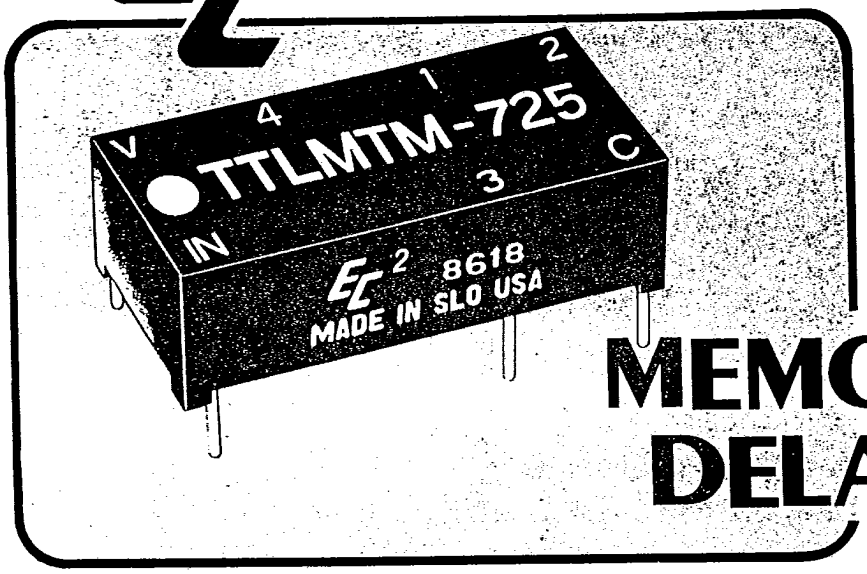
EC²



low profile

T²L COMPATIBLE MEMORY TIMING DELAY MODULE

- **T²L input and outputs**
- **Provides outputs for both address strobes and MUX control**
- **Available in various times to meet specific requirements for valid addresses**
- **Provides data valid strobe to latch memory output into register or other device**
- **14—pin DIP package (.280 high)**

design notes

The "DIP Series" Memory Timing Modules developed by Engineered Components Company have been designed to provide four separate output signals, each with a controlled pulse width and occurring at predetermined times after a common rising edge input trigger. These modules have been developed for use with high-density, multiplexed address RAMs; they may also be used in any applications requiring strobe or enable signals with various starting and finishing times in reference to an initiating input trigger signal. These timing modules incorporate Schottky T²L input and operate on the rising edge of the input trigger signal. Minimum input pulse required is 10ns. All outputs are Schottky T²L buffered and are positive pulses with leading and trailing edge times of each pulse individually controlled. Each output has the capability of driving up to 10 Schottky T²L or DTL loads. The modules are designed for fast recovery and a new pulse sequence may be initiated 25ns after the last output pulse trailing edge.

These 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 1.8 million hours. Module design includes compensation for propagation delays and incorporates internal termination at the output; no additional external components are needed to obtain the required delay.

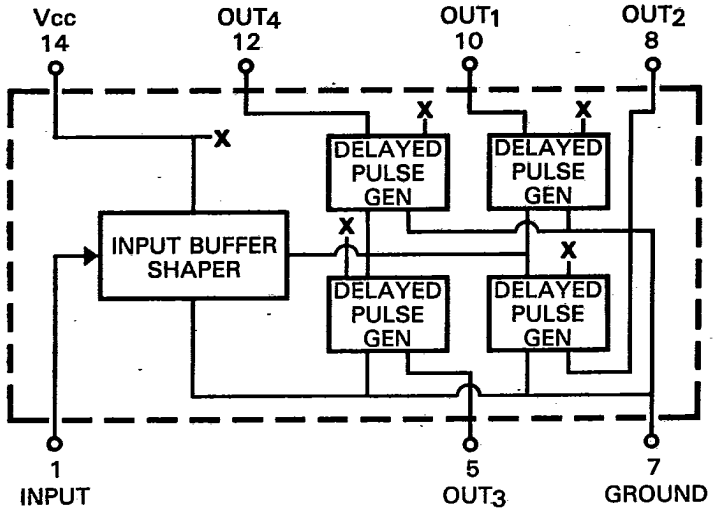
The TTLMTM is offered with various output times in 34 modules, as shown in the part number table. When tested under the "Test Conditions" shown, leading edge delay tolerance at each output is maintained at ±3ns or ±5%, whichever is greater; trailing edge delay tolerance at each output is maintained at ±8%. Delay times are measured at the +1.5V level on the leading or trailing edges. Rise time for all modules is 4ns maximum, when measured from 0.75V to 2.4V. Temperature coefficient of delay is approximately +400 ppm/°C over the operating temperature range of 0 to +70° C.

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.

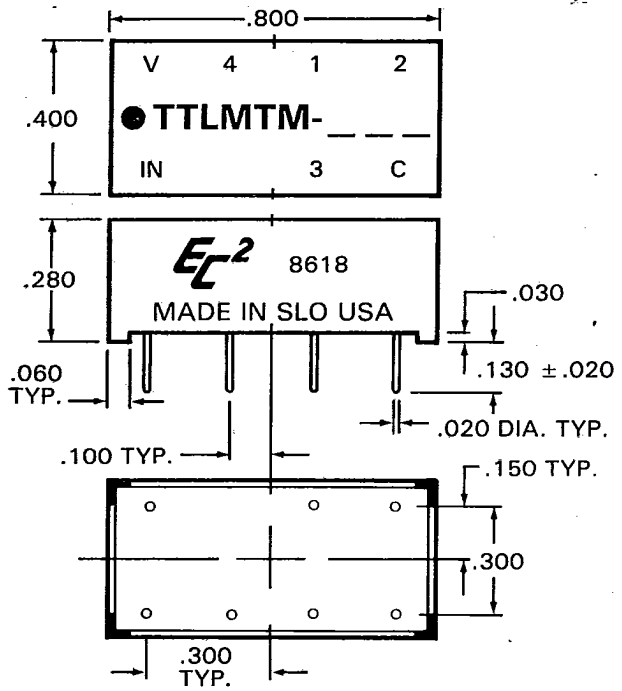
Marking consists of manufacturer's name, logo (EC²), part number, terminal identification and date code of manufacture. All marking is applied by silk screen process using white epoxy paint in accordance with MIL-STD-130, to meet the permanency of identification required by MIL-STD-202, Method 215.

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



OPERATING SPECIFICATIONS

*V_{CC} supply voltage: . . . . . 4.75 to 5.25V DC
V_{CC} supply current: . . . . . 85ma typ. (operating)

Logic 1 input:
Voltage . . . . . 2.0V min.; 5.5V max.
Current . . . . . 2.7V = 100ua max.

Logic 0 input:
Voltage . . . . . .8V max.
Current . . . . . .5V = −4ma 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.

*Delays increase or decrease approximately 1% for a respective increase or decrease of 5% in supply voltage.

TEST CONDITIONS

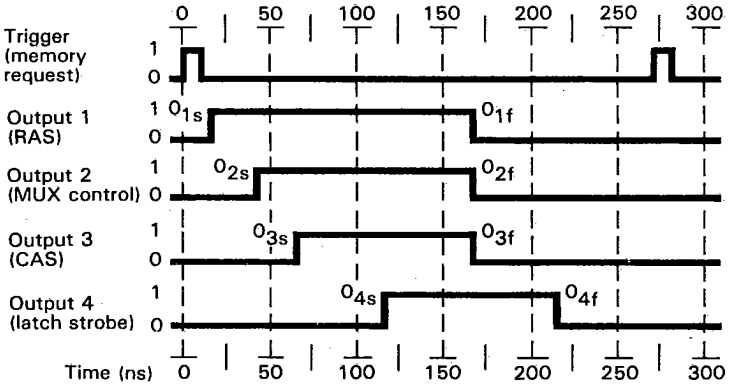
1. All measurements are made at 25°C.
2. V_{CC} supply voltage is maintained at 5.0V DC.
3. All units are tested using a Schottky toggle-type positive input pulse and one Schottky T^2L load at the output being tested.
4. Input pulse width used is 10ns.

PART NUMBER TABLE

PART NUMBER	OUTPUT 1 (RAS)		OUTPUT 2 (MUX control)		OUTPUT 3 (CAS)		OUTPUT 4 (latch strobe)	
	LE	TE	LE	TE	LE	TE	LE	TE
TTLMTM-721	15	135	30	135	50	135	85	235
TTLMTM-722	15	165	30	165	50	165	115	265
TTLMTM-723	15	165	40	165	65	165	115	165
TTLMTM-724	15	165	40	165	65	165	115	215
TTLMTM-725	15	165	40	165	65	165	115	215
TTLMTM-726	15	165	40	165	65	165	165	215
TTLMTM-727	15	190	40	190	65	190	140	190
TTLMTM-728	15	190	40	190	65	190	140	240
TTLMTM-729	15	190	40	190	65	190	190	240
TTLMTM-730	15	215	40	215	65	215	165	215
TTLMTM-731	15	215	40	215	65	215	165	265
TTLMTM-732	15	215	40	215	65	215	165	335
TTLMTM-733	15	215	40	215	65	215	215	265
TTLMTM-734	15	240	40	240	90	240	190	240
TTLMTM-735	15	240	40	240	90	240	190	290
TTLMTM-736	15	240	40	240	90	240	240	290
TTLMTM-737	15	265	40	265	115	265	215	265
TTLMTM-738	15	265	40	265	115	265	215	315
TTLMTM-739	15	265	40	265	115	265	215	315
TTLMTM-740	15	265	40	265	115	265	265	315
TTLMTM-741	15	265	65	265	90	265	215	265
TTLMTM-742	15	265	65	265	90	265	215	315
TTLMTM-743	15	265	65	265	90	265	265	315
TTLMTM-744	15	275	40	275	65	275	220	370
TTLMTM-745	15	290	65	290	115	290	240	290
TTLMTM-746	15	290	65	290	115	290	240	340
TTLMTM-747	15	290	65	290	115	290	290	340
TTLMTM-748	15	315	65	315	140	315	265	315
TTLMTM-749	15	315	65	315	140	315	265	365
TTLMTM-750	15	315	65	315	140	315	315	365
TTLMTM-751	25	275	75	275	100	275	275	325
TTLMTM-752	25	300	75	300	125	300	250	350
TTLMTM-753	25	500	75	500	125	500	450	550
TTLMTM-754	25	500	75	500	150	500	400	500

Special modules can be readily manufactured to improve accuracies and/or provide customer specified random delay times for specific applications.

THE WAVEFORMS SHOWN BELOW ARE TYPICAL FOR THE ENTIRE SERIES. THE TIMES SHOWN ARE FOR THE TTLMTM-725 ONLY.



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