CHANNELS CHARACTERISTICS	P9082M	P2582M | P2584M	P1282M | 1284M
NUMBER OF CHANNELS	2	2 | 4	2 | 4
INITIAL SKEW	<20ps		
FINE DELAY			
RANGE	0 to 5 ns		
RESOLUTION	5ps		
ACCURACY	±5ps		
COARSE DELAY			
RANGE	0 to wavelength		
RESOLUTION	1 sample point		

ARBITRARY MODE	P9082M	P2582M | P2584M	P1282M | 1284M
MAX. SAMPLE RATE	9GS/s	2.5GS/s	1.25GS/s
RESOLUTION	8-bit	16-bit	
MAX. MEMORY SIZE	Up to 16GS	Up to 8GS	
NUMBER OF SEGMENTS	64k		
MINIMUM SEGMENT LENGTH NORMAL FAST SEGMENT	2048 points 224 points	1024 points 64 points	
WAVEFORM GRANULARITY STANDARD OPTIONAL	64 points 32 points	32 points 16 points	32 points 16 points

TASK MODE	
TASK TABLE LENGTH	64K tasks per channel
TASK LOOPS	1M
SEQUENCE	A sequence is defined as a continuous and looped series of tasks
MAX. NUMBER OF SEQUENCES	32K sequences
SEQUENCE LOOPS	1M
SCENARIO	A scenario is defined as a continuous series of tasks/sequences
MAX. NUMBER OF SCENARIOS	1K scenarios

STREAMING (STM OPTION)	
MAX. STREAM RATE	6GS/s
MINIMUM PC REQUIREMENTS	
CPU	i7
MEMORY	32GB
OPERATING SYSTEM	WINDOWS 10
SOURCE	PXI Express Bus

SIGNAL PURITY	DC OUTPUT	DIRECT OUTPUT
HARMONIC DISTORTION (2)		
fout = 10 MHz - 200 MHz, Measured @ DC to 2 GHz	<-70 dBc (typ.)	<-70 dBc (typ.)
fout = 200 MHz ... 1.5 GHz, Measured @ DC to 4.5 GHz	<-60 dBc (typ.)	<-60 dBc (typ.)
fout = 1.5 GHz ... 4.5 GHz, Measured @ DC to 4.5 GHz	<-50 dBc (typ.)	<-50 dBc (typ.)
SFDR (3)		
fout = 10 MHz...500 MHz, Measured @ DC to 1.5 GHz	-80 dBc (typ)	<-85 dBc (typ)
fout = 500 MHz...4.5 GHz , Measured @ DC to 4.5 GHz	-70 dBc (typ)	<-75 dBc (typ)
PHASE NOISE (@10kHz offset)		
fout = 140.625MHz	-134 dBc/Hz	
fout = 280.25MHz	-128 dBc/Hz	
fout = 562.5MHz	-122 dBc/Hz	
fout = 1.125GHz	-116 dBc/Hz	
fout = 2.25GHz	-110 dBc/Hz	
fout = 4.5GHz	-104 dBc/Hz	

(1) Max input data rate is 2.5GS/s. Max. interpolating sample rate is 9GS/s
(2) SCLK=Max sample rate, amplitude = 400mVpp, Direct mode, measured using balun
(3) SCLK=Max sample rate, amplitude = 400mVpp, excluding SCLK/2-fout, measured using balun

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DC OUTPUT	
OUTPUT TYPE	Single-ended or differential, DC-coupled
IMPEDANCE	50Ω (nom)
AMPLITUDE	50 mVp-p to 1.3 Vp-p
AMPLITUDE RESOLUTION	1mV
DC AMPLITUDE ACCURACY	±(3% of amplitude ±2 mV)
VOLTAGE WINDOW	±1.15V
DC OFFSET	±0.5V
OFFSET RESOLUTION	10mV
DC OFFSET ACCURACY	±(3% of setting ±15 mV)
SKEW BETWEEN NORMAL AND COMPLEMENT OUTPUTS	0ps
RISE/FALL TIME (20% TO 80%)	< 130 ps (typ)
INSTANTANEOUS BANDWIDTH P128xM | P258xM | P9082M	 625MHz | 1.25GHz | 4.5GHz
MAX. USABLE FREQUENCY P128xM | P258xM | P9082M	2nd Nyquist 1.25GHz | 2.5GHz | 8GHz
JITTER (PEAK-PEAK)	<15 ps (typ)
OVERSHOOT	<5% (typ)
CONNECTOR TYPE	SMA

DIRECT OUTPUT (OPTIONAL)	
OUTPUT TYPE	Single-ended or differential, AC coupled
IMPEDANCE	50Ω (nom)
AMPLITUDE	1mVpp to 550mVpp
AMPLITUDE RESOLUTION	1mV
AMPLITUDE ACCURACY	±(3% of amplitude ±2 mV)
RISE/FALL TIME (20% TO 80%)	< 60 ps (typ)
INSTANTANEOUS BANDWIDTH P128xM | P258xM | P9082M	 625MHz | 1.25GHz | 4.5GHz
MAX. USABLE FREQUENCY P128xM | P258xM | P9082M	2nd Nyquist 1.25GHz | 2.5GHz | 8GHz
CONNECTOR TYPE	SMA

SAMPLE CLOCK OUTPUT	
SOURCE	Selectable, internal synthesizer or sample clock input
FREQUENCY RANGE	SCLK Range
OUTPUT AMPLITUDE	0.5V to 1V depending on SCLK
IMPEDANCE	50Ω (nom), AC coupled
CONNECTOR	SMA

SYNC CLOCK OUTPUT	
AMPLITUDE	500mVpp, typ.
FREQUENCY P9082M P128xM, P258xM	 SCLK/32 SCLK/8
WAVEFORM	Square
RISE/FALL TIME (20% TO 80%)	<150ps
IMPEDANCE	LVCMOS
CONNECTOR	SMP

MARKER OUTPUTS	
NUMBER OF MARKERS P1282M, P1284M P2582M,P2584M, P9082M	 4 (extra 8 Optional) 8 (extra 8 Optional)
OUTPUT TYPE	Single Ended
OUTPUT IMPEDANCE	50Ω (nom)
AMPLITUDE	
VOLTAGE WINDOW	±1.15V
LEVEL	32mVpp to 1.2Vpp (32 discrete levels)
RESOLUTION	10mVpp
ACCURACY	±7%
OFFSET	
RANGE	±0.5V
RESOLUTION	10mV
ACCURACY	±(3% of setting ±15 mV)
RISE/FALL TIME (20% TO 80%)	<200ps
RANGE	0 - waveform length
RESOLUTION P128xM, P258xM P9082M	 2 pts 8 pts
MARKER DELAY	
COARSE DELAY	
RANGE	0 to 2048 points
RESOLUTION P128xM, P258xM P9082M	 8 points 32 points
FINE DELAY	
RANGE	0 to 1.2ns
RESOLUTION	1ps
ACCURACY	15ps
CONNECTOR TYPE	SMP

REFERENCE CLOCK OUTPUT	
SOURCE	Internal TCXO
WAVEFORM	Square
FREQUENCY	100MHz or REF IN
STABILITY	+/- 2.5 PPM
AGING	+/- 1 PPM @ +25°C (per year)
CONNECTOR	SMP

REFERENCE CLOCK INPUT	
INPUT FREQUENCIES	10MHz / 100MHz selectable
LOCK RANGE	± 1MHz
INPUT LEVEL	0.6 Vp-p to 1.7 Vp-p
IMPEDANCE	50Ω, AC coupled (nom)
CONNECTOR TYPE	SMP

SAMPLE CLOCK INPUT	
FREQUENCY RANGE	SCLK Range
INPUT LEVEL RANGE	0.4Vpp to 1.2Vpp
DAMAGE LEVEL	<-0.5V or >1.5V
INPUT IMPEDANCE	50Ω nom, AC coupled
CONNECTOR TYPE	SMA

TRIGGER INPUTS	
RANGE	–5 V to +5 V
THRESHOLD	±5 V
RESOLUTION	100 mV
SENSITIVITY	200 mV
JITTER Standard P128xM, P258xM P9082M Low Trigger Jitter Opt.	 8 SCLK periods 32 SCLK periods SQRT(SCLK period^2 + 150e-12^2)
LATENCY / SYSTEM DELAY P128xD, P258xD P908xD	 <900SCLK periods <2700 SCLK Periods
POLARITY	Pos or Neg
SOURCE	Selectable between channels
INPUT IMPEDANCE	10 kΩ or 50Ω (nom), DC coupled, factory configured
MAX TOGGLE FREQUENCY	10MHz (50MHz Optional)
MINIMUM PULSE WIDTH	50ns (5ns Optional)
CONNECTOR TYPE	SMP

FAST SEGMENT DYNAMIC CONTROL INPUT (OPTIONAL)	
INPUT SIGNALS	Data 10bit, Channel select 2 bit, Valid 1 bit
SEGMENTS / SEQUENCES	1024 (128 fast)
DATA RATE	35MHz
MINIMUM LATENCY (Dynamic control input to direct out)	
FAST SEGMENT	<250ns
NORMAL SEGMENT	<1µs
INPUT LEVEL	LVTTL
CONNECTOR	MDR

DIGITIZER CHARACTERISTICS (AWT OPTION)	
NUMBER OF CHANNELS	1 or 2
INPUT VOLTAGE RANGE	500 mVpp (full scale)
INPUT VOLTAGE OFFSET	-2V to +2V
INPUT FREQUENCY RANGE	9GHz
RESOLUTION	12 bits
ACQUISITION MEMORY	up to 8GS
SAMPLE CLOCK SOURCES	Internal or external
INTERNAL CLOCK SOURCE	Internal, external reference
MAX SAMPLING RATE	5.4GS/s in Single channel mode 2.7Gs/s in Dual channel mode
MIN SAMPLING RATE	1GS/s
CLOCK ACCURACY	<2 ppm
IMPEDANCE	50Ω
COUPLING	DC or AC (factory configured)
CONNECTOR	SMA
TRIGGER SYSTEM	
TRIGGER MODES	Positive, negative edge
TRIGGER SOURCES	External, Software, Channel
COUPLING	DC
IMPEDANCE	50Ω (nominal)
LEVEL RANGE	>± 2.5 V (nominal)
FREQUENCY RANGE	DC to 65MHz
CONNECTOR	SMA

FPGA PROGRAMMING	
FPGA TYPE	Xilinx Kintex UltraScale XCKU060 upgradeable to XCKU115
MODES	
STANDARD	Tabor standard built-In functionality
DECISION BLOCKS	Built-in library of mathematical functions, modulation & digital Filters
SHELL	Open core providing all interfaces and configuration path to the user

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DIGITAL UPCONVERTER	
MODES P258X ALL OTHERS MODELS	NCO / Interpolation / IQModulation NCO only
SAMPLING RATE	1GS/s to Max sample rate
CARRIER FREQUENCY	
RANGE	0 to 40% of Sampling rate
RESOLUTION	48 bit
PHASE RANGE	0 to 360°
PHASE RESOLUTION	16 bit
INTERPOLATION FACTORS	x2, x4, x8
IQ FORMAT IQ PAIR PER CHANNEL MAX INPUT RATE NUMBER OF CHANNELS	x2 Mode 1 1,250MS/s 2
SFDR AND HARMONICS	Same as Arbitrary
MEMORY	Same as Arbitrary

GENERAL	
Interface:	PXIe Gen3 x8 Lanes
Power Consumption:	50W max per slot
Current Consumption:	+3.3V 4A max. +12V 4A max.
Dimensions:	Base – 8HP PXIe (2 Slots) AWT/MRK Opt. add 4HP ea.
Weight: Without Package Shipping Weight Approx.	 Approx. 1 kg 1.5 kg
Temperature: Operating Storage	 0°C to +40°C -40°C to +70°C
Warm up time:	15 minutes
Humidity:	85% RH, non-condensing
Safety:	CE Marked, EC61010-1:2010
EMC:	IEC 61326-1:2013
Calibration:	2 years
Warranty*:	3 year standard * 1 year standard in India

ORDERING INFORMATION	
MODEL	**DESCRIPTION**
P1282M	1.25GS/s, AWG, 1GS Memory, 2CH, 4 Markers
P1284M	1.25GS/s, AWG, 1GS Memory, 4CH, 4 Markers
P2582M	2.5GS/s, AWG, 2GS Memory 2CH, 8 Markers
P2584M	2.5GS/s, AWG, 2GS Memory, 4CH, 8 Markers
P9082M	9GS/s, AWG, 4GS Memory 2CH, 8 Markers
OPTIONS	
4M1	4GS Memory option for models P1282M & P2582M
4M2	4GS Memory option for models P1284M & P2584M
8M1	8GS Memory option for models P1282M & P2582M
8M2	8GS Memory option for models P1284M, P2584M & P9082M
16M1	16GS Memory option for models P9082M
DO1	9GHz BW Direct Output option for models P1282M & P2582M
DO2	9GHz BW Direct Output option for models P1284M, P2584M & P9082M
DJ1	Dynamic Jump Input option for models P1282M & P2582M
DJ2	Dynamic Jump Input option for P1284M, P2584M & P9082M
MRK1	x8 Extra Markers option for models P1282M and P2582M
MRK2	x8 Extra Markers option for models P1284M, P2584M and P9082M
LTJ1	Ultra Low Trigger Jitter (200ps typ.) option for models P1282M & P2582M
LTJ2	Ultra Low Trigger Jitter (200ps typ.) option for models P1284M, P2584M & P9082M
G1	Low Waveform Granularity option for models P1282M & P2582M
G2	Low Waveform Granularity option for P1284M, P2584M & P9082M
DUC	Digital UpConverter for models P2582M &P2584M
TRG	Faster trigger input (50MHz instead of 10MHz)
AWT	5.4GS/s Single, 2.7GS/s Dual Channel 12 Bit Digitizer option for models P1284M, P2584M & P9082M
STM	6GS/s Streaming option
PROG	High level FPGA programming capability through desicion blocks of built-in Demodulation & digital Filters
Shell	Open core integration to allow simple FPGA control & programming