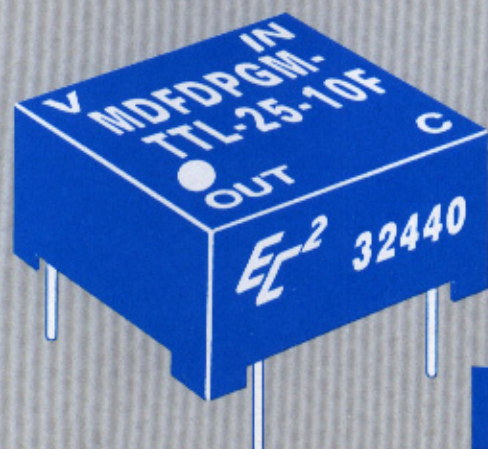


EC²



low profile

T²L

COMPATIBLE

Mini DIP

DELAYED PULSE GENERATOR MODULE

- T²L FAST input and outputs
- Pulse widths stable and precise
- 8-pin DIP package
- Leads - Thru-hole, J, Gull Wing or Tucked
- Available in pulse widths from 5 to 90ns
- 10 T²L fan-out capacity

design notes

The "Mini Dip Series" Delayed Pulse Generator Modules developed by Engineered Components Company have been designed to provide precise output pulse widths at specified delay times after input trigger when triggered by variable width inputs. All required driving and output circuitry, as well as timing components, are contained in an 8-pin DIP package. These pulse generator 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 modules are compatible with T²L FAST circuits and require no external components in order to obtain the specified output pulse.

The MDFDPGM-TTL is available in 19 pulse widths and 19 time delays from 5 to 90ns. These modules provide a stable T²L output

pulse of the specified width and at the specified time for each positive input step. It is necessary only that the input step be held positive for at least 10ns in order to obtain the desired output pulse. The duration of the positive input pulse, after this time, has no effect on the output pulse width. No output pulse will occur on the negative input pulse transition. Time between trigger inputs must be a minimum of twice the sum of the delay time and output pulse width specified. Both pulse width and delay time tolerance are maintained as shown in the accompanying Part Number Table, when tested under the "Test Conditions" shown. Pulse width is measured at the +1.5V level on both leading and trailing edges. Rise and fall times are less than 3ns, when measured from .8V to 2.0V. These modules are capable of driving 10 T²L loads. Temperature coefficient of delay is approximately +800ppm/°C and of pulse width is approximately -800ppm/°C over the operating temperature range of 0 to +70°C.

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. 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.

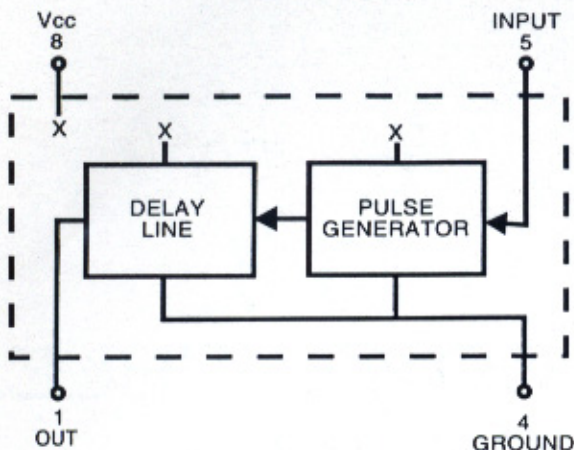
Marking consists of manufacturer's logo (EC²), Federal Supply Code, part number, pin one (1) identification and date code of manufacture. All marking is applied by silk screen process using white epoxy paint in accordance with MIL-STD-130, to meet the permanency of identification required by MIL-STD-202, Method 215.

EC²

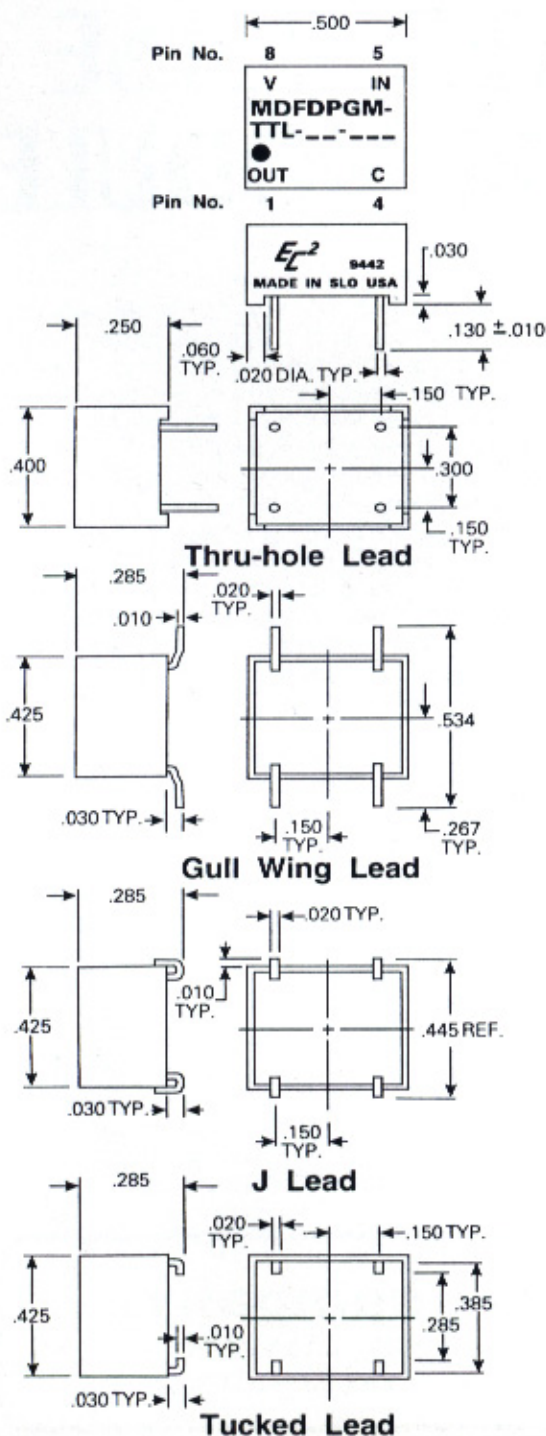
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BLOCK DIAGRAM IS SHOWN BELOW



MECHANICAL DETAIL IS SHOWN BELOW



TEST CONDITIONS

1. All measurements are made at 25°C.
2. V_{cc} supply voltage is maintained at 5.0V DC.
3. All units are tested using a FAST toggle-type positive input pulse and one FAST T²L load at the output.
4. Input pulse width used is 10ns for all modules; repetition rate is approximately 200kHz.

OPERATING SPECIFICATIONS

- * V_{cc} supply voltage: 4.75 to 5.25V DC
V_{cc} supply current:
Constant "0" in 30mA typical
Constant "1" in 30mA typical

Logic 1 Input:

- Voltage 2V min.; V_{cc} max.
Current 2.7V = 20uA max.
5.5V = 1mA max.

Logic 0 Input:

- Voltage8V 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.

- * Delay increases or decreases approximately 2% for a respective increase or decrease of 5% in supply voltage. Pulse width increases or decreases approximately 2% for a respective decrease or increase of 5% in supply voltage.

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: MD FPGM-TTL-10G (Gull Wing), MD FPGM-TTL-25J (J Lead), MD FPGM-TTL-70F (Thru-hole Lead) or MD FPGM-TTL-100T (Tucked Lead).

Part Number	Pulse Width (in ns)
MD FPGM-TTL-__-5	5 ± 1
MD FPGM-TTL-__-6	6 ± 1
MD FPGM-TTL-__-7	7 ± 1
MD FPGM-TTL-__-8	8 ± 1
MD FPGM-TTL-__-9	9 ± 1
MD FPGM-TTL-__-10	10 ± 1
MD FPGM-TTL-__-15	15 ± 1
MD FPGM-TTL-__-20	20 ± 1
MD FPGM-TTL-__-25	25 ± 1
MD FPGM-TTL-__-30	30 ± 1
MD FPGM-TTL-__-35	35 ± 1.5
MD FPGM-TTL-__-40	40 ± 1.5
MD FPGM-TTL-__-45	45 ± 1.5
MD FPGM-TTL-__-50	50 ± 1.5
MD FPGM-TTL-__-60	60 ± 1.5
MD FPGM-TTL-__-70	70 ± 2
MD FPGM-TTL-__-75	75 ± 2
MD FPGM-TTL-__-80	80 ± 2
MD FPGM-TTL-__-90	90 ± 3

Complete part number includes desired delay time (in ns) from input trigger to beginning of output pulse followed by a dash, the desired pulse width and then the lead style (F, G, J, or T). Delay times are available in the same delays as shown above for pulse widths (from 6 to 90ns), e.g., part number MD FPGM-TTL-25-10F has a delay of 25ns with a 10ns pulse and MD FPGM-TTL-8-30J has a delay of 8ns with a 30ns pulse width. [Special modules can be readily manufactured to improve accuracies and/or provide customer specified pulse widths for specific applications.](#)