M200/210 Series

Frequency Multipliers

FEATURES

- 200MHz to 650MHz Output Frequency
- Low 3ps (rms) Typical Phase Jitter
- Low 1.5nsec Skew (Fout to Fref) Maximum
- 10% Frequency Lock Range
- Multiplication Factors from 2 to 255
- Single Ended and Differential Input Models
- ECL/PECL Differential Outputs
- Single Supply Operation
- Extended Temperature Range Models Available

APPLICATIONS

- High-end RISC-based Computers
- Telecom Transmission
- Base Station
- ATE
- Datacom

DESCRIPTION

The M200/210 Series is a family of Phase-Locked Frequency Multipliers that range in output frequencies from 200MHz to 650MHz. These low-skew, low-noise devices accept either single-ended or differential inputs and are ideally suited to applications where an environmentally remote or stabilized reference is available as a low frequency source for multiplication.

The M200/210 Frequency Multiplier Series was developed specifically to meet tough performance requirements found in today's high-end RISC-based Computers, Telecom Transmission, Base Station, ATE, and Datacom applications.

Packaged in small, 24-pin double-wide metal DIP packages, the M200/210 Series devices are available with either ECL or PECL differential outputs and operate from a single supply (+5V for PECL and -5V for ECL).

Standard models are specified for 0°C to +70°C operation. Extended temperature range models are available for -25°C to +85°C operation (L models) and for -55°C to +125°C operation (M models).

ISO 9001 Registered

SPECIFICATIONS

Specifications @ T_A = +25°C, $-V_{EE}$ = -5V for "E", $+V_{CC}$ = +5V for "P", unless otherwise indicated.

PARAMETER	Min	Typ	Max	Units
Output Frequency Range	200		650	MHz
Input Frequency Range	1		80	MHz
Multiplication Factor	2		255	
Frequency Lock Range	1	10		%
Input Impedence (Note 4)	450	500	550	Ω
Input Voltage Levels: M200E		ECL, Single Ended		
M200P		PECL, Single Ended		
M210E		ECL, Differntial		
M210P		PECL, Differential		
Output Configuration (Note 1):				
M200/210E		Differential ECL		
M200/210P		Differential PECL		
Skew (Fout to Fref)			1.5	nsec
Rise/Fall Time (20% to 80%)			575	psec
Output Voltage Levels:				
M200/210E		ECL compatible		
M200/210P		PECL compatible		
Output Drive (Note 1)			50	mA
Output Symmetry (Note 3)	45/55	50/55	55/45	%
Output Phase Jitter (Note 2)		3	5	psec (rms)
Start Up Time		40		msec
Power Supply Requirements:				
M200/210E (-Vee)	-4.35	-5.00	-5.25	Volts
M200/210P (+Vcc)	+4.35	+5.00	+5.25	Volts
Power Supply Current:				
M200/210E (-Vee)		-350		mA
M200/210P (+Vcc)		+350		mA

Notes: 1. The output is measured with 250Ω termination resistor connected to V_{EE}.
2. The output jitter is measured with a maximum input jitter of 20psec p-p.
3. Symmetry is measured at V_{BB} = -1.35V for M200/210E models and V_{BB} = $+V_{CC}$ -1.35V for M200/210P models.
4. The M210 model's input does not contain pulldown resistors thereby providing a high impedance to the differential input source. The termination resistors should be located as close to the input pins as possible. The differential input voltage should not exceed 1.0V.

ORDERING INFORMATION

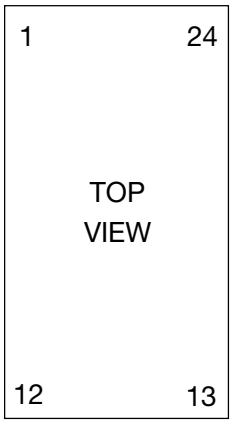
Part Number **M200P622.080-032K**

Select M200 for single-ended input or
M210 for differential input configuration:
Select device output format:
Specify "E" for ECL or "P" for PECL
Specify frequency in MHz xxx.xxxx:
Specify multiplication factor:
002 through 255
Add suffix:
"K" for 0°C to +70°C operation
"L" for -25°C to +85°C operation
"M" for -55°C to +125°C operation

ABSOLUTE MAX RATINGS

Operating Temp. Range (Case) ..... -55°C to +125°C
Specified Temp. Range
M2X0X-XXX.XX-XXXK ..... 0°C to +70°C
M2X0X-XXX.XX-XXXL ..... -25°C to +85°C
M2X0X-XXX.XX-XXXM ..... -55°C to +125°C
Storage Temp. Range (Ambient) ..... -55°C to +125°C
Supply M102/210E ..... -7.0 to 0Volts
Supply M102/210P ..... 0 to +7.0Volts
Output Current ..... 50mA Max

PIN CONFIGURATIONS



M200E Model

1.	Ground	24.	Ground
2.	Fin	23.	Ground
3.	Ground	22.	Ground
4.	-5 Volts	21.	Ground
5.	Ground	20.	-5 Volts
6.	-5 Volts	19.	NC
7.	Ground	18.	-5 Volts
8.	-5 Volts	17.	Ground
9.	Ground	16.	-5 Volts
10.	Osc. Out $\overline{Q}$	15.	Test Point
11.	Osc. Out Q	14.	-5 Volts
12.	Ground	13.	Ground

M200P Model

1.	Ground	24.	Ground
2.	Fin	23.	Ground
3.	Ground	22.	Ground
4.	Ground	21.	Ground
5.	+5 Volts	20.	Ground
6.	Ground	19.	NC
7.	+5 Volts	18.	Ground
8.	Ground	17.	+5 Volts
9.	+5 Volts	16.	Ground
10.	Osc. Out $\overline{Q}$	15.	Test Point
11.	Osc. Out Q	14.	Ground
12.	+5 Volts	13.	+5 Volts

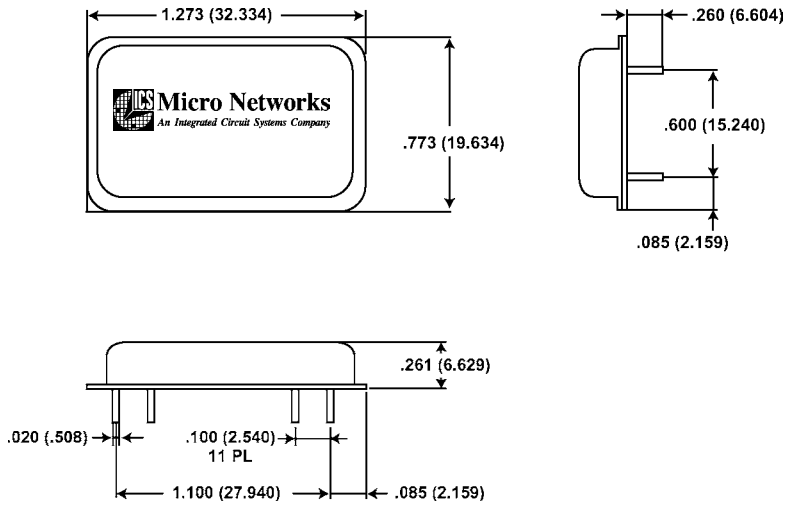
M210E Model

1.	Ground	24.	-5 Volts
2.	Fin	23.	Ground
3.	$\overline{Fin}$	22.	Ground
4.	-5 Volts	21.	Ground
5.	Ground	20.	-5 Volts
6.	-5 Volts	19.	NC
7.	Ground	18.	-5 Volts
8.	-5 Volts	17.	Ground
9.	Ground	16.	-5 Volts
10.	Osc. Out $\overline{Q}$	15.	Test Point
11.	Osc. Out Q	14.	-5 Volts
12.	Ground	13.	Ground

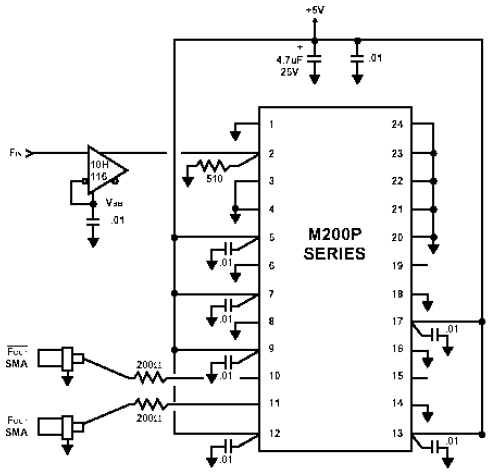
M210P Model

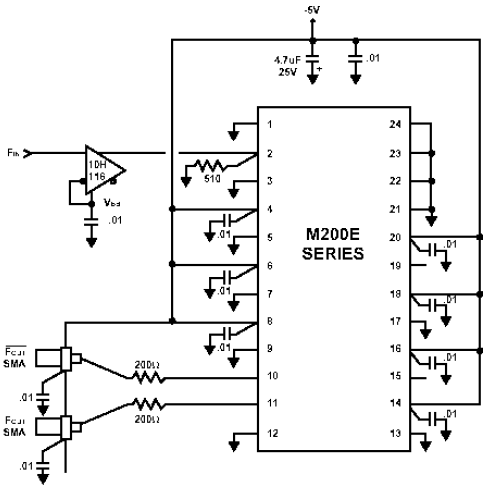
1.	+5 Volts	24.	Ground
2.	$\overline{Fin}$	23.	Ground
3.	Fin	22.	Ground
4.	Ground	21.	Ground
5.	+5 Volts	20.	Ground
6.	Ground	19.	NC
7.	+5 Volts	18.	Ground
8.	Ground	17.	+5 Volts
9.	+5 Volts	16.	Ground
10.	Osc. Out $\overline{Q}$	15.	Test Point
11.	Osc. Out Q	14.	Ground
12.	+5 Volts	13.	+5 Volts

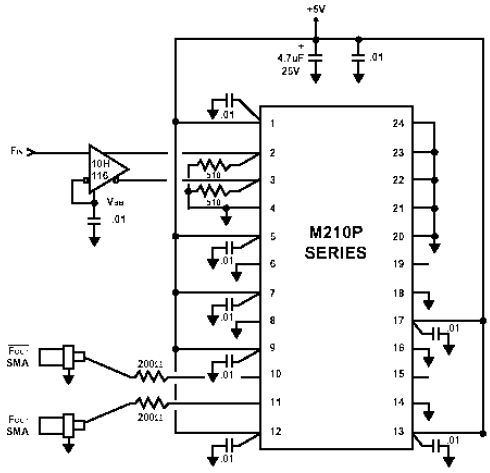
PACKAGE OUTLINES

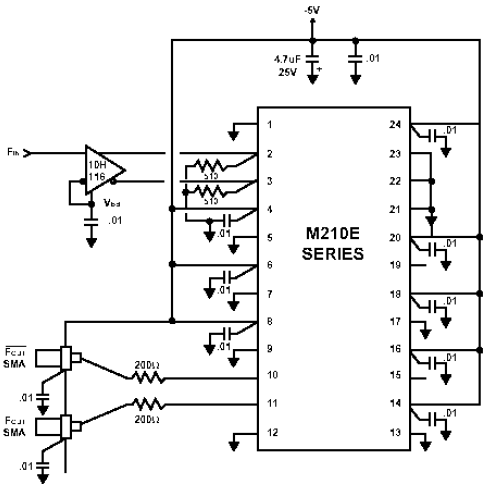


APPLICATION CIRCUITS









Micro Networks
An Integrated Circuit Systems Company
324 Clark Street ■ Worcester, MA 01606 ■ tel: 508-852-5400 ■ fax: 508-852-8456
European Sales Headquarters ■ Hertogsingel 20 ■ 6214 AD Maastricht ■ The Netherlands ■ tel: +31-43-32-70912 ■ fax: +31-43-32-70715
www.micronetworks.com