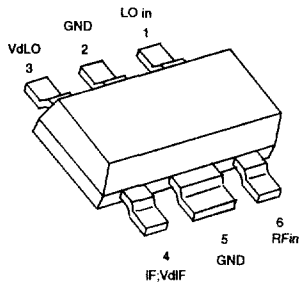


Preliminary Data

- * Ultralinear Downconverter 1200MHz to 40MHz
- * Operating Voltage Range: 3 to 6V
- * Very low Current Consumption, typ. 45mA
- * Single ended Input and Output
- * RF- and IF-Port Impedance close to 50 Ohm
- * Very wide LO-Level Range
- * All Gold Metallisation
- * Chip fully passivated
- * Very small Outlines



ESD: Electrostatic discharge sensitive device
Observe handling Precautions!

Type	Marking	Ordering code (tape and reel)	Package ¹⁾ (outlines see page 8)
CMY 200	M1	Q62702-M6	MW-6

Maximum Ratings	Symbol	Value		Unit
		min	max	
Supply Voltage to LO-Amp	$V_{d,LO}$	0	6	V
Supply Voltage to IF-Amp	$V_{d,IF}$	0	6	V
DC-Voltage to RF-Port	V_{RF}	-6	+6	V
DC-Voltage to Input LO-Amp	$V_{in,LO}$	-3	0	V
RF Input Power	$P_{in,RF}$		10	dBm
LO Input Power	$P_{in,LO}$		10	dBm
Channel Temperature	T_{Ch}		150	°C
Storage Temperature	T_{stg}	-55	150	°C
Thermal Resistance				
Channel to Soldering Point (GND)	R_{thChS}		≤100	K/W

1) For detailed dimensions see chapter Package Outlines

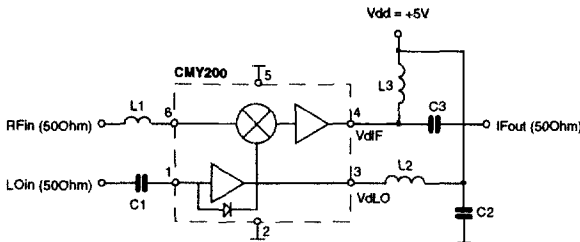
Electrical Characteristics

Test Conditions: $T_s = 25^\circ\text{C}$; $V_{dd} = 5\text{V}$; see test circuit

$f_{RF} = 1224\text{MHz}$; $f_{LO} = 1185\text{MHz}$; $P_{LO} = -2\text{dBm}$; $f_f = 39\text{MHz}$ unless otherwise specified

Parameter, Test Conditions	Symbol	min	typ	max	Unit
Operating Current	I_{op}	25	50	70	mA
Required LO-Power	P_{LO}	-	-5	-2	dBm
Conversion Gain	G_{mx}	6	8	-	dB
Single-Side-Band Noise Figure	F_{asb}	-	8	10	dB
3rd Order IMD 2 Tones $P_{in} = 2 \times -15\text{dBm}$ $f_{RF1} = 1224\text{MHz}$; $f_{RF2} = 1219\text{MHz}$	d_{IM3}	-	-65	-60	dBc
3rd Order Input Intercept Point $P_{in} = -12\text{dBm}$; 2 Tones 5MHz apart	$IP3_{in}$	18	21,5		dBm
LO Leakage at RF-Port	$P_{LO,RF}$		-9		dBm
P-1dB Output Power	$P_{-1dB,out}$		17		dBm

Test Circuit

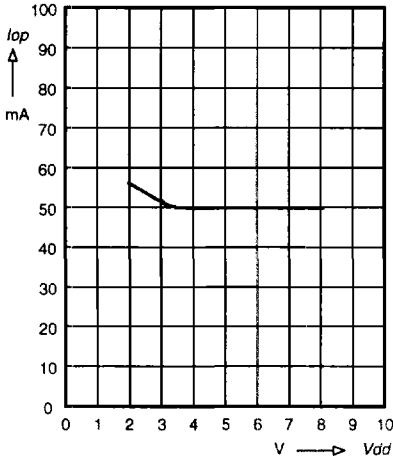


Element	Value	Notes
L1	6nH	1)
L2	12nH	2)
L3	22μH	
C1	22pF	
C2	47pF	
C3	1nF	

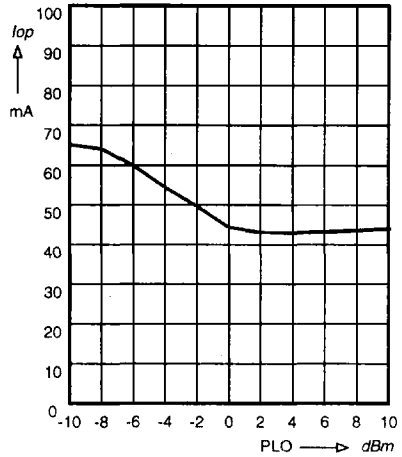
Note 1: approximate value for RF-frequency 1224MHz
(the value can be tuned for minimum F_{asb} at RF-frequency)

Note 2: approximate value for LO-frequency 1185MHz
(the value is tuned for max. gain of the LO-amplifier at LO-frequency; Indicator is e.g. a minimum DC-current consumption into port 3 at very low LO-power (<-10dBm) into port 1 or a maximum available G_{mx} at very low LO-power (<-10dBm) into port 1)

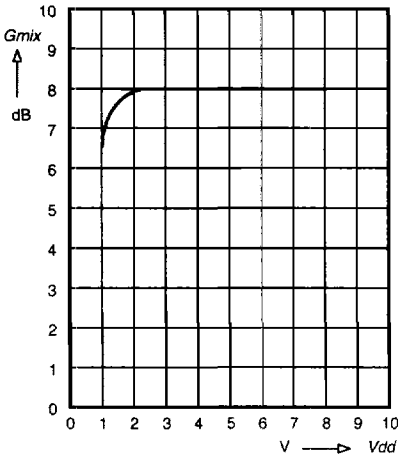
Operating Current $I_{op} = f(V_{dd})$
PLO = -2dBm



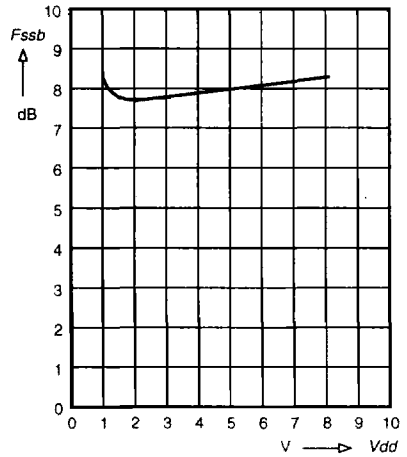
Operating Current $I_{op} = f(PLO)$
V_{dd} = +5V



Conversion Gain $G_{mix} = f(V_{dd})$
PLO = -2dBm; f_{RF} = 1224MHz; f_{LO} = 1185MHz

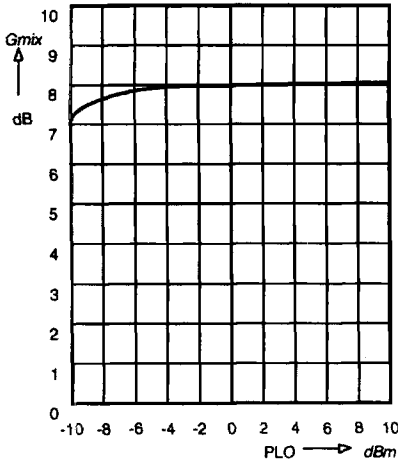


SSB Noise Figure $F_{ssb} = f(V_{dd})$
PLO = -2dBm; f_{RF} = 1224MHz; f_{LO} = 1185MHz



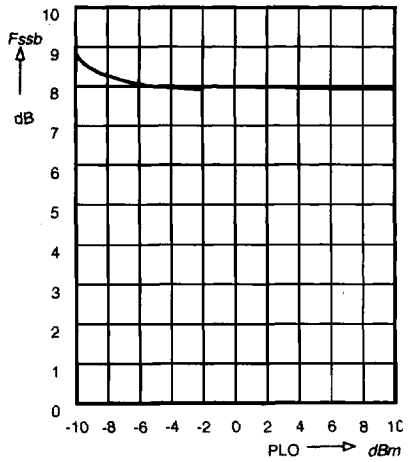
Conversion Gain $G_{mix} = f(PLO)$

Vdd = 5V; fRF = 1224MHz; fLO = 1185MHz



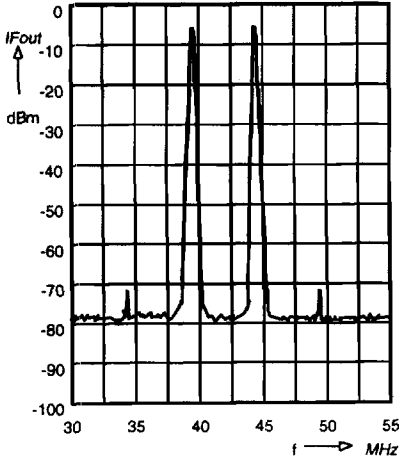
SSB Noise Figure $F_{ssb} = f(PLO)$

Vdd = +5V; fRF=1224MHz; fLO = 1185MHz



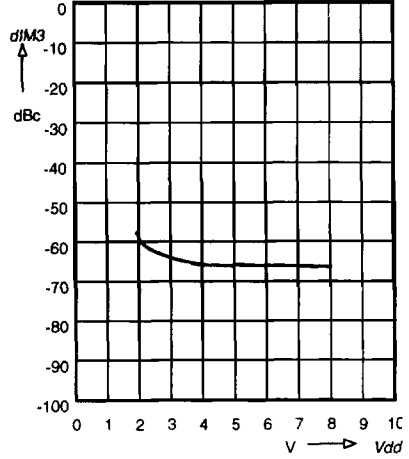
Third Order IMD

Pin = 2 x -15dBm; PLO = -2dBm



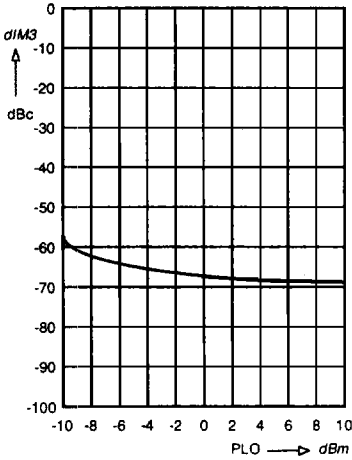
Third Order IMD $dIM3 = f(Vdd)$

Pin = 2 x -15dBm; PLO = -2dBm



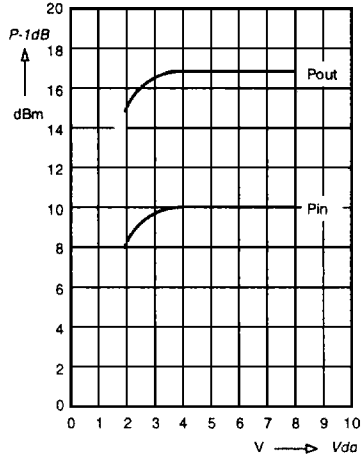
Third Order IMD $dIM3 = f(PLO)$

Vdd = +5V; Pin = -12dBm Tones 5MHz apart



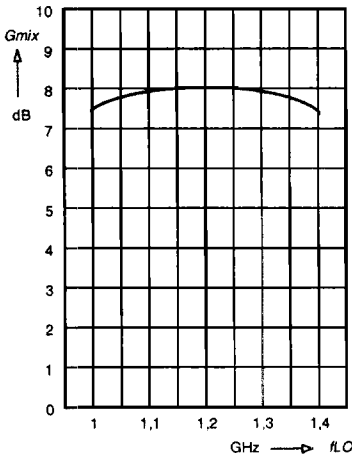
Power at 1dB Gain Compression $P-1dB = f(Vdd)$

PLO = -2dBm; fRF = 1224MHz; fLO = 1185MHz



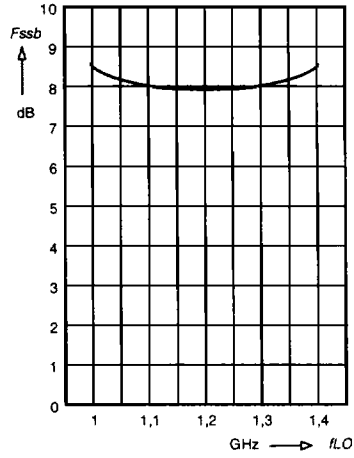
Conversion Gain $Gmix = f(fLO)$

PLO = -2dBm; fRF = fLO + fIF; fIF = 39MHz

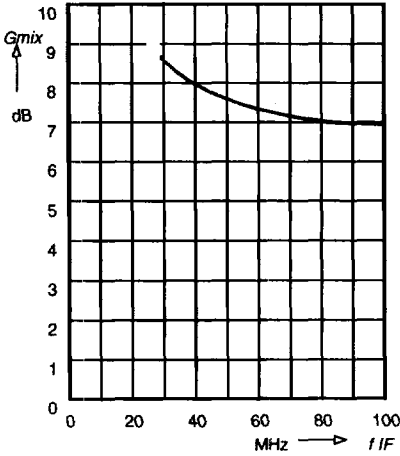


SSB Noise Figure $Fssb = f(fLO)$

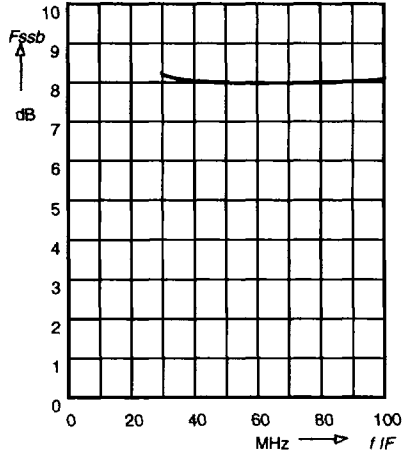
PLO = -2dBm; fRF = fLO + fIF; fIF = 39MHz



Conversion Gain $G_{mix} = f(f\ I/F)$
fLO = 1185MHz; PLO = -2dBm; fRF = fLO+fIF



SSB Noise Figure $F_{ssb} = f(f\ I/F)$
fLO = 1185MHz; PLO = -2dBm; fRF = fLO+fIF



Typical Reflexion Coefficients of CMY 200, $Z_0 = 50 \Omega$

f	Input Impedance into RF-Port (Pin #6) @ $P_{10} = -2\text{dBm}$; $f_{10} = 1185 \text{ MHz}$		Impedance into IF-Port (Pin #4) @ $P_{10} = -2\text{dBm}$; $f_{10} = 1185 \text{ MHz}$		Input Impedance into LO-Port (Pin #1)	
	Reflexion Coefficient		Reflexion Coefficient		Reflexion Coefficient	
MHz	Mag	Ang	Mag	Ang	Mag	Ang
100	0,94	-22	0.25	-1	0.98	-6
200	0.82	-40	0.32	4	0.97	-12
300	0.75	-50	0.34	-1	0.98	-17
400	0.69	-63	0.35	-7	0.99	-22
500	0.64	-76	0.32	-14	1.0	-28
600	0.57	-89	0.27	-17	1.02	-33
700	0.48	-102	0.22	-11	1.04	-40
800	0.36	-112	0.21	7	1.05	-43
900	0.23	-117	0.26	19	1.06	-55
1000	0.13	-105	0.32	22	1.07	-61
1050	0.15	-53	-	-	-	-
1100	0.21	-44	0.41	15	1.00	-75
1150	0.33	-43	-	-	0.94	-80
1200	0.42	-52	0.45	9	0.88	-83
1250	0.47	-67	-	-	0.80	-86
1300	0.47	-73	0.47	3	0.75	-87
1350	0.48	-80	-	-	0.69	-87
1400	0.47	-84	0.48	-2	0.65	-87
1450	-	-	-	-	0.62	-86
1500	0.44	-91	0.49	-5	0.60	-85
1600	0.42	-97	0.50	-8	0.58	-85
1700	0.40	-103	0.50	-9	0.55	-86
1800	0.38	-108	0.50	-11	0.53	-87
1900	0.36	-111	0.50	-13	0.50	-88
2000	0.36	-113	0.50	-14	0.48	-90