

Configuration Rexotech ASine 216		
Output Channels:	2	
Trigger Inputs:	1	
Sync Outputs:	1	
AM Modulation Inputs:	1	
Digital Input/Output Section	1	
Ultra Low Noise/Distortion 1 kHz Sine Output	1	
USB Remote Mode	Yes	
Standard Waveforms		
SINE	CH1	CH2
Frequency Range:	1 Hz to 25 MHz	1 Hz to 160 MHz
Start Phase Range(Int/Ext TRG):	0-360°	-
Resolution:	1°	-
Total Harmonics Distortion (THD)(Typ)(HI-Z)		
DC to 20kHz:	≤ 0,09%	≤ 0,04%
-20dB Option CH1:	≤ 0,1%	
Harmonics Distortion Typical (0dBm / into 50R)(Typ):		
DC to 20kHz:	≤ - 55 dBc	≤ - 60 dBc
20 kHz to 1 MHz	≤ - 55 dBc	≤ - 50 dBc
1 MHz to 20 MHz:	≤ - 35 dBc	≤ - 50 dBc
10 MHz (+/-) 3 dBc:	≤ - 41 dBc	≤ - 50 dBc
>20 MHz to 30 MHz:	≤ - 34 dBc	≤ - 38 dBc
>30 MHz to 100 MHz:	-	≤ - 36 dBc
>100 MHz to 130 MHz:	-	≤ - 26 dBc
>130 MHz to 160 MHz:	-	≤ - 16 dBc
Phase Noise(Typ):		
10kHz deviation : 10 MHz	<-105dBc/Hz	<-105dBc/Hz
Crosstalk from Channel to Channel:		
Crosstalk Output Relais set to off state (20Vpp/500 kHz):	≤ - 57 dBc	
Crosstalk Output Relais set to off state (20Vpp/500 kHz):	≤ 60 dBc	
Triangle		
Frequency Range:	1 Hz to 2 MHz	
Start Phase Range:	0-360°	
Resolution:	1°	
Default Outputmode:	Asymmetrical	
Square		
Frequency Range:	1 Hz to 30 MHz	1 Hz to 30 MHz
Duty Cycle Range(Typ):		
1Hz to 1 MHz	10% to 90%	(Typ) Fixed to 50 % ± 2%
Resolution(Typ):	1% ± 0,8%	-
1MHz to 20MHz:	20% to 70%	-
Resolution(Typ):	5% ± 0,7%	-
Rise/Fall Time(10-90%,90-10%)(Typ):	≤ 6ns	≤ 5ns
Overshot,into 50Ω typical (Typ.):	≤ 3%	≤ 3%
Jitter(Typ. 1 kHz, 1Vp):	5ns + 0.1% Periode	5ns + 0.07% Periode
Low Jitter Mode for Freq ≤ 1MHz (Fix.50%Duty) CH1 (Typ) 1 kHz, 1Vp:	5ns + 8 ppm Periode	
Pulse Jitter((Typ) 1 kHz, 1Vp):	5ns + 8 ppm of Periode	
Default Outputmode:	Asymmetrical	Asymmetrical
CH2 DirectSquare Mode		
Frequency Range:		1Hz to 170 MHz
Rise/Fall Time(10-90%,90-10%)(Typ):		≤ 4ns
Overshot 50Ω Load,typical :		≤ 3%
Jitter(Typ):		5ns + 0.07% Periode
Duty:		Fixed 50% ± 1%
Default Outputmode:		Asymmetrical

Analog Noise		
RF Noise		
Bandwidth:	>10 MHz	
Range(Typ) :	100mVp-p to 10Vp-p into 50Ω	
Pink Noise		
Bandwidth:	<22 kHz	
Range(Typ) :	100mVp-p to 10Vp-p into 50Ω	
Default Outputmode:	Asymmetrical	
^{1,2} Accuracy (1kHz,0V DC, >100mVpp Hi-Z):	(Typ) ±(2% of setting ± 8mVrms)	
Pulse		
Frequency Range:	0 to 8 MHz	
Resolution:	4 digits format: 00.00 in ns: 000 16 Bit down to 2 Bit	
Minimum Pulse Width:	63ns restriction: steps of 63ns in range ns	
Minimum Pulse Period:	125ns restriction: steps of 125ns in range ns	
Maximum Pulse Period:	8 Sec	
Duty:	1-99%	
Units:	ns,ms,S,%	
PWM Modulation		
Range:		
From 10% to 90%		
Additional Up then Down Mode (Linear Sweep): 10-90% -> 90-10%	Yes	
Duration(Seconds): (From 10% to 90%)	max 320 Sec.	
Duration Units:	ms,us,S	
Minimum Duration Time:	5 * Periode setting	
Step(Typ) :	1 - 20 %	
Units:	us,ms,S	
COMMON CHARACTERISTICS		
Frequency	CH1	CH2
Resolution:	9 digits, format: 000.000000	9 digits, format: 000.000000
Accuracy/Stability	Same as reference	Same as reference
Units:	mHz(kHz Range),Hz,kHz,MHz (limited by 279mHz)	mHz(kHz Range),Hz,kHz,MHz (limited by 93mHz)
Clock reference:	20 MHz 0.5ppm VCXO 100 MSPS	20 MHz 0.5ppm VCXO 400 MSPS
Amplitude		
Sine:		
Range(Typ) :		
	20Vp-p max. into open circuit	20Vp-p into open circuit
≤ 30MHz	100mVp-p to 10Vp-p into 50Ω (20Vpp Hi-Z)	100mV to 10Vp-p into 50Ω (20Vpp Hi-Z)
≤ 35MHz		100mV to 10Vp-p into 50Ω (20Vpp Hi-Z)
36 MHz to 55 MHz		max 5 Vp-p into 50Ω (10 Vpp Hi-Z)
56 MHz to 100 MHz		max 2 Vp-p into 50Ω (4 Vpp Hi-Z)
100 MHz to 160 MHz		max 1 Vp-p into 50Ω (2 Vpp Hi-Z)
Square / Pulse		
Range(Typ) Direct Mode:		Fixed: 3.3 Vpp 50% Dty into Hi-Z
Range(Typ):		
≤ 30MHz	100mVp-p to 5Vp-p into 50Ω	100 mVpp to 5Vpp into 50Ω
DirectSquare Mode ≤ 170MHz	-	Fixed: 3.3 Vp 50% Duty into Hi-Z
Triangle		
Range(Typ):		
≤ 2MHz	100mVp-p to 5Vp-p into 50Ω	
Flatness(Typ)(relative to 100kHz, Sine wave, 50R,0dBm/-20dB)		
≤ 10 MHz	± 0,2 dB	± 0,3 dB
10 MHz to 20 MHz	± 0,2 dB	± 0,3 dB
20 MHz to 70 MHz	± 0,2 dB	± 0,8 dB
70 MHz to 160 MHz	-	± 0,9 dB
-20dB Option CH1 (No 600R Output Option)		
Range(Typ):		
Sine:	20mVp-p to 400mVp-p into 50Ω	
Triangle,Square,Noise,Pulse:	20mVp-p to 250mVp-p into 50Ω	
^{1,2} Accuracy (1kHz,0V DC, >100mVpp Hi-Z):	(Typ) ±(1% of setting ± 4mVrms)	(Typ) ±(1% of setting +4mVrms)
Units:	mVpp,Vp-p, mVp,Vp	mVp-p,Vpp, mVp,Vp
Resolution(Typ):	1mV	1mV
Attenuation:	0dB and -20dB ±1,5% switchable Relais	

OFFSET		
Sine/Triangle/Noise:		
Range:	0 to ±10V into open circuit (Typ)	0 to ±10V into open circuit (Typ)
AC Peak + DC	0 to ±5V into 50Ω (Typ)	0 to ±5V into 50Ω (Typ)
Square		
Range:	0 to ±8V into open circuit (Typ)	0 to ±10V into open circuit (Typ)
Vp Peak + DC	0 to ±4V into 50Ω (Typ)	
-20dB Option	0 to ±6V into open circuit (Typ)	
	0 to ±3V into 50Ω (Typ)	
Square Direct Mode CH2		
Units:	mV,V	mV,V
Resolution:	5 digits	5 digits
Accuracy:	±(1% of setting + 0.8% of Amplitude ± 5mV) (Typ)	±(1% of setting + 0.7% of Amplitude ± 5mV) (Typ)
1. Add 1/9th of the output amplitude and Offset accuracy per °C for operation at temperatures beyond 22°C ±2 °C		
Main Output	CH1	CH2
Connector:	Front panel BNC	Front panel BNC
Impedance:	50Ω±2% or 600Ω±2% selectable (Typ)	50Ω±2% (Typ)
Protection:	Short circuit protection, Over Current and Voltage protection, Disables automatically main output relays when overload or harmful combinations detected. Power-On Self Test.	Except Direct Square mode. Short circuit protection, Over Current and Voltage protection, Disables automatically main output relays when overload or harmful combinations detected. Power-On Self Test.
Standby:	Output On/Off (Output Relays disconnected)	Output On/Off (Output Relays disconnected)
Option: Quick Off	Disables all BNC Output relays upon encoder press Not available in LA mode	
Trig / Sync Output		
Connector:	Back panel BNC	
Level:	3V3 (Typ)	
Option:	Square Output	
Impedance:	50Ω±1% (Typ)	
Trigger / Burst Input		
Connector:	Rear panel BNC	
Impedance:	10kΩ±1% (Typ)	
Slope:	Positive	
Level:	3.3V, 5V (Typ)	
Pulse Width:	>10ns minimum	
Option:	External Gated Burst Input mode for Sine, Triangle, Square on CH1 (CH1 only)	
AM Modulation IN		
Connector:	Rear panel BNC	
Impedance:	47kΩ±1% (Typ)	
Level:	±0,3Vpk maximal	
Option:		
MODULATION CH1		
COMMON CHARACTERISTICS		
Trigger:	Internal, External	
FSK		
Carrier Waveform:	Sine Wave	
Carrier Frequency:	1Hz to 25 MHz	
Internal Baudrate Generator Support:	YES	
PSK		
Carrier Waveform:	Sine Wave	
Carrier Frequency:	1Hz to 25 MHz	
Carrier Phase:	0 to 360°	
Internal Baudrate Generator Support:	YES	
ASK(OOK)		
Carrier Waveform:	Sine Wave	
Carrier Frequency Center:	1Hz to 25 MHz	
Carrier Frequency Hop:	1Hz to 25 MHz	
Internal Baudrate Generator Support:	YES	

AM		
Carrier Waveform:	Sine Wave	
Carrier Frequency Center:	1Hz to 5 MHz	
Internal Baudrate Generator Support		
Baud Rate Range:	1200bits/sec to 56000kbits/Sec	
Data Bits:	8	
Start Bits:	1	
Stop Bits:	1,2	
Parity:	Odd, Even,None	
Operation:	Asynchronous, Synchronous Mode 0 &1	
Units	kpbs	
Option:	Can only be used together with the U-Data function Serial Data (TX) available on Sync Out	
U-Datas (User Programmable Data Bytes):		
Bytes:	6 maximal	
Delay per Byte:	999ms max.	
Trigger:	Internal, External	
Sweep		
	CH1	CH2
Common Characteristics		
Carrier Waveform:	Sine, Square, Triangle	Sine, Square,
Sweep Form:	Linear or Log(exp)	Linear or Log(exp)
Sweep Time:	10ms to 99.99 Hz(Octave)seconds	10ms to 99.99 Hz(Octave)seconds
Sweep Time F>120 MHz:	-	1000ms to 99.99 Hz(Octave)seconds
Marker Functions		
Center of Sweep:	Yes	Yes
Sync Impuls on Start:	Yes	Yes
Marker on Frequency:	Yes	Yes
Normal Sweep Mode:		
Options:	UP/Down,Down/UP, UP then Down	UP/Down,Down/UP,UP then Down
Holdtime switchable: Start and Stop(Typ)	500ms	500ms
Sweep Range:	1Hz to 25 MHz	1Hz to 160 MHz Sine, 1Hz to 30 MHz Square
Advanced Sweep Mode (Frequency Burst Generator):		
Sweep Range:	1Hz to <1MHz	
Stepfrequency:	1Hz to <1MHz	
Retrys of actual Freq:	maximal 999	
Frequency ON Time for Burst:	1ms to 9999ms	
Frequency OFF Time for Burst:	1ms to 9999ms	
Units:	kHz,MHz	
Tonegenerator:		
Frequencys:	Up to 4 different frequencys	
Units:	kHz	
TRIGGER CHARACTERISTICS		
RUN MODES		
Continous:	Free-Run output of a waveform	
Triggered:	Upon Trigger,outputs waveform	
Gated:	External signal transition enables or disables generator output.	
TRIGGER SOURCE		
EXTERNAL		
Trigger Level:	+3V3, TTL compatible	
Input Frequency:	DC to 2 MHz	
Min. Pulse Width:	>10ns	
Slope:	positive	
Trigger Jitter:	±5 Sample Clock Period	
System Delay:	>5ms	
Speaker System		
Support:	CH1 & CH2 All Modes except: Triangle CH1 / DirectSquare	
Volume:	Analog POT on Frontside	

Digital I/O POD CHARACTERISTICS		
COMMON CHARACTERISTICS		
Amplitude (POD programmable outputvoltage):		
Range:	1,25V to 5V DC 300mA maximal (Typ)	
Accuracy:	±(2% of setting ± 5mV No Load) (Typ)	
Option:	Systemvoltage for internal / external I/O	
	External Power Supply	
Sampleclock :	40 MHz 20ppm (Typ)	
Resolution:	8 Bits	
Patterngenerator (POD set to Outputstate):		
Source:	Internal Trigger Button	
Steps:	16 with 8 Bits each + 1 Hi-Z Step	
Logic State Monitor(Realtime 1S/Sec Monitor):		
Source:	Internal	
Samplerate	1S/sec (Typ)	
Inputchannels:	8	
Logic Analyzer:		
Supported Samplerates:		
50kS/s,125kS/s,250kS/s,500kS/s,1MS/s		
2MS/s,5MS/s,10MS/s,20MS/s,40MS/s,1S/s,EXT		
Option:	External Sample Clock In: 100kΩ±1% (Typ) 3,3V to 5V DC (Typ)	
	Logic Port Input Resistance 100Ω±1%	
Sample RAM Size:	128k * 8	
TRIGGER SOURCE		
Trigger Level(Typ):	1,25V to 5V DC same as I/O System voltage	
Min. Pulse Width(Typ):	>8ns	
Conditions:	High,Low,Ignore, On D0 : also Rise or Fall	
Masking:	8 Bit Triggermask	
Option:	External Trigger In Option 10kΩ±1%(Typ), LOW Active ,3,3V to 5V DC (Typ)	
Interpreter		
COMMON CHARACTERISTICS		
Logic Level:	Positive Logic 1,25V to 5V DC same as I/O voltage	
Decoding:		
Decoded byte lenght:	35 maximal	
SPI:		
Decoding Support:	8 Bit and 16 Bit MOSI only	
Display:	Hex or ASCII	
Datalines:	SS,MOSI,MISO,SCK	
Modes:	0,0 , 0,1 , 1,0 , 1,1	
I2C:		
Display:		
Start	S	
Write	W	
Read	R	
ACK	A	
NACK	N	
Start Repeat	Sr	
Data	D	
Stop	P	
Error	Er	
Datalines:	SD,SDA	
RS232:		
Decoding Support:	8 Bit LSB Fist	
Display:	Hex or ASCII	
Samplerate:	Fixed , 16 x programmed Baudrate	
Supported Baudrates:	1200,2400,4800,9600,14400,19200,38400,56000,57600,115200,230400,2500000	
Datalines:	TX,RX,CTS,RTS	
Decoding:	TX decode only	

Ultra Low Noise / Distortion 1 kHz Sine Generator		
Connector:	RCA / Chinch on backside	
Amplitude:		
Range(Typ):	1Vpp to 7Vpp into Hi-Z	
Adjustment:	Analog POT on backside	
Frequency:	1 kHz Sine +-1,5% (typ)	
Output:	Symmetrical	
Impedance	600Ω +-1% (typ)	
External Symmetric Supply Voltage:		
Range(typ):	37Vdc to 50Vdc , 30mA: Use 9V batteries for best performance	
Total Harmonic Distortion: 5 Min Warmup (Typ)	<= 0.001%	
Second Harmonic Distortion(Typ)	< -110dB	
Third Harmonic Distortion(Typ)	< -120dB	
GENERAL		
Power Supply:	100Vac to 240Vac 50/60 Hz	
Power Consumption:	< 40W max	
Front Panel Display:	LCD 320 x 240 pixels	
Fan:	No	
Operating temperature:	10°C - 40°C	
Humidity:		
(non-condensing)	10°C - 30°C - 85%	
	31°C - 40°C - 75%	
	41°C - 50°C - 40%	
Storage temperature:	-10°C to 70°C	
Interface	USB 1.0/ 2.0 Mini B	
Internal Protection Circuitry	Yes	
USB functions:	Firmware Update, Remote Mode	
Dimensions:(WxHxD)(mm)	200x225x85	
Weight:	approximately 2 kg	
EMC/EMV:	EN61010 see manual for more tested details. CE marked	
Supplied Accessories:	Power Cord,10 pol Dupont Female/Female Rainbow Cable	
Recommended Calibration Intervall	1 year or by User:	
Warranty:	2 years standard (european). 3 years if seals are unbroken	

Attention:

All these specifications apply to the Asine 216. To satisfy these, the following conditions must be met:

1. The instrument has been operating continuously for more than 45 minutes within specified operating temperature range (20°C - 24°C)
2. The temperature variation does not exceed 2°C
3. Unless otherwise stated, all specifications apply in Hi-Z state, 230Vac

Note: All specifications are guaranteed unless where noted with "typical" or (Typ).

Typical (Typ): The characteristic performance, which 80% or more of manufactured instruments will meet. This data is not warranted, does not include measurement uncertainty, and is valid only at room temperature (approx. 22°C)