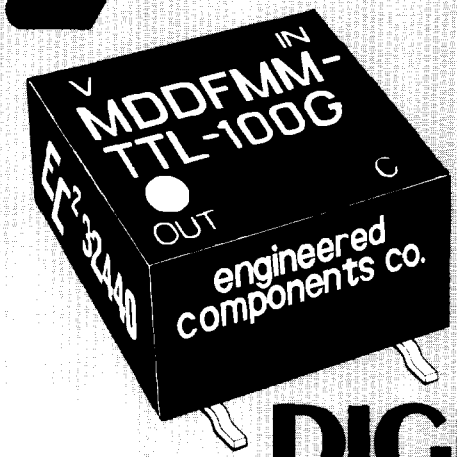
EC²



low profile

T²L COMPATIBLE

Mini DIP DIGITAL FREQUENCY MULTIPLIER MODULE

- **T²L input and output**
- **Output wavetrain synchronized with input square wave**
- **8-pin DIP package**
- **Available in frequencies from 2 Mhz to 100 Mhz**
- **10 T²L fan-out capacity**
- **Choice of leads, Thru-hole, Gull-Wing or J Lead**

design notes

The "Mini DIP Series" Digital Frequency Multiplier Modules developed by Engineered Components Company have been designed 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 coefficent of this free running frequency is less than ±500 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.

The MDDFMM-TTL is offered in thirty-eight (38) standard clock frequencies from 2 Mhz to 100 Mhz. 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.

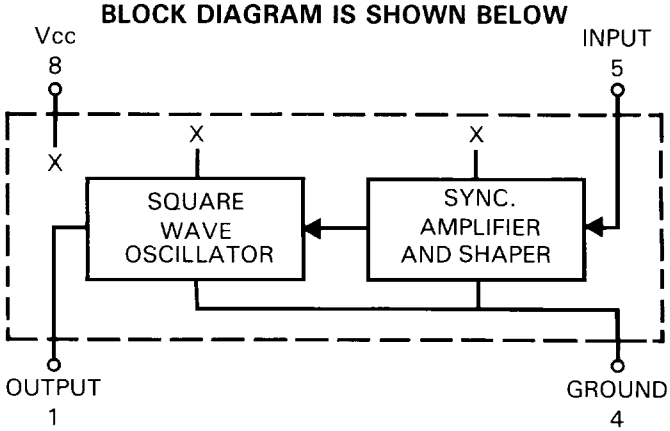
These Digital Frequency Multiplier Modules are of hybrid construction utilizing the proven technologies of active integrated circuitry and of passive networks utilizing capacitive, inductive and resistive elements. The ICs utilized in these modules are burned-in to level B of MIL-STD-883 to ensure a 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 "Mini DIP Series" modules are packaged in an 8-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 on the thru-hole lead version and lead design of the surface mount versions provide positive standoff from the printed circuit board to permit solder-fillet formation and flush cleaning of solder-flux residues for improved reliability.

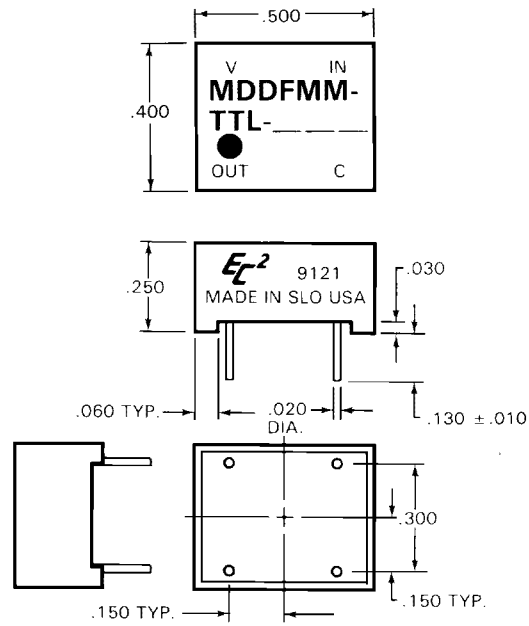
Marking consists of manufacturer's name, logo (EC²), part number, terminal identification and date code of manufacture. All marking is applied by silk screen process using white epoxy paint in accordance with MIL-STD-130, to meet the permanency of identification required by MIL-STD-202, Method 215.

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

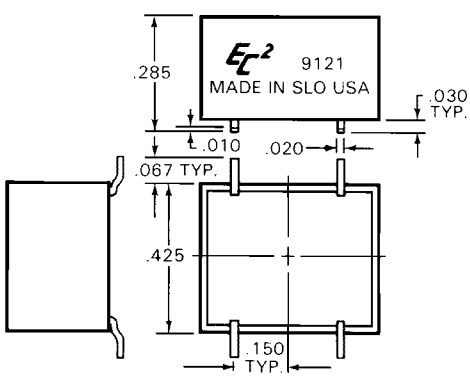
BLOCK DIAGRAM IS SHOWN BELOW



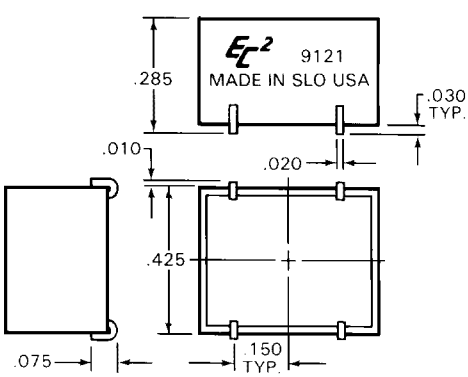
MECHANICAL DETAILS ARE SHOWN BELOW



*Thru-hole Lead Configuration



*Gull Wing Configuration



*J Lead Configuration

TEST CONDITIONS

1. All measurements are made at 25°C.
2. Vcc 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:

Constant "0" in . . . . . 65ma typical

Constant "1" in . . . . . 45ma typical

Logic 1 input:

Voltage . . . . . 2V min.; 5.5V max.

Current . . . . . 2.4V = 100ua max.
5.5V = 2ma max.

Logic 0 input:

Voltage . . . . . 0.8V max.

Current . . . . . −.4ma max.

Logic 1 Voltage out: . . . . . 2.4V min.

Logic 0 Voltage out: . . . . . .5V max.

Operating temperature range: . . . . . 0 to +70°C.

Storage temperature: . . . . . −55 to +125°C.

PART NUMBER TABLE

***Suffix Part Number with G (for Gull Wing Lead), J (for J Lead) or F (for Thru-hole Lead). Examples: MDDFMM-TTL-10G (Gull Wing), MDDFMM-TTL-25J (J Lead) or MDDFMM-TTL-70F (Thru-hole Lead).**

Part Number	Output Frequency	Part Number	Output Frequency
MDDFMM-TTL-2	2 Mhz	MDDFMM-TTL-22	22 Mhz
MDDFMM-TTL-3	3 Mhz	MDDFMM-TTL-24	24 Mhz
MDDFMM-TTL-4	4 Mhz	MDDFMM-TTL-25	25 Mhz
MDDFMM-TTL-5	5 Mhz	MDDFMM-TTL-26	26 Mhz
MDDFMM-TTL-6	6 Mhz	MDDFMM-TTL-28	28 Mhz
MDDFMM-TTL-7	7 Mhz	MDDFMM-TTL-30	30 Mhz
MDDFMM-TTL-8	8 Mhz	MDDFMM-TTL-32	32 Mhz
MDDFMM-TTL-9	9 Mhz	MDDFMM-TTL-34	34 Mhz
MDDFMM-TTL-10	10 Mhz	MDDFMM-TTL-35	35 Mhz
MDDFMM-TTL-11	11 Mhz	MDDFMM-TTL-36	36 Mhz
MDDFMM-TTL-12	12 Mhz	MDDFMM-TTL-38	38 Mhz
MDDFMM-TTL-13	13 Mhz	MDDFMM-TTL-40	40 Mhz
MDDFMM-TTL-14	14 Mhz	MDDFMM-TTL-45	45 Mhz
MDDFMM-TTL-15	15 Mhz	MDDFMM-TTL-50	50 Mhz
MDDFMM-TTL-16	16 Mhz	MDDFMM-TTL-60	60 Mhz
MDDFMM-TTL-17	17 Mhz	MDDFMM-TTL-70	70 Mhz
MDDFMM-TTL-18	18 Mhz	MDDFMM-TTL-80	80 Mhz
MDDFMM-TTL-19	19 Mhz	MDDFMM-TTL-90	90 Mhz
MDDFMM-TTL-20	20 Mhz	MDDFMM-TTL-100	100 Mhz

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

Catalog No. C/063091