low profile

T^2L COMPATIBLE DIGITAL FREQUENCY MULTIPLIER MODULE

- **T^2L FAST input and output**
- **Output wavetrain synchronized with input square wave**
- **14-pin DIP package**
- **Leads — thru-hole, J, Gull Wing or Tucked**
- **Available in frequencies from 2MHz to 100MHz**
- **10 T^2L fan-out capacity**

design notes

The "DIP series" FAST Digital Frequency Multiplier Modules developed by Engineered Components Company have been designed to provide precise T^2L 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 ±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 FDFMM-TTL is offered in 26 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 T^2L 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 MTBF on these modules, when calculated per MIL-HDBK-217 for a 50°C ground fixed environment, is in excess of 3 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 of 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 the 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.

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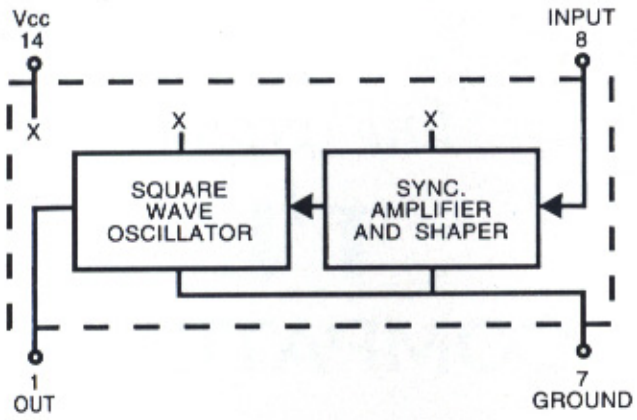
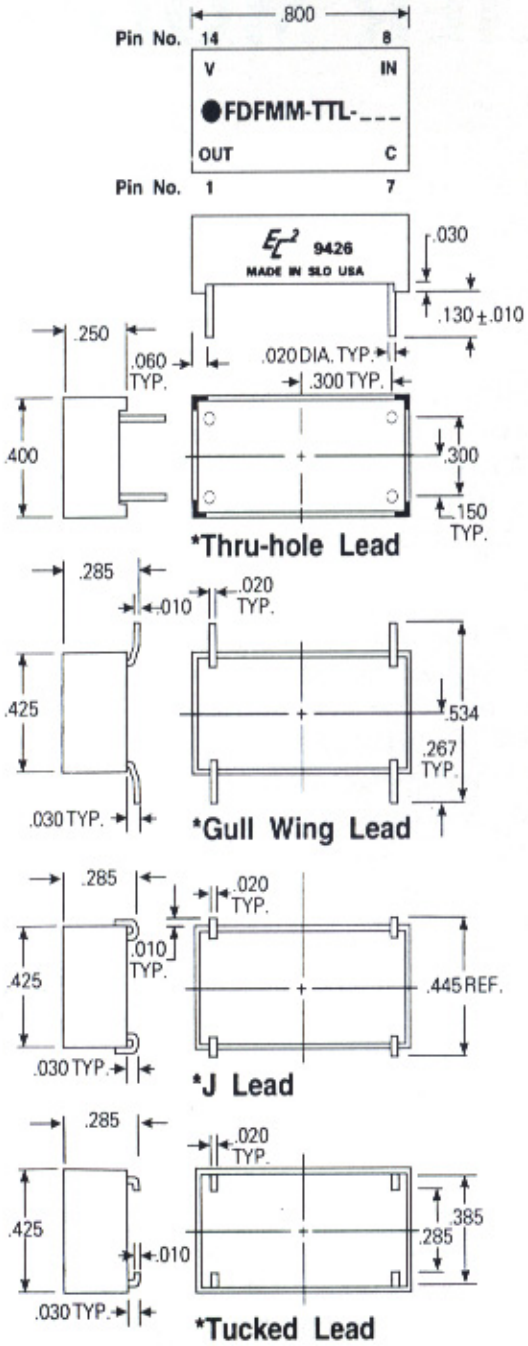
BLOCK DIAGRAM IS SHOWN BELOW



MECHANICAL DETAIL IS SHOWN BELOW



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 TTL FAST toggle-type positive input pulse with no load at the output.
4. Input is T^2L FAST square wave at 20% of output frequency.

OPERATING SPECIFICATIONS

Vcc supply voltage:	4.75 to 5.25V DC
Vcc supply current:	
FDFMM-TTL-2	30mA typical
FDFMM-TTL-100	60mA typical
(Current increases with operating frequency)	
Logic 1 input:	
Voltage	2V min.; Vcc max.
Current	2.7V = 20uA max.
	5.5V = 1mA max.
Logic 0 input:	
Voltage	.8V max.
Current	-.6mA max.
Logic 1 Voltage out:	2.7V 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), F (for Thru-hole Lead) or T (for Tucked Lead).**
Examples: FDFMM-TTL-10G (Gull Wing), FDFMM-TTL-25J (J Lead), FDFMM-TTL-75F (Thru-hole Lead) or FDFMM-TTL-80T (Tucked Lead)

PART NUMBER	OUTPUT FREQUENCY	PART NUMBER	OUTPUT FREQUENCY
FDFMM-TTL-2	2.0 MHz	FDFMM-TTL-15	15.0 MHz
FDFMM-TTL-3	3.0 MHz	FDFMM-TTL-20	20.0 MHz
FDFMM-TTL-4	4.0 MHz	FDFMM-TTL-25	25.0 MHz
FDFMM-TTL-5	5.0 MHz	FDFMM-TTL-30	30.0 MHz
FDFMM-TTL-6	6.0 MHz	FDFMM-TTL-35	35.0 MHz
FDFMM-TTL-7	7.0 MHz	FDFMM-TTL-40	40.0 MHz
FDFMM-TTL-8	8.0 MHz	FDFMM-TTL-45	45.0 MHz
FDFMM-TTL-9	9.0 MHz	FDFMM-TTL-50	50.0 MHz
FDFMM-TTL-10	10.0 MHz	FDFMM-TTL-60	60.0 MHz
FDFMM-TTL-11	11.0 MHz	FDFMM-TTL-70	70.0 MHz
FDFMM-TTL-12	12.0 MHz	FDFMM-TTL-80	80.0 MHz
FDFMM-TTL-13	13.0 MHz	FDFMM-TTL-90	90.0 MHz
FDFMM-TTL-14	14.0 MHz	FDFMM-TTL-100	100.0 MHz

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