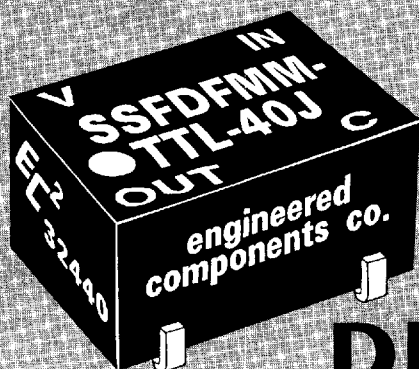


EC²

space saver

T²L**COMPATIBLE****FAST****DIGITAL FREQUENCY MULTIPLIER MODULE**

- T²L input and output
- Output wavetrain synchronized with input square wave
- 8-pin Space Saver package
- Available in frequencies from 2 MHz to 100 MHz
- 10 Schottky T²L fan-out capacity
- Leads - thru-hole, J, Gull Wing or Tucked

design notes

The "Space Saver 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 $\pm 2\%$ of the desired frequency. Temperature coefficient of this free running frequency is less than ± 500 ppm/ $^{\circ}\text{C}$. 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 SSFDFMM-TTL is offered in 38 standard clock frequencies from 2 MHz to 100 MHz. When tested under the "Test Conditions"

shown, output frequency is maintained to within $\pm 0.005\%$ of the nearest multiple input frequency. These modules are capable of driving 10 Schottky 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 MTBF on these modules, when calculated per MIL-HDBK-217 for a 50 $^{\circ}\text{C}$ ground fixed environment, is in excess of 2 million hours.

These "Space Saver Series" modules are packaged in an 8-pin housing, molded of flame-proof Diallyl Phthalate per MIL-M-14, Type SDG-F, and are fully encapsulated in epoxy resin. Thru-hole, J, Gull Wing or Tucked Lead configurations are available on these modules (see Part Number Table note to specify). 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.

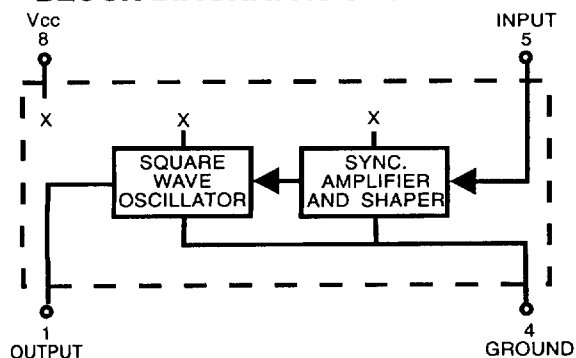
Marking consists of manufacturer's name, logo (EC²), part number, terminal identification and date code of manufacture. All marking is applied by silk screen process using white epoxy paint in accordance with MIL-STD-130, to meet the permanency of identification required by MIL-STD-202, Method 215.

EC²**engineered components company**

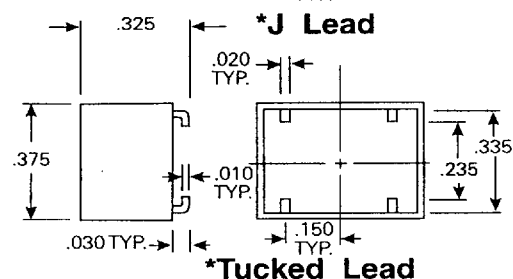
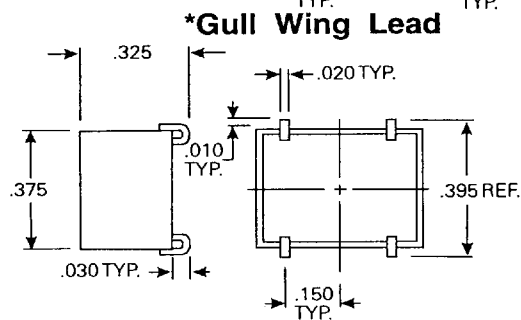
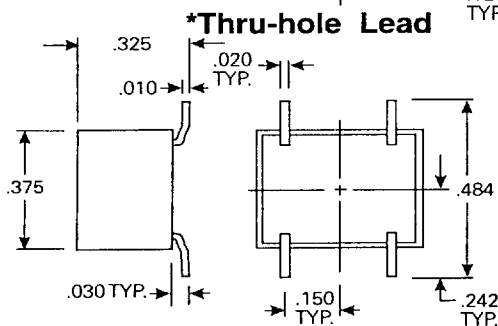
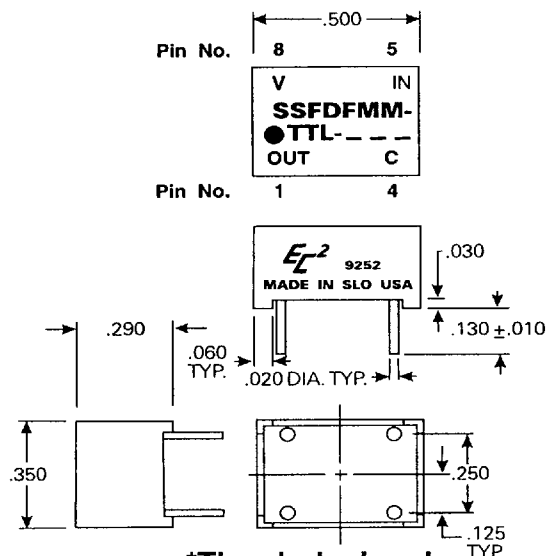
3580 Sacramento Drive, P.O. Box 8121, San Luis Obispo, CA 93403-8121

Phone: (805) 544-3800

BLOCK DIAGRAM IS SHOWN BELOW



MECHANICAL 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 and one Schottky T²L load at the output.
4. Input is T²L Schottky square wave at 20% of output frequency.

ENGINEERED COMPONENTS C 60E D

OPERATING SPECIFICATIONS

V_{cc} supply voltage: 4.75 to 5.25V DC

V_{cc} supply current: 30mA typical
 SSFDFMM-TTL-2 60mA typical
 SSFDFMM-TTL-100
 (Current increases with operating frequency)

Logic 1 Input:
 Voltage 2V min.; V_{cc} max.
 Current 2.7V = 40uA max.
 @ max. V_{in} = 200uA max.

Logic 0 Input:
 Voltage8V max.
 Current -.4mA max.

Logic 1 Voltage out: 2.5V 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: SSFDFMM-TTL-10G (Gull Wing), SSFDFMM-TTL-25J (J Lead), SSFDFMM-TTL-70F (Thru-hole Lead) or SSFDFMM-TTL-12T (Tucked Lead).

PART NUMBER	OUTPUT FREQUENCY	PART NUMBER	OUTPUT FREQUENCY
SSFDFMM-TTL-2	2 MHz	SSFDFMM-TTL-22	22 MHz
SSFDFMM-TTL-3	3 MHz	SSFDFMM-TTL-24	24 MHz
SSFDFMM-TTL-4	4 MHz	SSFDFMM-TTL-25	25 MHz
SSFDFMM-TTL-5	5 MHz	SSFDFMM-TTL-26	26 MHz
SSFDFMM-TTL-6	6 MHz	SSFDFMM-TTL-28	28 MHz
SSFDFMM-TTL-7	7 MHz	SSFDFMM-TTL-30	30 MHz
SSFDFMM-TTL-8	8 MHz	SSFDFMM-TTL-32	32 MHz
SSFDFMM-TTL-9	9 MHz	SSFDFMM-TTL-34	34 MHz
SSFDFMM-TTL-10	10 MHz	SSFDFMM-TTL-35	35 MHz
SSFDFMM-TTL-11	11 MHz	SSFDFMM-TTL-36	36 MHz
SSFDFMM-TTL-12	12 MHz	SSFDFMM-TTL-38	38 MHz
SSFDFMM-TTL-13	13 MHz	SSFDFMM-TTL-40	40 MHz
SSFDFMM-TTL-14	14 MHz	SSFDFMM-TTL-45	45 MHz
SSFDFMM-TTL-15	15 MHz	SSFDFMM-TTL-50	50 MHz
SSFDFMM-TTL-16	16 MHz	SSFDFMM-TTL-60	60 MHz
SSFDFMM-TTL-17	17 MHz	SSFDFMM-TTL-70	70 MHz
SSFDFMM-TTL-18	18 MHz	SSFDFMM-TTL-80	80 MHz
SSFDFMM-TTL-19	19 MHz	SSFDFMM-TTL-90	90 MHz
SSFDFMM-TTL-20	20 MHz	SSFDFMM-TTL-100	100 MHz

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