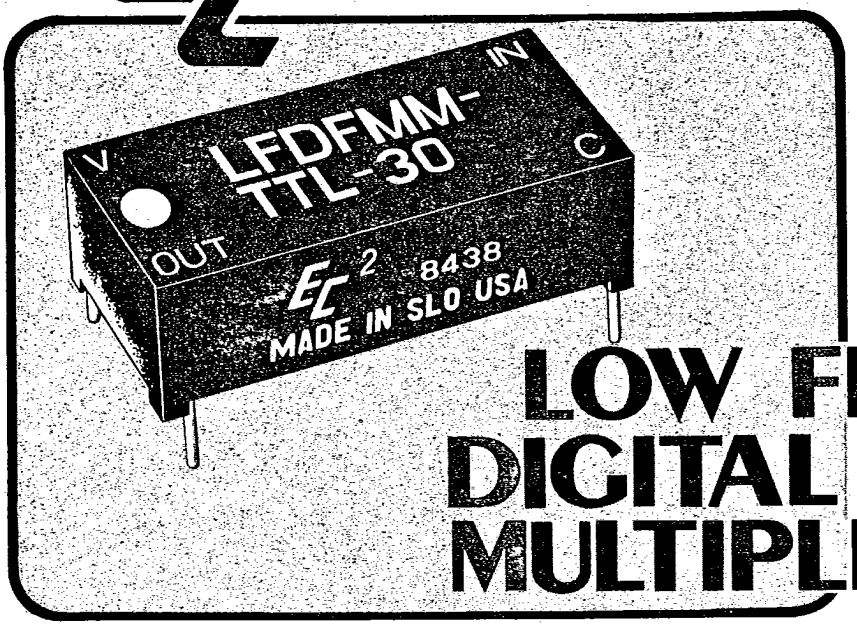
EC2




*low profile*

# T²L COMPATIBLE LOW FREQUENCY DIGITAL FREQUENCY MULTIPLIER MODULE

- T²L input and output
- Output wavetrain synchronized with input square wave
- 14-pin DIP package (.240 high)
- Available in frequencies from 1 Khz to 100 Khz
- 10 T²L fan-out capacity

The LFDFMM-TTL is offered in 51 standard clock frequencies from 1 Khz to 100 Khz. When tested under the "Test Conditions" shown, output frequency is maintained to within ±.005% of the nearest multiple of the input frequency. Each of these modules is capable of driving up to 10 T²L loads.

## design notes

The "DIP Series" Digital Frequency Multiplier Modules developed by Engineered Components Company have been disigned to provide precise T²L square wave outputs at selected clock frequencies which are synchronized by square wave inputs at sub-harmonic frequencies. These units can be synchronized by any sub-harmonic frequency; if no synchronizing input is present, the unit will free-run, providing a square wave output within ±2% of the desired frequency. Temperature coefficient of this free running frequency is less than ±200 ppm/°C. Like all frequency multipliers, either digital or sinusoidal, the amount of phase jitter in the output will increase as higher orders of multiplication are used; although this effect is small, lower orders of multiplication should be considered in those applications where these slight time variations are important.

These Digital Frequency Multiplier Modules are of hybrid construction utilizing the proven technologies of active integrated circuitry and of passive networks utilizing capacitive, inductive and resistive elements. The ICs utilized in these modules are burned in to Level B of MIL-STD-883 to ensure a high MTBF. The MTBF on these modules, when calculated per MIL-HDBK-217 for a 50°C ground fixed environment, is in excess of 2 million hours.

These "DIP Series" modules are packaged in a 14-pin DIP housing, molded of flame-proof Diallyl Phthalate per MIL-M-14, Type SDG-F, and are fully encapsulated in epoxy resin. Leads meet the solderability requirements of MIL-STD-202, Method 208. Corner standoffs on the housing provide positive standoff from the printed circuit board to permit solder-fillet formation and flush cleaning of solder-flux residues for improved reliability.

EC2 engineered components company
3580 Sacramento Drive, P. O. Box 8121, San Luis Obispo, CA 93403-8121
Phone: (805) 544-3800

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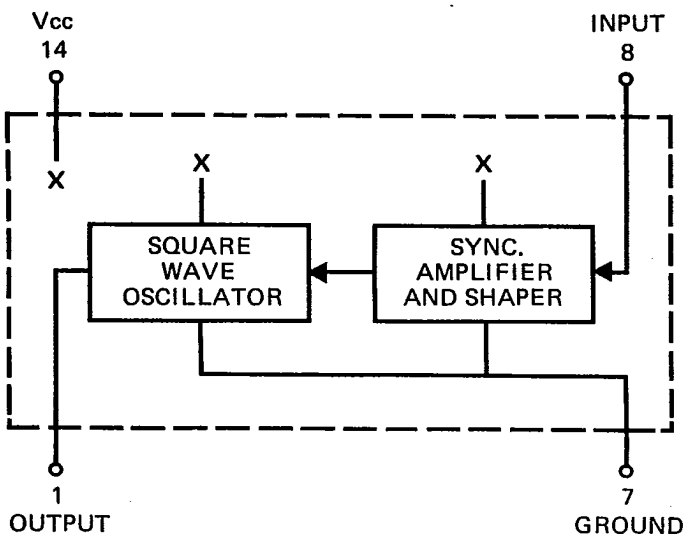
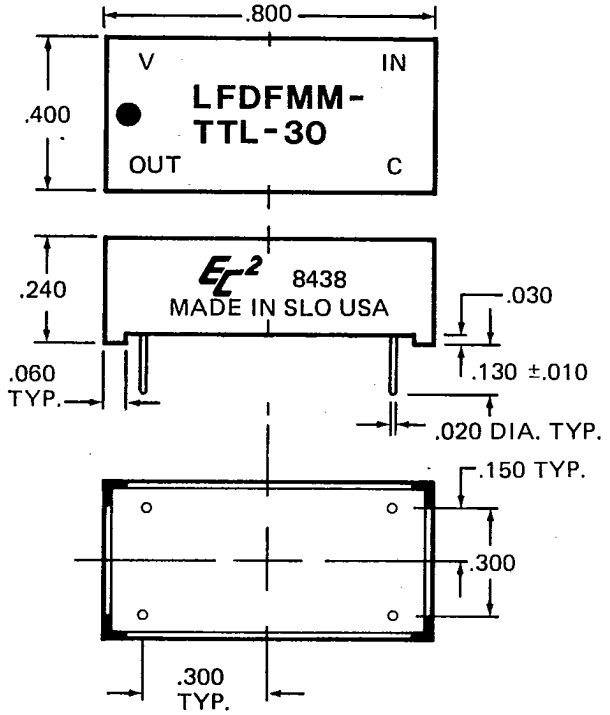
## DESIGN NOTES (continued)

Marking consists of manufacturer's name, logo ($EC^2$), part number, terminal identification and date code of manufacture. All marking is applied by silk screen process using white epoxy paint in accordance with MIL-STD-130, to meet the permanency of identification required by MIL-STD-202, Method 215.

### BLOCK DIAGRAM IS SHOWN BELOW




### MECHANICAL DETAIL IS SHOWN BELOW




## TEST CONDITIONS

1. All measurements are made at 25°C.
2. $V_{CC}$ supply voltage is maintained at 5.0V DC.
3. All units are tested using a Schottky toggle-type input pulse with no load at the output.
4. Input is $T^2L$ Schottky square wave at 20% of output frequency.

## OPERATING SPECIFICATIONS

| | |
|---|---|
| *$V_{CC}$ supply voltage: | 4.75 to 5.25V DC |
| $V_{CC}$ supply current: | 5ma typical |
| **Logic 1 input:** | |
| Voltage | 2V min.; 5.5V max. |
| Current | 2.4V = 50ua max. |
| | 5.5V = 1ma max. |
| **Logic 0 input:** | |
| Voltage | .8V max. |
| Current | −2ma max. |
| Logic 1 Voltage out: | 2.4V min. |
| Logic 0 Voltage out: | .4V max. |
| Operating temperature range: | 0 to 70°C. |
| Storage temperature: | −55 to +125°C. |

* Free-running output frequency will increase or decrease less than .5% for a respective increase or decrease of 5% in supply voltage.

## PART NUMBER TABLE

| Part Number | Output Frequency | Part Number | Output Frequency |
|---|---|---|---|
| LFDFMM-TTL-1 | 1 Khz | LFDFMM-TTL-52 | 52 Khz |
| LFDFMM-TTL-2 | 2 Khz | LFDFMM-TTL-54 | 54 Khz |
| LFDFMM-TTL-4 | 4 Khz | LFDFMM-TTL-56 | 56 Khz |
| LFDFMM-TTL-6 | 6 Khz | LFDFMM-TTL-58 | 58 Khz |
| LFDFMM-TTL-8 | 8 Khz | LFDFMM-TTL-60 | 60 Khz |
| LFDFMM-TTL-10 | 10 Khz | LFDFMM-TTL-62 | 62 Khz |
| LFDFMM-TTL-12 | 12 Khz | LFDFMM-TTL-64 | 64 Khz |
| LFDFMM-TTL-14 | 14 Khz | LFDFMM-TTL-66 | 66 Khz |
| LFDFMM-TTL-16 | 16 Khz | LFDFMM-TTL-68 | 68 Khz |
| LFDFMM-TTL-18 | 18 Khz | LFDFMM-TTL-70 | 70 Khz |
| LFDFMM-TTL-20 | 20 Khz | LFDFMM-TTL-72 | 72 Khz |
| LFDFMM-TTL-22 | 22 Khz | LFDFMM-TTL-74 | 74 Khz |
| LFDFMM-TTL-24 | 24 Khz | LFDFMM-TTL-76 | 76 Khz |
| LFDFMM-TTL-26 | 26 Khz | LFDFMM-TTL-78 | 78 Khz |
| LFDFMM-TTL-28 | 28 Khz | LFDFMM-TTL-80 | 80 Khz |
| LFDFMM-TTL-30 | 30 Khz | LFDFMM-TTL-82 | 82 Khz |
| LFDFMM-TTL-32 | 32 Khz | LFDFMM-TTL-84 | 84 Khz |
| LFDFMM-TTL-34 | 34 Khz | LFDFMM-TTL-86 | 86 Khz |
| LFDFMM-TTL-36 | 36 Khz | LFDFMM-TTL-88 | 88 Khz |
| LFDFMM-TTL-38 | 38 Khz | LFDFMM-TTL-90 | 90 Khz |
| LFDFMM-TTL-40 | 40 Khz | LFDFMM-TTL-92 | 92 Khz |
| LFDFMM-TTL-42 | 42 Khz | LFDFMM-TTL-94 | 94 Khz |
| LFDFMM-TTL-44 | 44 Khz | LFDFMM-TTL-96 | 96 Khz |
| LFDFMM-TTL-46 | 46 Khz | LFDFMM-TTL-98 | 98 Khz |
| LFDFMM-TTL-48 | 48 Khz | LFDFMM-TTL-100 | 100 Khz |
| LFDFMM-TTL-50 | 50 Khz | | |

Special modules can be readily manufactured to provide customer specified output frequencies for specific applications.

Catalog No. C/103184

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