

4.0um High-Power Benchtop Mid-Infrared FP-QCL Quantum Cascade Laser MIR-QCL-W4000 (Benchtop Light Source)



- **Product Description**

The 4.0um high-power desktop FP-QCL quantum cascade laser is developed by Idealphotonics as a continuous-wave laser with relatively high output power. It provides several hundred milliwatts of collimated output power,

making it suitable for mid-infrared testing light source requirements. Additionally, the desktop FP-QCL laser module integrates a drive and temperature control module, and it can also be controlled via software to adjust the temperature and operating current of the laser. This ensures stable operation of the laser, maintaining the accuracy of the measurement results

● Product features

Low power consumption, high power、 High side-mode suppression ratio、
Software intelligent control、 Compact structure and size

● Part Number

MP-QCL-4000-FP-250-B

● Application area

Mid-infrared testing light source 、 Mid-infrared device analysis 、
Mid-infrared system light source

● Core parameters

Wavelength	Output Power	Spectral Width
4.0um	250mW	8nm

● General Parameters

Tuning characteristics

Parameters	Unit	Technical Specification		
		Min.	Typ.	Max.
Laser collimated output power	mW		250	280
Peak operating wavelength	um	4	4.05	4.1
Spectral width (FWHM)	nm		8	
Output side mode suppression ratio (SMSR)	dB	30		
Output isolation	dB		30	
Wavelength temperature coefficient	nm/°C		0.6	
Wavelength current coefficient	nm/mA		0.2	
Output power stability (8 hours)	%		±1	±4
Output power adjustable range	%	0		100
TEC (Thermoelectric cooler) operating range	°C	0		50



Operating voltage	VAC	100	220	240
Operating temperature	°C	0		55
Storage temperature	°C	-20		65
Dimensions	mm	343(L) × 193(W) × 180(H) Benchtop		

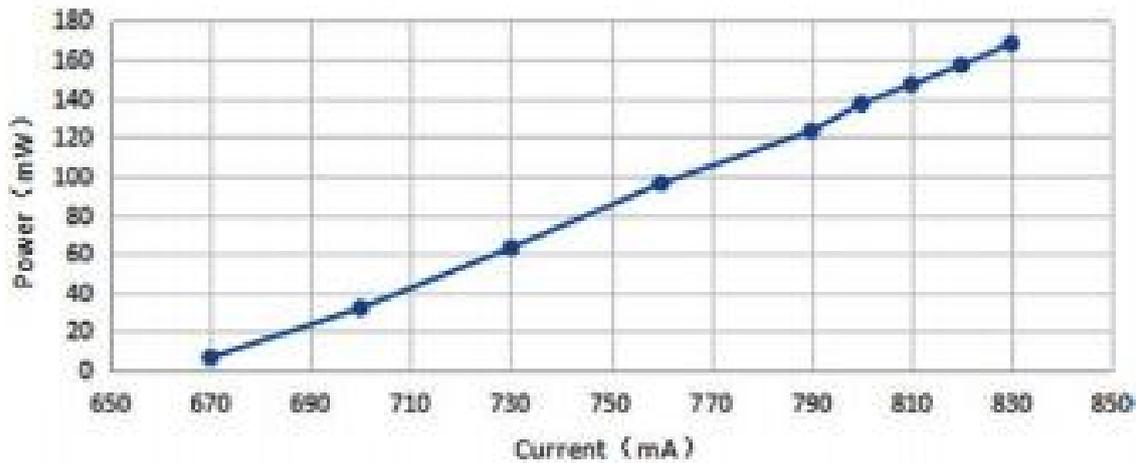
Technical Specification Explanation:

1. Output power is optional.
2. Peak operating wavelength is optional.
3. Output power stability test condition is 25°C, after 30 minutes of warm-up time post power-on.
4. Maximum power consumption refers to the overall power consumption under extreme operating conditions.
5. $I = 0.80 \text{ A}$, $V = 8.7 \text{ V}$, $T = 15^\circ\text{C}$, measured at $1/e^2$.

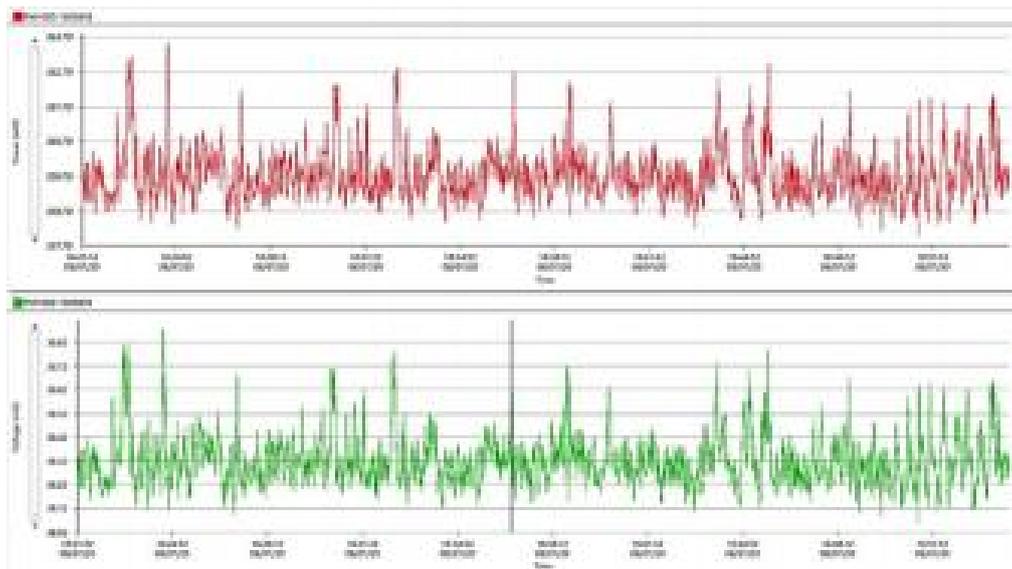


QCL Laser Characteristic Curve (Typical Wavelength 4.0um) Output Power Characteristic Curve

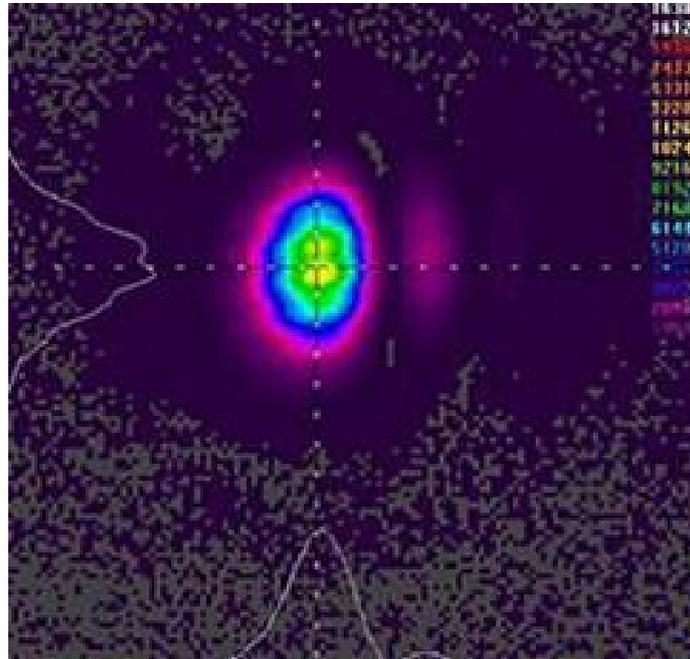
P-I tuning Curve



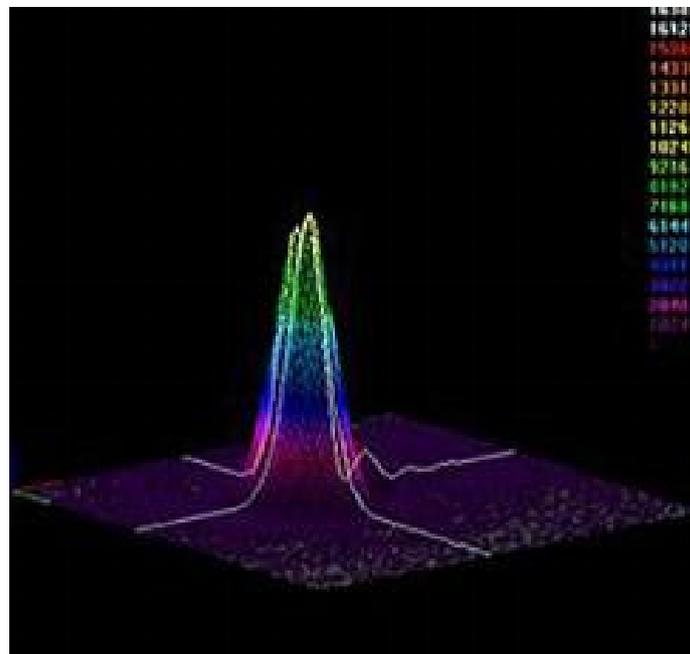
Power Stability of 4.0um FP-QCL Laser



Spot analysis

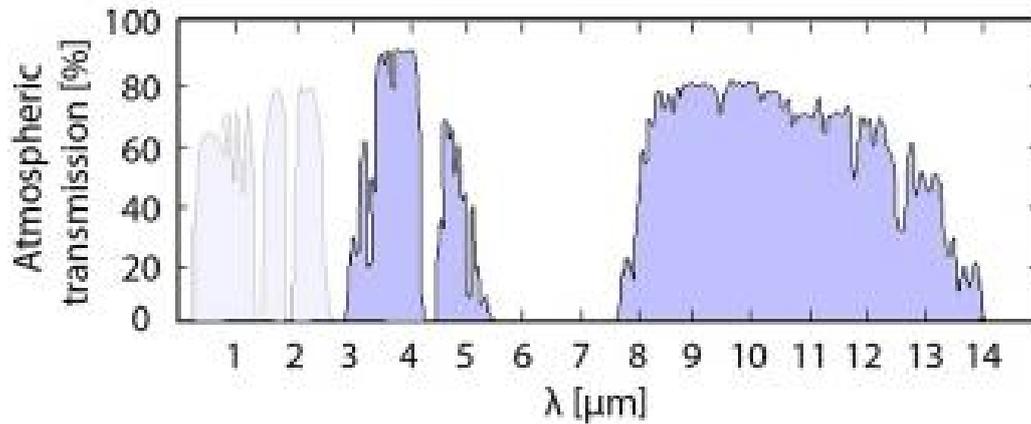


2-D Beam Profile at 1524.0 mm (60.0 in)



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

Mid-infrared atmospheric window



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

250=250mw

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 um

* 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

Wavelength(μm)	Wave number(cm ⁻¹)	Output power (mW)	Wavelength(μm)	Wave number(cm ⁻¹)	Output power (mW)	Wavelength(μm)	Wave number(cm ⁻¹)	Output power (mW)	Wavelength(μm)	Wave number(cm ⁻¹)	Output power (mW)
3.399	2942	4.453	2245	5.193	1925	6.135	1629	7.788	1284	9.489	1053
3.402	2939	4.457	2243	5.214	1917	6.143	1627	7.795	1282	9.509	1051
3.45	2898	4.461	2241	5.224	1914	6.153	1625	7.809	1280	9.529	1049
3.451	2897	4.465	2239	5.233	1910	6.156	1624	7.819	1278	9.544	1047
3.477	2876	4.471	2236	5.24	1908	6.17	1620	7.831	1276	9.586	1043



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 3	4.51 2215	5.30 188	7.17 1393	8.10 1234	9.94 100
3.65 5	2735 7	4.51 2213	5.30 188	7.18 1391	8.16 1225	9.96 100
3.72 4	2685 1	4.52 2211	5.45 183	7.19 1389	8.22 1216	9.98 100
4.18 4	2390 5	4.52 2209	5.48 182	7.20 1387	8.24 1213	10.0 999
4.18 5	2389 9	4.52 2207	5.52 181	7.21 1385	8.25 1211	10.0 997
4.18 8	2387 4	4.53 2205	5.55 179	7.22 1383	8.26 1209	10.0 995
4.19 4	2384 8	4.53 2203	5.59 178	7.25 1377	8.28 1207	10.0 993
4.19 7	2382 3	4.54 2201	5.61 178	7.26 1375	8.29 1205	10.1 981
4.2 4	2380 5	4.54 2200	5.62 177	7.28 1372	8.30 1204	10.2 979
4.20 4	2378 5	4.55 2197	5.63 177	7.28 1371	8.32 1201	10.2 976



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