DR-VE-10-MO
Preliminary specification

The DR-VE-10-MO is a non-inverting VErsatile RF amplifier module designed for analog, pulse and digital applications up to 12 GHz.

The following table is a summary of both specifications and measurements. All specifications given at 25°C.

Parameter	Symbol	Unit	Min	Typ	Max	Conditions
Impedance	Z_0	Ohm	-	50		-
Low Frequency 3dB Point	f_{LOW}	kHz	-	16	25	-
High Frequency 3dB Point	f_{HIGH}	GHz	11	12	-	-
Small Signal Gain	S_{21}	dB	28	30	-	-
Gain ripple	-	dB	-	-	± 1.5	f < 12 GHz
Input Return Loss	S_{11}	dB	-	-	-10	f < 20 GHz
Output Return Loss	S_{22}	dB	-	-	-10	f < 19 GHz
Isolation	S_{12}	dB	-	-	-60	f < 20 GHz
ANALOG MODE						
Output Power 1 dB Compression	P_{1dB}	dBm	-	21 19	-	0 - 10 GHz 10 - 16 GHz
Saturated Output Power	P_{sat}	dBm	-	-	23	F < 10 GHz, V_{in} ~ 0.6 V_{pp},
Input power	P_{in}	dBm	-	-	0	-
Noise Figure	NF	dB	2	-	4	2 - 10 GHz
Delay Time	t_d		-	450	-	-
PULSE MODE						
Pulse Width	PW	s	70 p	-	300 n	-
Pulse Repetition Frequency	PRF	Hz	10	-	1 G	Depending on duty cycle
Input Pulse Amplitude	V_{in}	V_{pp}	-	0.18	0.35	Square pulse
			-	-	0.12	Pulse shaping
Rise / Fall Time	t_r/t_f	ps	-	24/24	28/28	20%...80%
Output Pulse Amplitude (user adjustable)	V_{out}	V_{pp}	-	-	8	V_{in} ~ 0.2 V_{pp}
DIGITAL MODE						
Data Rate	-	Gb/s	0.1	-	14	-

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Input Eye Amplitude	V_{in}	V_{pp}	-	0.2	1	-
Output Eye Amplitude (user adjustable)	V_{out}	V_{pp}	2.5	6	8	V_{in} ~ 0.2 V_{pp}
Saturated Output Eye Amplitude	$Vout_{SAT}$	V_{pp}	-	-	8.5	V_{in} ~ 0.25 V_{pp}
Eye Cross point (user adjustable)	Xp	%	45	50	55	-
Output Jitter, RMS value	J_{RMS}	ps	-	0.9	0.95	calculated value; see note below
Rise Time / Fall Time	t_r/t_f	ps	-	20/20	22/22	20%...80%
Q Factor	Q	-	25	30	-	V_{out} ~ 6 V_{pp}
POWER SUPPLY						
Driver Supply Voltage	V_{bias}	V	-	+12	+12	-
Driver Supply Current	I_{bias}	mA	-	-	450	-
OTHERS						
Input Connector	SMA Female					
Output Connector	SMA Male					
Dimensions	-	mm	40 x 54 x 12.7			Excluding connectors
Storage Temperature	T_{st}	° C	-20	-	70	-
Operating Temperature	T_{op}	° C	0	25	40	-
Power Dissipation	P_{diss}	W	-	3.6	5.4	-

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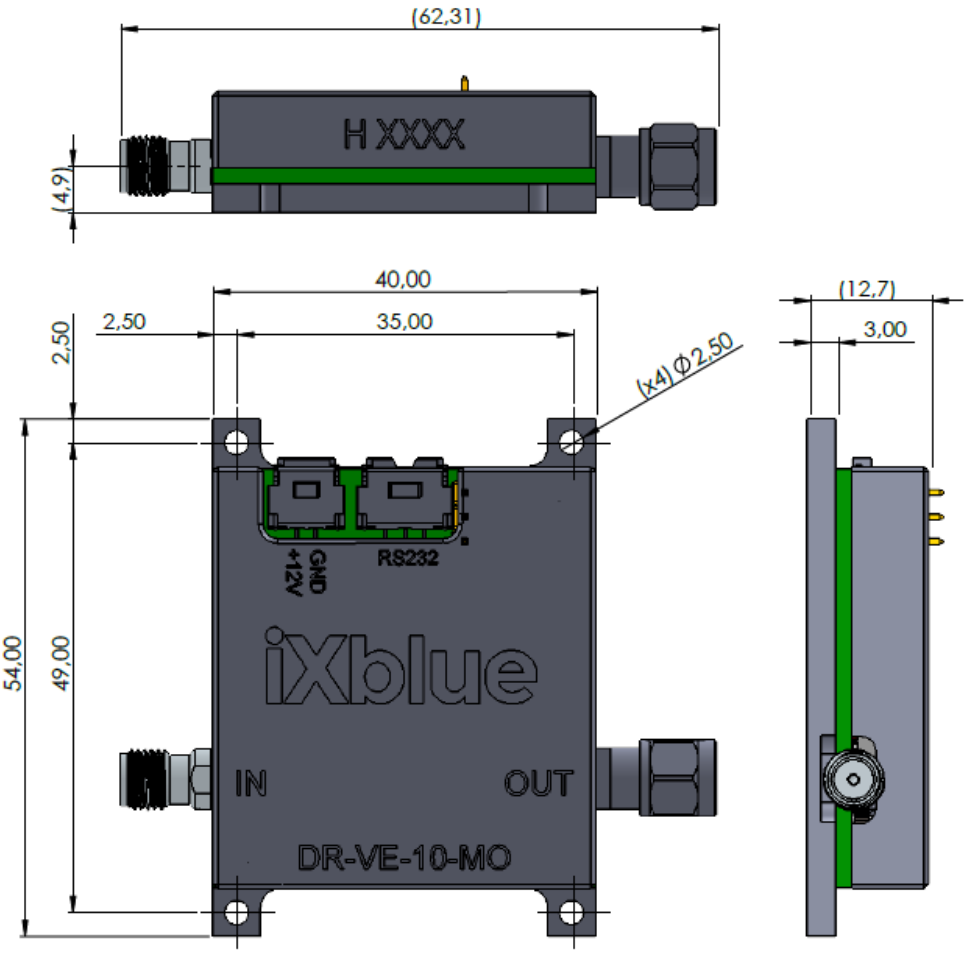
Mechanical Diagram and Pinout

All measurements in mm



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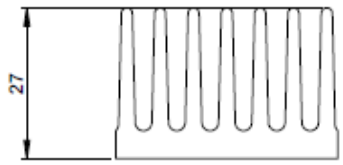
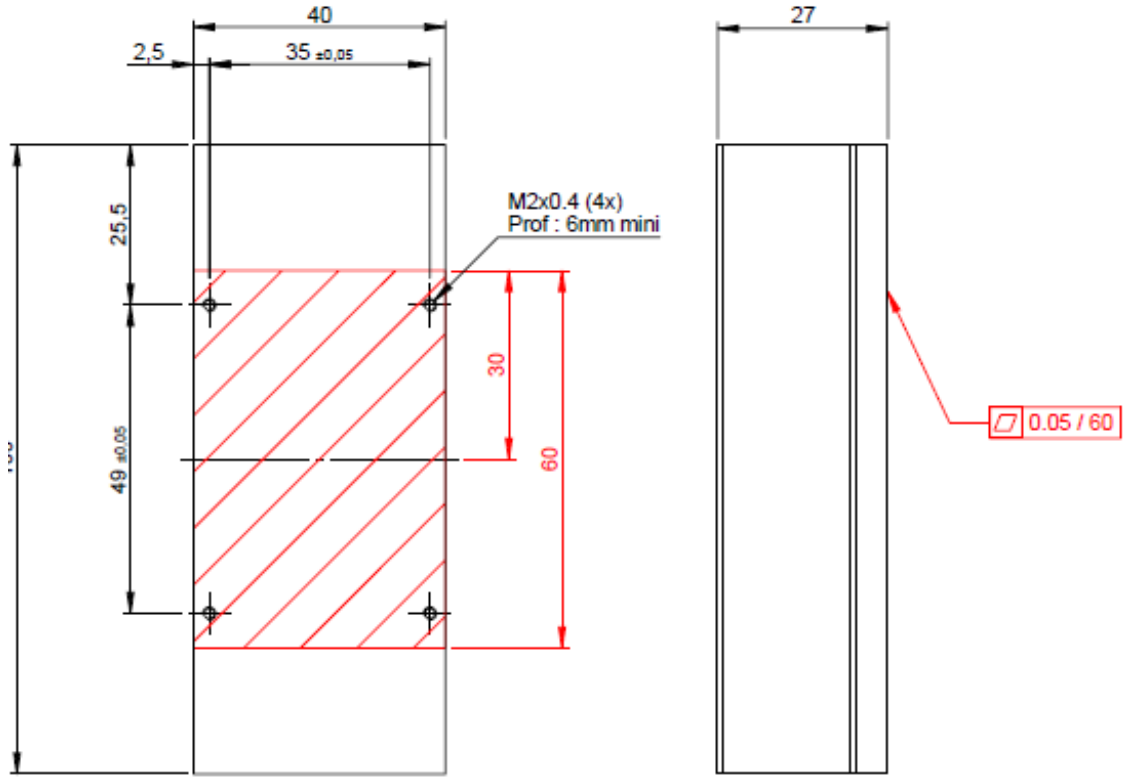
Mechanical Diagram and Pinout with HS-MO5

All measurements in mm





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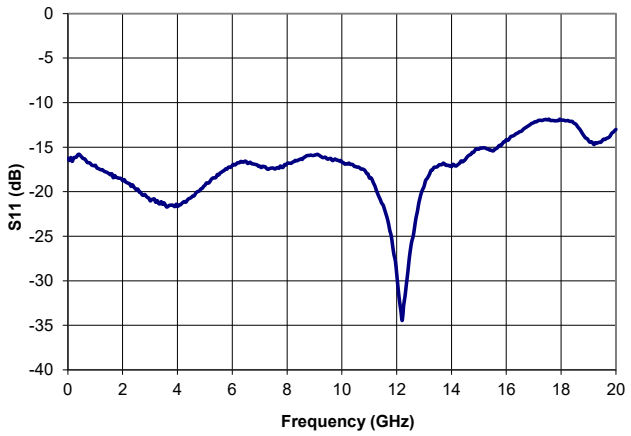
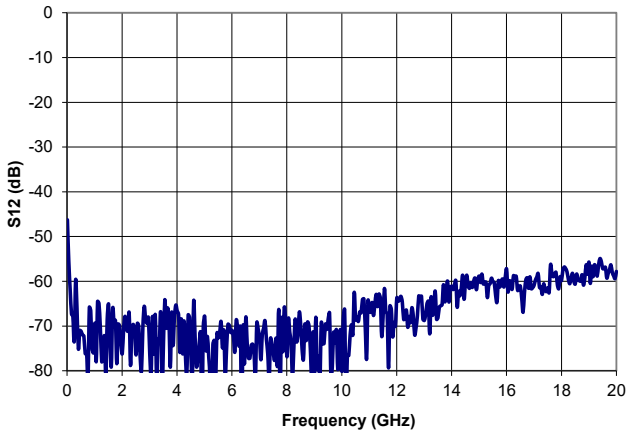
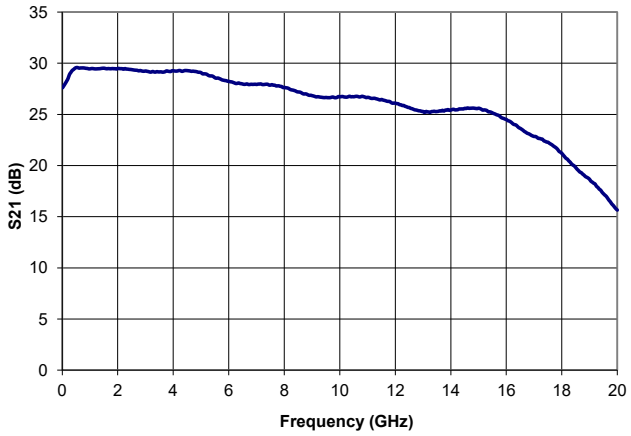
Typical Output Response:

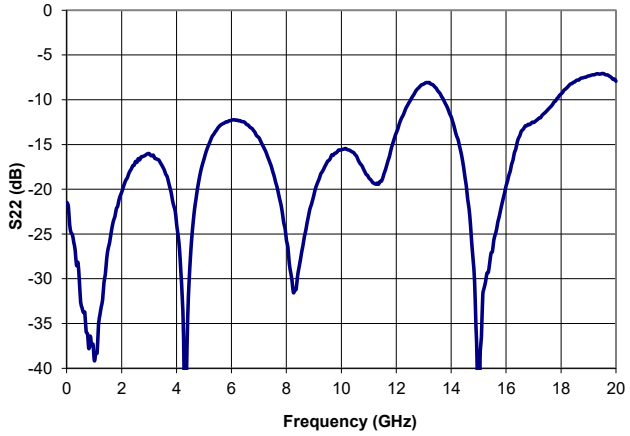
S-parameters and P_{1dB} measurement:

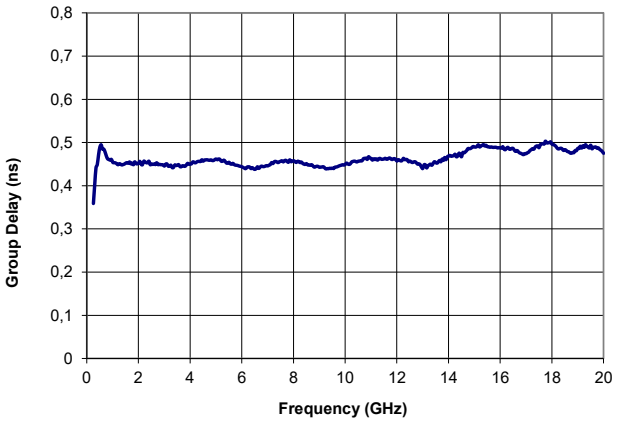
Test conditions: Output Amplitude = 70, Gain = 40, Crosspoint = 60, 12 V, 300 mA

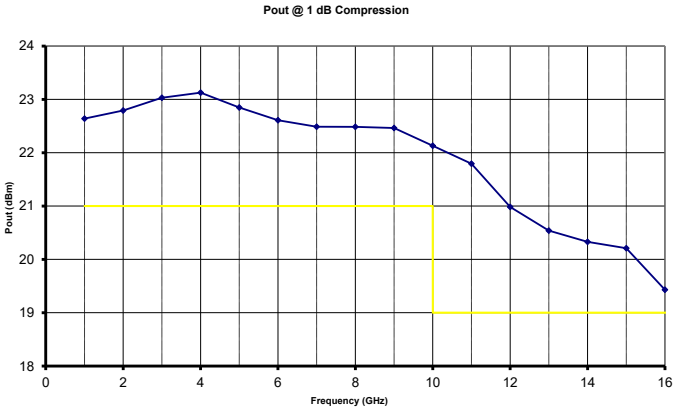












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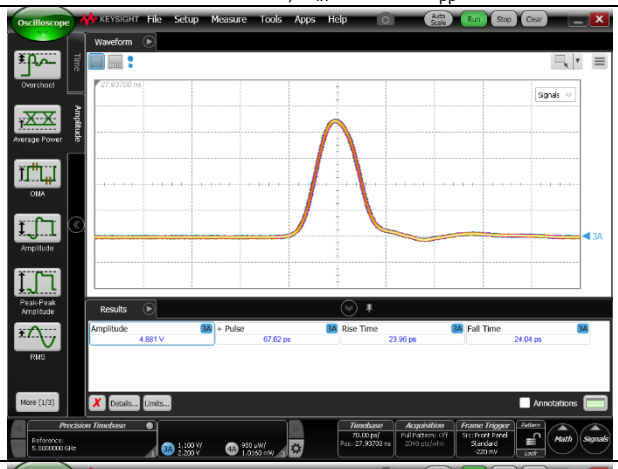
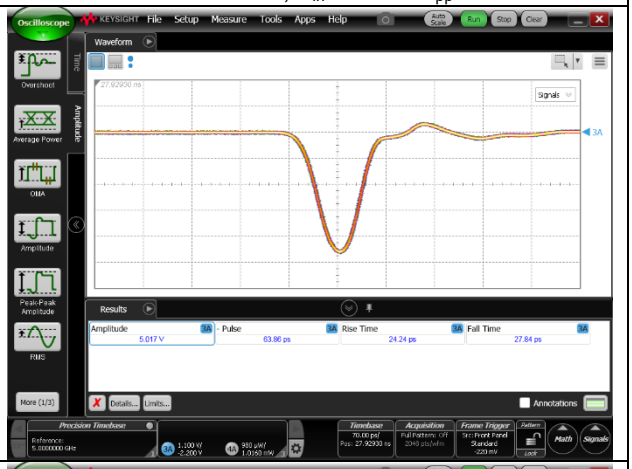
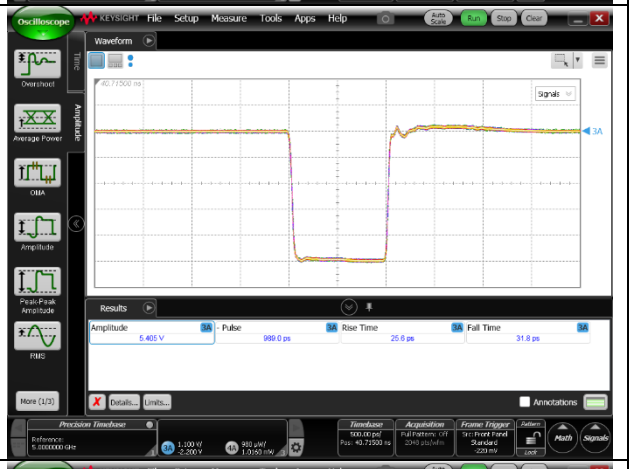
Pulse measurement (Pulse mode, square pulse, 0.18 V_{pp} < V_{IN} < 0.35 V_{pp})**:**

Test conditions: Depends on Pulse sign (⎍ or ⎍)

	Pulse ⎍, V_{in} = 180 mV_{pp}	Pulse ⎍, V_{in} = 180 mV_{pp}
Output pulse 70 ps		
Output pulse 1 ns		
Output pulse 5 ns		

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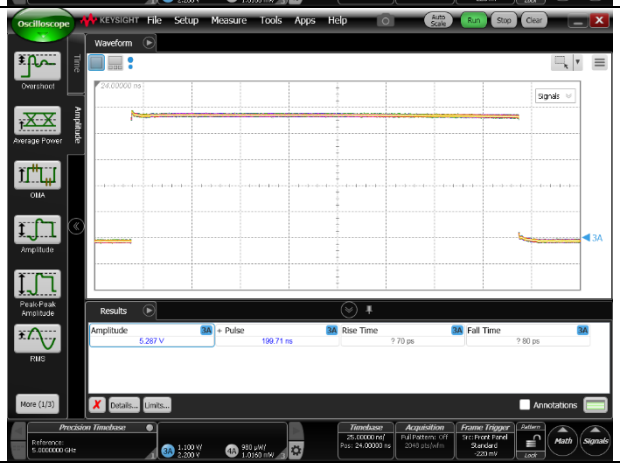
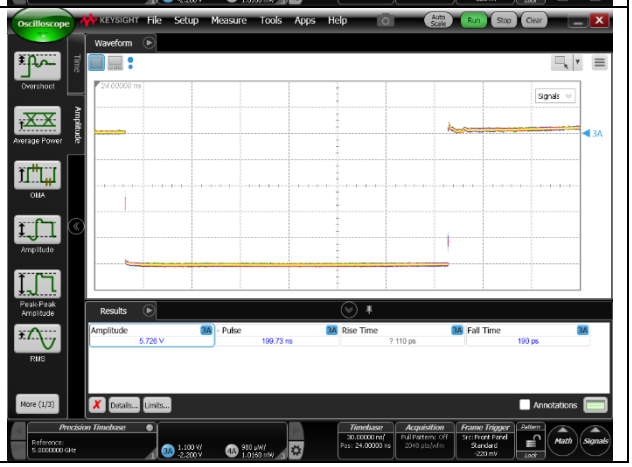
Output pulse 10 ns		
Output pulse 100 ns		
Output pulse 200 ns		

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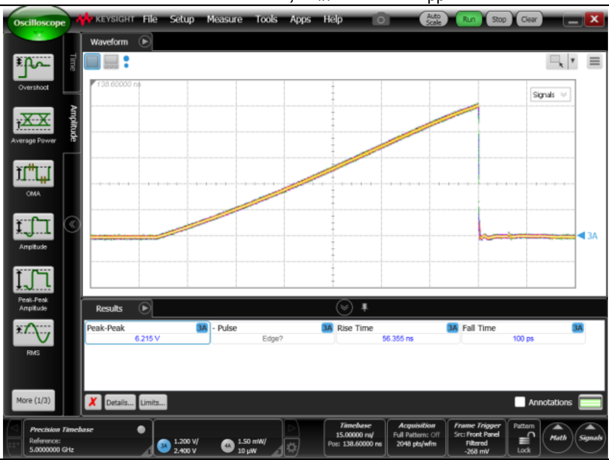
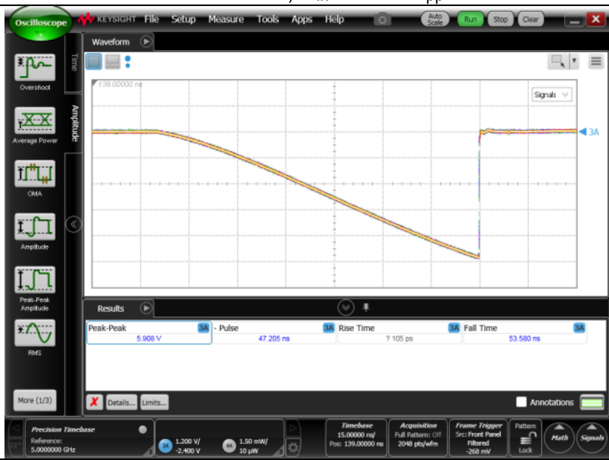
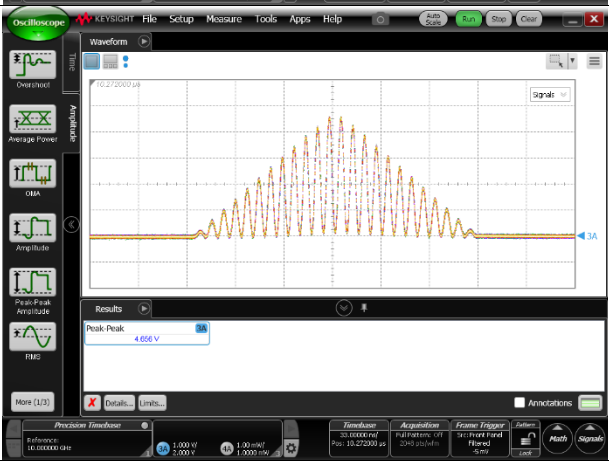
Linear operation (Pulse mode, Pulse shaping, V_{IN} < 0.12 V_{pp}):

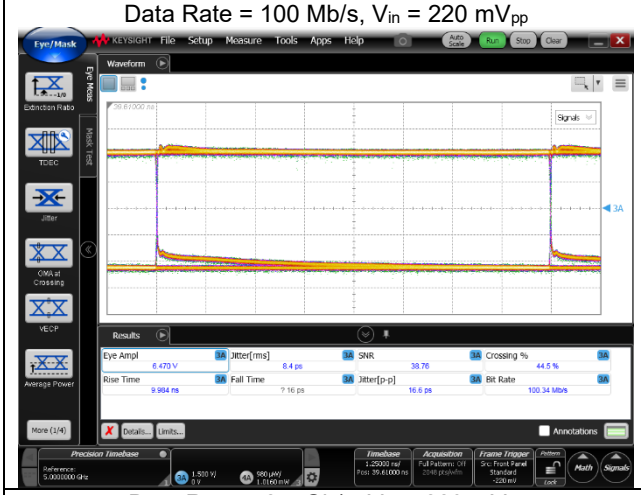
	Pulse ⏌⎿, V_{in} ~ 90 mV_{pp}	Pulse ⎿⏌, V_{in} ~ 90 mV_{pp}
Ramp		
Exponential		
Pulse Train with Triangle envelope		

Digital measurement:

Test conditions: Output Amplitude = 45, Gain = 30, Crosspoint = 55.

12V, 280mA

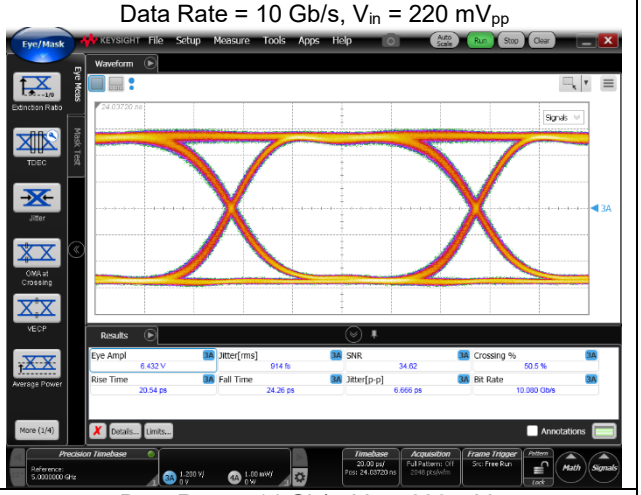
Data Rate = 100 Mb/s, V_{in} = 220 mV_{pp}



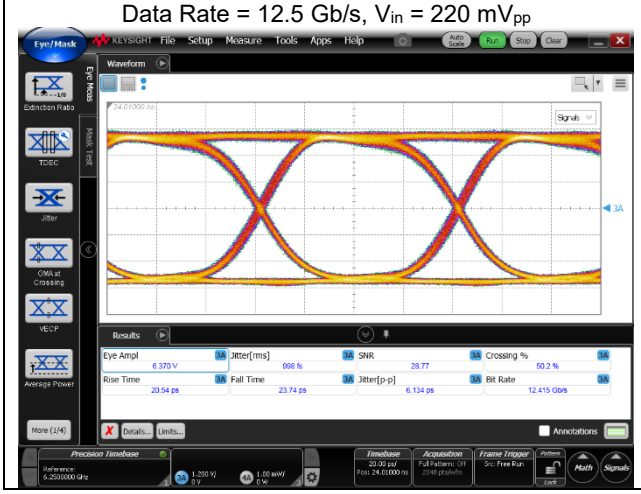
Data Rate = 1 Gb/s, V_{in} = 220 mV_{pp}

Data Rate = 2.5 Gb/s, V_{in} = 220 mV_{pp}

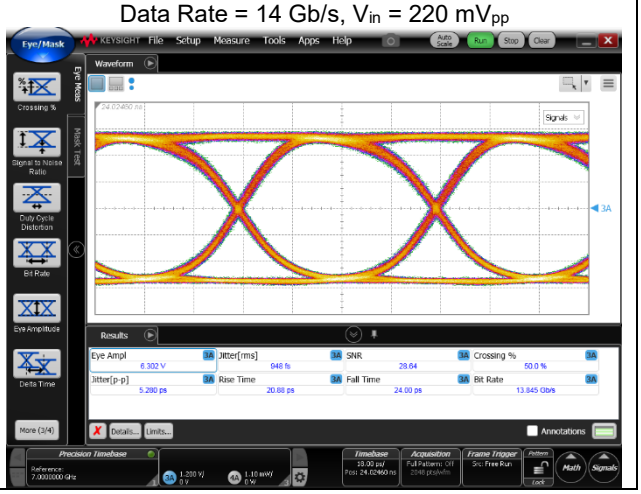
Data Rate = 10 Gb/s, V_{in} = 220 mV_{pp}



Data Rate = 12.5 Gb/s, V_{in} = 220 mV_{pp}



Data Rate = 14 Gb/s, V_{in} = 220 mV_{pp}



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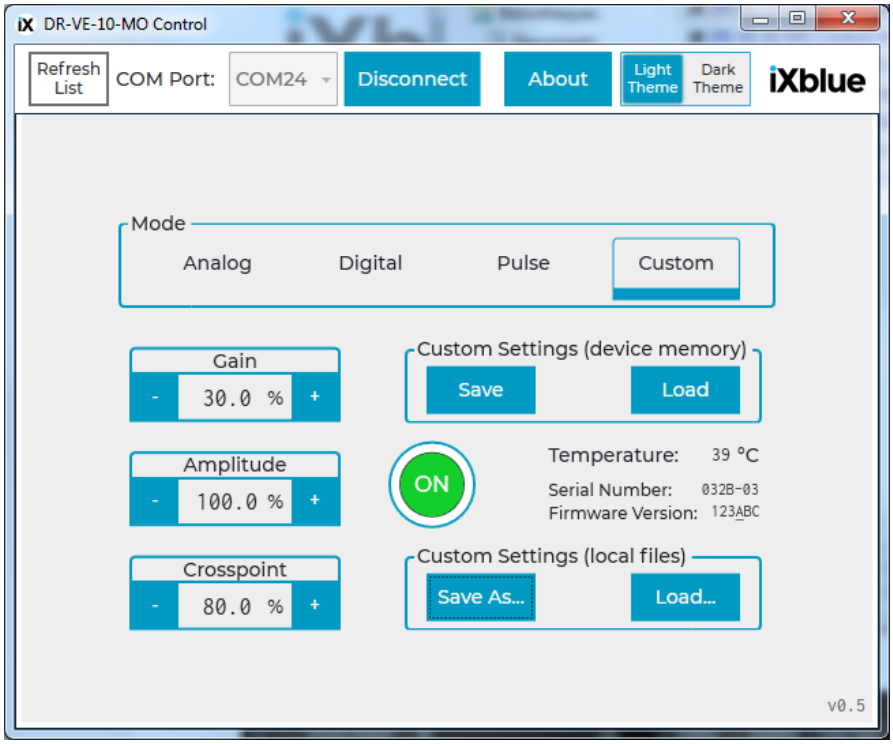
Driver Control Application:



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