

FML-1
HIGH PURITY FREQUENCY MULTIPLIER
USER'S MANUAL

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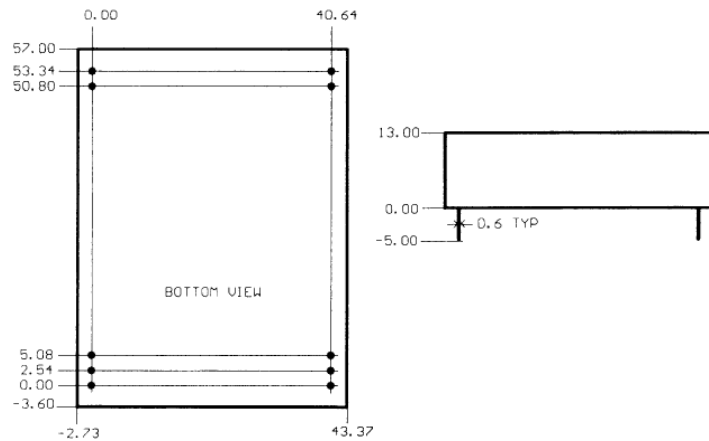
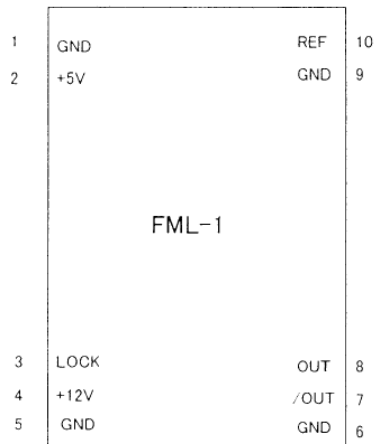
1. Outline of functions

FML-1 is a frequency multiplier using PLL technique. It can provide high purity signal which is N times reference frequency such as crystal oscillators. FML-1 is low spurious, low jitter because ECL phase comparator and low noise narrow band VCO are used, in order to reduce phase noise as much as possible. FML-1 can provide any fixed frequency from 100MHz to 1.5GHz. It may be used as a phase adjustment of a clock.

2. Electric specification

Output frequency range	100MHz ~ 1.5GHz
Output level	PECL differential output
Operation frequency band width	$\pm 5\%$ (possible $\pm 10\%$)
Output wave	square wave
Multiplication	2~1500
Spurious	more than 55dB
Reference input frequency range	1MHz ~ 50MHz
Reference input level	0.2V~2Vp-p, Input impedance 50 Ω
Phase noise	It depends on reference frequency and the number of multiplication.
Example :REF FREQ=25MHz	1KHz OFFSET -100dBc/Hz
OUT FREQ=800MHz	10KHz OFFSET -103dBc/Hz
	100KHz OFFSET -116dBc/Hz
Operating temperature range	0~+50°C(-30°C~+60°C possible)
Power supply	+5V $\pm 5\%$ less than 300mA +12V $\pm 25\%$ less than 10mA
Dimension	61x46x13mm

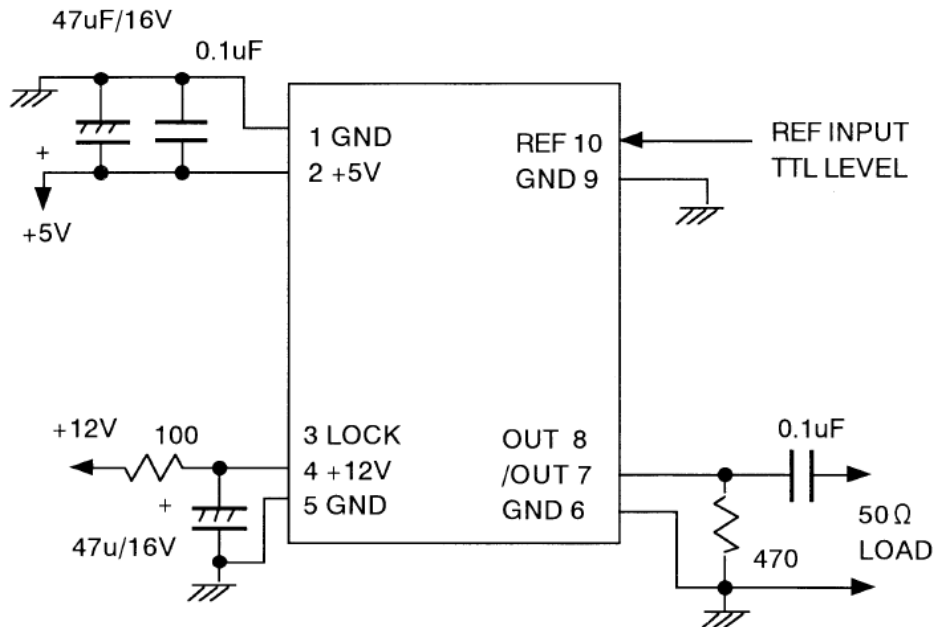
3. Outline and pin assignment



■ Pin designation and description

Pin number	name	description
1	GND	GND of power supply and signal
2	+5V	power supply pin. Supply $+5v \pm 5\%$
3	LOCK	PLL lock status signal(5V CMOS) H: lock L:unlock
4	+12V	power supply pin. Supply $+8V \sim +15V$
5	GND	GND of power supply and signal
6	GND	GND of power supply and signal
7	/OUT	PECL differential output
8	OUT	PECL differential output
9	GND	GND of power supply and signal
10	REF	external clock input

4. Test circuit



5. Caution

1. When FML-1 is mounted using an IC socket, poor grounding is sometime caused of reference signal leakage to output.
2. Please consider matching a load impedance. Care must be taken to keep 50ohm line impedance between the FML-1 output and load.
3. Use +5V, +12V low noise power supply

6. How to convert output level

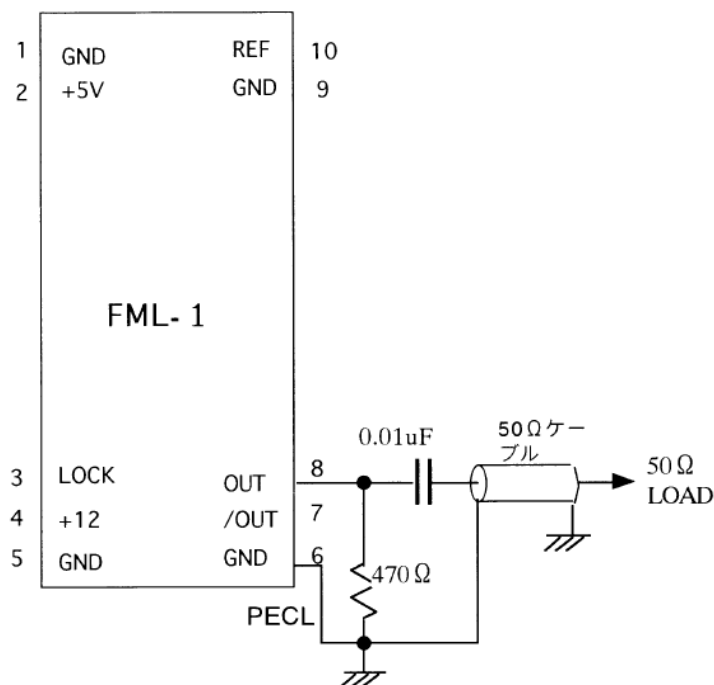
Output level is PECL. Use level conversion IC as below when converting PECL into other output level.

- (1) ECL level

MC10ELT91, MC100ELT91, MC100EVEL91(On Semiconductor)

(2) 50Ω AC level

A simply way is shown as below.



(Caution) Please do not connect directly OUT, /OUT to 50Ω resistance load not to damage an internal ECL drive IC.

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