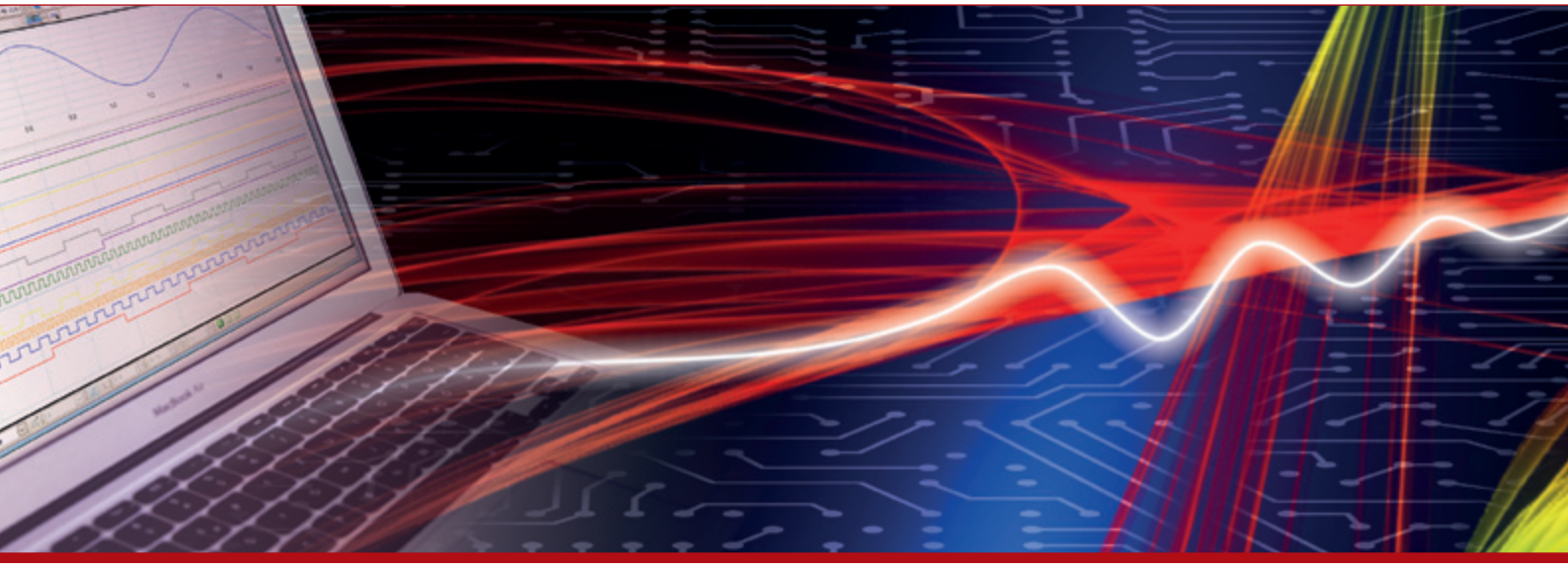
Product Datasheet - Technical Specifications



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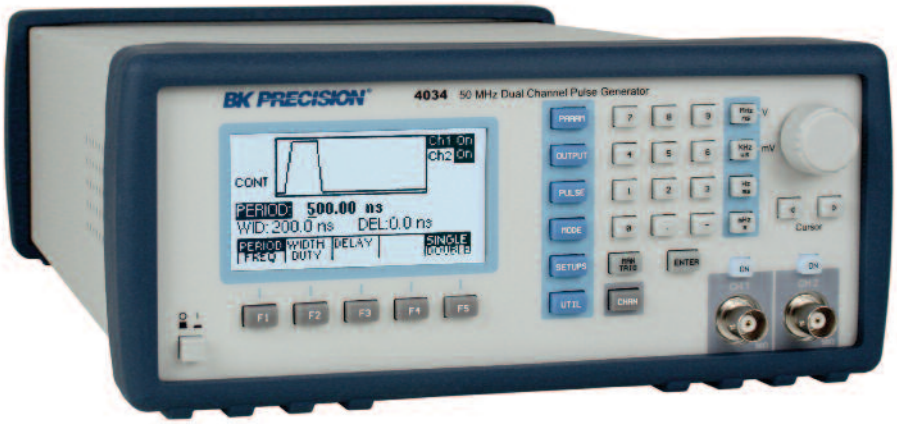
Data Sheet

50 MHz Programmable Pulse Generators

Models 4033 & 4034



GPIB

RS232

Description

The 4033 and 4034 are high performance programmable pulse generators for testing digital systems and circuits based on TTL, CMOS, or ECL te chnologie s. 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

BK PRECISION
ELECTRONIC TEST INSTRUMENTS

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

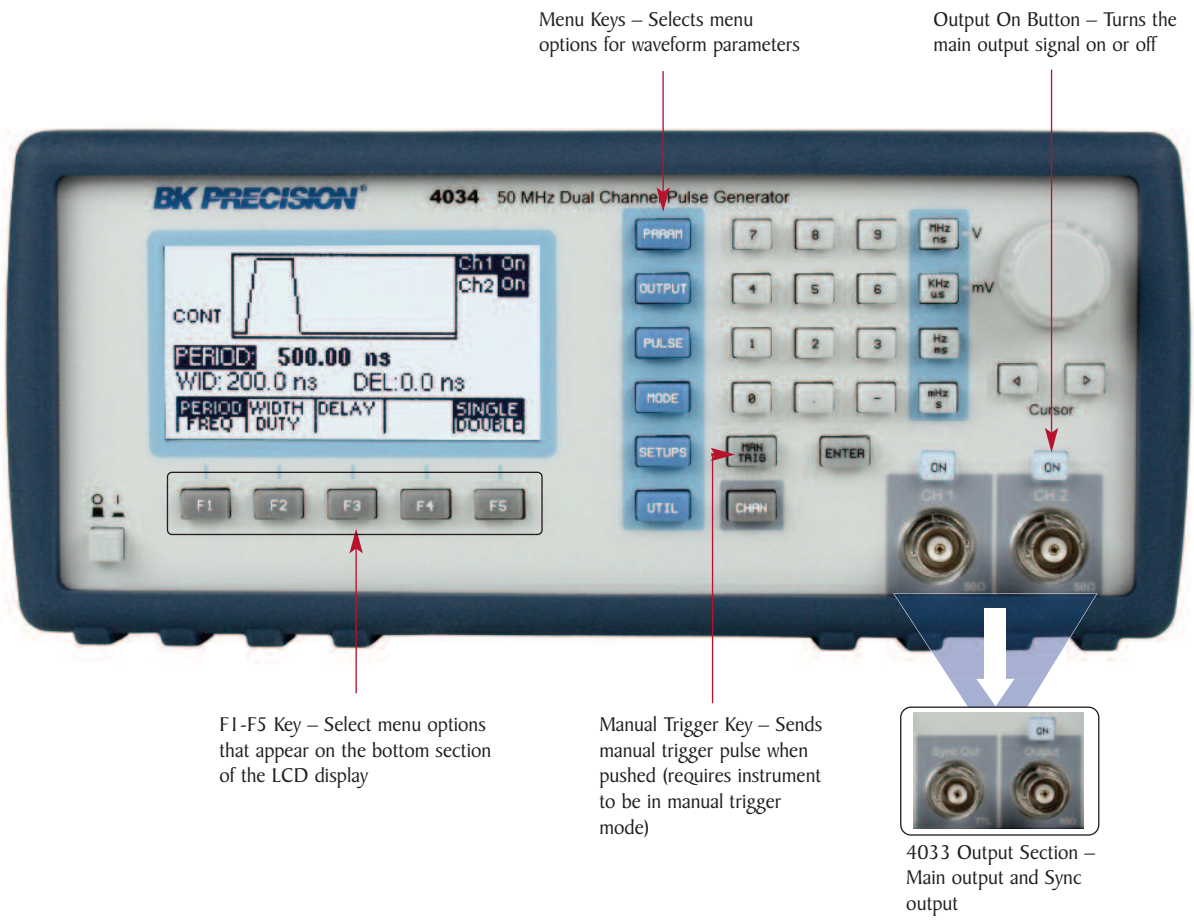
For added flexibility, variable rise and fall times can be programmed from 6 ns to 100 ms. Various shapes of pulses can be obtained for applications where parameters such as linearity, switching times, or reflection times must be analyzed. Programmable rise and fall times could be used to measure operational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

Front Panel Interface



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		1	2
FREQUENCY		0.1 Hz to 50 MHz	
TIMING CHARACTERISTICS			
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	Up to 6 digits, limited to 100 ps	
	Accuracy	±0.01 %[1]	
	Jitter	< 0.01 % of setting +20 ps on Period, Width and Delay	
WIDTH	Range	10 ns to (Period – 10 ns)	
	Resolution	Up to 6 digits, limited to 100 ps	
	Accuracy	±(0.5% of setting +500 ps)	
	Double Pulse	±(0.5% of setting +3 ns) for the second pulse	
DELAY	Range	0 ns to (Period – Width – 10 ns)	
	Resolution	Up to 6 digits, limited to 100 ps	
	Accuracy	±(0.5% of setting +500 ps)	
DUTY CYCLE	Range	1 to 99%	
	Resolution	3 digits (0.1%)	
	Accuracy	Limited by width and pulse accuracy	
OUTPUT CHARACTERISTICS			
AMPLITUDE	High Level Range	-9.90 V to +10 V into 50 Ω load (-19.80 V to +20 V into open circuit)	
	Low Level Range	-10 V to +9.90 V into 50 Ω load (-20 V to +19.80 V into open circuit)	
	Amplitude Range	0.1 V to 10 V p-p into 50 Ω load (20 V p-p max into open circuit)	
	Resolution	3 digits limited to 10 mV	
	Accuracy	±1% of setting ±10 mV into 50 Ω	
	Aberrations	<5% + 20 mV into 50 Ω load, for pulse levels between ±5V	
	Output Resistance	50 Ω	
	Offset Accuracy	±1% ±25 mV	
OPERATING MODES			
Continuous		Output continuous at programmed period rate	
Triggered		Output quiescent until triggered by an internal, external, GPIB or manual trigger, then generates one cycle at programmed period rate	
Gated		Same as triggered mode except pulses are output for the duration of the gated signal. The last cycle started is completed	
Burst		Same as triggered mode for programmed number of cycles from 2 to 999,999 as set by the N-BURST function	
External Width		Trigger duration and rate sets pulse width and repetition	
PULSE FUNCTIONS			
Single		One pulse at each selected period up to 50 MHz repetition rate	
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.	

TRANSITION TIMES		
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
Resolution		3 digits limited to 10 ps
Accuracy		±(5% of setting +2 ns)
Linearity		<5% deviation from a straight line between 10% and 90% points, for transitions > 50 ns
INTERNAL TRIGGER		
Range		100 ns to 100 s
Resolution		4 digits limited to 100 ns
Accuracy		±0.01%
INPUT AND OUTPUT		
TRIGGER INPUT	Sensitivity	200 mVpp minimum
	Minimum Width	10 ns
	Maximum Rate	50 MHz
	Input Impedance	10 kΩ
	Input Protection	±15V DC plus peak AC
	Range	Selectable from -10 V to +10 V
	Resolution	3 digits limited to 10 mV
	Slope Selection	Positive or Negative
SYNC OUTPUT		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.
REMOTE PROGRAMMING		
Interface		GPIB and RS-232, IEEE-488.2 and SCPI compatible
GPIB Function Codes		SH1, AH1, T6, L4, SR1, RL1, PP0, DC1,DT1, C0, E2
GENERAL		
Memory		Non-volatile, stores up to 99 complete panel settings. Last user setup also retained at power down.
Power Requirements		100-240 V, ±10%, 48-66 Hz, 50 VA maximum
Dimensions WxHxD		8.4 x 11.8 x 3.5 inches (213 x 300 x 88 mm)
Net Weight		6.61 lbs (3 kg)
EMC		Conforms to EN55011 class B for radiated and conducted emissions
Electrical Discharge Immunity		Conforms to EN55082
Safety Specifications		Conforms to EN61010, CE Approved
Operating Temperature		32 °F to 122 ° F (0 °C to 50 °C)
Storage Temperature		-4 ° F to 140 °F (-20 °C to 60 °C)
Humidity		90% RH at 32 °F to 86 °F (0 °C to 30 °C)

Three Year Warranty

Included accessories : AC Power cord, CD containing instruction manual, RS-232 cable, test report and certificate of calibration

[1]Applies to values entered when incremented frequency or decrementing period, entering values differently than described will typically be less accurate.