

MODELS PM8571/2A

50MHz Single/Dual Channel Pulse Waveform Generators

Specification

CONFIGURATION

Output Channels 1/2, semi-independent

PULSE

Type: Normal, Complement, Inverted, Linear transitions
Mode: Single, Delayed, Double, Fixed and External Width.

PERIOD PARAMETERS

Range: 20ns to 10s
Resolution:
 Continuous 11 digits
 Gated, and Burst 3 digits
Accuracy:
 Continuous Same as reference
 Gated, and Burst $\pm 3\%$ of programmed value
RMS Jitter:
 Continuous $< (10\text{ppm}+20\text{ps})$
 Gated, and Burst $< (100\text{ppm}+20\text{ps})$

PULSE WIDTH, DOUBLE PULSE

Range: 8ns to 10s
Delay: 0 to 10s
Resolution: 10ps; limited by 5 digits
Accuracy: $\pm(3\%$ of setting + 500ps)
RMS Jitter: $< (100\text{ppm}+15\text{ps})$ RMS

FIXED DUTY CYCLE MODE

Mode: Output duty cycle remains constant regardless of pulse width setting
Range: 1% to 99%.
Accuracy: $\pm(3\%$ of setting + 500ps).

OUTPUT LEVELS

Mode: High/Low, Amplitude/Offset, Positive, Negative.
Amplitude:
 Standard 16mV to 16Vpp, into 50 Ω ;
 32mV to 32Vpp, into open Z
 Option 3 21mV to 20Vpp, into 50 Ω ;
 42mV to 32Vpp, into open Z
 Option 4 16mV to 10Vpp, into 50 Ω ; 32mV to 20Vpp, into open Z High Level
Range:
 Standard -7.983V to +8V, into 50 Ω ;
 -15.966V to +16V, into open Z
 Option 3 -9.979V to +10V, into 50 Ω ;
 -15.958V to +16V, into open Z
 Option 4 -4.983V to +5V, into 50 Ω ;
 -9.966V to +10V, into open Z

Low Level Range:

Standard -8V to +7.983V, into 50 Ω ; -16V to +15.966V, into open Z
 Option 3 -10V to +9.979V, into 50 Ω ;
 -16V to +15.958V, into open Z
 Option 4 -5V to +4.983V, into 50 Ω ; -10V to +9.966V, into open Z
Resolution: 4 digits.

PULSE PERFORMANCE

Transition Time:
 Fast
 16mV to 16Vpp $< 5\text{ns}$ (typically $< 4\text{ns}$)
 16Vpp to 20Vpp $< 6\text{ns}$
 Linear Selectable
Aberration:
 16mV to 10Vpp $< 5\%$, typ.
 10Vpp to 20Vpp $< 8\%$
Impedance: 50 Ω , programmable

LINEAR TRANSITION TIMES

Range: 5ns to 5ms, in 6 overlapping ranges
In-range Span: 20:1
Resolution: 4 digits
Linearity: $\pm 3\%$ of setting above 100ns
Accuracy: $\pm(10\%$ of setting + 2ns).

EXTERNAL WIDTH CONTROL

DESCRIPTION: The pulse shape can be recovered whilst the period and width of an external input signal are maintained
Input: Rear panel TRIG IN connector

STANDARD WAVEFORMS

Waveforms: Sine, Triangle, Square, Pulse, Ramp, Sine(x)/x, Gaussian, Exponential, Repetitive Noise and DC
Frequency Range:
 Sine 100 μHz to 100MHz
 Square, Pulse 100 μHz to 62.5MHz
 All others 100 μHz to 31.25MHz

SINE

Start Phase: 0-360°
Phase Resolution: 0.01°
Harmonics Distortion, 3Vp-p (typ.):
 DC to 2.5MHz $< -55\text{dBc}$
 2.5MHz to 25MHz $< -50\text{dBc}$
 25MHz to 40MHz $< -40\text{dBc}$
 40MHz to 50MHz $< -35\text{dBc}$
 50MHz to 100MHz $< -28\text{dBc}$
Non-Harmonic Distortion:
 DC to 50MHz $< -70\text{dBc}$
 50MHz to 100MHz $< -65\text{dBc}$

Total Harmonic Distortion:

DC to 100kHz 0.1%
Flatness (1kHz):
 DC to 1MHz 1%
 1MHz to 10MHz 3%
 10MHz to 25MHz 5%
 25MHz to 80MHz 10%
 80MHz to 100MHz 15%

Phase Noise (8 points Sine, Max. SCLK)

100Hz Offset -80dBc/Hz
 1kHz Offset -89dBc/Hz
 10kHz Offset -92dBc/Hz
 100kHz Offset -112dBc/Hz
 1MHz Offset -140dBc/Hz

TRIANGLE

Start Phase Range: 0-360°
Phase Resolution: 0.01°
Timing Ranges: 0%-99.9% of period

SQUARE

Duty Cycle Range: 0% to 99.9%
Timing Ranges: 0%-99.9% of period
Rise/Fall Time:
 16mV to 16Vpp $< 5\text{ns}$ (typically $< 4\text{ns}$)
 16Vpp to 20Vpp $< 6\text{ns}$
Aberration:
 16mV to 10Vpp $< 5\%$, typ.
 10Vpp to 20Vpp $< 8\%$

SINC (Sine(x)/x)

"0 Crossings": 4-100

GAUSSIAN

Time Constant: 10-200

EXPONENTIAL PULSE

Time Constant: -100 to 100

DC

Range: -8V to 8V, standard
 -10V to 10V (with option 3)
 -5V to 5V (with option 4)

HALF-CYCLE WAVEFORMS

Function Shape: Sine, Triangle, Square
Frequency Range: 0.01Hz to 1MHz
Phase (Sine/triangle): 0 to 360°
Phase Resolution: 0.01°
Duty Cycle Range: 0% to 99.9%
Run Modes: Continuous, Triggered
Delay Between Half Cycles (Continuous only): 200ns to 20s
 Delay Resolution 20ns

MODELS PM8571/2A

50MHz Single/Dual Channel Pulse Waveform Generators Specification

ARBITRARY WAVEFORMS

Sample Rate:	1.5S/s to 250MS/s (typ. 300MS/s)
Vertical Resolution:	16 Bits
Waveform Memory:	1M points (2M/4M optional)
Min. Segment Size:	16 points
Resolution:	4 points
No. of Segments:	1 to 10k

SEQUENCED WAVEFORMS

Operation:	Segments may be linked and repeated in a user-selectable order to generate extremely long waveforms. Segments are advanced using either a command or a trigger
Multi Sequence:	1 to 10, Selectable
Sequencer Steps:	1 to 4k
Segment Duration:	600ns min.
Segment Loops:	1 to 1M

ADVANCE MODES

Automatic:	No triggers required to step from one segment to the next. Sequence is repeated continuously through a pre-programmed sequence table
Stepped:	Current segment is sampled continuously, external trigger advances to next programmed segment.
Single:	Current segment is sampled to the end of the segment including repeats and idles there. Next trigger advances to next segment
Mixed:	Each step of a sequence can be programmed to advance either: a) automatic (Automatic mode), or b) with trigger (Stepped mode)
Advance Source:	External (TRIG IN), Internal or software

MODULATION

COMMON CHARACTERISTICS

Carrier Waveform:	Sinewave, except for PWM
Carrier Frequency:	10Hz to 100MHz
Source:	Internal
Run Modes:	Off (Outputs CW), Continuous, Triggered, Delayed Trigger, Burst, Timer and Gated
Advance Source:	Front panel button, Software commands, TRIG IN
Carrier Idle Mode:	On or Off, programmable
Marker Position:	TTL, Programmable at selectable frequency

FM

Modulating Shape:	Sine, square, triangle, ramp
Modulation Freq.:	10mHz to 100kHz
Deviation Range:	Up to 50MHz

ARBITRARY FM

Modulating Shape:	Arbitrary waveform
Modulating SCLK:	1S/s to 2.5MS/s
Freq. Array Size:	4 to 10,000 frequencies

AM

Envelope Freq.:	10mHz to 100kHz
Envelope Shape:	Sine, square, triangle, ramp
Modulation Depth:	0% to 100%

FSK

Baud Rate Range:	1bits/sec to 10Mbits/sec
Data Bits Length:	2 to 4,000

PSK

Carrier Phase:	0 to 360°
Baud Rate Range:	1bits/sec to 10Mbits/sec
Data Bits Length:	2 to 4,000

FREQUENCY HOPPING

Hop Table Size:	2 to 1,000
Dwell Time Mode:	Fixed / Programmable per step
Dwell Time:	200ns to 20s
Time Resolution:	20ns

ASK

Start/Shift Amp.:	16mVp-p to 16Vpp into 50 Ω
Resolution:	Maximum amplitude/4096
Baud Rate Range:	1Bits/s to 10Mbits/s
Data Bits Length:	2 to 4,000

AMPLITUDE HOPPING

Range:	16mVp-p to 16Vpp into 50 Ω
Resolution:	Maximum amplitude/4096
Dwell Time Mode:	Fixed / Programmable per step
Dwell Time:	200ns to 20s
Time Resolution:	20ns

ARBITRARY 3D

Modulating Shape:	Arbitrary waveform
Modulating Type:	Amplitude CH1, Amplitude CH2, Frequency and Phase
Modulating SCLK:	1S/s to 2.5MS/s
Memory Size:	4 to 30,000

(n)PSK and (n)QAM

Carrier Frequency:	1Hz to 75MHz
Carrier Control:	On/Off
Modulation Type:	PSK, BPSK, QPSK, OQPSK, PI/4 DQPSK, 8PSK, 16PSK, 16QAM, 64QAM, 256QAM and User Defined
Symbol Rate:	1S/s to 1MS/s

Carrier Control:	On/Off
Symbol Accuracy:	$\pm(500ns + \text{Carrier Period})$
Table Size:	2 to 4096

PULSE WIDTH MODULATION

Carrier Waveform:	Pulse
Source:	Channel 1
Width Range:	10ns to 500ms
Resolution:	625ps
Deviation:	1% to 99%
Standard Modulating Waveforms:	Sine, square, triangle, ramp
Period	500ns to 1s
Resolution	Pulse width period
Accuracy	Reference + 1 Pulse width period
Arbitrary Modulating Waveforms:	Any shape
Period	Pulse Width x Number of Points
Size	5 to 512k
Resolution	Pulse width period
Accuracy	Same as Reference

SWEEP

Sweep Step:	Linear or log
Sweep Direction:	Up or Down
Sweep Time:	1 μ s to 40s

COMMON CHARACTERISTICS

FREQUENCY

Resolution:	Display 11 digits (limited by 1 μ Hz) Remote 14 digits (limited by 1 μ Hz)
Accuracy/Stability:	Same as reference

ACCURACY REFERENCE CLOCK

Internal	0.0001% (1 ppm TCXO) initial tolerance over a 19°C to 29°C temperature range; 1ppm/°C below 19°C and above 29°C; 1ppm/year aging rate
External	10MHz TTL, 50% \pm 2%, or 50 Ω \pm 5% 0dBm (jumper)

AMPLITUDE

Range:	Standard 16mV to 16Vpp, into 50 Ω ; 32mV to 32Vpp, into open Z
Option 3	21mV to 20Vpp, into 50 Ω ; 42mV to 32Vpp, into open Z
Option 4	16mV to 10Vpp, into 50 Ω ; 32mV to 20Vpp, into open Z
Resolution:	4 digits

MODELS PM8571/2A

50MHz Single/Dual Channel Pulse Waveform Generators

Specification

Accuracy (1kHz):

16mV to 160mVp-p	±(1% + 5mV)
160mV to 1.6Vp-p	±(1% + 10mV)
1.6V to 12Vp-p	±(1% + 70mV)
12V to 16Vp-p	±2%
16V to 20Vp-p	±5%

OFFSET

Range:

Standard	0 to ±7.992V, into 50Ω
Option 3	0 to ±9.981V, into 50Ω
Option 4	0 to ±4.992V, into 50Ω

Resolution:

1mV

Accuracy:

±(1%+1% of Amplitude +5mV)

FILTERS

Type:

Bessel	25MHz or 50MHz
Elliptic	60MHz or 120MHz

OUTPUTS

MAIN OUTPUT

Coupling: DC coupled

Connector: Front panel BNC

Impedance: 50Ω ±1%

Protection:

Standard Short Circuit to Case Ground, 10s max

Option 4 ±5VDC, 50Ω

SYNC OUTPUT

Connector: Front panel BNC

Level: TTL

Sync Type:

Pulse Arbitrary and Standard waves

LCOM Sequence and Burst modes

Position: 0 to 1M (2M or 4M optional)

Resolution: 4 points

SAMPLE CLOCK OUTPUT

Connector: Rear panel SMB

Level: 400mVp-p

Impedance: 50Ω

COUPLE OUTPUT

Connector: Rear panel SMB

Level: LVPECL

Impedance: 50Ω, terminated to +1.3V

DIGITAL PATTERN OUTPUTS

Connector: Rear panel SCSI-2, 68-pin

VHDC

Pattern Width: 16-bits, differential

Source: Channel 1 only

Output Level: LVDS

Pattern Length:

Dedicated Memory 1 to 128k

Arbitrary Memory 16 to 1M (2M or 4M optional)

Update Frequency: 100μpps to 250Mpps

INPUTS

TRIGGER INPUT

Connector: Rear panel BNC

Input Impedance: 10kΩ

Polarity: Positive or negative, selectable

Level: ±5V

Sensitivity: 100mV

Damage Level: ±12V

Min. Pulse Width: 10ns

EXTERNAL REFERENCE INPUT

Connector: Rear panel SMB

Frequency: 10MHz

Impedance & Level:

Default 10kΩ ±5%, TTL, 50% ±2%

Option 50Ω ±5%, 0dBm Sinewave

SAMPLE CLOCK INPUT

Connector: Rear panel SMB

Input Level: 300mVp-p to 1Vp-p

Impedance: 50kΩ

Range: 1.5Hz to 250MHz

Min. Pulse Width: 4 ns

COUPLE INPUT

Connector: Rear panel SMB

Input Level: LVPECL

Impedance: 50Ω, terminated to +1.3V

Min. Pulse Width: 4 ns

RUN MODES

Continuous: Free-run output of a waveform.

Triggered: Upon trigger, outputs one waveform cycle. Last cycle always completed.

Gated: External signal transition enables or disables generator output. Last cycle always completed

Burst: Upon trigger, outputs a Dual or multiple pre-programmed number of waveform cycles from 1 through 1M.

Mixed: First output cycle is initiated by a software trigger. Consequent output requires external triggers through the rear panel TRIG IN

TRIGGER CHARACTERISTICS

System Delay: 6 SCLK+150ns

Trigger Delay:

Pulse [(0; 100ns to 20s)+system delay]

All Others [(0; 200ns to 20s)+system delay]

Trigger Resolution:

Pulse 10ps, limited by 5 digits

All Others 20ns

Trigger Delay Error:

Pulse ±(3% of setting + 500ps)

All Others 6 SCLK+150ns

EXTERNAL

Source: Rear panel BNC

Trigger Level: ±5V

Resolution: 1mV

Input Frequency: DC to 2.5MHz

Min. Pulse Width: 10ns

Slope: Positive/Negative, selectable

Trigger Jitter:

Pulse <50ps

All Others <100ps

INTERNAL / TIMER

Range:

Pulse 100ns to 1s

All Others 200ns to 20s

Resolution:

20ns

Error: 3 sample clock cycles+20ns

MANUAL

Source: Soft trigger command from the front panel or remote

FREQUENCY COUNTER / TIMER

Measurements: Frequency, Period, Averaged Period, Pulse Width & Totalize Trigger Input

Range: 10Hz to 100MHz (typ.120MHz)

Sensitivity: 500mVpp

Accuracy: 1ppm

Slope: Positive/Negative transitions

Gate Time: 100μSec to 1 Sec

Input Range: ±5V

Trigger Modes: Continuous, Hold and Gated

Period Averaged:

Range 10ns to 50ms

Resolution 7 digits / Sec

Period and Pulse Width:

Range 500ns to 50ms

Resolution 100ns

Totalize:

Range 10¹²-1

Overflow Led indication

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50MHz Single/Dual Channel Pulse Waveform Generators

Specification

INTER-CHANNEL DEPENDENCY (PM8572)

Separate controls: Output on/off, amplitude, offset, standard waveforms, user waveforms, user waveform size, sequence table

Common Controls: Sample clock (Arb), frequency (Std), period (Pulse) reference source, trigger modes, trigger advance source, SYNC OUT.

PHASE OFFSET (LEADING EDGE)

Range: 0 to 1M points, 2M/4M optional

Resolution: 1 point

Initial Skew: < 1ns

Error: 1 SCLK

MULTI-INSTRUMENT SYNCHRONIZATION

Initial Skew: < 25 ns + 1 SCLK

Waveform Types: Standard, Arbitrary and Sequenced using the automatic sequence advance mode only

Run Modes: Continuous, Triggered, Gated and Counted Burst

LEADING EDGE OFFSET

Run Mode: Continuous run mode only

Offset Range: 200ns to 20s

Resolution: 20ns

GENERAL

Voltage Range: 85 to 265V

Frequency Range: 48 to 63Hz

Power Consumption: 60W

Display Type: Color LCD, back-lit

Size: 3.8" reflective

Resolution: 320 x 240 pixels.

Interfaces:

USB

Device 1 x rear, USB device, (B type)

Host 1 x rear, USB device, (A type)

LAN 100/10 BASE-T

GPIO IEEE 488.2 standard interface

Dimensions:

With Feet 212 x 102 x 415mm (WxHxD)

Without Feet 212 x 88 x 415mm (WxHxD)

Weight:

Without Package 3.5Kg

Shipping Weight 4Kg

Temperature:

Operating 0°C - 50°C

Storage -40°C to + 70°C.

Humidity:

11°C - 30°C 85%

31°C - 40°C 75%

41°C - 50°C 45%

Safety: EN61010-1, 2nd revision

Calibration: 1 year

Warranty ⁽¹⁾: 5 years standard

ORDERING INFORMATION

MODEL	DESCRIPTION
PM8571A	50MHz Single Channel Pulse Waveform Generator
PM8572A	50MHz Dual Channel Pulse Waveform Generator

OPTIONS

Option 1: 2M Memory (per channel)

Option 2: 4M Memory (per channel)

Option 3: 20Vp-p into 50Ω

Option 4: ±5VDC Protection.

10Vp-p into 50Ω

ACCESSORIES

Sync Cable:	Multi-instrument synchronization
S-Rack Mount:	19" Single Rack Mounting Kit
D-Rack Mount:	19" Dual Rack Mounting Kit
Case Kit:	Professional Carrying Bag

Note: Options and Accessories must be specified at the time of your purchase.

⁽¹⁾ Standard warranty in India is 1 year.