50 MHz Programmable Pulse Generators Models 4033 & 4034

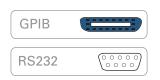




The 4033 and 4034 are high performance programmable pulse generators for testing digital systems and circuits based on TTL, CMOS, or ECL technologies. Both instruments generate clean and accurate pulses at up to 6 digits resolution with a repetition rate up to 50 MHz, variable pulse widths from 10 ns to 10 s, and pulse delays from 0 ns to 10 s. Output levels are adjustable from -10 V to +10 V, with pulse amplitudes settable from 0.1 Vpp to 10 Vpp into a 50 ohm load. All parameters, modes, and functions are programmable via the front panel or remote control commands. Additionally, the pulse generators provide selectable complementary pulse and double pulse generation in continuous, triggered, gated, and counted burst modes.

Features & Benefits

- Repetition rate of 0.1 Hz to 50 MHz
- Flexible trigger modes: Continuous, Triggered (internal, external, manual), Gated Burst and External Width
- Pulse width programmable from 10 ns to 10 s
- Transition times (rise and fall times) variable from 6 ns to 100 ms
- Programmable delay and double pulse
- Predefined amplitude levels for ECL, TTL, and CMOS signals
- Store up to 99 different test setups with auto retention of last power down setup
- 10 Vpp into 50 ohm output
- Closed case calibration
- Programmable via GPIB and RS-232
- SCPI compatible
- Three year warranty



Dual-Channel Model 4034

- Both channels offer full functionality and all parameters such as pulse width and transition time can be set independently
- Synchronize both channels with the push of a button
- Saves cost and bench space

Applications

- Automatic Test Equipment (ATE)
- Avionics and radar testing
- Switching power supply testing
- Characterization of active components



Industry Leading Performance

External Width

In the external width pulse mode, pulse period and width are determined by an externally applied signal. The pulse generator then applies transition and level parameters to this signal in order to generate the pulse. A power supply designer for example could use this feature to shape the width and period of the output signal to drive the power supply's FET transistors while remaining synchronized with its control circuits.

Variable Transitions

For added flexibility, variable rise and fall times can be programmed from 6 ns to 100 ms. Various shapes of pulses can be obtained for applications where parameters such as linearity, switching times, or reflection times must be analyzed. Programmable rise and fall times could be used to measure operational amplifier slew rates and easily test thresholds of devices and circuits.

Straightforward User Interface

These generators use a menu-driven front panel keypad and control knob to adjust all parameters. The bright, easy-to-read display shows all relevant parameters along with a graphical representation of the output pulse. If an entered parameter is not compatible with the existing setup status, the operator is informed by an error message.

Users can conveniently select predefined amplitude levels for TTL, ECL, and CMOS signals, or choose a custom amplitude level for specialized applications.

Output On Button - Turns the

main output signal on or off

Front Panel Interface

BK PRECISION 4034 50 MHz Dual Channel Pulse Generato MHZ 9 Ch1 On Ch2 On KHZ CONT Hz 3 1100 500.00 ns 200.0 ns DEL:0.0 ns D mHz DELAY SINGLE ENTER F1-F5 Key - Select menu options Manual Trigger Key - Sends that appear on the bottom section manual trigger pulse when of the LCD display pushed (requires instrument

to be in manual trigger

mode)

Menu Keys - Selects menu

options for waveform parameters

4033 Output Section – Main output and Sync output

2

Specifications

The specifications describe the instrument performance after 30 minutes warm-up period into a 50 Ω load. All timing characteristics are measured at 50% of amplitude with fastest edges.

Models		4033	4034			
CHANNELS		I	2	TRANSITION TIMES		
	QUENCY ARACTERISTICS	0.1 Hz to 50 MHz		Range		<6 ns to 100 ms variable. Leading and trailing edges settable separately and limited to 20:1 ratio between settings into one of the following ranges: 5 ns-100 ns; 50 ns-1.0 us; 500 ns-10 us; 5.0 us-100 us; 50 us-1.0 ms; 500 us-10 ms, 5 ms – 100 ms
PERIOD	Range (single pulse)) 20 ns to 10 s (50 MHz to 0.1 Hz repetition rate)				
	Range (double pulse)	40 ns to 10 s (25 MHz to 0.1 Hz repetition rate)		Resolution		3 digits limited to 10 ps
	Resolution	Up to 6 digits, limited to 100 ps		Accuracy		\pm (5% of setting +2 ns)
	Accuracy	±0.01 %		Linearity		< 5% deviation from a straight line between 10% and 90% points, for transitions > 50 ns
	Jitter	< 0.01 % of setting +20 ps on Period, Width and Delay		INTERNAL TRIGGER		
WIDTH	Range	10 ns to (Period - 10 ns)		Range 100 ns to 100 s		
	Resolution	Up to 6 digits, limited to 100 ps		Resolution		4 digits limited to 100 ns
	Accuracy	$\pm (0.5\% \text{ of setting } + 500 \text{ ps})$		Accuracy		±0.01%
	Double Pulse	\pm (0.5% of setting +3 ns) for the second pulse		INPUT AND OUTPUT		
DELAY	Range	0 ns to (Period –			Sensitivity	200 mVpp minimum
	Resolution	Up to 6 digits, lin		TRIGGER INPUT	Minimum Width	l0 ns
	Accuracy	±(0.5% of setti			Maximum Rate	50 MHz
DUTY CYCLE	Range	1 to 5			Input Impedance	10 kΩ
	Resolution	3 digits			Input Protection	±15V DC plus peak AC
	Accuracy	Limited by width an			Range	Selectable from -10 V to +10 V
OUTPUT CHARACTERISTICS					Resolution	3 digits limited to 10 mV
AMPLITUDE		-9.90 V to +10 V	V to ± 10 V into 50 Ω load		Slope Selection	Positive or Negative
	High Level Range	(-19.80 V to +20 V -10 V to +9.90 V (-20 V to +19.80 V	i' into 50 Ω load i' into open circuit)			A TTL level pulse at the programmed period. Output impedance is 50 Ω , protected against short circuit and up to ± 15 V accidental input. The high level is >2 V into 50 Ω and with 3.5 ns typical transition times.
	Amplitude Range	0.1 V to 10 V p-p (20 V p-p max in	0.1 V to 10 V p-p into 50 Ω load REMOTE PROGRAMMING (20 V p-p max into open circuit) REMOTE PROGRAMMING		in great tailonten tintoi	
	Resolution	3 digits limite	d to 10 mV	Interface		GPIB and RS-232, IEEE-488.2 and SCPI compatible
	Accuracy	$\pm 1\%$ of setting ± 1	0 mV into 50 Ω	GPIB Function Codes		SH1, AH1, T6, L4, SR1, RL1, PP0, DC1,DT1, C0, E2
	Aberrations	<5% + 20 mV into 50 Ω load,	$<5\% + 20$ mV into 50 Ω load, for pulse levels between $\pm 5V$ GENERAL			
	Output Resistance	50 9		Memory		Non-volatile, stores up to 99 complete panel settings. Last user setup also retained at power down.
005045040	Offset Accuracy	±1% ±2	25 mV	Power Requirements		100-240 V, ±10%, 48-66 Hz, 50 VA maximum
OPERATING				Dimensions WxHxD		8.4 x 11.8 x 3.5 inches (213 x 300 x 88 mm)
Continuous		Output continuous at programmed period rate		Net Weight		6.61 lbs (3 kg)
Triggered		Output quiescent until triggered by an internal, external, GPIB or manual trigger, then generates one cycle at programmed period rate		EMC		Conforms to EN55011 class B for radiated and conducted emissions
Gated		Same as triggered mode except pulses are output for the dura- tion of the gated signal. The last cycle started is completed		Electrical Discharge Immunity		Conforms to EN55082
Burst		Same as triggered mode for programmed number of cycles from 2 to 999,999 as set by the N-BURST function		Safety Specifications Operating Temperature		Conforms to EN61010, CE Approved 32 °F to 122 ° F (0 °C to 50 °C)
External Width		Trigger duration and rate sets pulse width and repetition		Storage Temperature		-4 ° F to 140 °F (-20 °C to 60 °C)
PULSE FUNCTIONS				Humidity		90% RH at 32 °F to 86 °F (0 °C to 30 °C)
Single		One pulse at each selected period	1 up to 50 MHz repetition rate			Three Year Warranty
Double		One pair of pulses at each period up to 25 MHz repetition rate. Both pulses have the same selected width; the position of the second pulse set by the delay control.		Included accessories : AC Power cord, CD containing instruction manual, RS-232 cable, test report and certificate of calibration		