

9.0 μ m High-Power Benchtop FP-QCL

Mid-Infrared Quantum Cascade Laser

QCL9000FP (Benchtop Light Source)



- **Product Description**

The MP-QCL-9000-FP-400-B high-power desktop FP-QCL mid-infrared quantum cascade laser is a mid-infrared testing laser developed by

Idealphotonics in the first half of 2019. Its low loss in the atmospheric window makes it suitable for space optical communication testing and research. Our desktop light source offers high power and does not require ITAR review, making it an excellent choice for commercial mid-infrared testing light sources. With a tunable range of over 100nm and an output power greater than 400mW, it meets the industrial testing needs of our customers. Our laser features built-in ZnSe collimation for stable output power, with superior temperature and wavelength stability, far surpassing the stability of traditional high-power quantum cascade lasers by several orders of magnitude

- **Product features**

High power、 Compact structure、 Software intelligent control、 Built-in FPGA

- **Part Number**

MP-QCL-9000-FP-400-B

- **Application area**

Mid-infrared test light source、 Mid-infrared device analysis

● Core parameters

Wavelength	Output Power	Spectral Width
9.0um	400mW	3nm

● General Parameters

Parameters

Parameters	Unit	Technical Specification		
		Min.	Typ.	Max.
Output Power 1	mW	350	-	500
Peak Operating Wavelength 2	um	8.9	9.0	9.1
Spectral Width (FWHM)	nm	-	3	-
Output Side-Mode Suppression Ratio (SMSR)	dB	30	-	-
M ² Factor			<1.2	
Output Beam Divergence Angle	Mrad		<2	
Output Isolation	dB	-	30	-
Wavelength Temperature Coefficient	nm/°C		0.6	
Wavelength Current Coefficient	nm/mA		0.2	

Output Power Stability (15 minutes) 4	%	-	±0.5	±1.0
Output Power Stability (8 h)	%	-	±1.0	±2.0
Output Power Adjustment Range	%	0	-	100
Output Power Control Mode		Software Control		
TEC Stability	°C	-	±0.1	±0.2
TEC Working Range	°C	0	30	50
Operating Voltage	VAC	100	220	240
Electrical Power Consumption: 5	W	-	-	2
Operating Temperature	°C	0	-	55
Storage Temperature	°C	-20	-	65
Dimensions	mm	343(L) × 193(W) × 180(H) Benchtop		

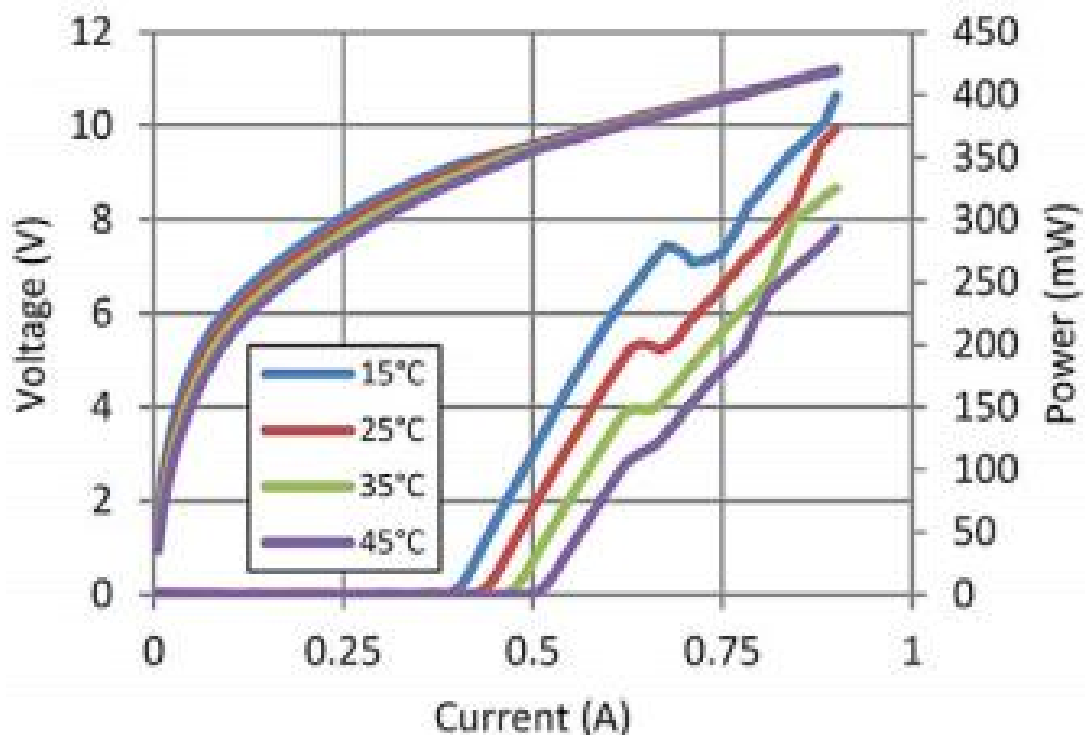
Technical Specification Notes:

1. Output power is selectable.
2. Peak operating wavelength is selectable.
3. Output power stability test conditions are at 25°C, with a 30-minute warm-up after powering on.

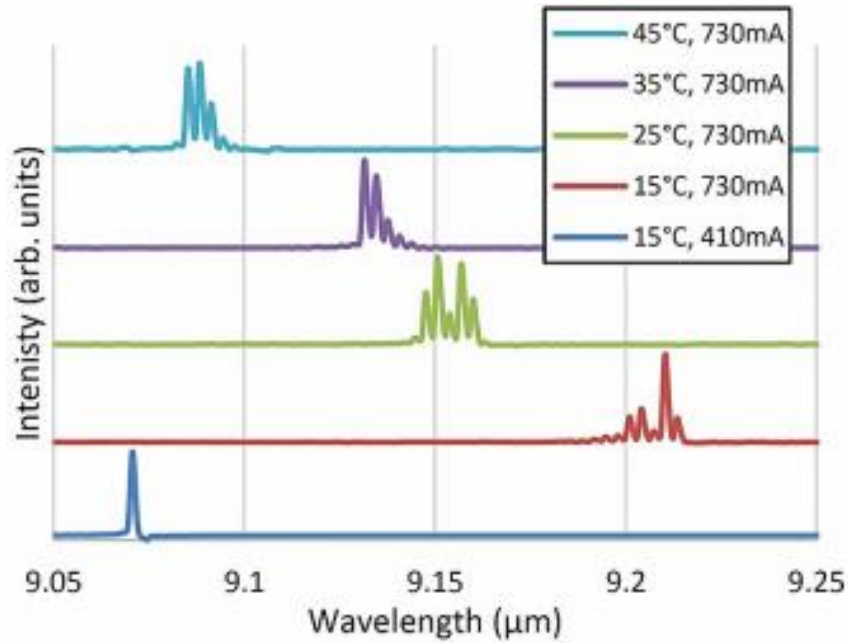
4. Maximum power consumption refers to the overall power consumption under extreme operating conditions.



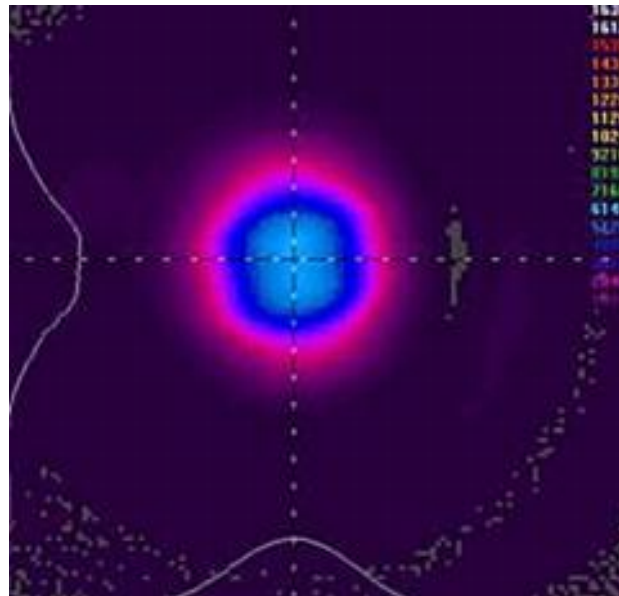
QCL Laser Characteristic Curve (Example for 9.0um Typical Wavelength) Output Power Characteristic Curve



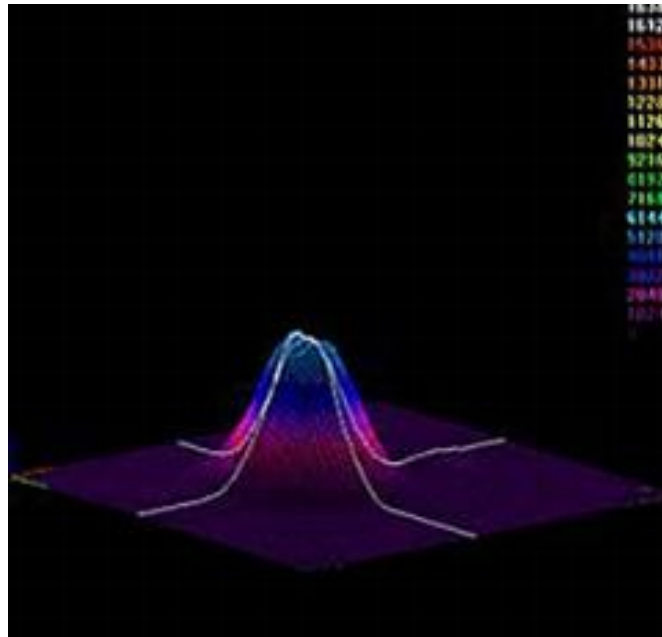
Laser Spectrum (Continuous)



Spot analysis



2-D Beam Profile at 1524.0 mm (60.0 in)



3-D Beam Profile at 1524.0 mm (60.0 in)

PN#/Ordering Info

MP-QCL- W□□□□ -☆-△-XX

W□□□□ : Wavelength

4000: 4000nm 4600: 4600nm 9000: 9000nm

☆: Collimated output

1: With

0: Without

△: Laser type

FP: QCL-FP

DFB: QCL-DFB

XX: Output power

001=1mw

010=10mw

400=400mw

1000=1000mw

CW Distributed Feedback (DFB) Quantum Cascade Laser

* Center wavelength measured at T = 15°C under continuous wave

* Center wavelength tuning range: +/- 0.03 μm

* Other center wavelengths are listed in the table +/- 100 nm We can provide screening services

* Other center wavelengths can be customized, minimum order quantity: 5 pieces

The wavelengths we can currently provide are as follows*

Wavele ngth(μ m)	Wave number (cm^{-1})	Outpu t power (mW)	Wavele ngth(μ m)	Wave number (cm^{-1})	Outpu t power (mW)	Wavele ngth(μ m)	Wave number (cm^{-1})	Outpu t power (mW)
4.22	2370	> 50	6.25	1600	> 100	9.38	1066	> 100

4.28	2336	> 50	7.15	1399	> 100	9.47	1056	> 150
4.32	2315	> 50	7.26	1377	> 100	9.49	1054	> 150
4.34	2304	> 50	7.32	1366	> 100	9.52	1050	> 200
4.45	2247	> 80	7.37	1357	> 100	9.56	1046	> 200
4.48	2232	> 80	7.43	1346	> 150	9.63	1038	> 150
4.53	2208	> 150	7.57	1321	> 150	9.66	1035	> 100
4.56	2193	> 150	7.61	1314	> 150	9.68	1033	> 100
4.59	2179	> 150	7.75	1290	> 300	9.72	1029	> 100
4.61	2169	> 100	7.78	1285	> 300	9.95	1005	> 100
4.72	2119	> 100	7.80	1282	> 300	10.24	977	> 150
5.18	1931	> 150	7.82	1279	> 300	10.26	975	> 150
5.26	1901	> 150	7.85	1274	> 300	10.28	973	> 150
5.66	1767	> 300	8.01	1248	> 100	10.32	969	> 150
5.73	1745	> 150	8.28	1208	> 200	10.36	965	> 150
6.13	1631	> 150	9.02	1109	> 100	10.54	949	> 100
6.15	1626	> 150	9.05	1105	> 100	10.60	943	> 80
6.18	1618	> 100	9.26	1080	> 100	10.63	941	> 80

Pulsed Distributed Feedback (DFB) Quantum cascade lasers

Wav elen gth(μm)	Wav e num ber(cm^{-1})	Out put po wer (m W)	Wav elen gth(μm)	Wav e num ber(cm^{-1})	Out put po wer (m W)	Wav elen gth(μm)	Wav e num ber(cm^{-1})	Out put po wer (m W)	Wav elen gth(μm)	Wav e num ber(cm^{-1})	Out put po wer (m W)
3.39 9	2942	4.45 3	2245	5.19 3	192 5	6.13 5	1629	7.78 8	1284	9.48 9	105 3
3.40 2	2939	4.45 7	2243	5.21 4	191 7	6.14 3	1627	7.79 5	1282	9.50 9	105 1
3.45	2898	4.46 1	2241	5.22 4	191 4	6.15 3	1625	7.80 9	1280	9.52 9	104 9
3.45 1	2897	4.46 5	2239	5.23 3	191 0	6.15 6	1624	7.81 9	1278	9.54 4	104 7
3.47 7	2876	4.47 1	2236	5.24	190 8	6.17	1620	7.83 1	1276	9.58 6	104 3
3.48	2873	4.47 5	2234	5.24 4	190 6	6.17 7	1618	7.85 7	1272	9.59 8	104 1

3.49 7	2859	4.47 9	2232	5.25	190 4	6.21 4	1609	7.86 9	1270	9.62 3	103 9
3.51 9	2841	4.48 3	2230	5.25 5	190 2	6.22 5	1606	7.88 7	1267	9.63 4	103 7
3.53 6	2828	4.48 5	2229	5.26 1	190 0	6.22 8	1605	7.90 6	1264	9.65 5	103 5
3.53 8	2826	4.48 9	2227	5.26 4	189 9	6.24 2	1602	7.93 3	1260	9.67 2	103 3
3.54 6	2820	4.49 2	2226	5.26 6	189 8	6.24 3	1601	7.98 6	1252	9.69 2	103 1
3.54 9	2817	4.49 8	2223	5.27 2	189 6	6.25 8	1597	7.99 8	1250	9.72	102 8
3.56 6	2804	4.50 1	2221	5.27 9	189 4	6.26 2	1596	8.01 6	1247	9.74 4	102 6
3.56 8	2802	4.50 6	2219	5.28 9	189 0	7.14 8	1398	8.02 6	1245	9.90 3	100 9
3.60 5	2773	4.50 9	2217	5.29 4	188 8	7.16 4	1395	8.05 4	1241	9.92 1	100 7
3.60 7	2772	4.51 3	2215	5.30 4	188 5	7.17 6	1393	8.10 1	1234	9.94 3	100 5

3.65 5	2735	4.51 7	2213	5.30 6	188 4	7.18 5	1391	8.16 3	1225	9.96 4	100 3
3.72 4	2685	4.52 1	2211	5.45 2	183 4	7.19 5	1389	8.22	1216	9.98 3	100 1
4.18 4	2390	4.52 5	2209	5.48 6	182 2	7.20 5	1387	8.24 2	1213	10.0 01	999
4.18 5	2389	4.52 9	2207	5.52 3	181 0	7.21 7	1385	8.25 2	1211	10.0 29	997
4.18 8	2387	4.53 4	2205	5.55 7	179 9	7.22 9	1383	8.26 5	1209	10.0 42	995
4.19 4	2384	4.53 8	2203	5.59 2	178 8	7.25 8	1377	8.28 2	1207	10.0 63	993
4.19 7	2382	4.54 3	2201	5.61 2	178 1	7.26 8	1375	8.29 2	1205	10.1 9	981
4.2	2380	4.54 5	2200	5.62 6	177 7	7.28 5	1372	8.30 1	1204	10.2 06	979
4.20 4	2378	4.55	2197	5.63 2	177 5	7.28 9	1371	8.32 6	1201	10.2 38	976
4.20 7	2376	4.55 4	2195	5.63 9	177 3	7.32 7	1364	8.33 5	1199	10.2 59	974

4.21 5	2372	4.56	2192	5.64 6	177 1	7.33 7	1362	8.35 2	1197	10.2 89	971
4.21 9	2370	4.56 5	2190	5.65 1	176 9	7.34 8	1360	8.38 6	1192	10.3 27	968
4.22 1	2369	4.56 9	2188	5.65 7	176 7	7.35 4	1359	8.90 2	1123	10.3 42	966
4.22 6	2366	4.57 4	2186	5.66 5	176 5	7.36 7	1357	8.94 8	1117	10.3 77	963
4.23 1	2363	4.57 7	2184	5.66 9	176 3	7.37 3	1356	9.00 4	1110	10.3 96	961