





- 50MHz Single / Dual Channel Pulse / Pattern generator
- 100MHz Function Generator for standard waveforms
- 300MS/s, 16Bit Arbitrary Waveform / Sequence Generator
- · 10ps pulse resolution with 4ns transition time
- 32Vpp into open circuit with programmable impedance
- · 16-Bit Digital Pattern Generator with programmable level
- · AM, FM, FSK, ASK, PSK, PWM and sweep
- · Powerful sequence generator links and loops segments

50MHz Single/Dual Channel Pulse Waveform Generators

in user-defined fashion. Stores up to 10 different sequence tables

- High resolution 3.8" User Friendly color LCD display
- · Ethernet, USB and GPIB interfaces
- Waveforms transfer and storage through USB/CD/DVD
- "Drop-in" Emulators for: Fluke 80/1, HP8116, HP8112, HP8160, HP8165, Tabor 8500, Tabor 8550/1

Model PM8571/2A is very high performance, dual channel pulse/pattern generator that stretch normal pulse generators' spec to the limit, becoming by far the most advanced pulse waveform generator available in the market. In addition to its high performance pulse features, the new PM8571/2A generate a complete array of standard, arbitrary and sequenced waveforms which are necessities in today's laboratories.

Versatile Pulse Controls

If your application requires more than just a fixed duty cycle or programmable pulse width, then you can modulate and control your leading edge with any standard or arbitrary waveform shape. Combine all of these features with external pulse width control and you have an extremely versatile pulse generation tool.

Extremely Accurate Resolution

Need to control pulse transitions and placement? Just program each channel to output pulses with linear or fast transitions and control edge placement with 10ps resolution.

High Speed Function Generator

Care to use the instrument as a function generator? No need to calculate complex waveforms because the PM8571/2A does the work for you. Select the standard waveforms tab and start generating any of ten waveforms that are pre-computed and available for immediate use. Included are: sine, triangle, square, pulse, ramp, sinc and others at frequencies up to 100MHz.

32Vp-p Into Open Circuit

While typical pulse/function generators come with 10Vp-p into 50Ω , model PM8571/2A provides an unmatched output of up to 20Vp-p into 50Ω (32Vp-p into open circuit). On top of that, the PM8571/2A output impedance can be programmed simply either from the front panel or through remote to fit the UUT requirement.

Trigger Jitter

Many applications require accurate triggering capabilities, with a trigger jitter of less than 100ps the PM series offers unprecedented triggering accuracy enabling users to implement various testing scenarios.

Store / Recall (Memory stick/CD/DVD)

The new PM series is equipped with a USB host enabling the loading and saving of setups and waveforms from various memory storage devices such as USB stick, CD ROM and DVD. This allows the user to instantly upload the waveforms and setup to the instrument without the need of a PC or Laptop.

Emulating Legacy Products

Model PM8571/2A implements command emulators to both new and discontinued Pulse and Function Generators sold in the market, providing smooth transition for all the aging automatic test systems that face obsolescence and maintenance problems. The unique feature will allow clients to easily "drop-in" the PM8571/2A in slots vacated by out-of-order Agilent, Fluke, HP, LeCroy, Tabor, Tektronix or Wavetek models, solving TPS programmers' replacement issues.

50MHz Single/Dual Channel Pulse Waveform Generators

Waveform Memory

Waveform memory is the internal scratchpad where the waveforms reside. Larger memory banks provide for longer waveforms. One can use the entire memory (up to 4M) for a single waveform or split the length to smaller segments. In this case, many waveforms can be stored in the same memory and replayed, one at a time, when recalled to the output. The memory segmentation feature may be combined with a sequence generator that can take different memory segments and link (and loop) them in any order as required for the test. The ability to loop waveform segments in a sequence can save a lot of memory and extend the capability of the generator to produce longer, more complex waveforms. The PM8571/2A has a sequence generator for each of its output channels that can be loaded with unique sequences.

Signal Integrity

As technology evolves and new devices are developed each day, faster and more complex signals are needed to simulate and stimulate these new devices. With its wide sample clock generator range (up to 300MS/s), 16-bit vertical resolution and wide output bandwidth (over 100MHz), one can create mathematical profiles, download the coordinates to the instrument and regenerate waveforms without compromising signal fidelity and design integrity.

16-Bit Digital Pattern Generator

16-bits are available as digital patterns from a rear-panel VHDC connector. The standard output level is LVDS which is efficient and sufficient for high speed digital data transmissions, however, programmable levels and impedances can be achieved by using a standard external accessory.

Inter-Channel Control (PM8572A Only)

In the PM8572A, both channels share a common sample clock, and both channels are triggered from the same source assuring tightly synchronized channel-to-channel timing. Precise control over channel-to-

channel phase offset is achieved by allowing control over channel start phase with a resolution down to as small as 1 waveform point. This enables extremely accurate timing or phase dependencies to be studied, such as those found in high speed digital communication systems.

Smart, Small and Cost Effective Solution

The PM8571/2A offers unmatched performance even compared to instruments designed to generate fewer types of signals. Its smart, compact, 2U 1/2 rack size box design will allow designers and manufacturers to conserve substantial bench space, while benefiting from high performance, high bandwidth, signal integrity, reliability and the flexibility to adapt to a full spectrum of applications, for many years to come, offering unprecedented integration levels, which make it the best in its category for size-price-performance.

Easy to use

A large and user-friendly 3.8" back-lit color LCD display facilitates browsing through menus, updating parameters and displaying detailed waveform information. Combined with a numeric keypad, cursor position control and a knob, the front panel controls simplify the operation of this universal waveform source.

Remote Control

Access speed is an increasingly important requirement for test systems. Ethernet, USB and GPIB interfaces are available so that the most suitable interface for the application may be selected. Remote control of instrument functions, parameters and waveform downloads is easily tailored to specific system environments regardless of whether control is via a laptop computer or full-featured ATE system. IVI drivers and factory support will speed up system integration and minimize test development time and costs.

Remote Calibration

Normal calibration cycles in the industry range from one to three years where instruments are sent to a service center, opened to allow access to trimmers, calibrated and certified for repeated usage. Leading-edge technology was employed on the PM8571/2A to allow calibration from any PM8571/2A remote interface such as USB, GPIB or LAN. Calibration factors are stored in a flash memory thus eliminating the need to open instrument covers.

Multi-Instrument Synchronization

Multiple PM8571/2A can be synchronized using a Master-Slave arrangement allowing users to benefit from the same high quality performance in their multi-channels needs.

Multiple Environments to Write Your Code

The PM8571/2A comes with a complete set of drivers, allowing you to write your application in various environments including: Labview, CVI, C++, VB and MATLab. You may also link the supplied dll to other Windows-based API's or use low-level SCPI commands to program the instrument, regardless if your application is written for Windows, Linux or Macintosh operating systems.

ArbConnection

ArbConnection is a powerful software package that allows you to easily design any type of waveform and control the instrument functions, modes and features via a graphical user interface (GUI). Whether you need to generate output using a built-in waveform, a hand sketched or played back waveform, a pulse pattern, a serial data string, a modulated carrier or even an equation, ArbConnection provides you the editing tools which makes virtually any application possible.



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 ±3% of programmed value RMS Jitter:

RMS Jitter:

Range:

Continuous < (10ppm+20ps) Gated, and Burst < (100ppm+20ps)

PULSE WIDTH, DOUBLE PULSE

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

FIXED DUTY CYCLE MODE

Output duty cycle remains Mode: constant regardless of pulse

width setting 1% to 99%

< (100ppm +15ps) RMS

 \pm (3% of setting + 500ps). Accuracy:

OUTPUT LEVELS

Mode: High/Low, Amplitude/Offset, Positive, Negative Amplitude: Standard 16mV to 16Vpp, into 50Ω ; 32mV to 32Vpp, into open Z Option 3 21mV to 20Vpp, into 50Ω; 42mV to 32Vpp, into open Z 16mV to 10Vpp, into Option 4 50Ω; 32mV to 20Vpp. into open Z High Level Standard -7.983V to +8V. into 500: -15.966V to +16V, into open Z Option 3 -9.979V to +10V, into 50Ω;

-15.958V to +16V, into open Z

-9.966V to +10V, into open Z

-4.983V to +5V, into 50Ω;

Low Level Range:

Standard -8V to +7.983V, into 50Ω; -16V to +15.966V, into open Z Option 3 -10V to +9.979V, into 50Ω; -16V to +15 958V into open 7 -5V to +4.983V, into 50Ω; -10V Option 4 to +9.966V, into open Z

Resolution:

PULSE PERFORMANCE

Transition Time:

Fast

16mV to 16Vpp <5ns (typically <4ns) 16Vpp to 20Vpp <6ns

Linear Selectable

Aberration:

In-range Span:

16mV to 10Vpp <5%, typ. 10Vpp to 20Vpp

Impedance: 500, programmable

LINEAR TRANSITION TIMES

Range: 5ns to 5ms, in 6 overlapping

20:1

Resolution: 4 digits Linearity: ±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

Rear panel TRIG IN connector Input:

STANDARD WAVEFORMS

Waveforms: Sine, Triangle, Square, Pulse,

Ramp, Sine(x)/x, Gaussian. Exponential, Repetitive Noise and DC

Frequency Range:

Sine 100μHz to 100MHz Square, Pulse 100µHz to 62.5MHz All others 100μHz to 31.25MHz

SINE

Start Phase: Phase Resolution: 0.019

Harmonics Distortion, 3Vp-p (typ.):

DC to 2 5MHz <-55dBc 2.5MHz to 25MHz <-50dBc 25MHz to 40MHz <-40dBc 40MHz to 50MHz <-35dBc 50MHz to 100MHz <-28dBc Non-Harmonic Distortion:

DC to 50MHz <-70dBc

50MHz to 100MHz <-65dBc

Total Harmonic Distortion:

DC to 100kHz 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 <5ns (typically <4ns) 16Vpp to 20Vpp <6ns

Aberration:

16mV to 10Vpp <5%, typ. 10Vpp to 20Vpp <8%

SINC (Sine(x)/x)

Time Constant:

"0 Crossings": 4-100

GAUSSIAN

EXPONENTIAL PULSE

Time Constant: -100 to 100

DC

Range: -8V to 8V, standard

10-200

-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

Option 4

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 preprogrammed sequence table

Stepped: Current segment is sampled

> continuously, external trigger advances to next programmed segment. Current segment is sampled

to the end of the segment including repeats and idles there. Next trigger advances

to next seament

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

Single:

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

Start/Shift Amp.: 16mVp-p to 16Vpp into 50Ω 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 50Ω 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:

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: ±(500ns + Carrier Period)

Table Size: 2 to 4096

PULSE WIDTH MODULATION

Carrier Waveform: Pulse Source: Channel 1 Width Range: 10ns to 500ms Resolution: 625ps 1% to 99% Deviation:

Standard Modulating

Waveforms: Sine, square, triangle, ramp

Period 500ns to 1s Resolution Pulse width period Accuracy Reference + 1 Pulse width

Arbitrary Modulating

Waveforms: Any shape

Period Pulse Width x Number of

Points

Size 5 to 512k Resolution Pulse width period

Same as Reference Accuracy

SWEEP

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

COMMON CHARACTERISTICS

FREQUENCY

Resolution:

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

ACCURACY REFERENCE CLOCK

0.0001% (1 ppm TCXO) initial Internal 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% ±2%, or 50Ω

±5% 0dBm (jumper)

AMPLITUDE

Range:

Standard 16mV to 16Vpp, into 50Ω; 32mV to 32Vpp, into open Z Option 3 21mV to 20Vpp, into 50Ω;

42mV to 32Vpp, into open Z Option 4

16mV to 10Vpp, into 50Ω; 32mV to 20Vpp, into open Z

Resolution: 4 digits



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:

 $\begin{array}{lll} Standard & 0 \ to \ \pm 7.992 V, \ into \ 50 \Omega \\ Option \ 3 & 0 \ to \ \pm 9.981 V, \ into \ 50 \Omega \\ Option \ 4 & 0 \ to \ \pm 4.992 V, \ into \ 50 \Omega \end{array}$

Resolution: 1mV

Accuracy: $\pm (1\%+1\% \text{ of Amplitude } +5\text{mV})$

FILTERS

Type:

Bessel 25MHz or 50MHz

Elliptic 60MHz or 120MHz

OUTPUTS

MAIN OUTPUT

Coupling: DC coupled
Connector: Front panel BNC
Impedance: 500 +1%

Protection:

Standard Short Circuit to Case Ground, 10s max

Option 4 ±5VDC, 50Ω

SYNC OUTPUT

Connector: Front panel BNC

Level:

Sync Type:

Pulse Ar

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 SMBLevel:400 mVp-pImpedance: 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 ±5V

Level: ±5V
Sensitivity: 100mV
Damage Level: ±12V
Min. Pulse Width: 10ns

EXTERNAL REFERENCE INPUT

Connector: Rear panel SMB

Frequency: 10MHz

Impedance & Level:

Default $10k\Omega \pm 5\%$, TTL, $50\% \pm 2\%$ Option $50\Omega \pm 5\%$, OdBm 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

Burst:

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

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 $\pm (3\% \text{ of setting} + 500 \text{ps})$

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

Source: Trigger Input

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

Sensitivity: 500mVpp Accuracy: 1ppm

Slope: Positive/Negative transitions

Gate Time: 100µSec to 1 Sec

Input Range: ±

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 $10^{12}-1$

Overflow Led indication

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

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

Continuous, Triggered, Gated Run Modes:

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 Interfaces:

USB

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

320 x 240 pixels,

LAN 100/10 BASE-T

GPIB 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 3.5Ka 4Kg

Shipping Weight

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

PM8572A 50MHz Dual Channel Pulse

Waveform Generator

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:

Note:

D-Rack Mount: Case Kit:

19" Dual Rack Mounting Kit Professional Carrying Bag

19" Single Rack Mounting Kit

Options and Accessories must be specified at the time

of your purchase.

⁽¹⁾ Standard warranty in India is 1 year.