

G4 Pulsed Fiber Laser Specification

20 W, Air-cooled EP-Z Laser

Part Number	Beam Type	Optical Connector	Optical Cable Length	Visible Pilot Laser
SP-020P-A-EP-Z-A-Y	Divergent, collimator accessories available	ILLK	2 m	Yes (Class 3R)
SP-020P-A-EP-Z-A-N	Divergent, collimator accessories available	ILLK	2 m	No
SP-020P-A-EP-Z-B-Y	Divergent, collimator accessories available	ILLK	3 m	Yes (Class 3R)
SP-020P-A-EP-Z-B-N	Divergent, collimator accessories available	ILLK	3 m	No
SP-020P-A-EP-Z-F-Y	Collimated, beam diameter 7.5 mm	ILOC	3 m	Yes (Class 1)



G4 Laser with ILLK (type A1)



G4 Laser with ILOC (type A4)

Laser Characteristics

All parameters specified for waveform 0 at rated power, PRF₀ (pulse repetition frequency providing maximum pulse energy at rated power) and over full operating temperature range, unless otherwise stated.

Parameter	Unit	SP-020P-A-EP-Z-[AB]-[NY]	SP-020P-A-EP-Z-F-Y
Rated average output power	W	20	
Output power stability	% p-p	< 5	
Maximum pulse energy	mJ	> 1.0	
Maximum peak power	kW	> 10	
Pulse duration range (see pulse waveform table)	ns	3 - 500	
Pulse-to-Pulse energy stability (at stable temperature)	% rms	< 3	
Pulse repetition frequency range (PRF)	kHz	1 - 1000	
CW mode		YES	
Central emission wavelength, λ_0	nm	1059 - 1065	
Emission bandwidth	nm	< 10	
Fraction of power within $\lambda_0 \pm 20$ nm	%	> 80	
M ² (averaged over x, y axes)		≤ 1.6	
Collimated beam diameter, 2 nd moment	mm	n/a	6.0 - 9.0
Full angle divergence / collimated divergence, 2 nd moment	mrad	80 - 120	≤ 0.5
Beam offset	mm	≤ 0.1	≤ 1
Pointing error	mrad	≤ 10	≤ 2.15
Circularity	%	> 90	> 85
Astigmatism	Z _R	< 0.3	
Degree of polarization	%	< 20	

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Related Documents

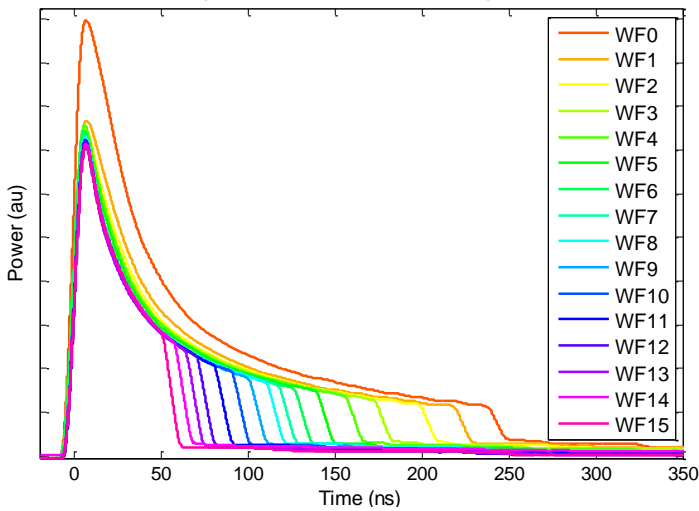
Document Number	Description
SM-S00227	OEM Safety and System Integration Manual: Modules Type A1, A4
SM-S00360	V8 Control Interface Manual
SM-S00220	G4 Accessories (including beam collimator options)

Pulse Waveform Table

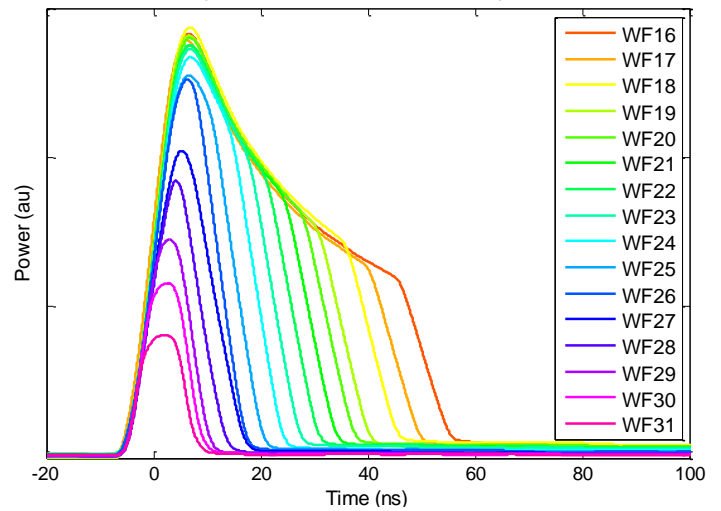
Waveform	PRF ₀ (kHz)	PRF _{max} (kHz)	Max. pulse energy, E _{max} (mJ)	Typ. FWHM pulse duration at E _{max} (ns)	Pulse duration at 10% (ns)	Typ. peak power at E _{max} (kW)
0	20	1000	1.00	40	241	14
1	25	1000	0.80	35	221	14
2	27	1000	0.74	33	202	14
3	29	1000	0.70	31	177	14
4	30	1000	0.67	29	161	14
5	32	1000	0.63	28	144	14
6	34	1000	0.60	27	131	14
7	36	1000	0.56	25	118	14
8	37	1000	0.54	26	113	14
9	39	1000	0.52	26	103	14
10	41	1000	0.49	26	100	14
11	43	1000	0.47	27	90	14
12	45	1000	0.44	26	80	14
13	48	1000	0.42	27	65	13
14	51	1000	0.39	27	58	13
15	54	1000	0.37	27	60	13
16	57	1000	0.35	27	55	14
17	61	1000	0.33	27	50	13
18	65	1000	0.31	15	45	13
19	70	1000	0.29	27	40	14
20	76	1000	0.26	15	36	13
21	83	1000	0.24	28	33	13
22	90	1000	0.22	25	30	13
23	100	1000	0.20	22	26	13
24	115	1000	0.19	19	23	12
25	140	1000	0.16	16	20	12
26	170	1000	0.13	12	16	11
27	215	1000	0.09	12	13	10
28	290	1000	0.07	9	10	10
29	395	1000	0.05	5	7	11
30	500	1000	0.04	4	5	11
31	715	1000	0.03	3	3	11
32	20	900	1.00	62	220	13
33	20	900	1.00	66	245	12
34	20	800	1.00	70	270	12
35	20	600	1.00	78	320	10
36	20	600	1.00	81	350	10
37	20	600	1.00	85	390	9
38	20	500	1.00	90	440	8
39	20	500	1.00	95	490	8

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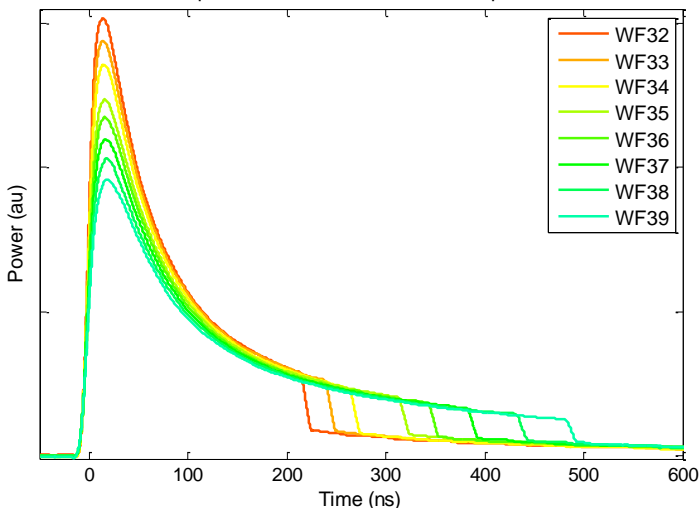
Pulse Shapes for Waveform 0 to 15 at Respective PRFO



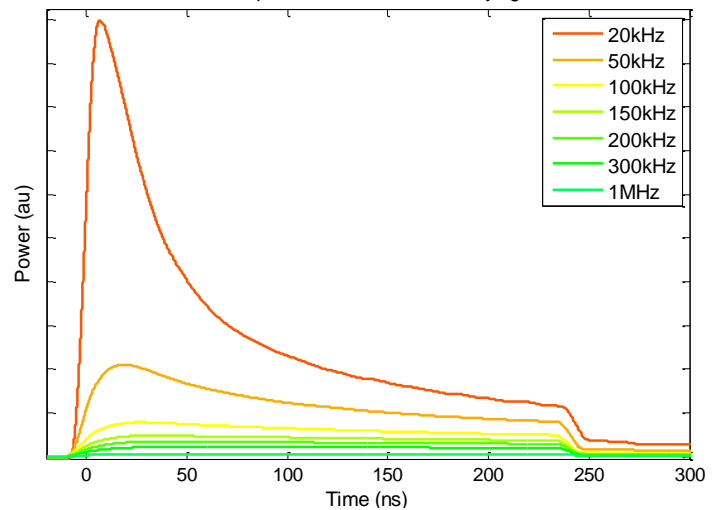
Pulse Shapes for Waveform 16 to 31 at Respective PRFO



Pulse Shapes for Waveform 32 to 39 at Respective PRFO




Pulse Shapes for Waveform 0 at Varying PRF



System Integration Details

Parameter	Unit	Range
Laser module type		A1, A4
Laser module dimensions	mm	347.2 x 201 x 95
Control interface version		V8
Power supply voltage	V DC	24 ± 2
Logic power supply requirement	W	50
Laser diode power supply requirement	W	200
Operating temperature range	°C	0 to +45
Storage temperature range	°C	-10 to +60

<p>INVISIBLE LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION CLASS 4 LASER DEVICE</p> <p>Wavelength 1040 – 1200 nm Pulsed output - Max average power < 60W Max pulse energy < 2.0mJ Repetition freq. 1–1000kHz Pulse duration 1ns – 500ns CW Output power < 60W IEC EN 60825-1:2014</p>	<p>Component for Incorporation</p> <p>This device is intended as a component for incorporation into a laser product, and as such requires additional features for Laser Safety and to comply with IEC EN 60825-1 and 21CFR1040.10</p>	<p>VISIBLE LASER RADIATION AVOID DIRECT EYE EXPOSURE CLASS 3R LASER DEVICE (ALIGNMENT PURPOSES ONLY)</p> <p>Wavelength 630-670nm OUTPUT < 5mW CW IEC EN 60825-1:2014</p> 
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