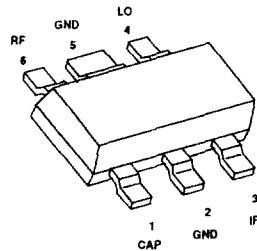


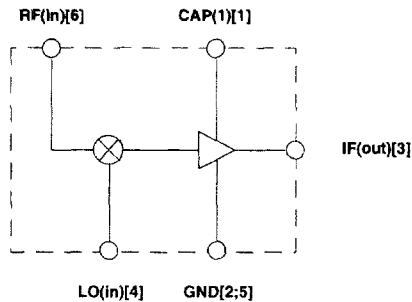
Datasheet

- \* GaAs mixer with integrated IF-amplifier for mobile communication
- \* Frequency range 0.8 GHz to 2.5 GHz
- \* Very low power consumption (1 mA typ.)
- \* Single positive supply voltage
- \* Operating voltage range: 2.7 to 6 V
- \* Miniature package MW6 based on SOT23



ESD: Electrostatic discharge sensitive device, observe handling precautions!

Type	Marking	Ordering code (taped)	Package 1)
CMY 91	M2	Q62702-M9	MW-6



Maximum ratings	Symbol		Unit
Drain-source voltage	$V_{IF-GND}$	8	V
Gate-source voltage range	$V_{LO-GND}$	-5 ... 0	V
Drain current	$I_{IF}$	20	mA
RF- / LO-peak current	$+I_{RF}, +I_{LO}$	2	mA
Channel temperature	$T_{Ch}$	150	°C
Storage temperature range	$T_{stg}$	-55...+150	°C
Total power dissipation ( $T_s = t_{bd} \text{ } ^\circ\text{C}^2$ )	$P_{tot}$	160	mW
<b>Thermal resistance</b>			
Channel-soldering point GND	$R_{thChS}$	350	K/W

1) Dimensions see chapter Package Outlines  
 2) TS: Temperature measured at soldering point GND

Electrical characteristics at  $T_A = 25^\circ\text{C}$  /  $V_D = 3\text{ V}$  unless otherwise specified

Characteristics of 900MHz test and application circuit (see page app. circuit)

Parameters	Symbol	min	typ	max	Unit
Drain-source breakdown voltage $I_{IF} = 500\ \mu\text{A}$ $V_{LO-GND} = 0\ \text{V}$ $V_{RF-GND} = 4\ \text{V}$ CAP-pin not connected	$V_{(BR)}$ $IF-GND$	8	-	-	V
Drain current $V_{RF-GND} = 0\ \text{V}$ $V_{LO-GND} = 0\ \text{V}$ $V_{IF-GND} = 3\ \text{V}$ CAP-pin not connected	$I_D$	0.8	1	1.4	mA
Conversion gain $f_{RF} = 920\ \text{MHz}$ $f_{LO} = 965\ \text{MHz}$ $f_{IF} = 45\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$G_c$	-	5.5	-	dB
Single sideband noise figure $f_{RF} = 920\ \text{MHz}$ $f_{LO} = 965\ \text{MHz}$ $f_{IF} = 45\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$F_{SSB}$	-	9	-	dB
3rd order intermodulation $f_{RF} = 920\ \text{MHz}$ $f_{LO} = 965\ \text{MHz}$ $f_{IF} = 45\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$IP3$	-	-2	-	dBm
LO/RF isolation $f = 965\ \text{MHz}$	$ISO_{LO/RF}$	-	11	-	dB

$T_A = 25^\circ\text{C}$  /  $V_D = 3\ \text{V}$ ; CAP-pin connected to ground by 680 $\Omega$  resistor

Parameters	Symbol	min	typ	max	Unit
Drain current $V_{RF-GND} = 0\ \text{V}$ $V_{LO-GND} = 0\ \text{V}$ $V_{IF-GND} = 3\ \text{V}$	$I_D$	-	2.5	-	mA
Conversion gain $f_{RF} = 920\ \text{MHz}$ $f_{LO} = 965\ \text{MHz}$ $f_{IF} = 45\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$G_c$	-	9.5	-	dB
Single sideband noise figure $f_{RF} = 920\ \text{MHz}$ $f_{LO} = 965\ \text{MHz}$ $f_{IF} = 45\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$F_{SSB}$	-	8.0	-	dB
3rd order intermodulation $f_{RF} = 920\ \text{MHz}$ $f_{LO} = 965\ \text{MHz}$ $f_{IF} = 45\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$IP3$	-	0	-	dBm
LO/RF isolation $f = 965\ \text{MHz}$	$ISO_{LO/RF}$	-	11	-	dB

Not used ports were terminated by 50  $\Omega$ .

Please make sure that LO-signal is clean of noise and spurious at  $f = f_{LO} \pm f_{IF}$

Electrical characteristics at  $T_A = 25^\circ\text{C}$  /  $V_D = 3\text{ V}$  unless otherwise specified

Characteristics of 1450MHz application circuit (see page app. circuit)

Parameters	Symbol	min	typ	max	Unit
Drain-source breakdown voltage $I_{IF} = 500\ \mu\text{A}$ $V_{LO-GND} = 0\text{ V}$ $V_{RF-GND} = 4\text{ V}$ CAP-pin not connected	$V_{(BR)}$ $IF-GND$	8	-	-	V
Drain current $V_{RF-GND} = 0\text{ V}$ $V_{LO-GND} = 0\text{ V}$ $V_{IF-GND} = 3\text{ V}$ CAP-pin not connected	$I_D$	0.8	1	1.4	mA
Conversion gain $f_{RF} = 1450\text{ MHz}$ $f_{LO} = 1350\text{ MHz}$ $f_{IF} = 100\text{ MHz}$ $P_{LO} = -3\text{ dBm}$	$G_c$	-	5.5	-	dB
Single sideband noise figure $f_{RF} = 1450\text{ MHz}$ $f_{LO} = 1350\text{ MHz}$ $f_{IF} = 100\text{ MHz}$ $P_{LO} = -3\text{ dBm}$	$F_{SSB}$	-	10	-	dB
3rd order intermodulation $f_{RF} = 1450\text{ MHz}$ $f_{LO} = 1350\text{ MHz}$ $f_{IF} = 100\text{ MHz}$ $P_{LO} = -3\text{ dBm}$	$IP3$	-	-2	-	dBm
LO/RF isolation $f = 1350\text{ MHz}$	$ISO_{LO/RF}$	-	8	-	dB

$T_A = 25^\circ\text{C}$  /  $V_D = 3\text{ V}$ ; CAP-pin connected to ground by  $680\ \Omega$  resistor

Parameters	Symbol	min	typ	max	Unit
Drain current $V_{RF-GND} = 0\text{ V}$ $V_{LO-GND} = 0\text{ V}$ $V_{IF-GND} = 3\text{ V}$	$I_D$	-	2.5	-	mA
Conversion gain $f_{RF} = 1450\text{ MHz}$ $f_{LO} = 1350\text{ MHz}$ $f_{IF} = 100\text{ MHz}$ $P_{LO} = -3\text{ dBm}$	$G_c$	-	7.5	-	dB
Single sideband noise figure $f_{RF} = 1450\text{ MHz}$ $f_{LO} = 1350\text{ MHz}$ $f_{IF} = 100\text{ MHz}$ $P_{LO} = -3\text{ dBm}$	$F_{SSB}$	-	9.5	-	dB
3rd order intermodulation $f_{RF} = 1450\text{ MHz}$ $f_{LO} = 1350\text{ MHz}$ $f_{IF} = 100\text{ MHz}$ $P_{LO} = -3\text{ dBm}$	$IP3$	-	0	-	dBm
LO/RF isolation $f = 1350\text{ MHz}$	$ISO_{LO/RF}$	-	8	-	dB

Not used ports were terminated by  $50\ \Omega$ .

Electrical characteristics at  $T_A = 25^\circ\text{C}$  /  $V_D = 3\text{ V}$  unless otherwise specified

Characteristics of 1900MHz application (see page app. circuit)

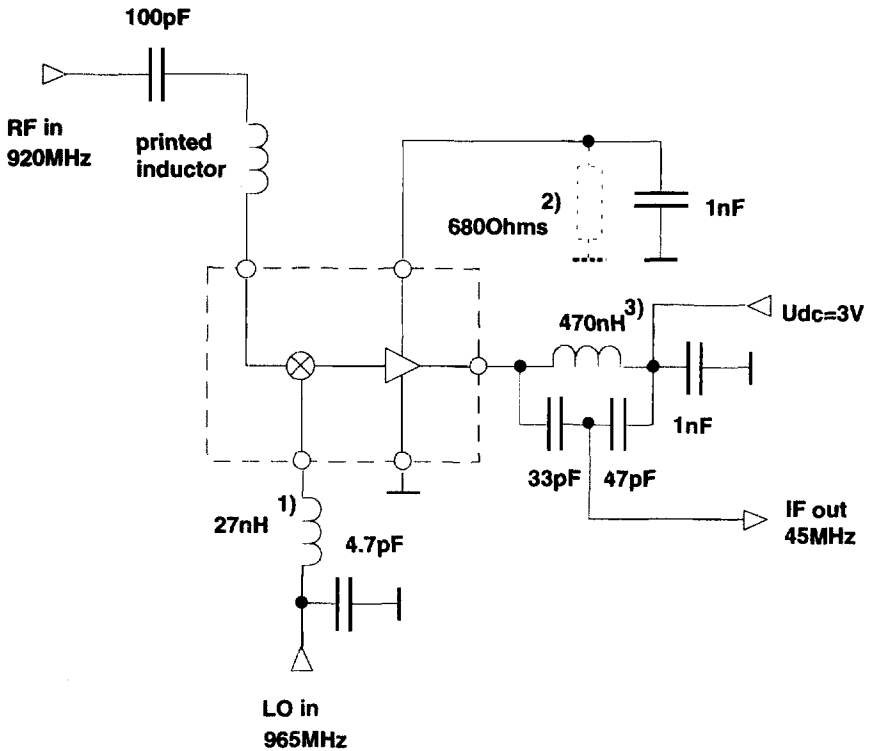
Parameters	Symbol	min	typ	max	Unit
Drain-source breakdown voltage $I_{IF} = 500\ \mu\text{A}$ $V_{LO-GND} = 0\ \text{V}$ $V_{RF-GND} = 4\ \text{V}$ CAP-pin not connected	$V_{(BR)}$ $IF-GND$	8	-	-	V
Drain current $V_{RF-GND} = 0\ \text{V}$ $V_{LO-GND} = 0\ \text{V}$ $V_{IF-GND} = 3\ \text{V}$ CAP-pin not connected	$I_D$	0.8	1	1.4	mA
Conversion gain $f_{RF} = 1900\ \text{MHz}$ $f_{LO} = 1800\ \text{MHz}$ $f_{IF} = 100\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$G_c$	-	5	-	dB
Single sideband noise figure $f_{RF} = 1900\ \text{MHz}$ $f_{LO} = 1800\ \text{MHz}$ $f_{IF} = 100\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$F_{SSB}$	-	10.5	-	dB
3rd order intermodulation $f_{RF} = 1900\ \text{MHz}$ $f_{LO} = 1800\ \text{MHz}$ $f_{IF} = 100\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$IP3$	-	-2	-	dBm
LO/RF isolation $f = 1800\ \text{MHz}$	$ISO_{LO/RF}$	-	8	-	dB

$T_A = 25^\circ\text{C}$  /  $V_D = 3\ \text{V}$ ; CAP-pin connected to ground by 680Ω resistor

Parameters	Symbol	min	typ	max	Unit
Drain current $V_{RF-GND} = 0\ \text{V}$ $V_{LO-GND} = 0\ \text{V}$ $V_{IF-GND} = 3\ \text{V}$	$I_D$	-	2.5	-	mA
Conversion gain $f_{RF} = 1900\ \text{MHz}$ $f_{LO} = 1800\ \text{MHz}$ $f_{IF} = 100\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$G_c$	-	7.5	-	dB
Single sideband noise figure $f_{RF} = 1900\ \text{MHz}$ $f_{LO} = 1800\ \text{MHz}$ $f_{IF} = 100\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$F_{SSB}$	-	9.5	-	dB
3rd order intermodulation $f_{RF} = 1900\ \text{MHz}$ $f_{LO} = 1800\ \text{MHz}$ $f_{IF} = 100\ \text{MHz}$ $P_{LO} = -3\ \text{dBm}$	$IP3$	-	0	-	dBm
LO/RF isolation $f = 1800\ \text{MHz}$	$ISO_{LO/RF}$	-	8	-	dB

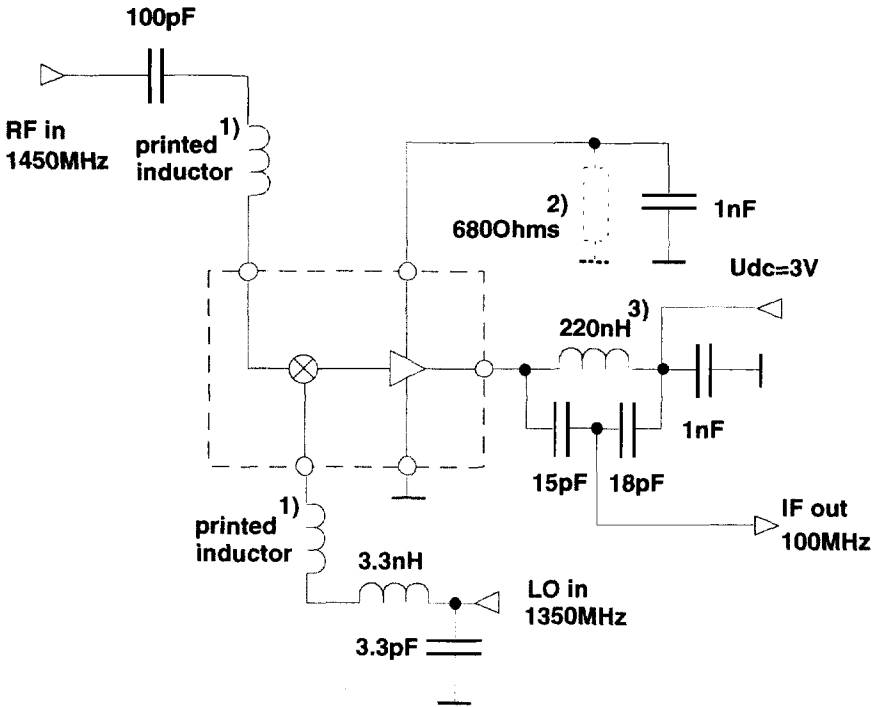
Not used ports were terminated by 50 Ω.

900MHz measurement and application circuit (Figure 1)



- 1) Siemens SIMID 01-coil; Ordering code: B82412-A3270-M
- 2) Optional resistor increases IF-amplifier operating current and improves conversion gain and intermodulation performance (minimum value: 27Ω)
- 3) Siemens SIMID 01-coil; Ordering code: B82412-A3471-K

1450MHz measurement and application circuit (Figure 2)

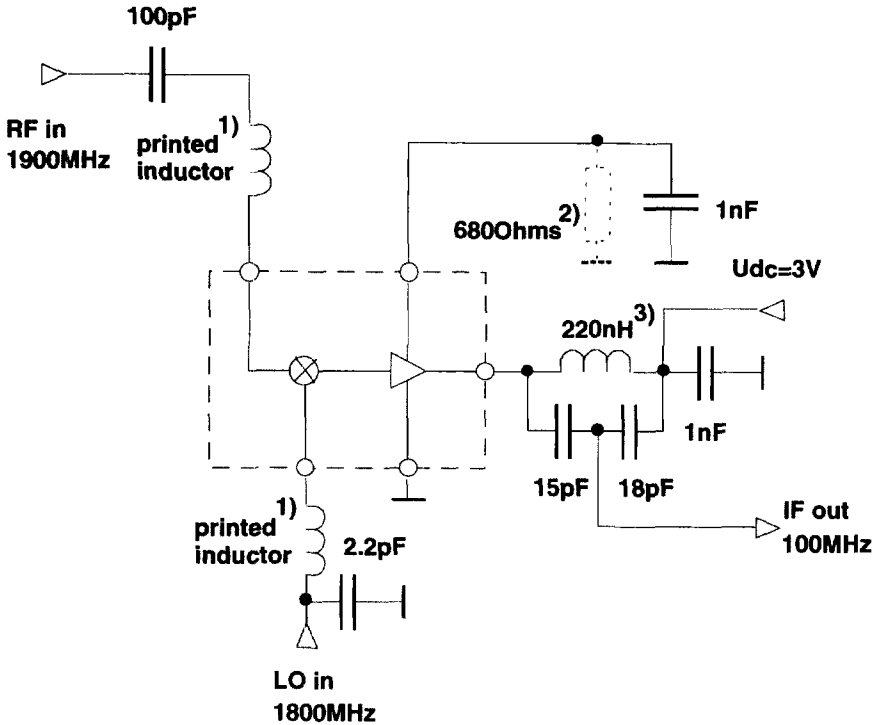


1) Tune for optimum match

2) Optional resistor increases IF-amplifier operating current and improves conversion gain and intermodulation performance (minimum value: 27Ω)

3) Siemens SIMID 01-coil; Ordering code: B82412-A3221-K

1900MHz measurement and application circuit (Figure 1)



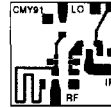
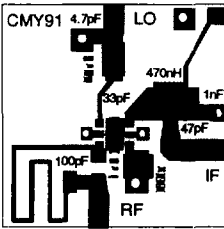
1) Tune for optimum match

2) Optional resistor increases IF-amplifier operating current and improves conversion gain and intermodulation performance (minimum value: 27Ω)

3) Siemens SIMID 01-coil; Ordering code: B82412-A3221-M

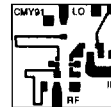
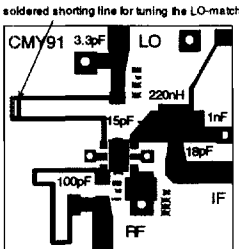
PCB - Layouts for Application Circuits

900MHz - application board:



Actual size  
20mm × 20mm

1450MHz - application board:

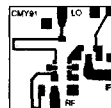
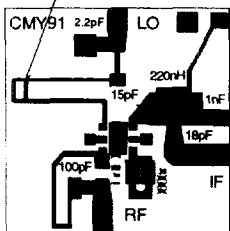


Actual size  
20mm × 20mm

PCB - data: Glass fiber epoxy board (double sided)  $\epsilon_r = 4.8$  thickness = 1mm

1900MHz - application board:

soldered shunting line for tuning the I.O-match



Actual size  
20mm × 20mm

PCB - data: Glass fiber epoxy board (double sided)  $\epsilon_r = 4.8$  thickness = 1mm