

EC²



low profile

ADVANCED CMOS

T²L

COMPATIBLE

VOLTAGE VARIABLE FAST RECOVERY PULSE GENERATOR

- T²L compatible input and outputs
- Pulse widths stable and precise
- Pulse width voltage trimmable
- High output duty cycles
- 14-pin DIP package (.240 high)
- Available in pulse widths from 10 to 500ns
- 10 T²L fanout capacity

design notes

The "DIP series" Variable Pulse Generator Modules developed by Engineered Components Company have been designed to provide trimmable output pulse widths when triggered by variable width inputs. All required driving and output circuitry, as well as timing components, are contained in a 14-pin DIP package. These trimmable 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 Schottky T²L, Advanced CMOS and Fast circuits.

The VFRPG-ACT is available in 33 pulse widths from 10 to 500ns. These modules provide a stable yet trimmable output pulse for each positive input step. Pulse width adjustment is attained by adjusting the voltage at pin V_a between 3 and 5V DC, with minimum pulse width occurring at 5V DC. The generated pulse is inverted internally to provide a negative pulse as an additional output. It is necessary only that the input be held low for at least 10ns, then high for at least 10ns to obtain the desired output pulse. The duration of the positive input pulse, after this time, has no effect on output pulse width. No output pulse will occur on the negative input pulse transition. Pulse width tolerance is 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 edge. Rise and fall times are less than 4ns, when measured from .75V to 2.4V. These modules are capable of driving 10 Schottky T²L loads. Temperature coefficient of pulse width for the majority of this product line is approximately +500ppm/°C over the operating temperature range of -40 to +85°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.

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engineered components company

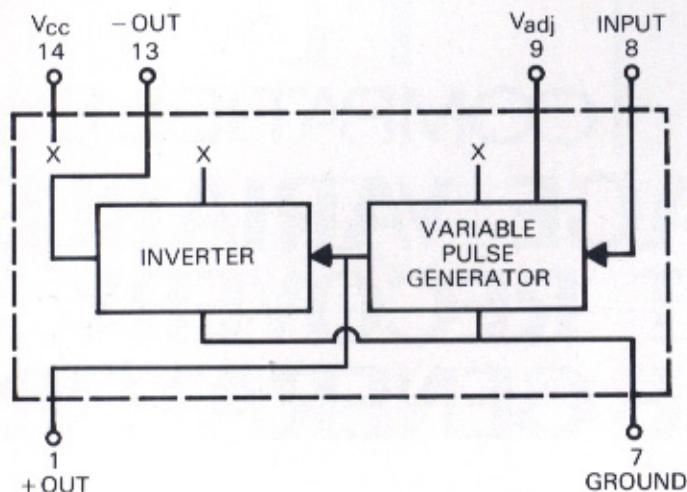
3580 Sacramento Drive, P. O. Box 8121, San Luis Obispo, CA 93403-8121

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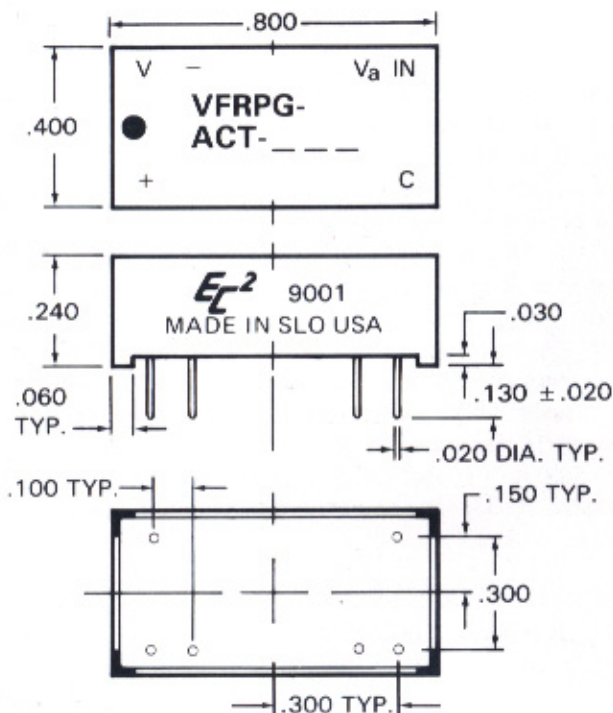
DESIGN NOTES (continued)

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.

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 an ACT toggle-type positive input pulse and one ACT load at the output.
4. Input pulse width used is 10ns for all modules; repetition rate is approximately 200 KHz.

OPERATING SPECIFICATIONS

*V_{CC} supply voltage: 4.75 to 5.25V DC

V_{CC} supply current:

Constant "1" or "0" in 2ma typical

Constant 1Mhz in 4ma typical

Logic 1 Voltage in: 2V min.; V_{CC} max.

Logic 0 Voltage in:8V max.

Logic 1 Voltage out: 4.3V min. @ -24ma.

Logic 0 Voltage out: 0.44V max. @ +24ma.

Operating temperature range: -40 to +85°C.

Storage temperature: -55 to +125°C.

*Pulse width increases or decreases approximately 1% for a respective increase or decrease of 5% in supply voltage.

PART NUMBER TABLE

Part Number	Pulse Width (in ns) V _{adj} @ 4V	Pulse Width Adjustability (nominal 4V)	Maximum Rep. Rate (in Mhz)
VFRPG-ACT-10	10 ± 0.5	± 1.0ns	48.1
VFRPG-ACT-11	11 ± 0.5	± 1.0ns	45.7
VFRPG-ACT-12	12 ± 0.5	± 1.0ns	43.5
VFRPG-ACT-13	13 ± 0.5	± 1.0ns	41.5
VFRPG-ACT-14	14 ± 0.5	± 1.0ns	39.6
VFRPG-ACT-15	15 ± 0.5	± 1.0ns	37.9
VFRPG-ACT-16	16 ± 0.5	± 1.0ns	36.3
VFRPG-ACT-17	17 ± 0.5	± 1.0ns	34.9
VFRPG-ACT-18	18 ± 0.5	± 1.0ns	33.6
VFRPG-ACT-19	19 ± 0.5	± 1.0ns	32.3
VFRPG-ACT-20	20 ± 0.5	± 1.0ns	31.1
VFRPG-ACT-21	21 ± 0.5	± 1.0ns	30.1
VFRPG-ACT-22	22 ± 0.5	± 1.1ns	29.0
VFRPG-ACT-23	23 ± 0.5	± 1.1ns	28.1
VFRPG-ACT-24	24 ± 0.5	± 1.1ns	27.2
VFRPG-ACT-25	25 ± 0.5	± 1.2ns	26.4
VFRPG-ACT-30	30 ± 0.6	± 1.3ns	22.8
VFRPG-ACT-35	35 ± 0.7	± 1.5ns	20.0
VFRPG-ACT-40	40 ± 0.8	± 1.7ns	17.8
VFRPG-ACT-45	45 ± 0.9	± 1.9ns	16.1
VFRPG-ACT-50	50 ± 1.0	± 2.0ns	14.6
VFRPG-ACT-60	60 ± 1.2	± 2.4ns	12.3
VFRPG-ACT-70	70 ± 1.3	± 2.7ns	10.6
VFRPG-ACT-75	75 ± 1.4	± 2.9ns	9.9
VFRPG-ACT-80	80 ± 1.5	± 3.0ns	9.3
VFRPG-ACT-90	90 ± 1.6	± 3.3ns	8.3
VFRPG-ACT-100	100 ± 1.8	± 3.6ns	7.5
VFRPG-ACT-150	150 ± 2.5	± 5.2ns	4.9
VFRPG-ACT-200	200 ± 3.5	± 6.6ns	3.6
VFRPG-ACT-250	250 ± 4.0	± 8.0ns	2.9
VFRPG-ACT-300	300 ± 4.5	± 9.3ns	2.4
VFRPG-ACT-400	400 ± 6.0	± 11.9ns	1.7
VFRPG-ACT-500	500 ± 7.0	± 14.5ns	1.4

Pulse widths are trimmable by adjusting V_a between 3 and 5V DC. All modules can be operated up to the maximum pulse rate specified in the Part Number Table with pulse widths as low as 10ns and pulse spacing as low as 10ns. Since pulse width accuracies may be somewhat degraded at high pulse rates, it is suggested that the module be evaluated under the specific operating conditions. **Special modules can be readily manufactured to improve accuracies and/or provide customer specified random pulse widths for specific applications.**