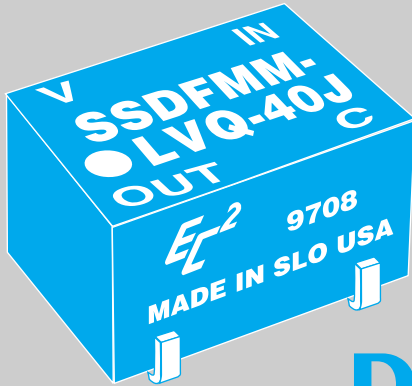


EC²



space saver

LVQ 3V

DIGITAL FREQUENCY MULTIPLIER MODULE

- T²L LV CMOS input and output
- Output wavetrain synchronized with input square wave
- 8-pin Space Saver package
- Available in frequencies from 2 MHz to 80 MHz
- 12mA output drive capability
- Leads - thru-hole, J, Gull Wing or Tucked

design notes

The LVQ "Space Saver Series" Digital Frequency Multiplier Modules developed by Engineered Components Company have been designed to provide precise 3V LVQ 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 ± 600 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 SSDFMM-LVQ is offered in 36 standard clock frequencies from 2 MHz to 80 MHz. When tested under the "Test Conditions"

shown, the output frequency is locked to the nearest multiple input frequency. These modules are capable of driving $\pm 12\text{mA}$.

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 3 million hours.

These LVQ "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.

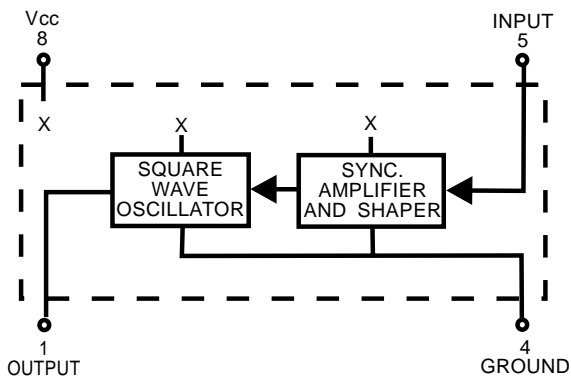
Marking consists of manufacturer's name, logo (EC²), part number, terminal identification and date code of manufacture. All marking is applied by silk screen process using white epoxy paint in accordance with MIL-STD-130, to meet the permanency of identification required by MIL-STD-202, Method 215.

EC² engineered components company

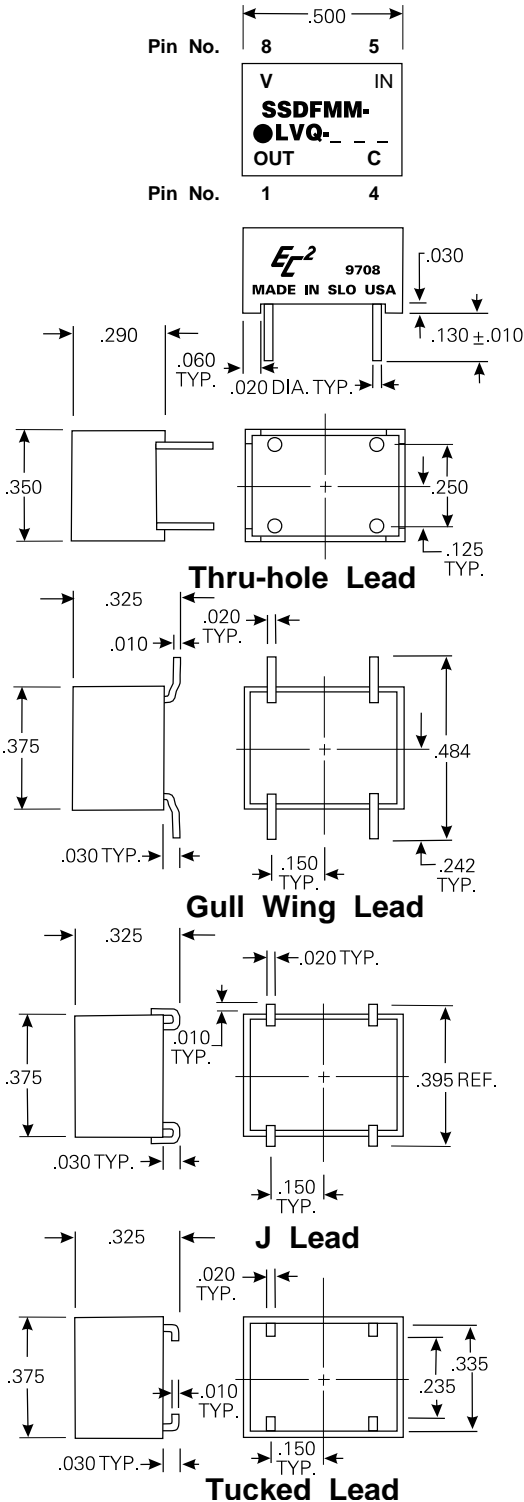
P.O. Box 8121 • San Luis Obispo CA 93403-8121
From California (805) 544-3800
Toll Free (800) 235-4144
FAX (805) 544-8091

www.ec2.com or
www.engineeredcomponents.com
info@ec2.com or
info@engineeredcomponents.com

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 3.3V DC.
3. All units are tested using a LVQ gate providing an input pulse and one LVQ load at the output.
4. Input is a square wave at 20% of the output frequency.

OPERATING SPECIFICATIONS

V_{CC} supply voltage: 2.7 to 3.6V DC
 V_{CC} supply current:
 SSDFMM-LVQ-2 14mA typical
 SSDFMM-LVQ-80 22mA typical
 (Current increases with operating frequency)

Logic 1 Input:
 Voltage 2V min.; V_{CC} max.
 Current V_{CC} max.; 1uA max.

Logic 0 Input:
 Voltage8V max.
 Current 1μA max.

Logic 1 Voltage out: 2.2V min.; V_{CC} 3.0;
 I_{OH} -12mA

Logic 0 Voltage out:4V max. I_{OL} +12mA

Operating temperature range: -40 to +85°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: SSDFMM-LVQ-10G (Gull Wing), SSDFMM-LVQ-25J (J Lead), SSDFMM-LVQ-70F (Thru-hole Lead) or SSDFMM-LVQ-12T (Tucked Lead).

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

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