Pin vs. Pout, Idt, η_t for PCS1900



$F_{in}=1880\text{MHz}$
 $V_{d1}=V_{d2}=3.2\text{V}$
 $I_{d1}=150\text{mA}, I_{d2}=550\text{mA}$
 CW evaluation

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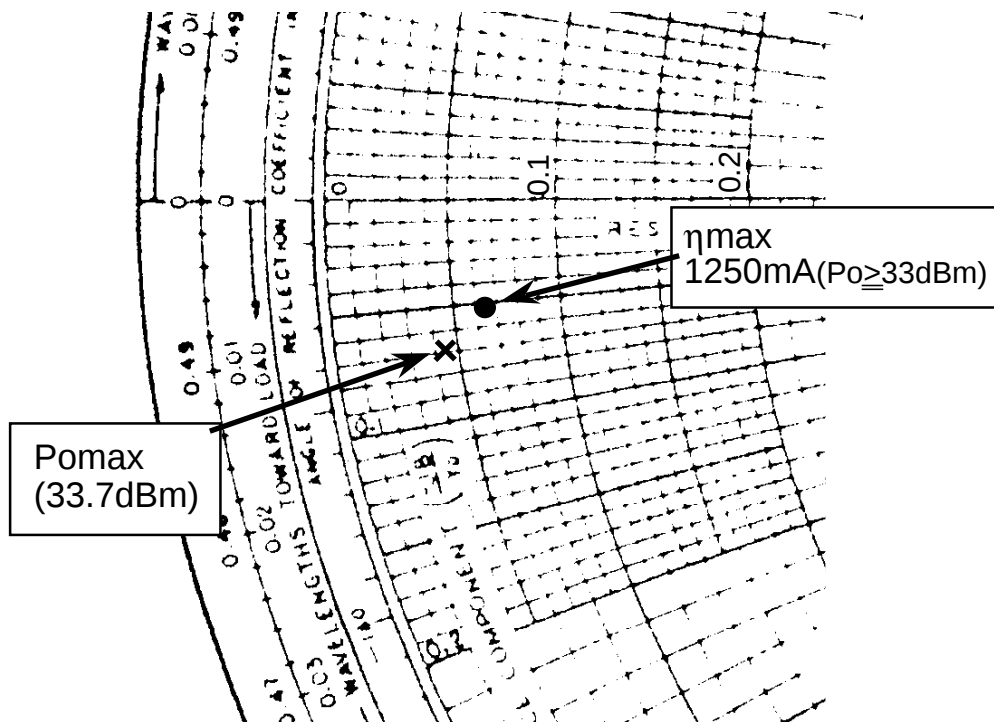
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Input/Output Impedance (DCS1800)

$Z_I = 6.0 - j22.4 (\Omega) : 1.75\text{GHz}$

$Z_L(\eta_{\max}) = 3.3 - j2.6 (\Omega) : 1.75\text{GHz}$

$Z_L(P_o \max) = 2.2 - j3.5 (\Omega) : 1.75\text{GHz}$



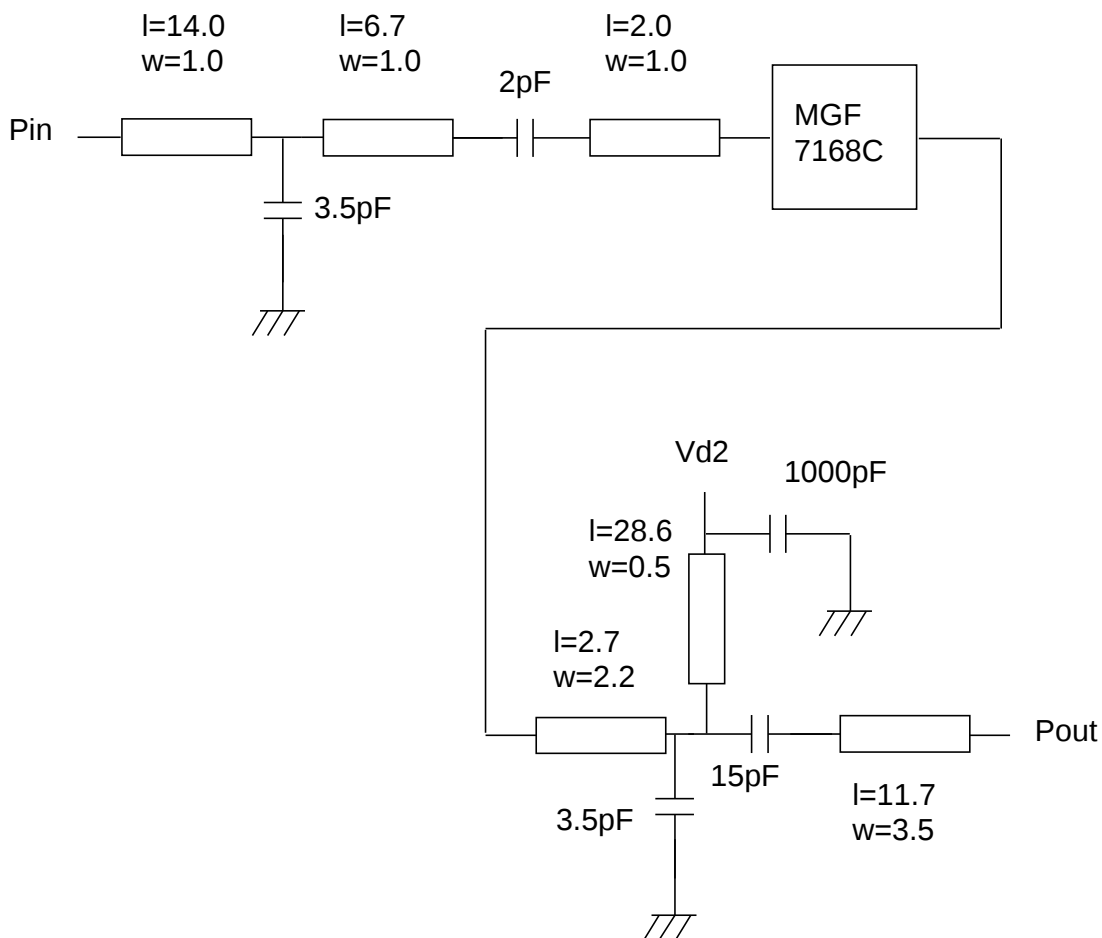
Conditions;
 $V_{d1} = V_{d2} = 3.2\text{V}$
 $V_{gg} = -2.0\text{V}$
 $P_{in} = 10\text{dBm}$

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Equivalent Circuit of Test Board for PCN(DCS1800)

<Exsample 1>



Unit:mm

SUB. data

ER=4.8

H=600μm

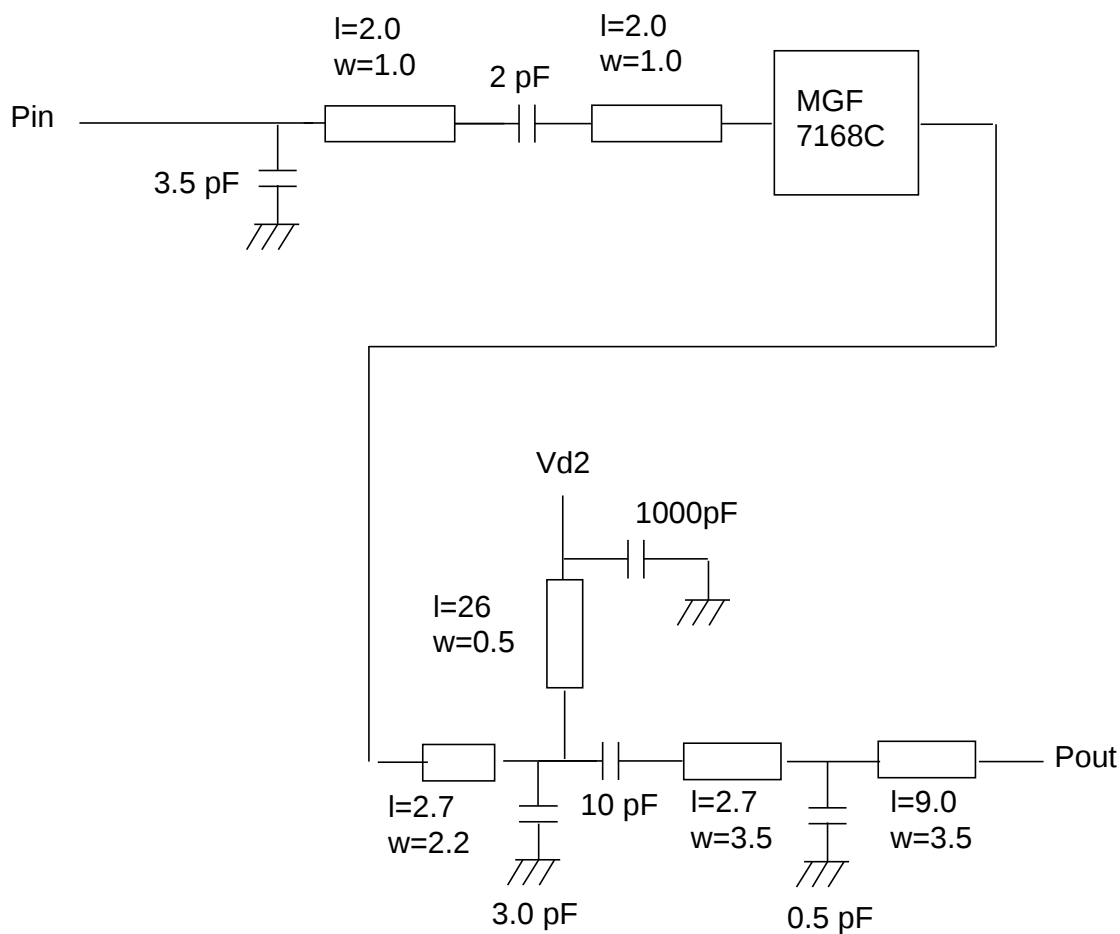
Metal T=43μm

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Equivalent Circuit of Test Board for PCN (DCS1800)

<Example 2>



Unit:mm

SUB. data

ER=4.8

H=600 μ m

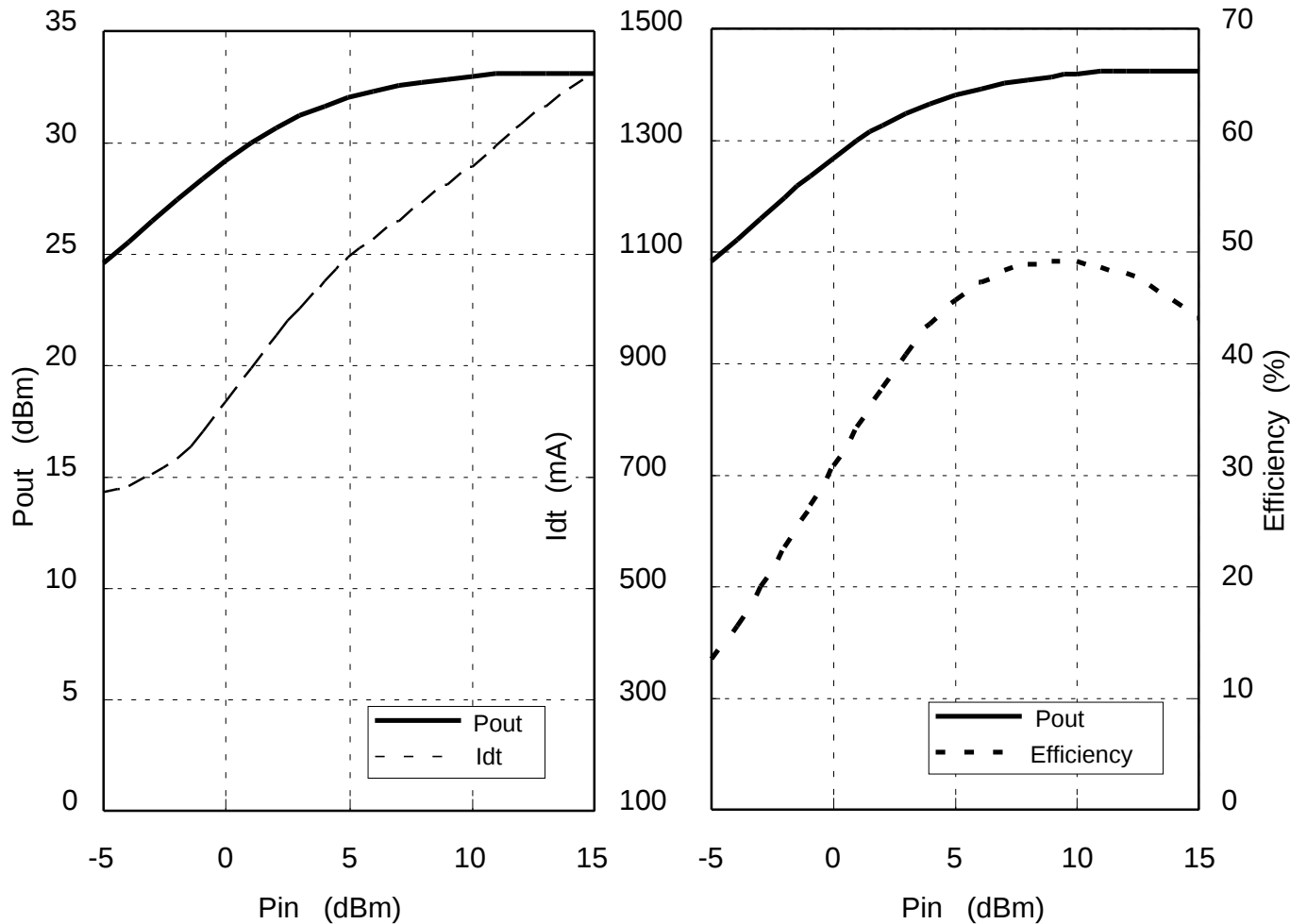
Metal T=43 μ m

Preliminary
information

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Pin vs. Pout, Idt, η_t for PCN/DCS1800

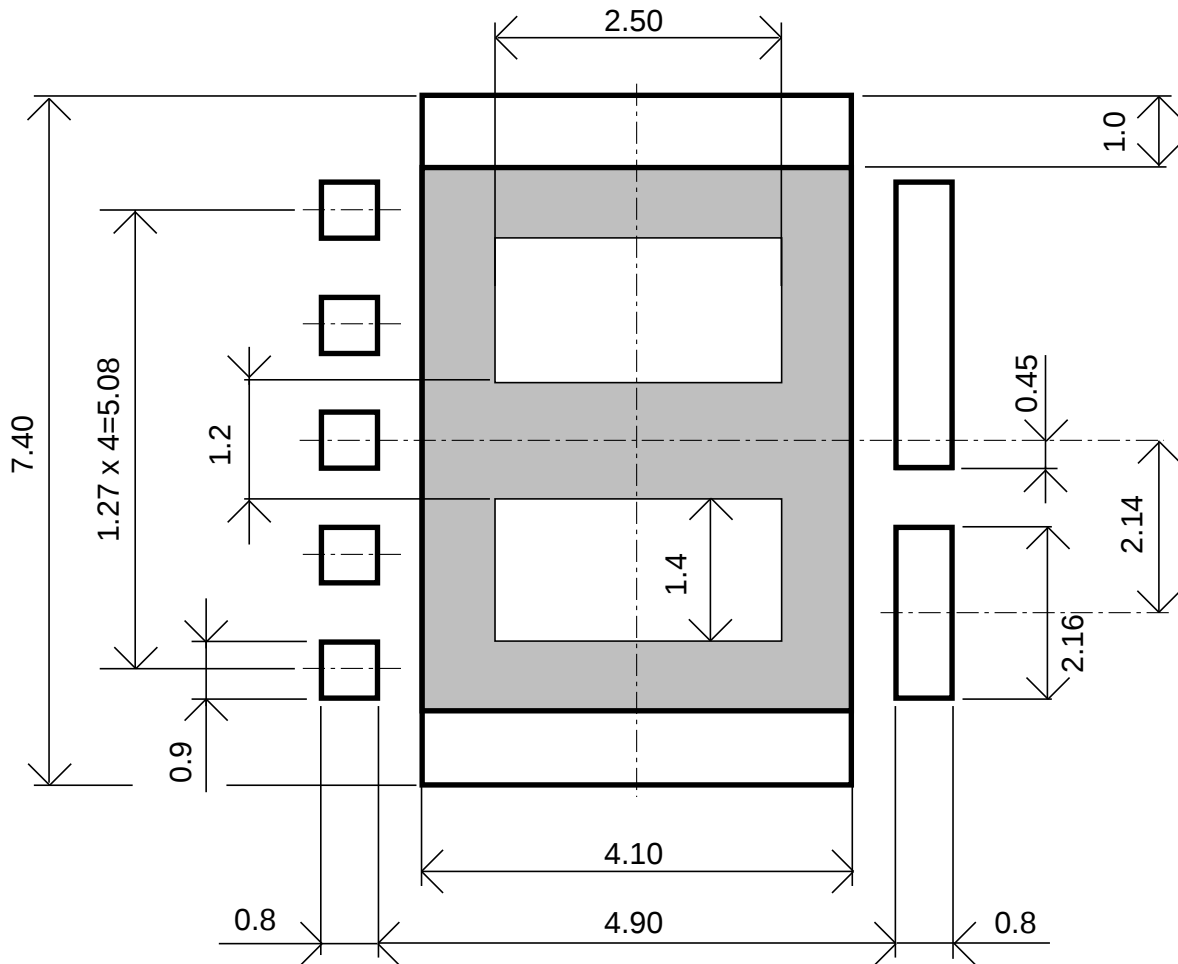


Fin=1750MHz
Vd1=Vd2=3.2V
Id1=150mA, Id2=550mA
CW evaluation

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Recommended Mount Pad



Unit:mm

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Unit : mm



Note2 : The values without tolerance are typical.